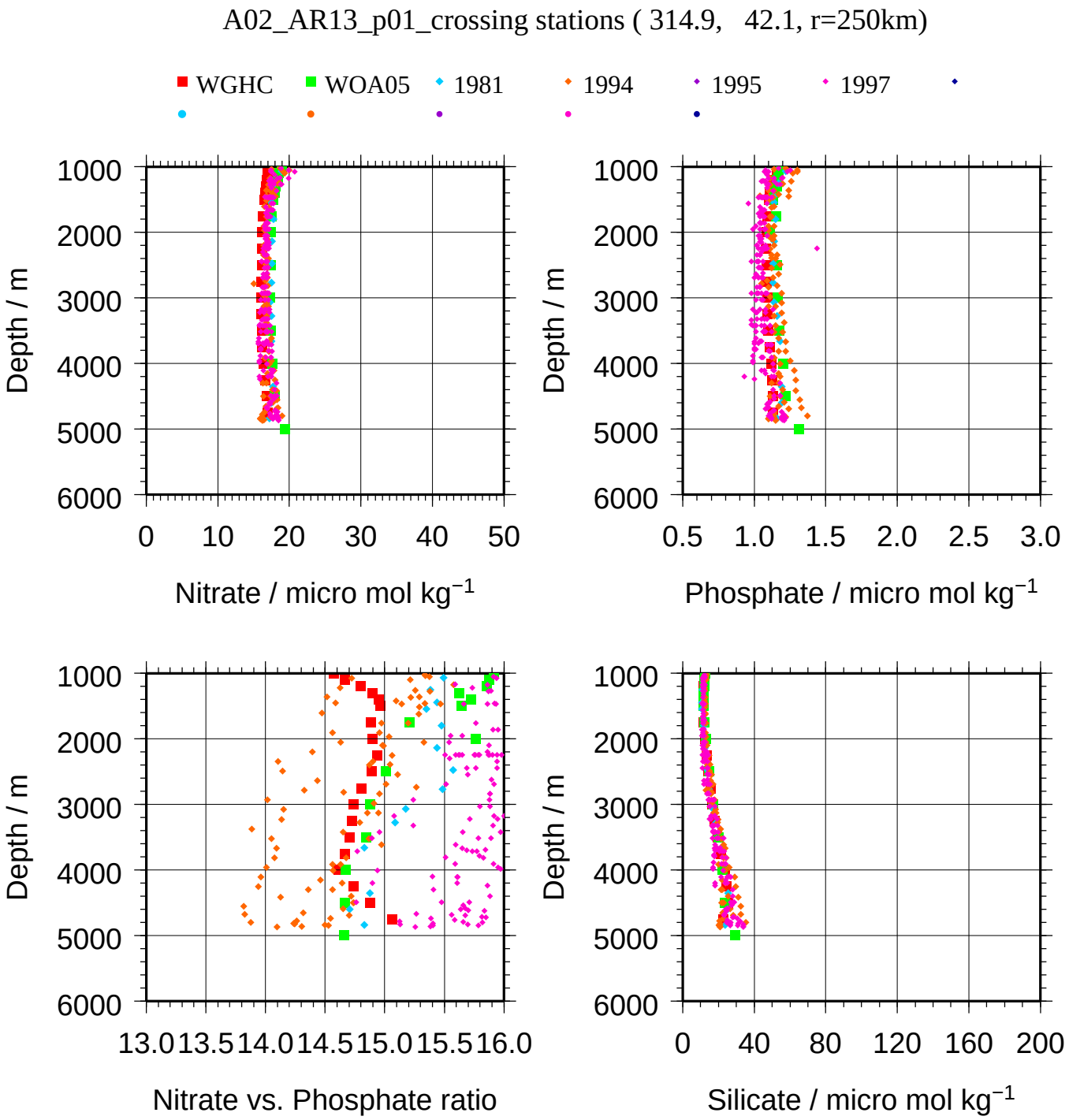
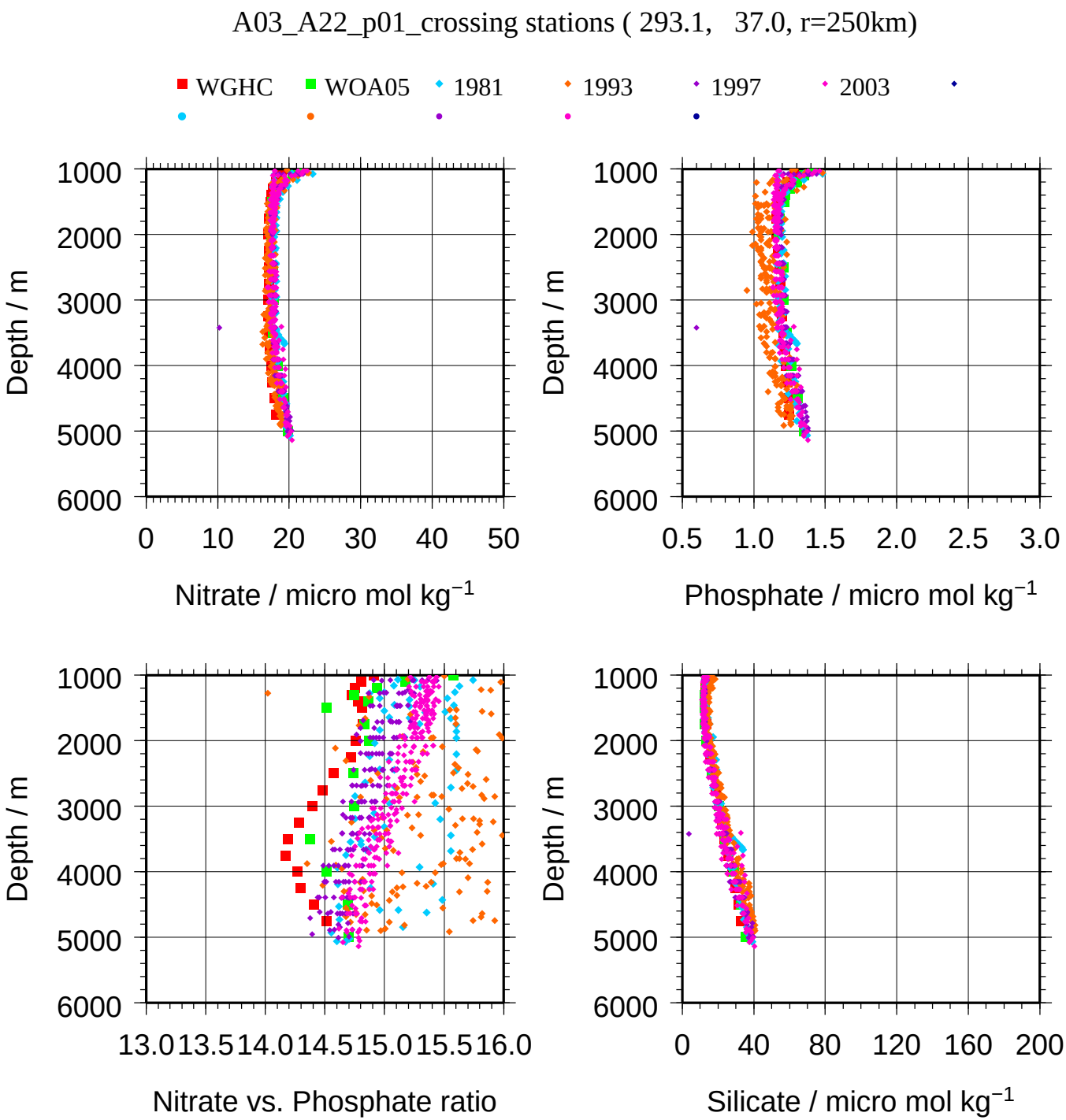
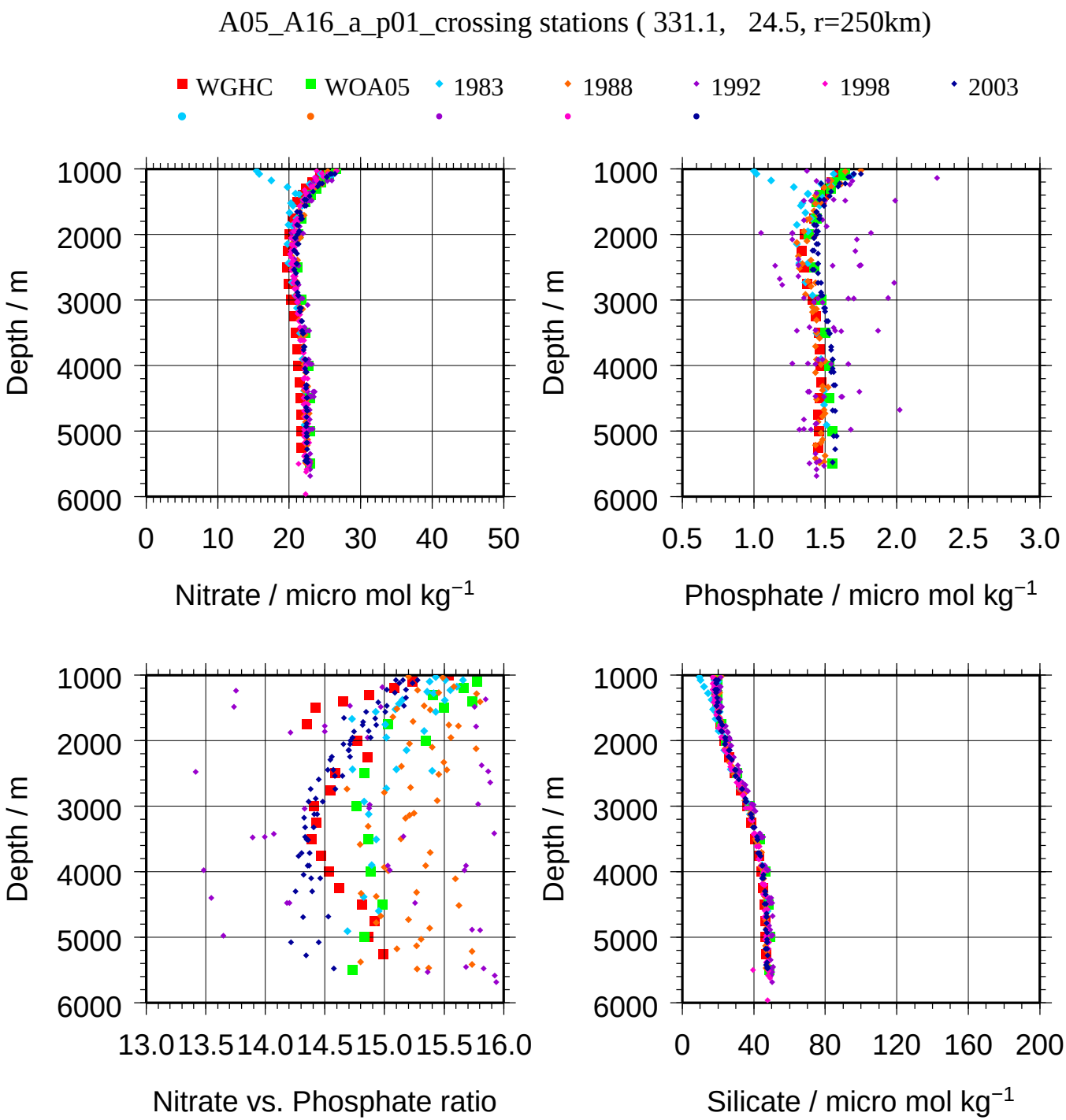
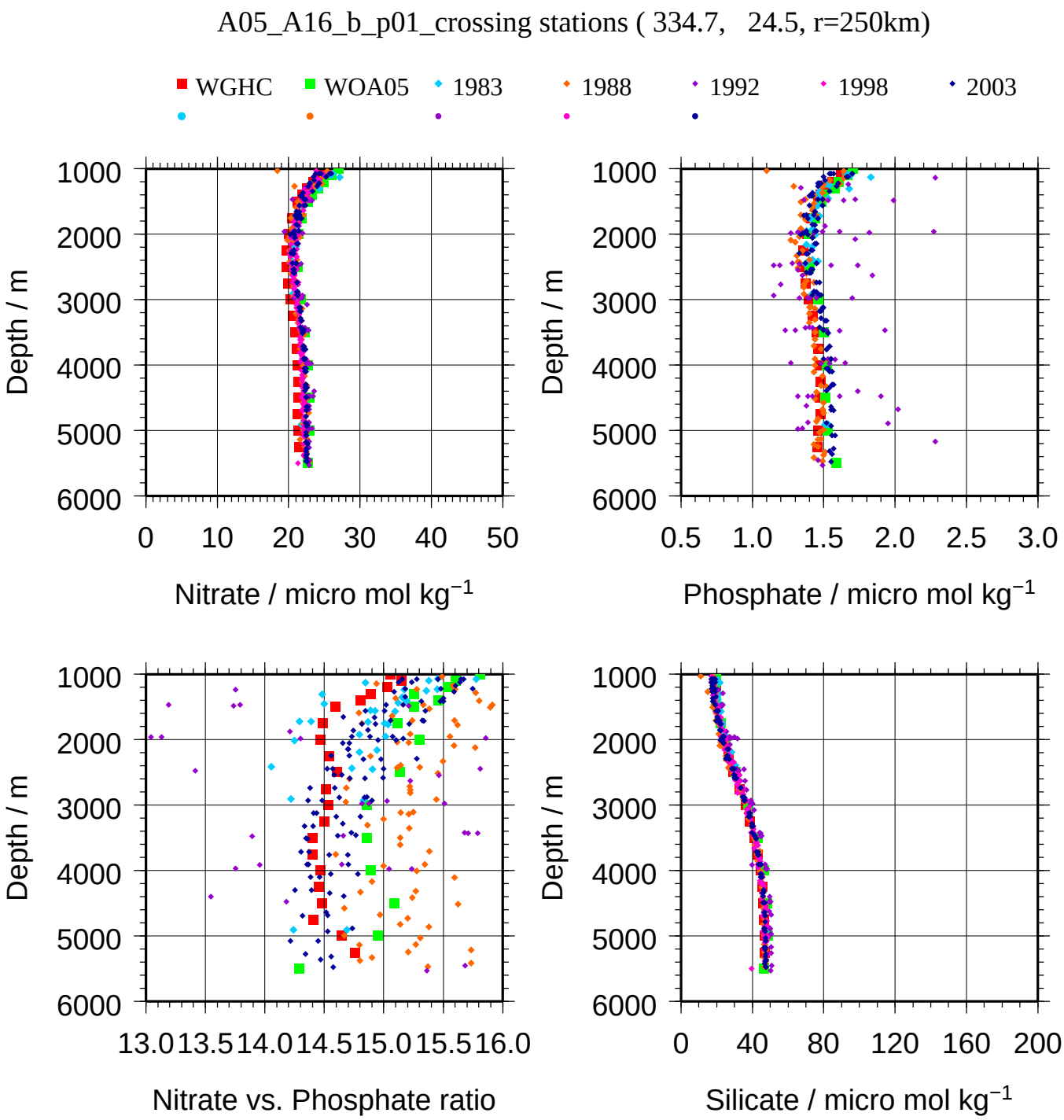
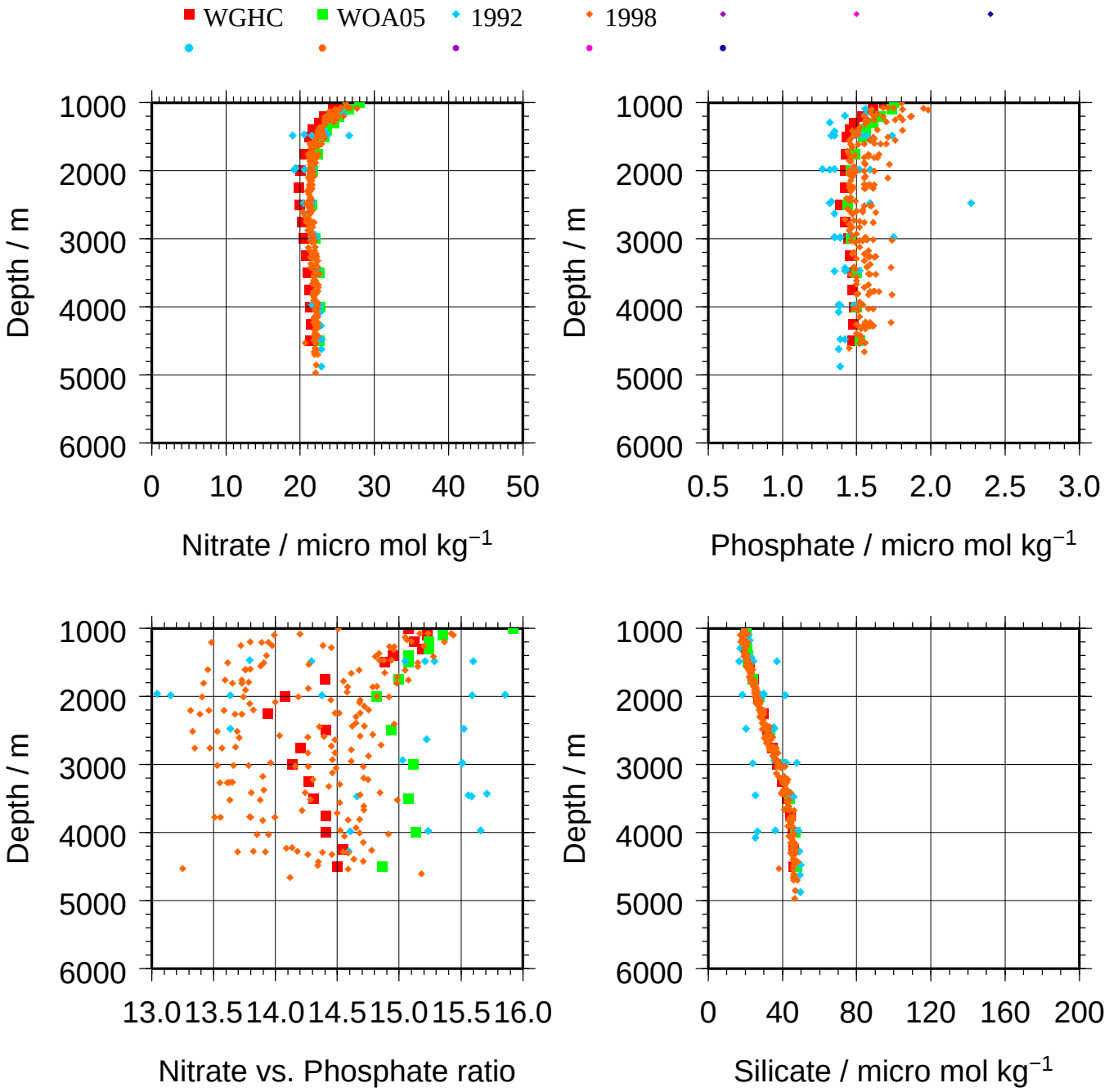

A02_AR13_p01_crossing stations (314.9, 42.1, r=250km)
WGHC
WOA05
1981
1994
1995
1997
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
80
120
160
200
Silicate / micro mol kg−1

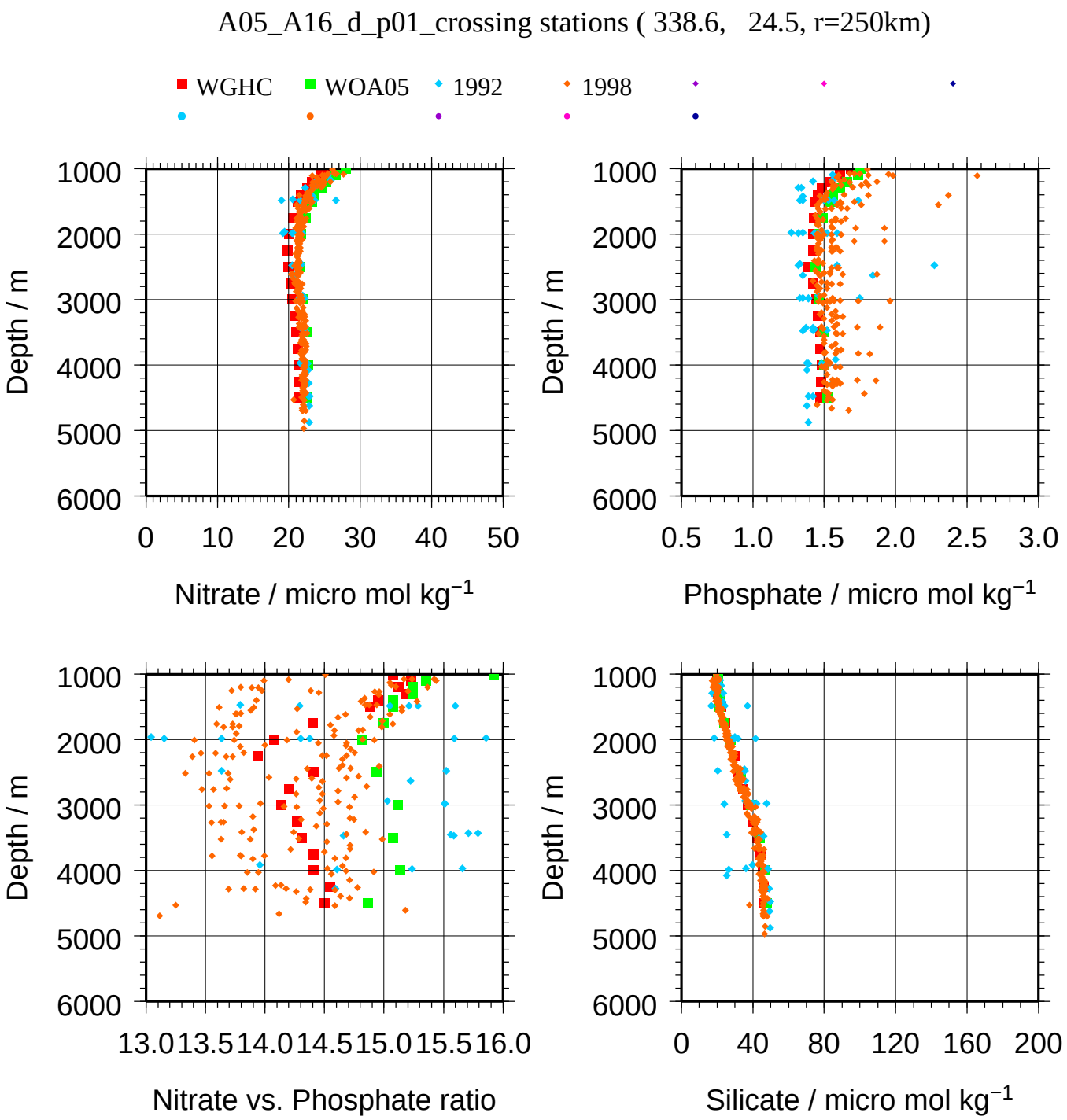

A03_A22_p01_crossing stations (293.1, 37.0, r=250km)
WGHC
WOA05
1981
1993
1997
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

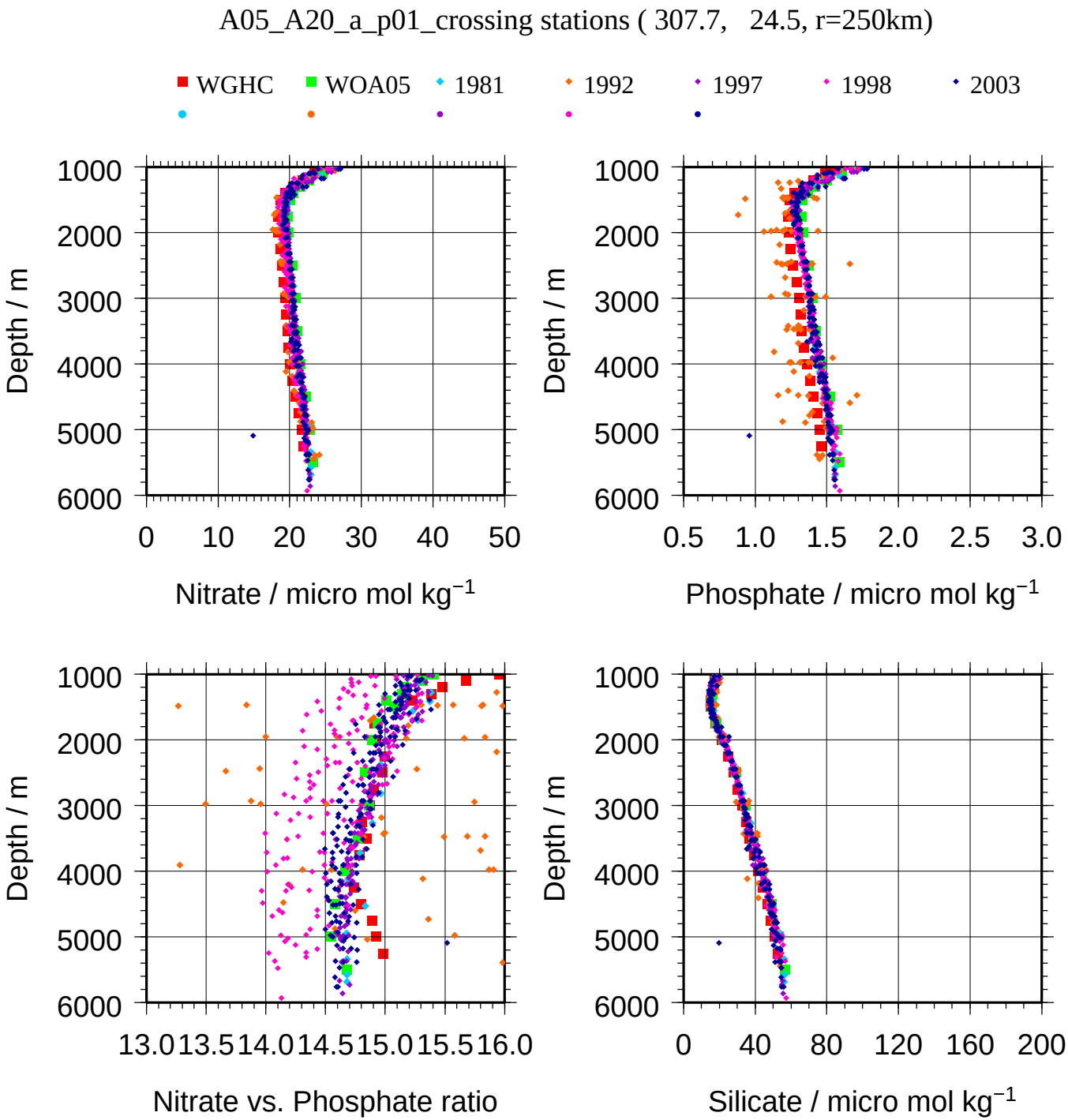

A05_A16_a_p01_crossing stations (331.1, 24.5, r=250km)
WGHC
WOA05
1983
1988
1992
1998
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
80
120
160
200
Silicate / micro mol kg−1

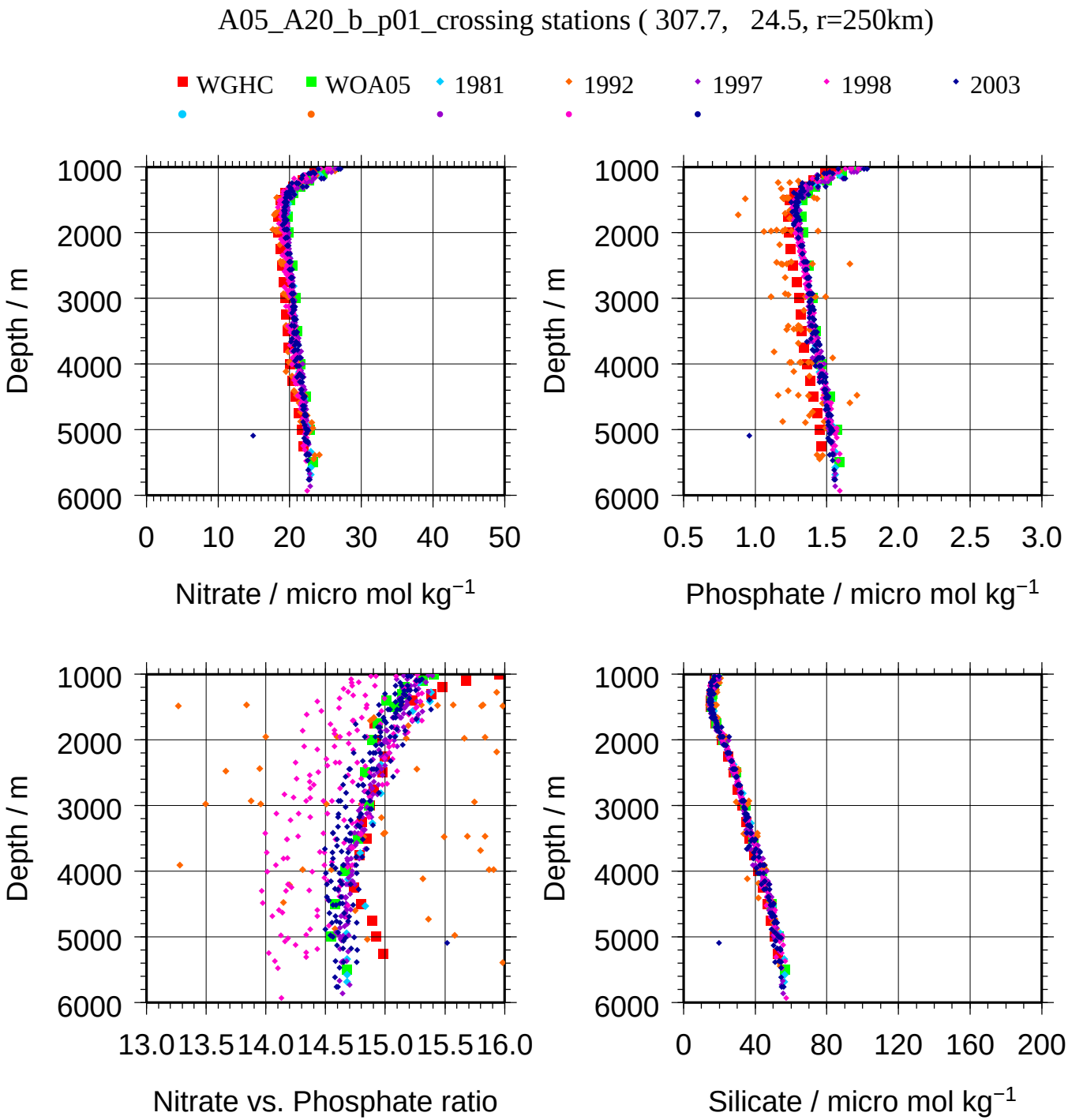

A05_A16_b_p01_crossing stations (334.7, 24.5, r=250km)
WGHC
WOA05
1983
1988
1992
1998
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

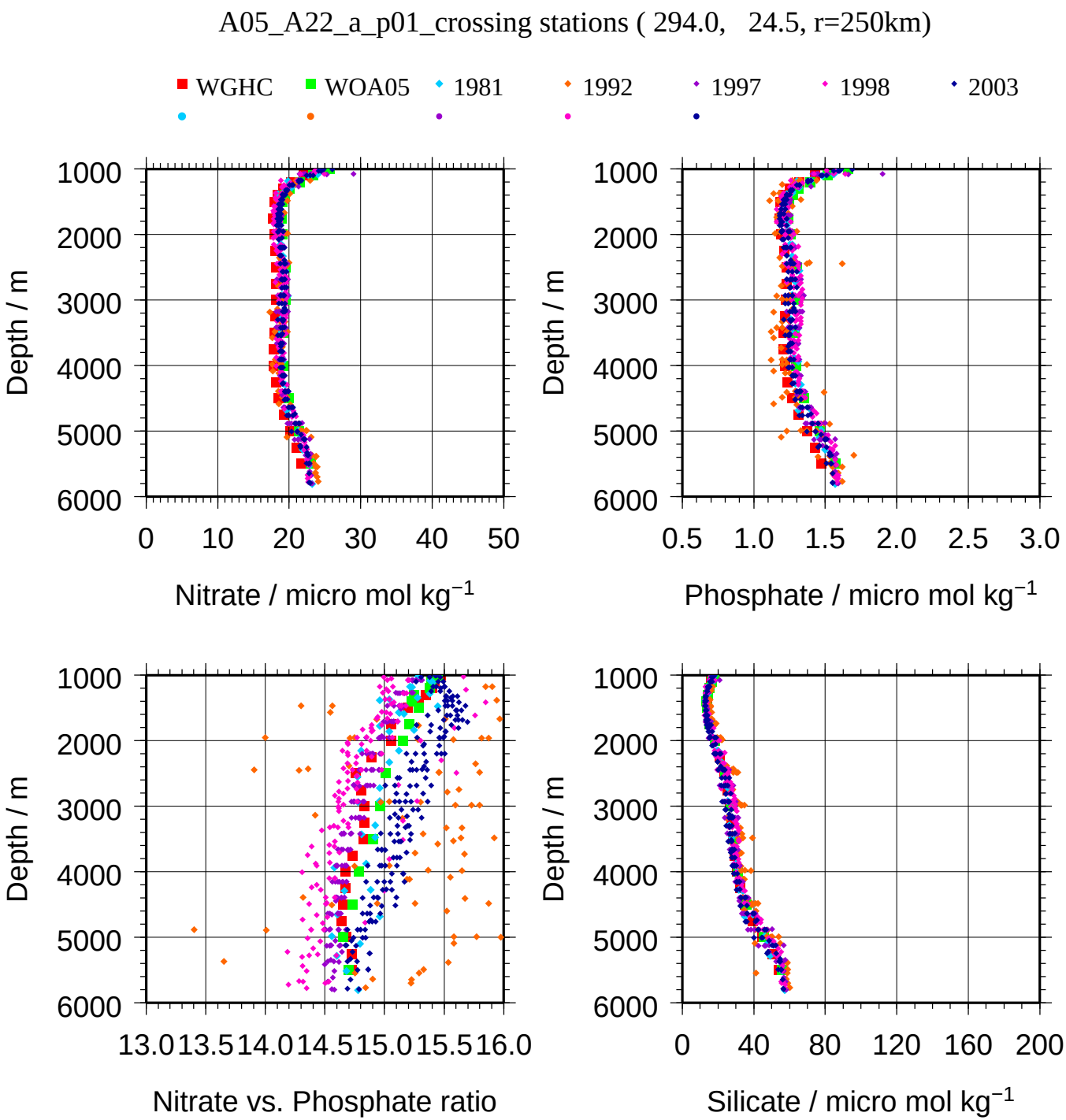
A05_A16_c_p01_crossing stations (338.8, 24.5, r=250km)

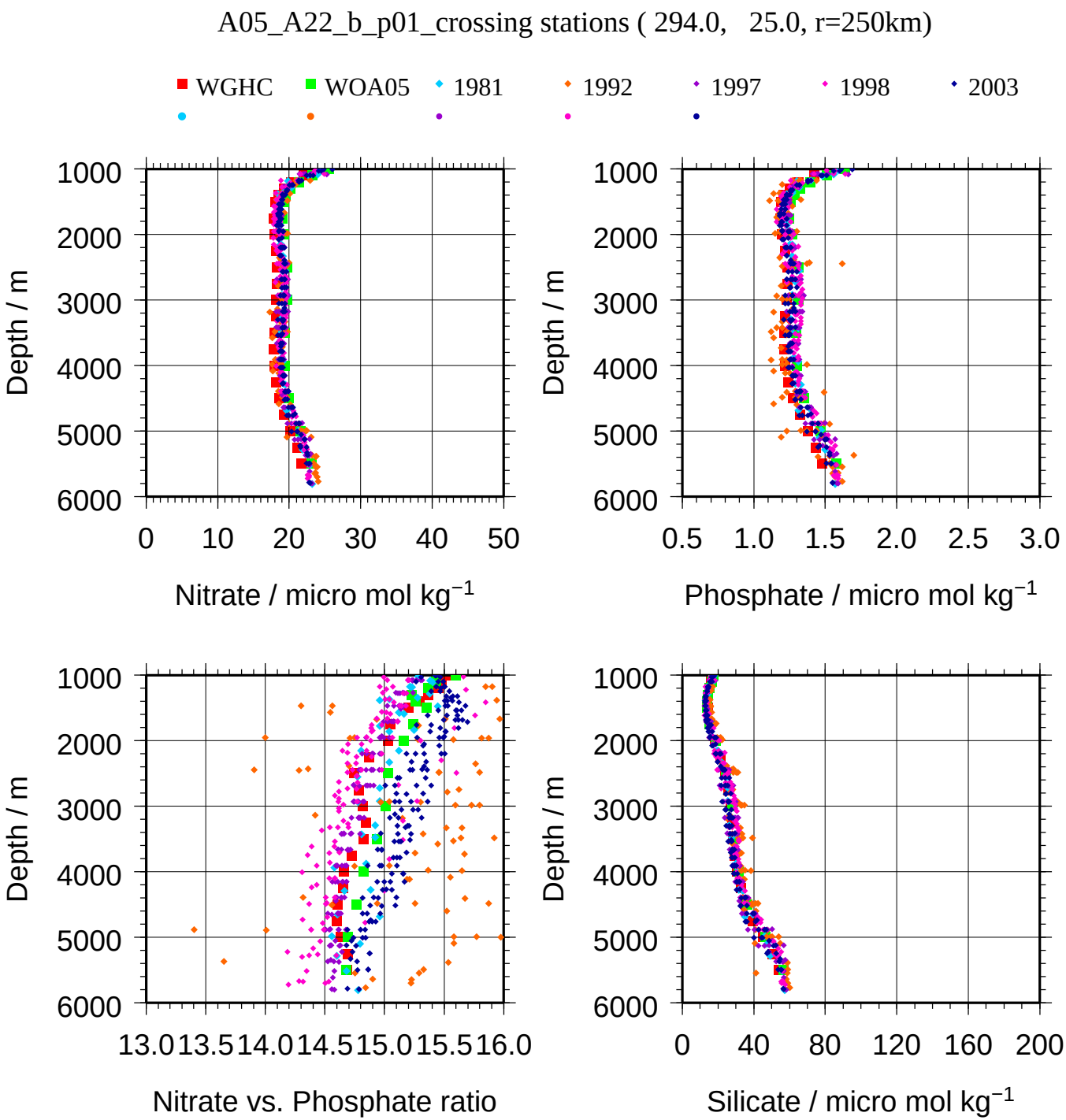


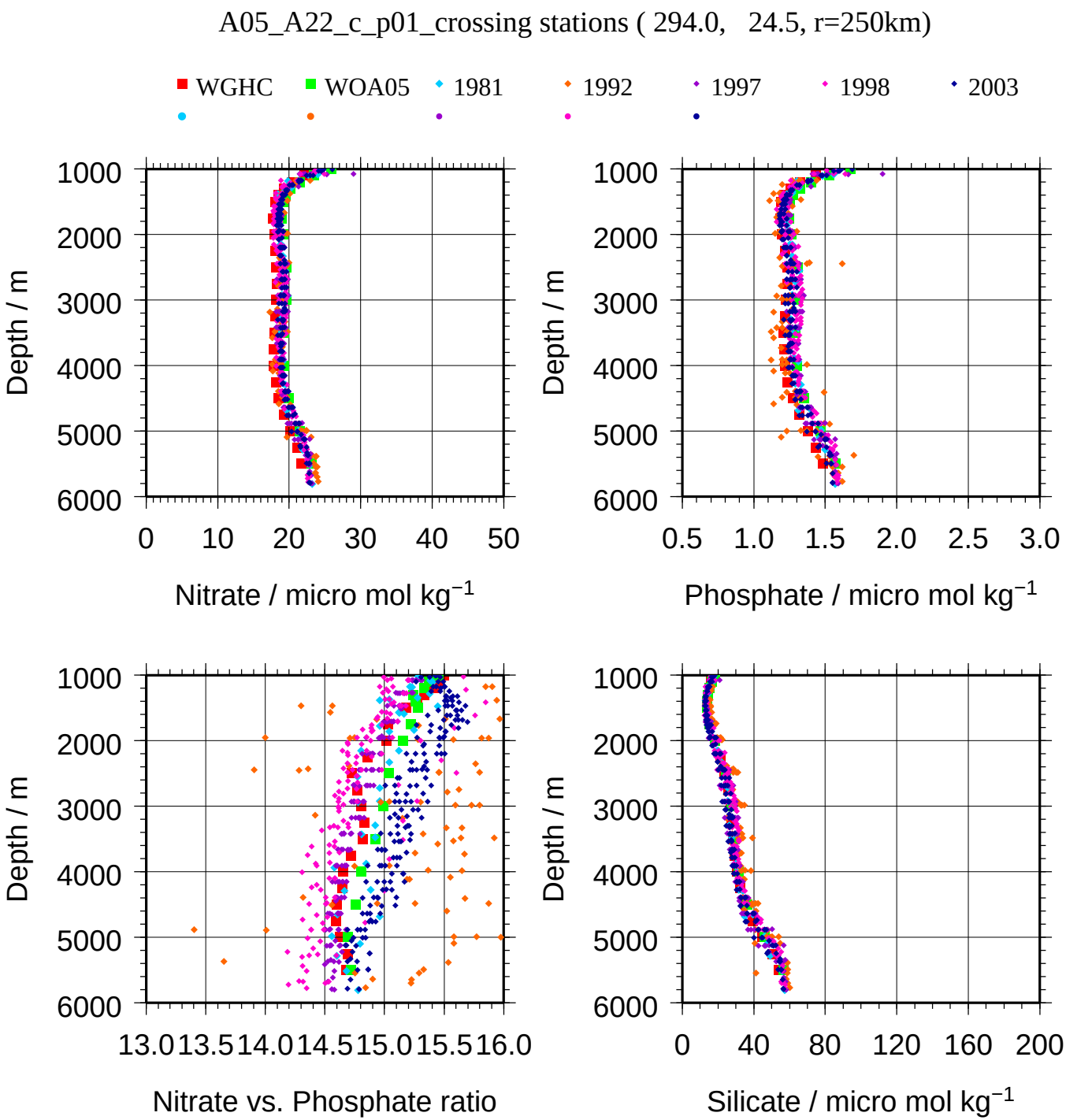

A05_A16_d_p01_crossing stations (338.6, 24.5, r=250km)
WGHC
WOA05
1992
1998
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

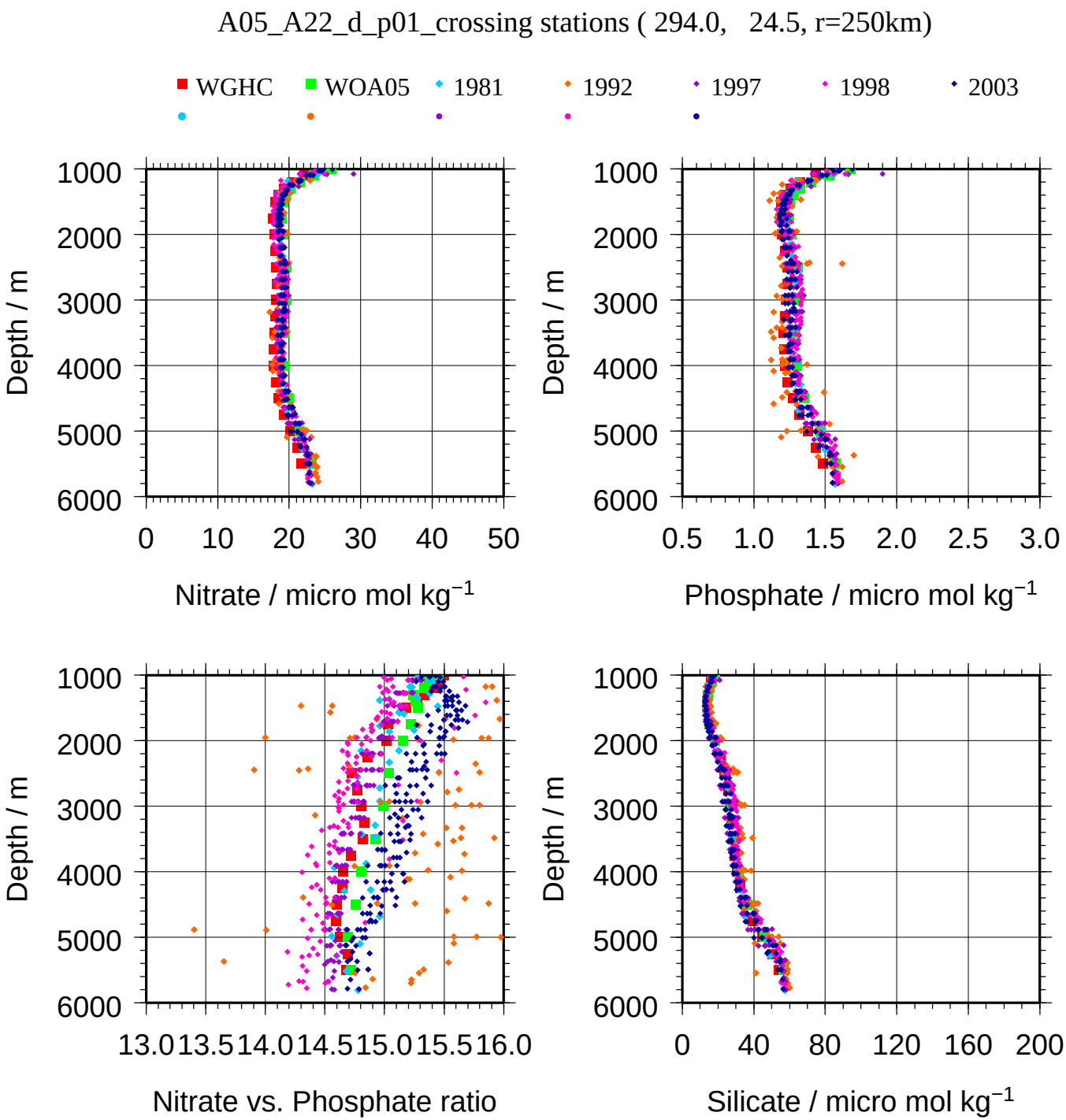

A05_A20_a_p01_crossing stations (307.7, 24.5, r=250km)
WGHC
WOA05
1981
1992
1997
1998
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

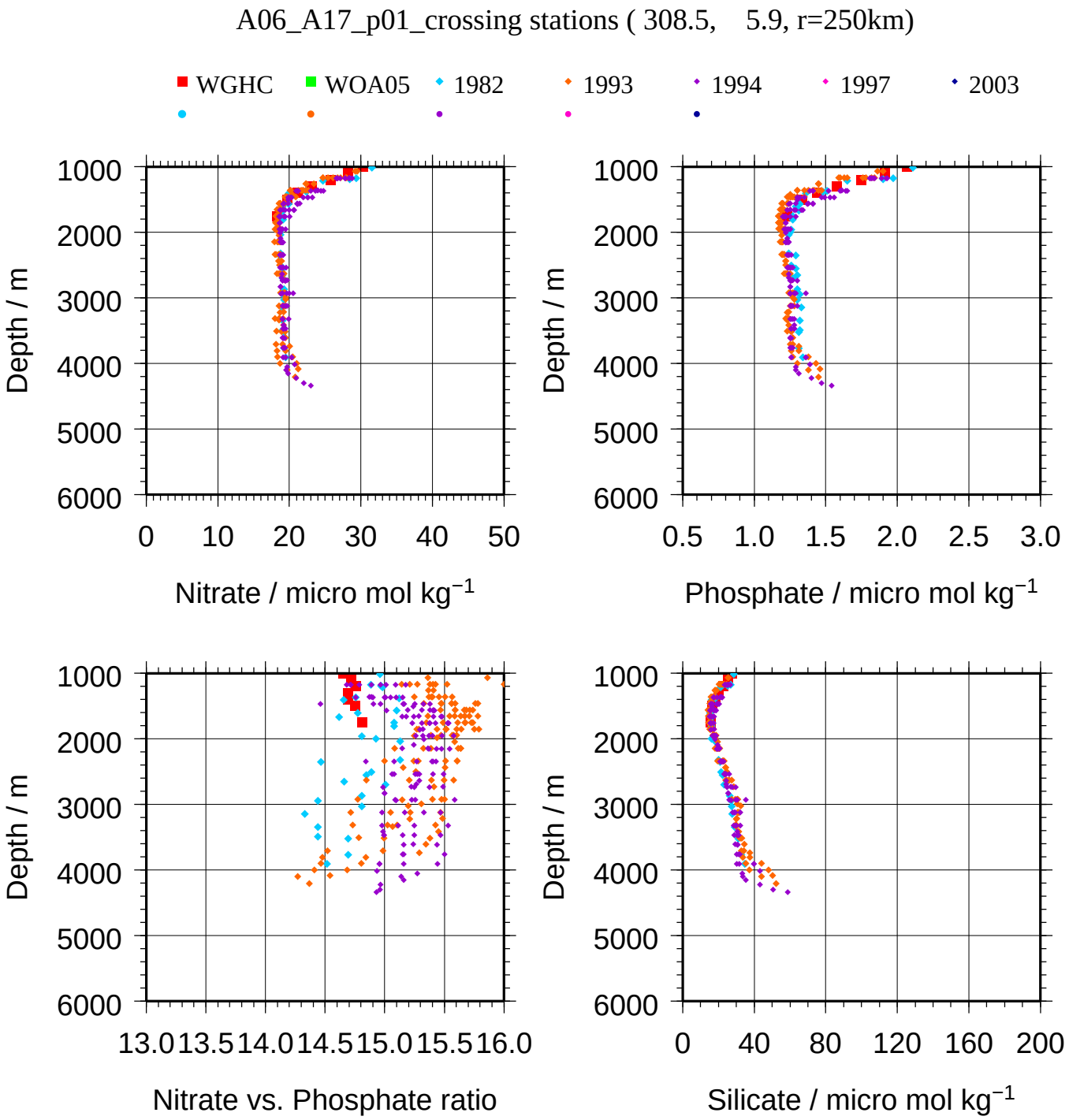

A05_A20_b_p01_crossing stations (307.7, 24.5, r=250km)
WGHC
WOA05
1981
1992
1997
1998
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
80
120
160
200
Silicate / micro mol kg−1

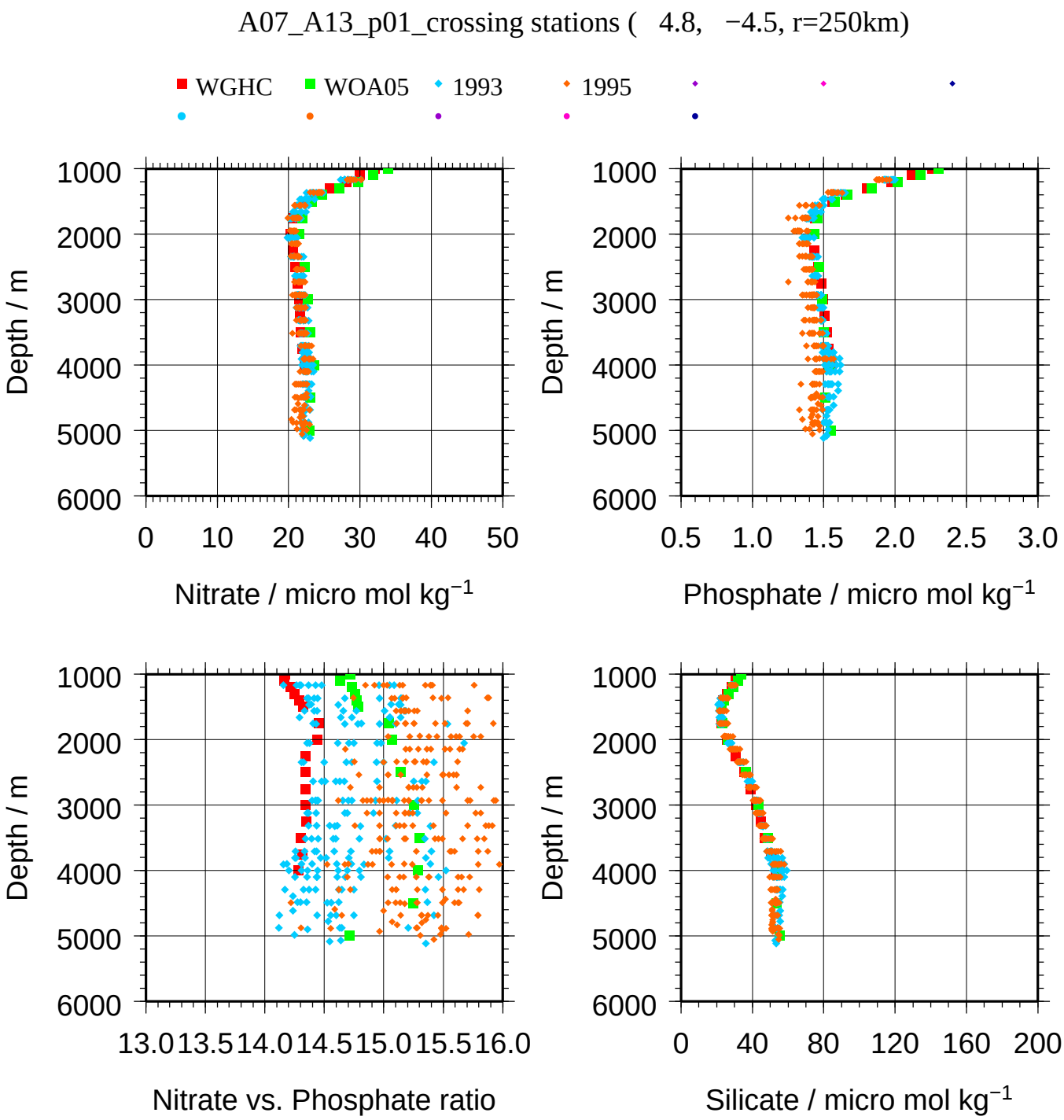

A05_A22_a_p01_crossing stations (294.0, 24.5, r=250km)
WGHC
WOA05
1981
1992
1997
1998
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
80
120
160
200
Silicate / micro mol kg−1

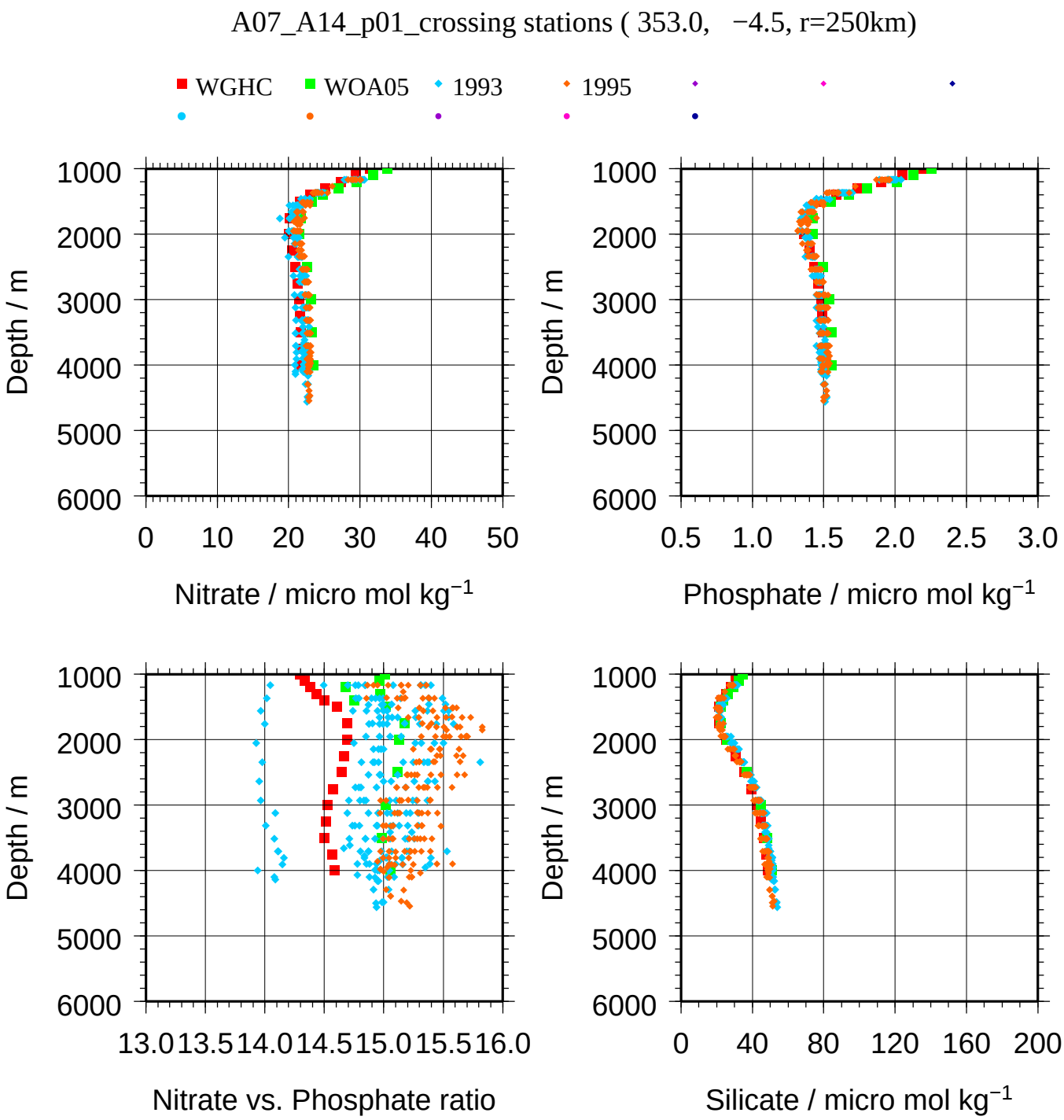

A05_A22_b_p01_crossing stations (294.0, 25.0, r=250km)
WGHC
WOA05
1981
1992
1997
1998
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

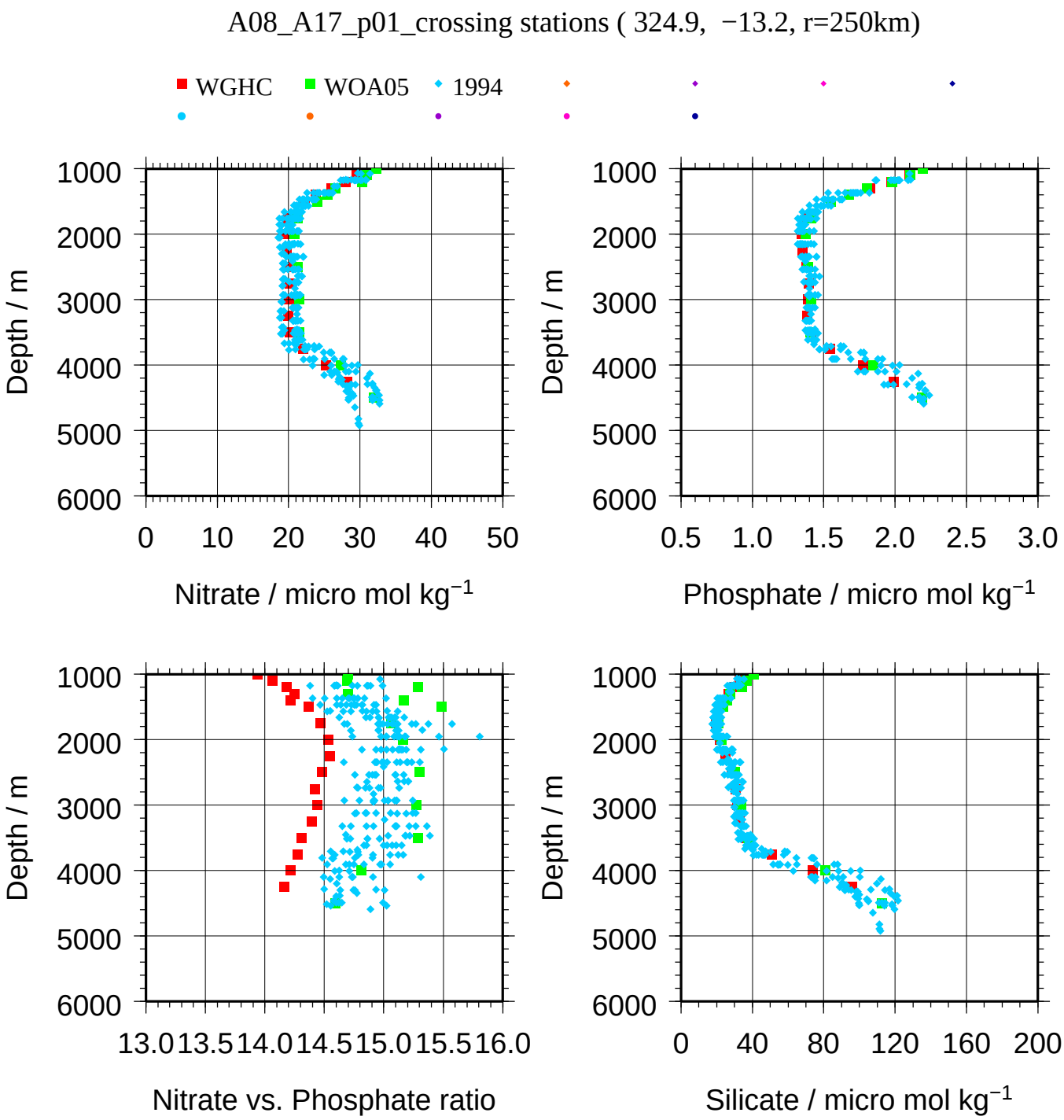

A05_A22_c_p01_crossing stations (294.0, 24.5, r=250km)
WGHC
WOA05
1981
1992
1997
1998
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

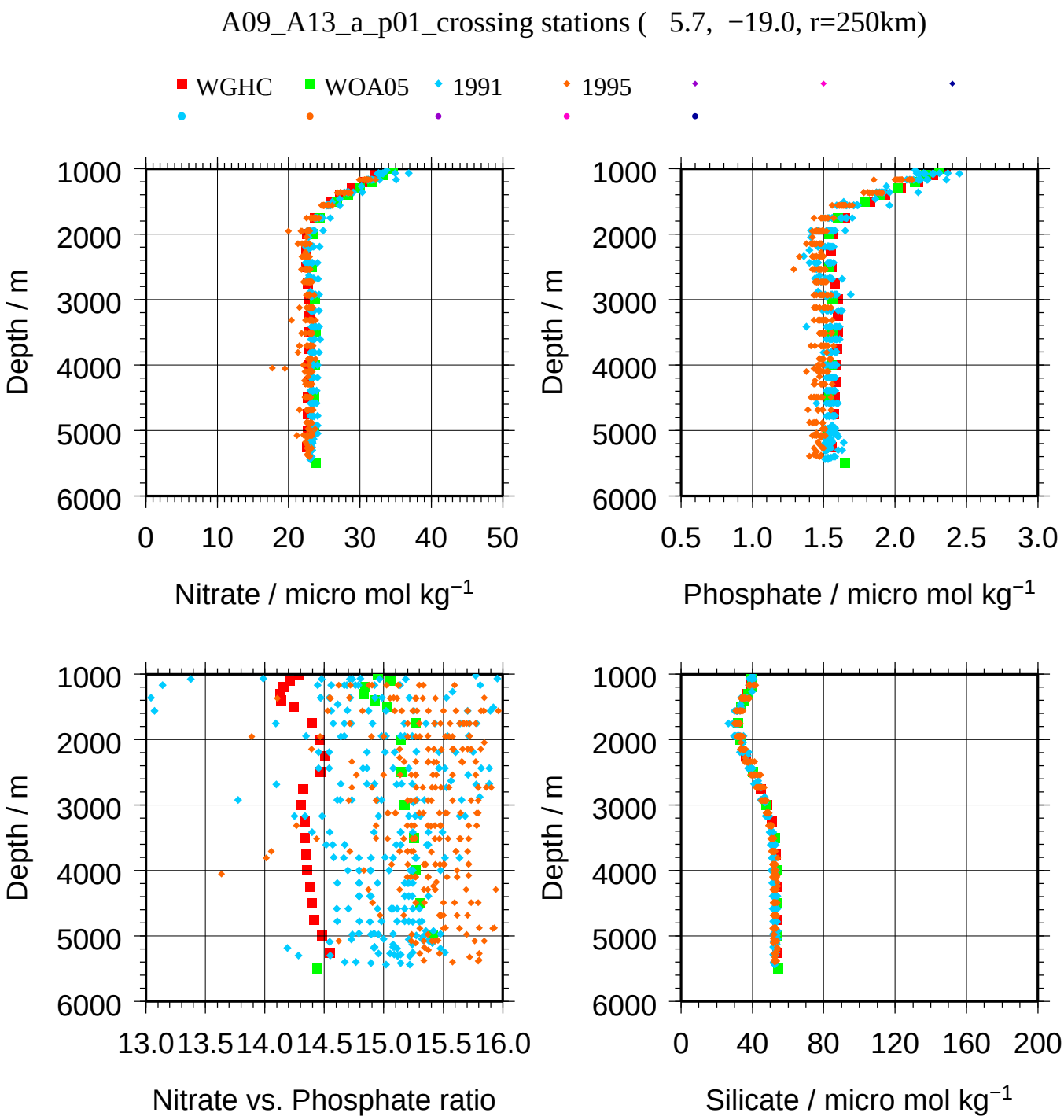

A05_A22_d_p01_crossing stations (294.0, 24.5, r=250km)
WGHC
WOA05
1981
1992
1997
1998
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

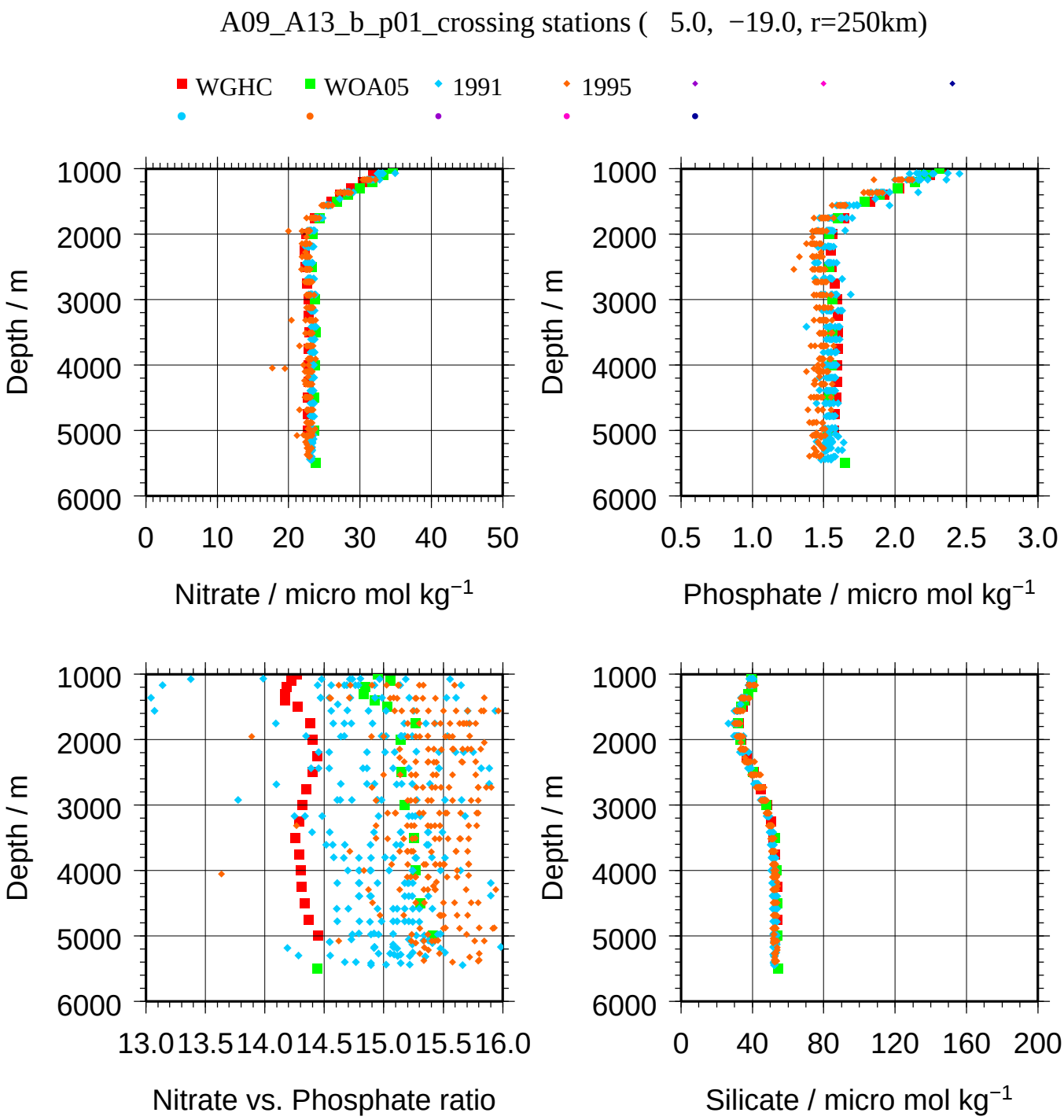

A06_A17_p01_crossing stations (308.5, 5.9, r=250km)
WGHC
WOA05
1982
1993
1994
1997
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

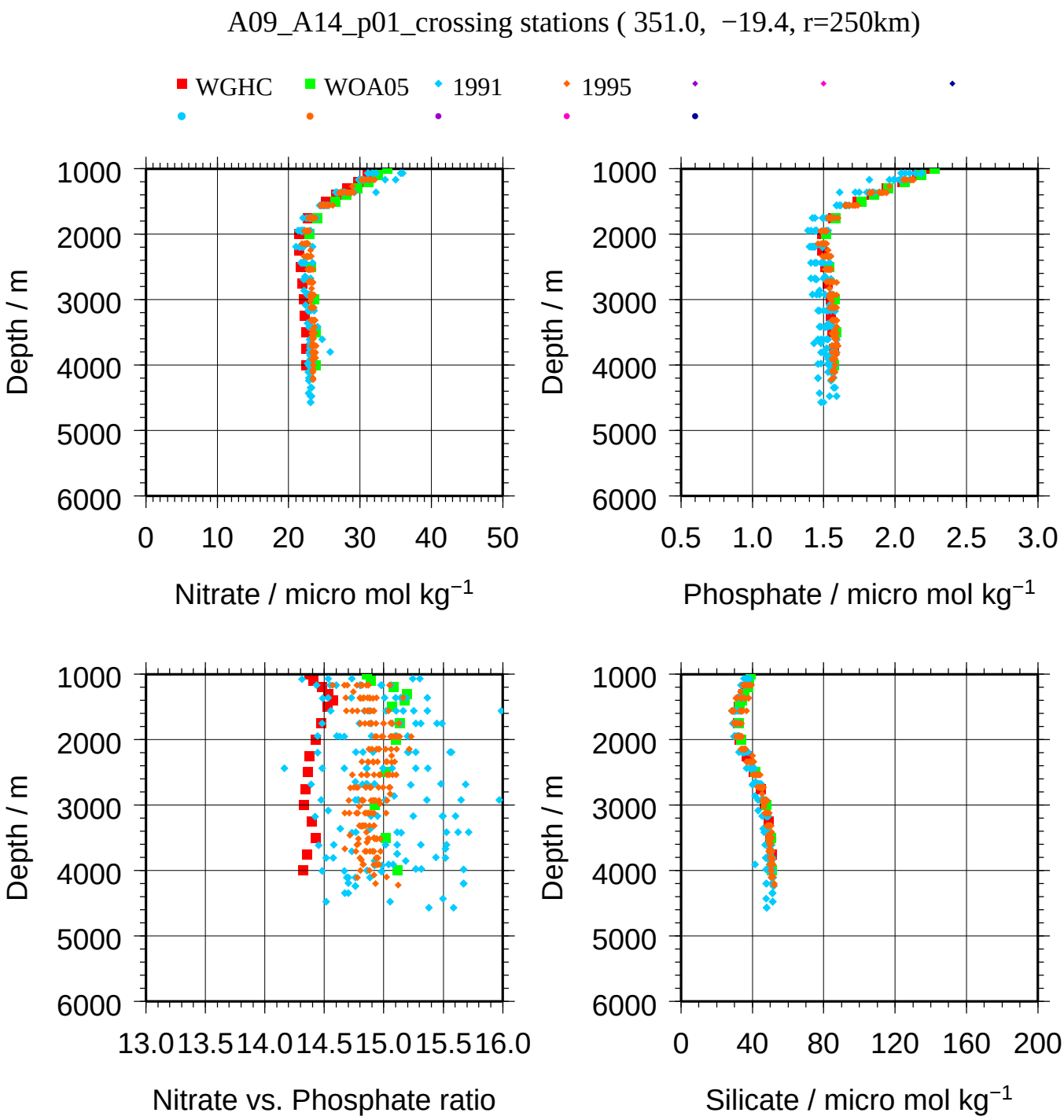

A07_A13_p01_crossing stations (4.8, −4.5, r=250km)
WGHC
WOA05
1993
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

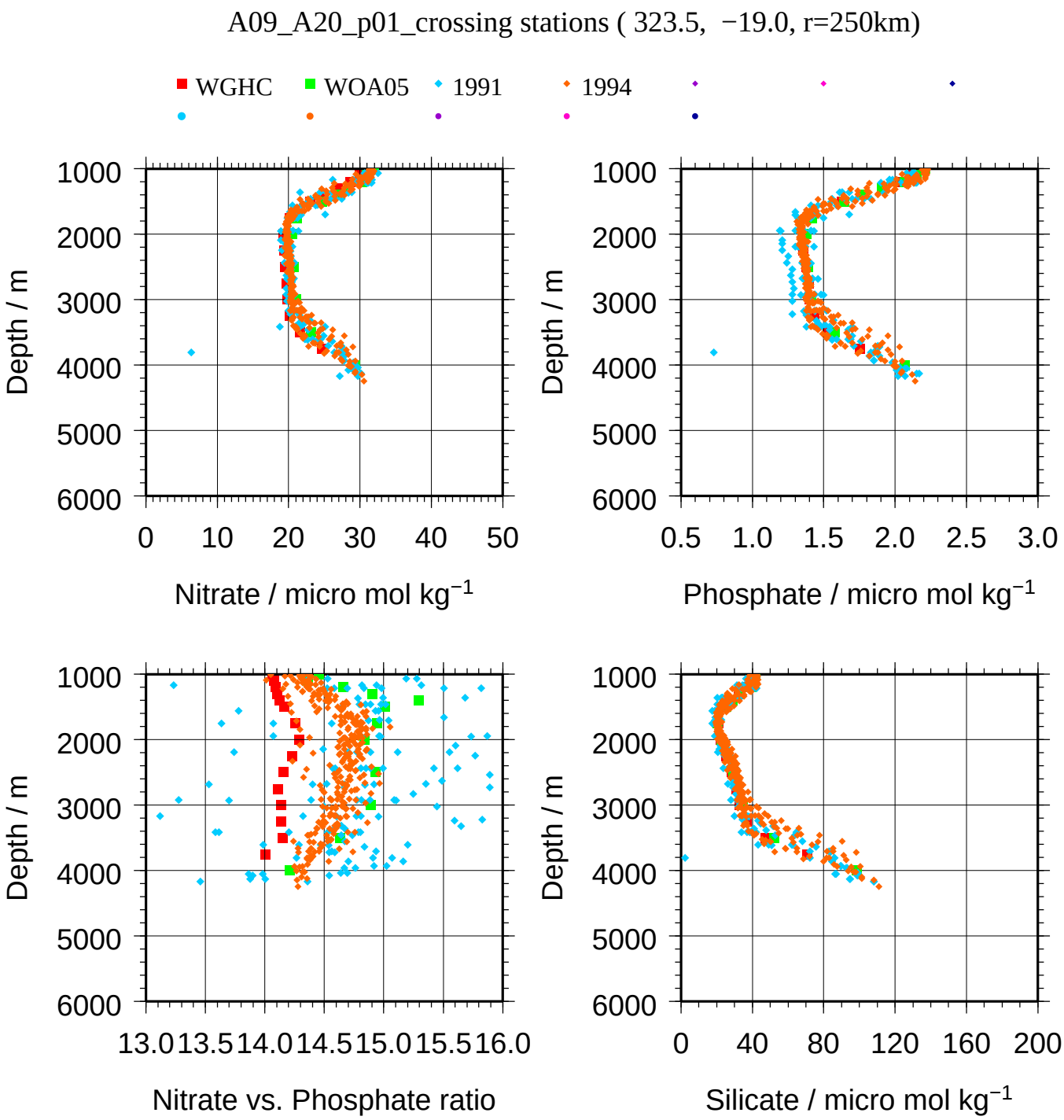

A07_A14_p01_crossing stations (353.0, −4.5, r=250km)
WGHC
WOA05
1993
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

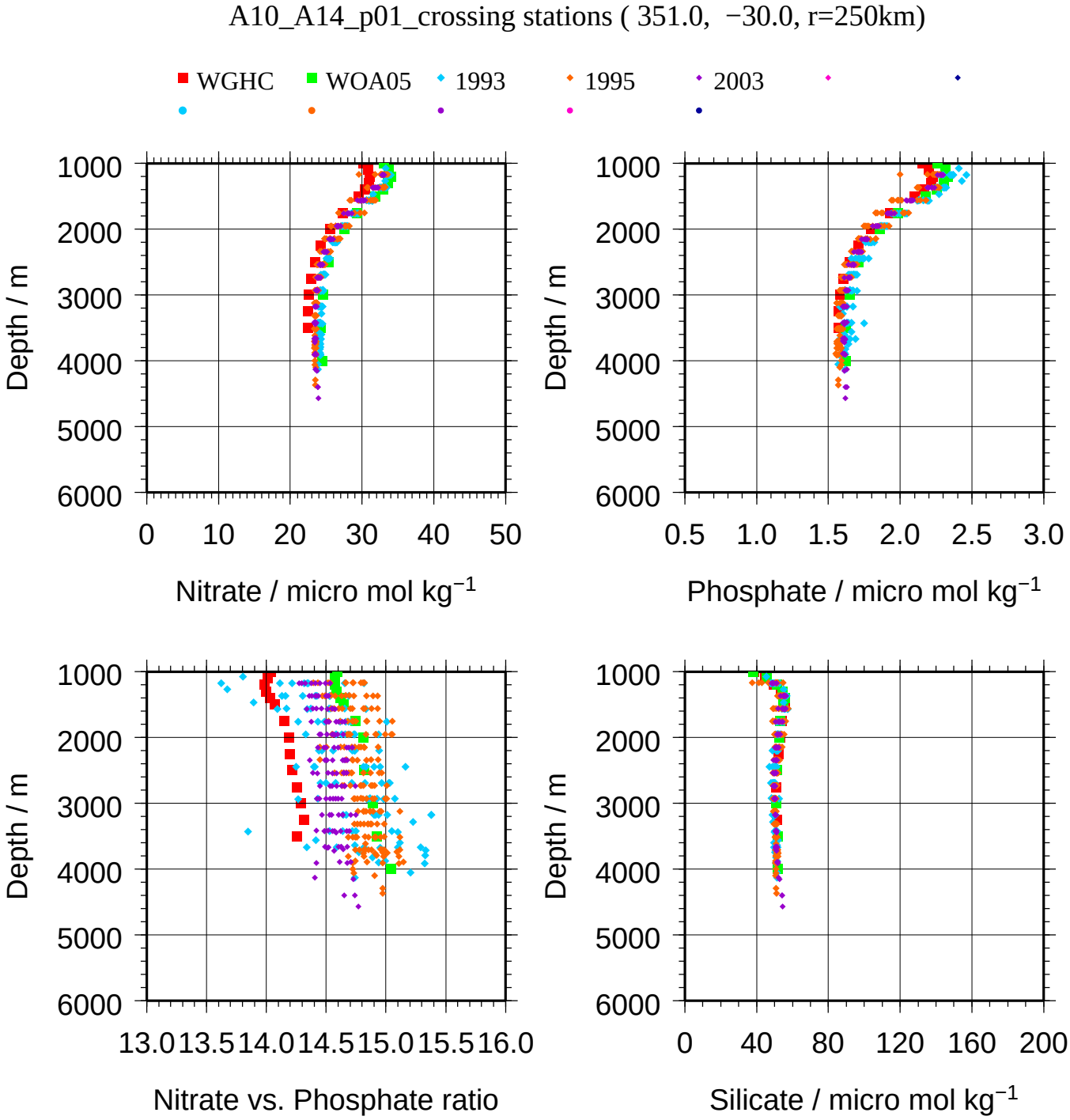

A08_A17_p01_crossing stations (324.9, −13.2, r=250km)
WGHC
WOA05
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

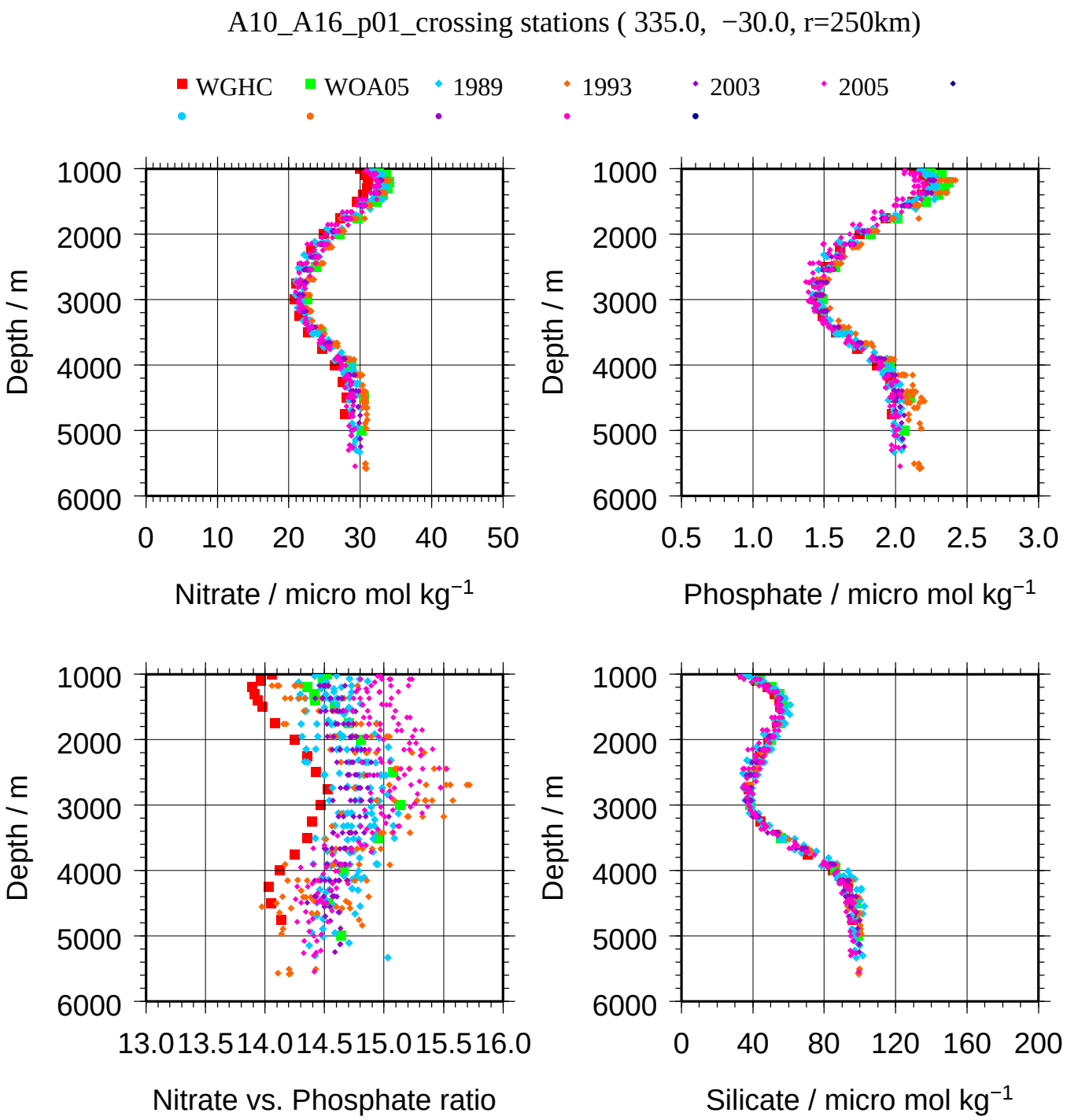

A09_A13_a_p01_crossing stations (5.7, −19.0, r=250km)
WGHC
WOA05
1991
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

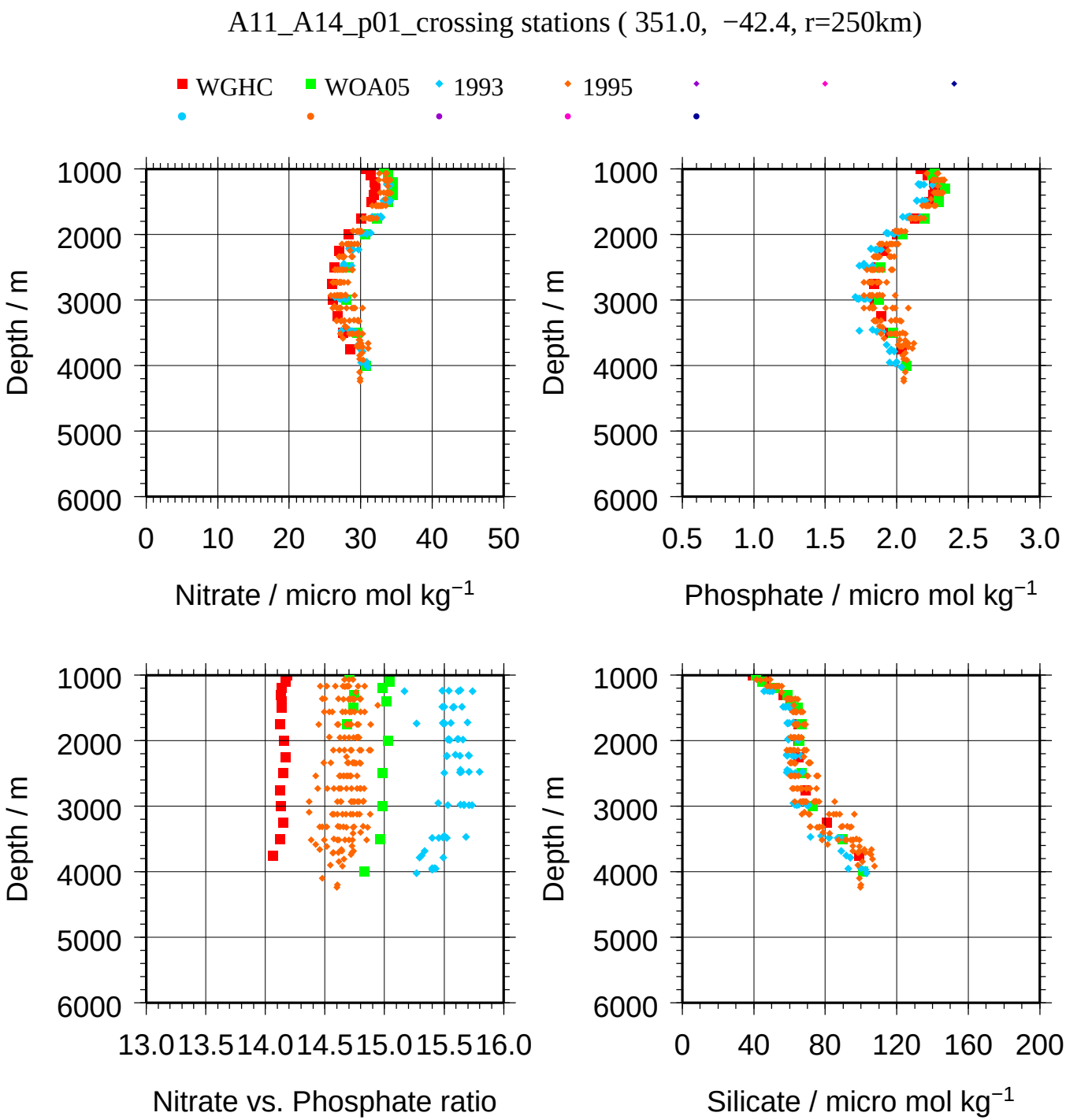

A09_A13_b_p01_crossing stations (5.0, −19.0, r=250km)
WGHC
WOA05
1991
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

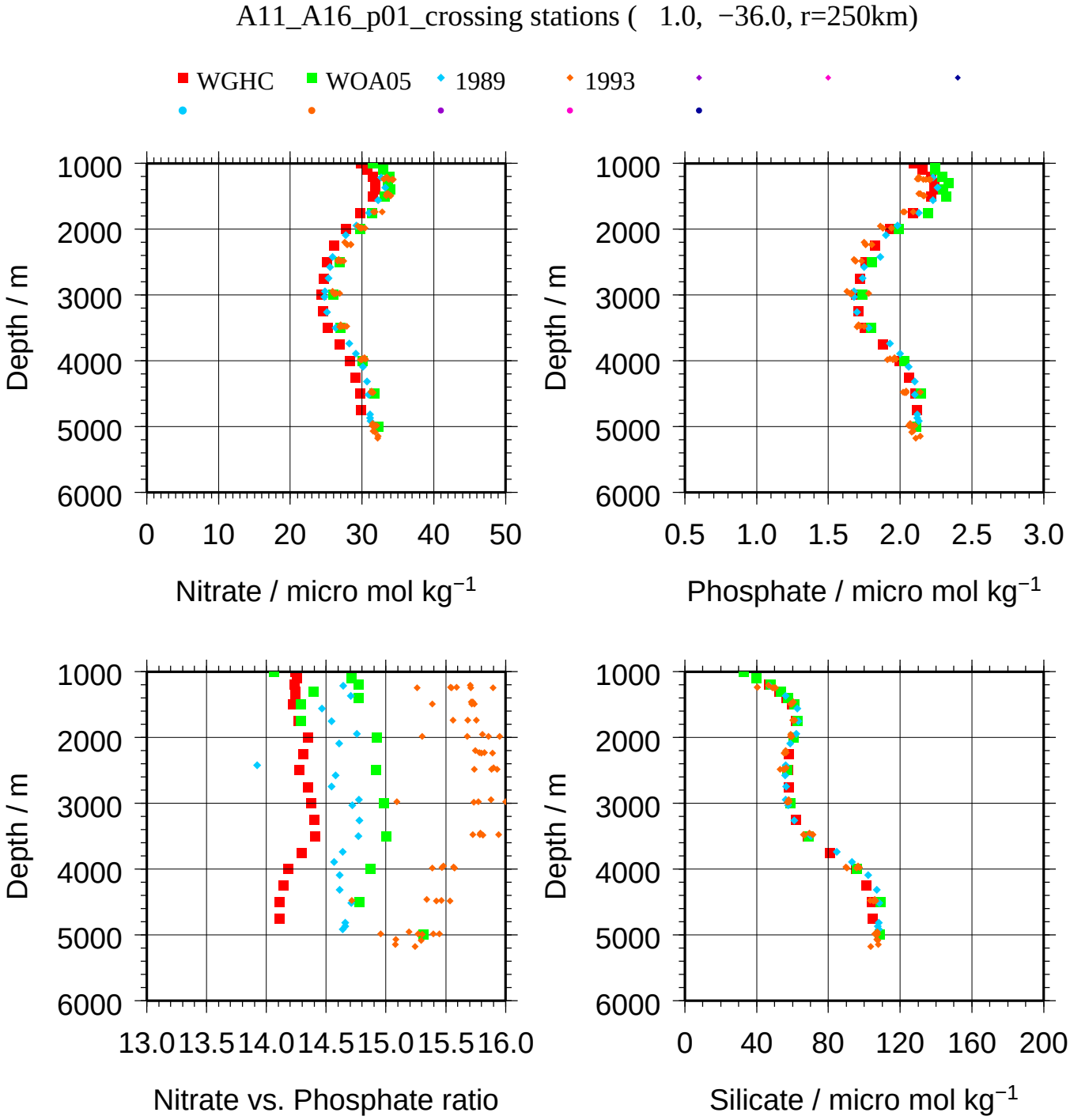

A09_A14_p01_crossing stations (351.0, −19.4, r=250km)
WGHC
WOA05
1991
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

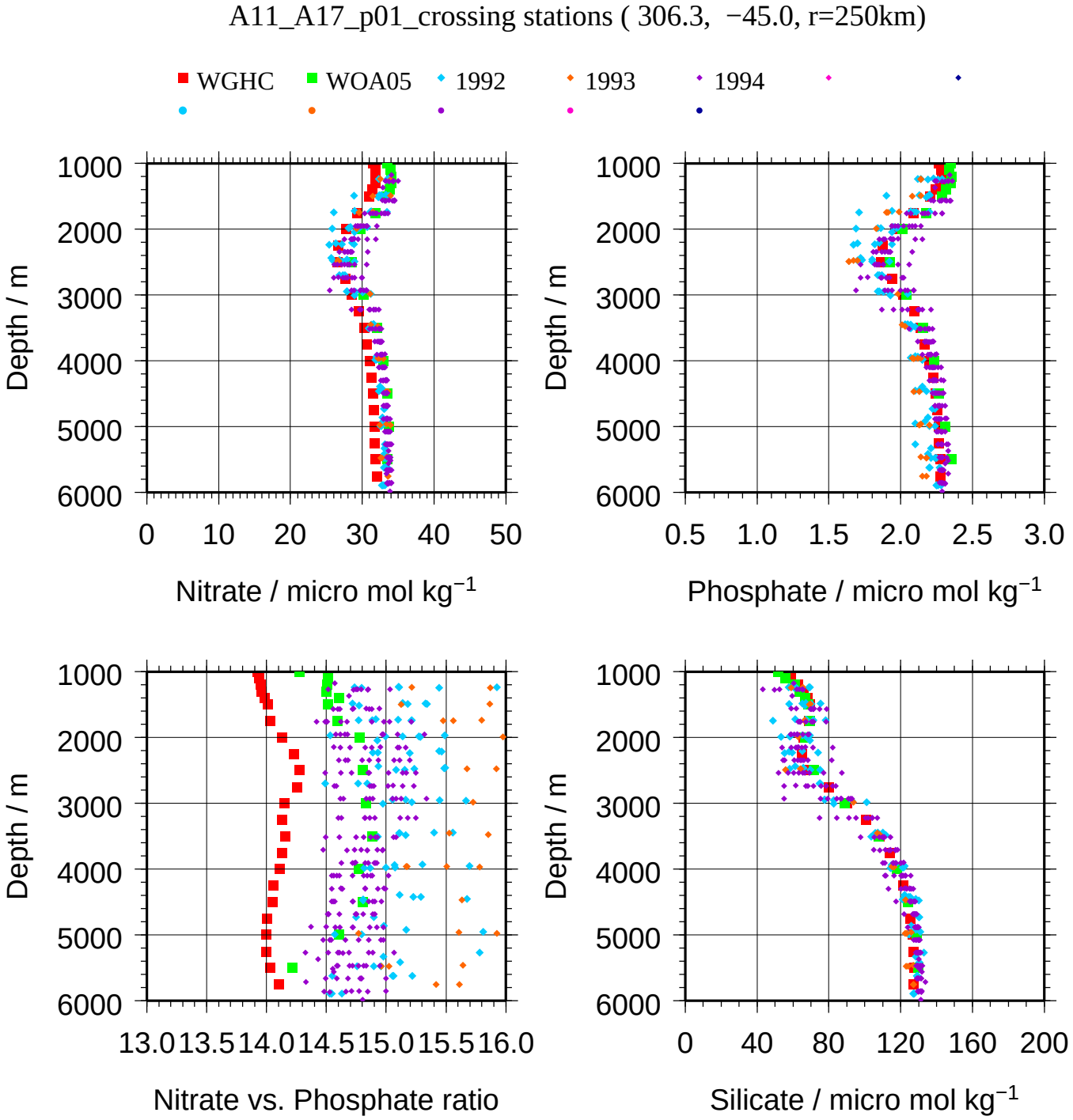

A09_A20_p01_crossing stations (323.5, −19.0, r=250km)
WGHC
WOA05
1991
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1


A10_A14_p01_crossing stations (351.0, −30.0, r=250km)
WGHC
WOA05
1993
1995
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

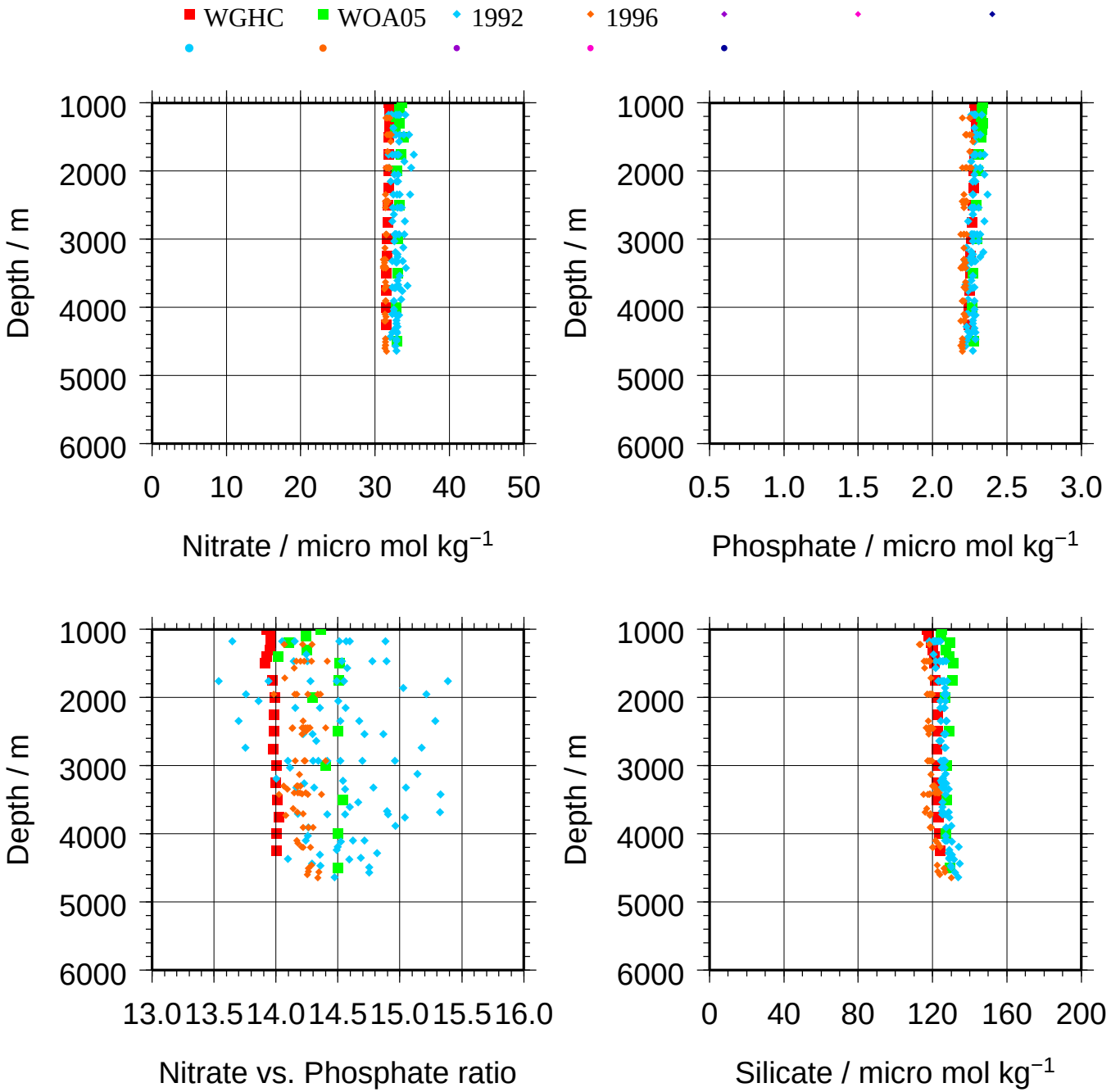

A10_A16_p01_crossing stations (335.0, −30.0, r=250km)
WGHC
WOA05
1989
1993
2003
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

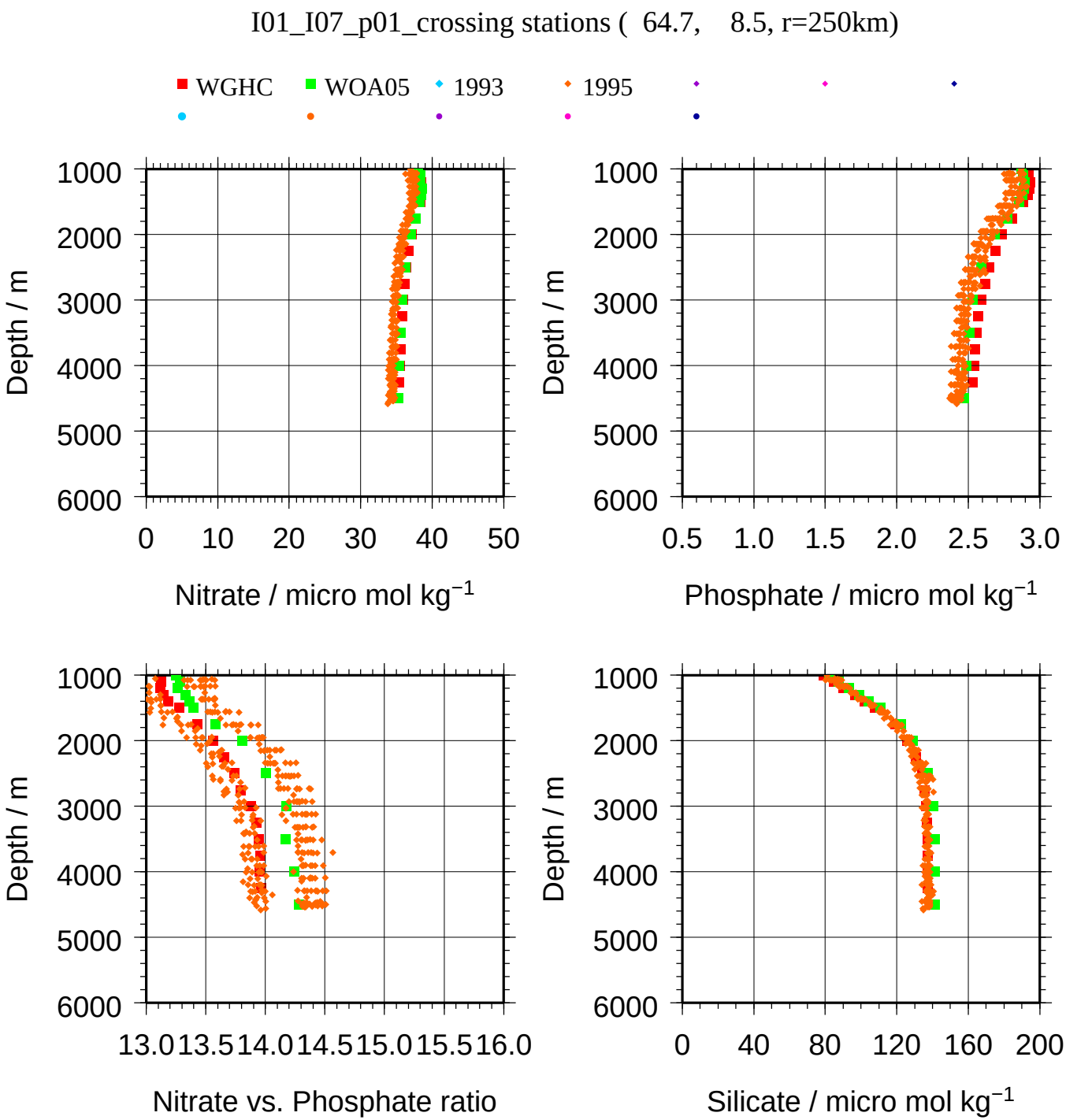

A11_A14_p01_crossing stations (351.0, −42.4, r=250km)
WGHC
WOA05
1993
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

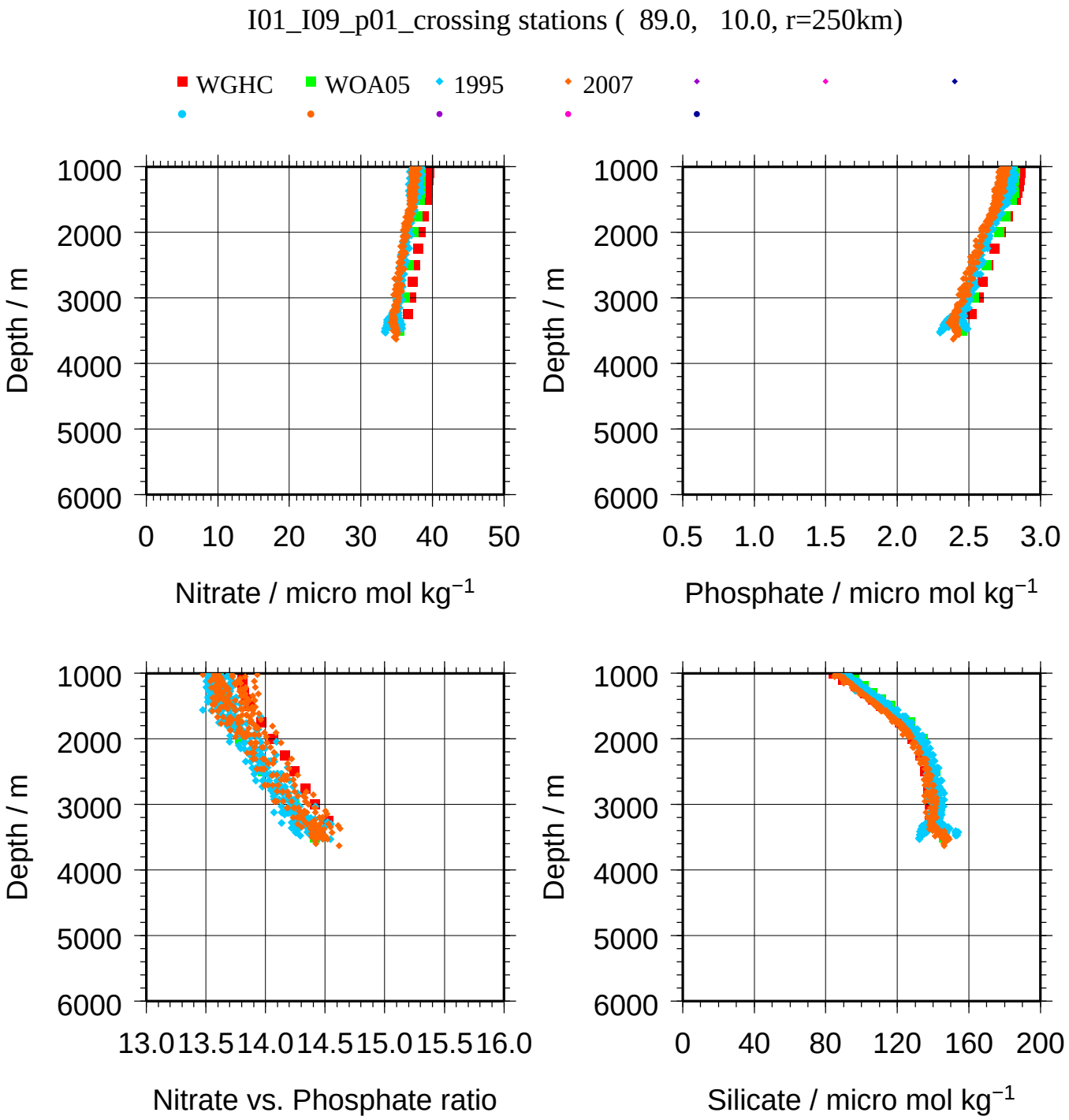

A11_A16_p01_crossing stations (1.0, −36.0, r=250km)
WGHC
WOA05
1989
1993
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

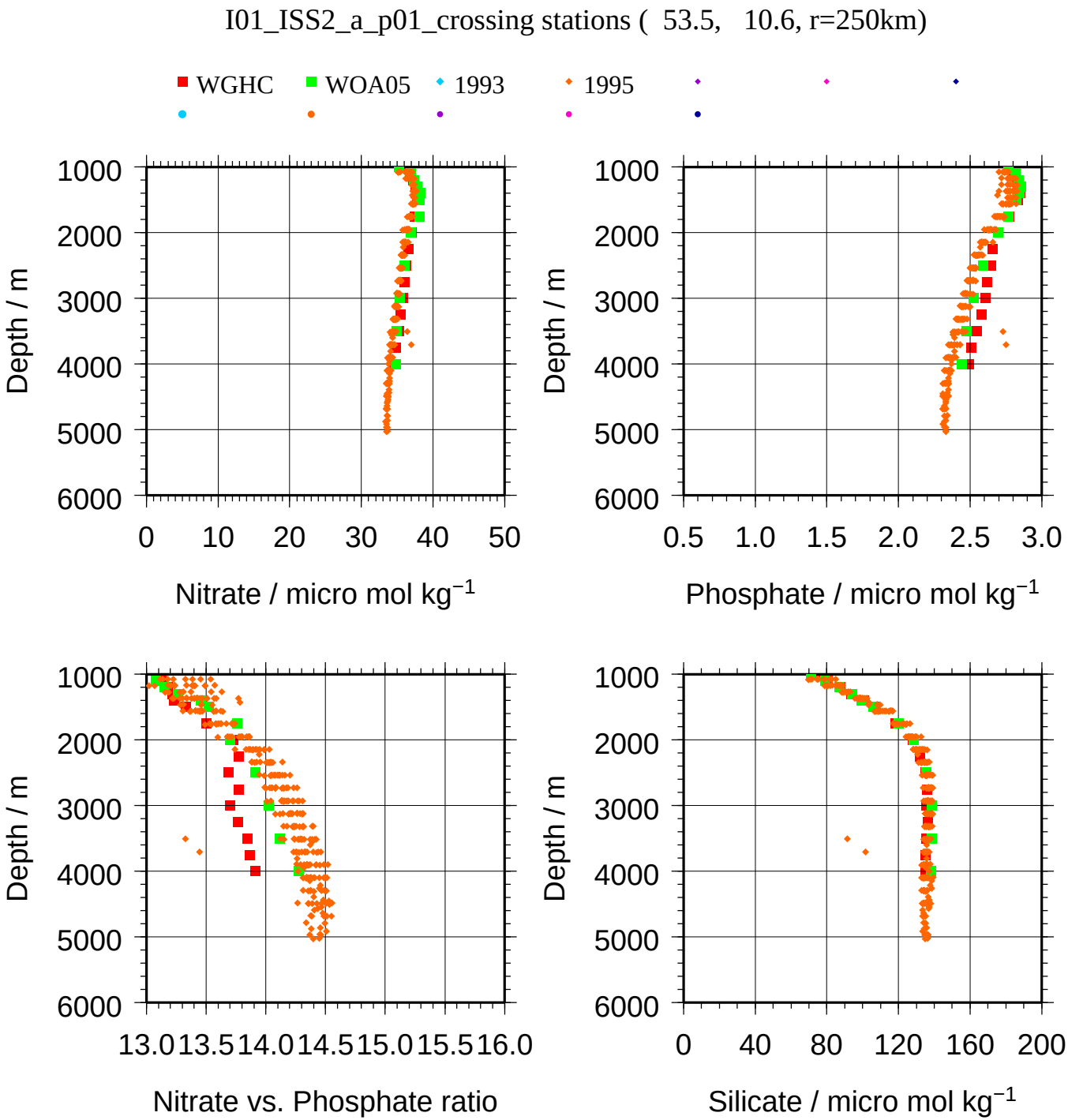

A11_A17_p01_crossing stations (306.3, −45.0, r=250km)
WGHC
WOA05
1992
1993
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

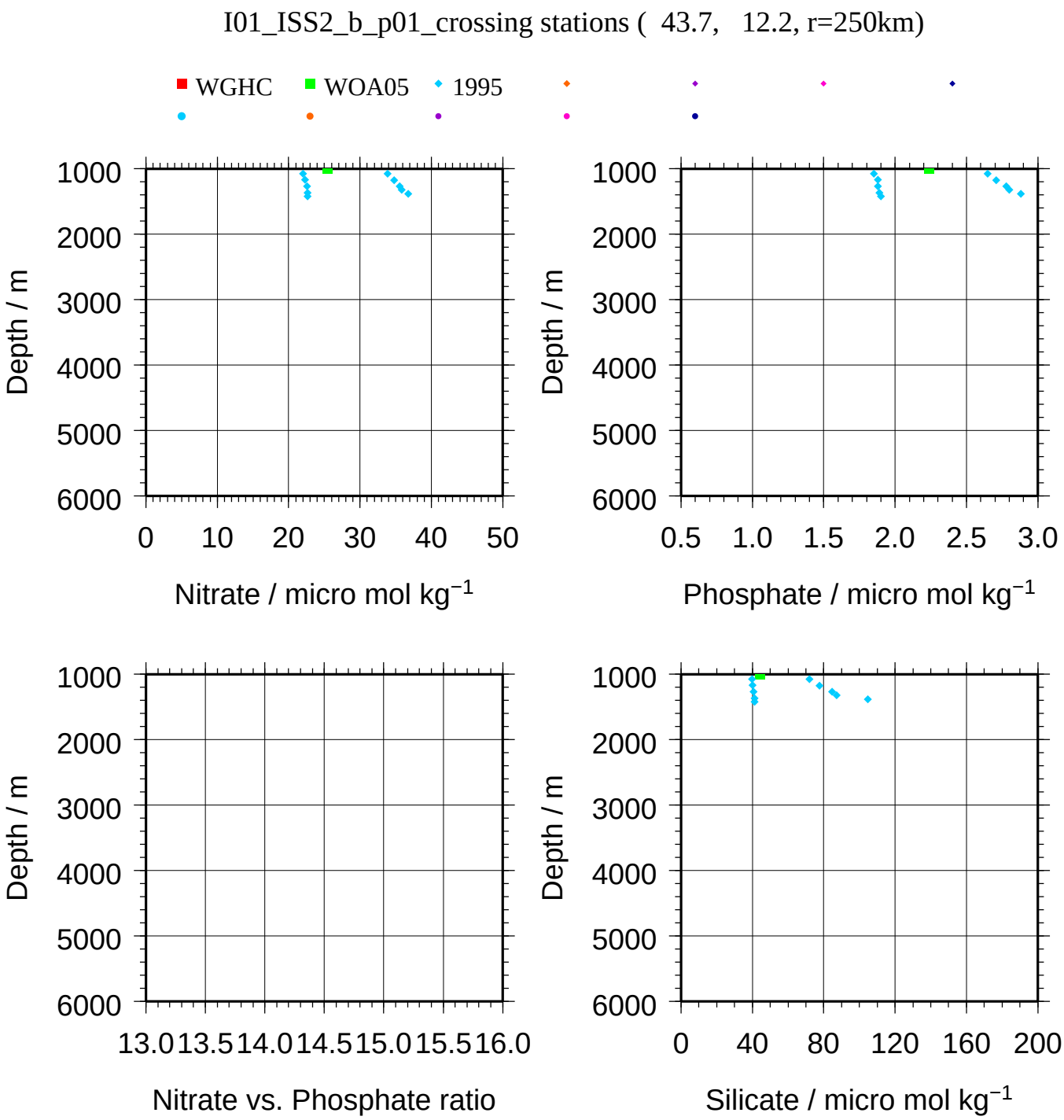
A12_S04_p01_crossing stations (0.0, −68.0, r=250km)

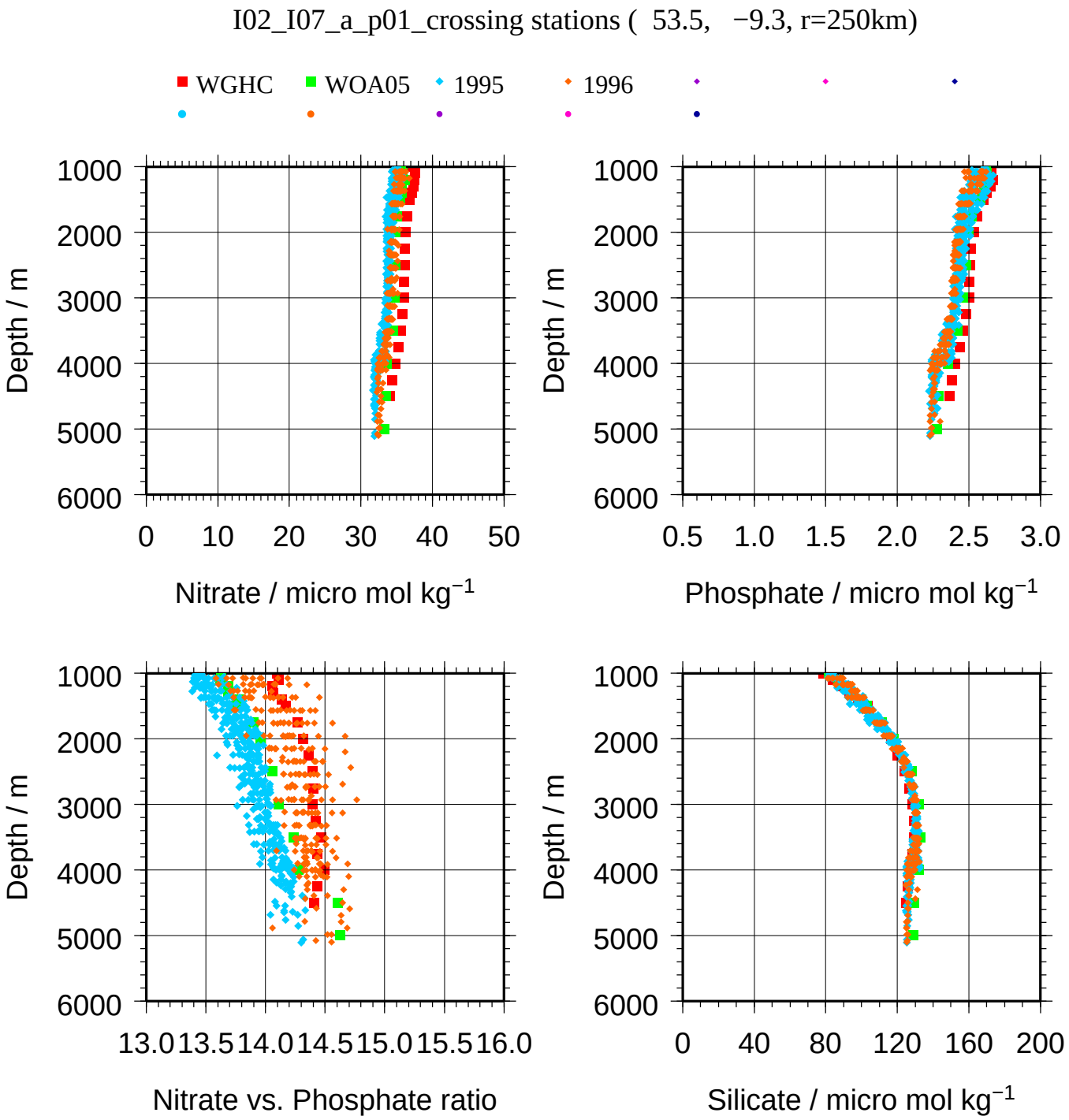


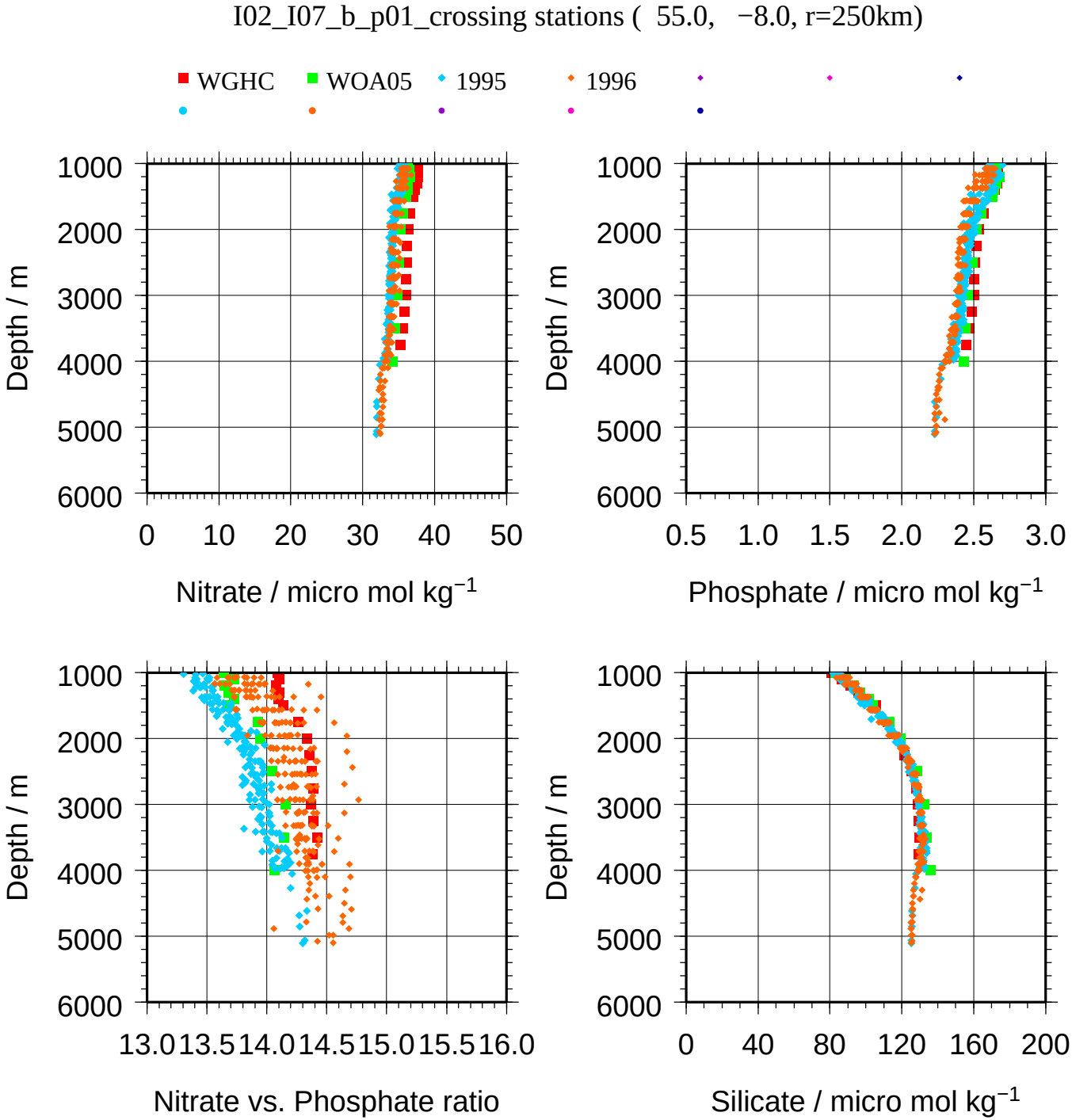

I01_I07_p01_crossing stations (64.7, 8.5, r=250km)
WGHC
WOA05
1993
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

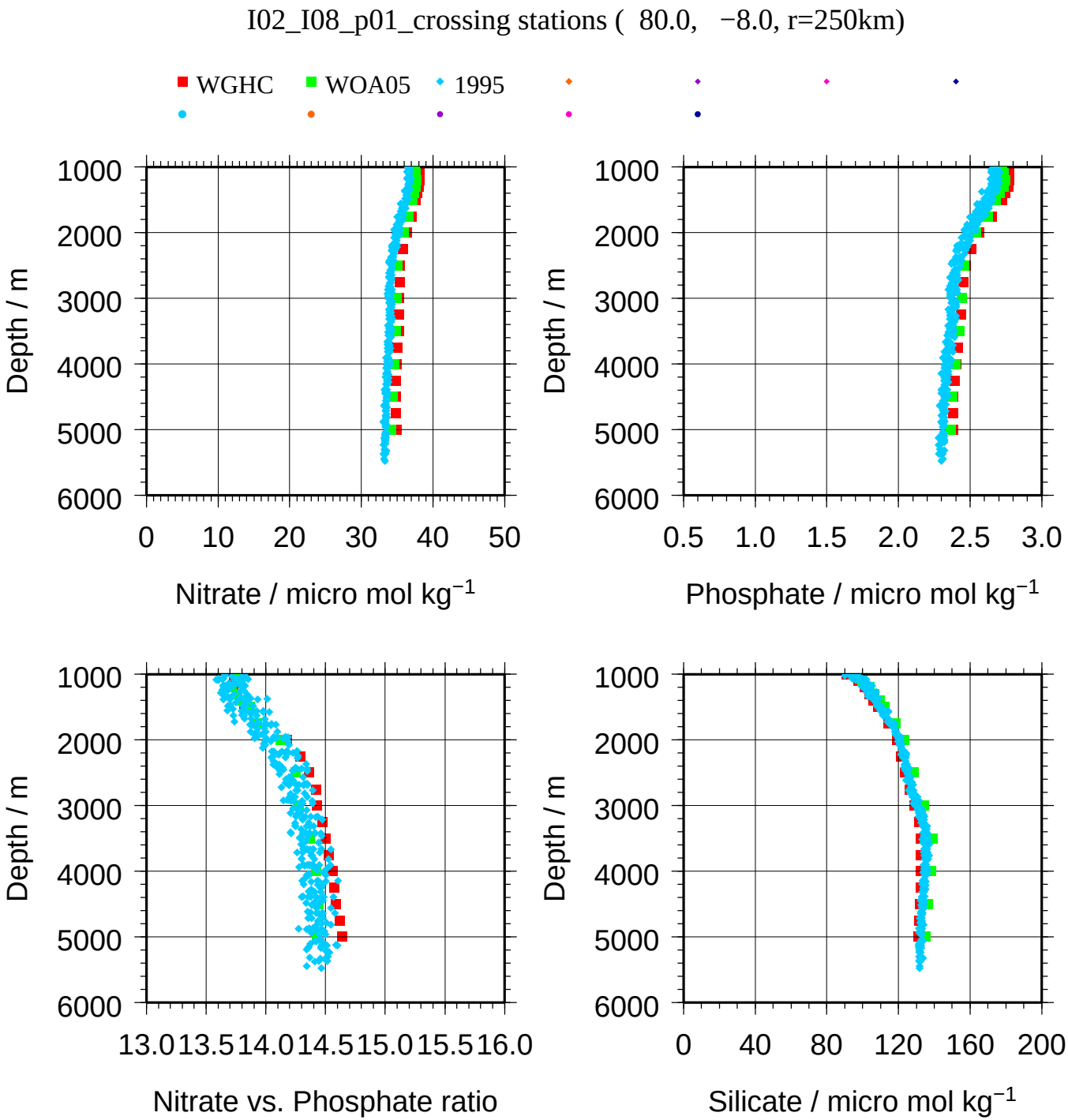

I01_I09_p01_crossing stations (89.0, 10.0, r=250km)
WGHC
WOA05
1995
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
80
120
160
200
Silicate / micro mol kg−1

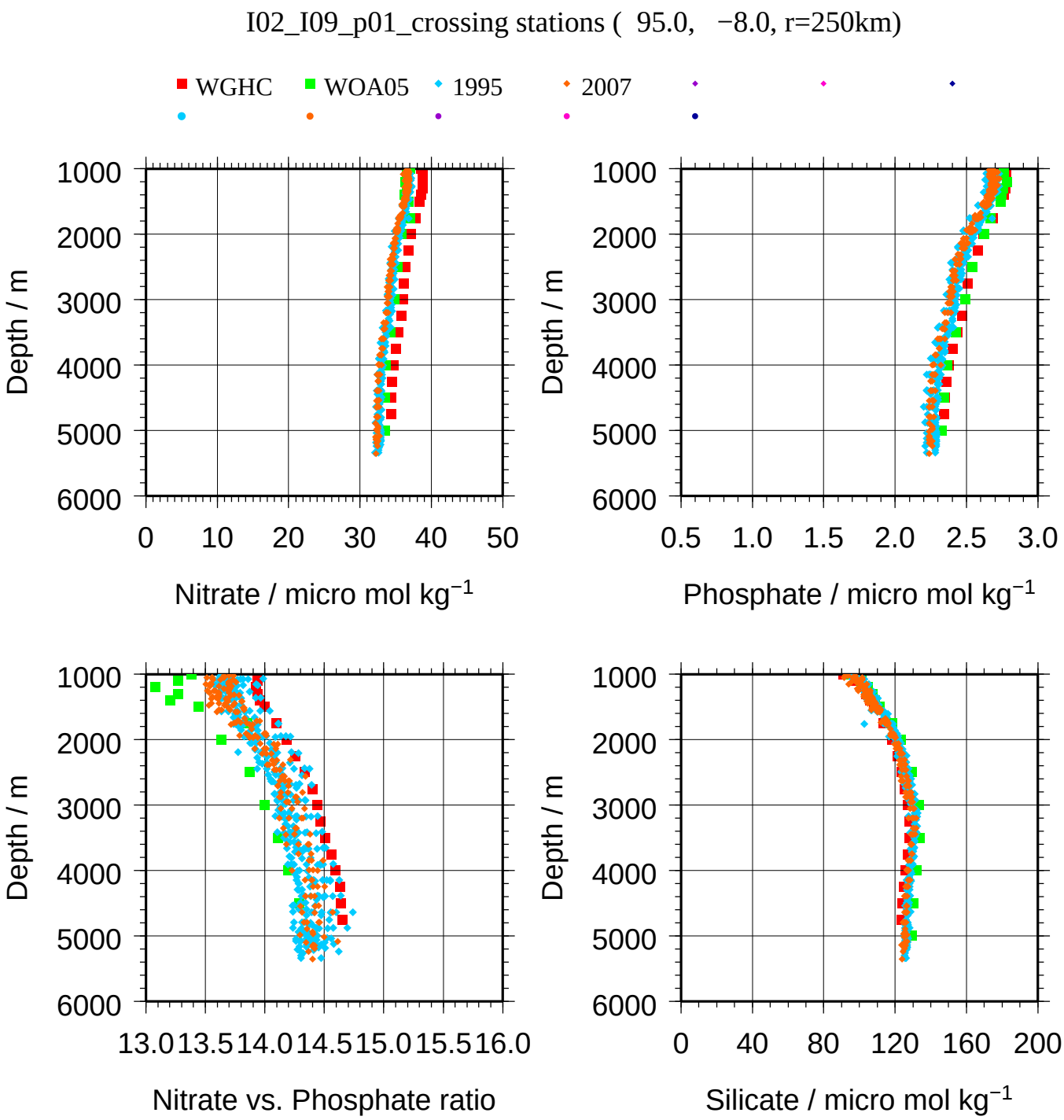

I01_ISS2_a_p01_crossing stations (53.5, 10.6, r=250km)
WGHC
WOA05
1993
1995
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

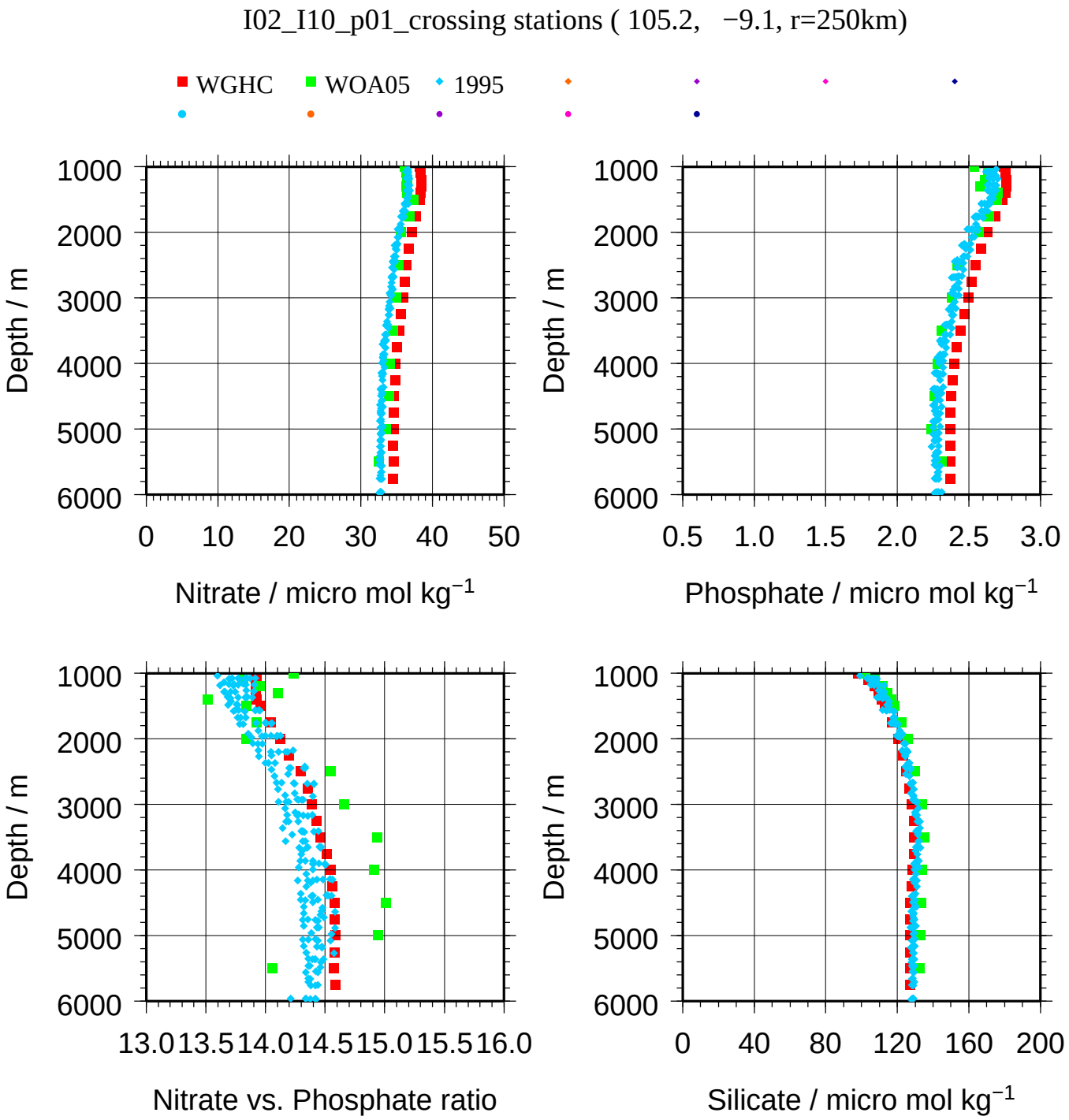

I01_ISS2_b_p01_crossing stations (43.7, 12.2, r=250km)
WGHC
WOA05
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

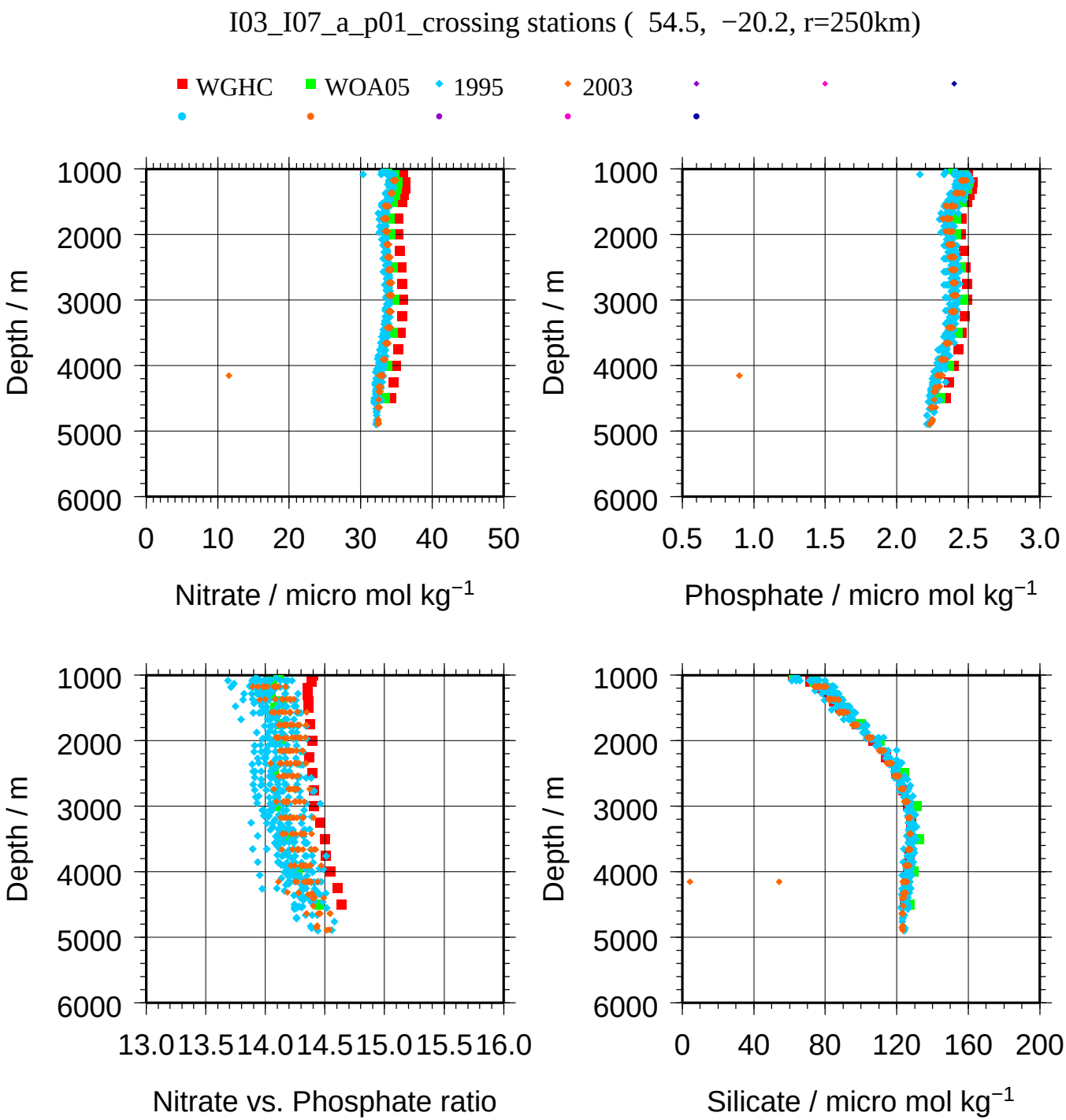

I02_I07_a_p01_crossing stations (53.5, −9.3, r=250km)
WGHC
WOA05
1995
1996
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

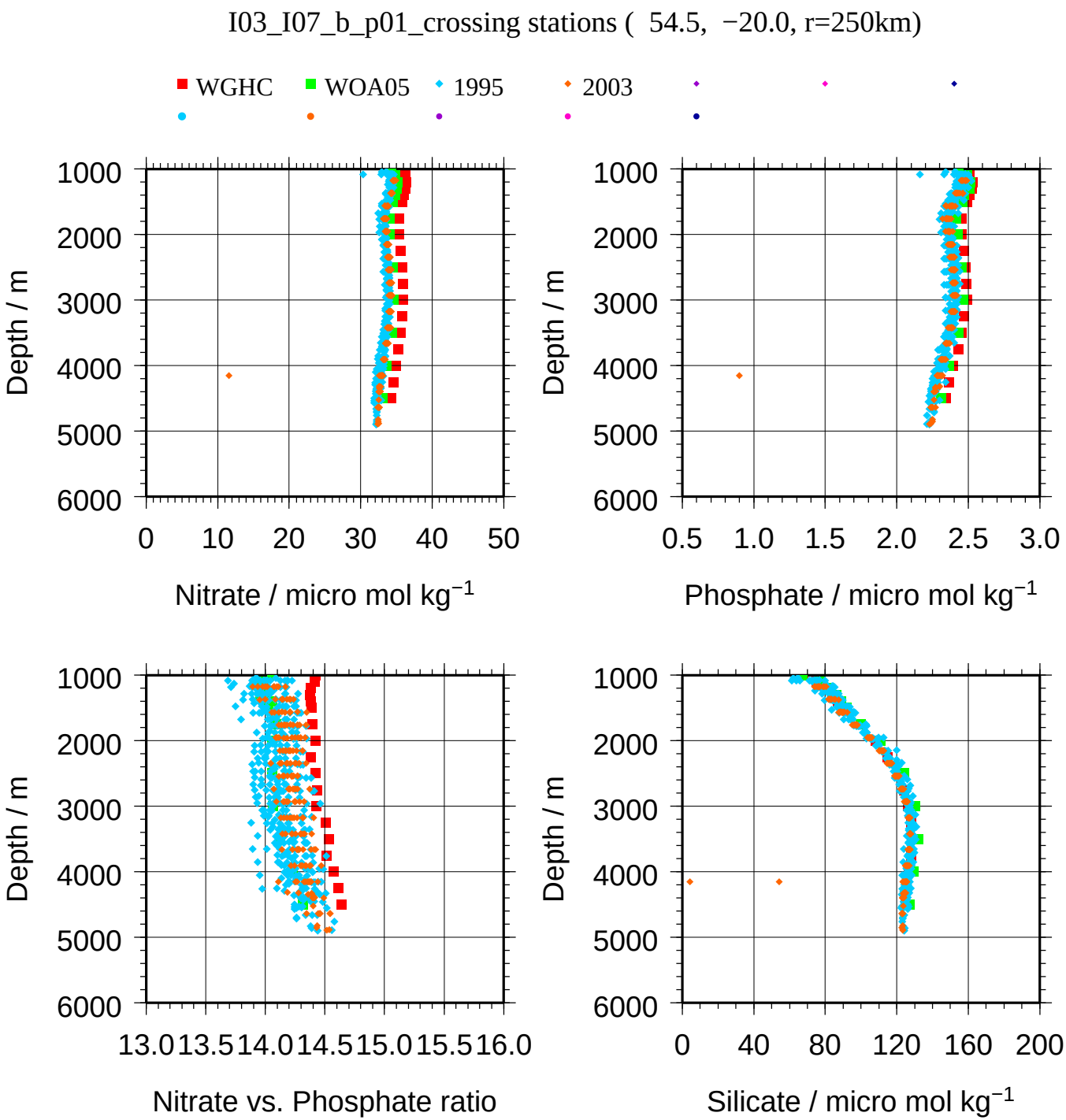

I02_I07_b_p01_crossing stations (55.0, −8.0, r=250km)
WGHC
WOA05
1995
1996
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

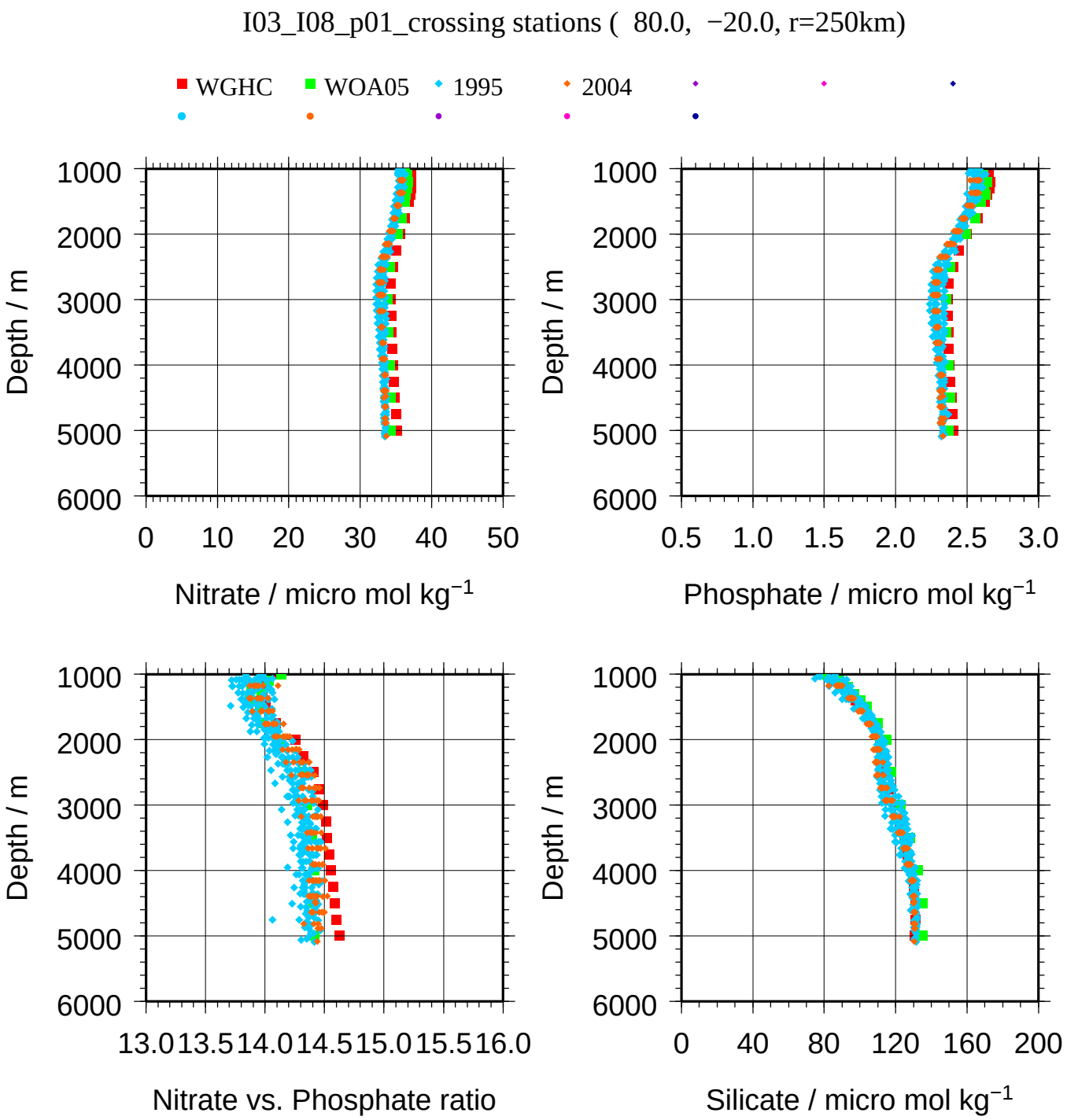

I02_I08_p01_crossing stations (80.0, −8.0, r=250km)
WGHC
WOA05
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

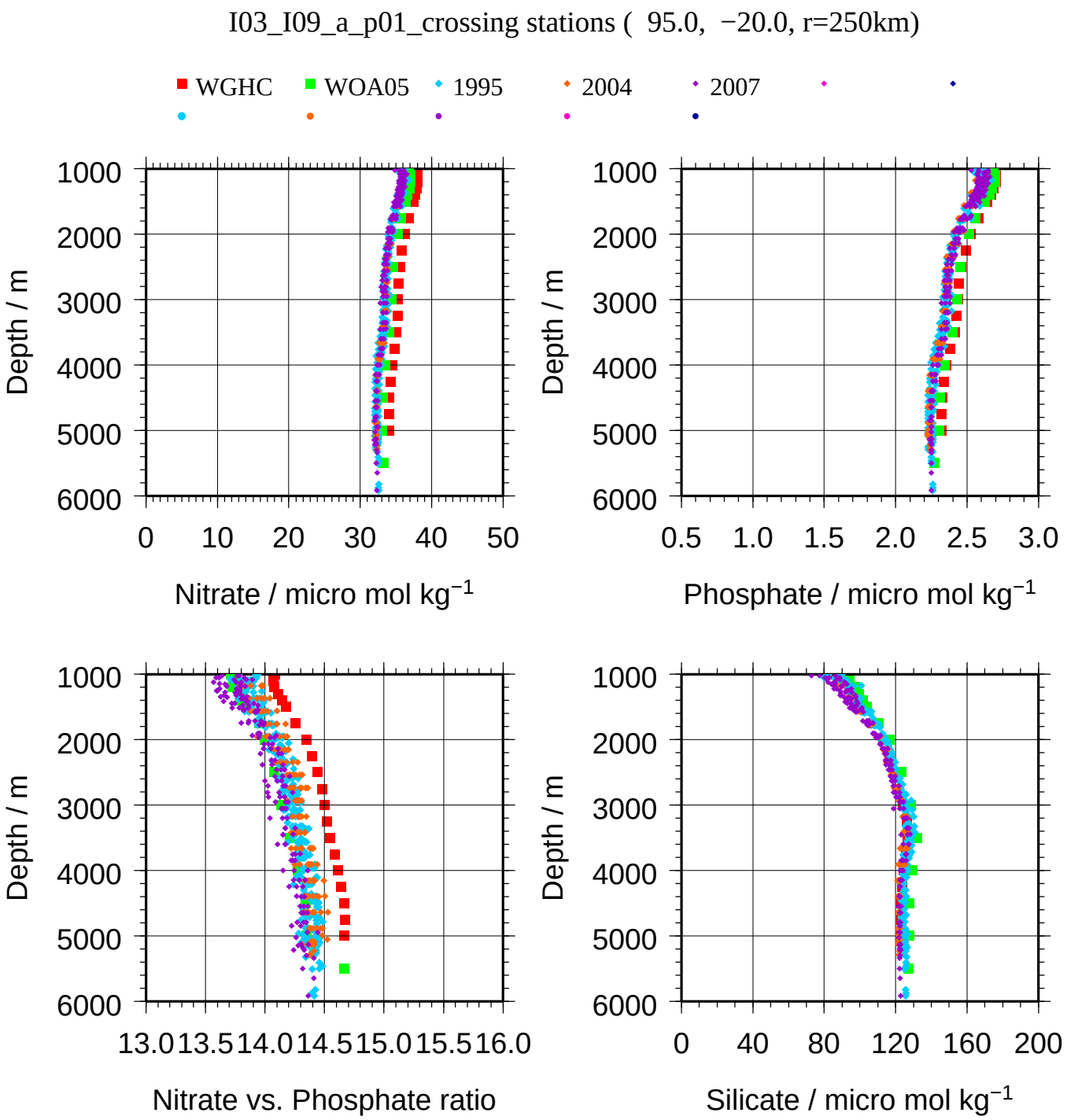

I02_I09_p01_crossing stations (95.0, −8.0, r=250km)
WGHC
WOA05
1995
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
80
120
160
200
Silicate / micro mol kg−1

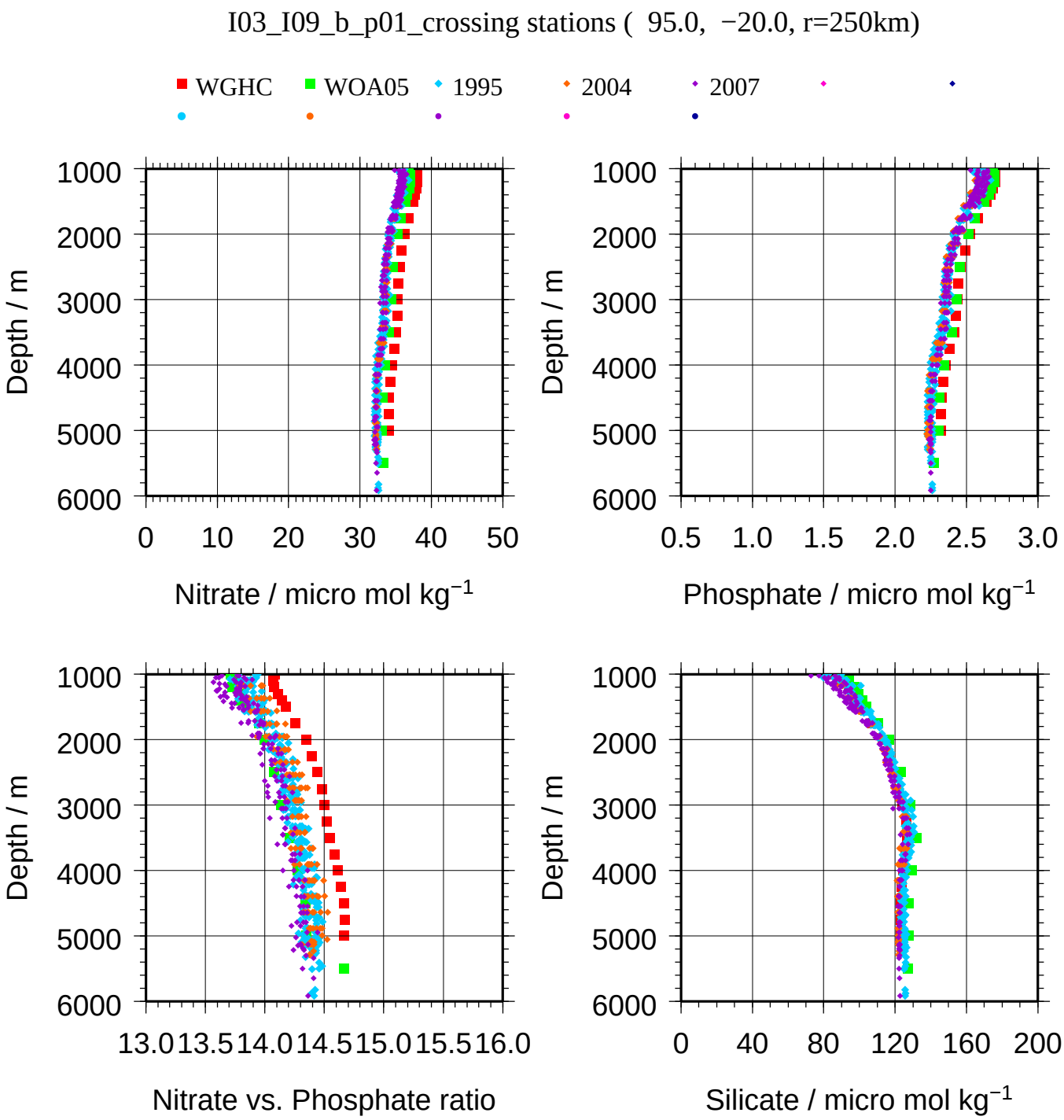

I02_I10_p01_crossing stations (105.2, −9.1, r=250km)
WGHC
WOA05
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

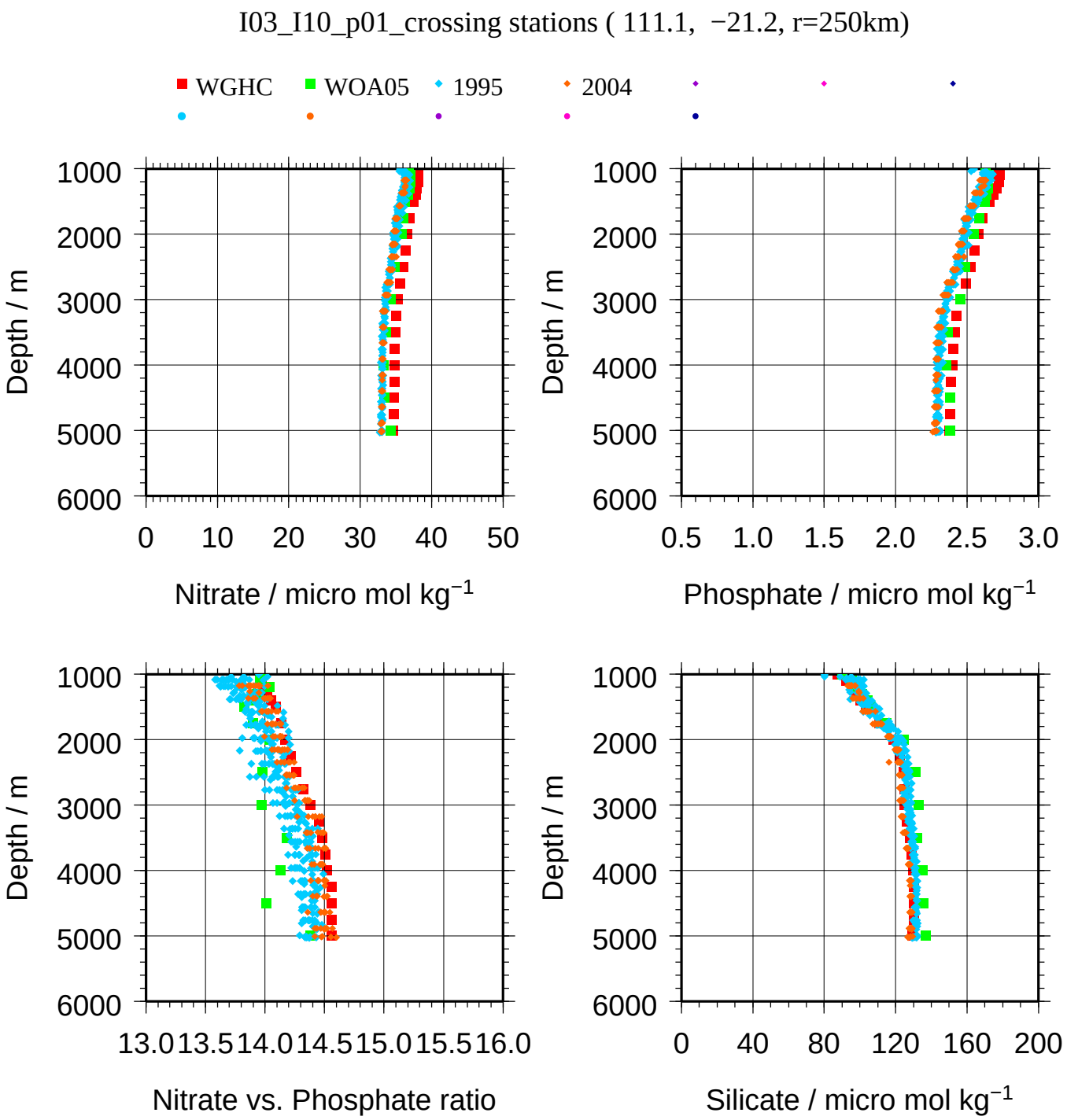

I03_I07_a_p01_crossing stations (54.5, −20.2, r=250km)
WGHC
WOA05
1995
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

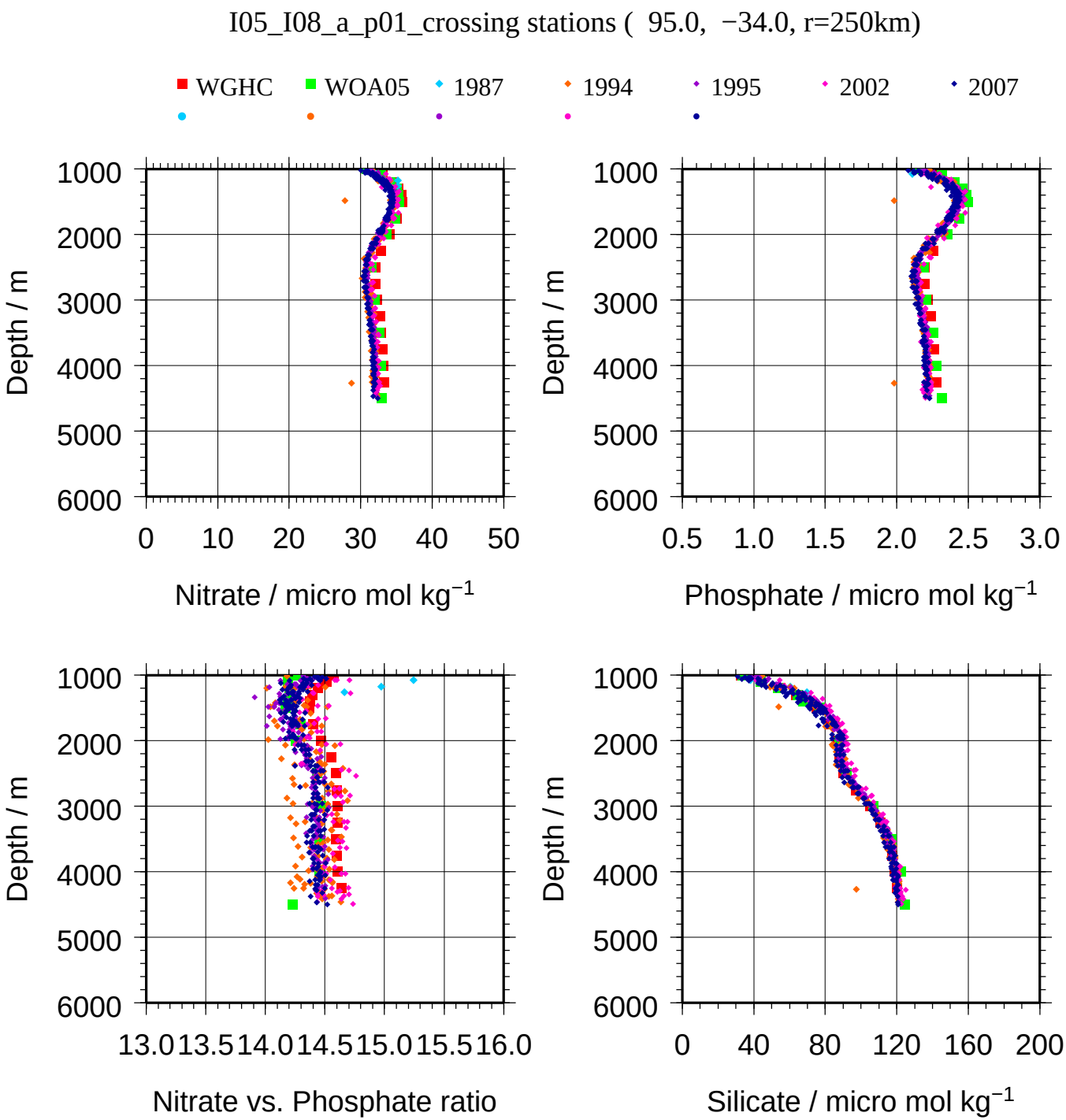

I03_I07_b_p01_crossing stations (54.5, −20.0, r=250km)
WGHC
WOA05
1995
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

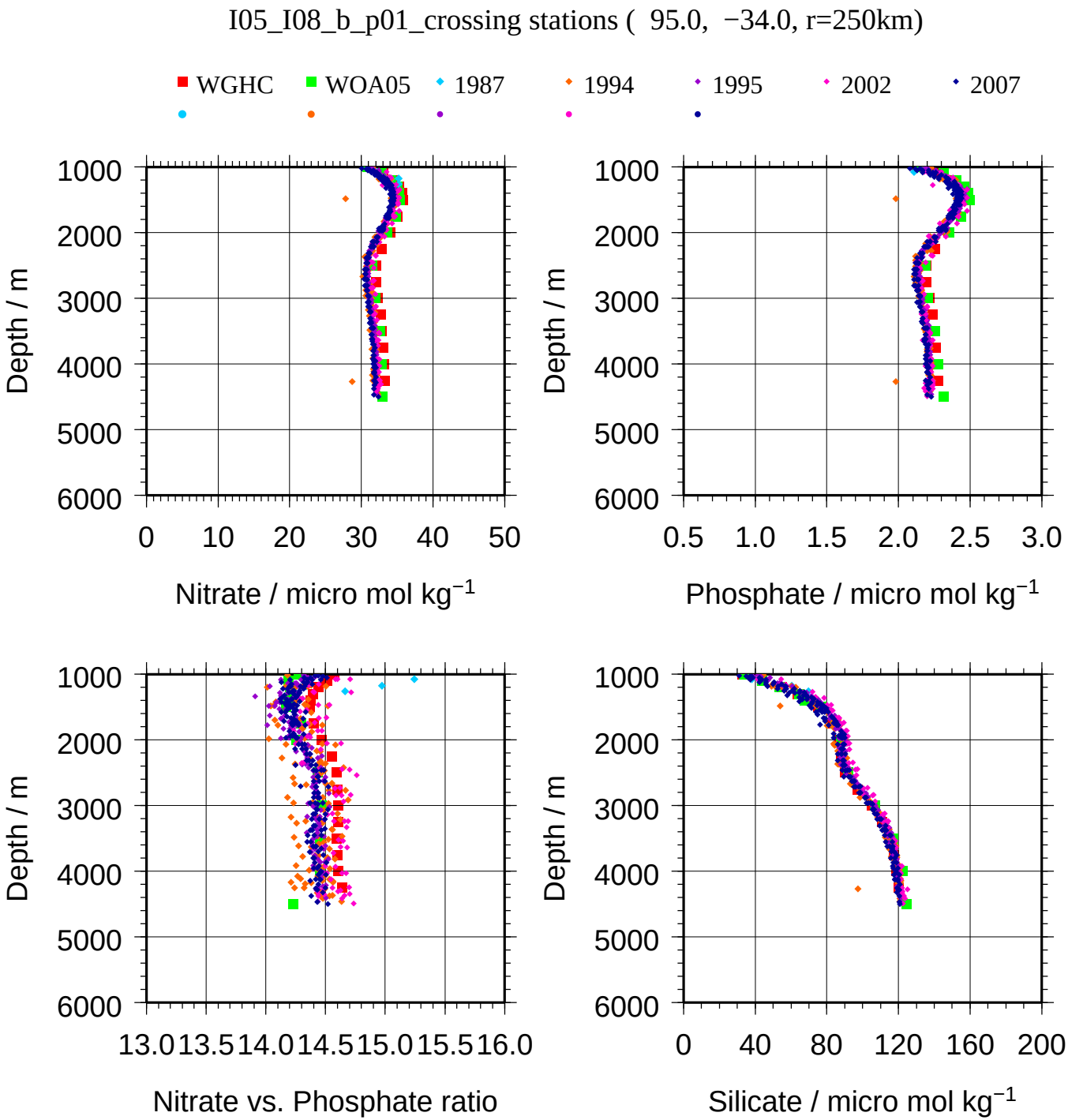

I03_I08_p01_crossing stations (80.0, −20.0, r=250km)
WGHC
WOA05
1995
2004
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

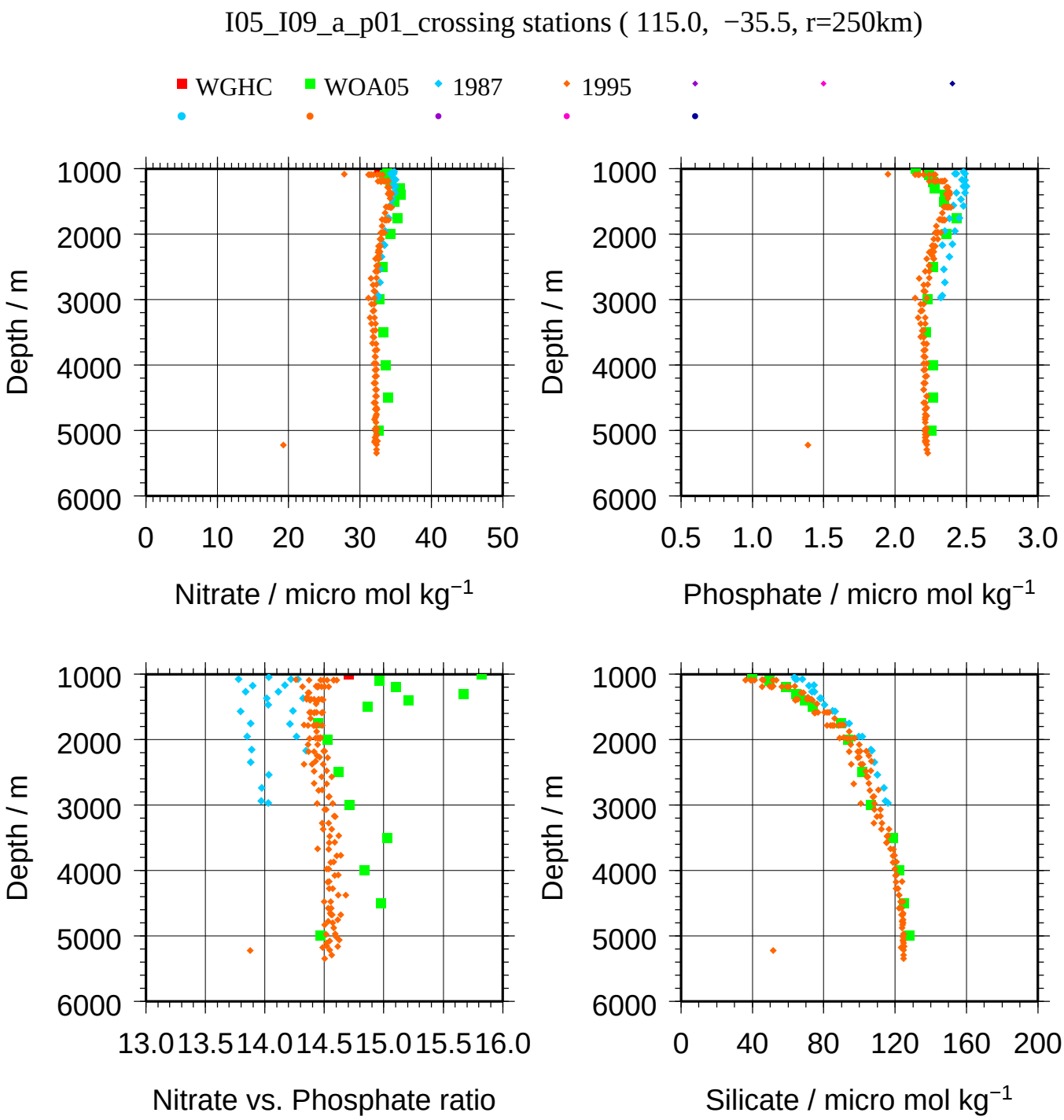

I03_I09_a_p01_crossing stations (95.0, −20.0, r=250km)
WGHC
WOA05
1995
2004
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

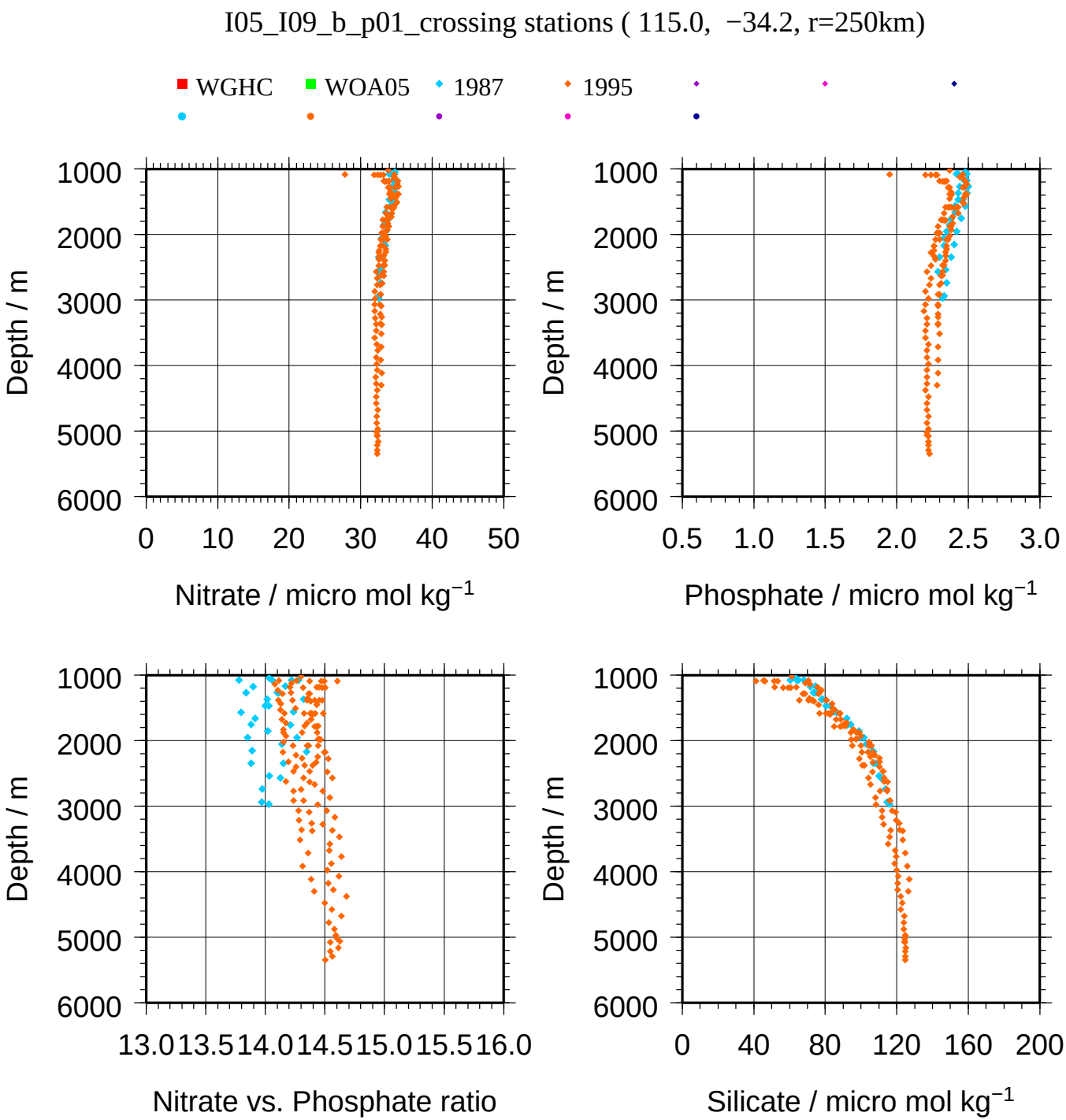

I03_I09_b_p01_crossing stations (95.0, −20.0, r=250km)
WGHC
WOA05
1995
2004
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

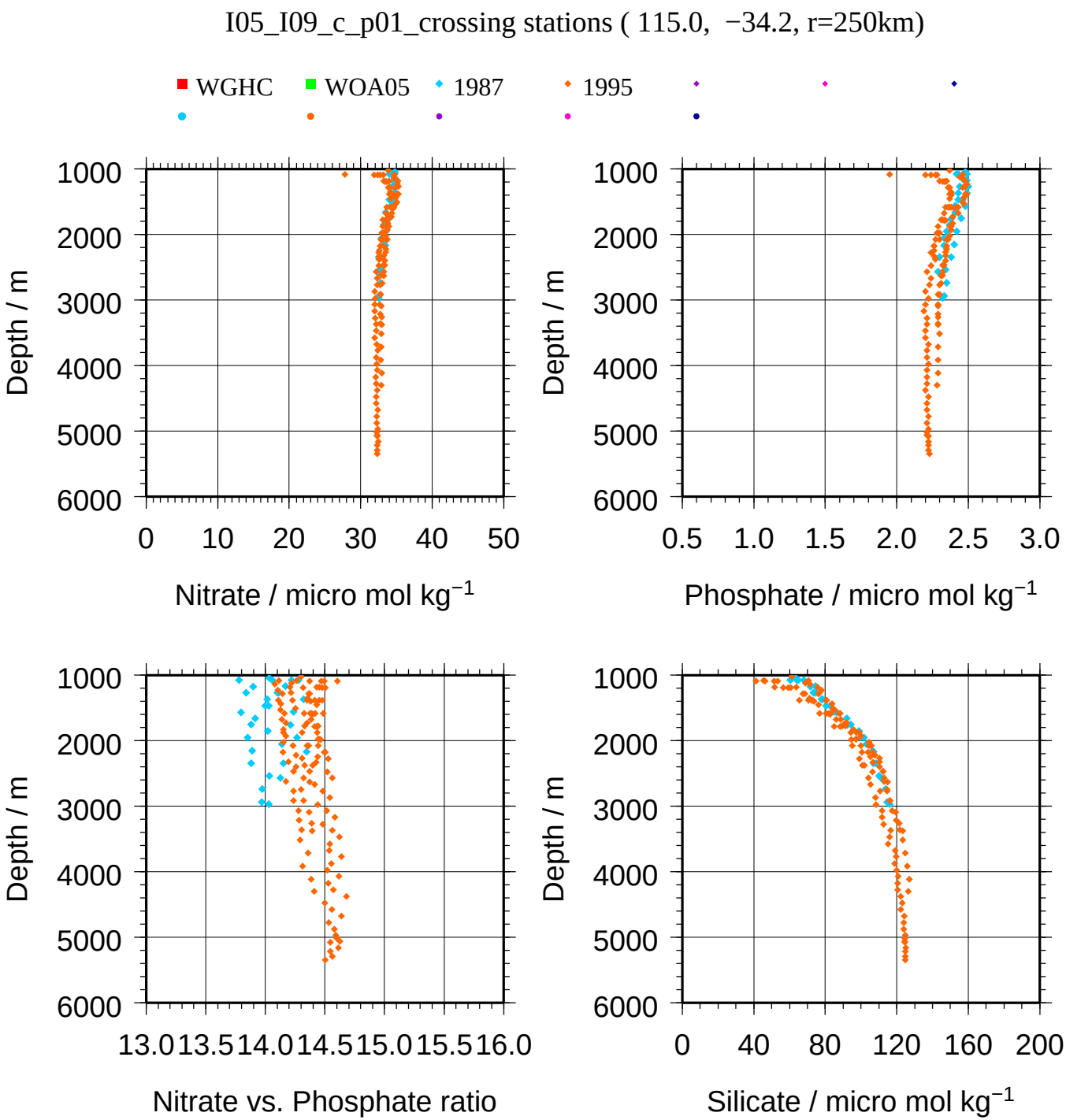

I03_I10_p01_crossing stations (111.1, −21.2, r=250km)
WGHC
WOA05
1995
2004
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

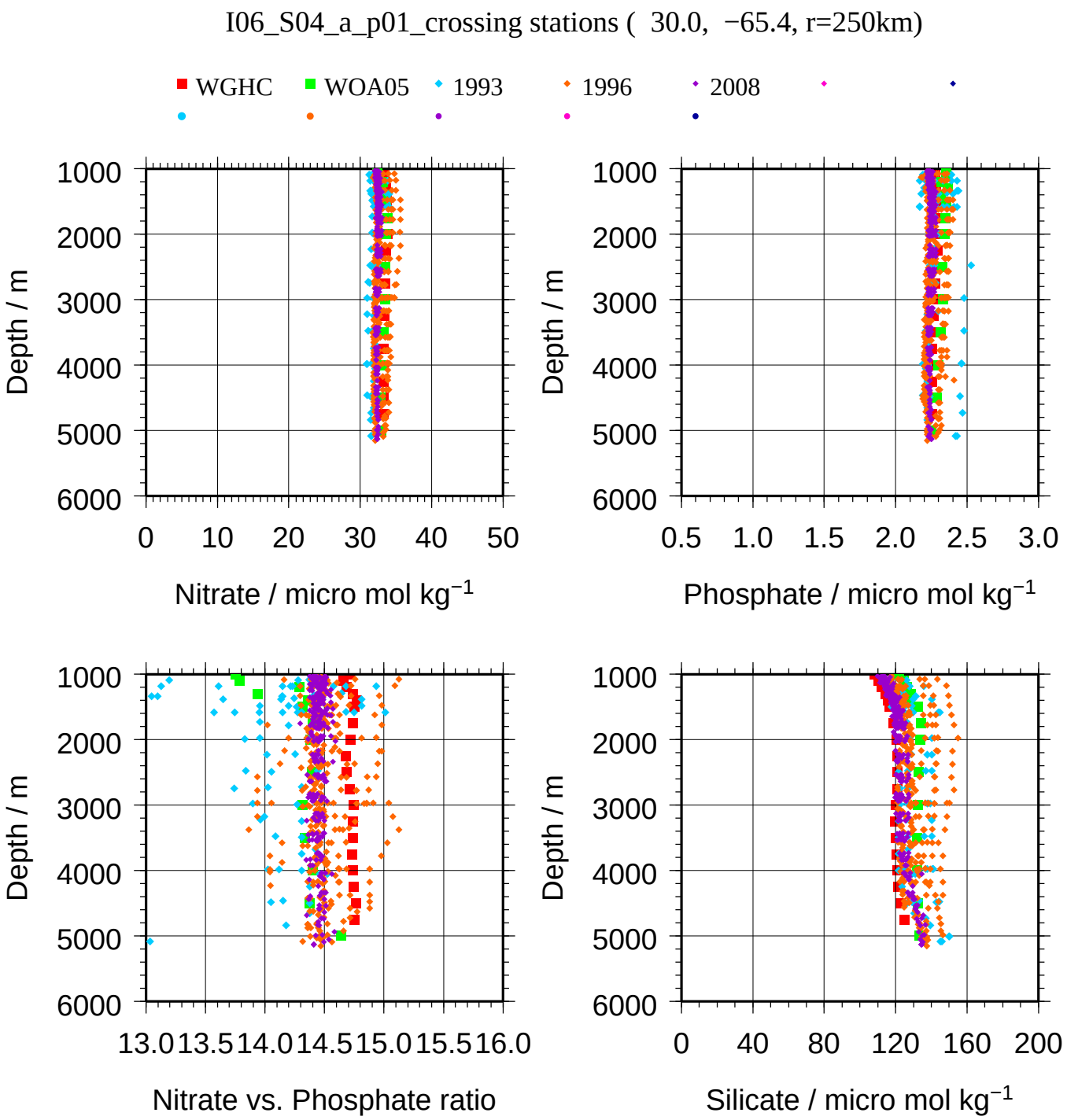

I05_I08_a_p01_crossing stations (95.0, −34.0, r=250km)
WGHC
WOA05
1987
1994
1995
2002
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

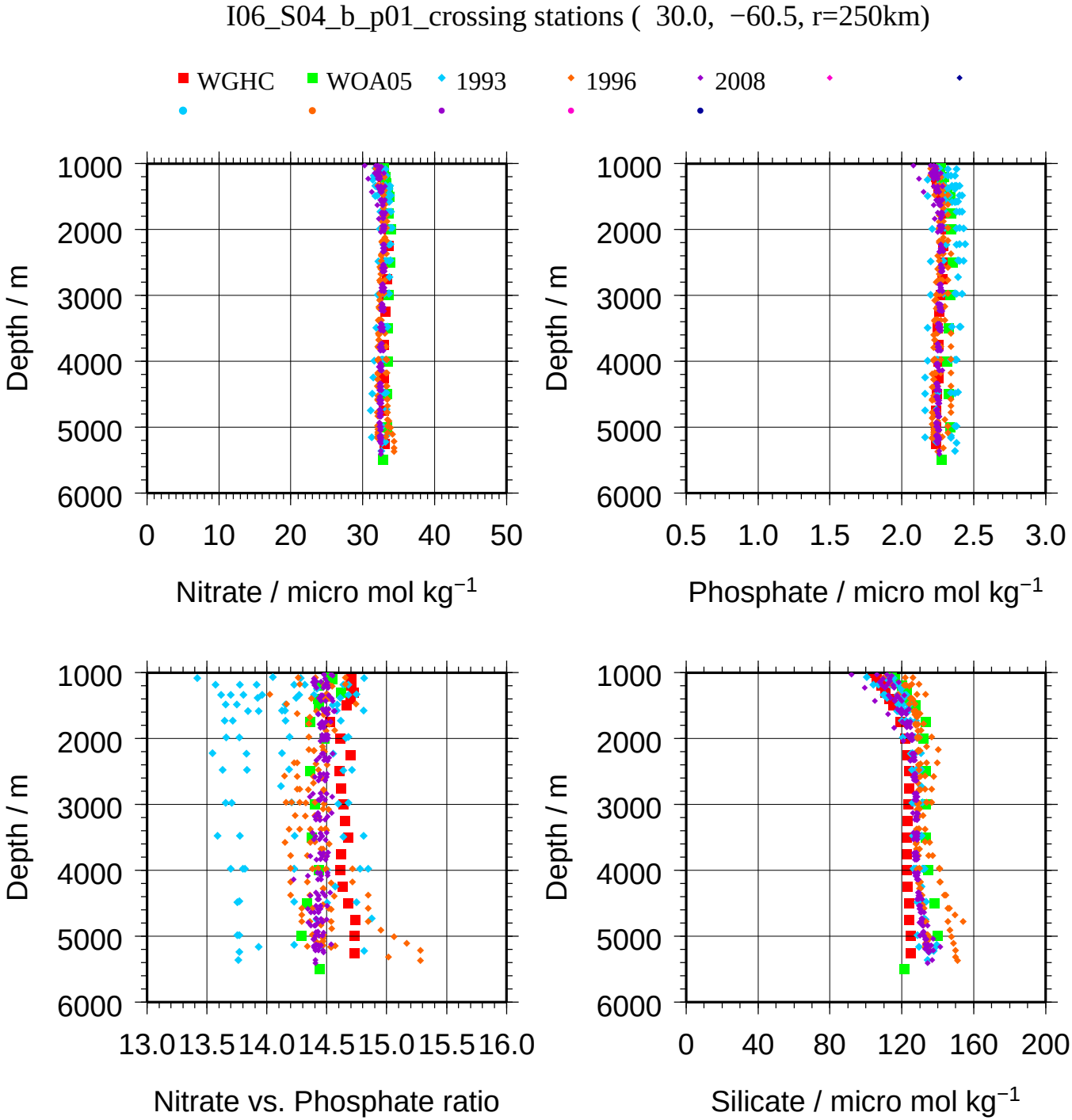

I05_I08_b_p01_crossing stations (95.0, −34.0, r=250km)
WGHC
WOA05
1987
1994
1995
2002
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

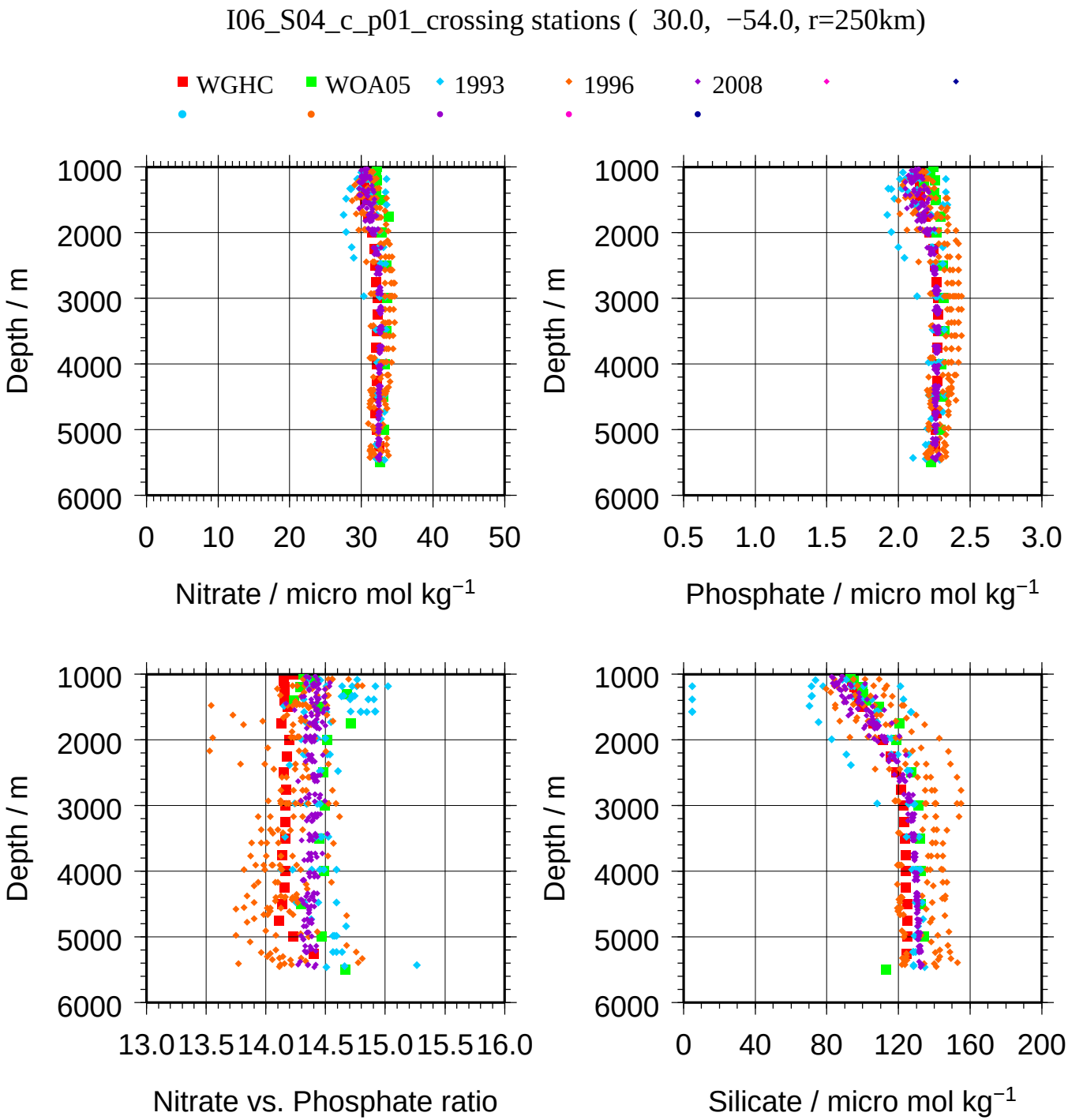

I05_I09_a_p01_crossing stations (115.0, −35.5, r=250km)
WGHC
WOA05
1987
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

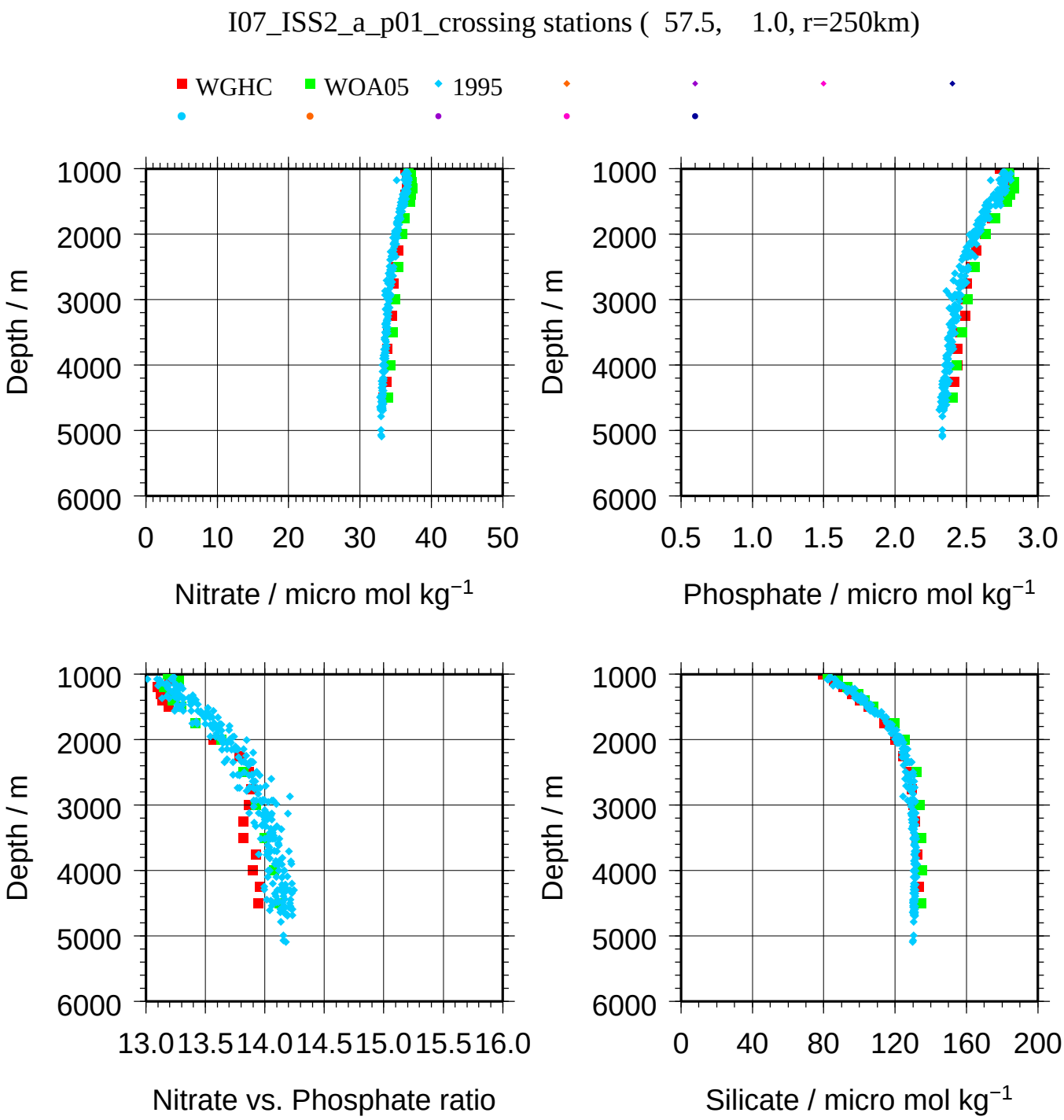

I05_I09_b_p01_crossing stations (115.0, −34.2, r=250km)
WGHC
WOA05
1987
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

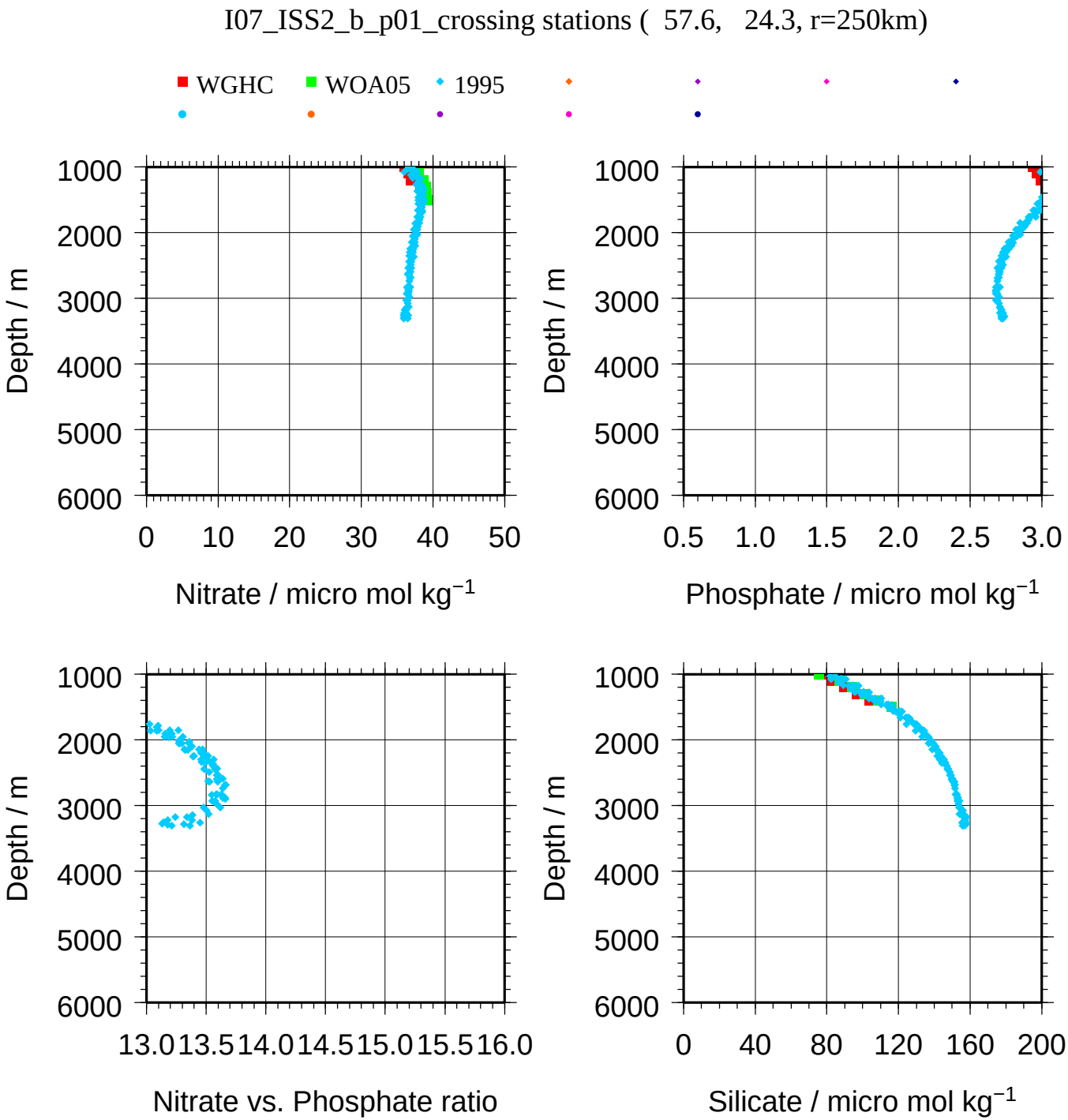

I05_I09_c_p01_crossing stations (115.0, −34.2, r=250km)
WGHC
WOA05
1987
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

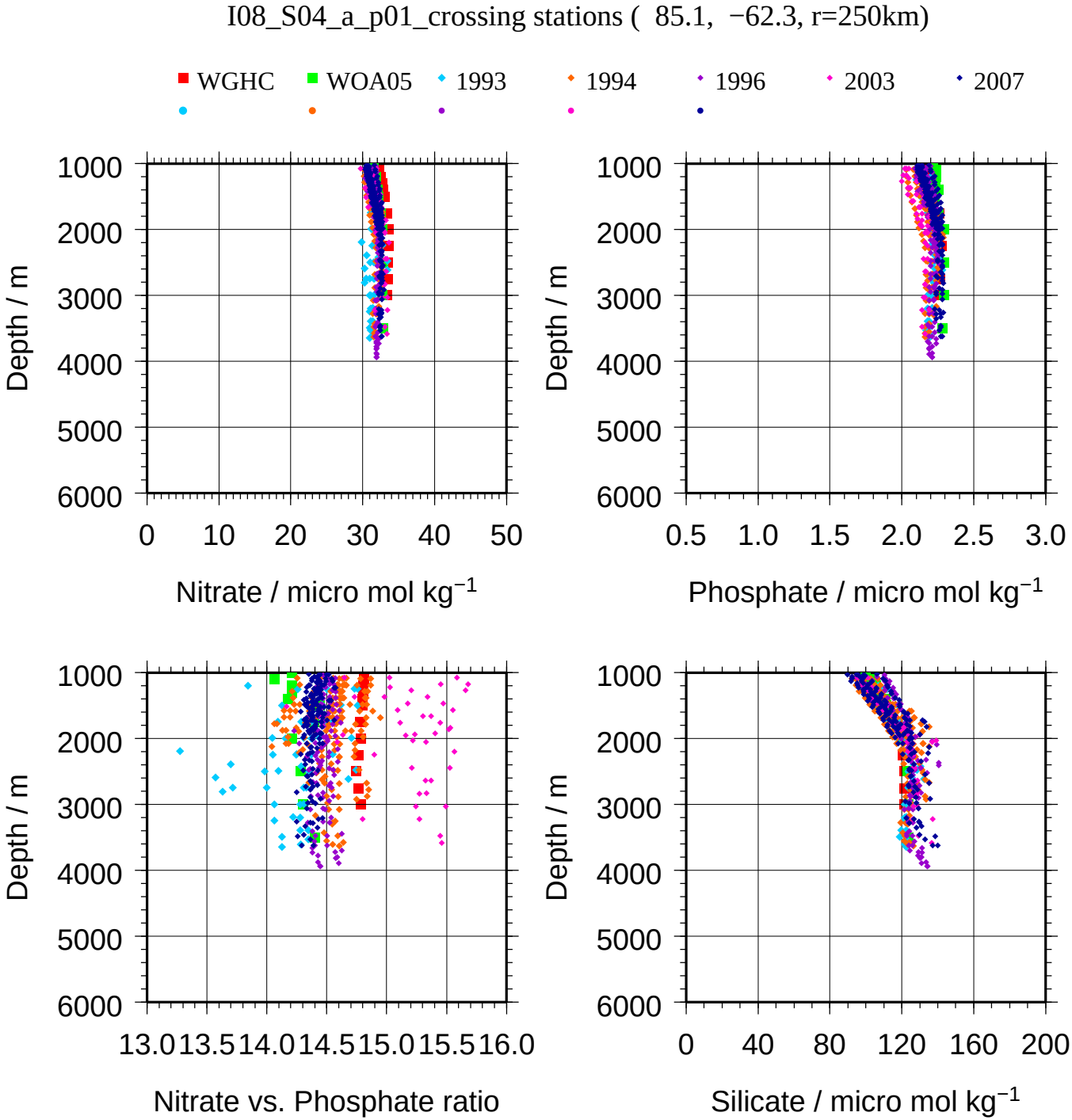

I06_S04_a_p01_crossing stations (30.0, −65.4, r=250km)
WGHC
WOA05
1993
1996
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

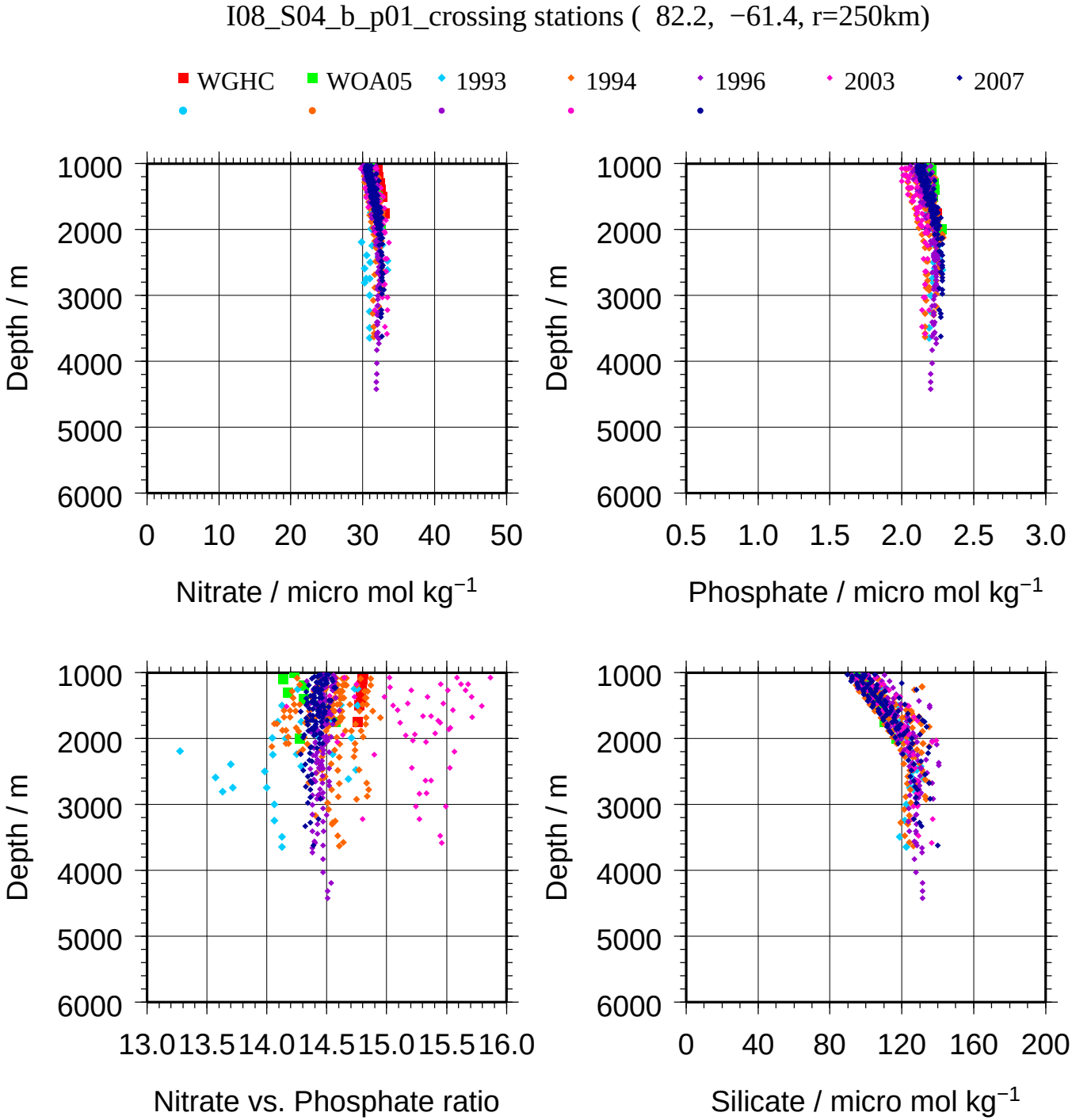

I06_S04_b_p01_crossing stations (30.0, −60.5, r=250km)
WGHC
WOA05
1993
1996
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

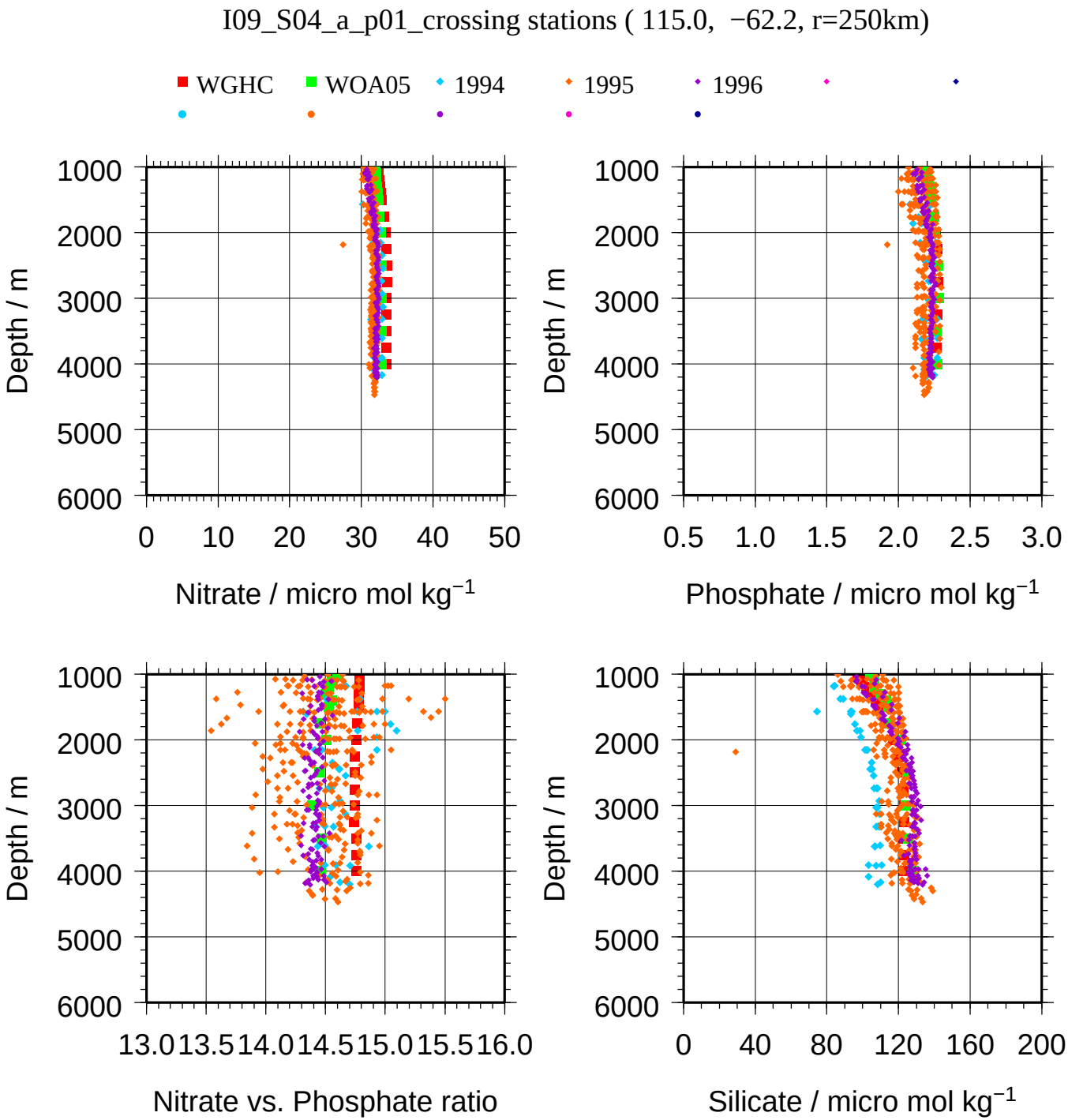

I06_S04_c_p01_crossing stations (30.0, −54.0, r=250km)
WGHC
WOA05
1993
1996
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

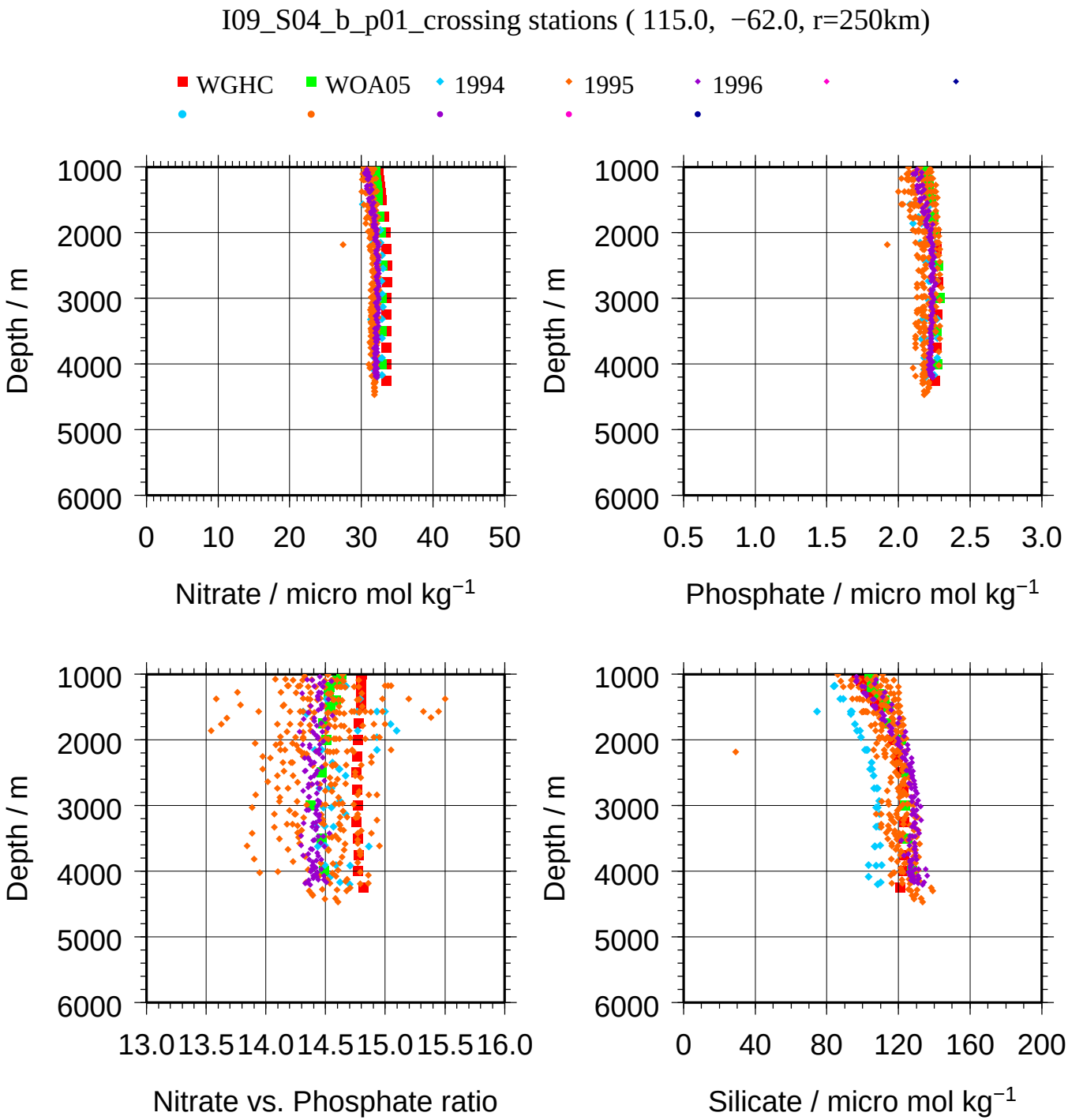

I07_ISS2_a_p01_crossing stations (57.5, 1.0, r=250km)
WGHC
WOA05
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
80
120
160
200
Silicate / micro mol kg−1

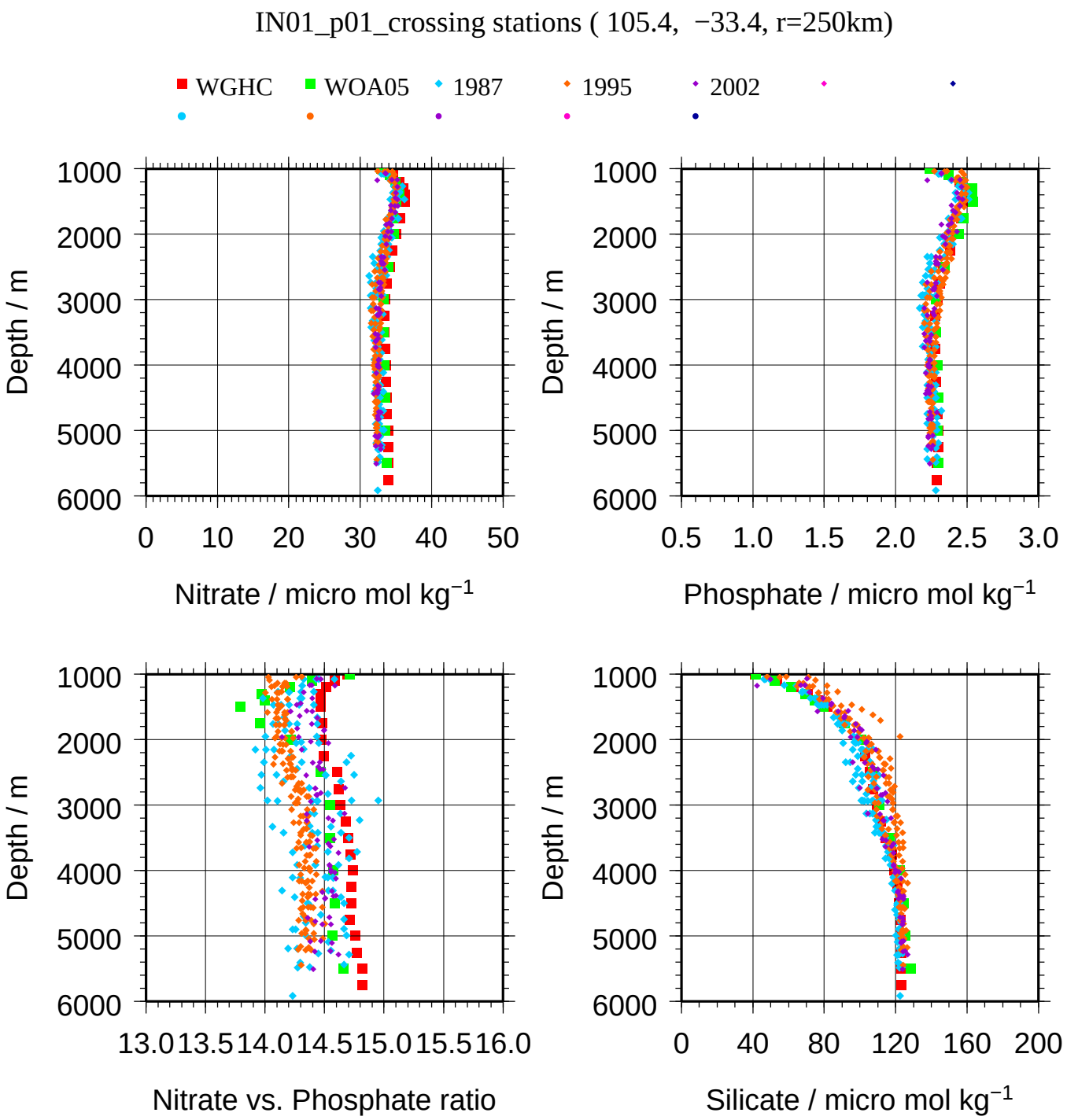

I07_ISS2_b_p01_crossing stations (57.6, 24.3, r=250km)
WGHC
WOA05
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

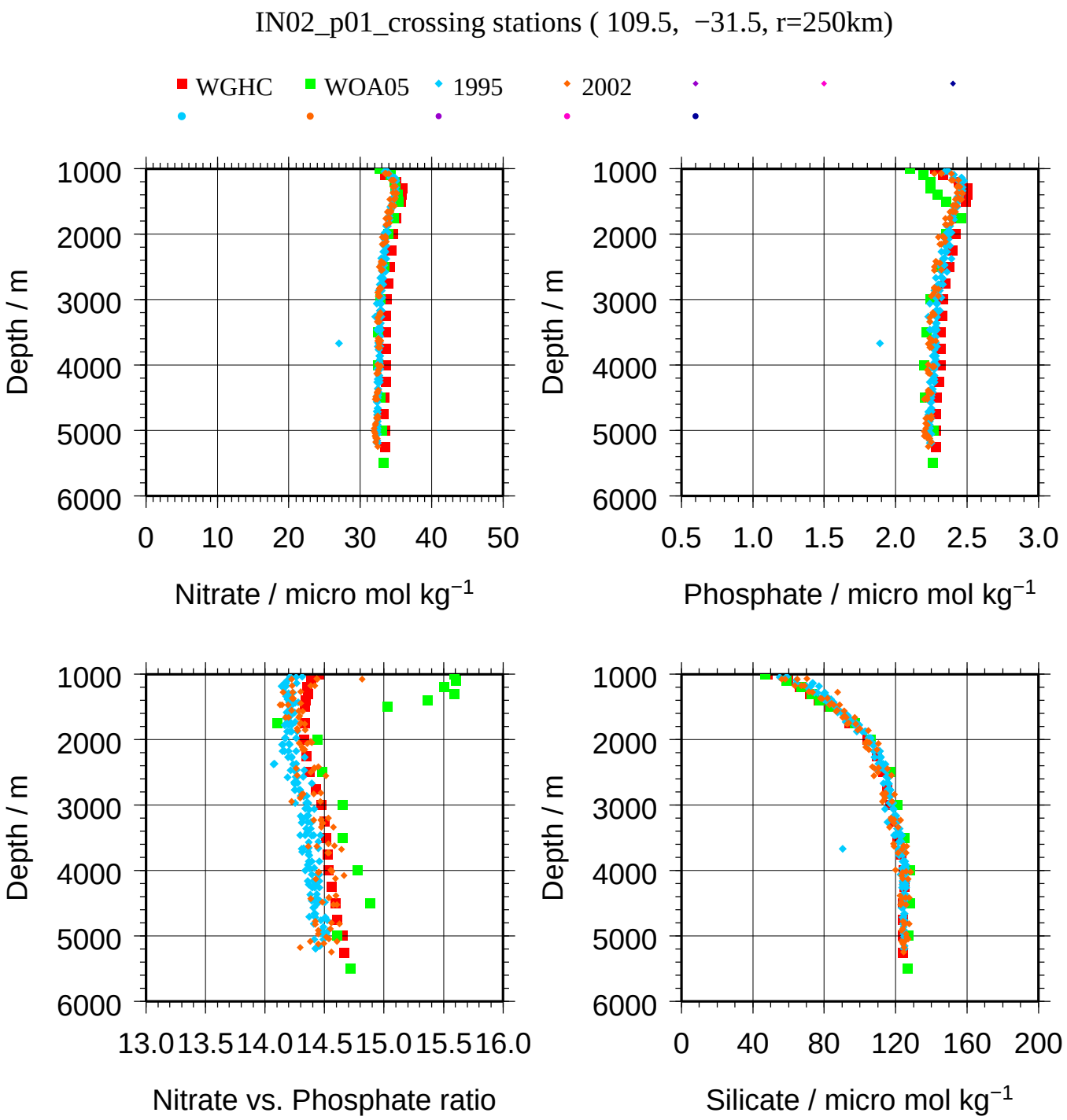

I08_S04_a_p01_crossing stations (85.1, −62.3, r=250km)
WGHC
WOA05
1993
1994
1996
2003
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

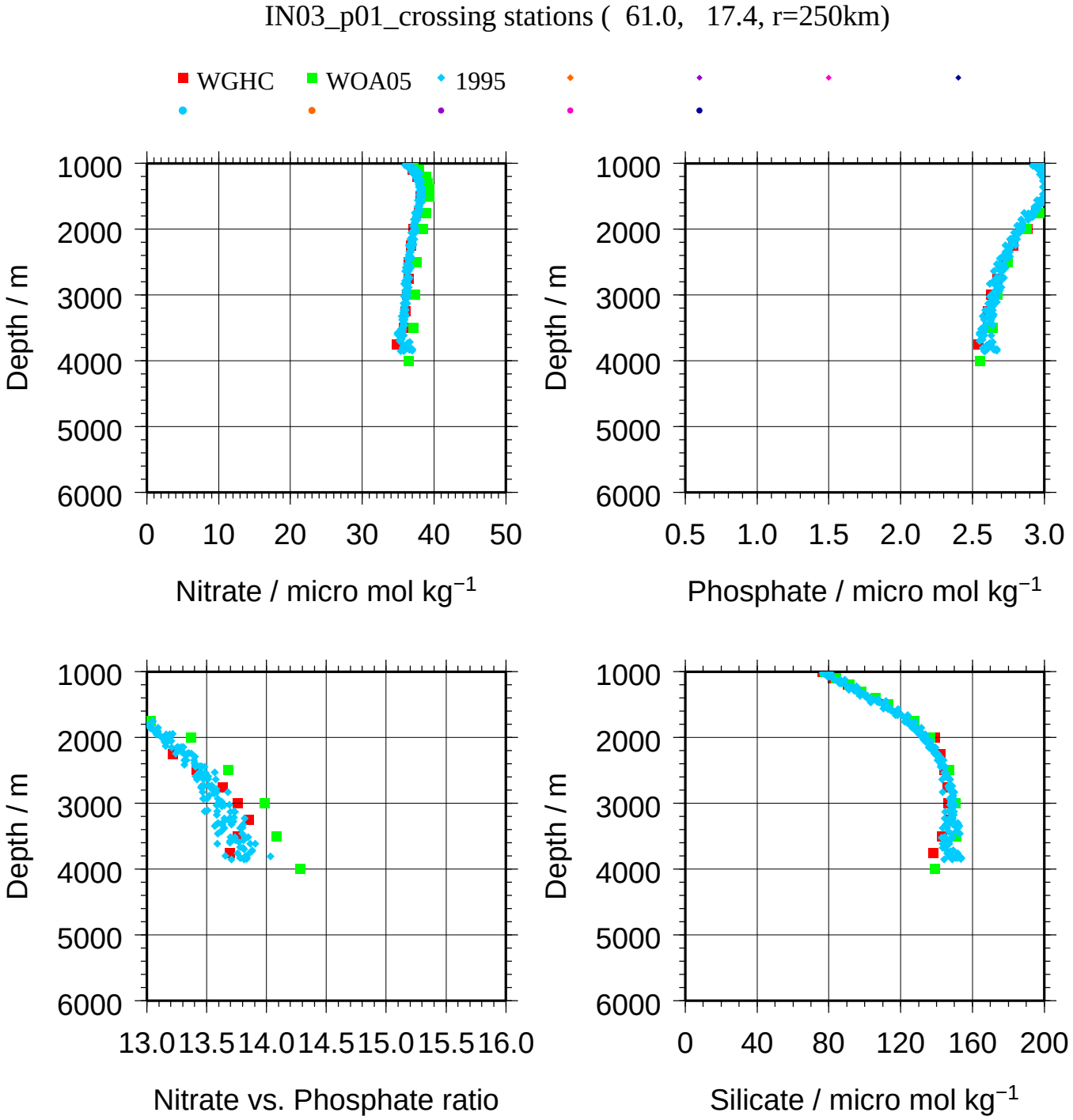

I08_S04_b_p01_crossing stations (82.2, −61.4, r=250km)
WGHC
WOA05
1993
1994
1996
2003
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

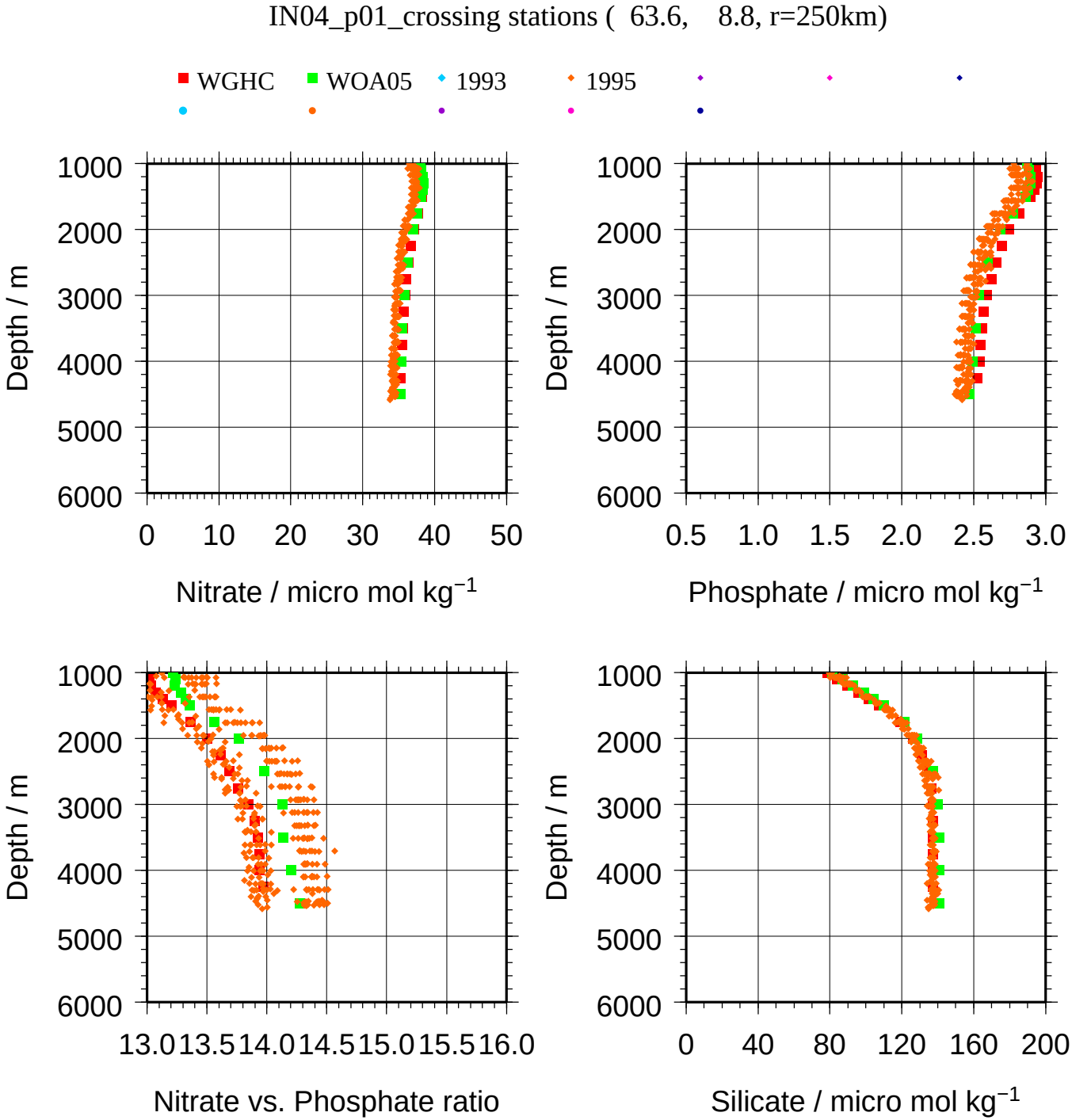

I09_S04_a_p01_crossing stations (115.0, −62.2, r=250km)
WGHC
WOA05
1994
1995
1996
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

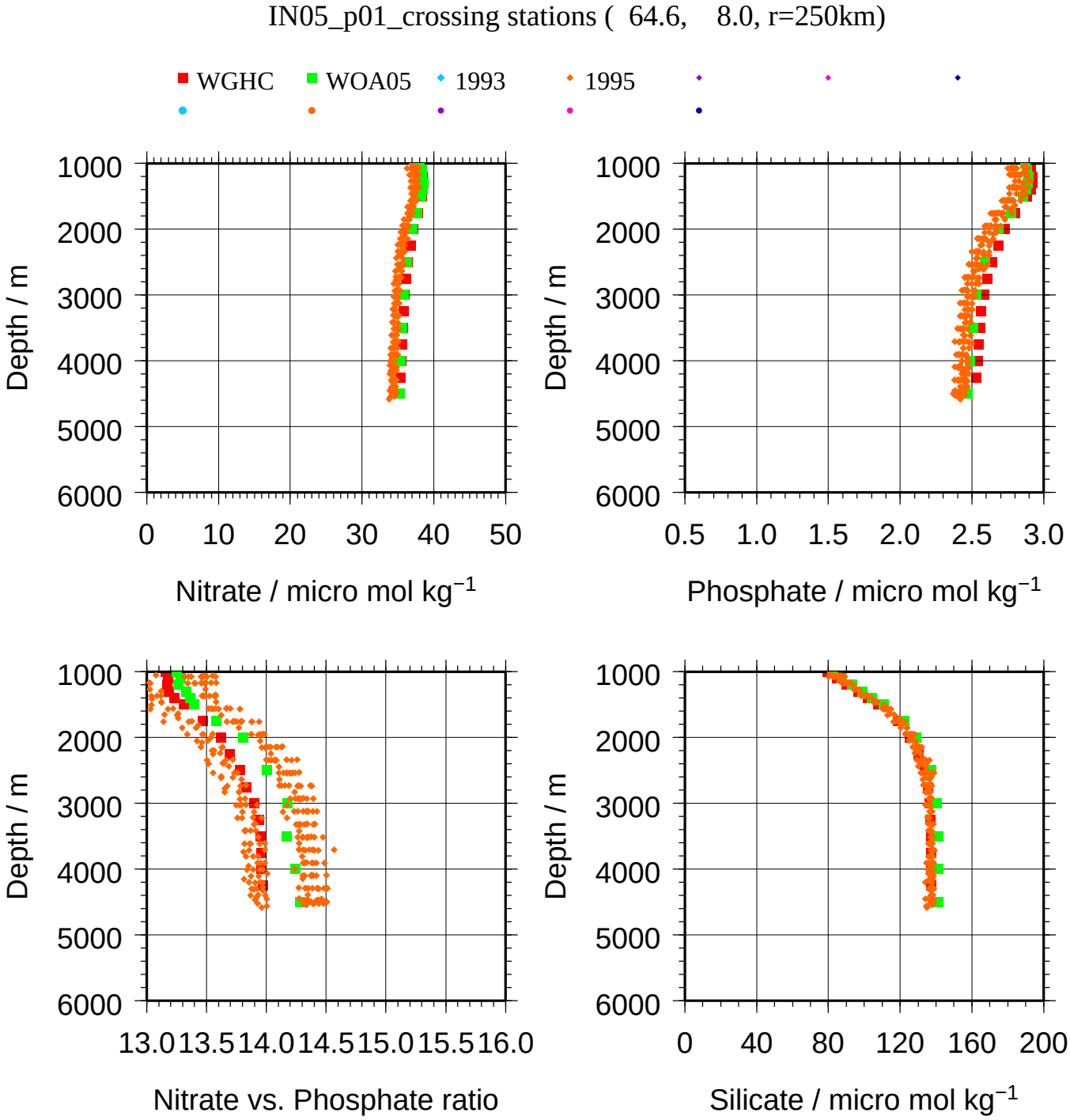

I09_S04_b_p01_crossing stations (115.0, −62.0, r=250km)
WGHC
WOA05
1994
1995
1996
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

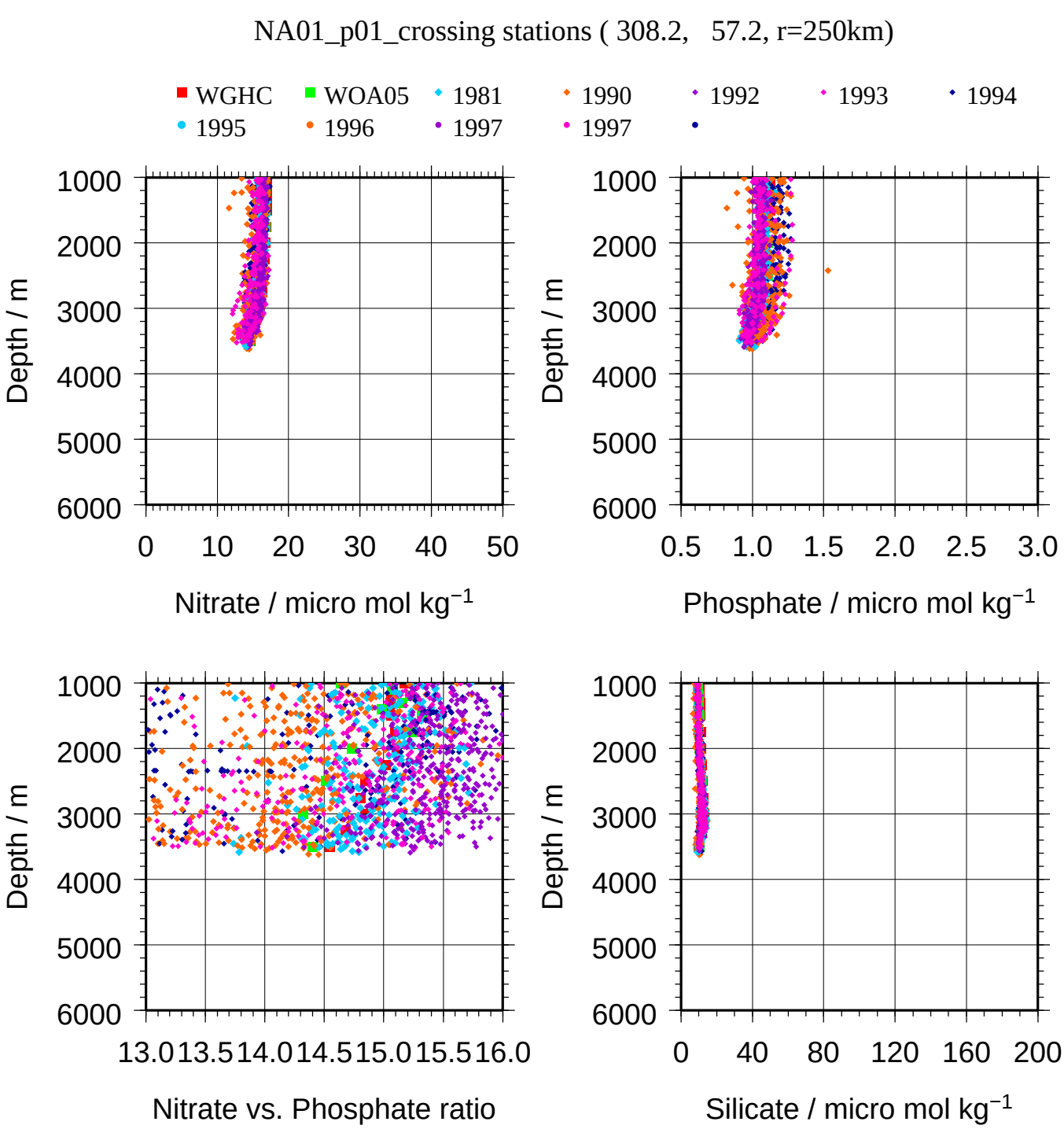

IN01_p01_crossing stations (105.4, −33.4, r=250km)
WGHC
WOA05
1987
1995
2002
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

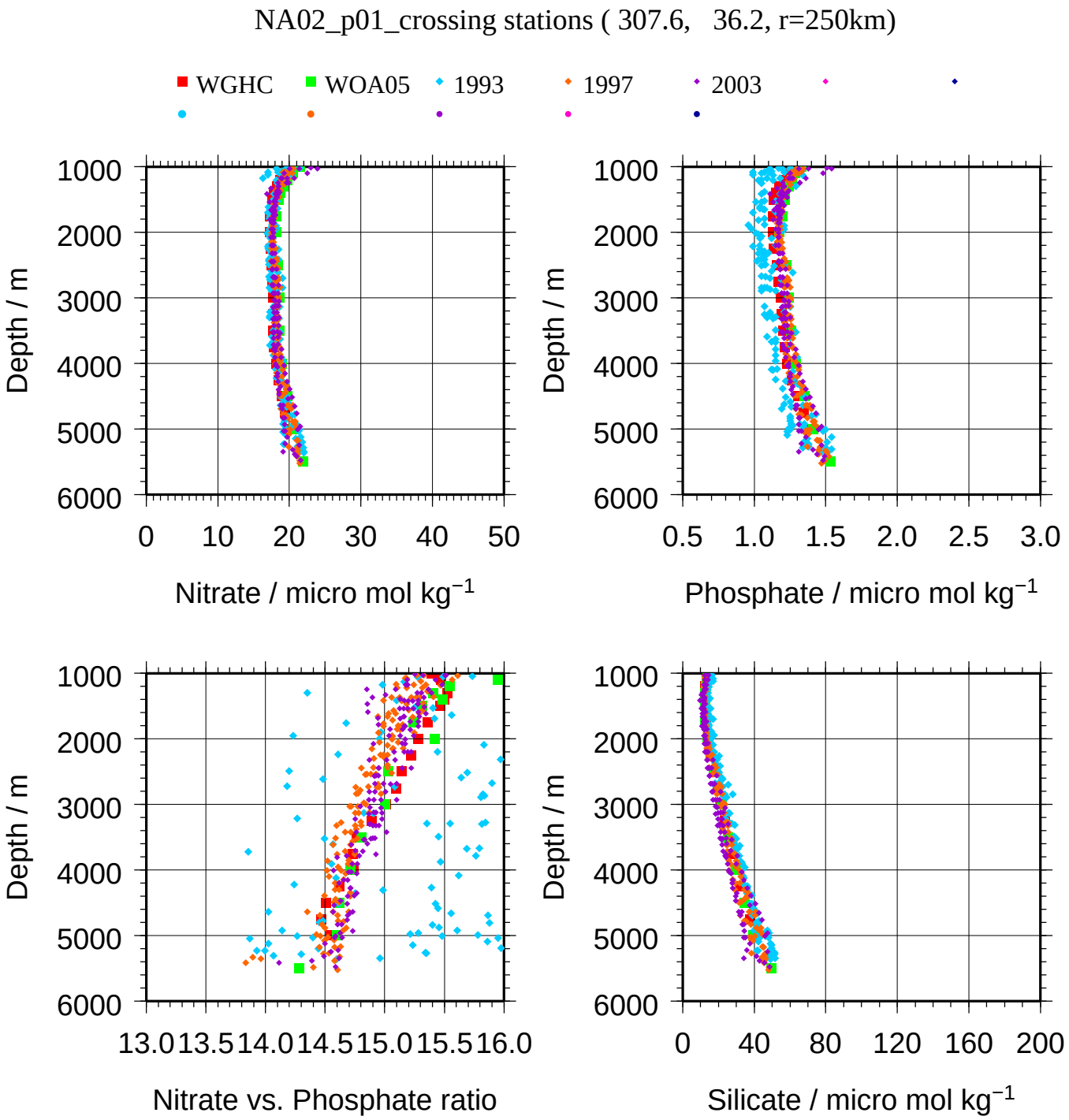

IN02_p01_crossing stations (109.5, −31.5, r=250km)
WGHC
WOA05
1995
2002
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

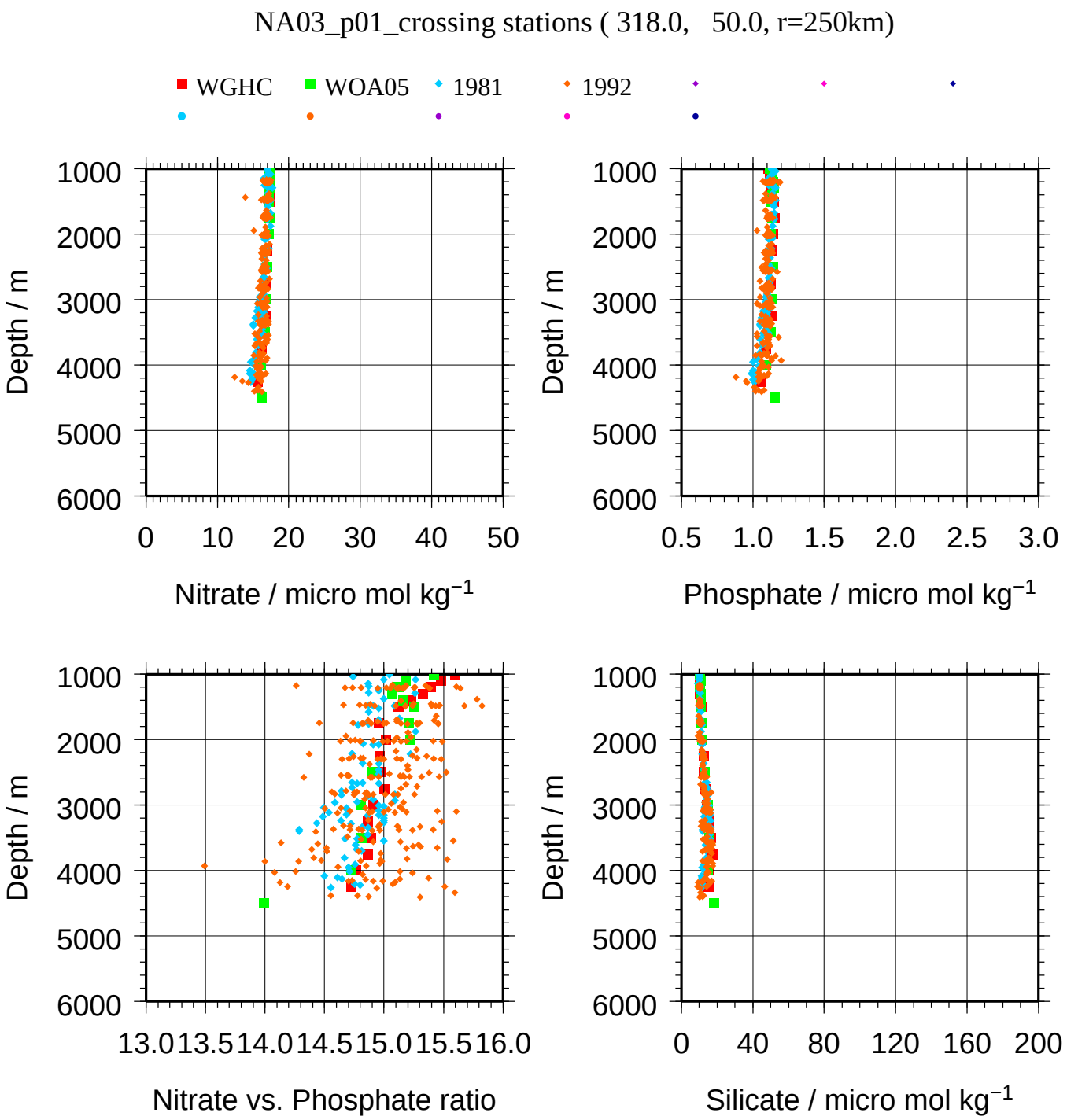

IN03_p01_crossing stations (61.0, 17.4, r=250km)
WGHC
WOA05
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

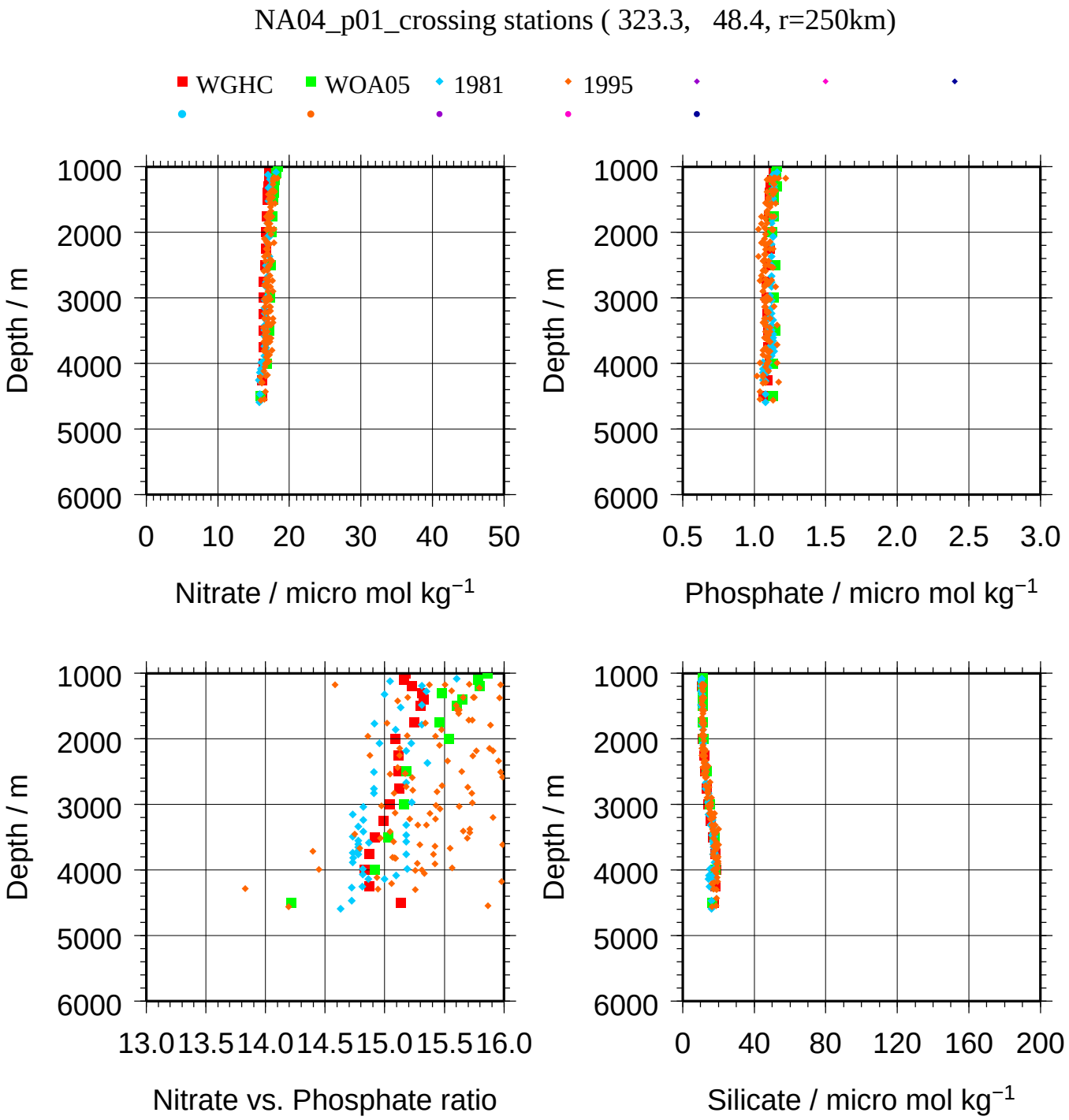

IN04_p01_crossing stations (63.6, 8.8, r=250km)
WGHC
WOA05
1993
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

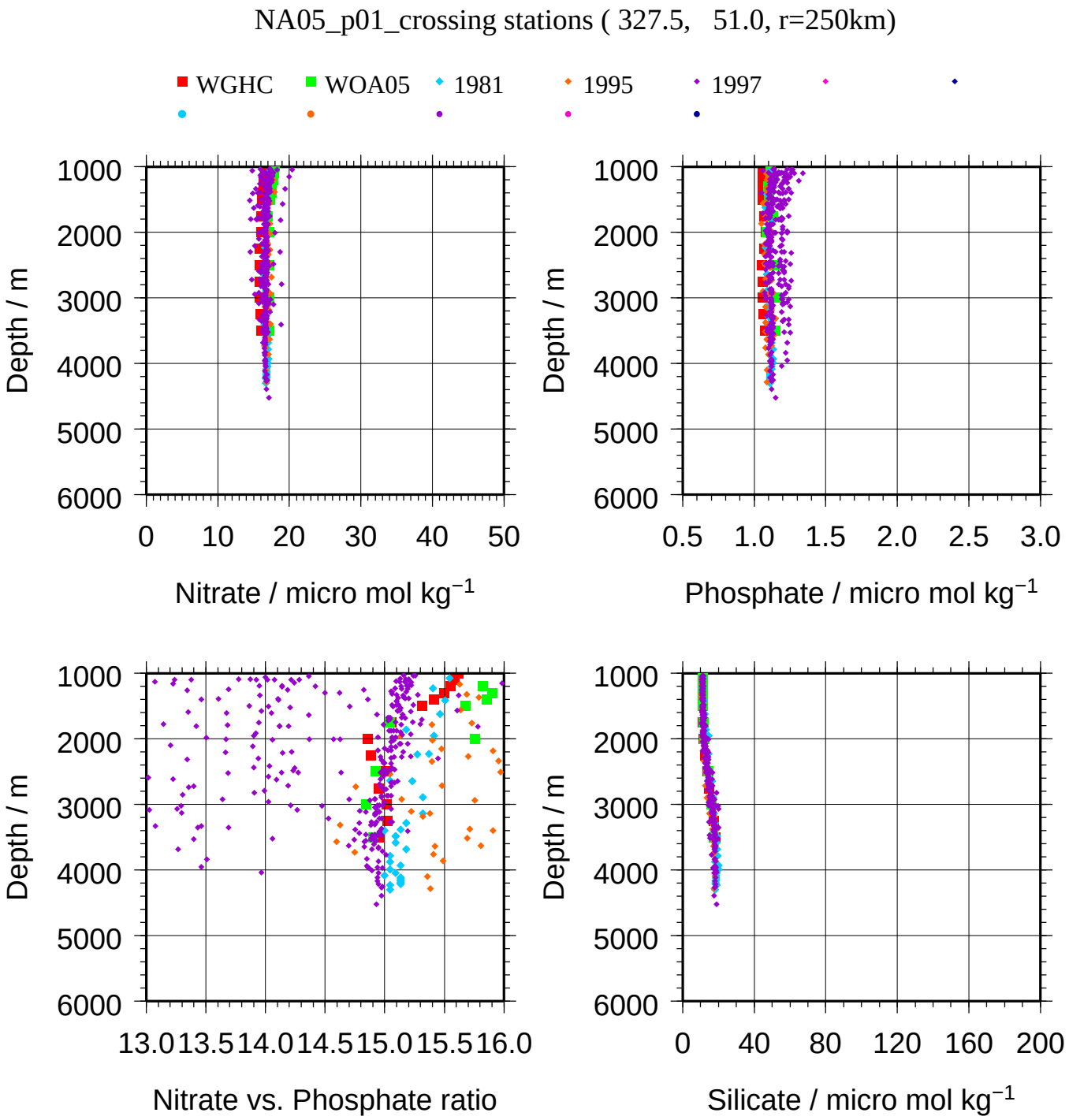

IN05_p01_crossing stations (64.6, 8.0, r=250km)
WGHC
WOA05
1993
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

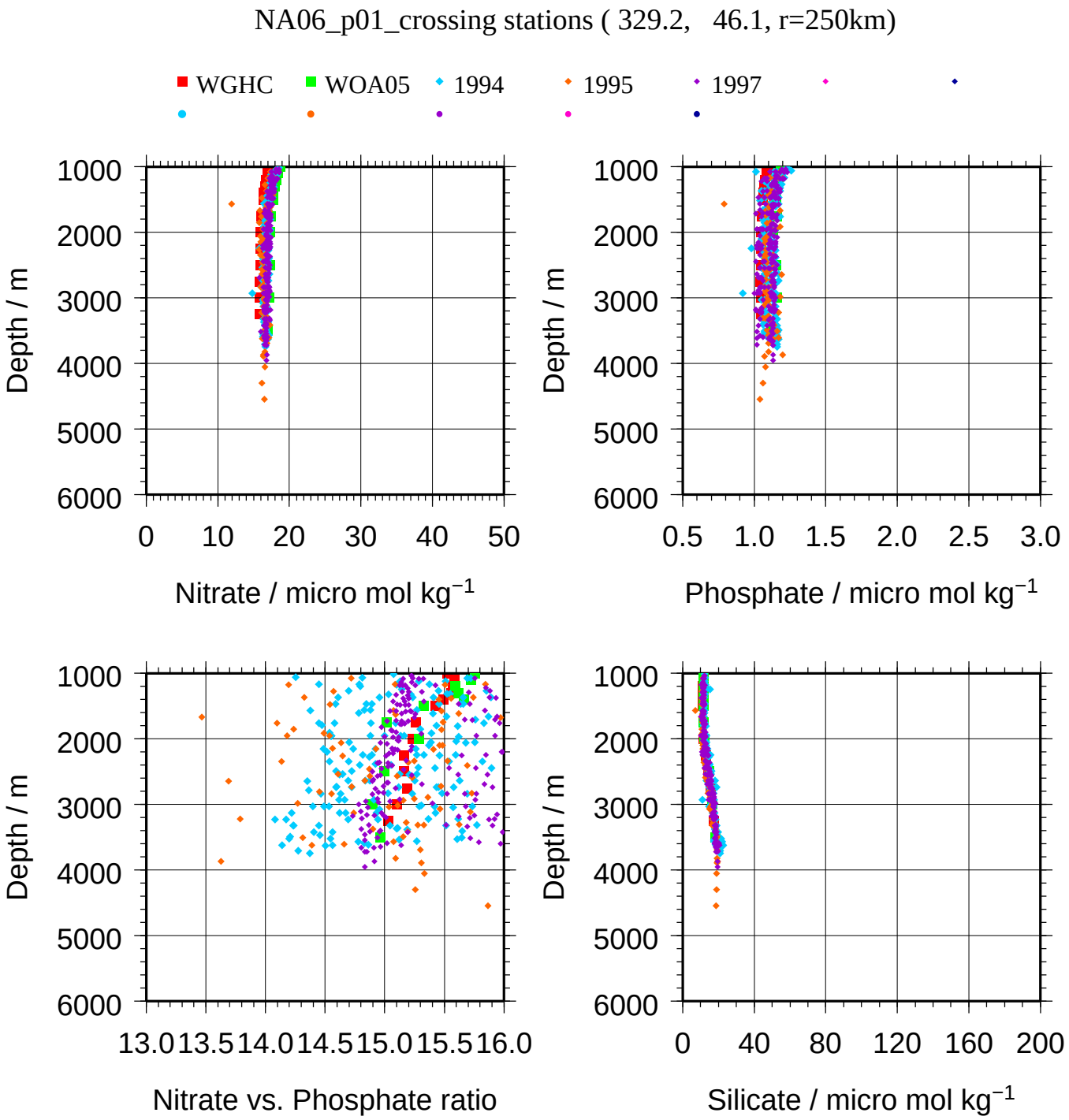

NA01_p01_crossing stations (308.2, 57.2, r=250km)
WGHC
WOA05
1981
1990
1992
1993
1994
1995
1996
1997
1997
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
80
120
160
200
Silicate / micro mol kg−1

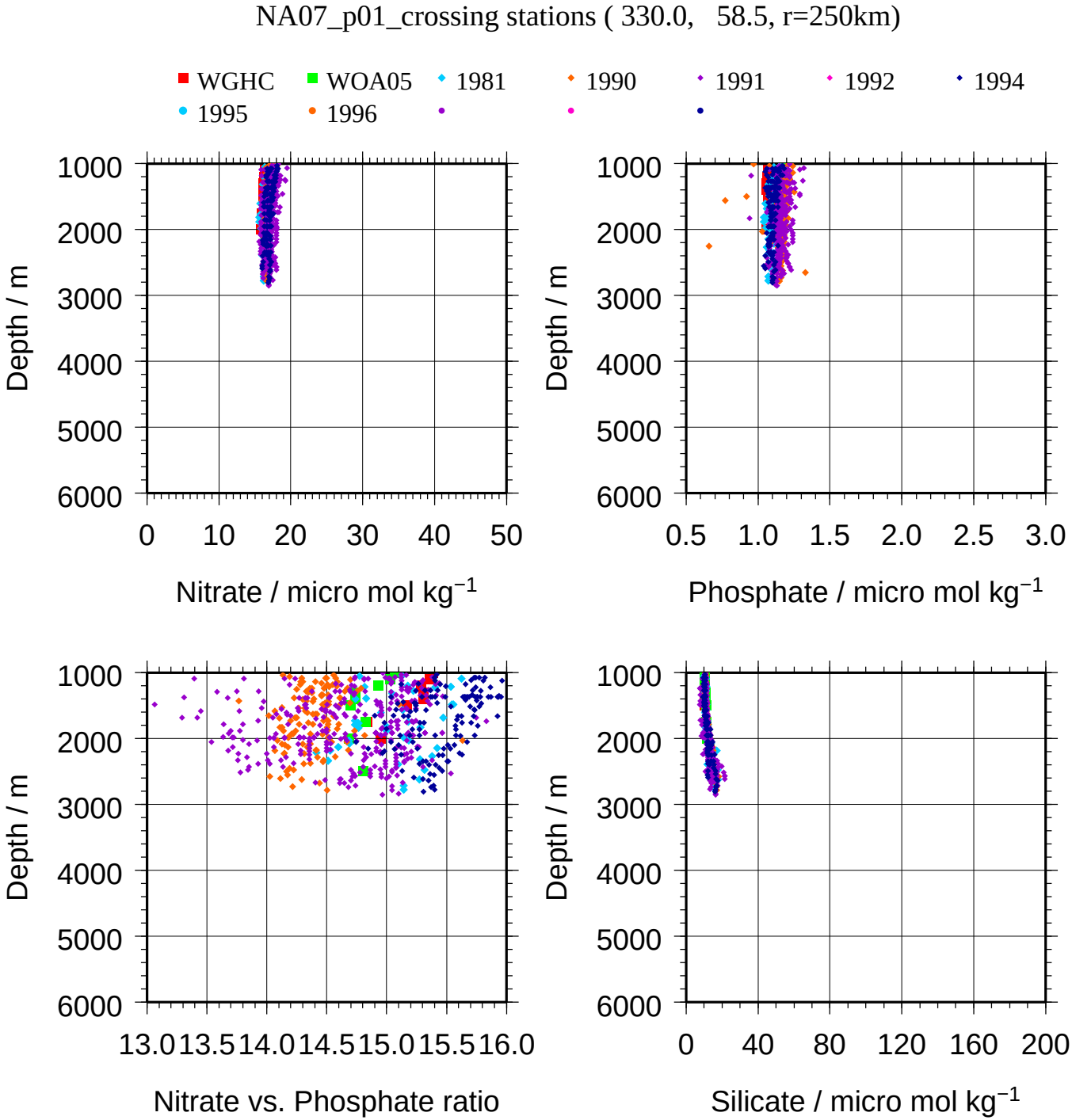

NA02_p01_crossing stations (307.6, 36.2, r=250km)
WGHC
WOA05
1993
1997
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

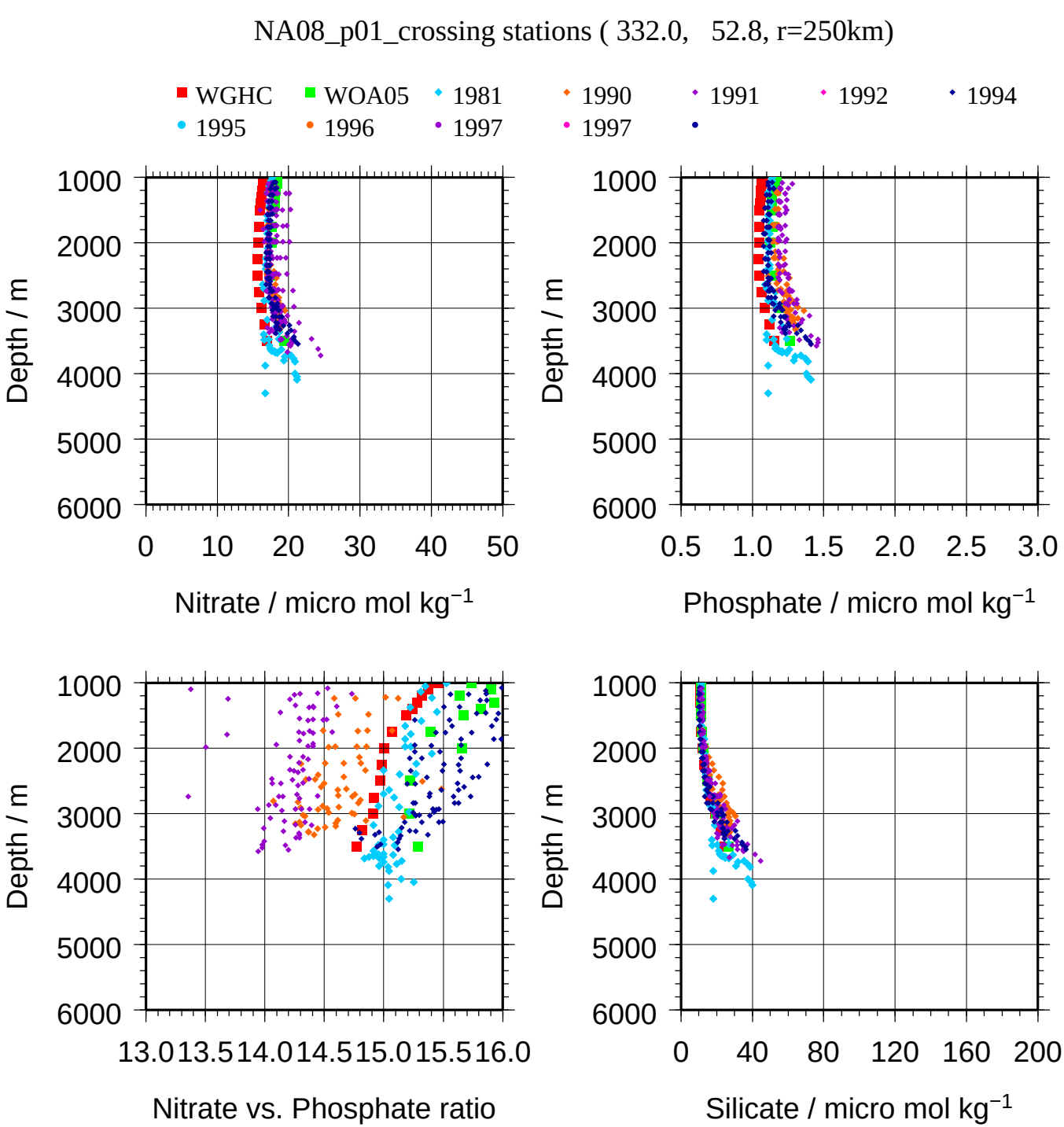

NA03_p01_crossing stations (318.0, 50.0, r=250km)
WGHC
WOA05
1981
1992
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

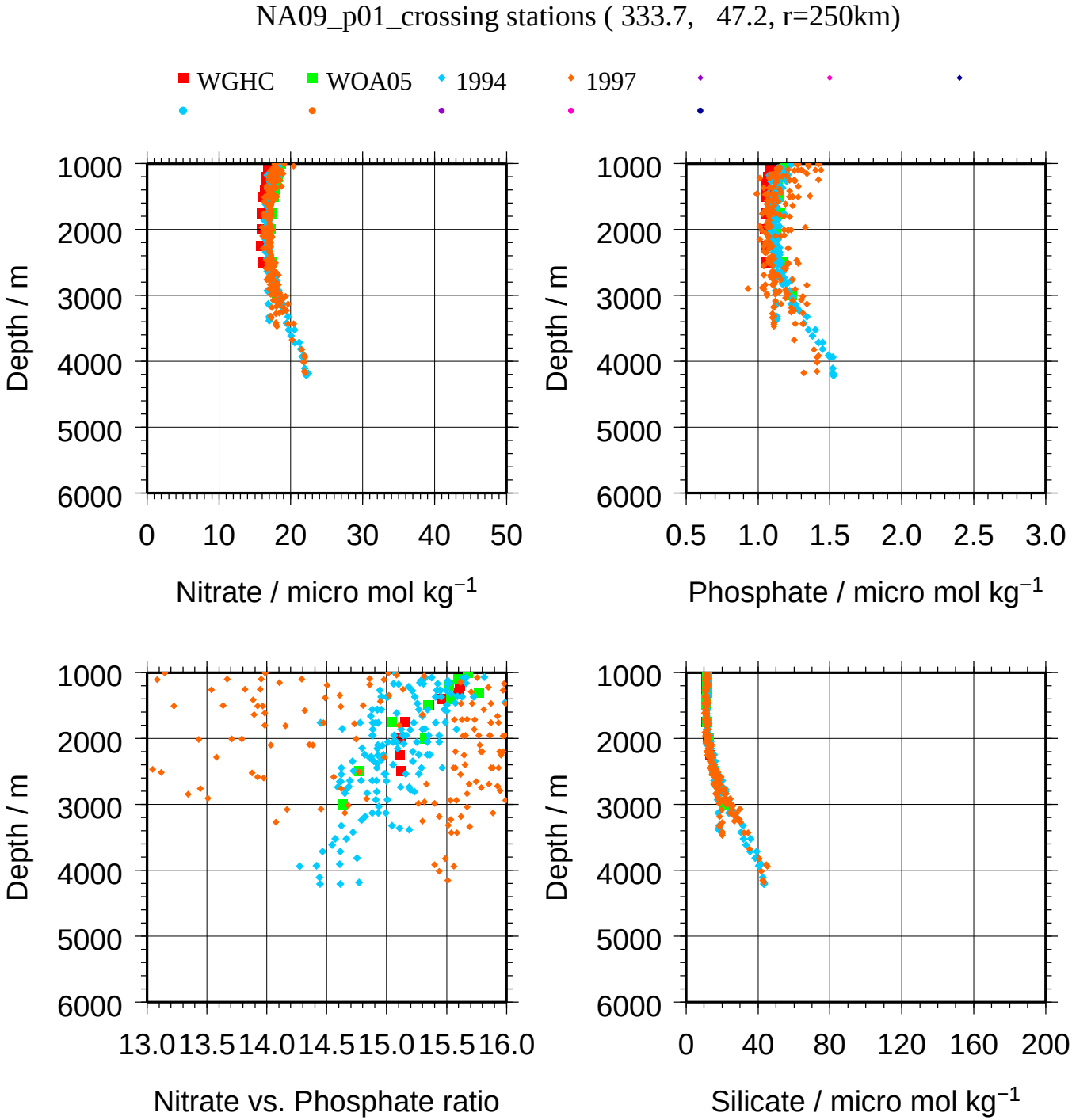

NA04_p01_crossing stations (323.3, 48.4, r=250km)
WGHC
WOA05
1981
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
80
120
160
200
Silicate / micro mol kg−1

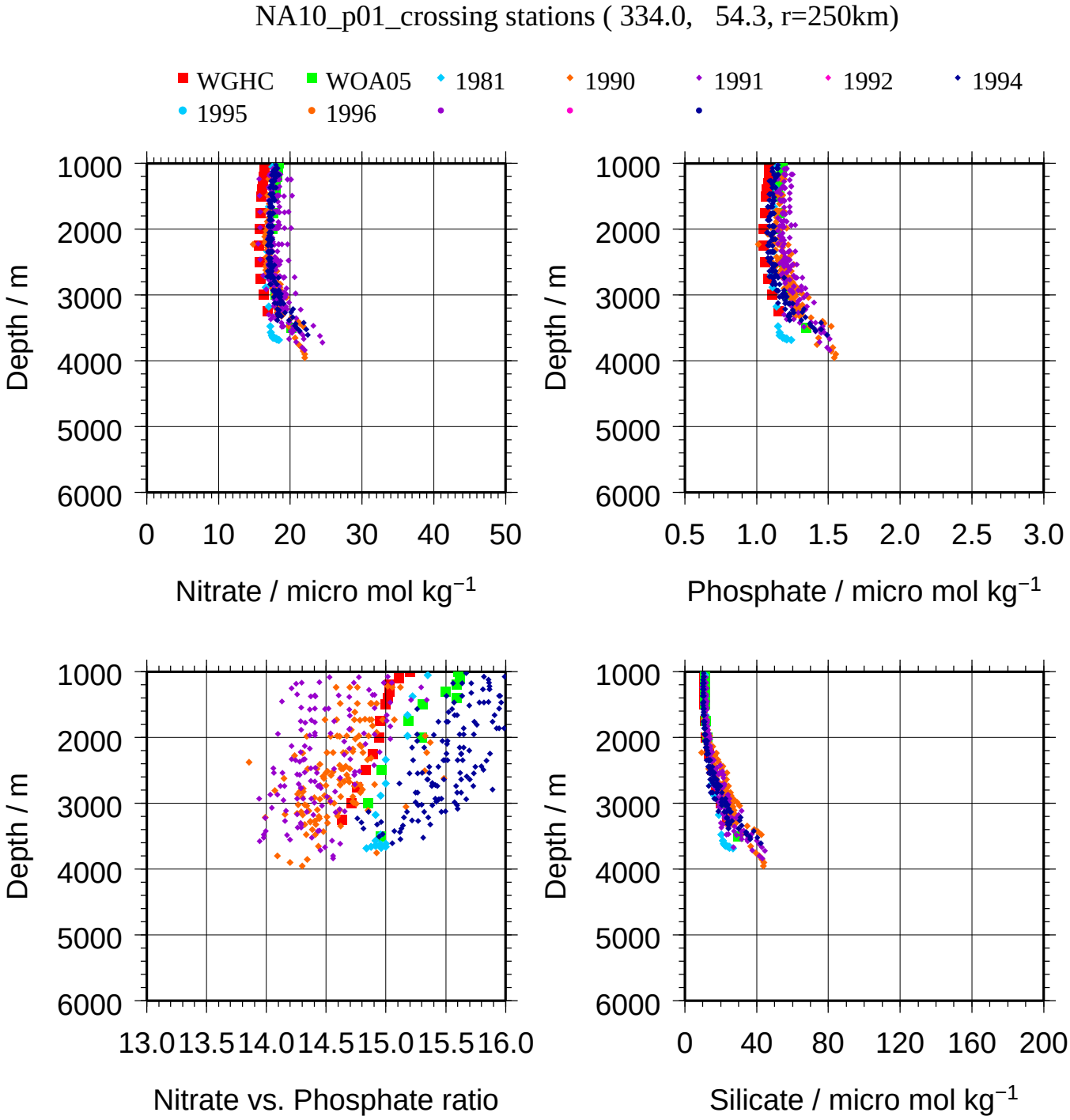

NA05_p01_crossing stations (327.5, 51.0, r=250km)
WGHC
WOA05
1981
1995
1997
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

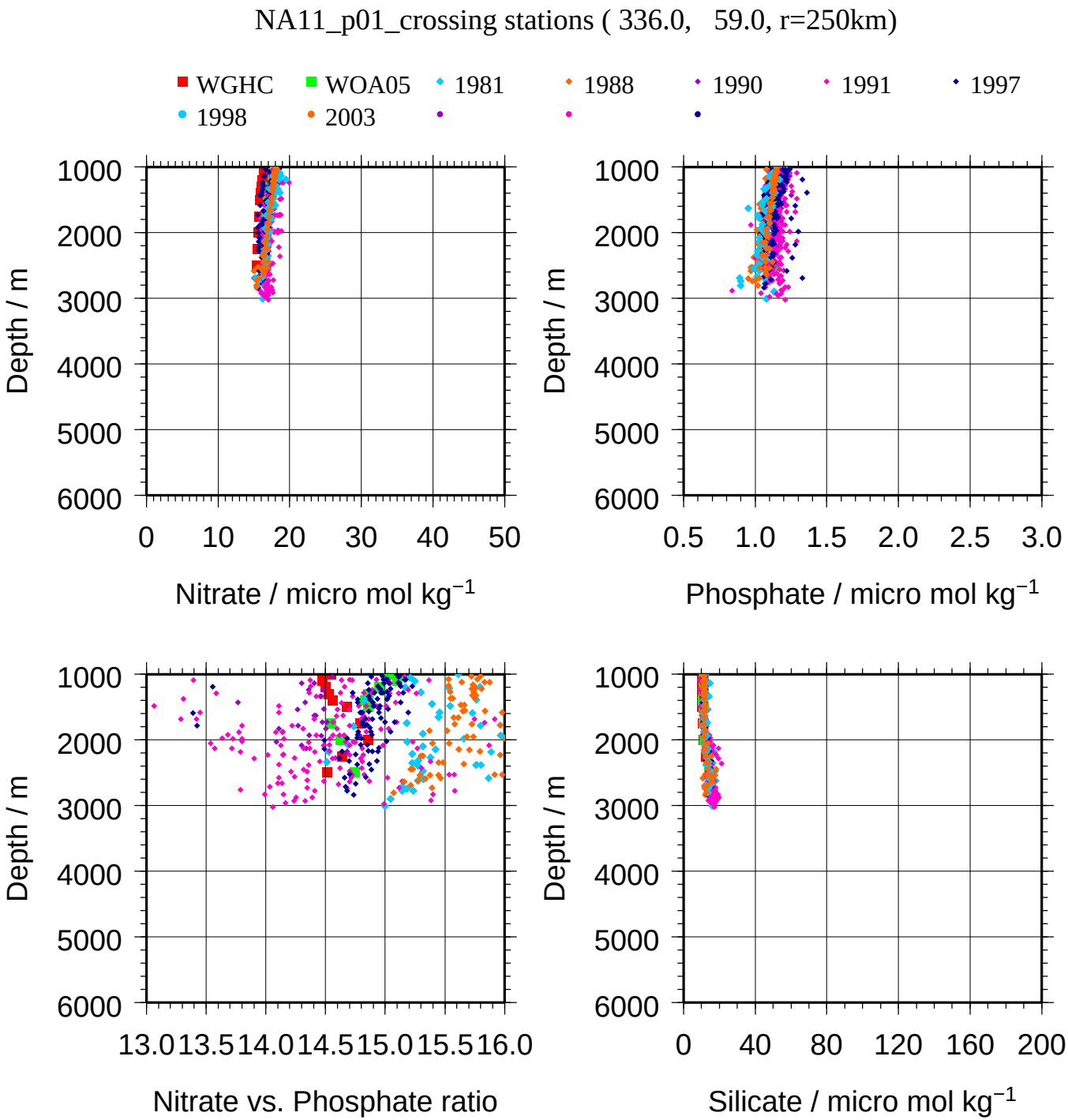

NA06_p01_crossing stations (329.2, 46.1, r=250km)
WGHC
WOA05
1994
1995
1997
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
80
120
160
200
Silicate / micro mol kg−1

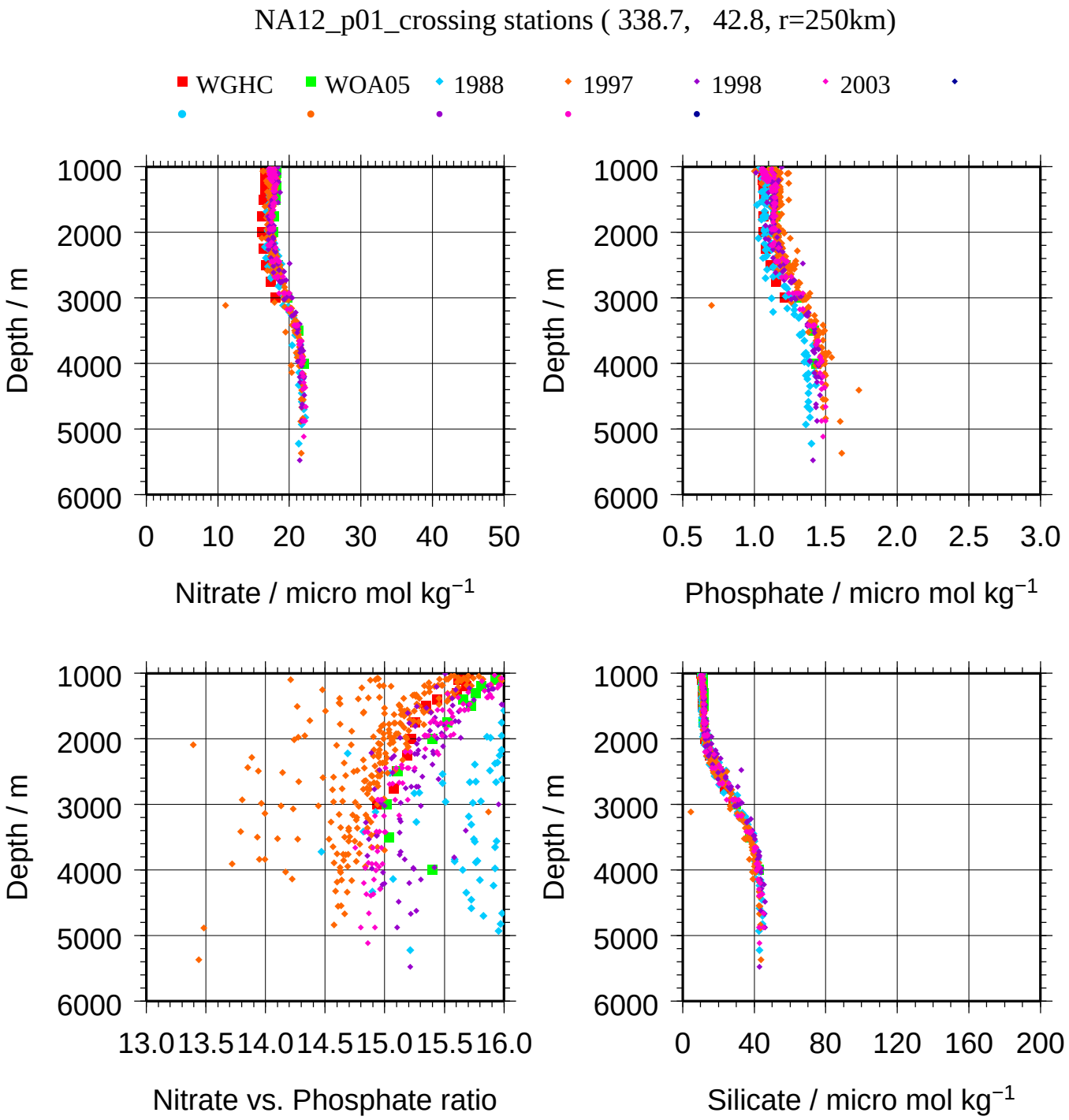

NA07_p01_crossing stations (330.0, 58.5, r=250km)
WGHC
WOA05
1981
1990
1991
1992
1994
1995
1996
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
80
120
160
200
Silicate / micro mol kg−1

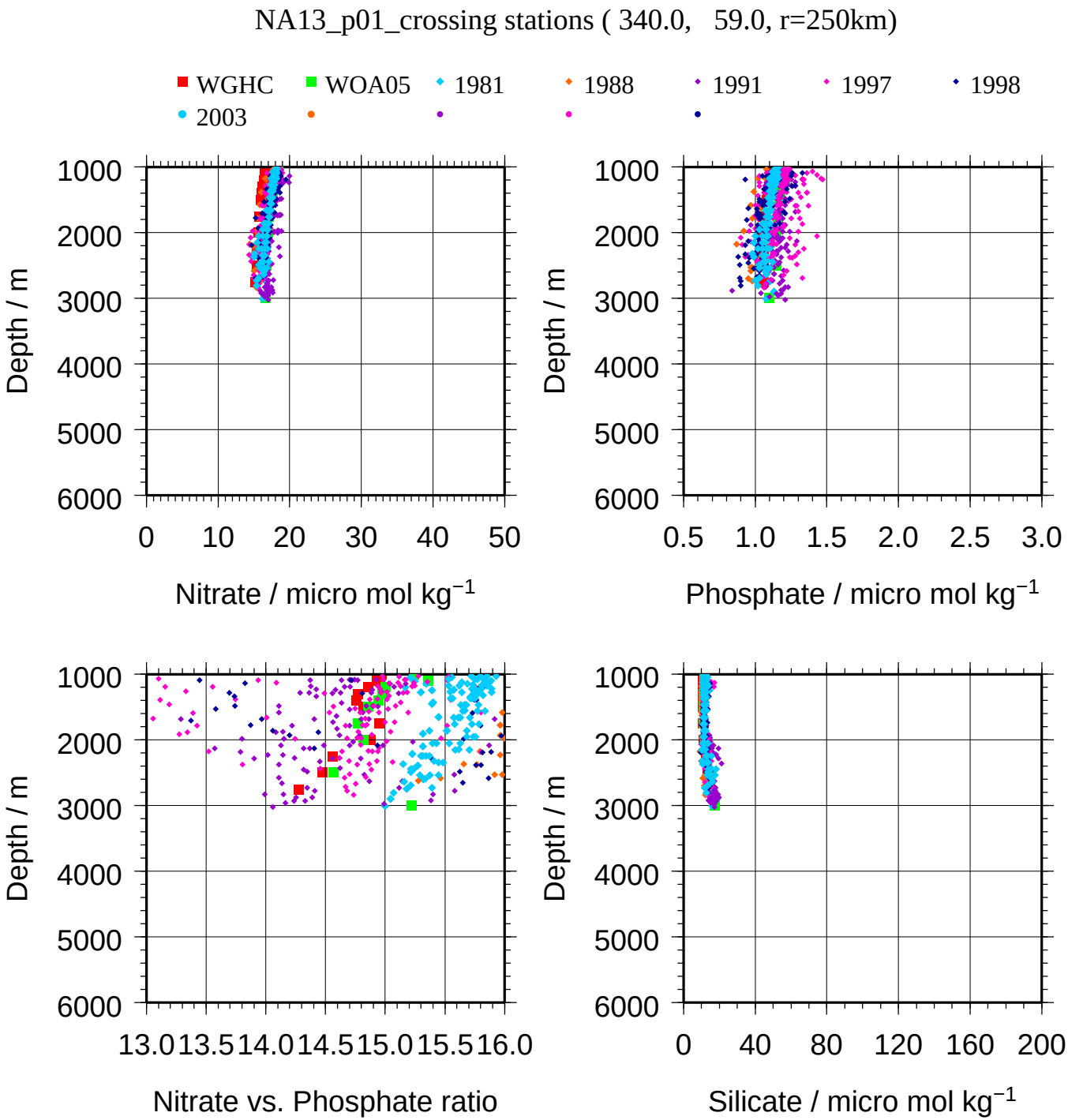

NA08_p01_crossing stations (332.0, 52.8, r=250km)
WGHC
WOA05
1981
1990
1991
1992
1994
1995
1996
1997
1997
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
80
120
160
200
Silicate / micro mol kg−1

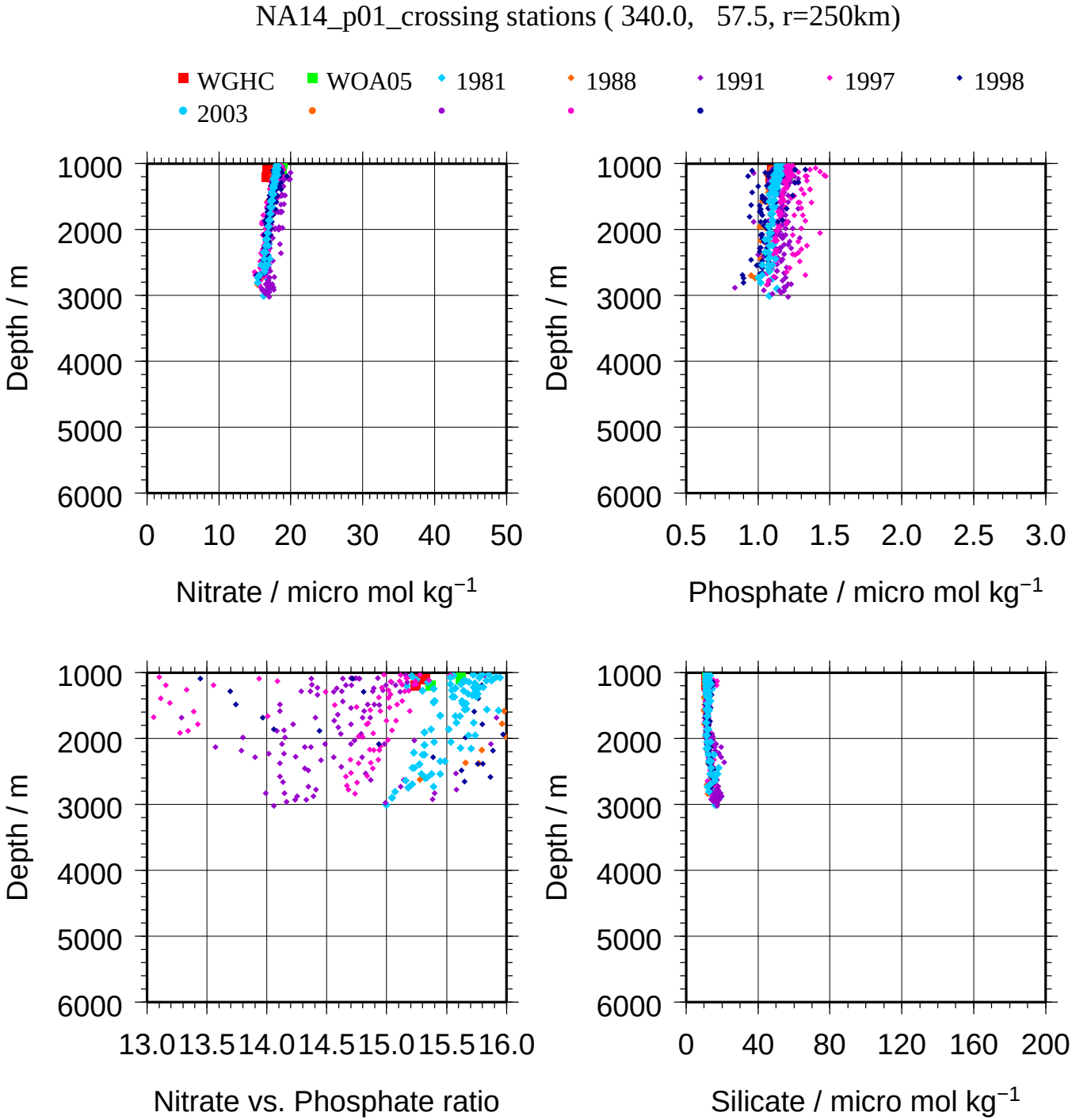

NA09_p01_crossing stations (333.7, 47.2, r=250km)
WGHC
WOA05
1994
1997
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

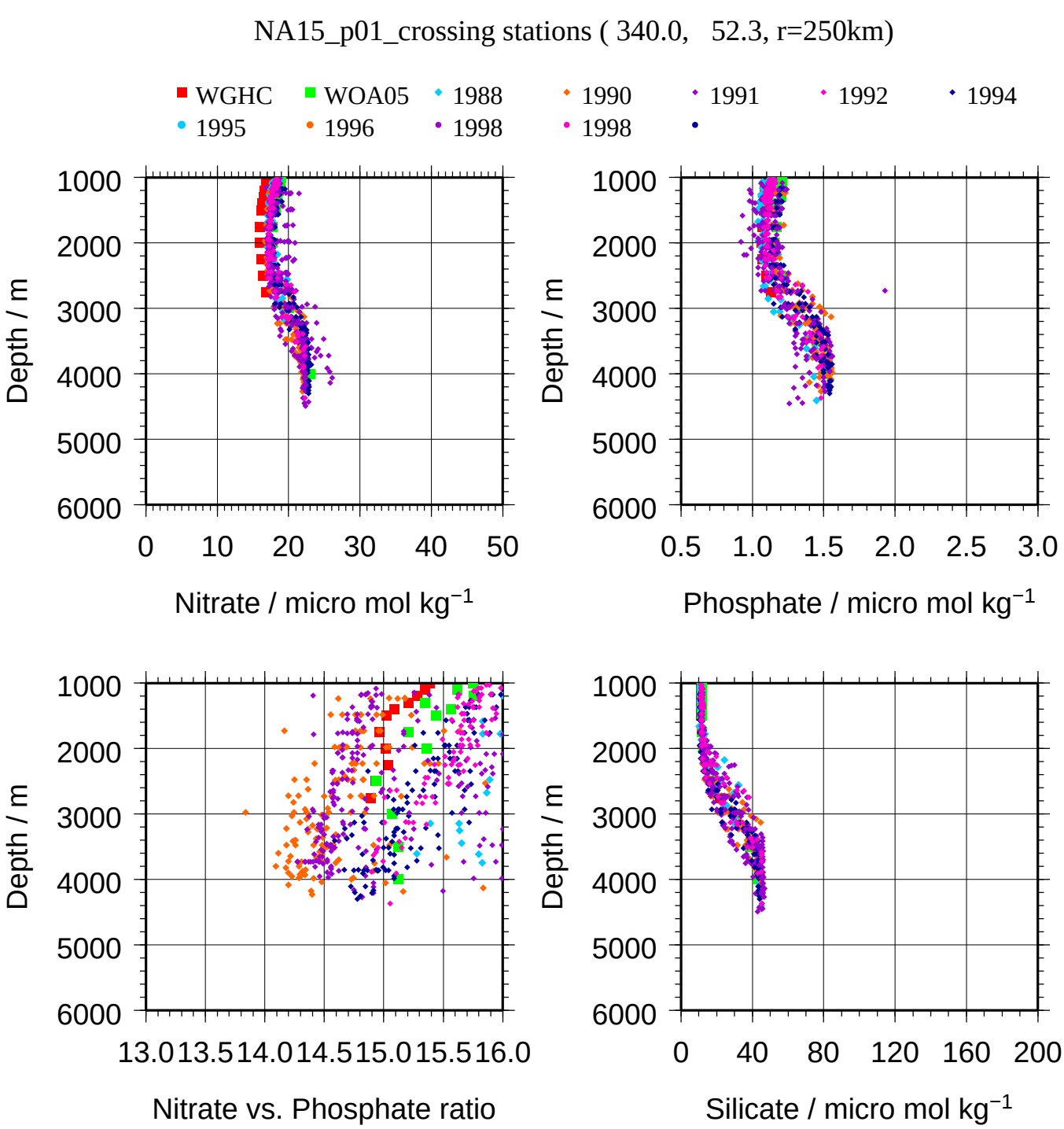

NA10_p01_crossing stations (334.0, 54.3, r=250km)
WGHC
WOA05
1981
1990
1991
1992
1994
1995
1996
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

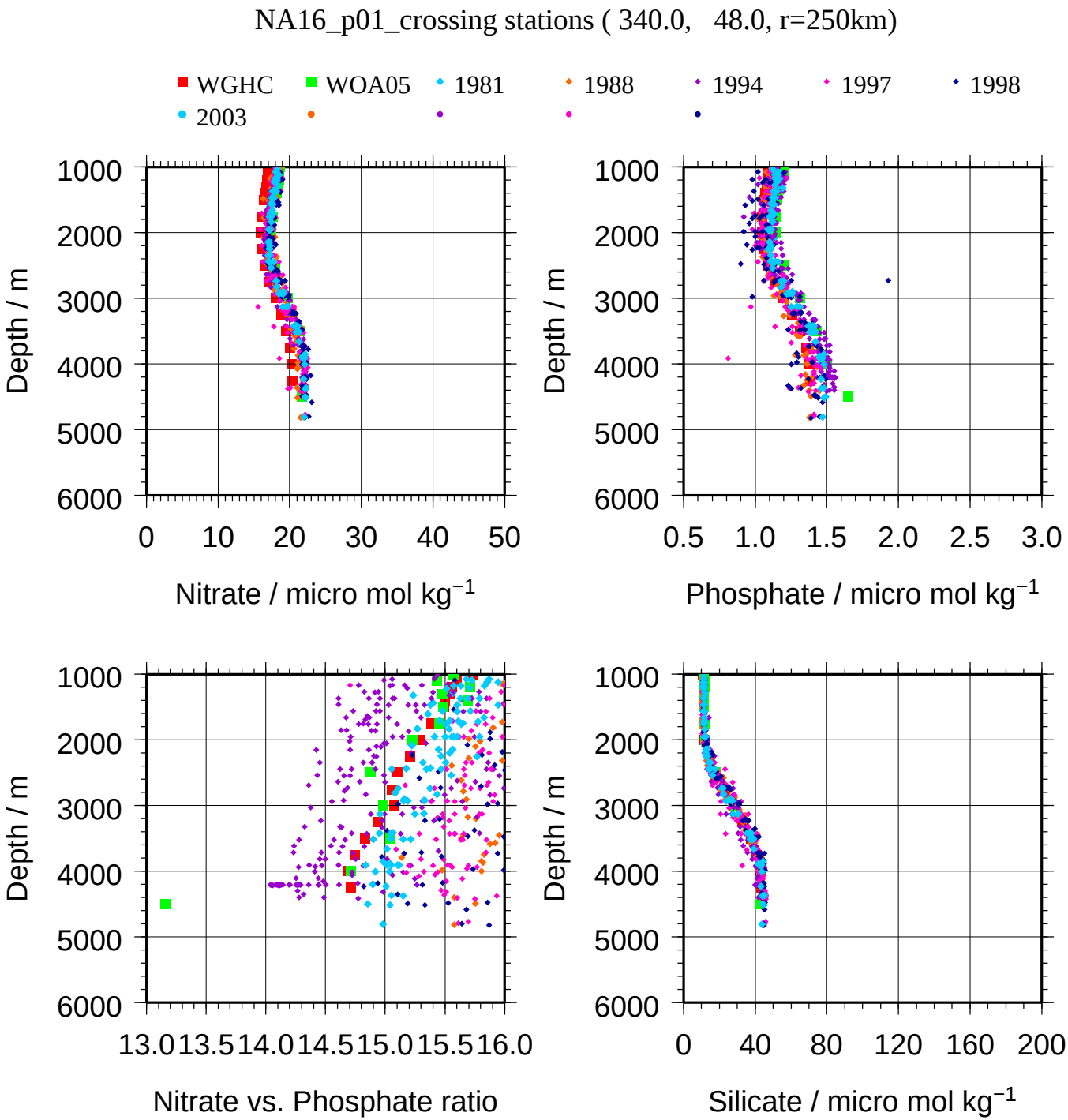

NA11_p01_crossing stations (336.0, 59.0, r=250km)
WGHC
WOA05
1981
1988
1990
1991
1997
1998
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
80
120
160
200
Silicate / micro mol kg−1

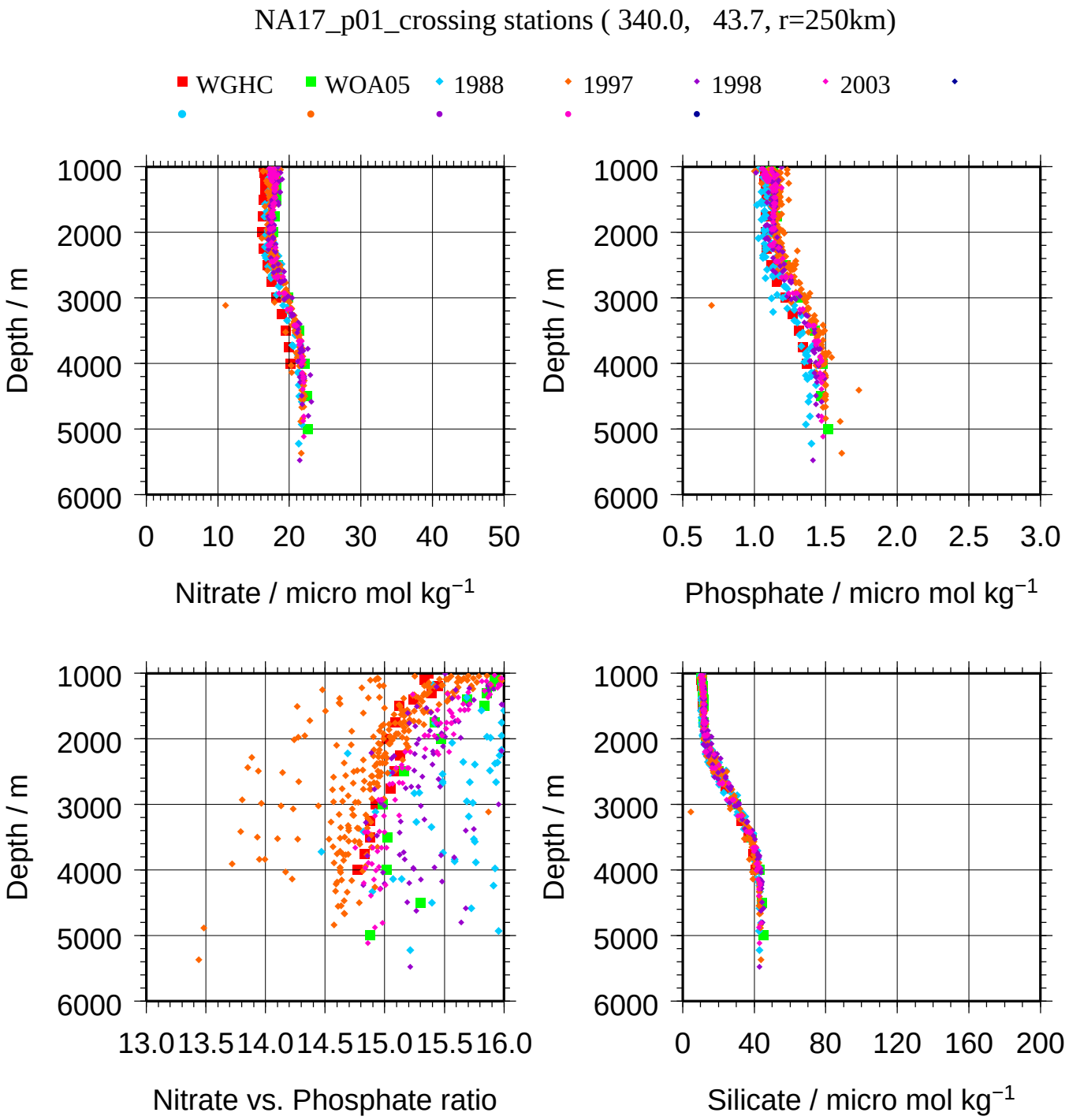

NA12_p01_crossing stations (338.7, 42.8, r=250km)
WGHC
WOA05
1988
1997
1998
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

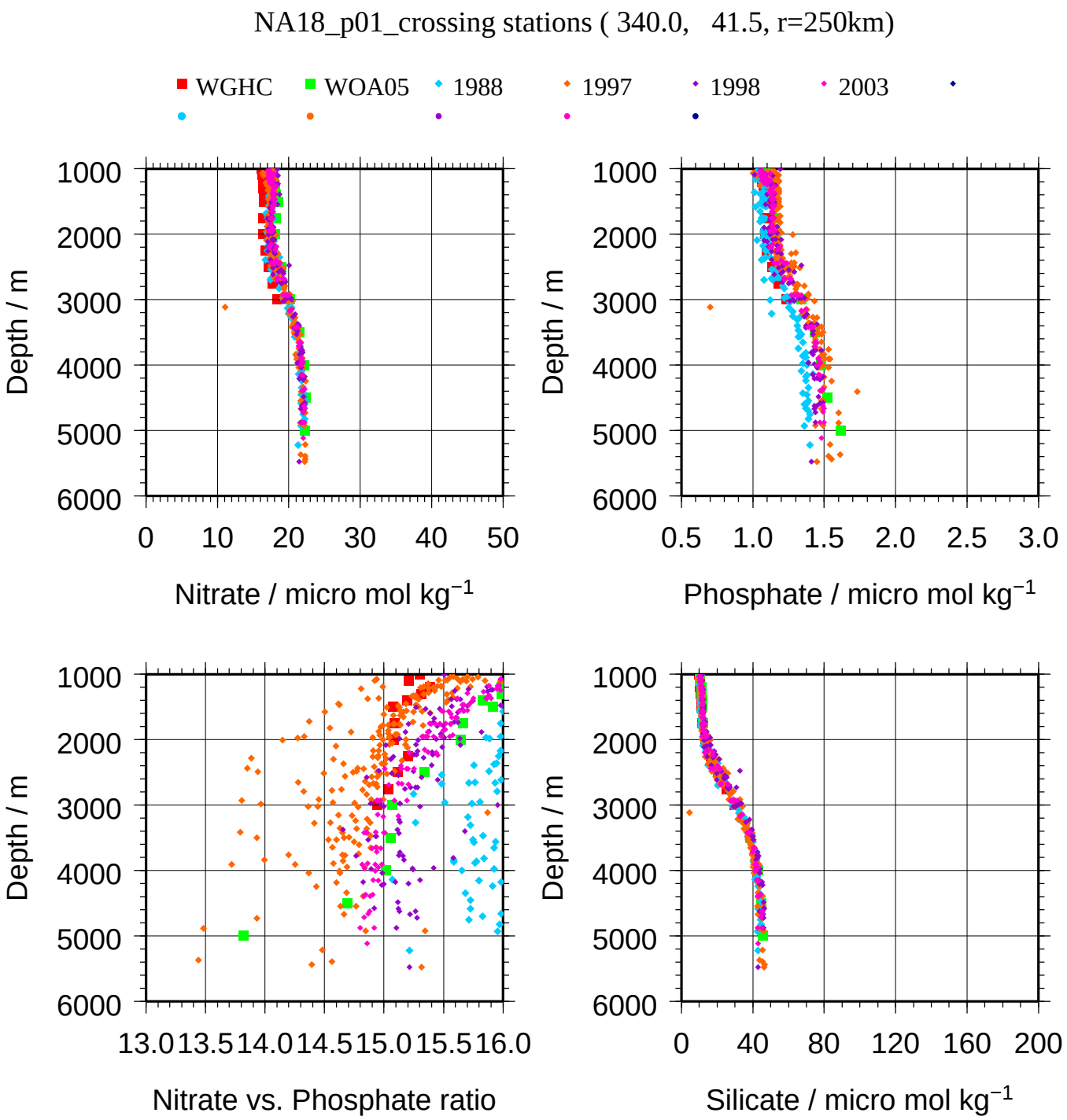

NA13_p01_crossing stations (340.0, 59.0, r=250km)
WGHC
WOA05
1981
1988
1991
1997
1998
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
80
120
160
200
Silicate / micro mol kg−1

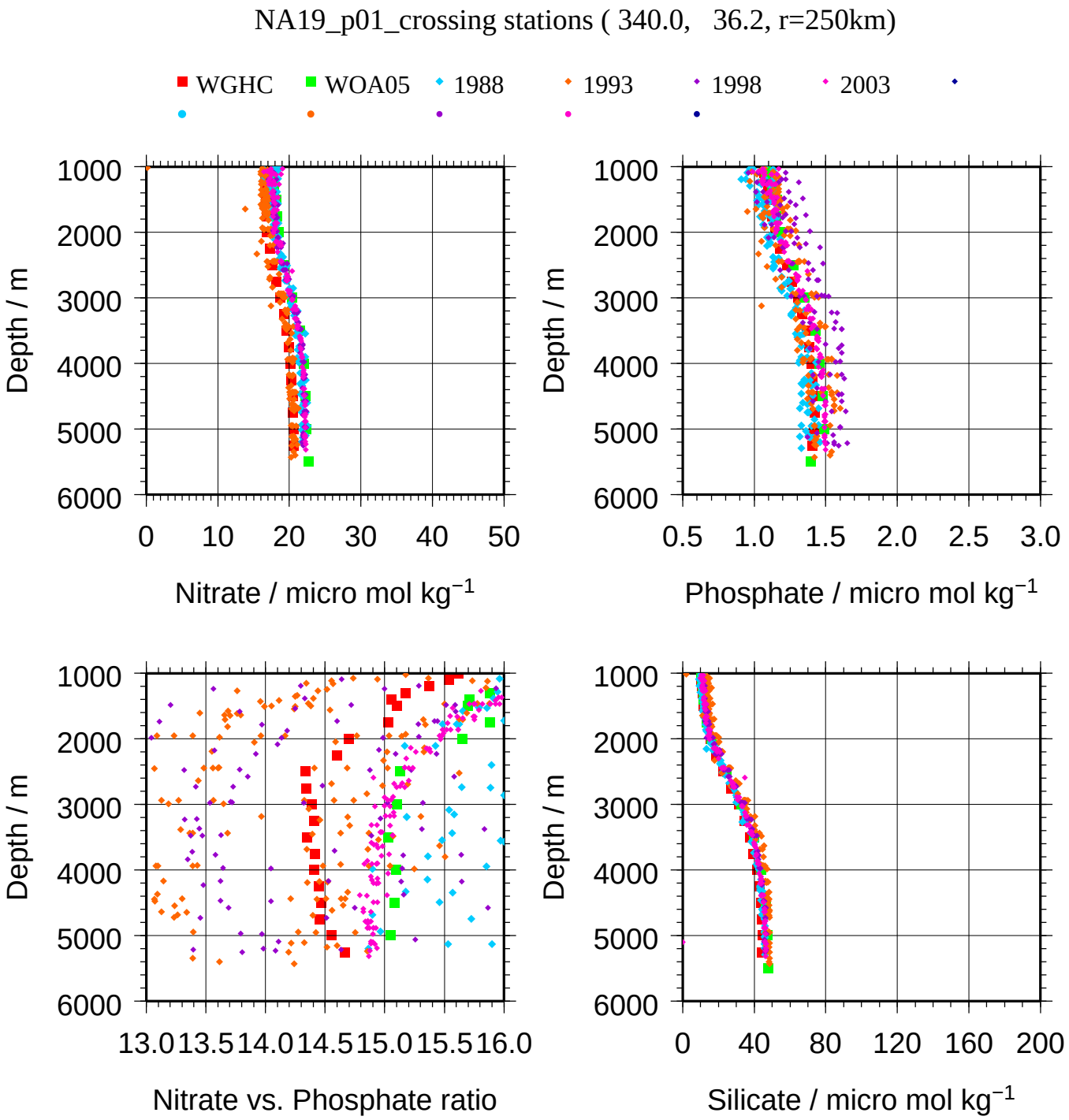

NA14_p01_crossing stations (340.0, 57.5, r=250km)
WGHC
WOA05
1981
1988
1991
1997
1998
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

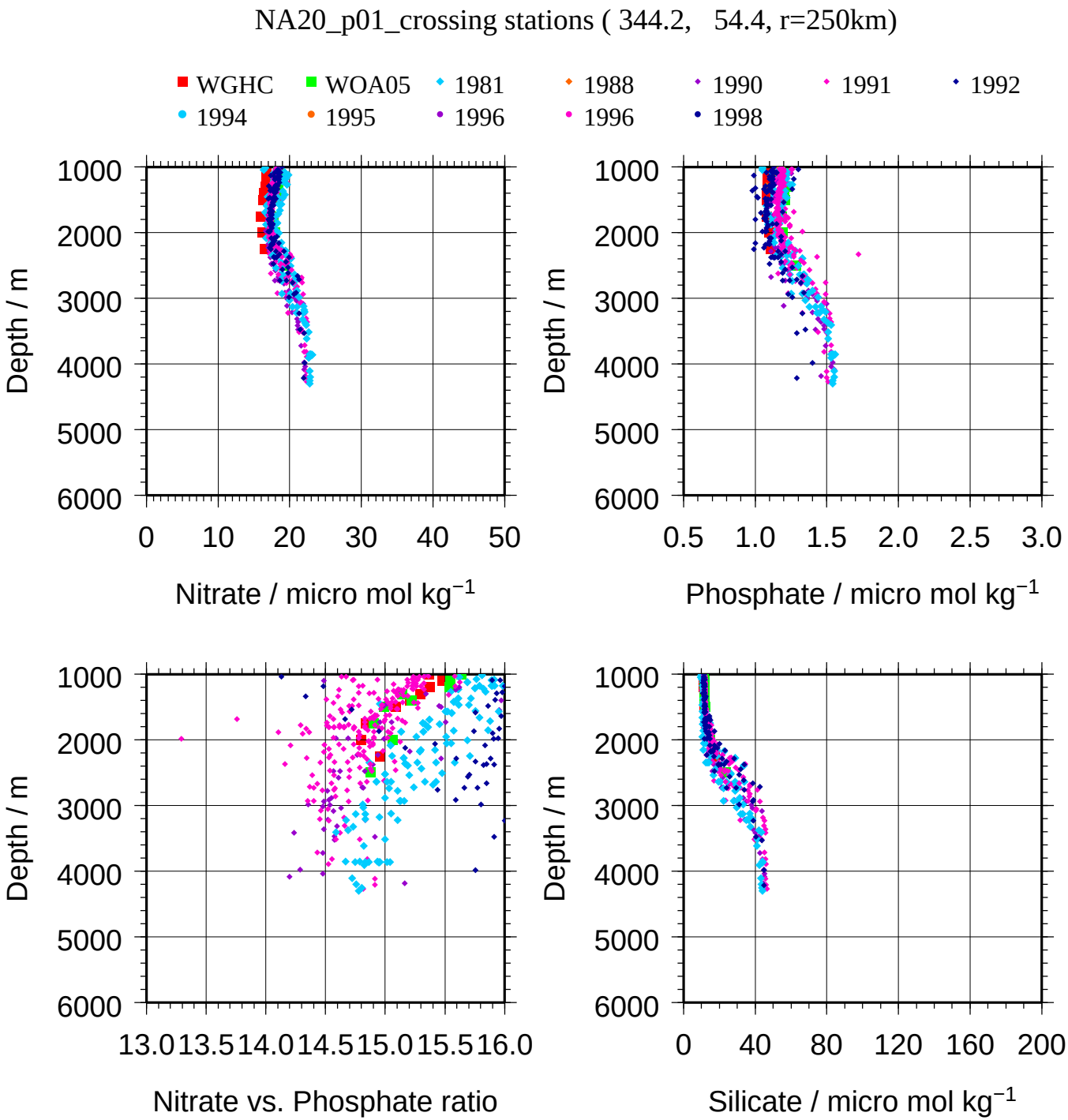

NA15_p01_crossing stations (340.0, 52.3, r=250km)
WGHC
WOA05
1988
1990
1991
1992
1994
1995
1996
1998
1998
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

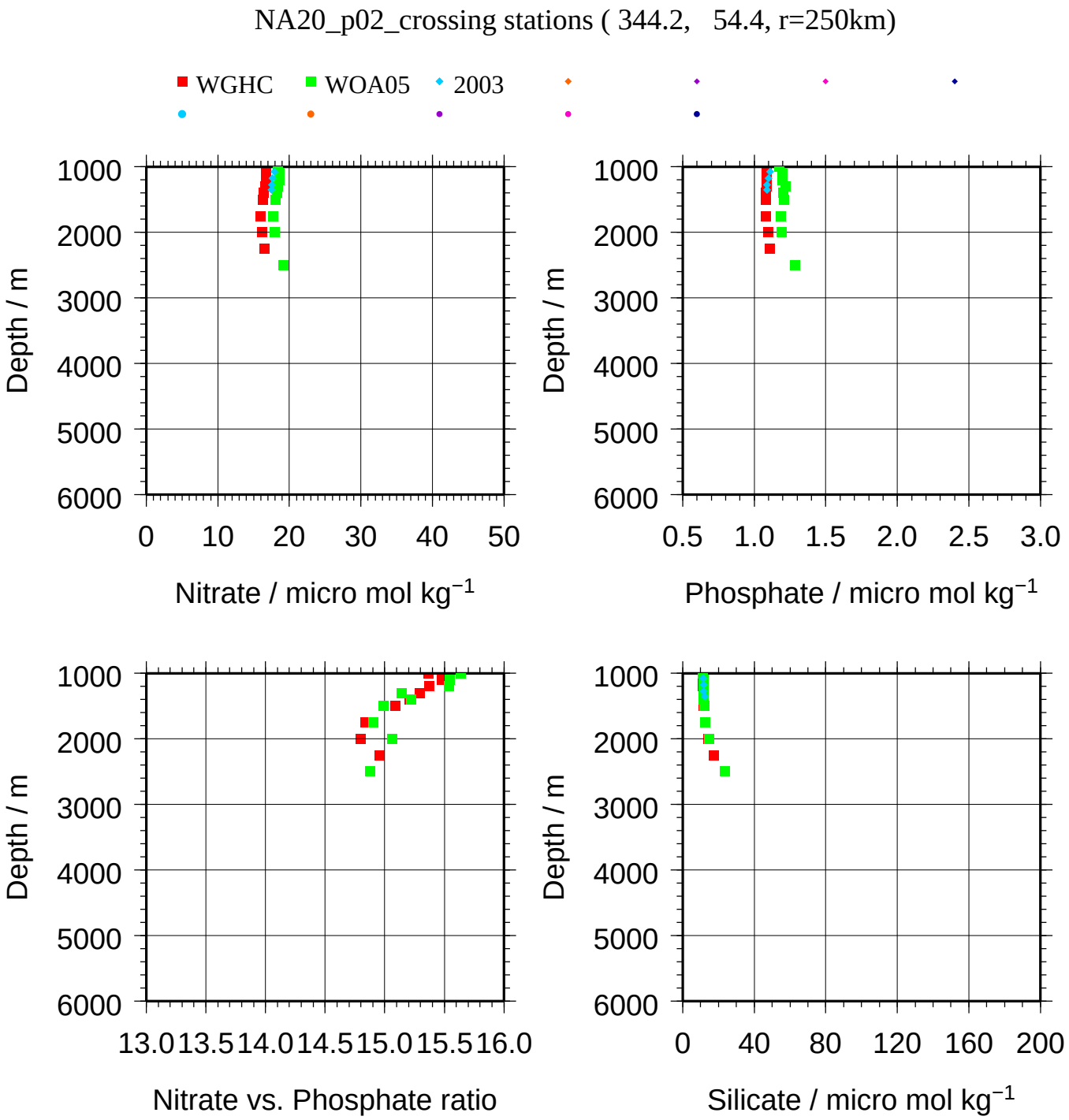

NA16_p01_crossing stations (340.0, 48.0, r=250km)
WGHC
WOA05
1981
1988
1994
1997
1998
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

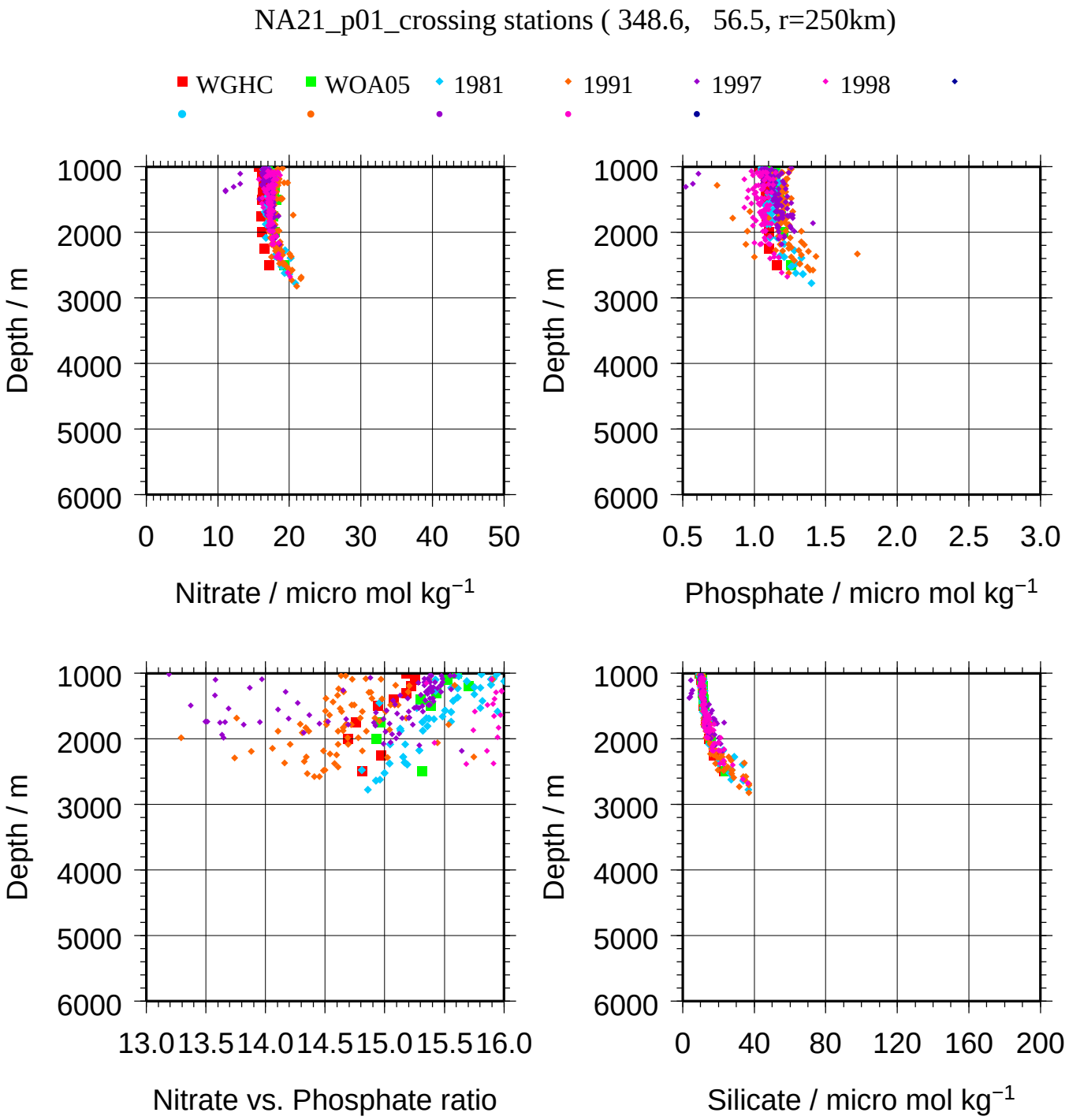

NA17_p01_crossing stations (340.0, 43.7, r=250km)
WGHC
WOA05
1988
1997
1998
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

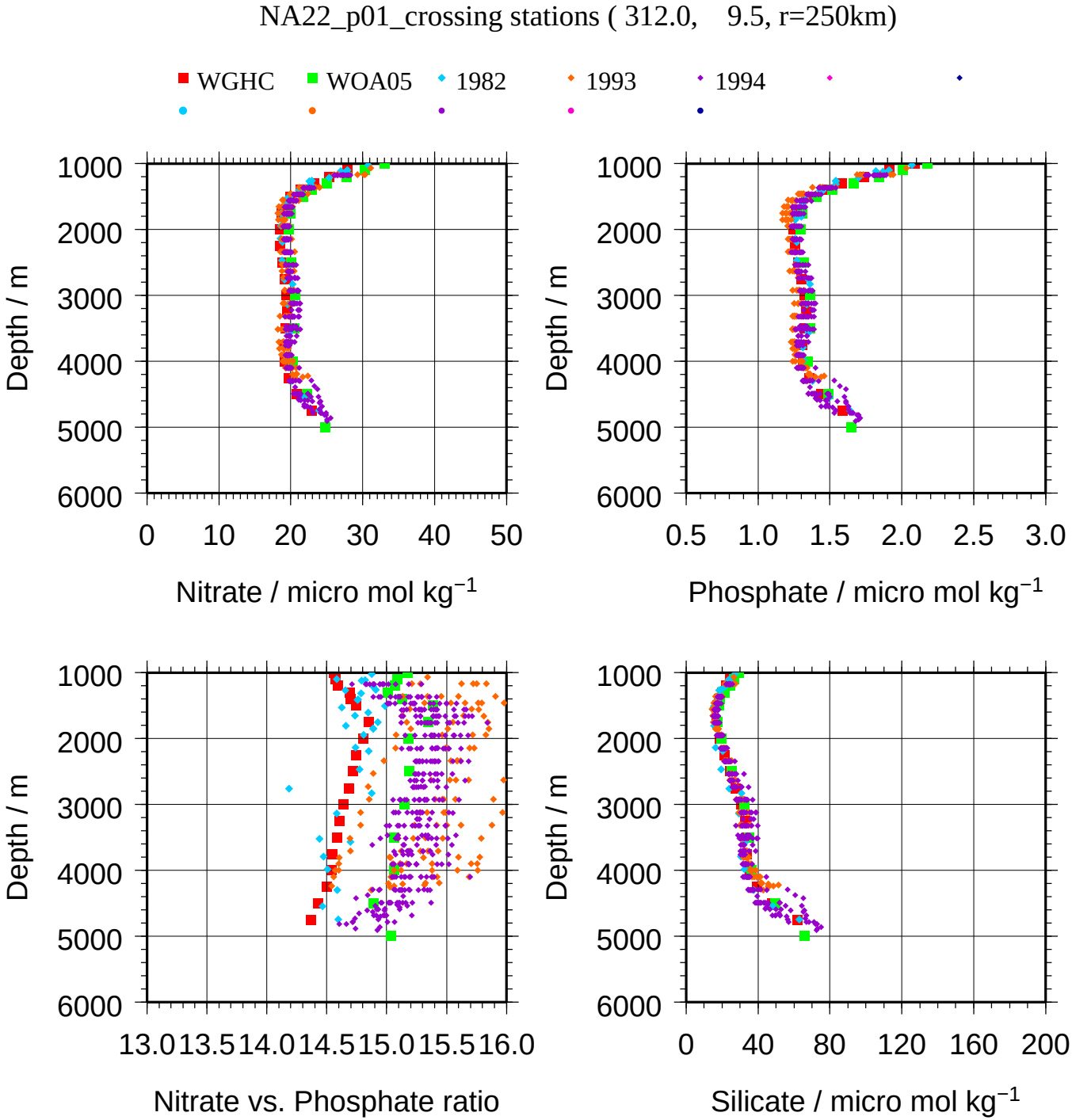

NA18_p01_crossing stations (340.0, 41.5, r=250km)
WGHC
WOA05
1988
1997
1998
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

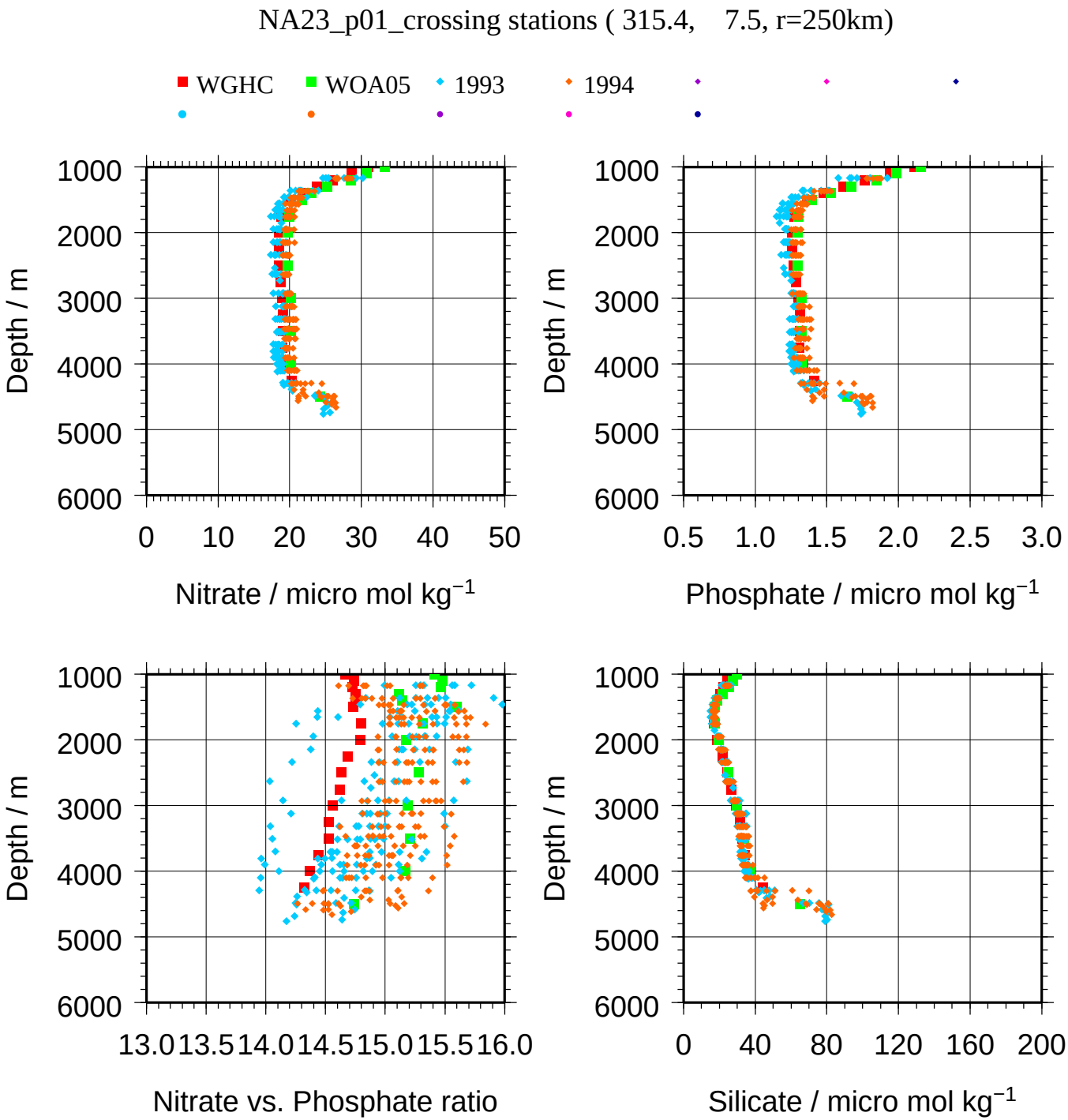

NA19_p01_crossing stations (340.0, 36.2, r=250km)
WGHC
WOA05
1988
1993
1998
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

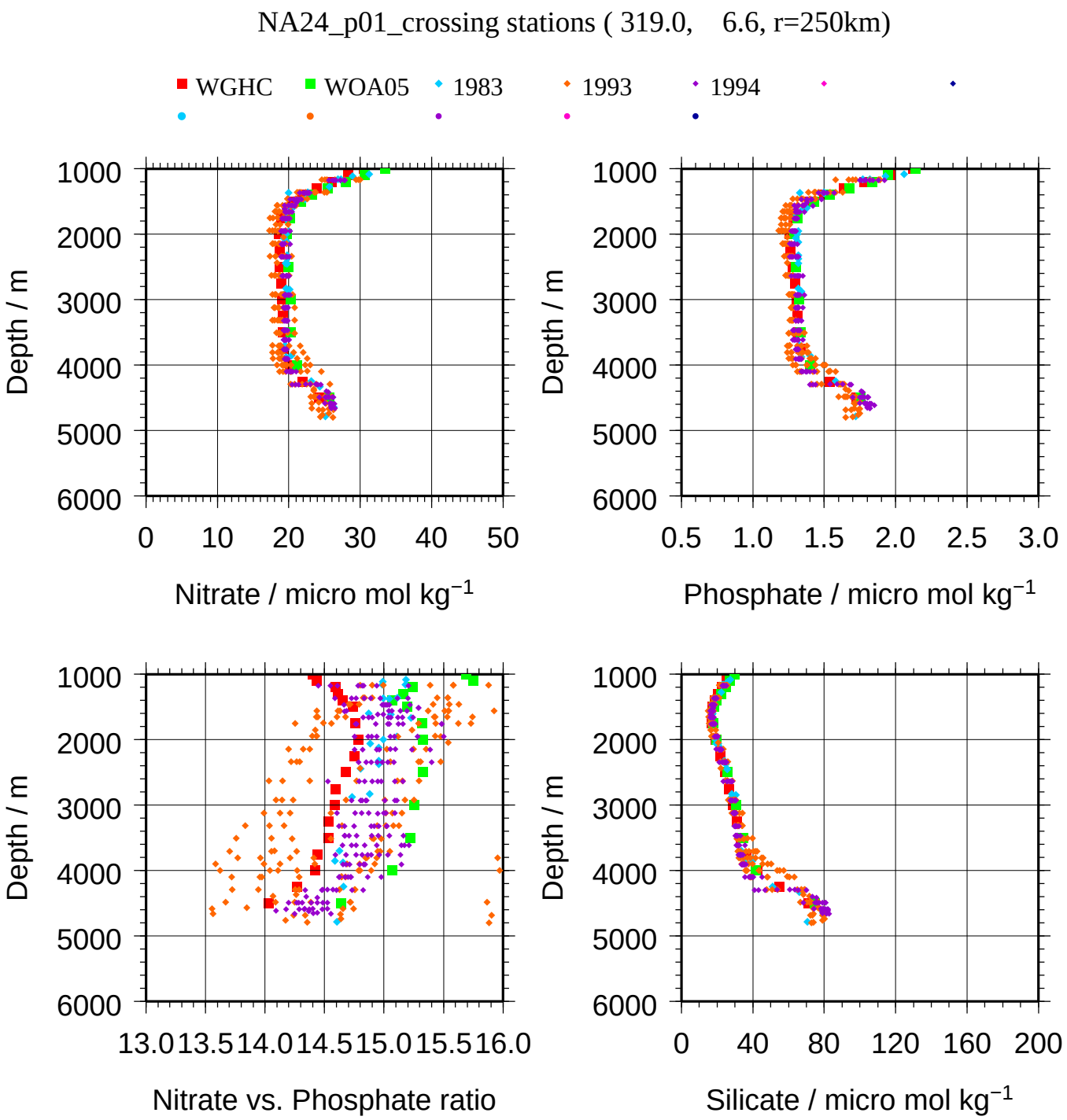

NA20_p01_crossing stations (344.2, 54.4, r=250km)
WGHC
WOA05
1981
1988
1990
1991
1992
1994
1995
1996
1996
1998
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

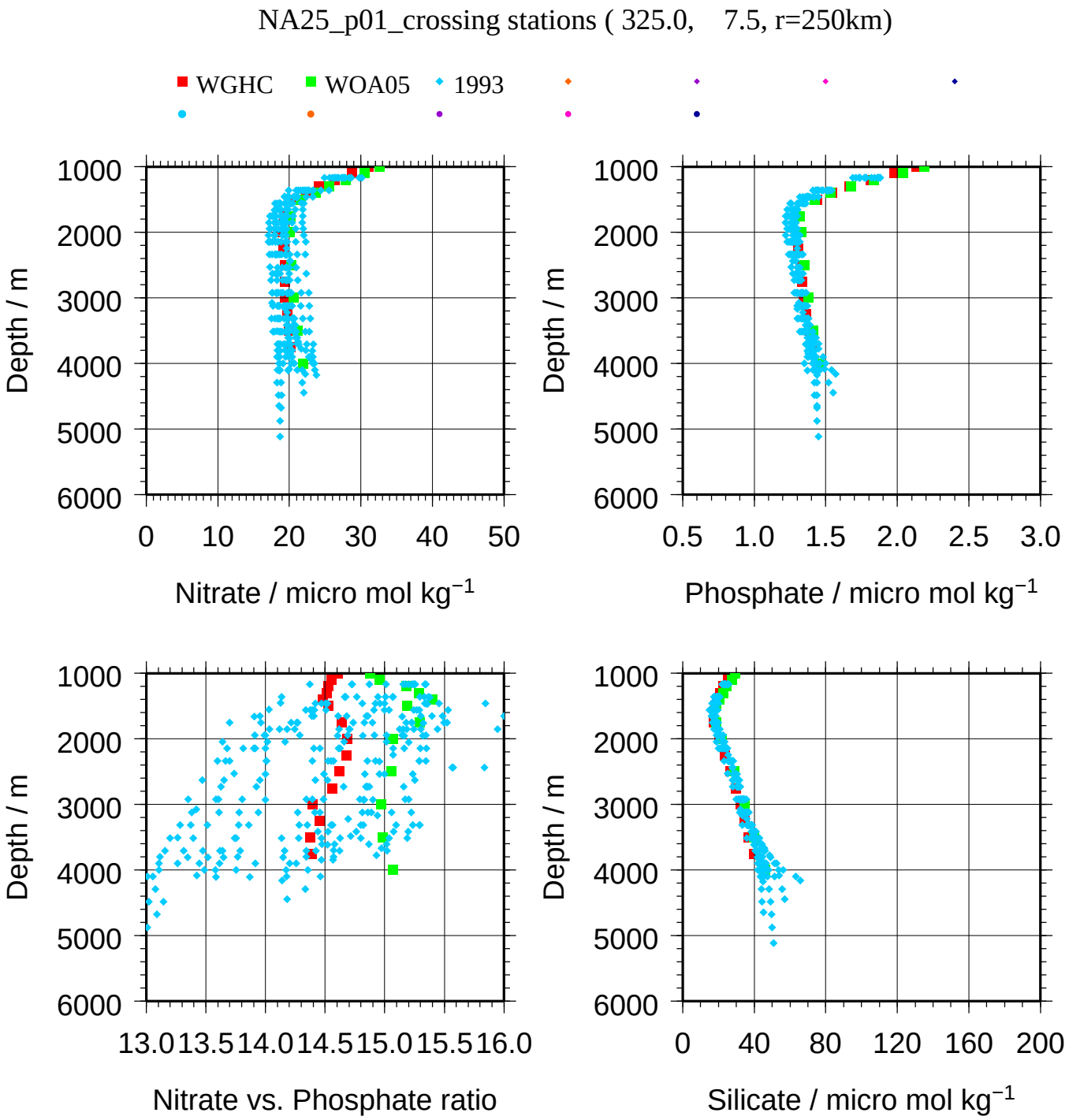

NA20_p02_crossing stations (344.2, 54.4, r=250km)
WGHC
WOA05
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

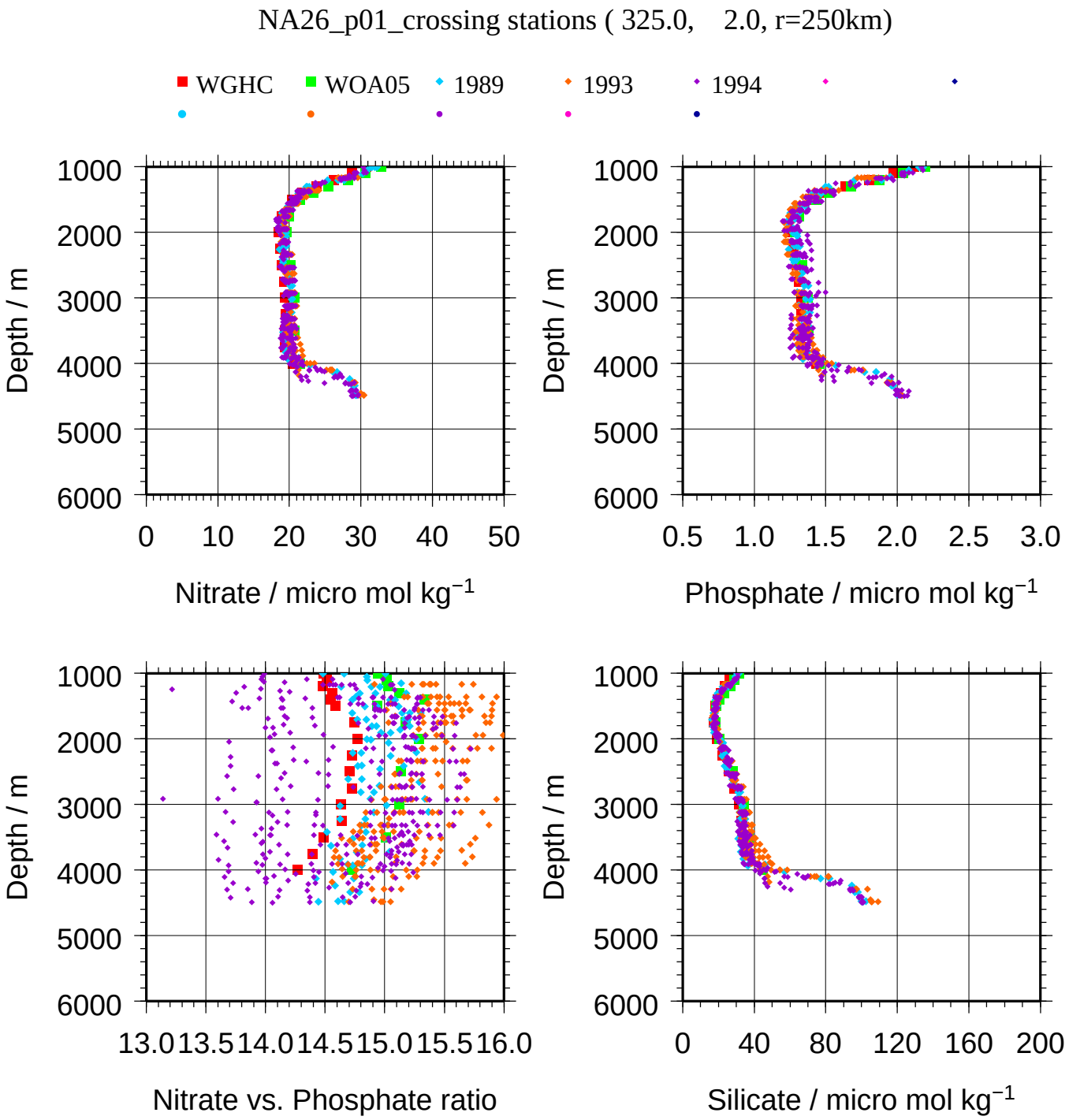

NA21_p01_crossing stations (348.6, 56.5, r=250km)
WGHC
WOA05
1981
1991
1997
1998
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

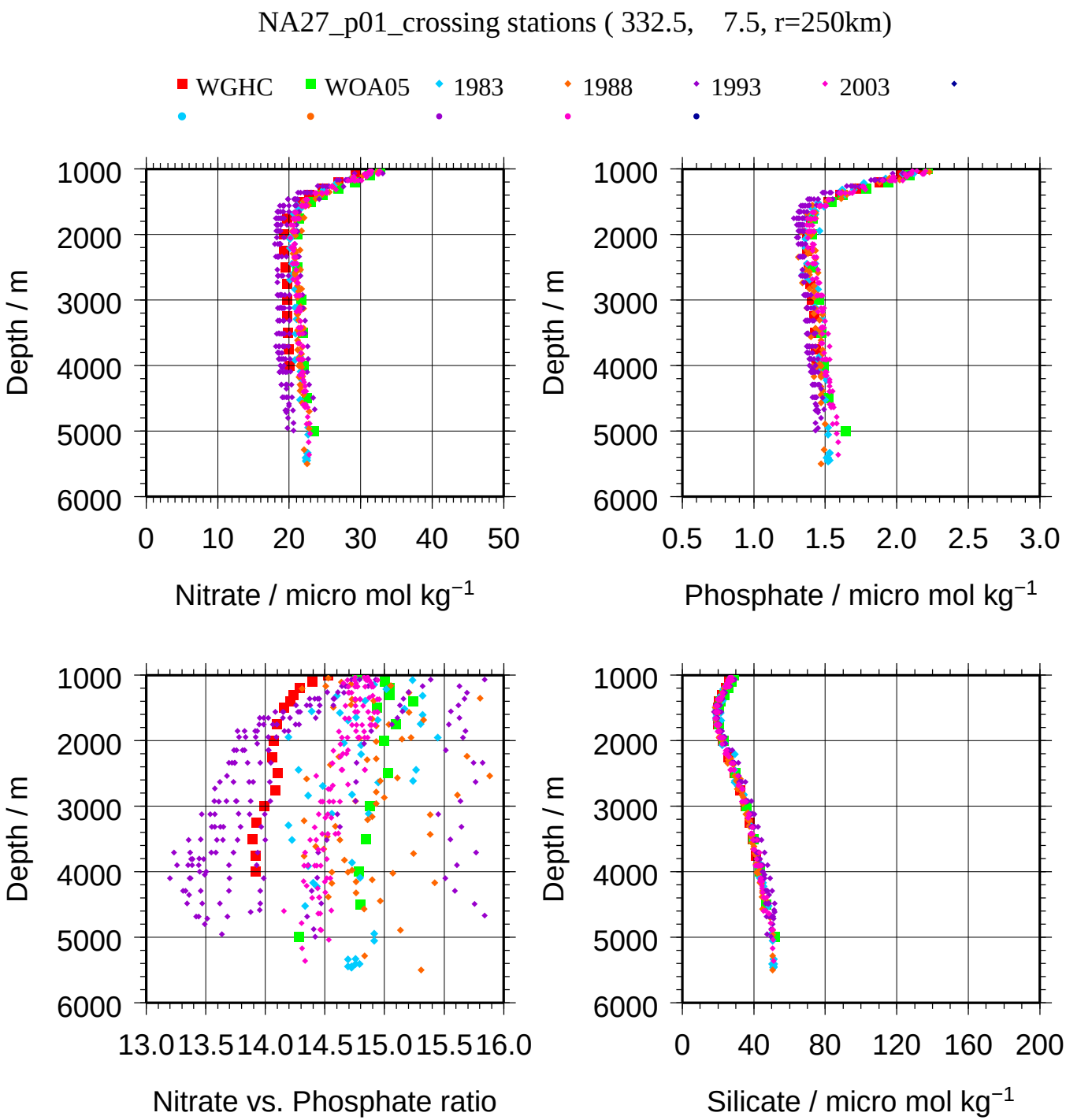

NA22_p01_crossing stations (312.0, 9.5, r=250km)
WGHC
WOA05
1982
1993
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

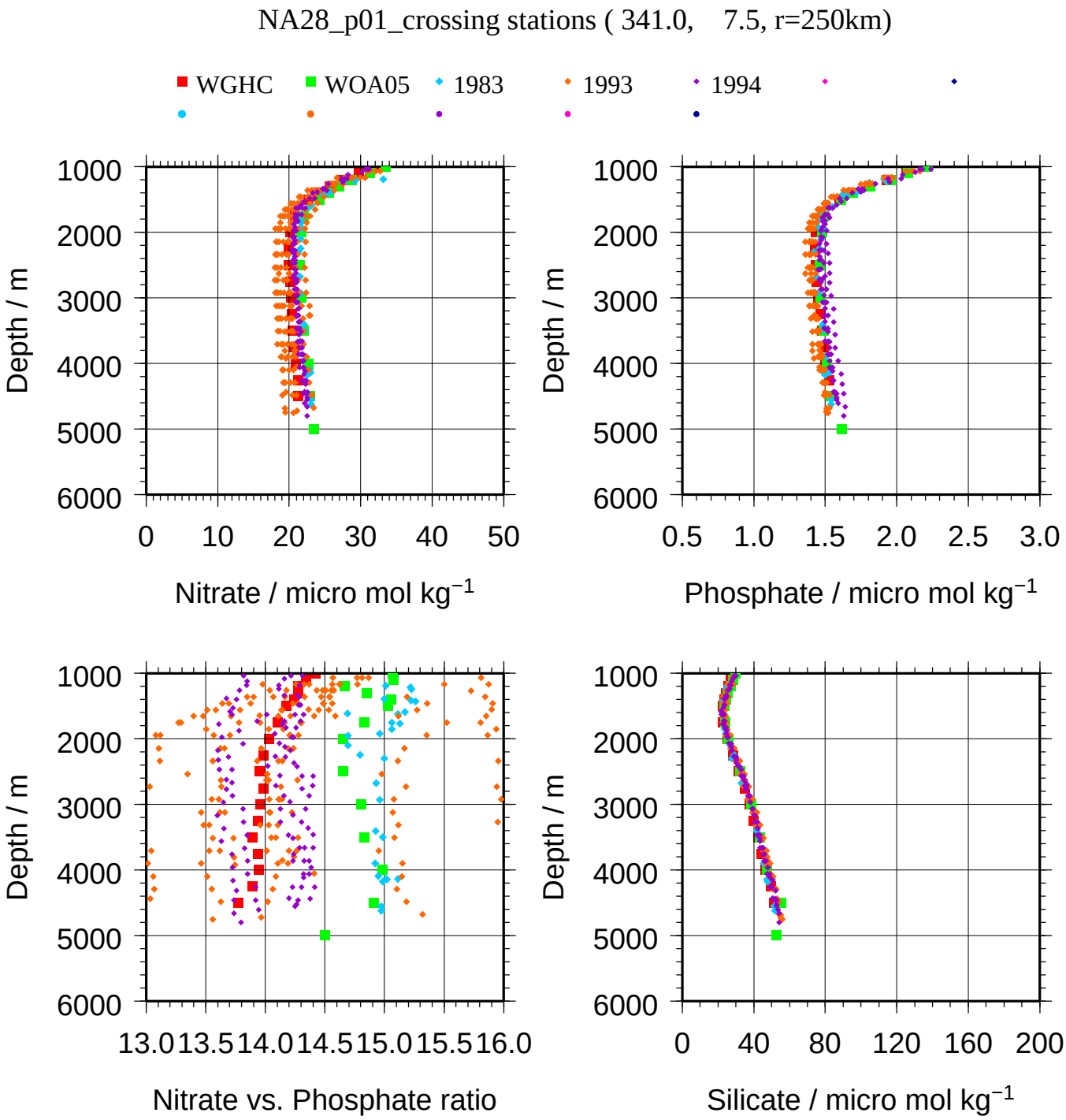

NA23_p01_crossing stations (315.4, 7.5, r=250km)
WGHC
WOA05
1993
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

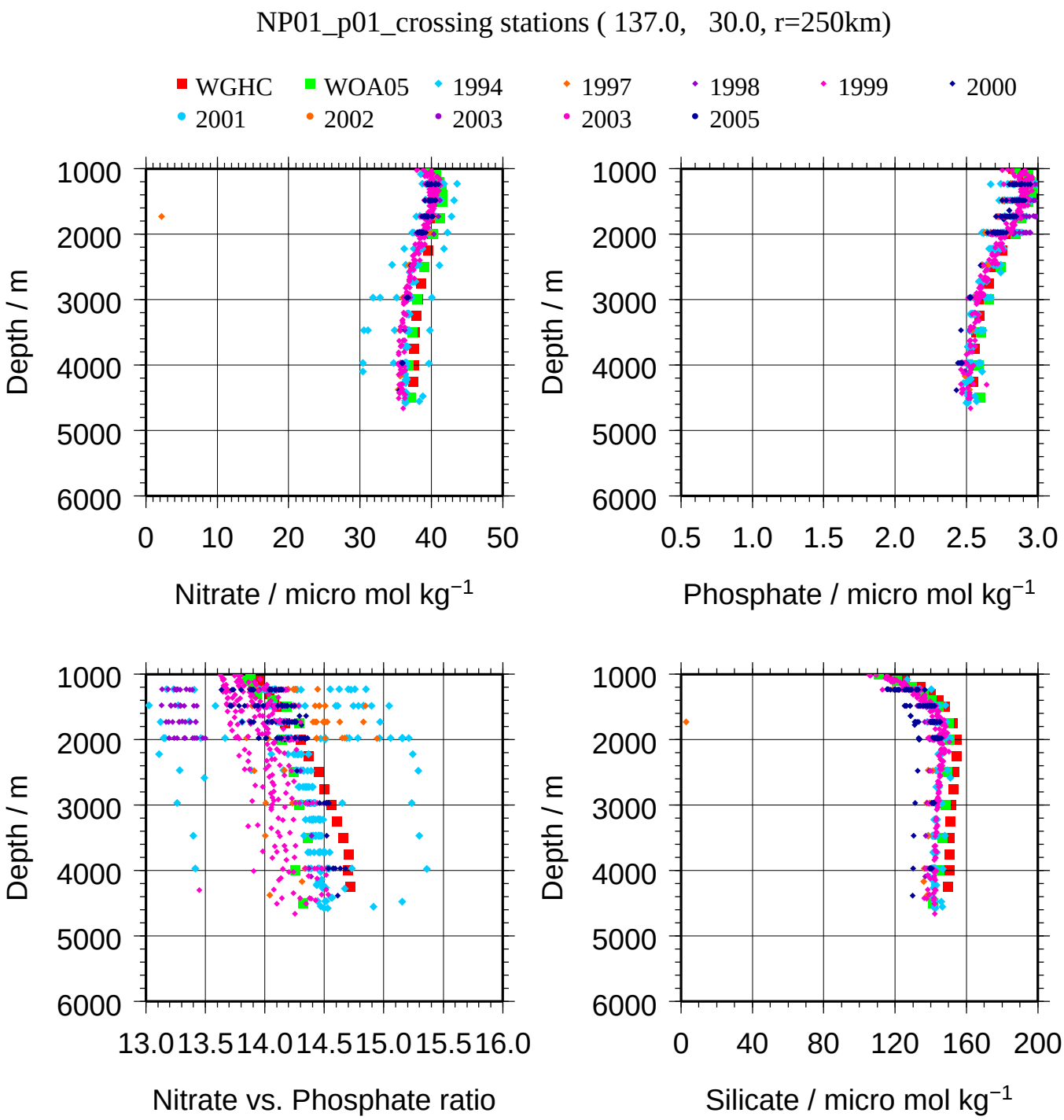

NA24_p01_crossing stations (319.0, 6.6, r=250km)
WGHC
WOA05
1983
1993
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

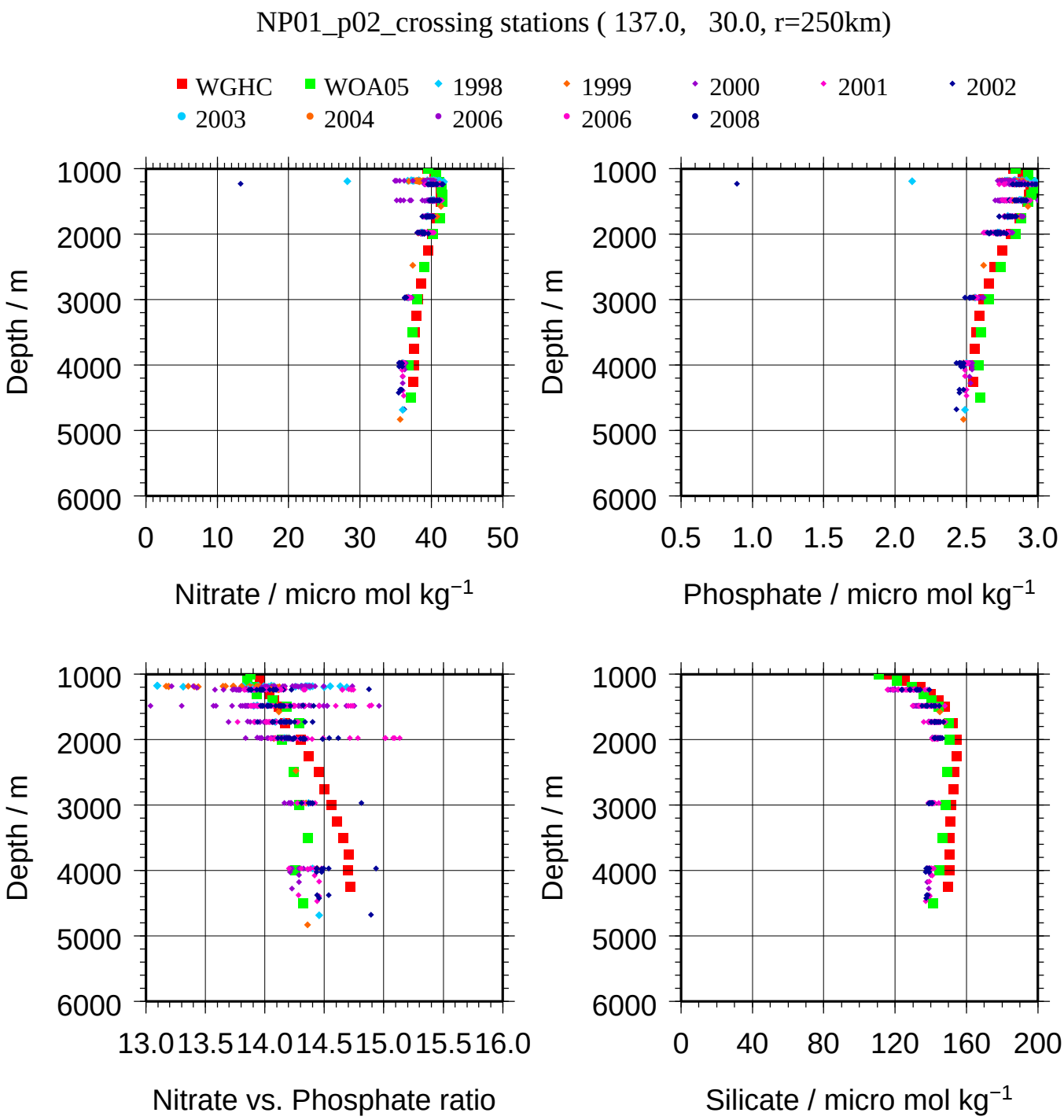

NA25_p01_crossing stations (325.0, 7.5, r=250km)
WGHC
WOA05
1993
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

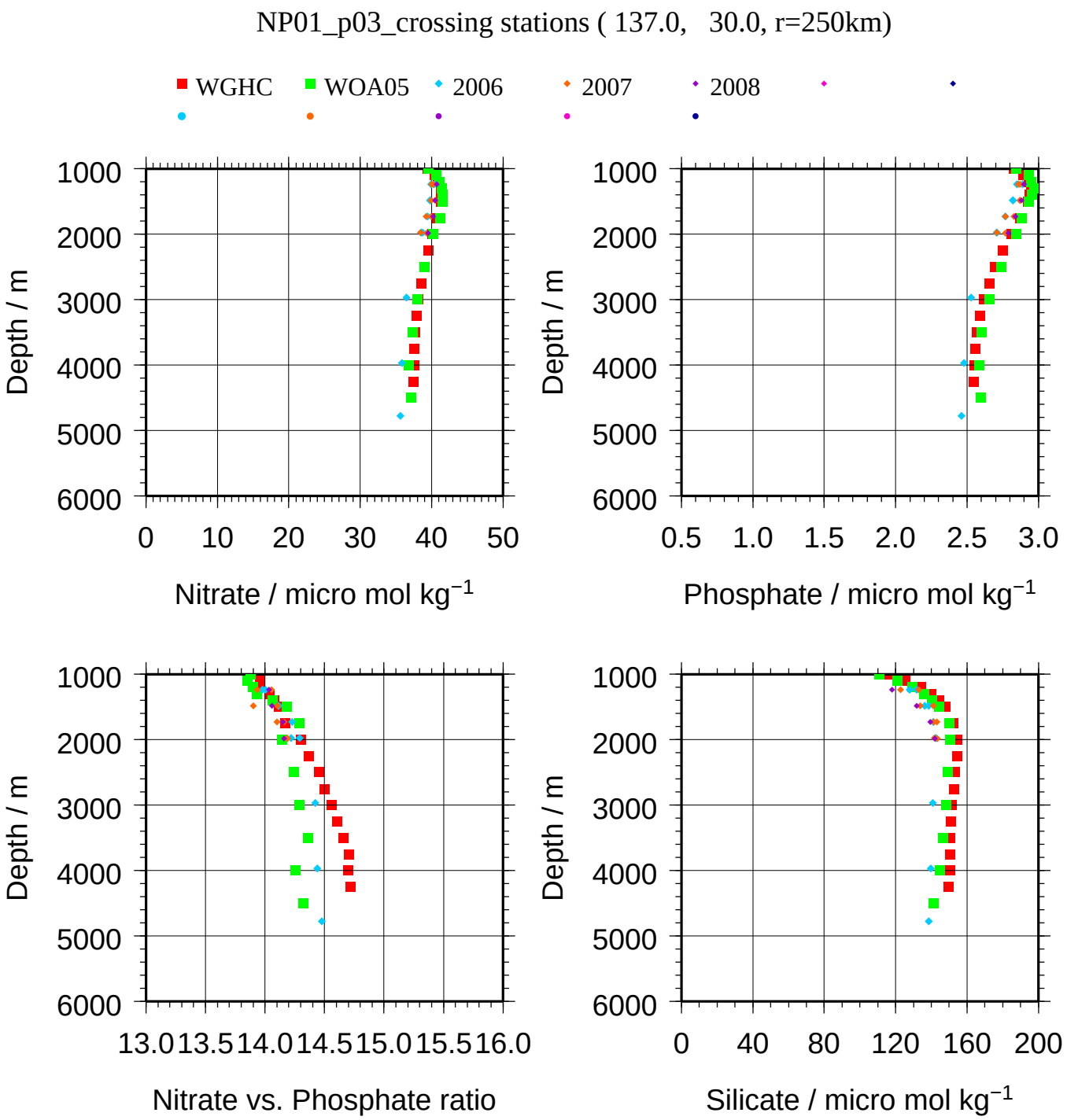

NA26_p01_crossing stations (325.0, 2.0, r=250km)
WGHC
WOA05
1989
1993
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

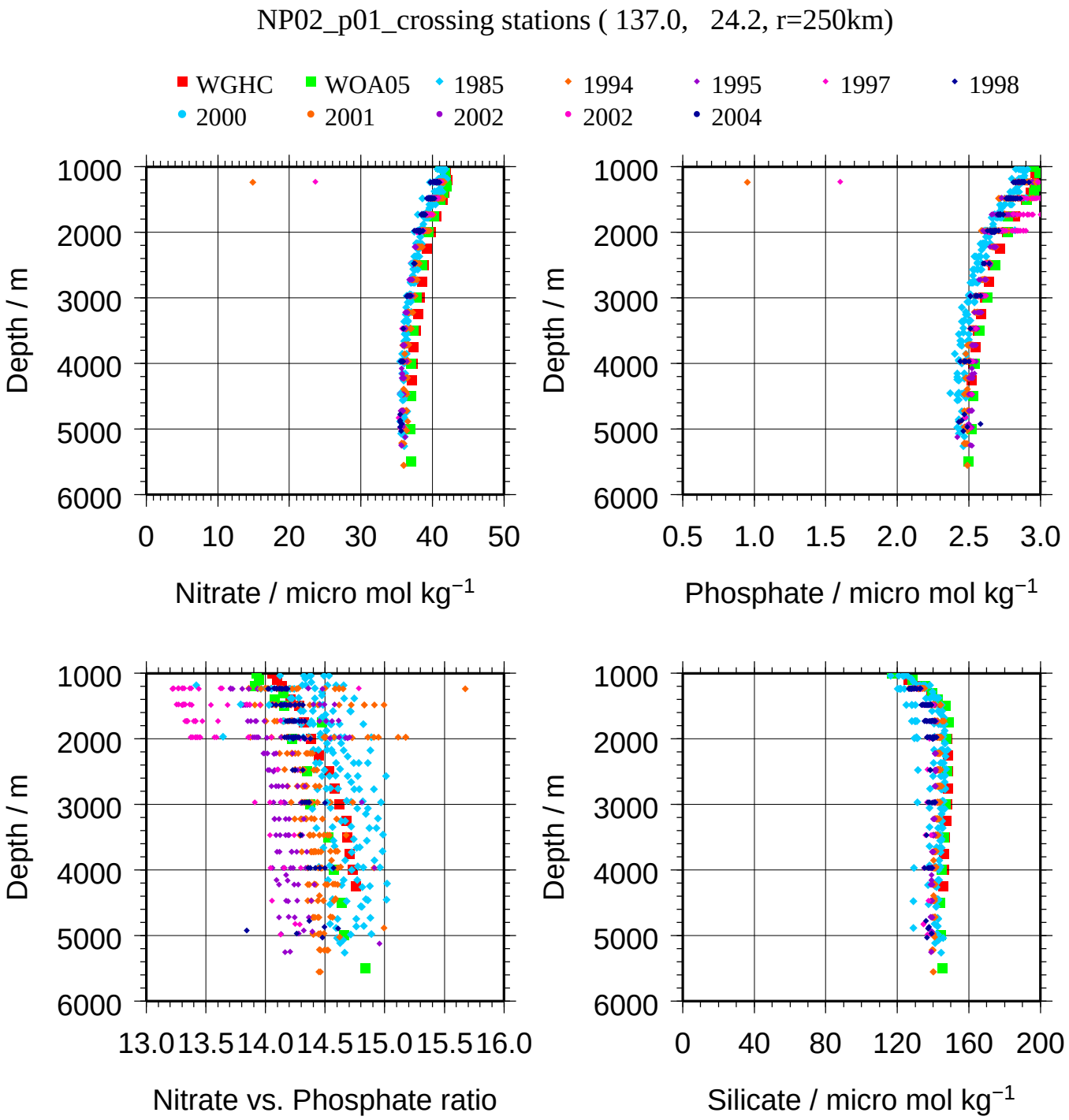

NA27_p01_crossing stations (332.5, 7.5, r=250km)
WGHC
WOA05
1983
1988
1993
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

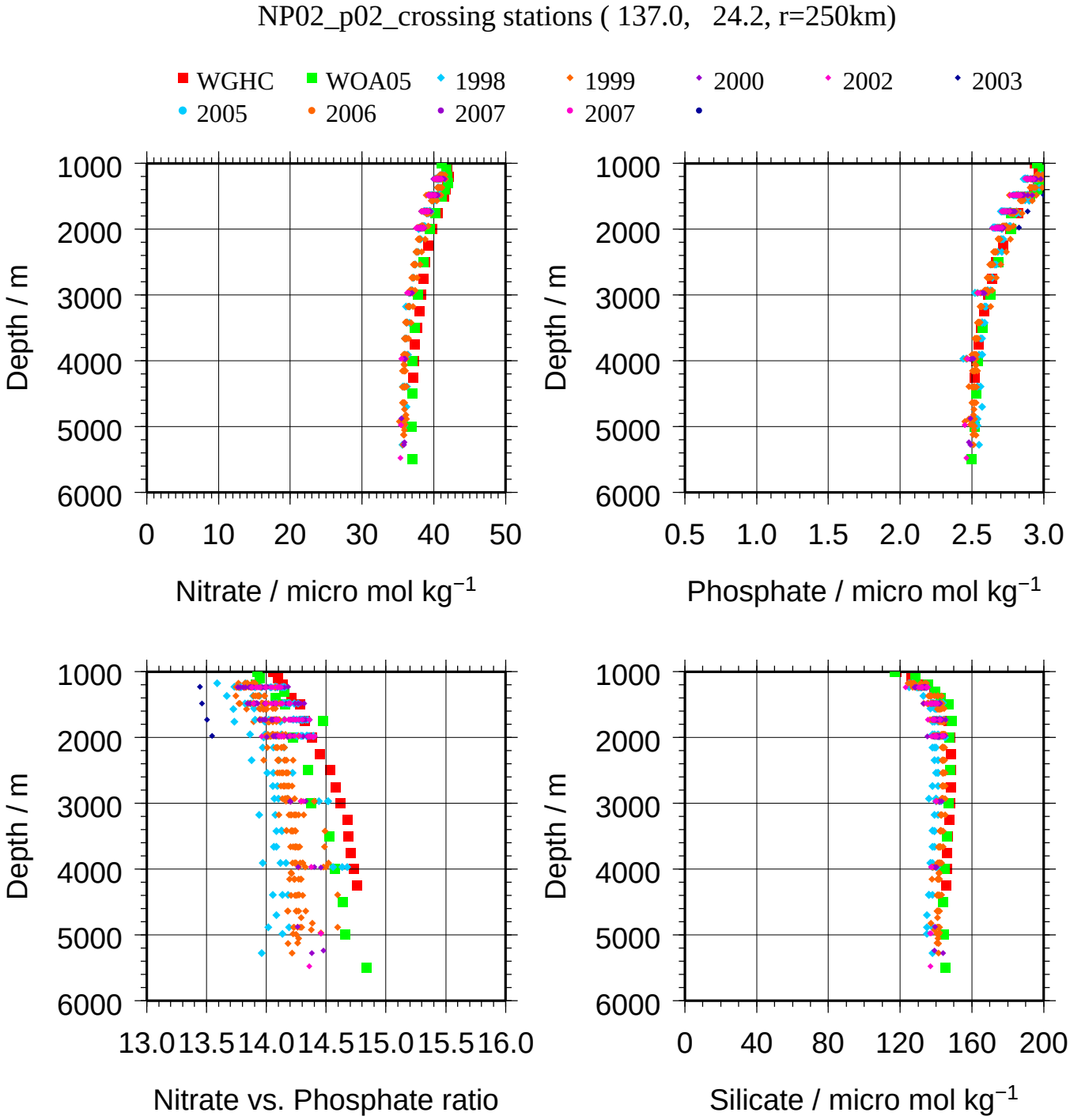

NA28_p01_crossing stations (341.0, 7.5, r=250km)
WGHC
WOA05
1983
1993
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

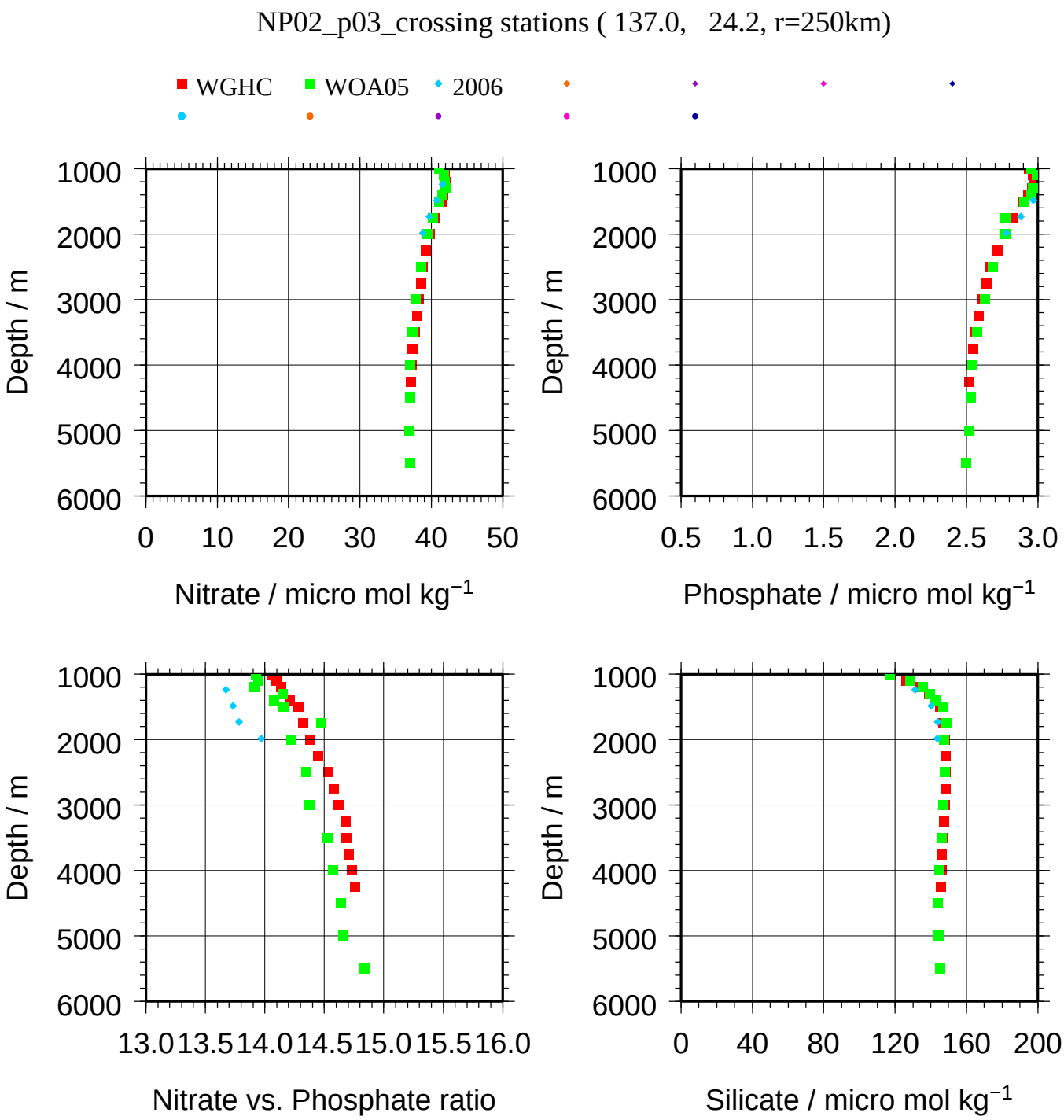

NP01_p01_crossing stations (137.0, 30.0, r=250km)
WGHC
WOA05
1994
1997
1998
1999
2000
2001
2002
2003
2003
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

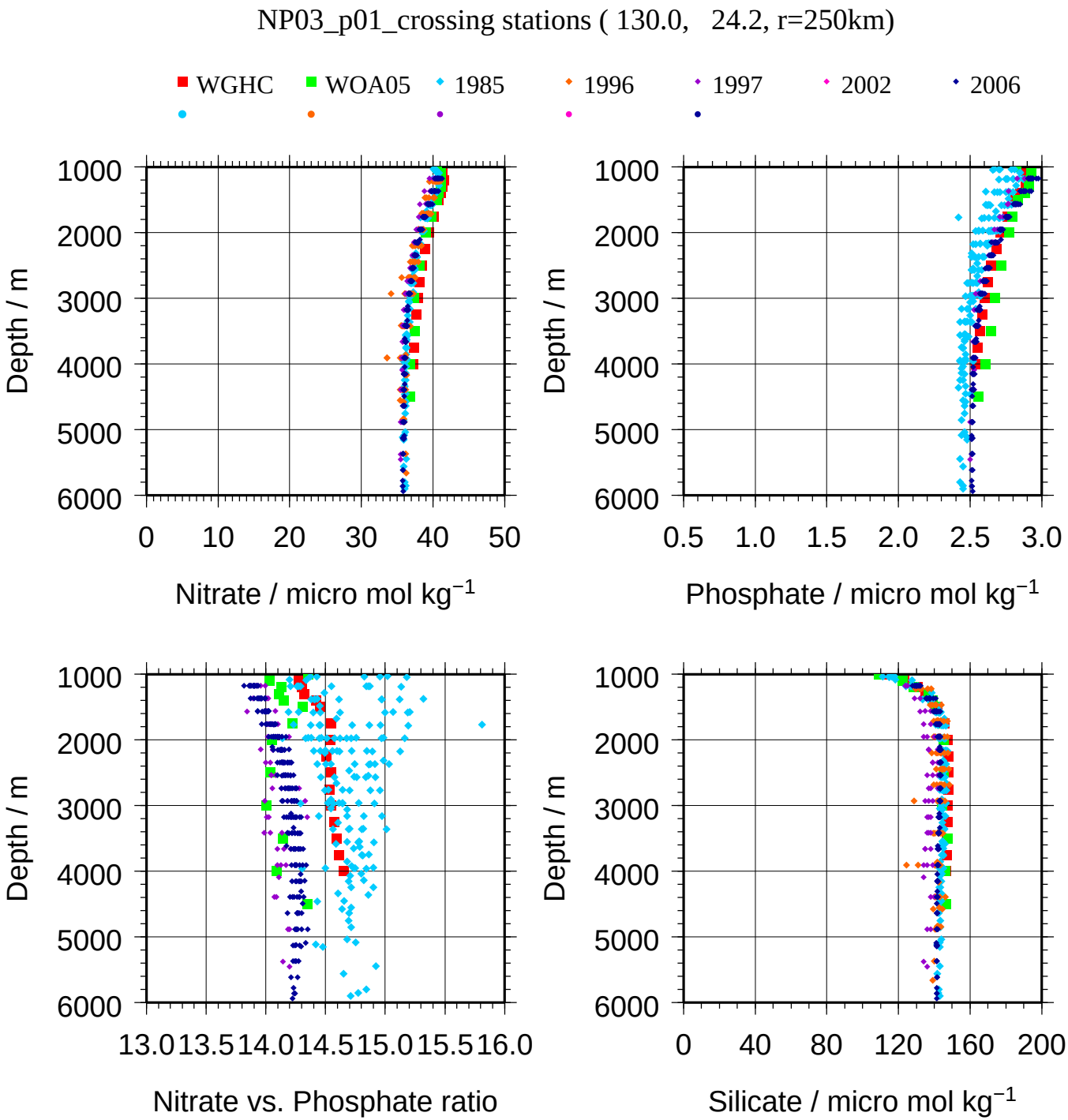

NP01_p02_crossing stations (137.0, 30.0, r=250km)
WGHC
WOA05
1998
1999
2000
2001
2002
2003
2004
2006
2006
2008
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

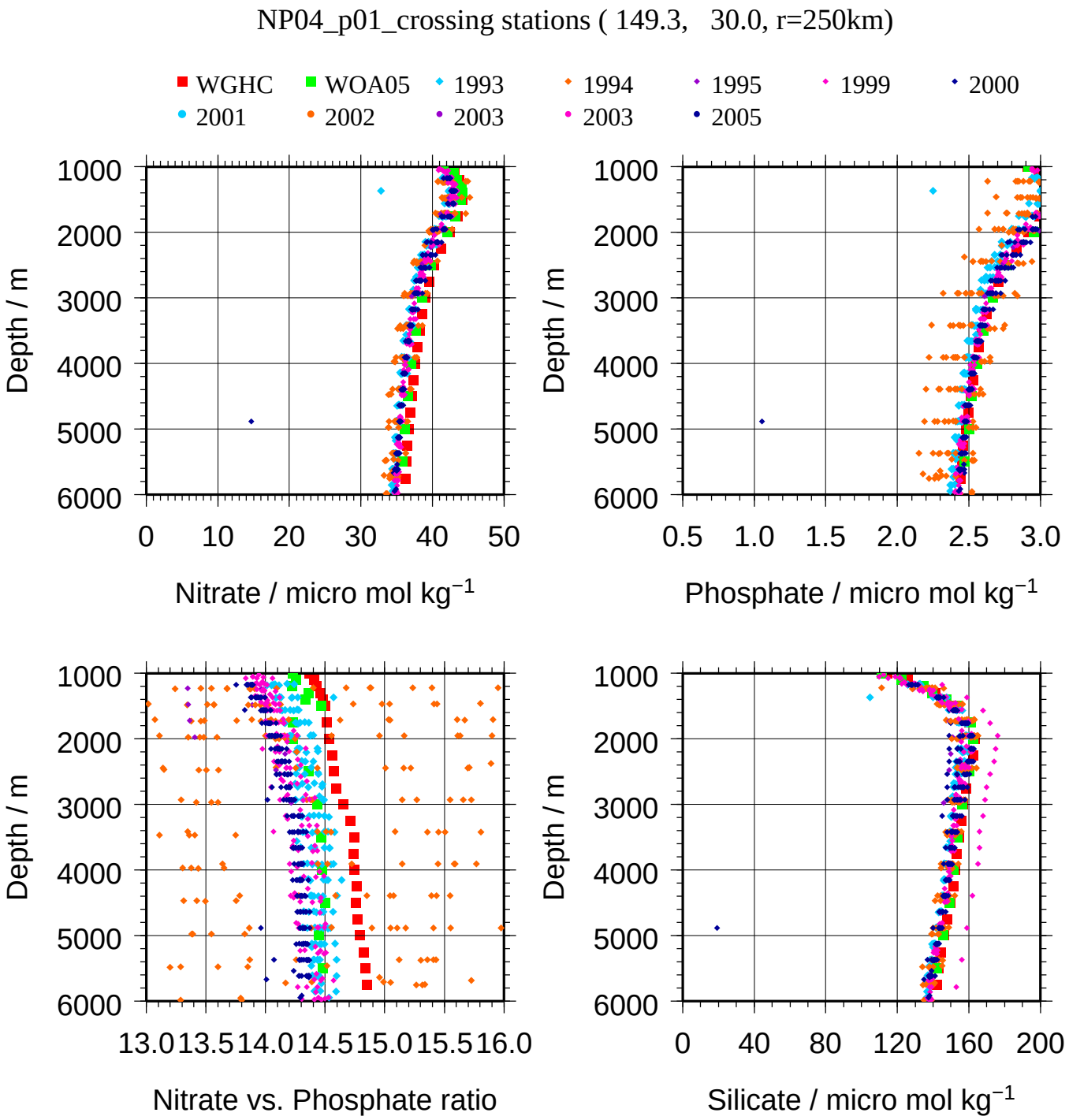

NP01_p03_crossing stations (137.0, 30.0, r=250km)
WGHC
WOA05
2006
2007
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

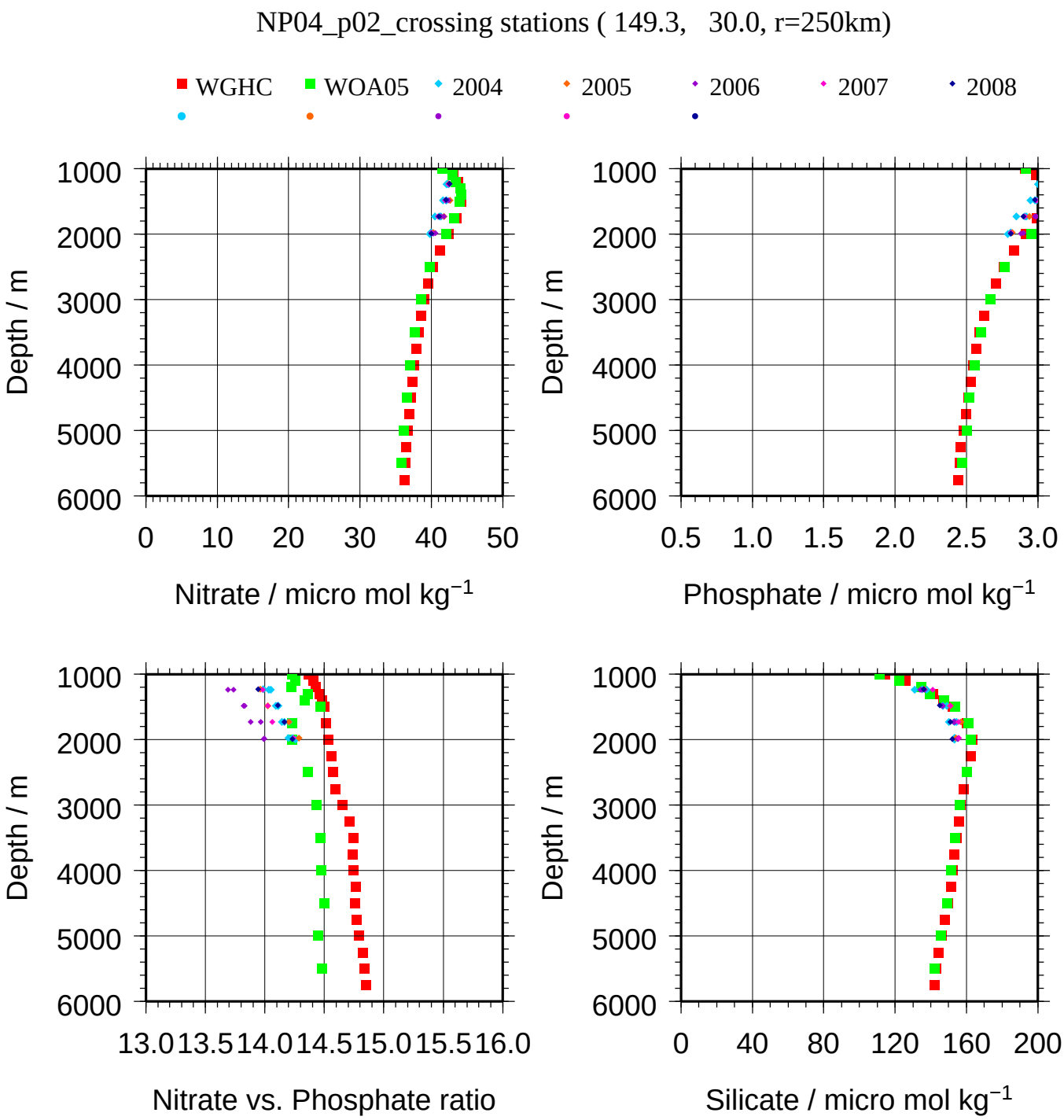

NP02_p01_crossing stations (137.0, 24.2, r=250km)
WGHC
WOA05
1985
1994
1995
1997
1998
2000
2001
2002
2002
2004
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

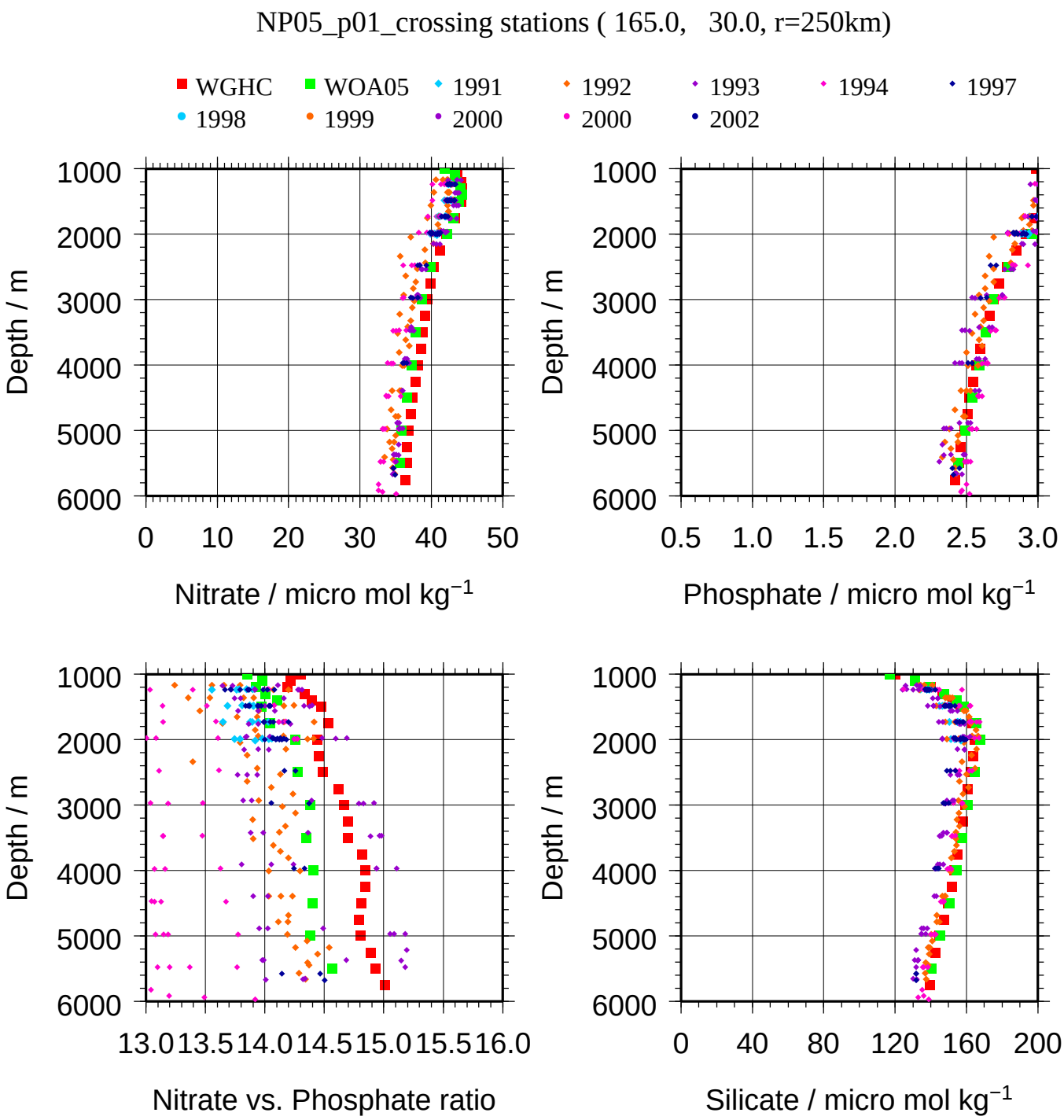

NP02_p02_crossing stations (137.0, 24.2, r=250km)
WGHC
WOA05
1998
1999
2000
2002
2003
2005
2006
2007
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

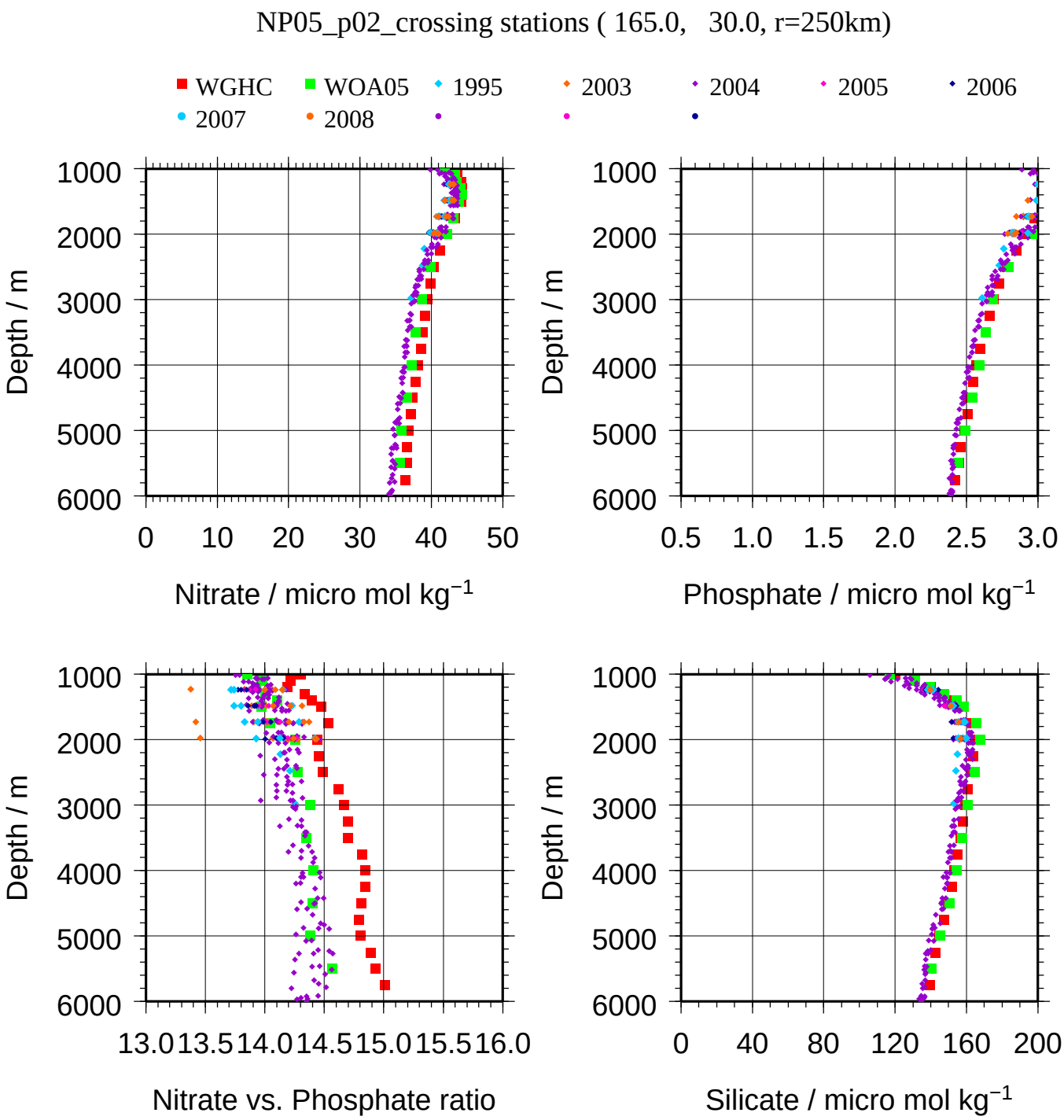

NP02_p03_crossing stations (137.0, 24.2, r=250km)
WGHC
WOA05
2006
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

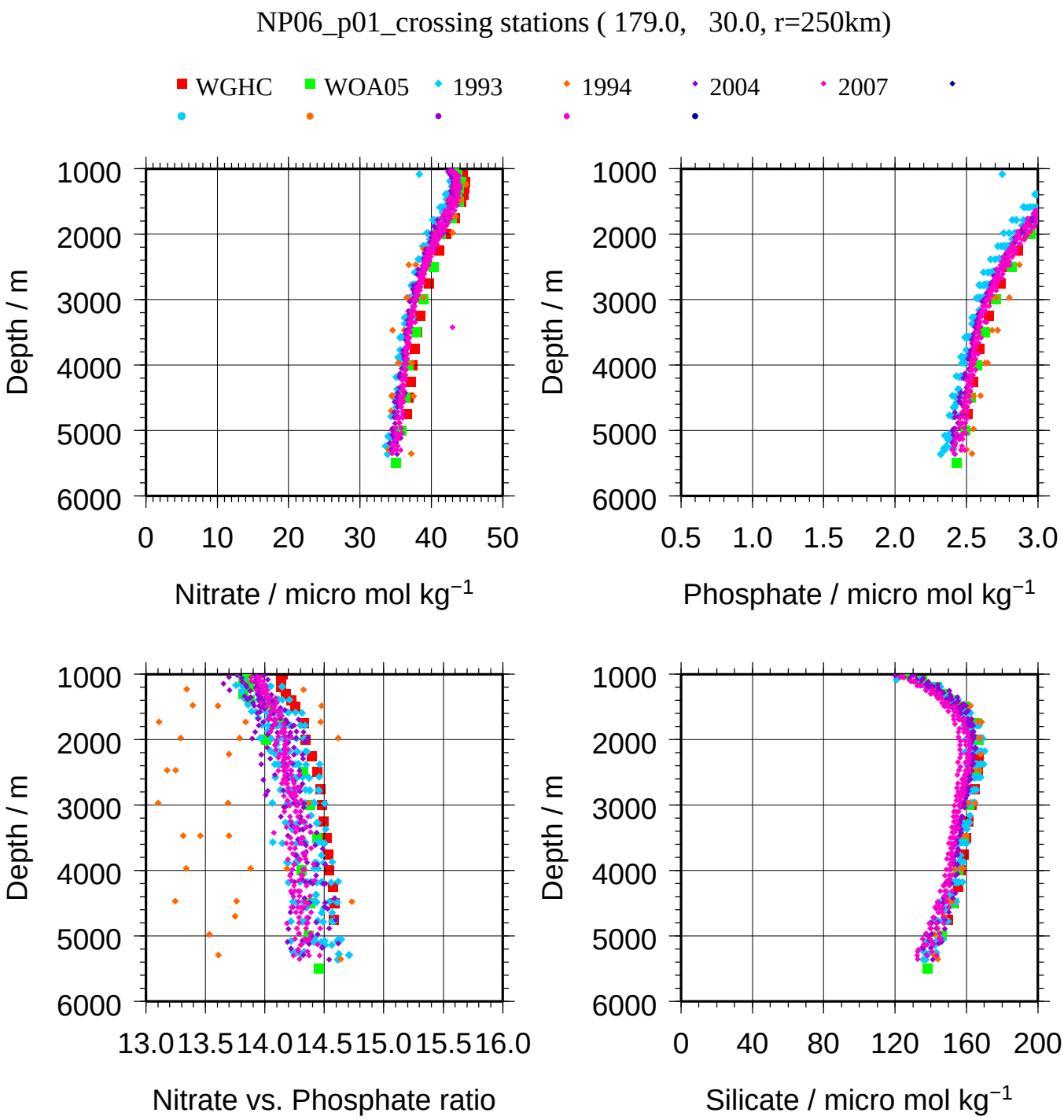

NP03_p01_crossing stations (130.0, 24.2, r=250km)
WGHC
WOA05
1985
1996
1997
2002
2006
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

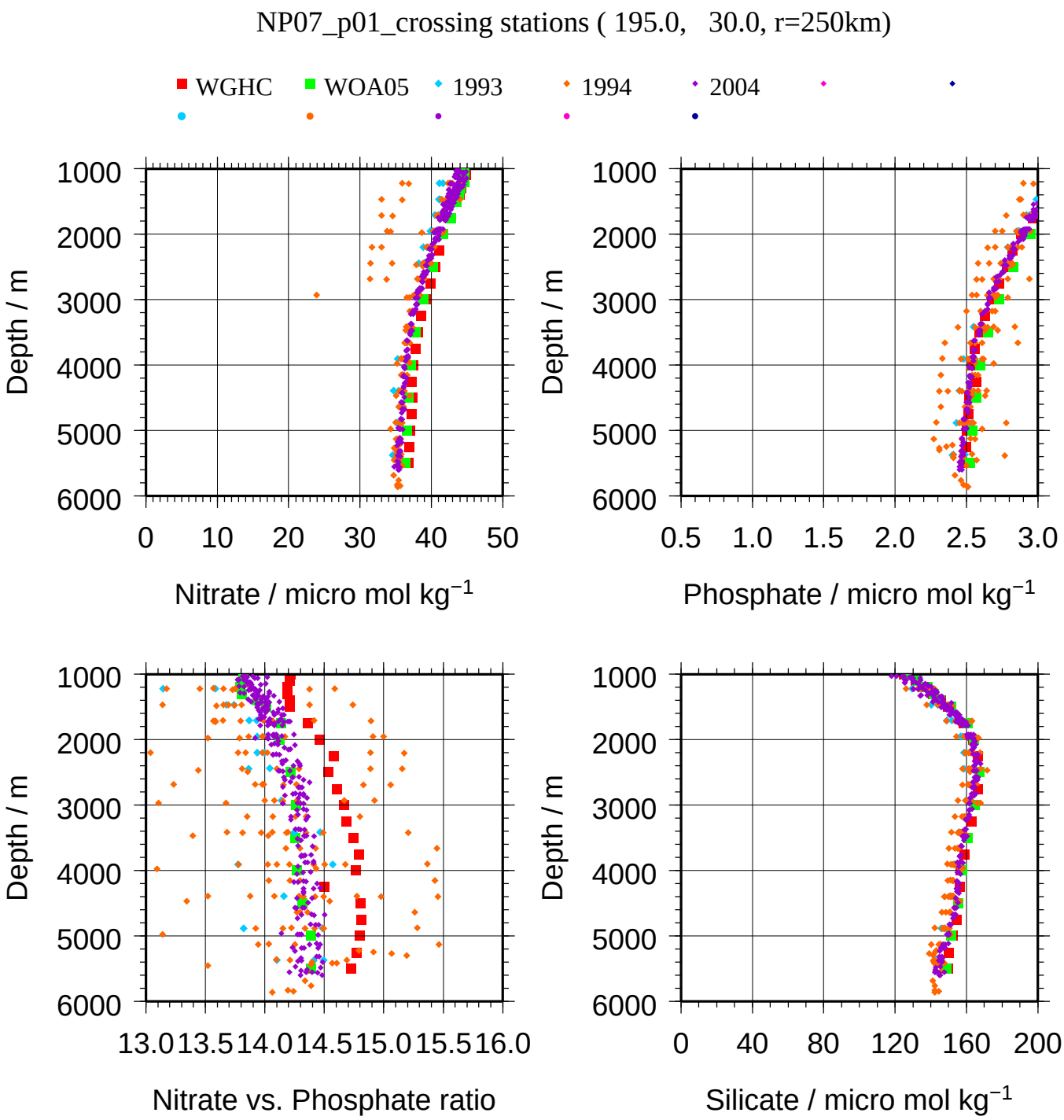

NP04_p01_crossing stations (149.3, 30.0, r=250km)
WGHC
WOA05
1993
1994
1995
1999
2000
2001
2002
2003
2003
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

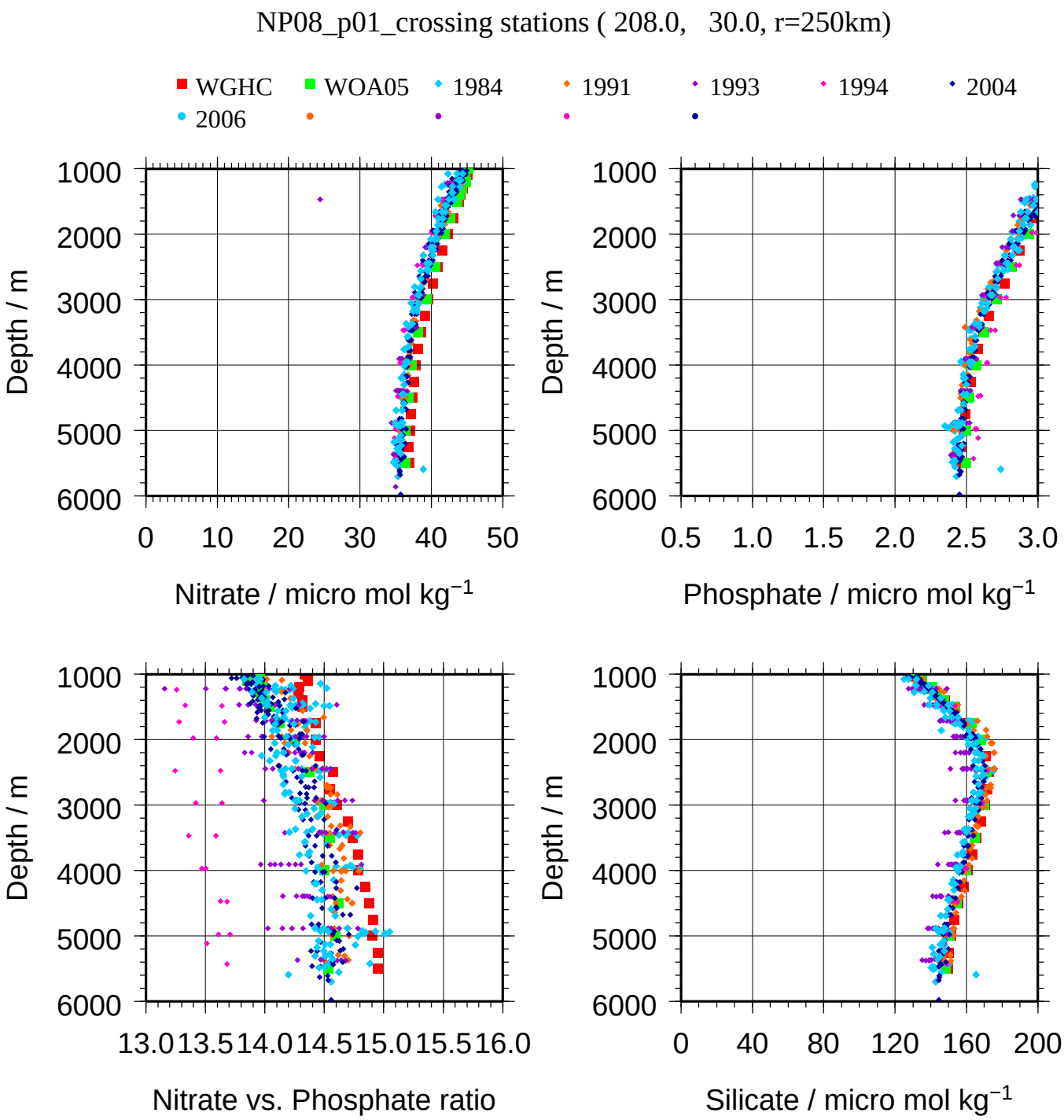

NP04_p02_crossing stations (149.3, 30.0, r=250km)
WGHC
WOA05
2004
2005
2006
2007
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

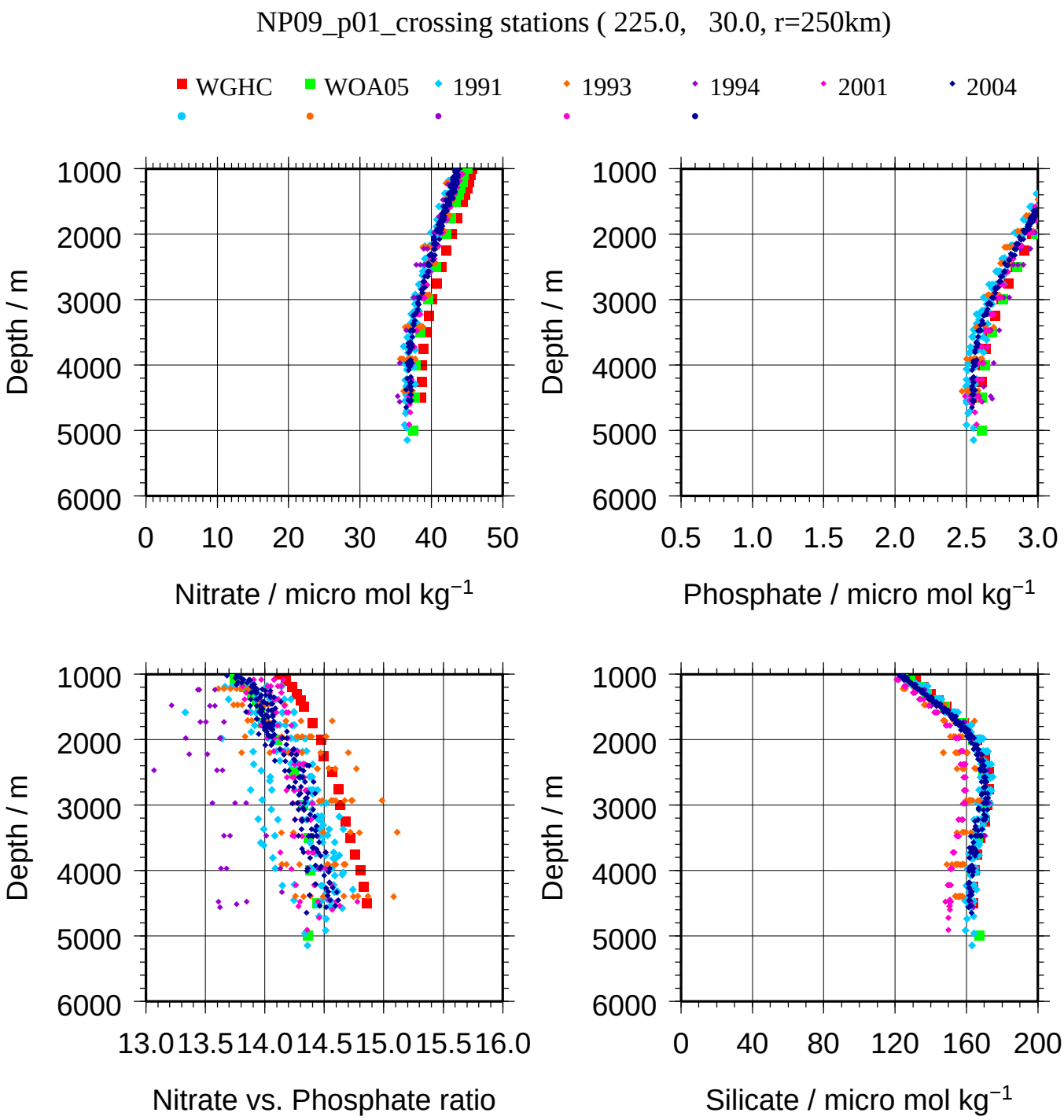

NP05_p01_crossing stations (165.0, 30.0, r=250km)
WGHC
WOA05
1991
1992
1993
1994
1997
1998
1999
2000
2000
2002
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

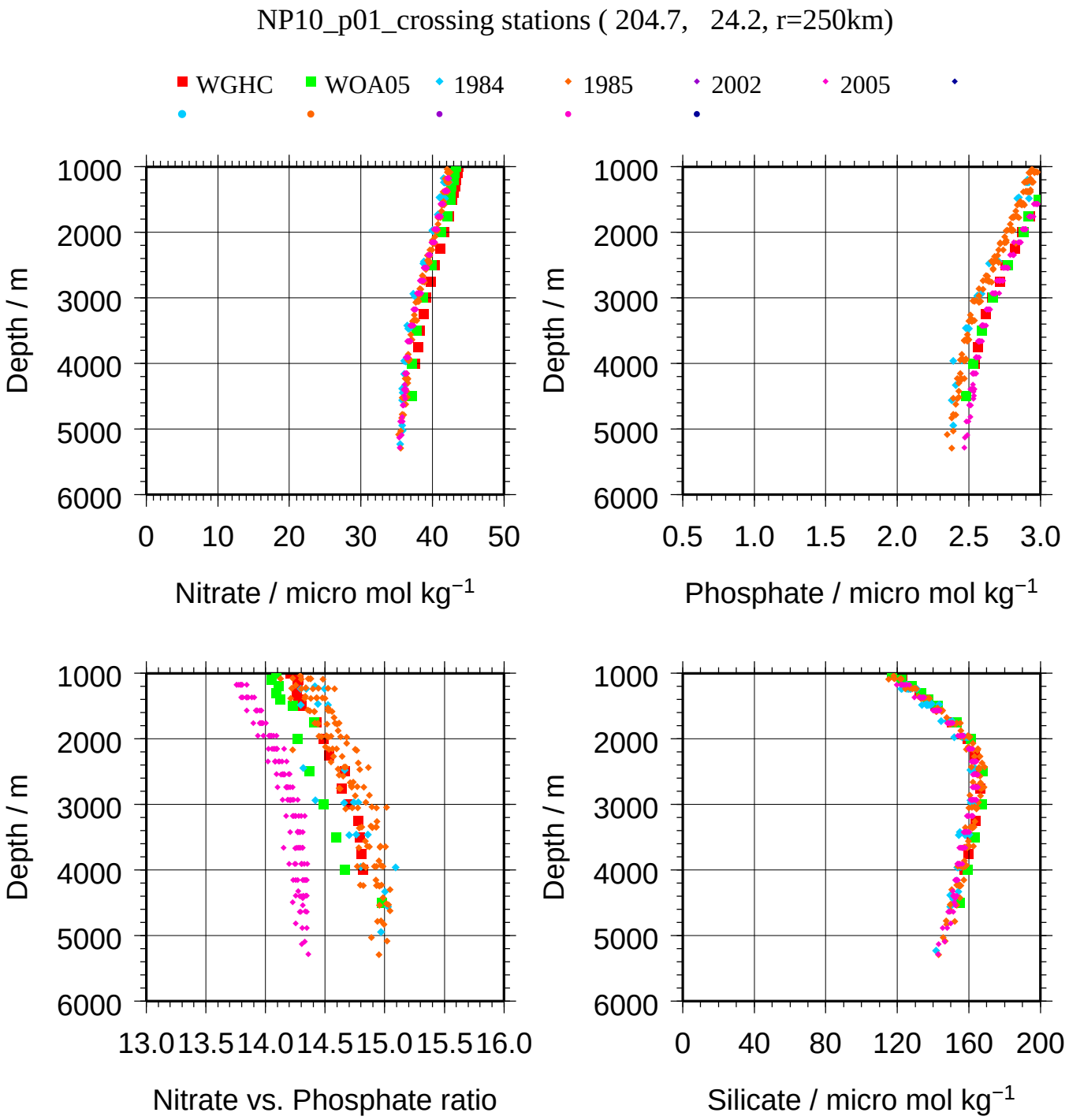

NP05_p02_crossing stations (165.0, 30.0, r=250km)
WGHC
WOA05
1995
2003
2004
2005
2006
2007
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1


NP06_p01_crossing stations (179.0, 30.0, r=250km)
WGHC
WOA05
1993
1994
2004
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

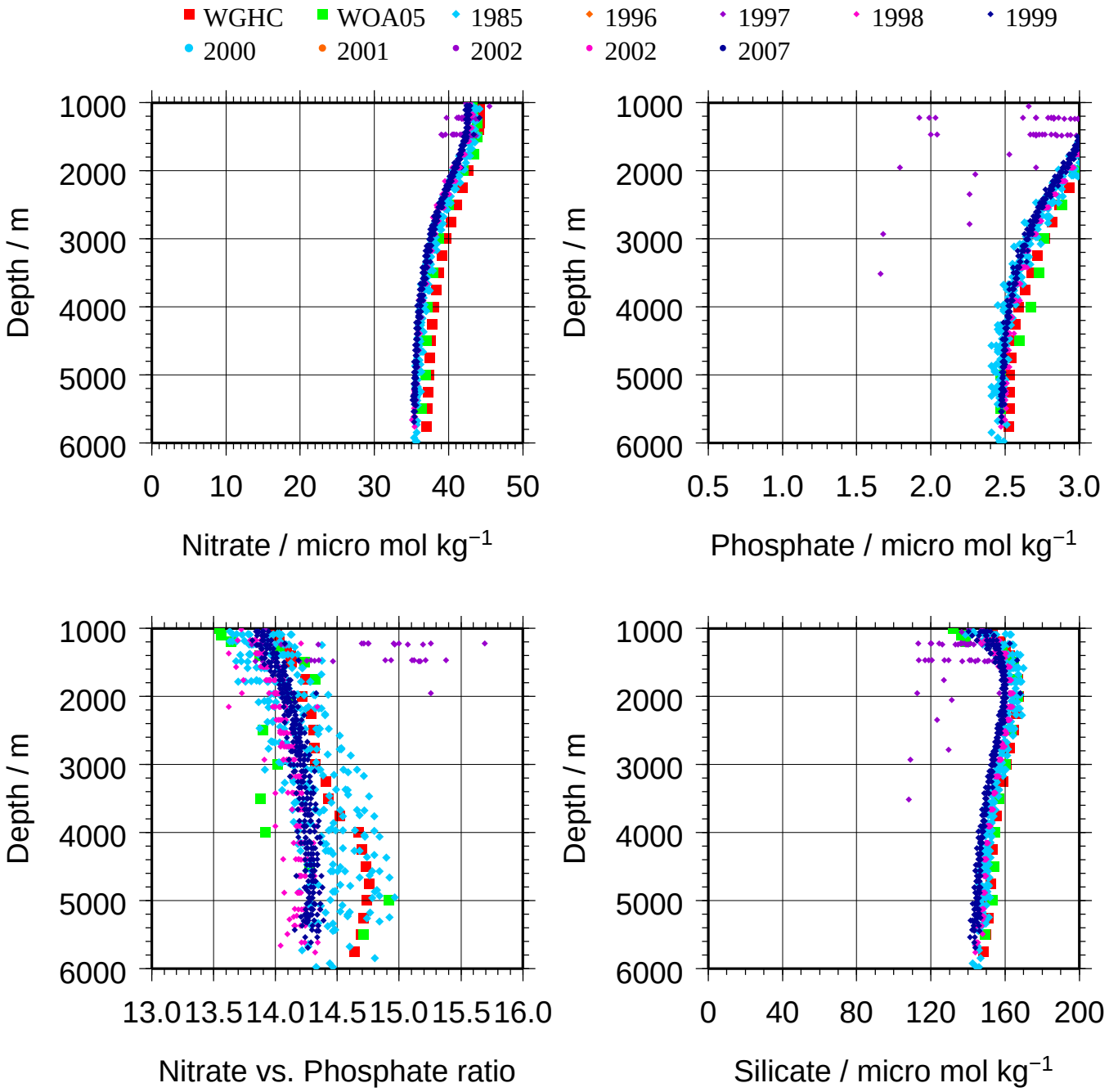

NP07_p01_crossing stations (195.0, 30.0, r=250km)
WGHC
WOA05
1993
1994
2004
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1


NP08_p01_crossing stations (208.0, 30.0, r=250km)
WGHC
WOA05
1984
1991
1993
1994
2004
2006
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

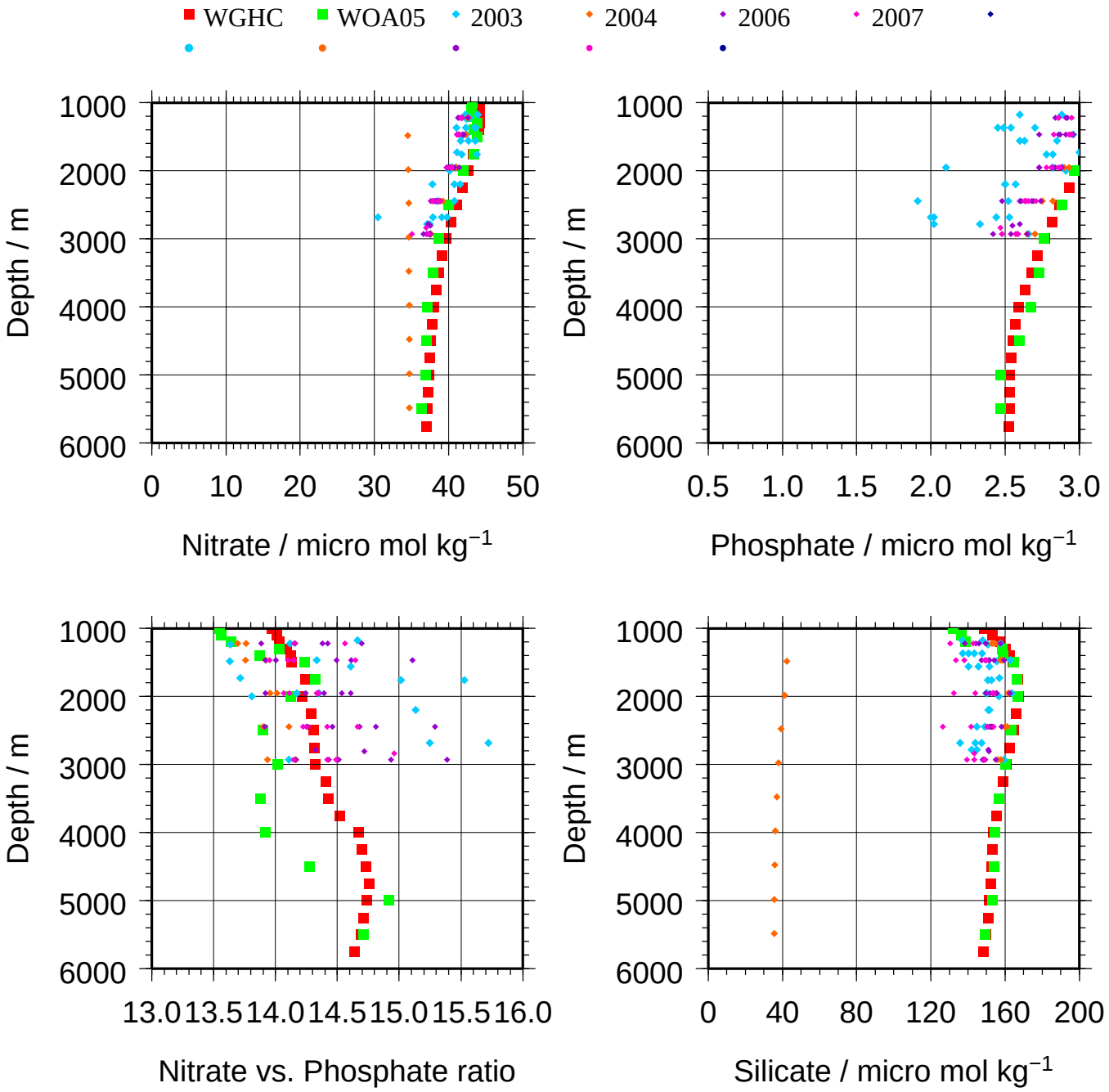

NP09_p01_crossing stations (225.0, 30.0, r=250km)
WGHC
WOA05
1991
1993
1994
2001
2004
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

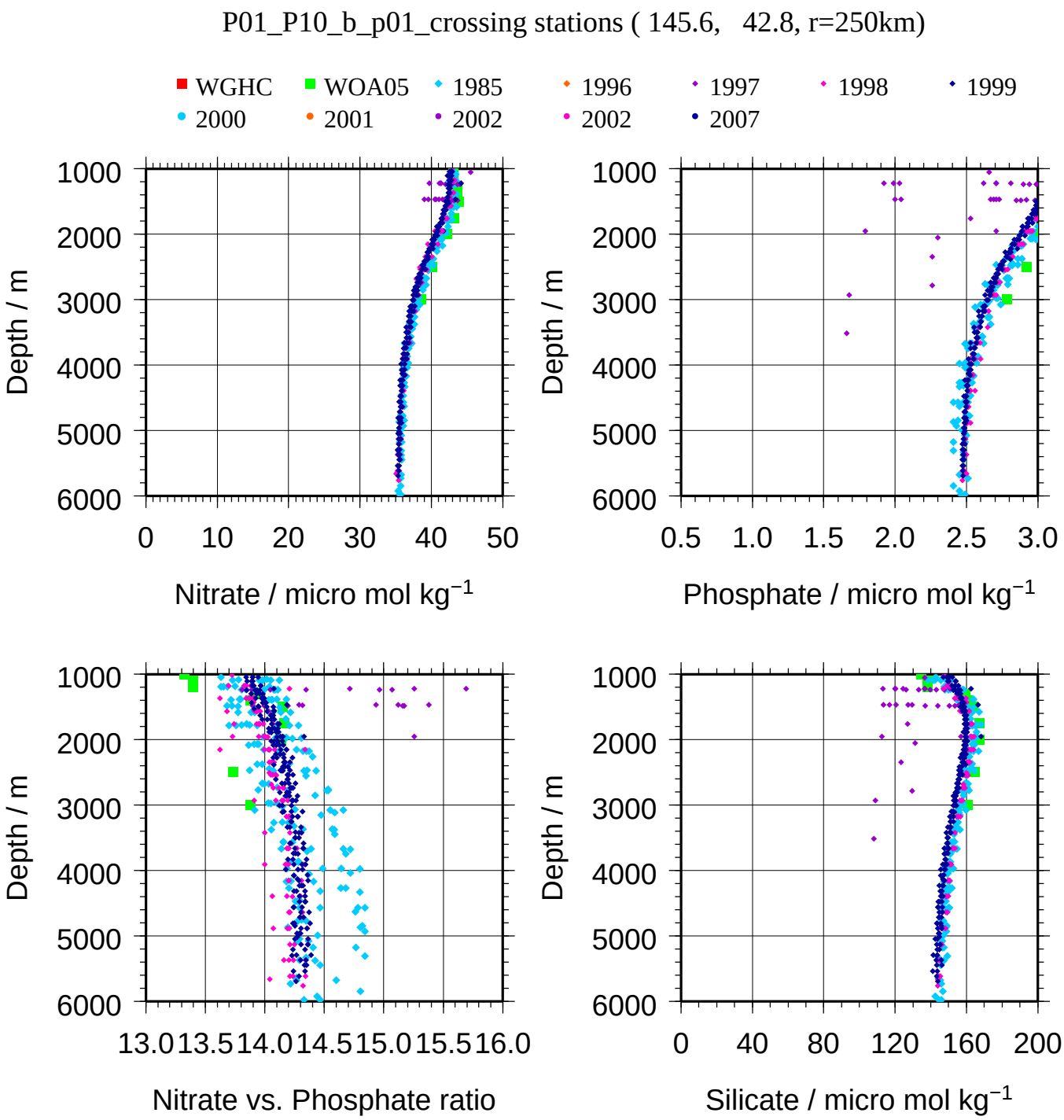

NP10_p01_crossing stations (204.7, 24.2, r=250km)
WGHC
WOA05
1984
1985
2002
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

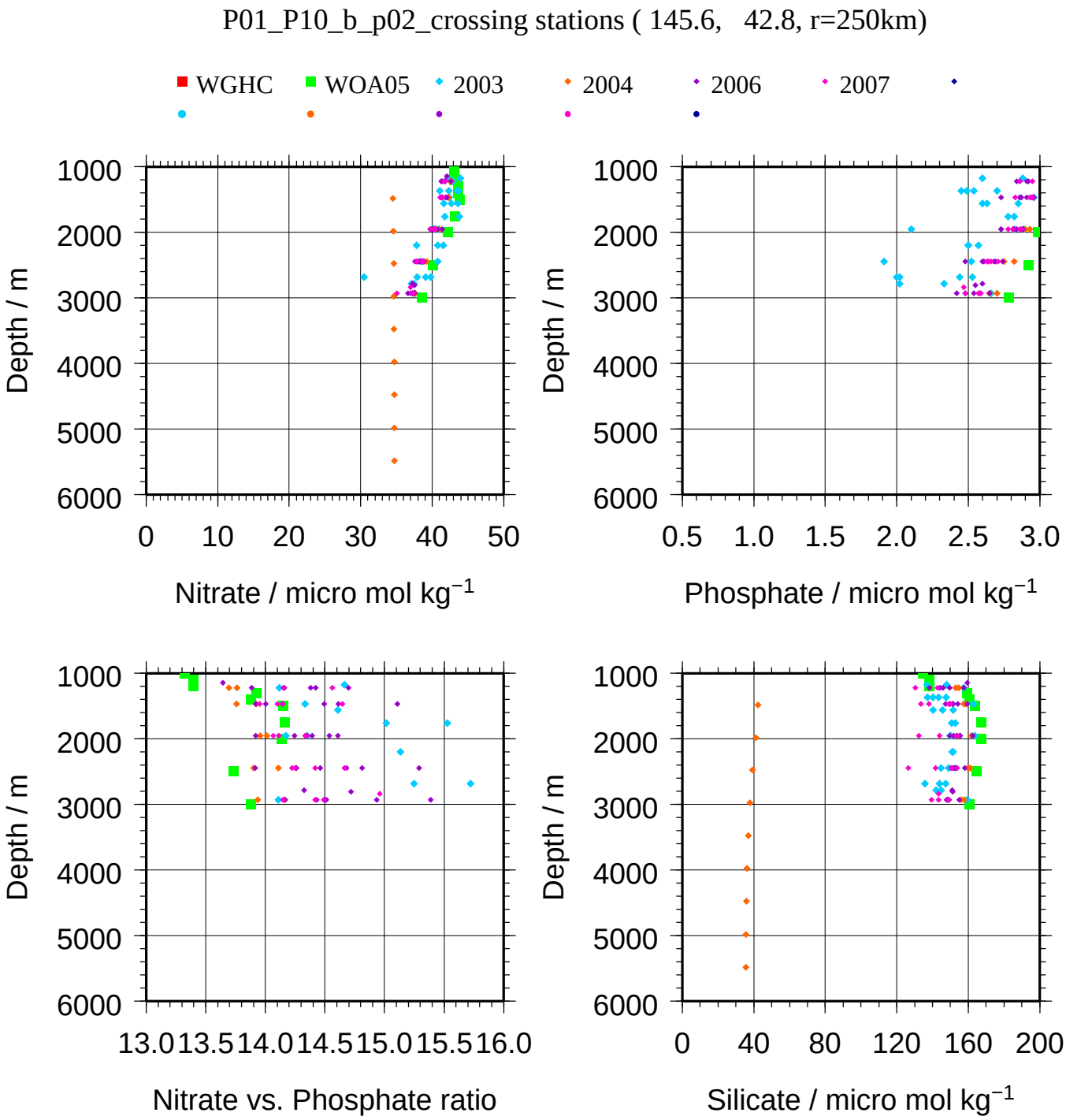
P01_P10_a_p01_crossing stations (146.6, 41.9, r=250km)

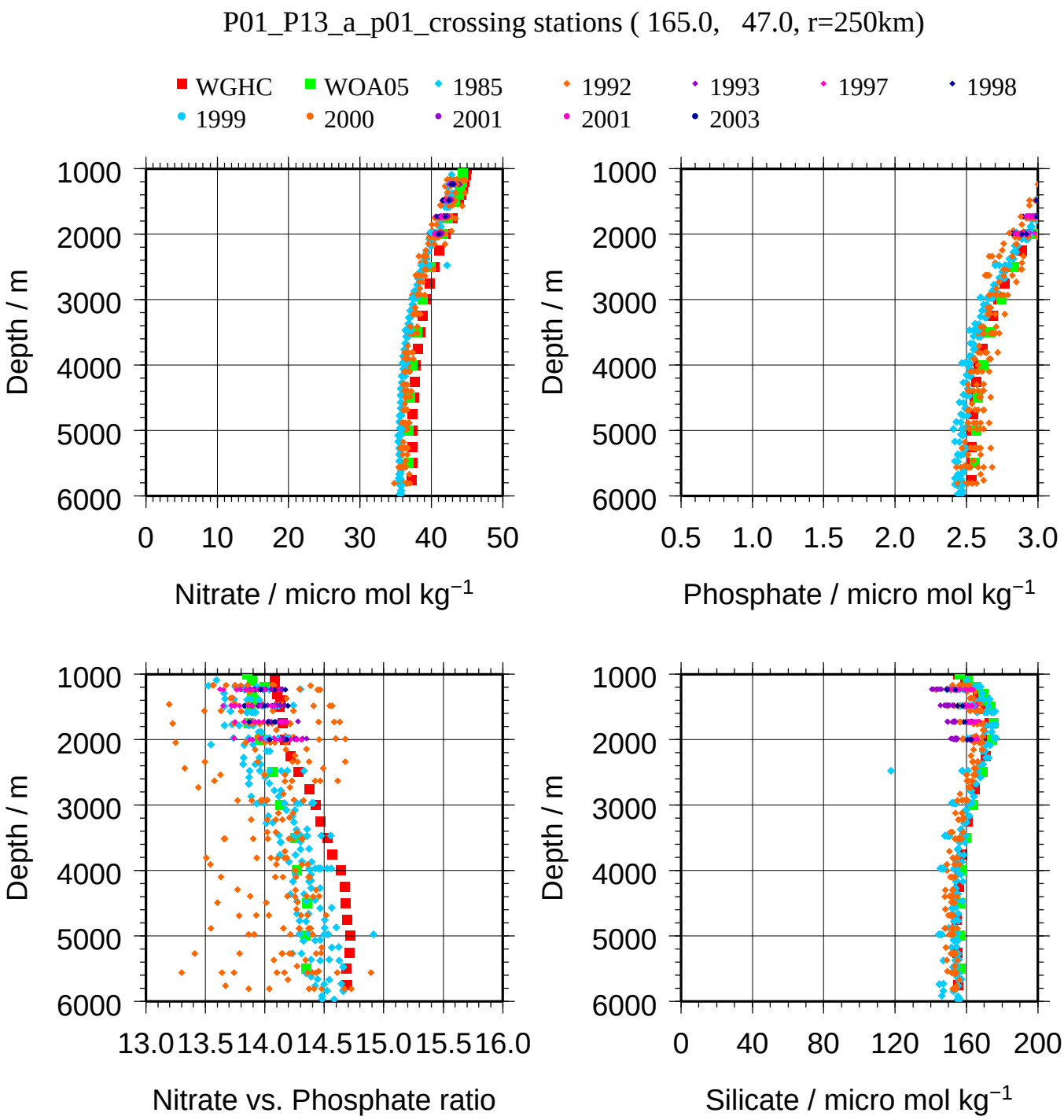


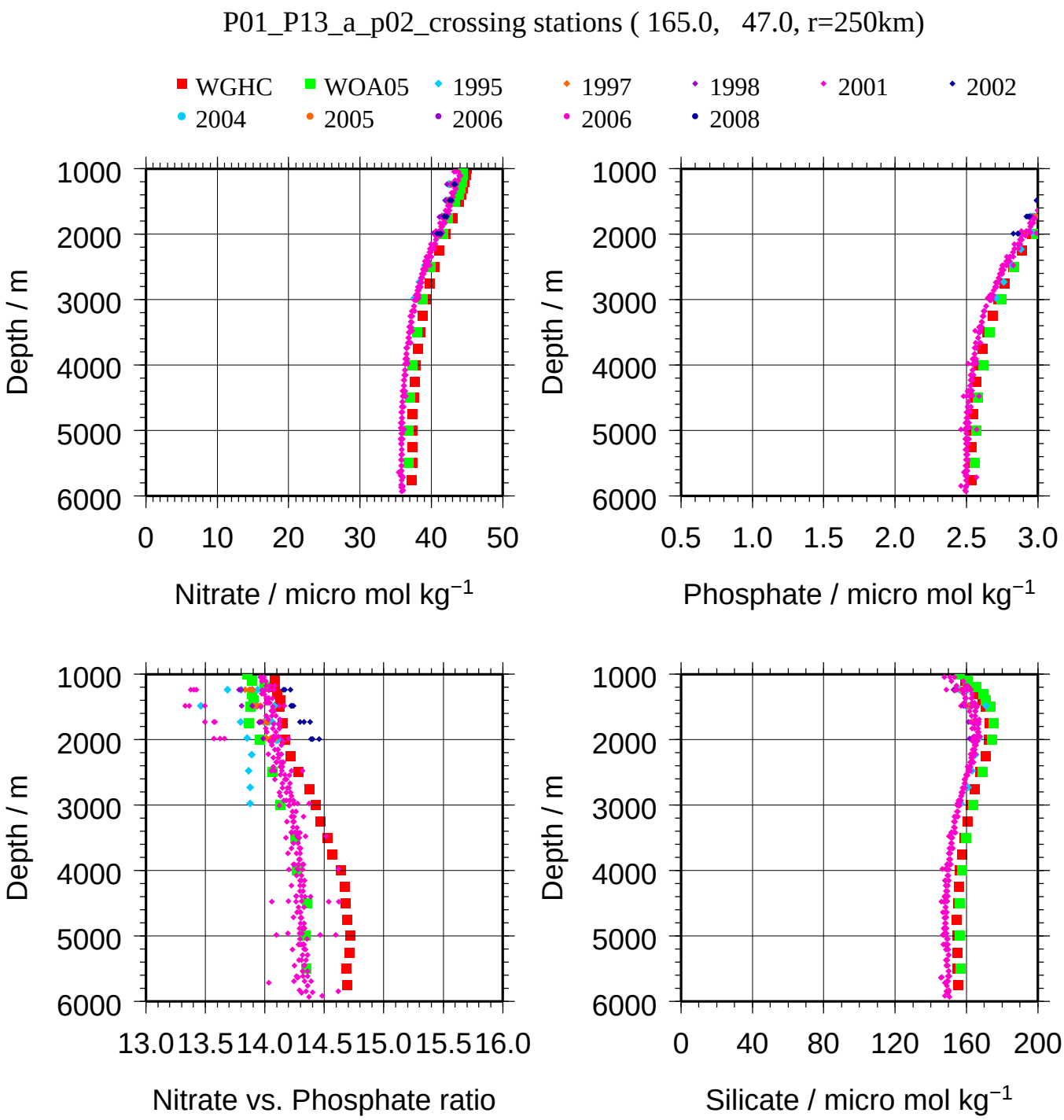
P01_P10_a_p02_crossing stations (146.6, 41.9, r=250km)

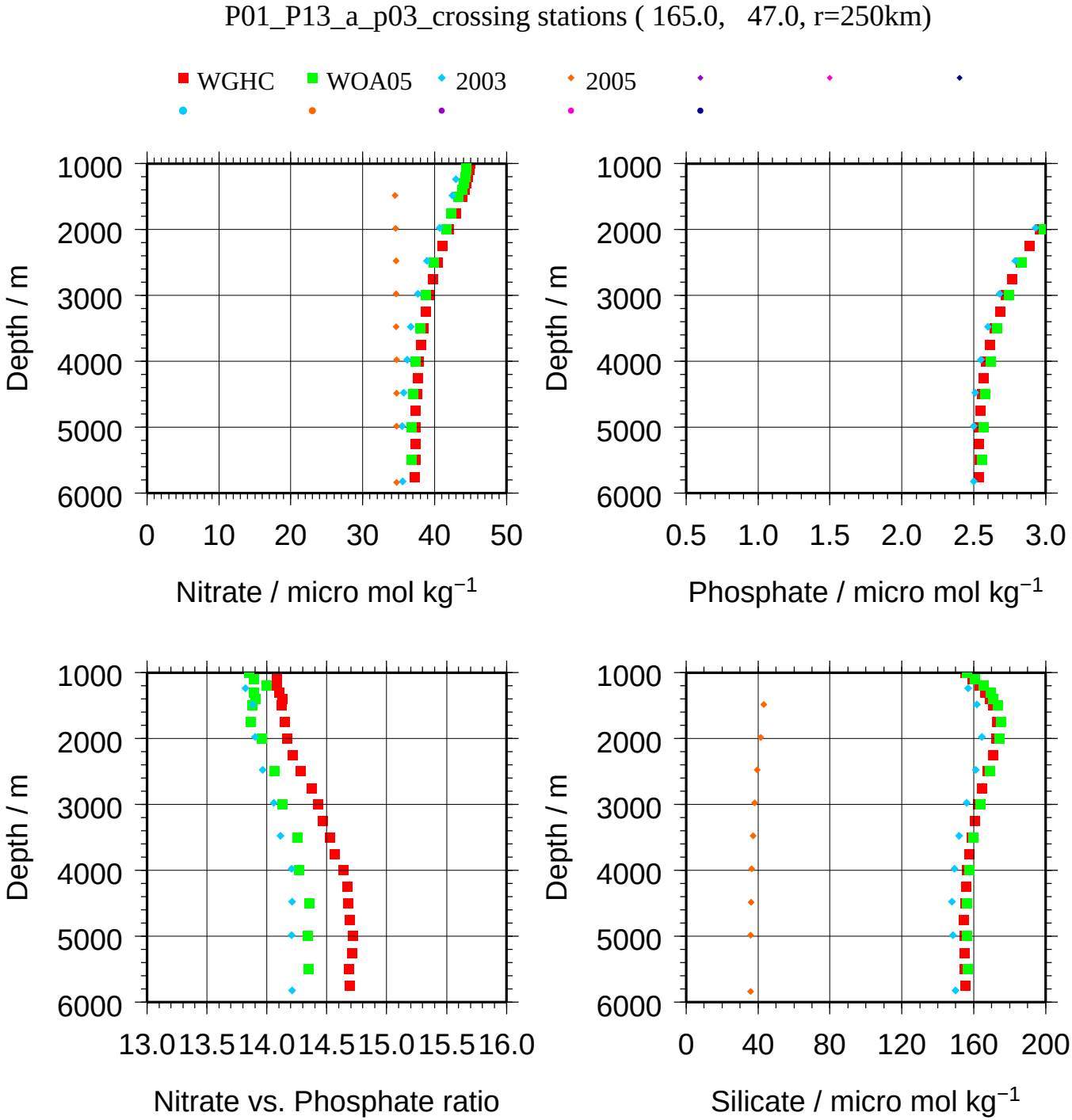


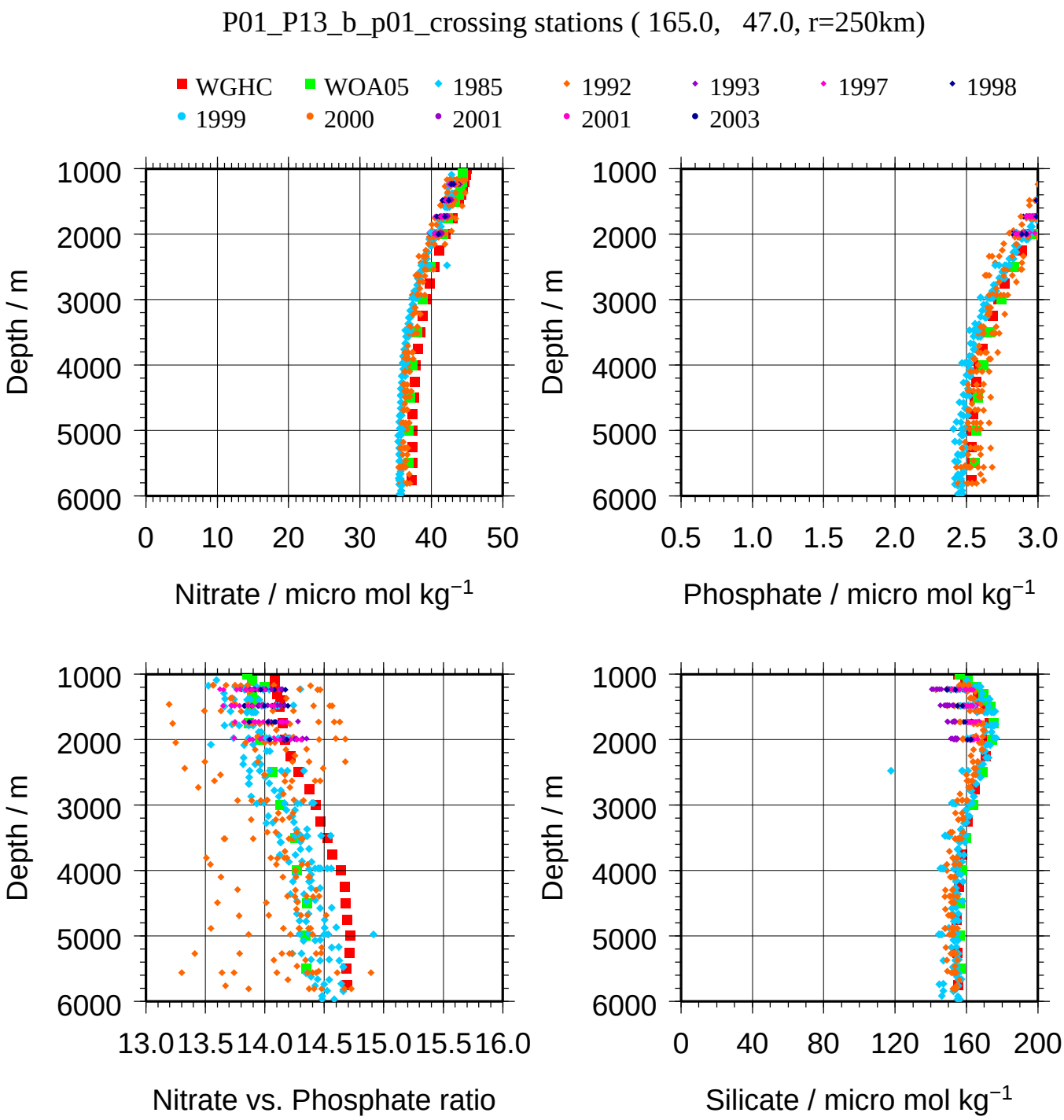

P01_P10_b_p01_crossing stations (145.6, 42.8, r=250km)
WGHC
WOA05
1985
1996
1997
1998
1999
2000
2001
2002
2002
2007
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

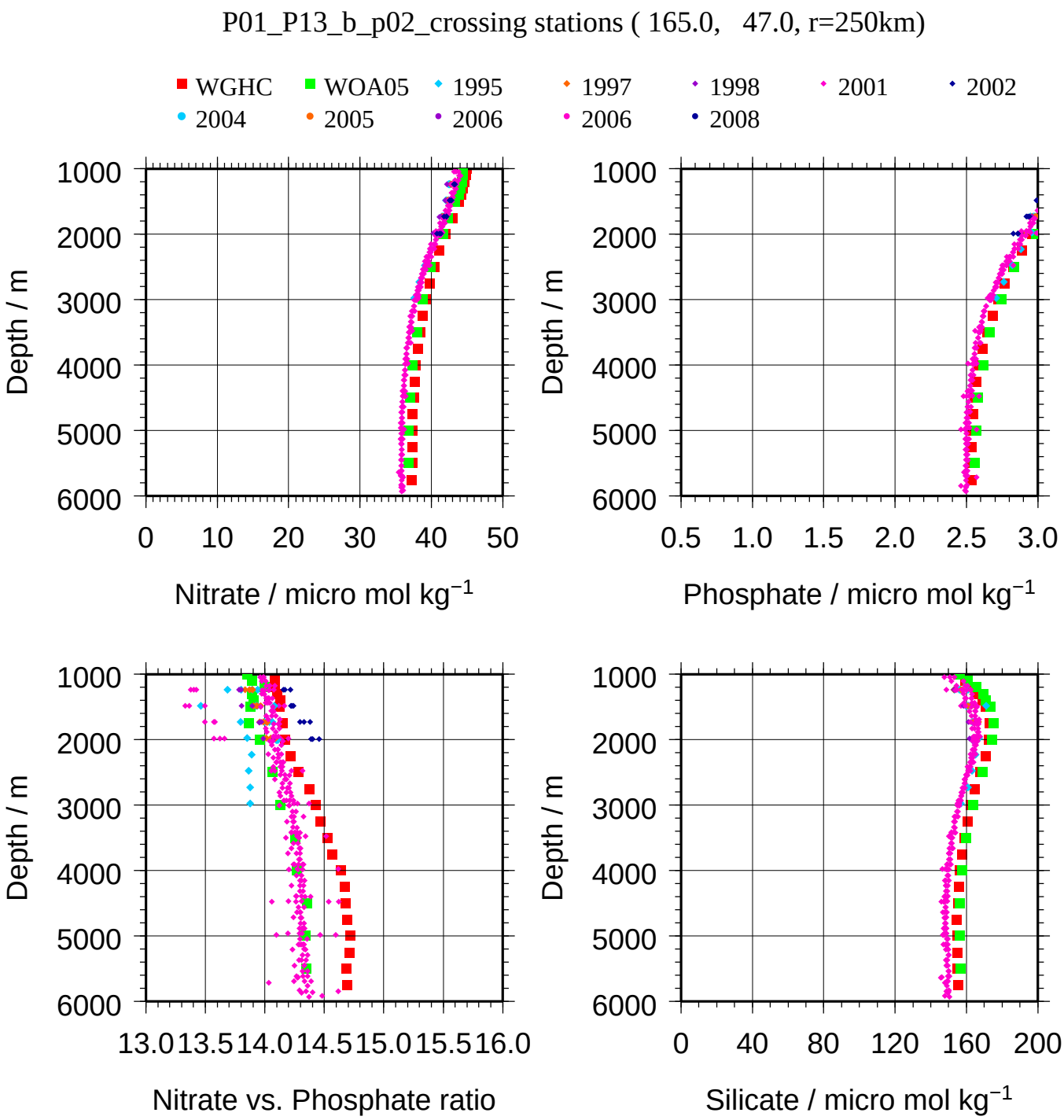

P01_P10_b_p02_crossing stations (145.6, 42.8, r=250km)
WGHC
WOA05
2003
2004
2006
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

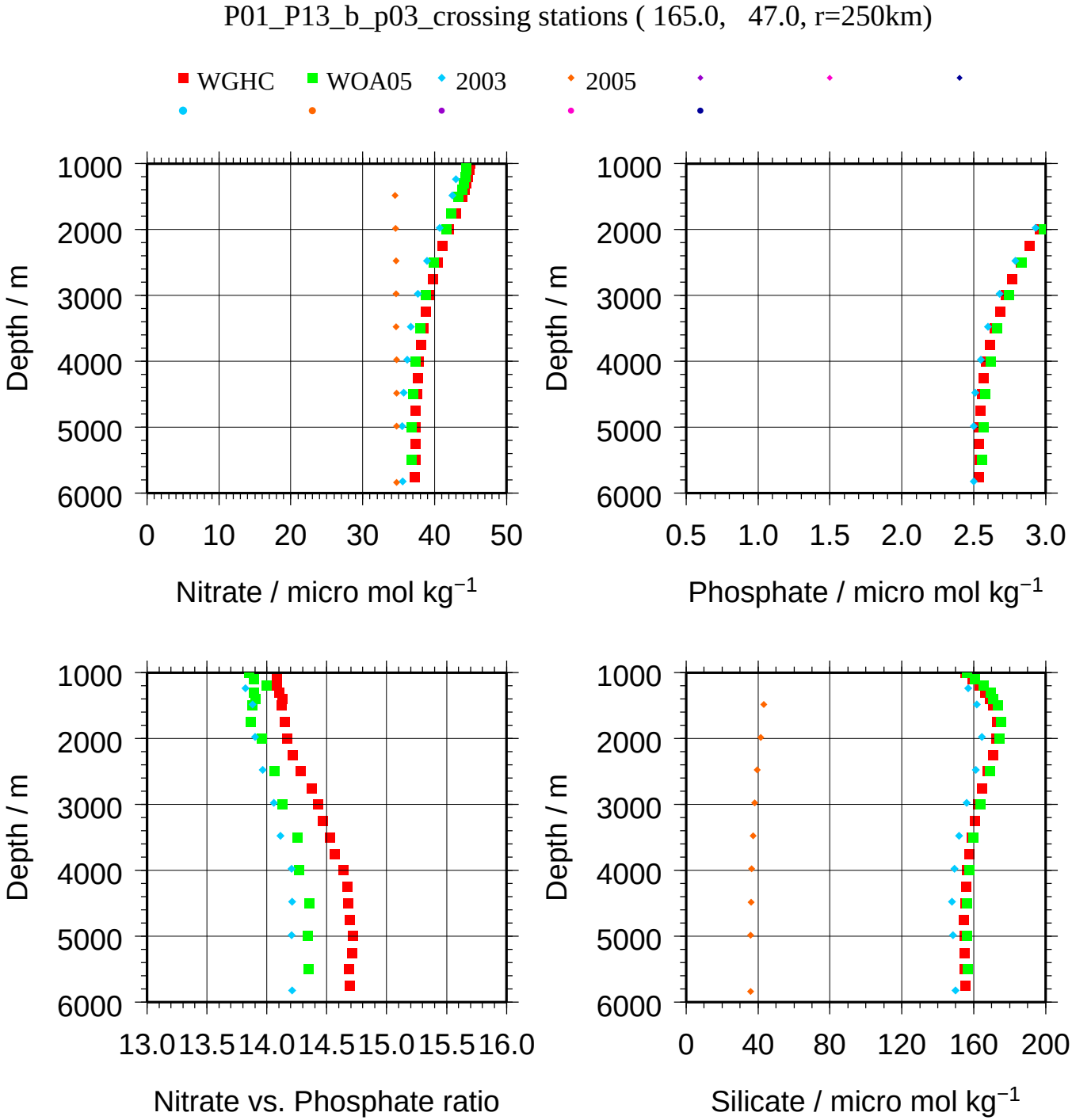

P01_P13_a_p01_crossing stations (165.0, 47.0, r=250km)
WGHC
WOA05
1985
1992
1993
1997
1998
1999
2000
2001
2001
2003
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

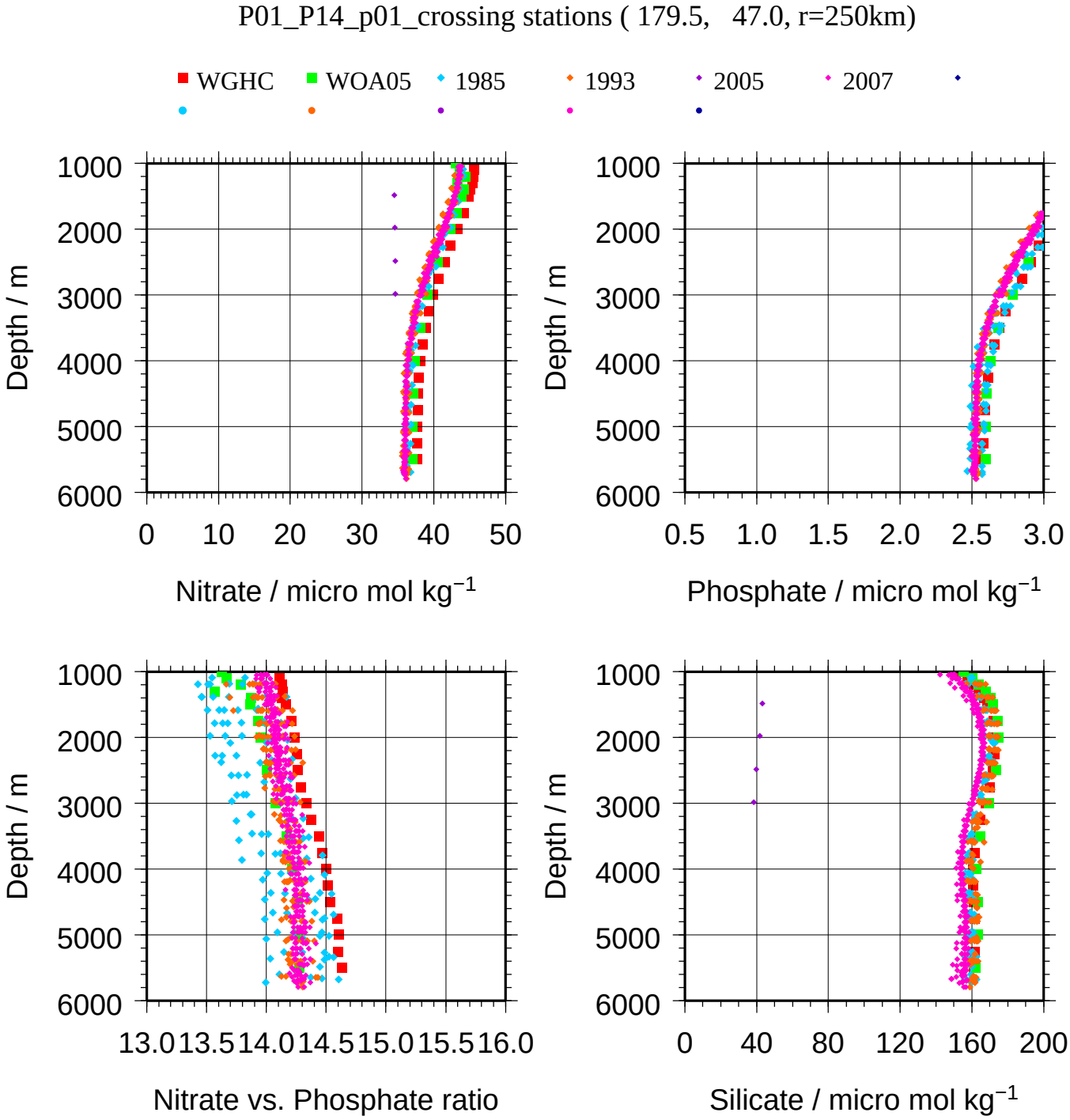

P01_P13_a_p02_crossing stations (165.0, 47.0, r=250km)
WGHC
WOA05
1995
1997
1998
2001
2002
2004
2005
2006
2006
2008
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

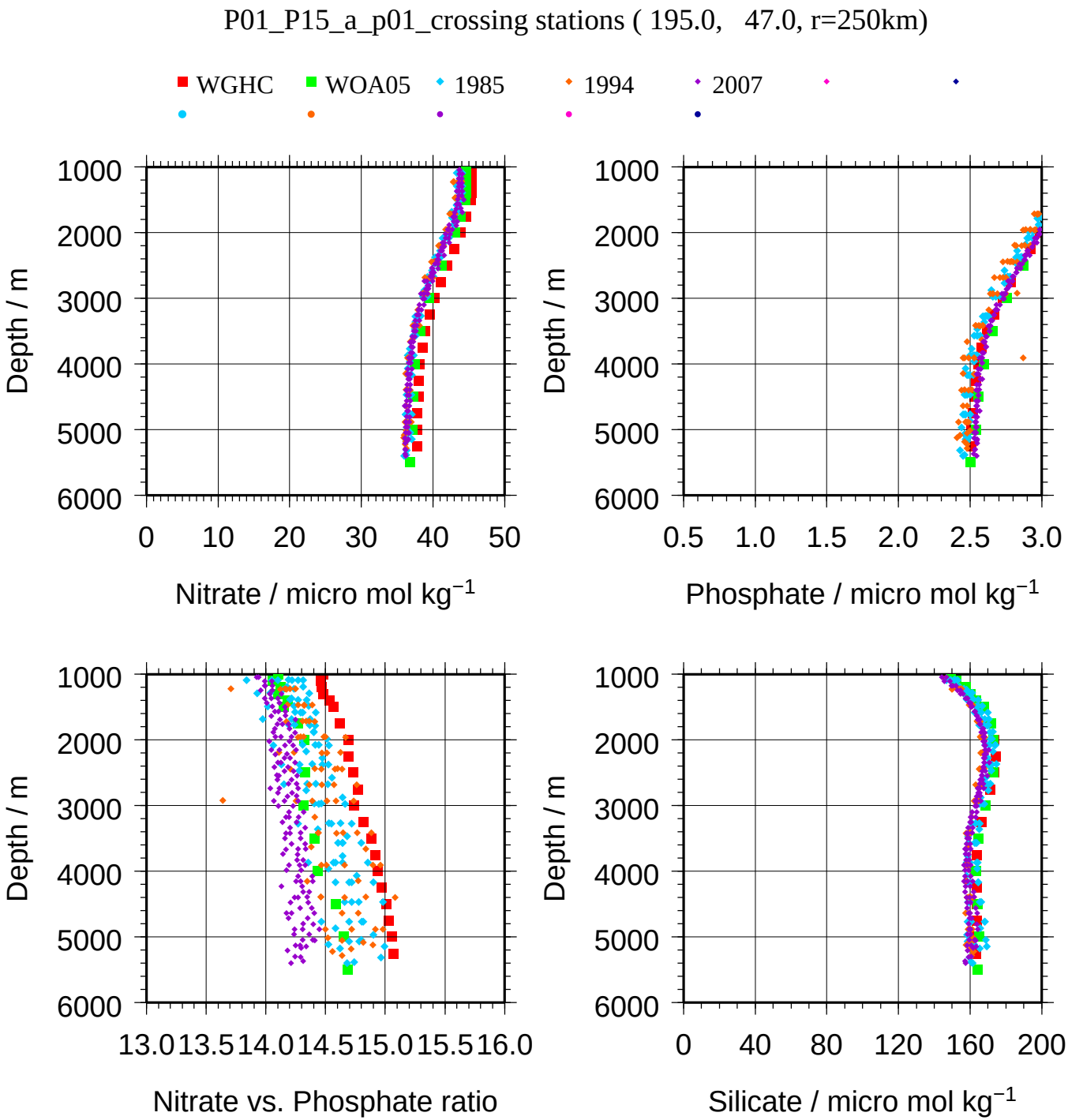

P01_P13_a_p03_crossing stations (165.0, 47.0, r=250km)
WGHC
WOA05
2003
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

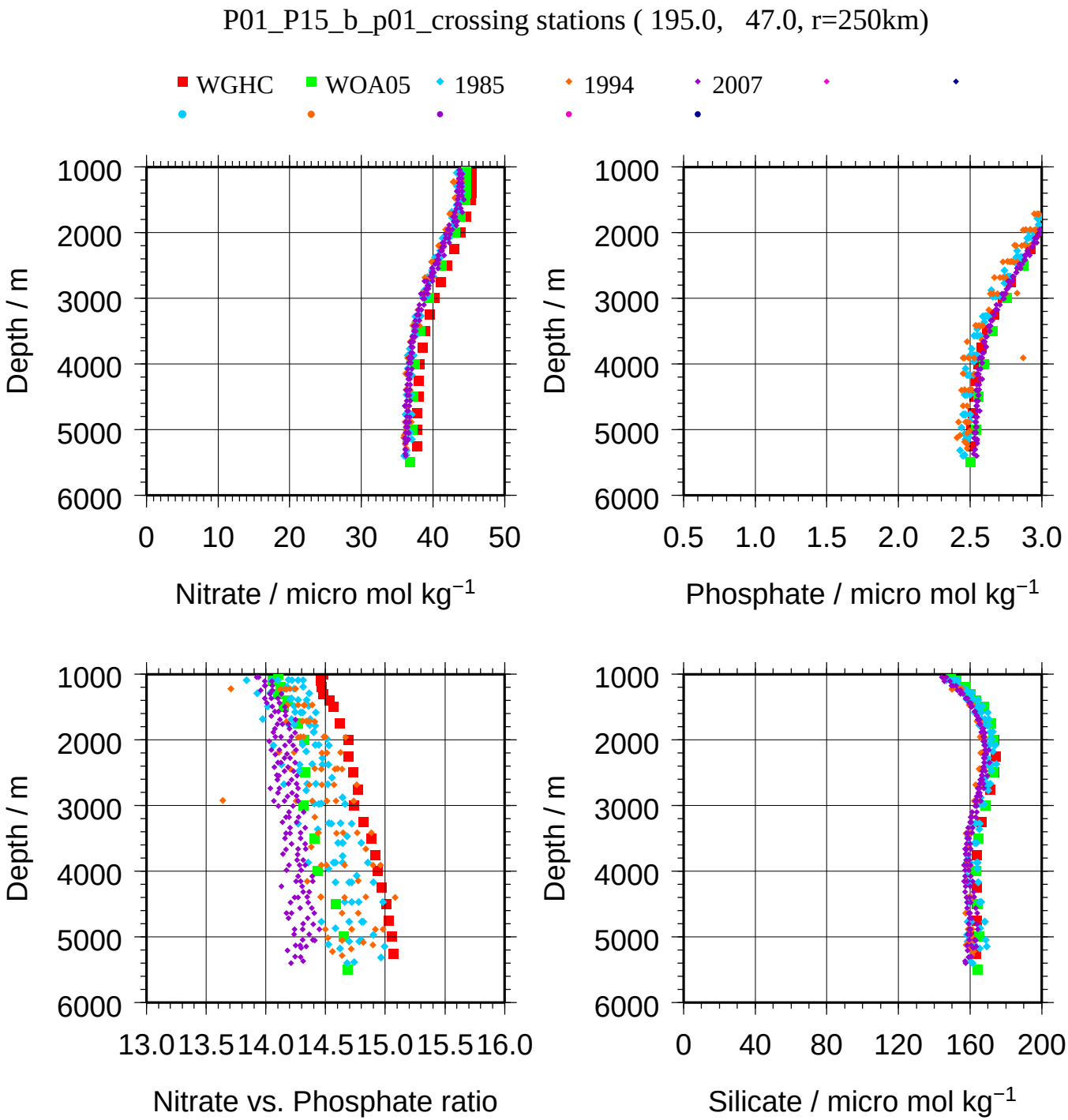

P01_P13_b_p01_crossing stations (165.0, 47.0, r=250km)
WGHC
WOA05
1985
1992
1993
1997
1998
1999
2000
2001
2001
2003
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

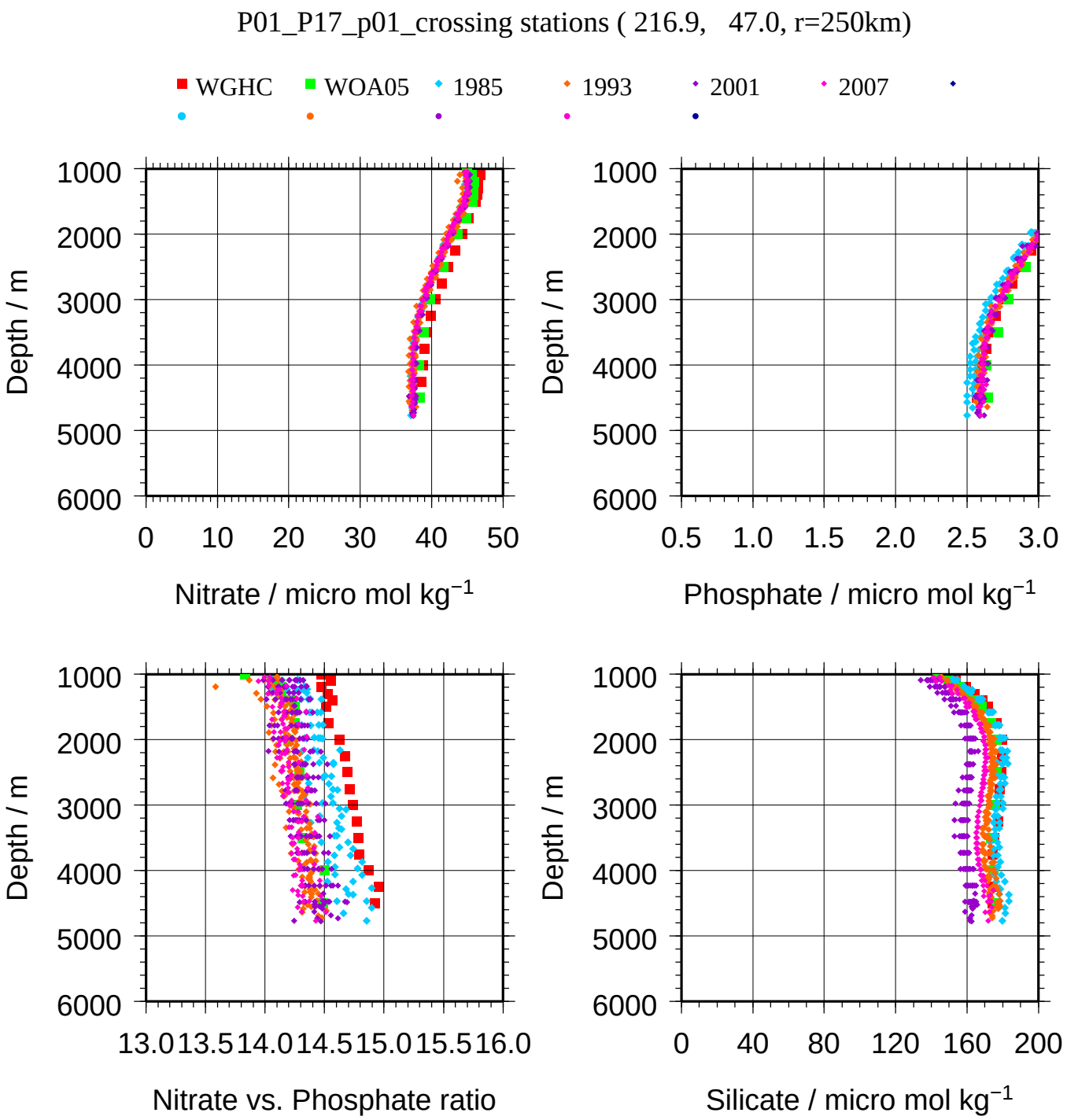

P01_P13_b_p02_crossing stations (165.0, 47.0, r=250km)
WGHC
WOA05
1995
1997
1998
2001
2002
2004
2005
2006
2006
2008
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

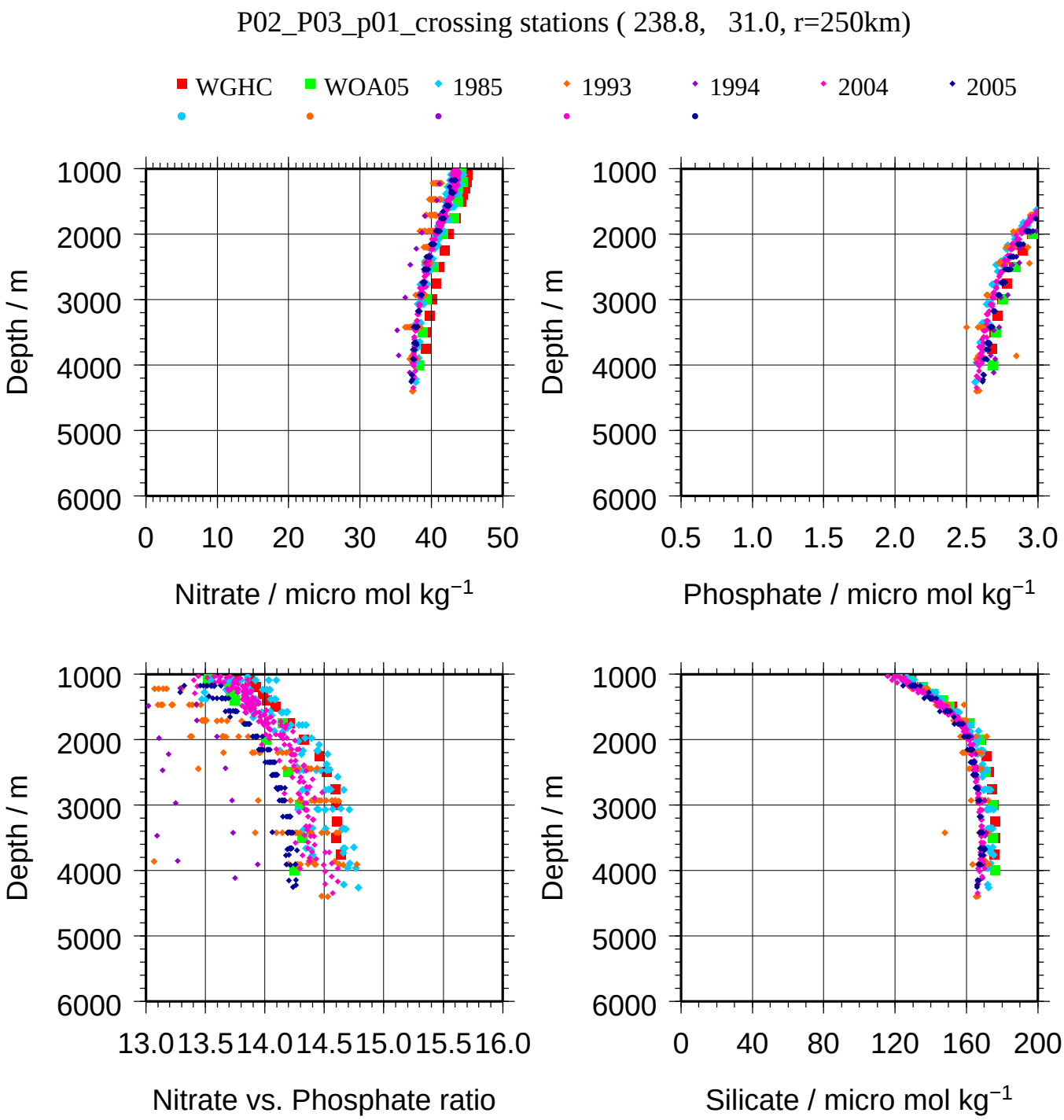

P01_P13_b_p03_crossing stations (165.0, 47.0, r=250km)
WGHC
WOA05
2003
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
80
120
160
200
Silicate / micro mol kg−1

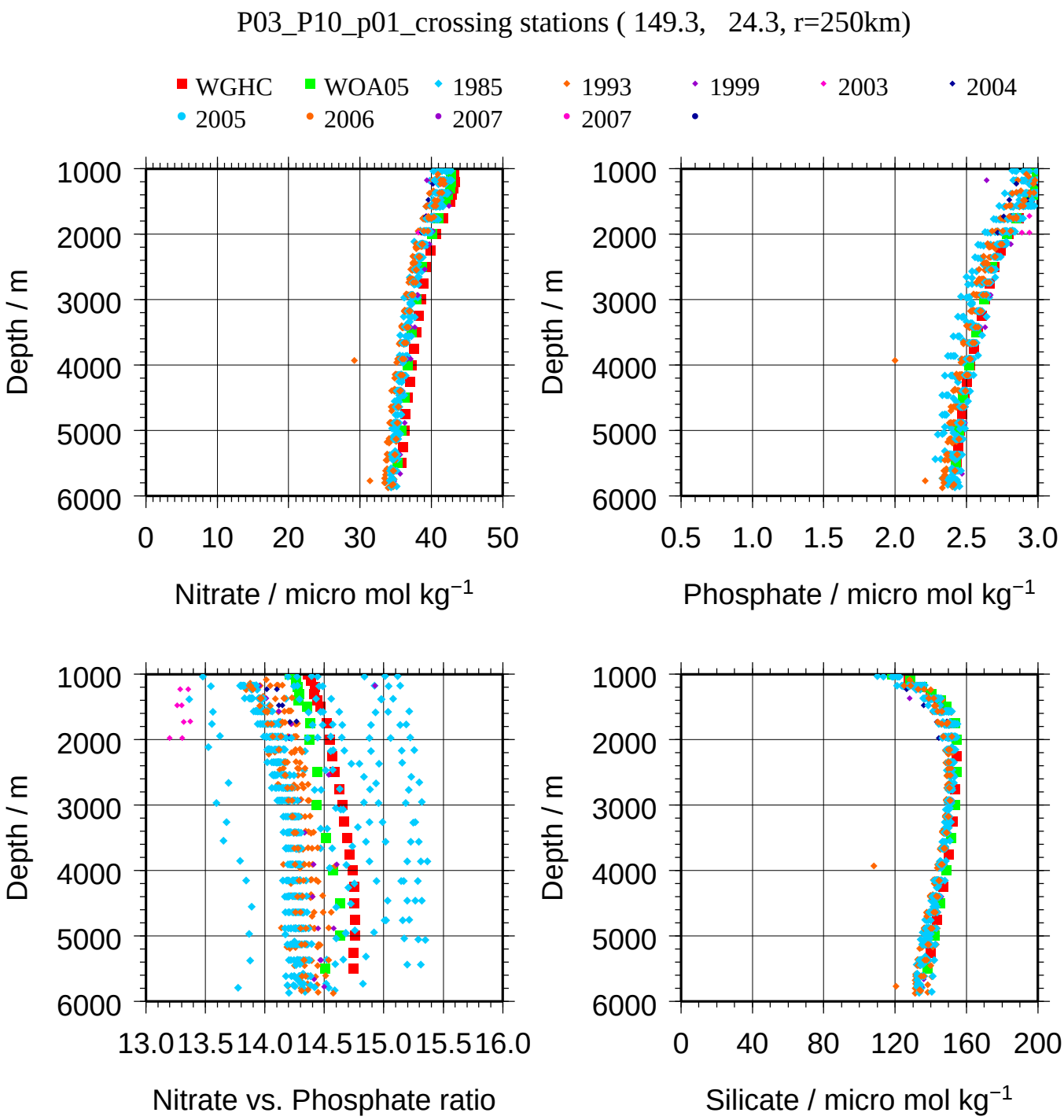

P01_P14_p01_crossing stations (179.5, 47.0, r=250km)
WGHC
WOA05
1985
1993
2005
2007
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

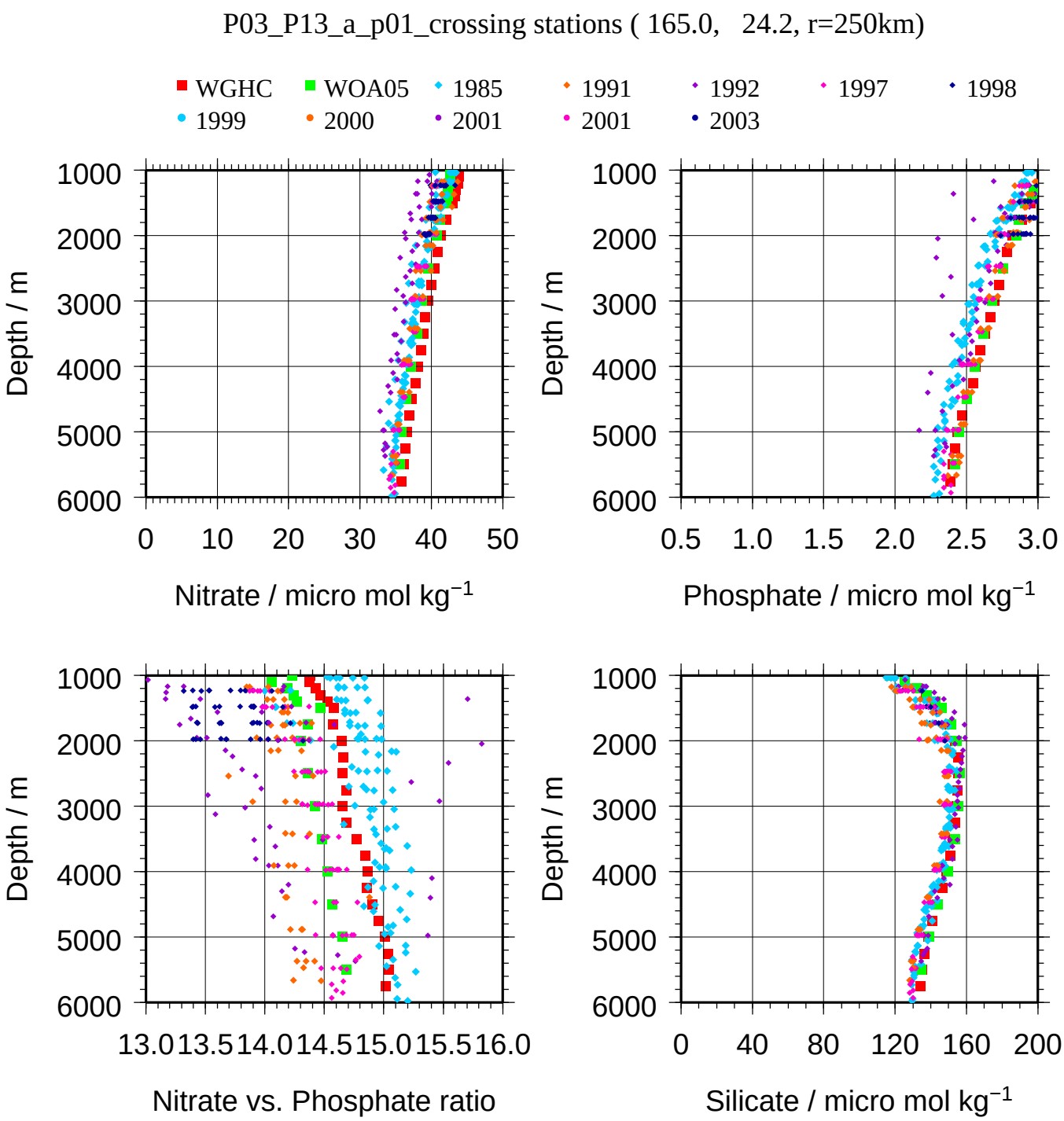

P01_P15_a_p01_crossing stations (195.0, 47.0, r=250km)
WGHC
WOA05
1985
1994
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1


P01_P15_b_p01_crossing stations (195.0, 47.0, r=250km)
WGHC
WOA05
1985
1994
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

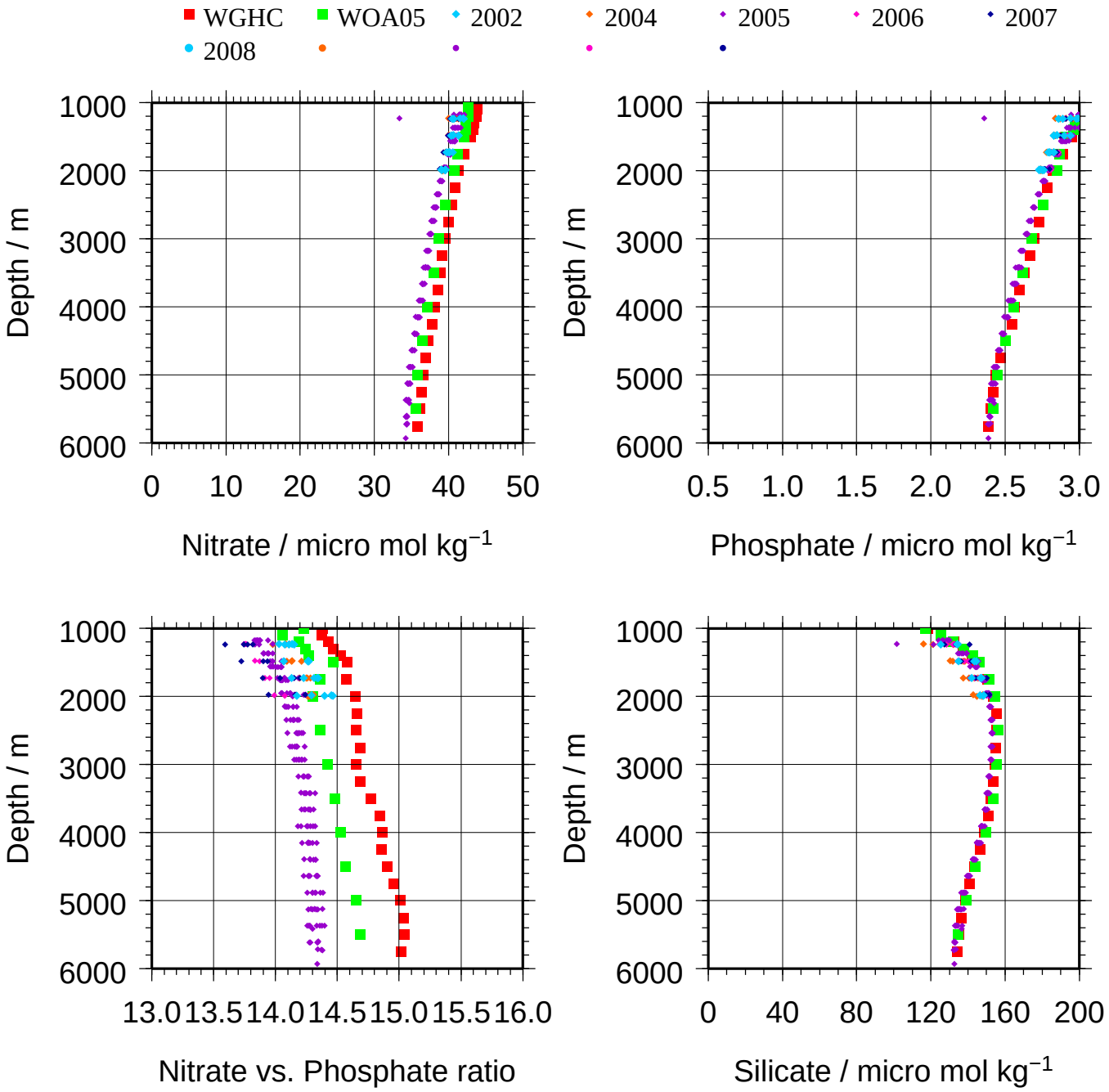

P01_P17_p01_crossing stations (216.9, 47.0, r=250km)
WGHC
WOA05
1985
1993
2001
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1


P02_P03_p01_crossing stations (238.8, 31.0, r=250km)
WGHC
WOA05
1985
1993
1994
2004
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

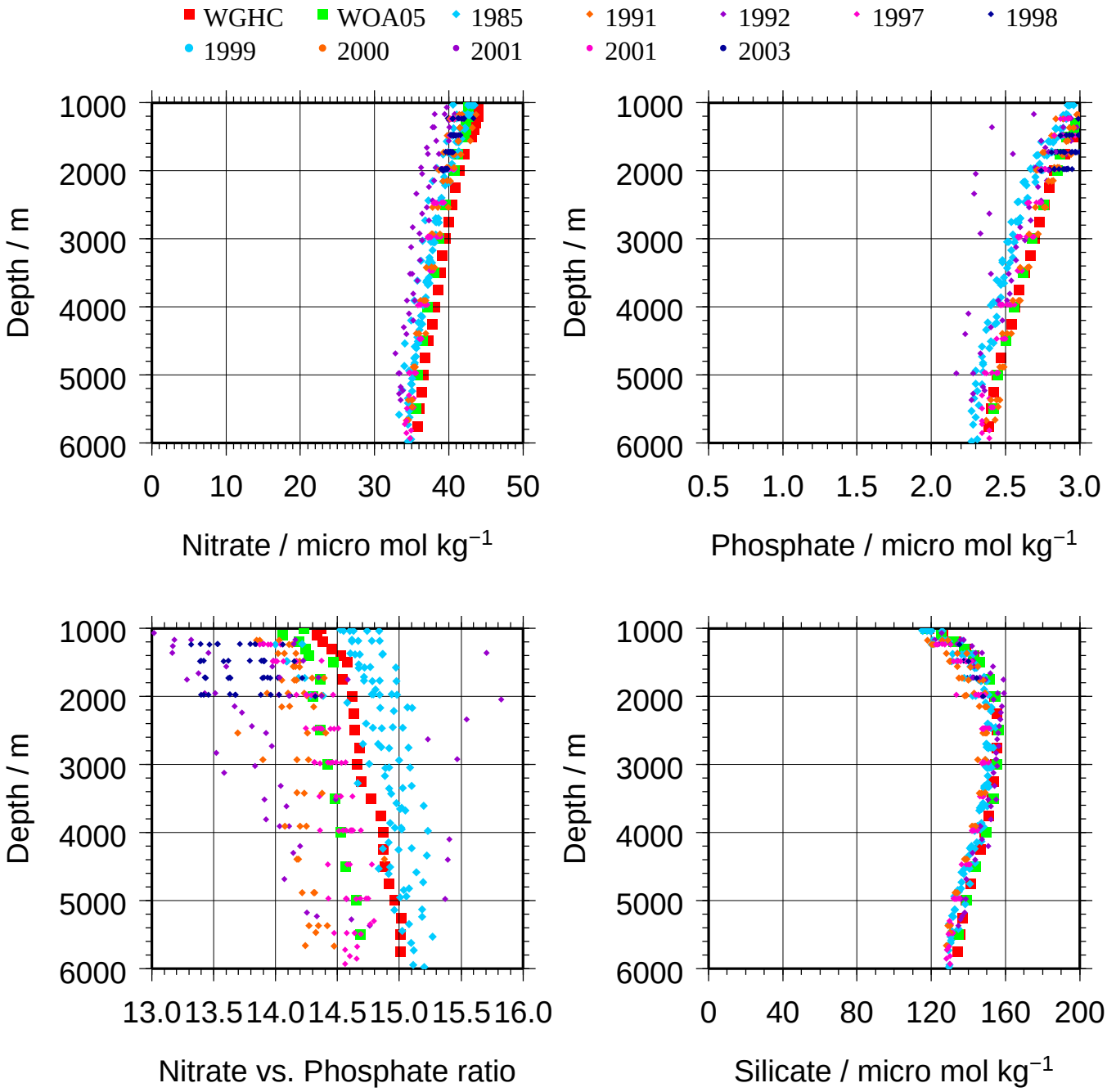

P03_P10_p01_crossing stations (149.3, 24.3, r=250km)
WGHC
WOA05
1985
1993
1999
2003
2004
2005
2006
2007
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

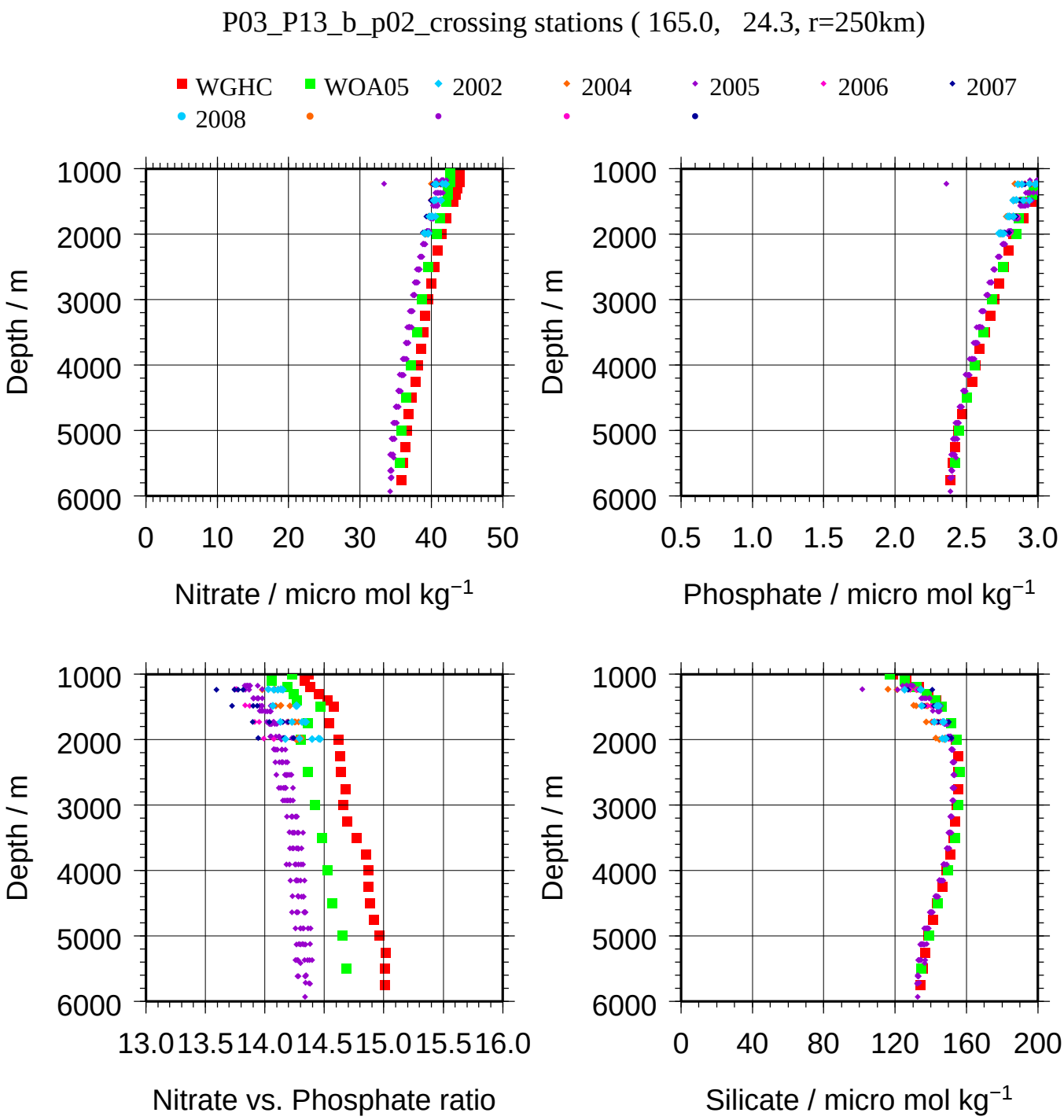

P03_P13_a_p01_crossing stations (165.0, 24.2, r=250km)
WGHC
WOA05
1985
1991
1992
1997
1998
1999
2000
2001
2001
2003
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

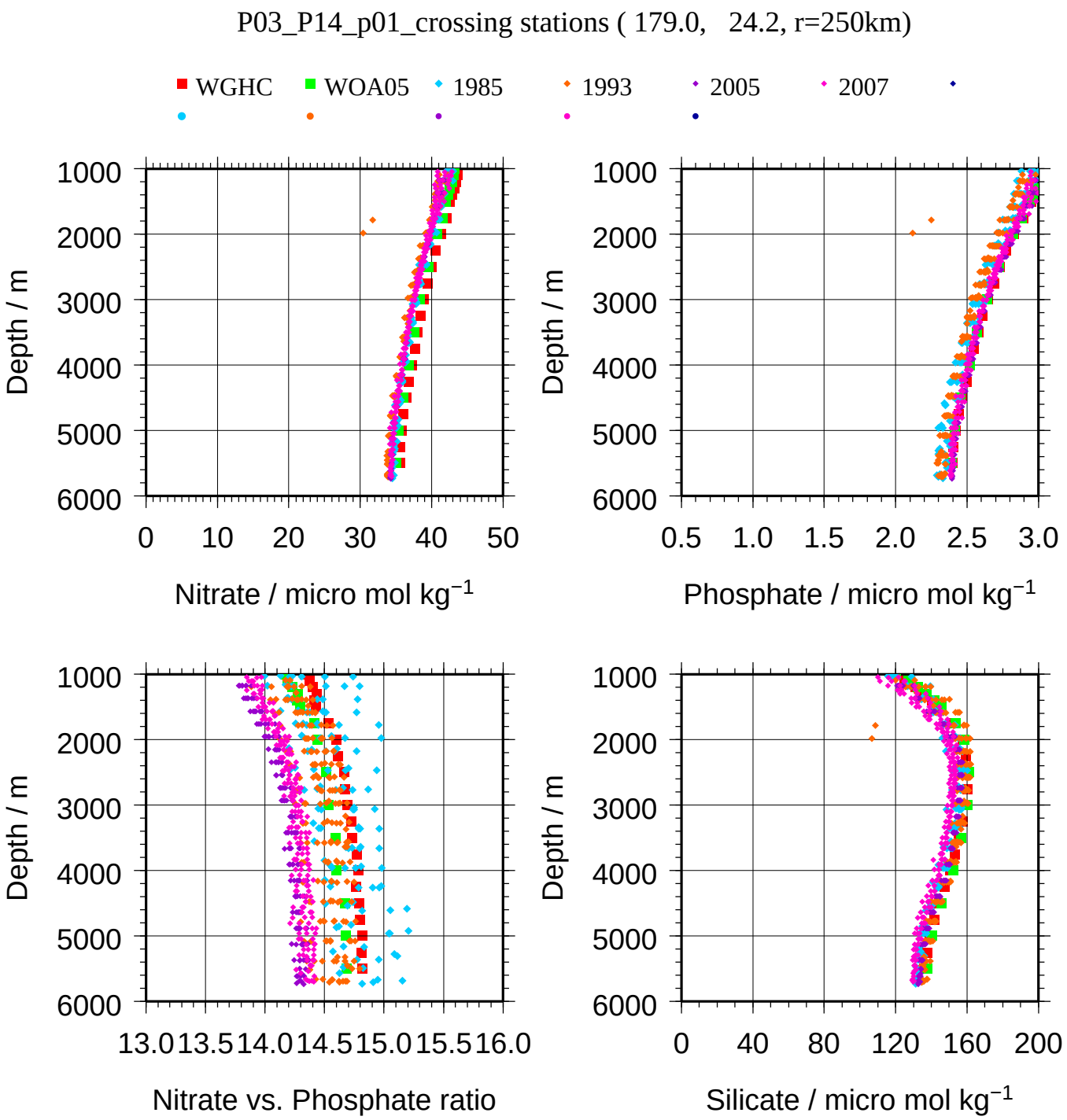
P03_P13_a_p02_crossing stations (165.0, 24.2, r=250km)

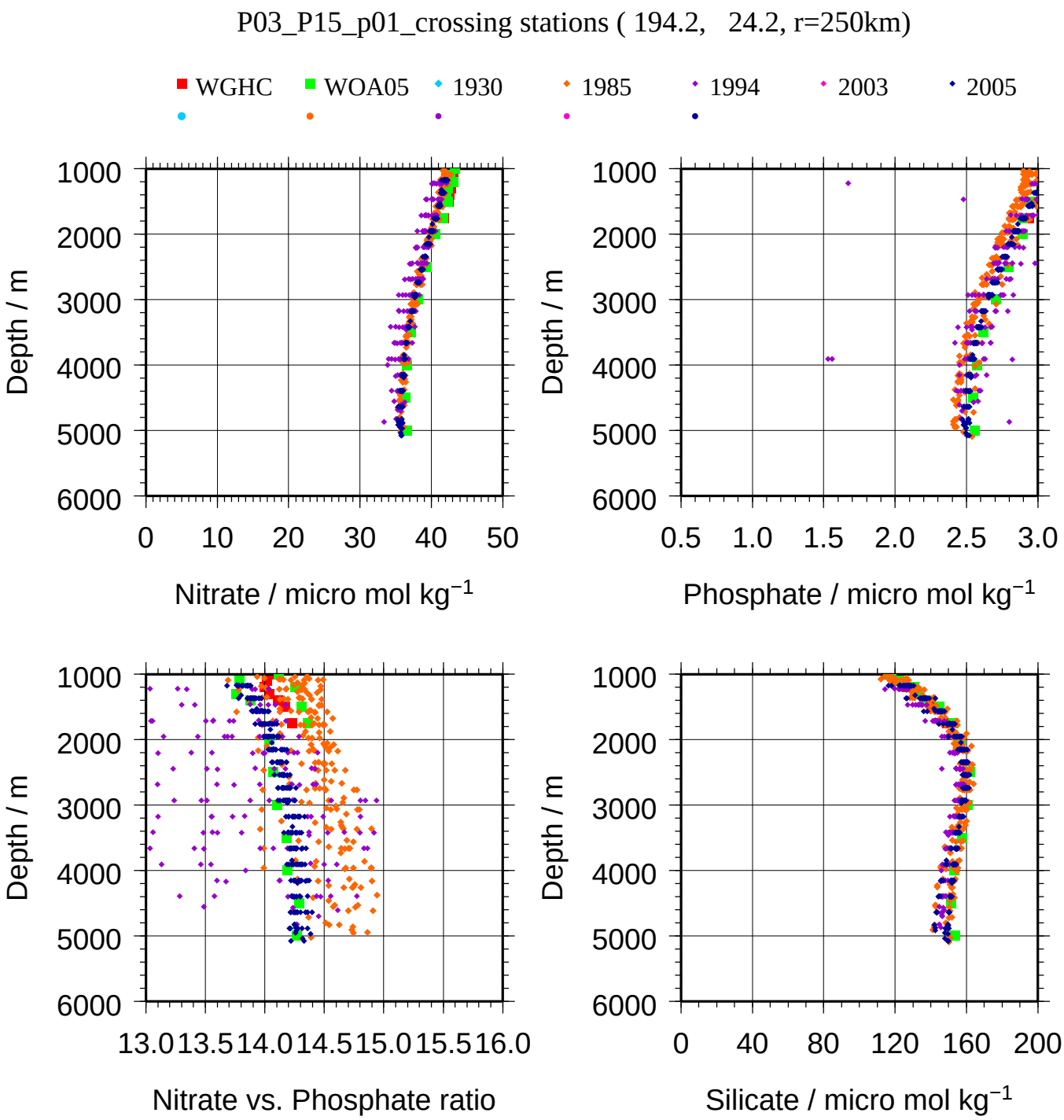


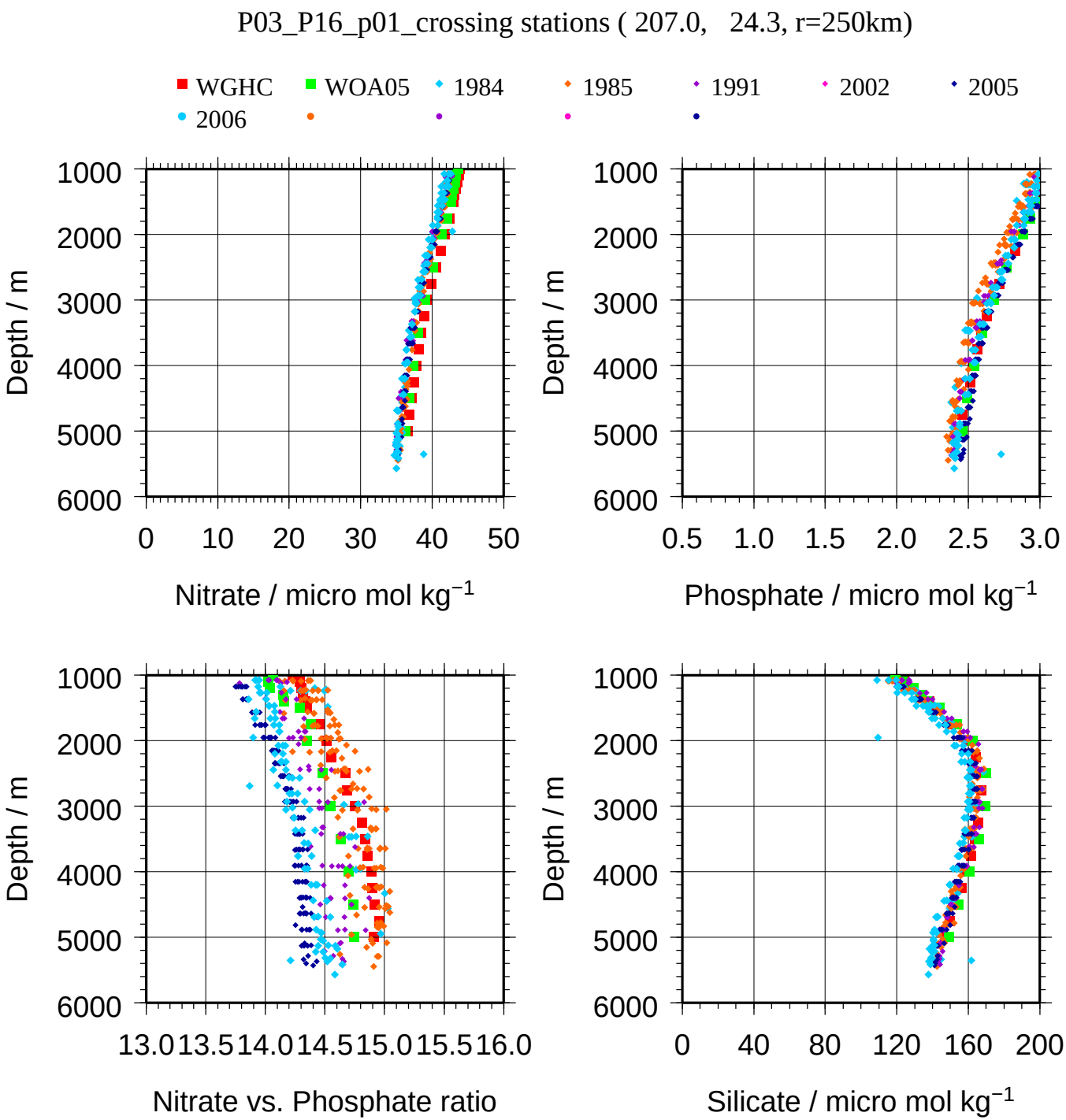
P03_P13_b_p01_crossing stations (165.0, 24.3, r=250km)

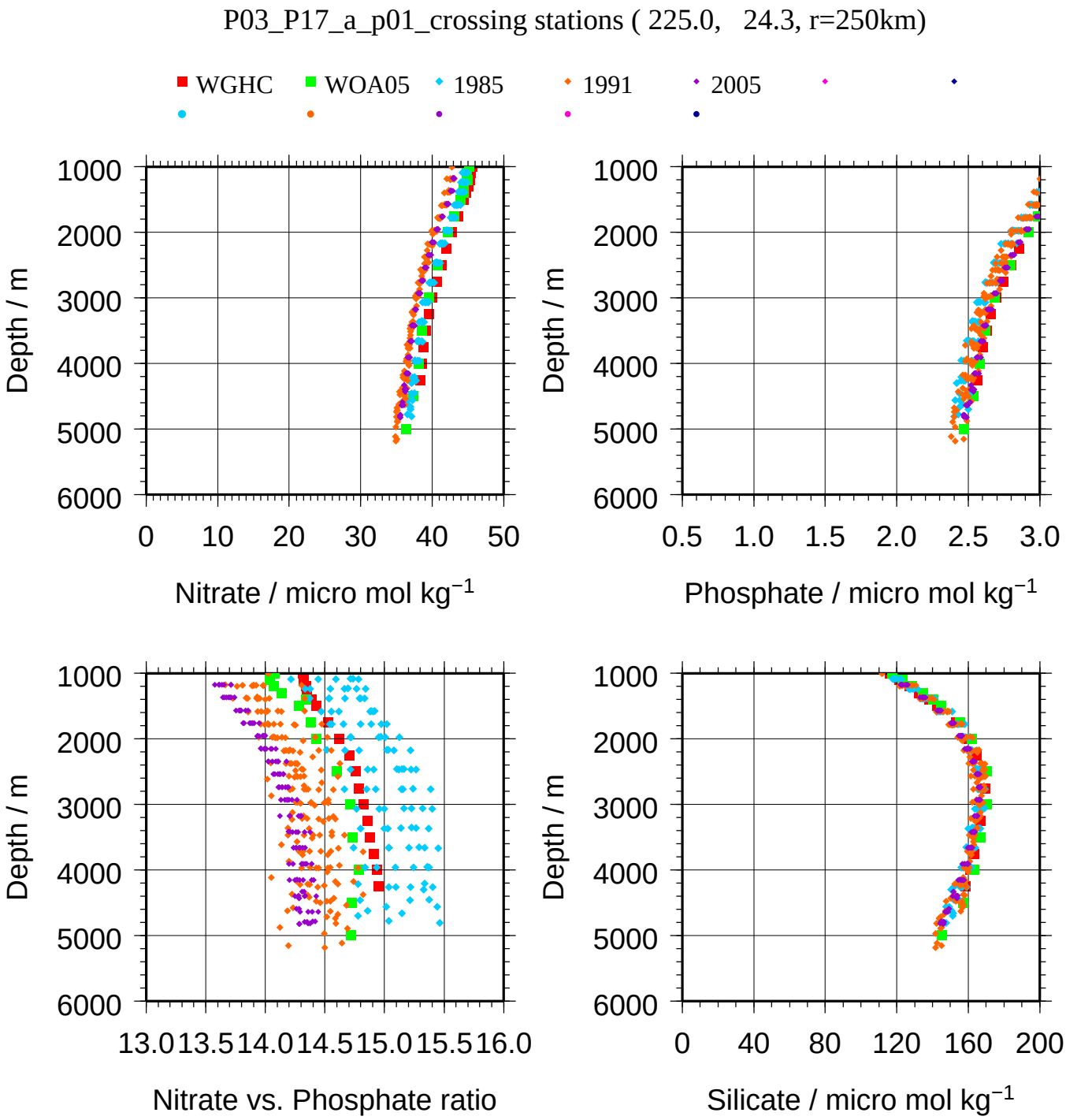


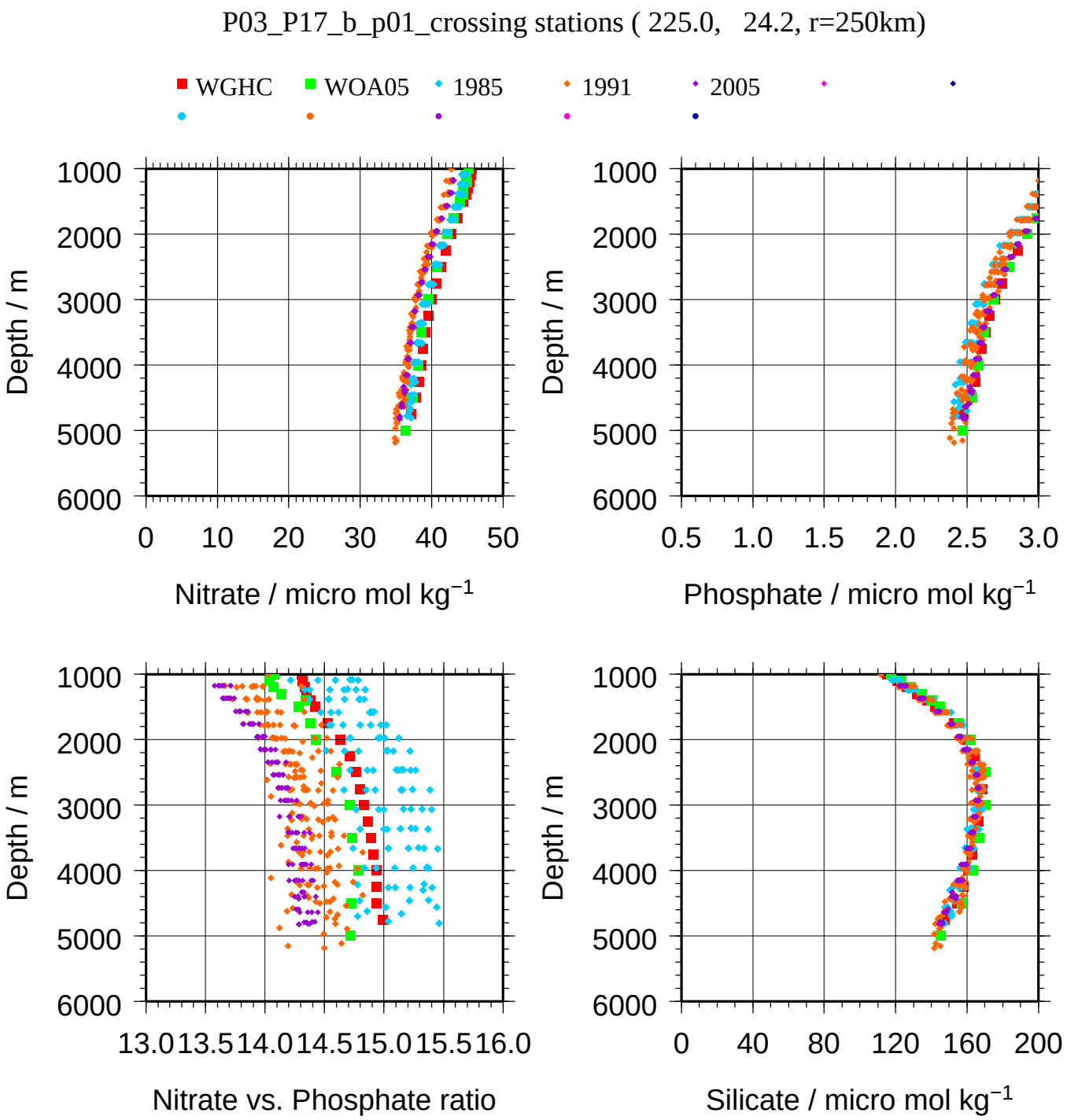

P03_P13_b_p02_crossing stations (165.0, 24.3, r=250km)
WGHC
WOA05
2002
2004
2005
2006
2007
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

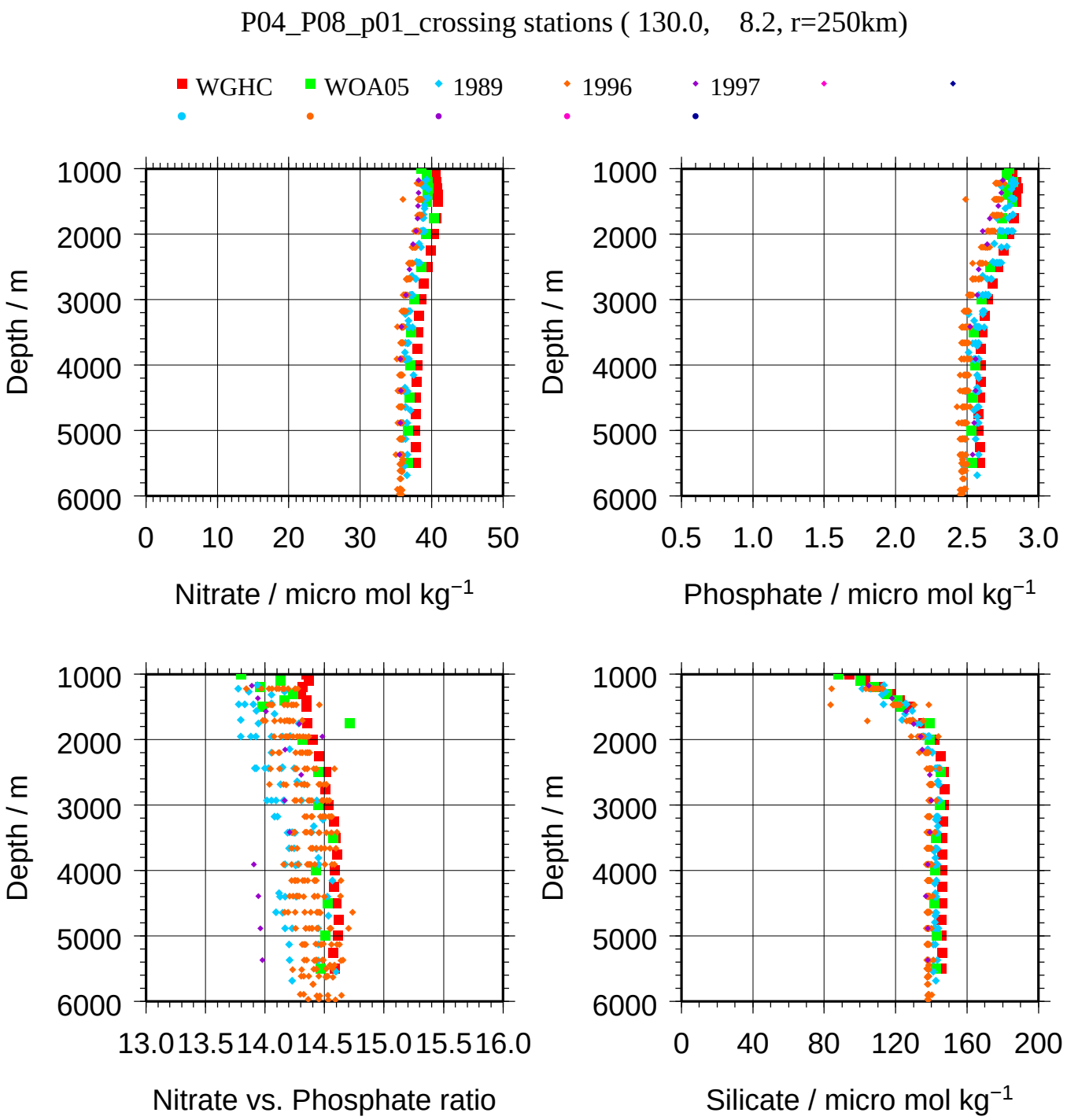

P03_P14_p01_crossing stations (179.0, 24.2, r=250km)
WGHC
WOA05
1985
1993
2005
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

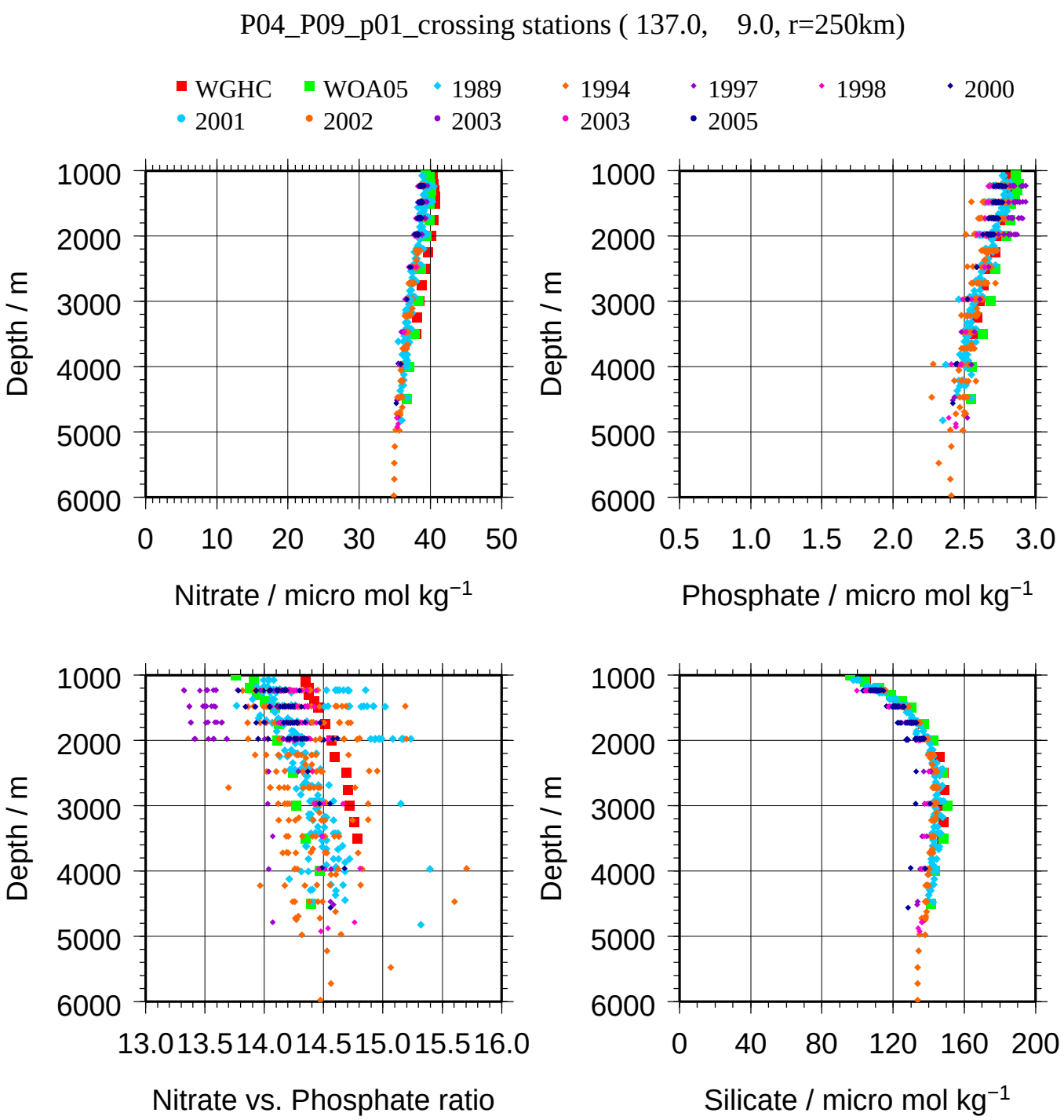

P03_P15_p01_crossing stations (194.2, 24.2, r=250km)
WGHC
WOA05
1930
1985
1994
2003
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

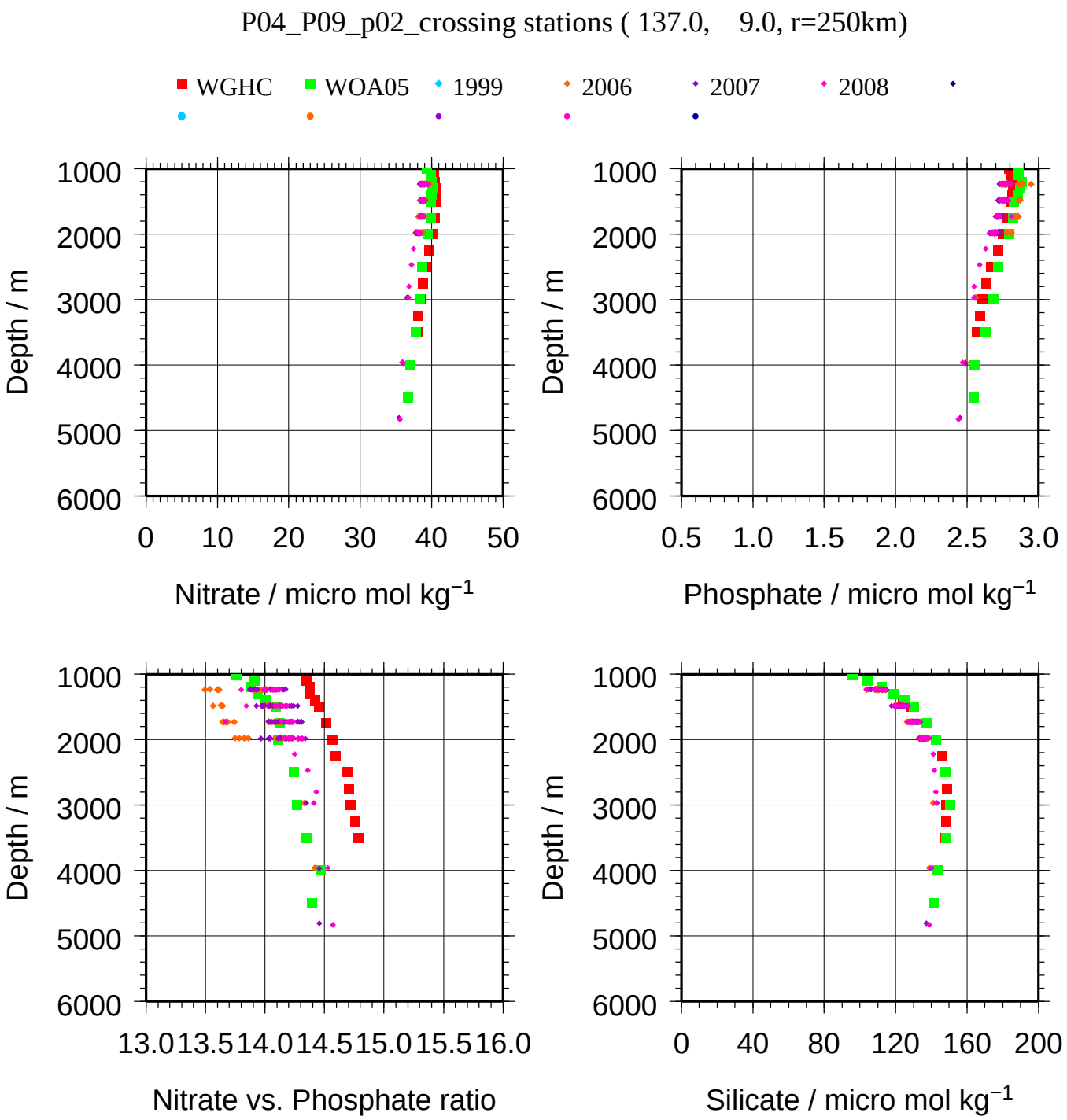

P03_P16_p01_crossing stations (207.0, 24.3, r=250km)
WGHC
WOA05
1984
1985
1991
2002
2005
2006
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

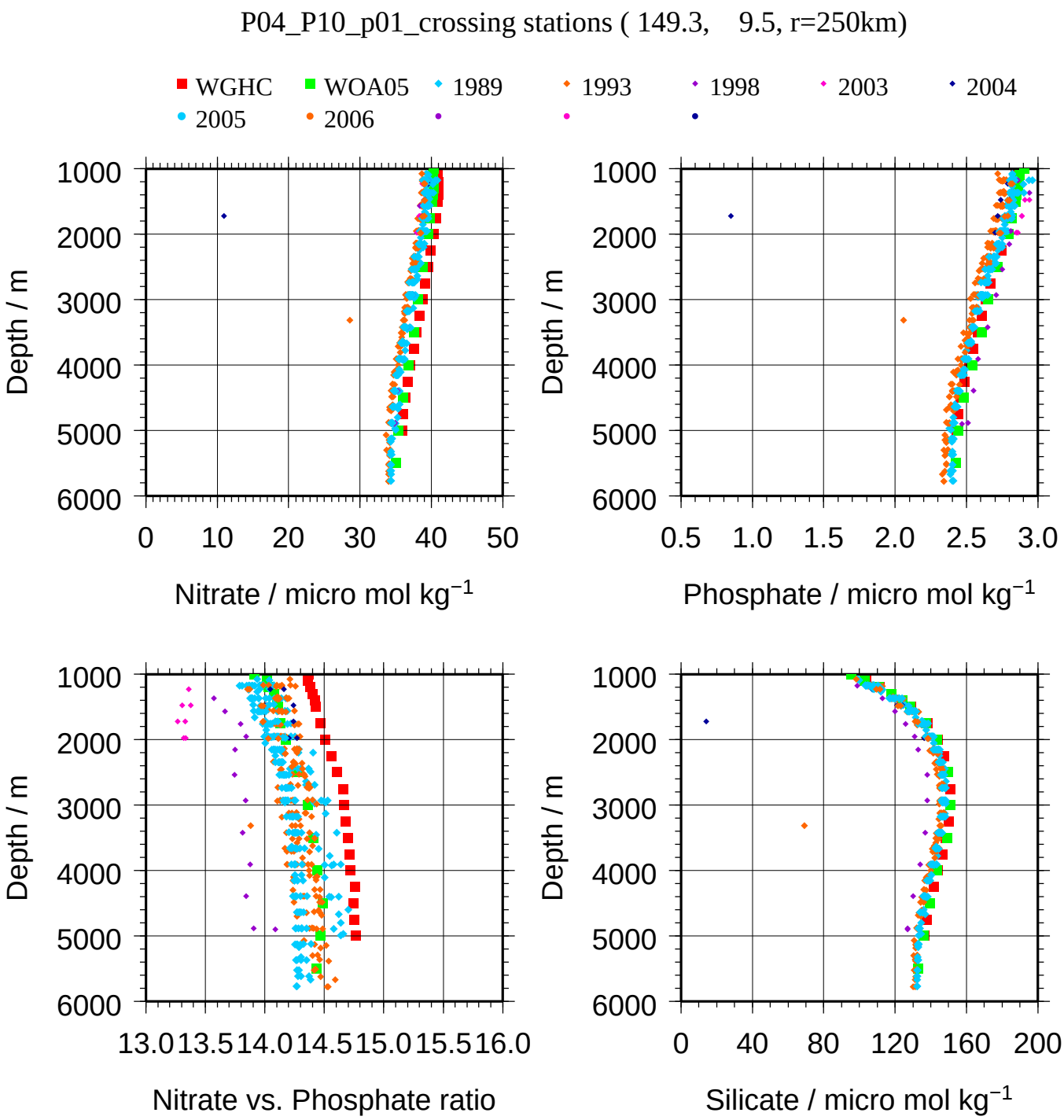

P03_P17_a_p01_crossing stations (225.0, 24.3, r=250km)
WGHC
WOA05
1985
1991
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1


P03_P17_b_p01_crossing stations (225.0, 24.2, r=250km)
WGHC
WOA05
1985
1991
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

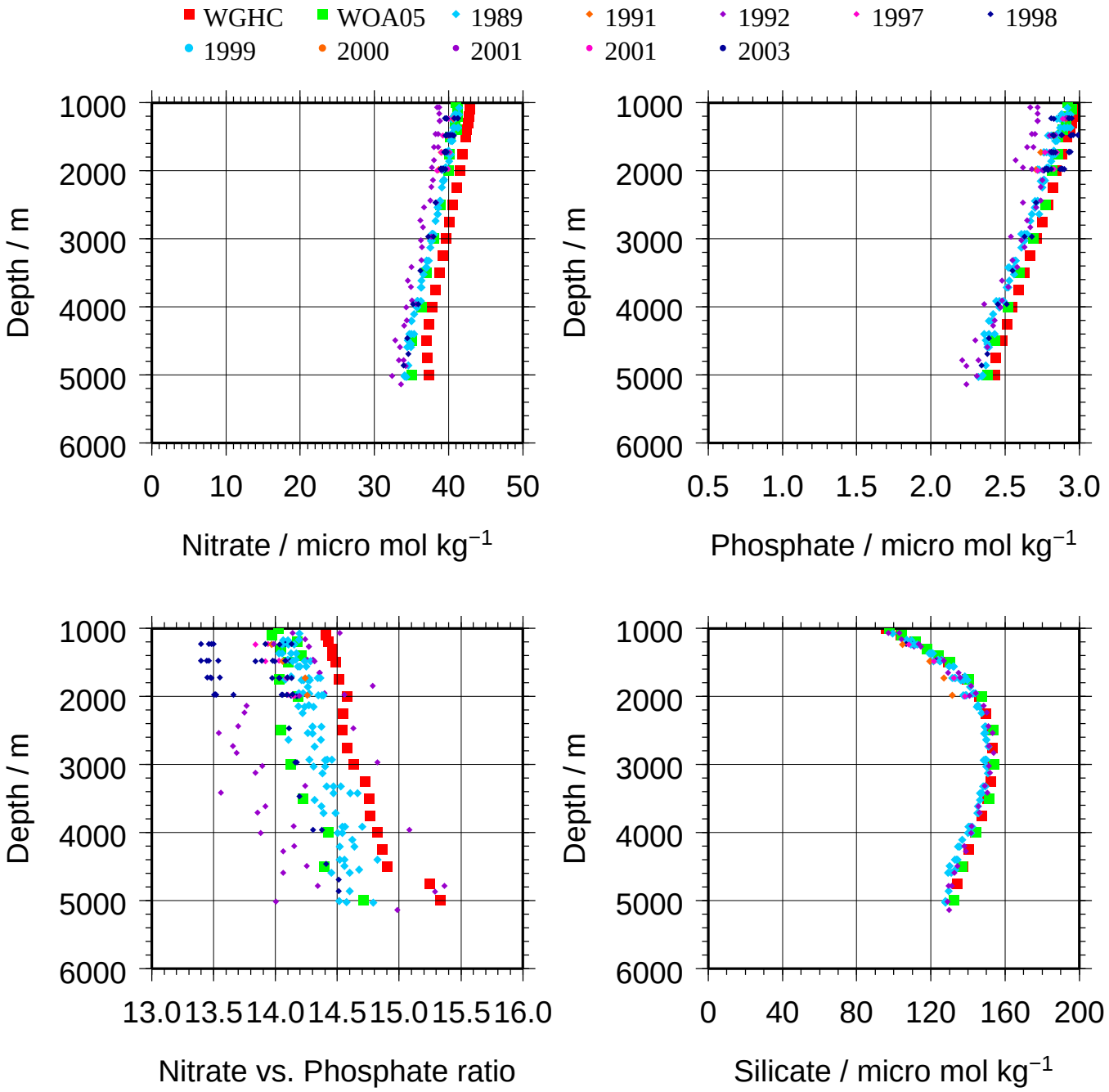

P04_P08_p01_crossing stations (130.0, 8.2, r=250km)
WGHC
WOA05
1989
1996
1997
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

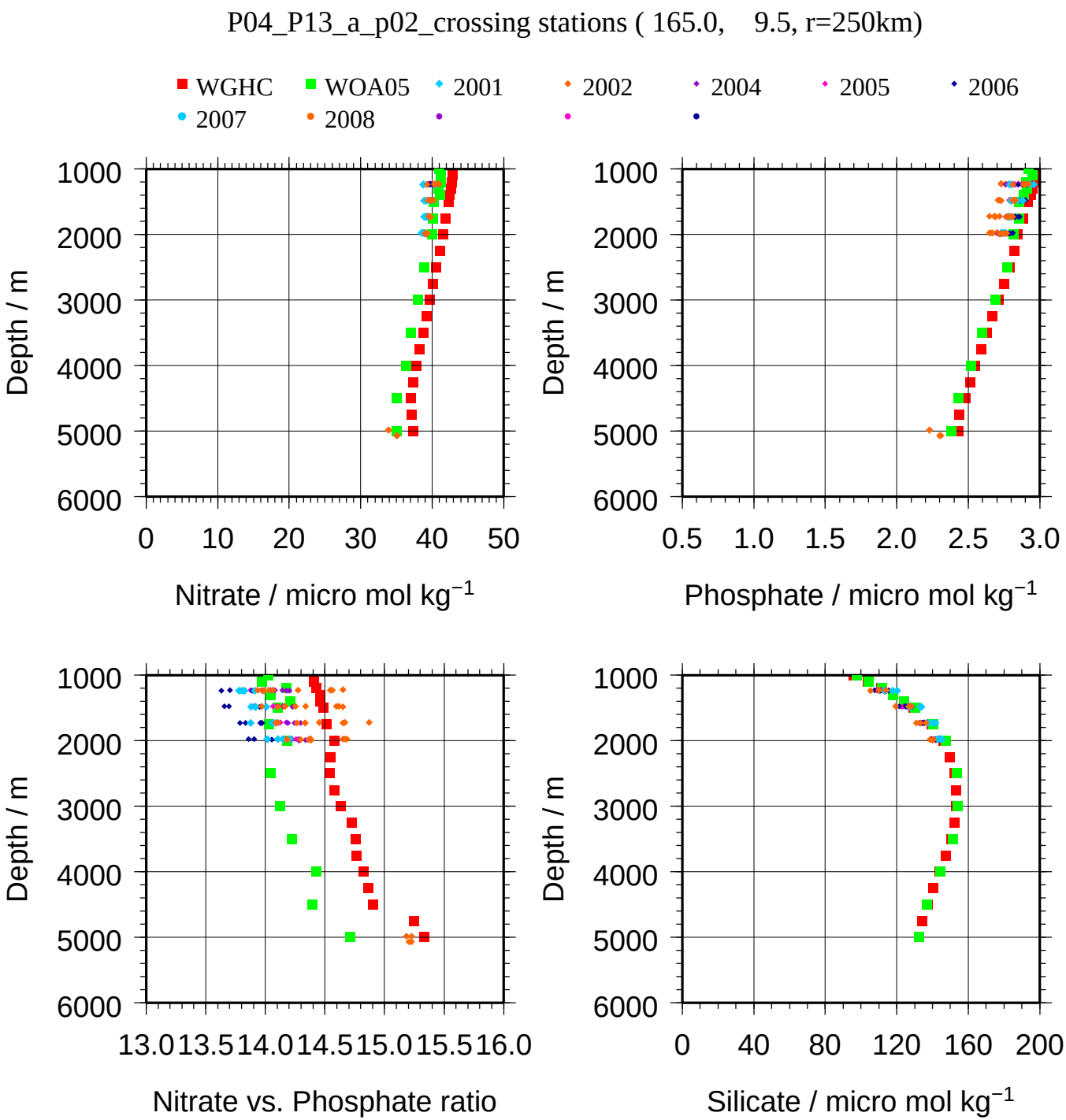

P04_P09_p01_crossing stations (137.0, 9.0, r=250km)
WGHC
WOA05
1989
1994
1997
1998
2000
2001
2002
2003
2003
2005
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1


P04_P09_p02_crossing stations (137.0, 9.0, r=250km)
WGHC
WOA05
1999
2006
2007
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

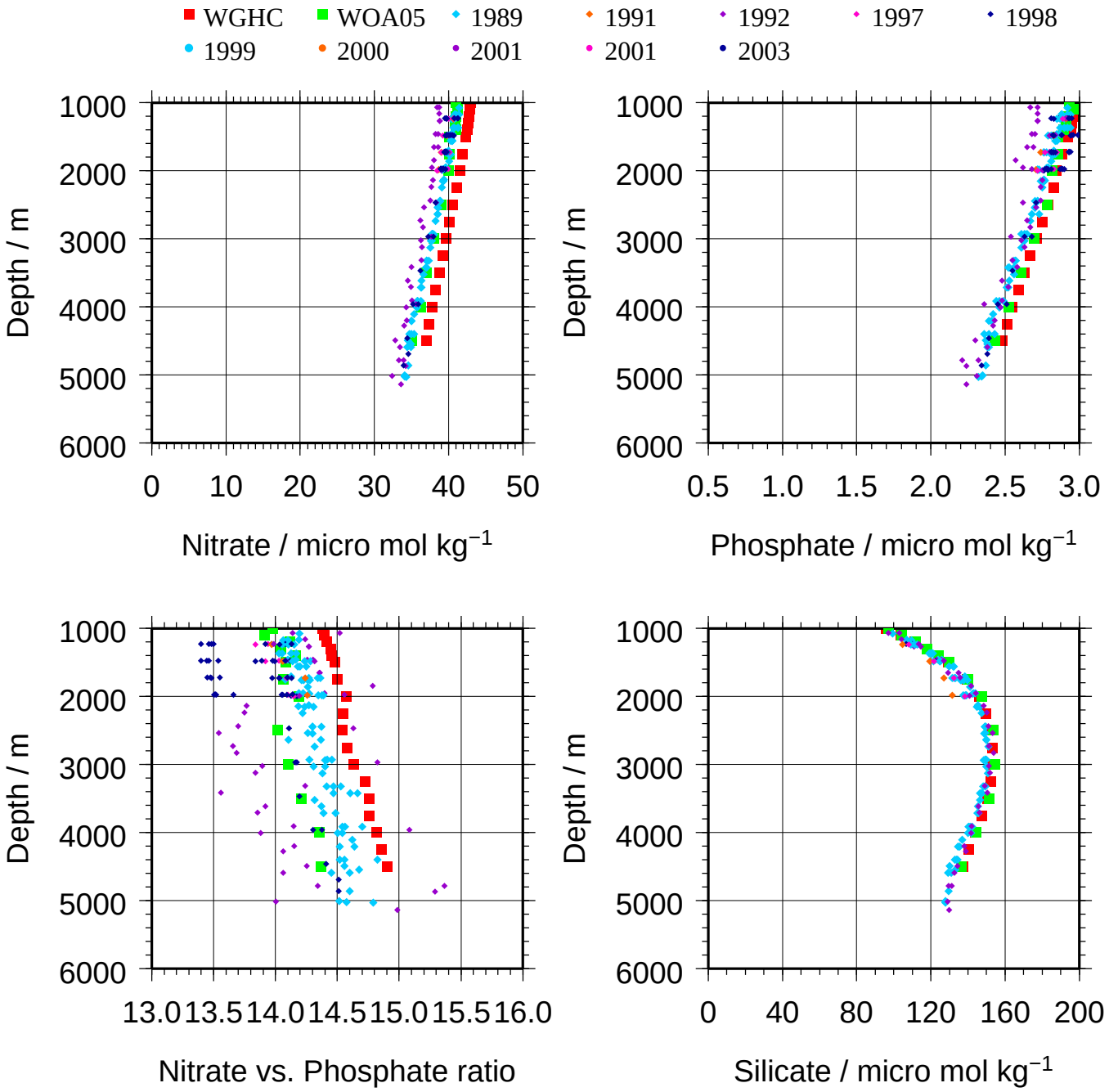

P04_P10_p01_crossing stations (149.3, 9.5, r=250km)
WGHC
WOA05
1989
1993
1998
2003
2004
2005
2006
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

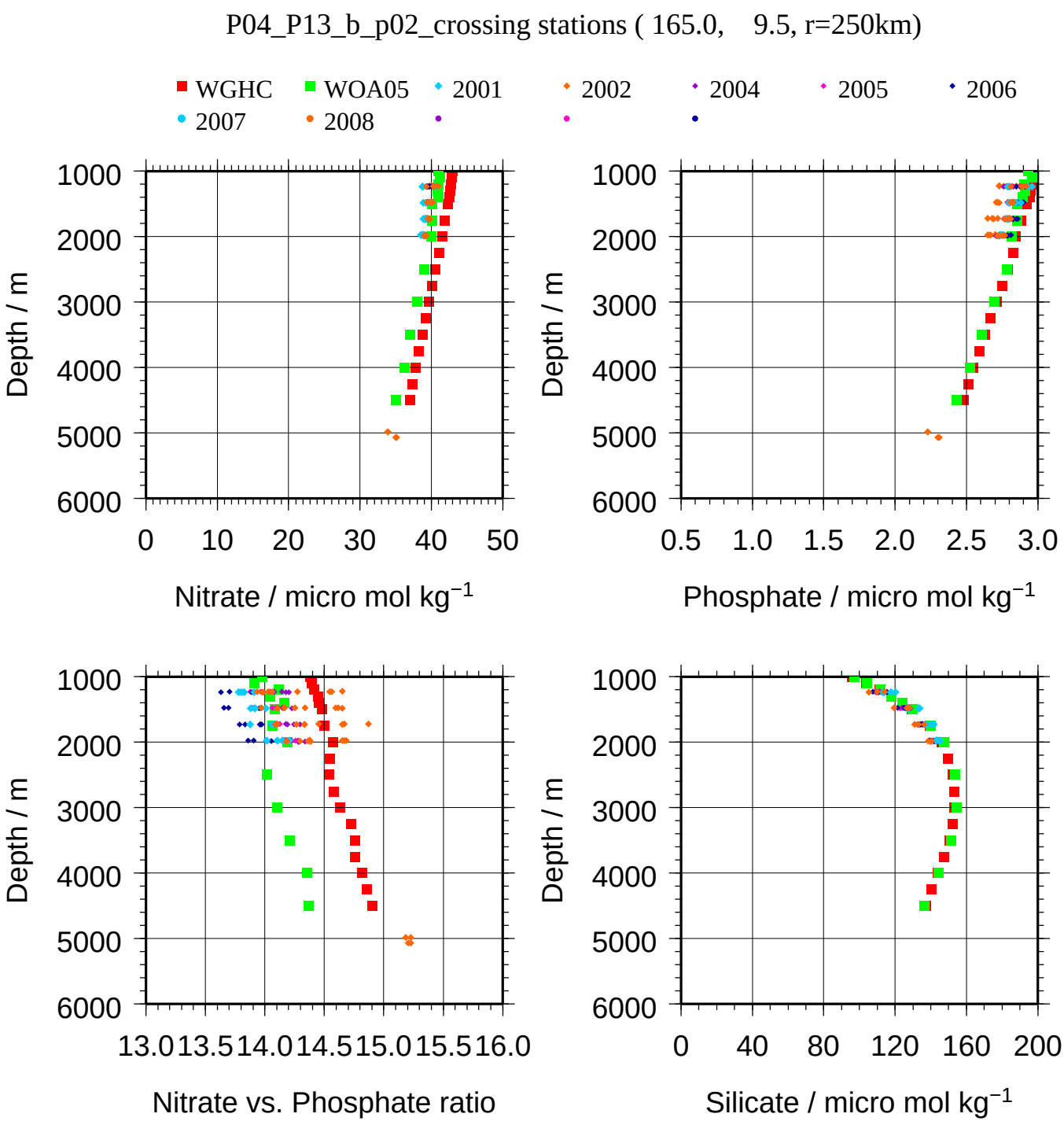
P04_P13_a_p01_crossing stations (165.0, 9.5, r=250km)

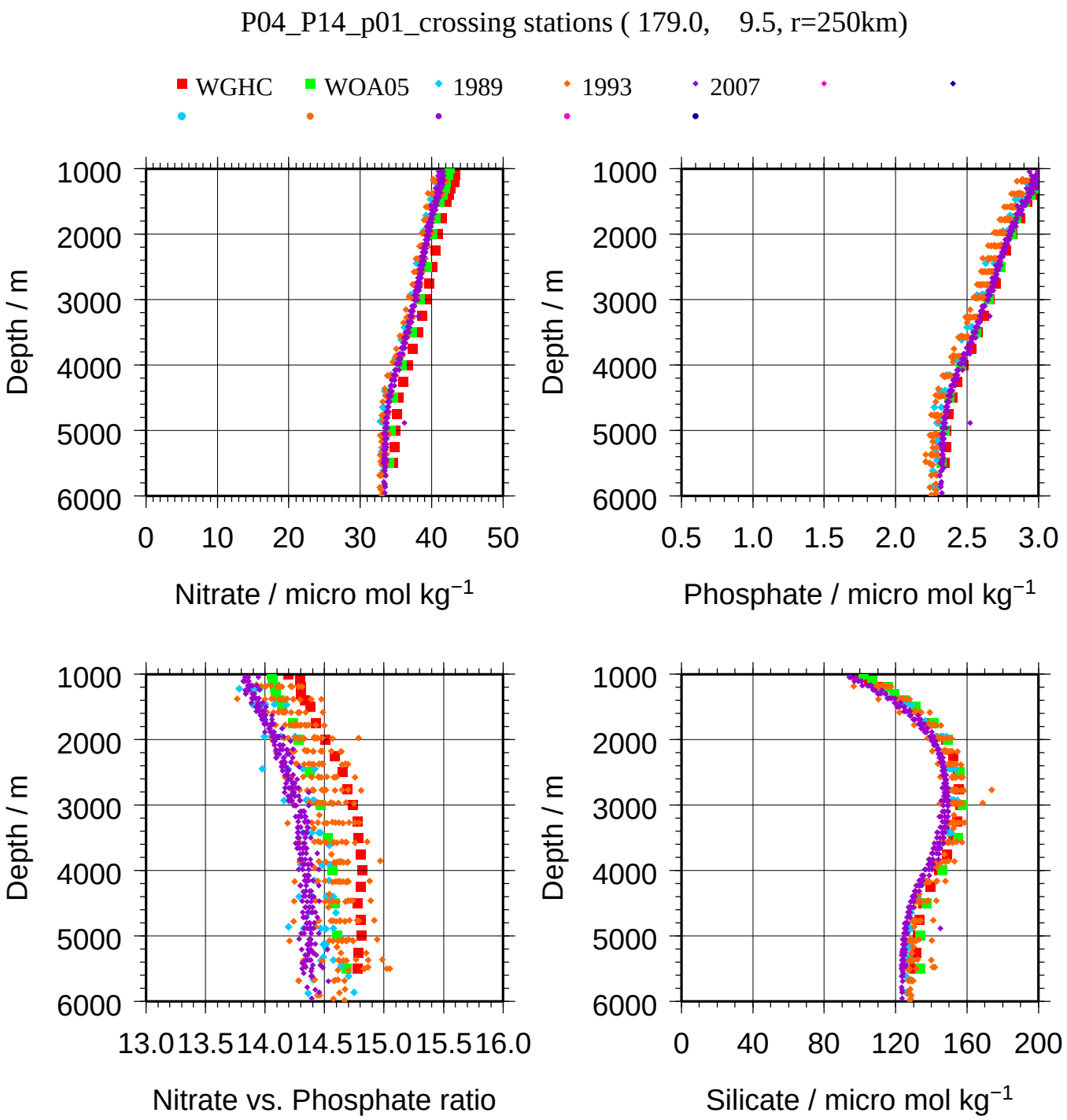


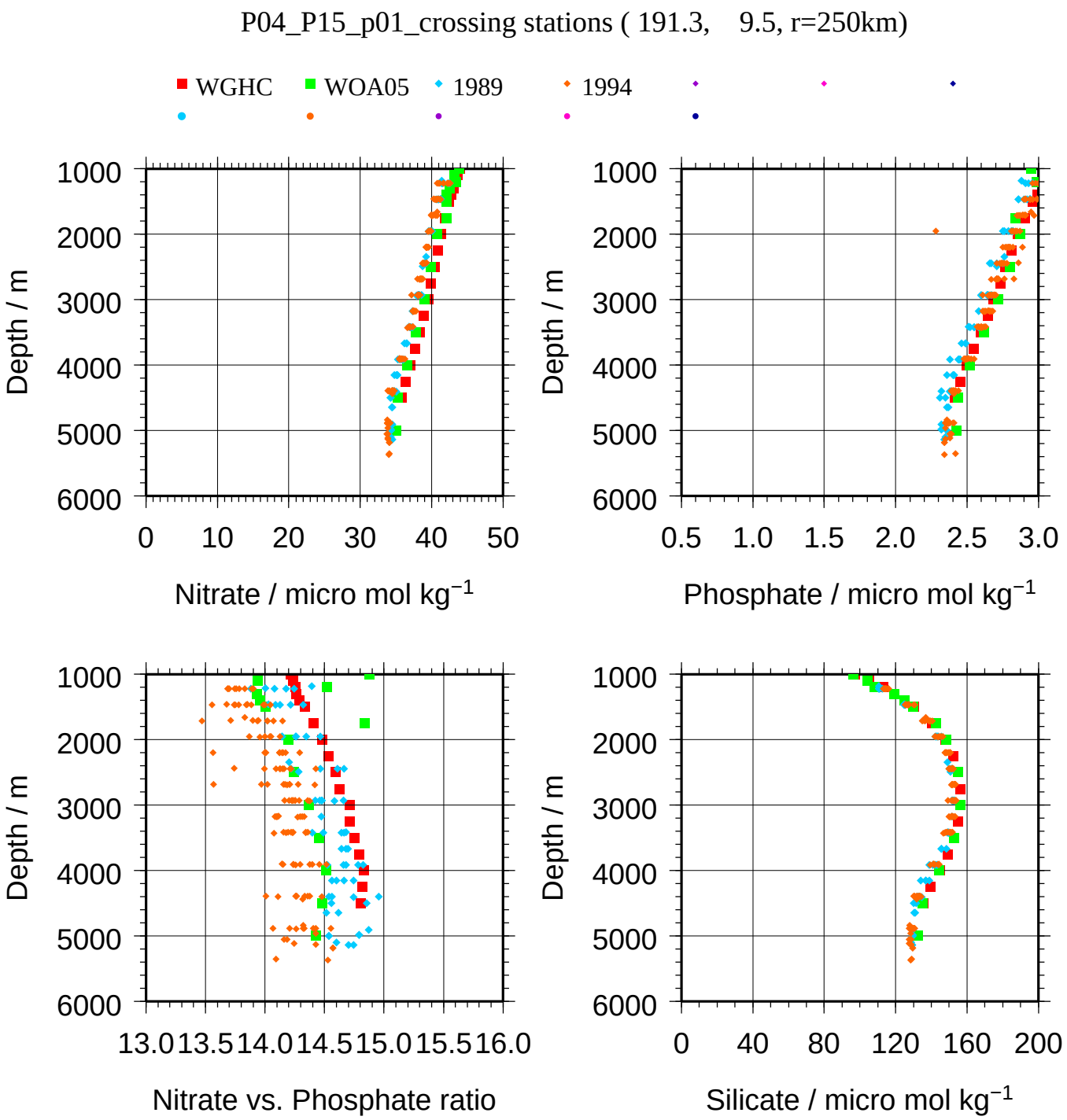

P04_P13_a_p02_crossing stations (165.0, 9.5, r=250km)
WGHC
WOA05
2001
2002
2004
2005
2006
2007
2008
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

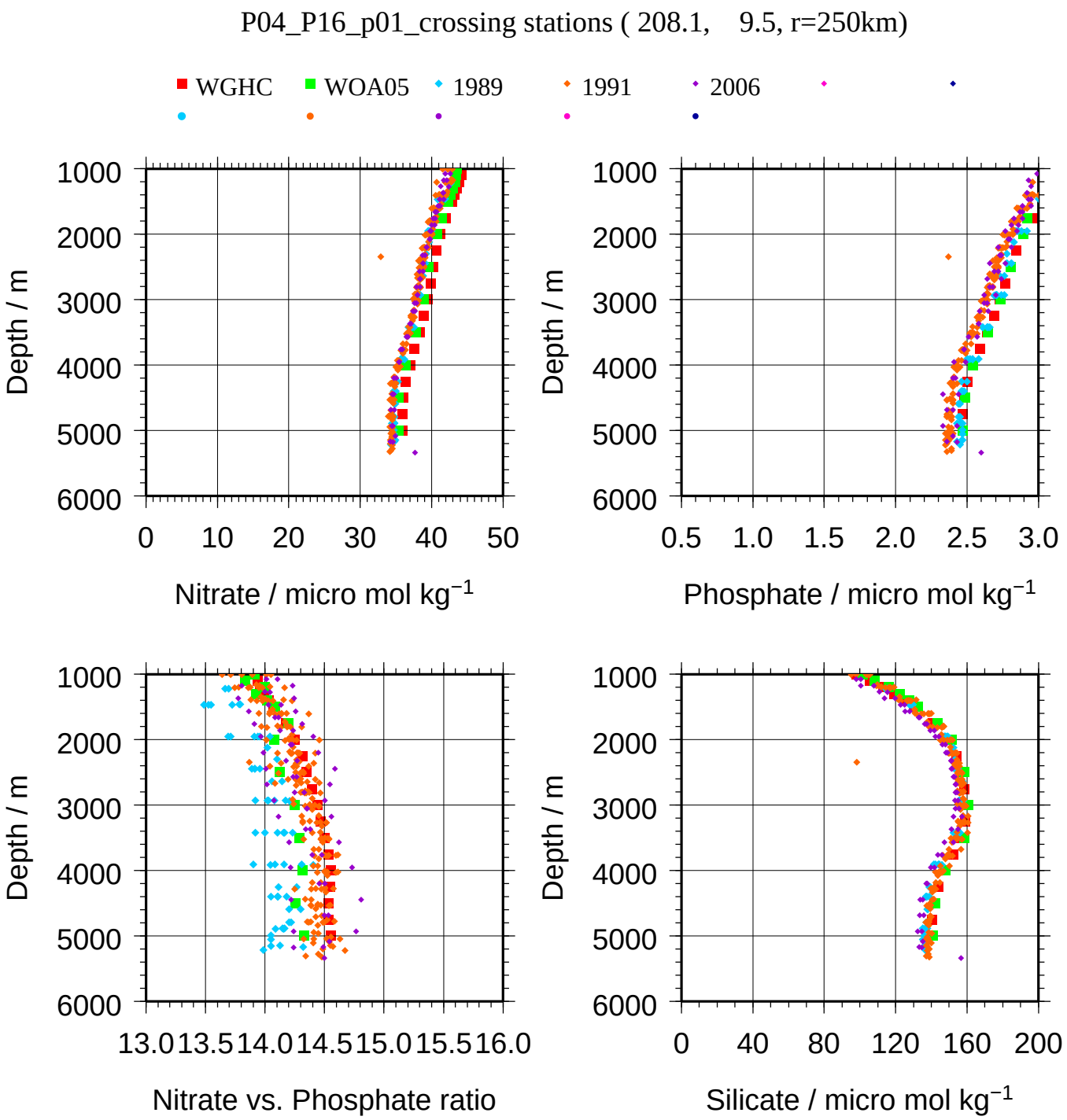
P04_P13_b_p01_crossing stations (165.0, 9.5, r=250km)

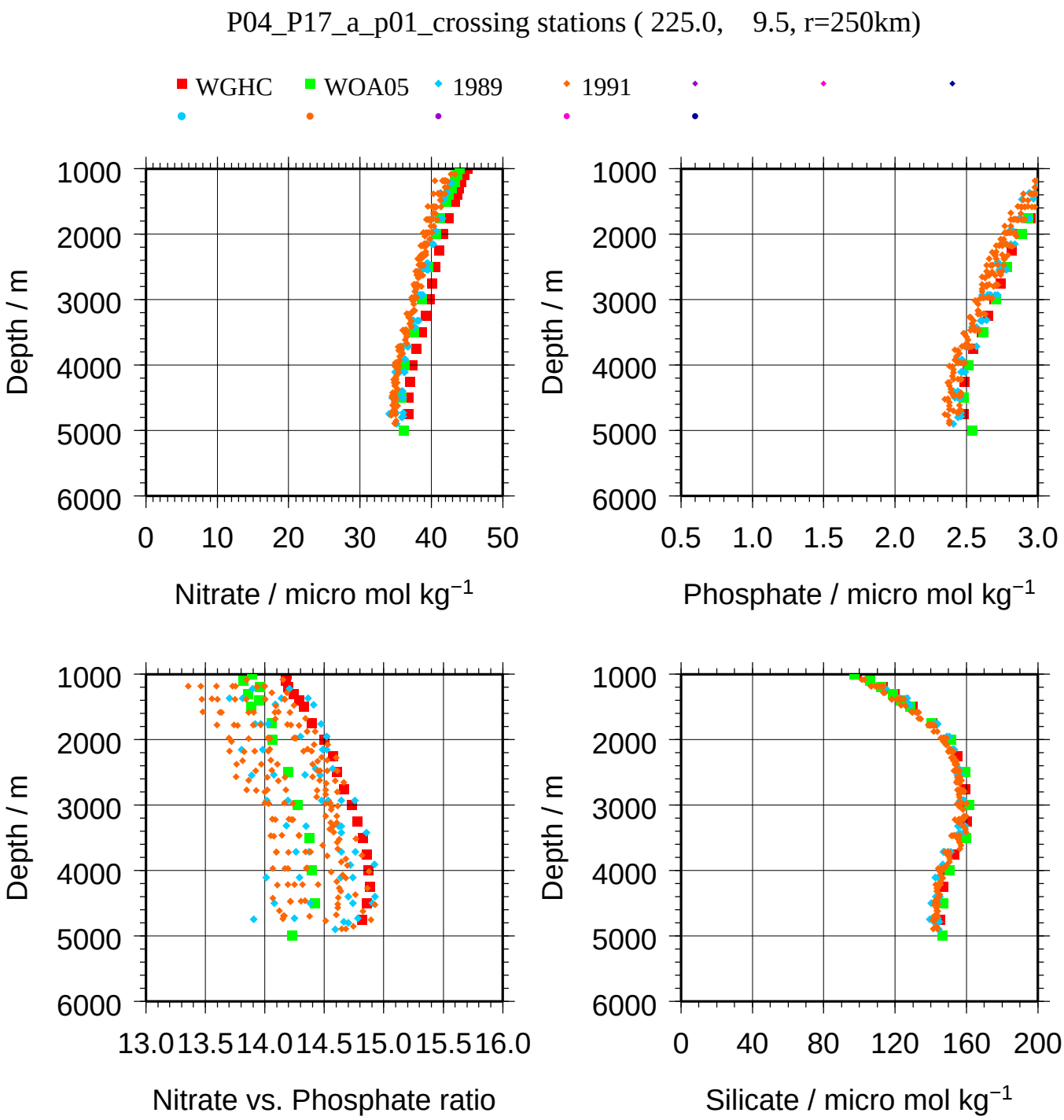


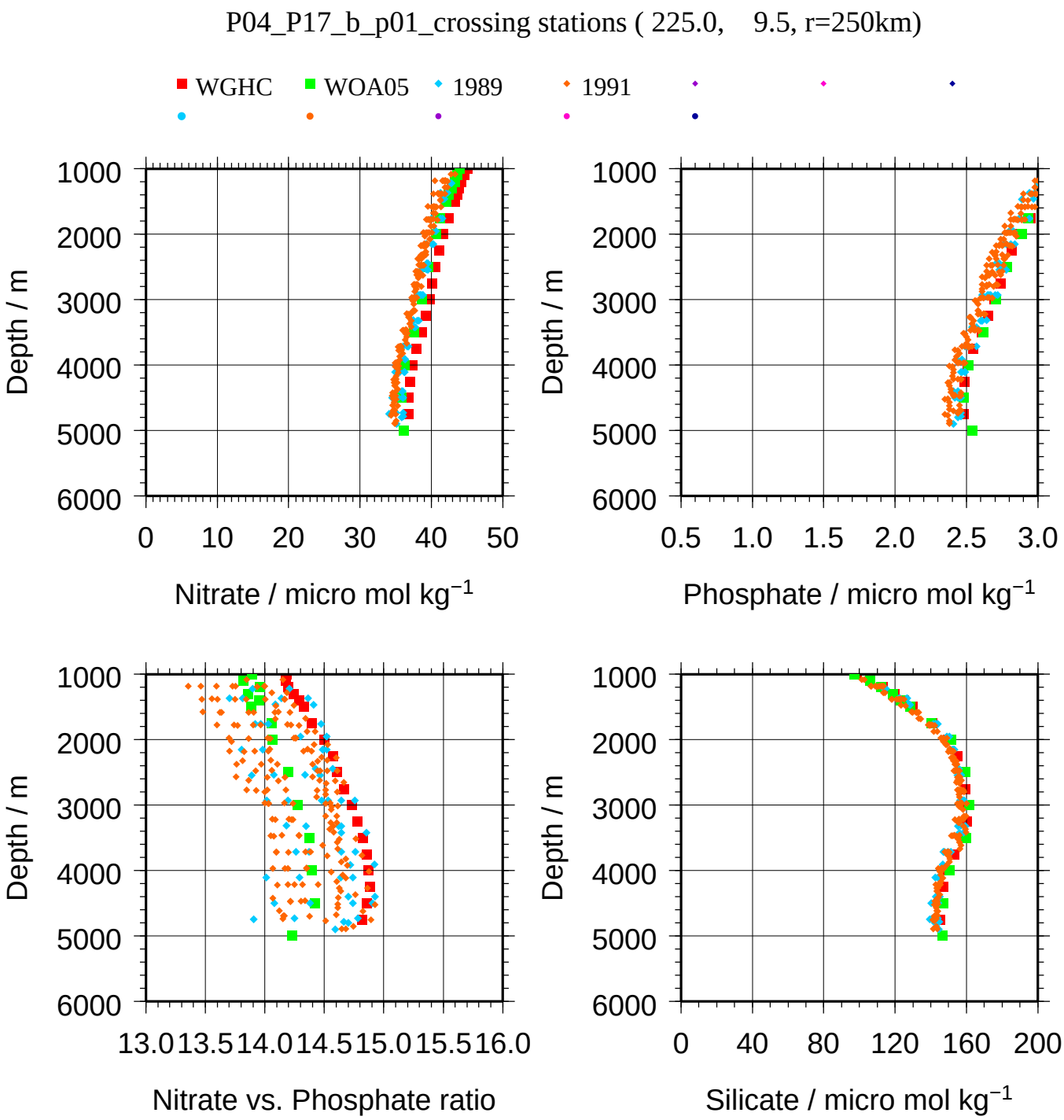

P04_P13_b_p02_crossing stations (165.0, 9.5, r=250km)
WGHC
WOA05
2001
2002
2004
2005
2006
2007
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

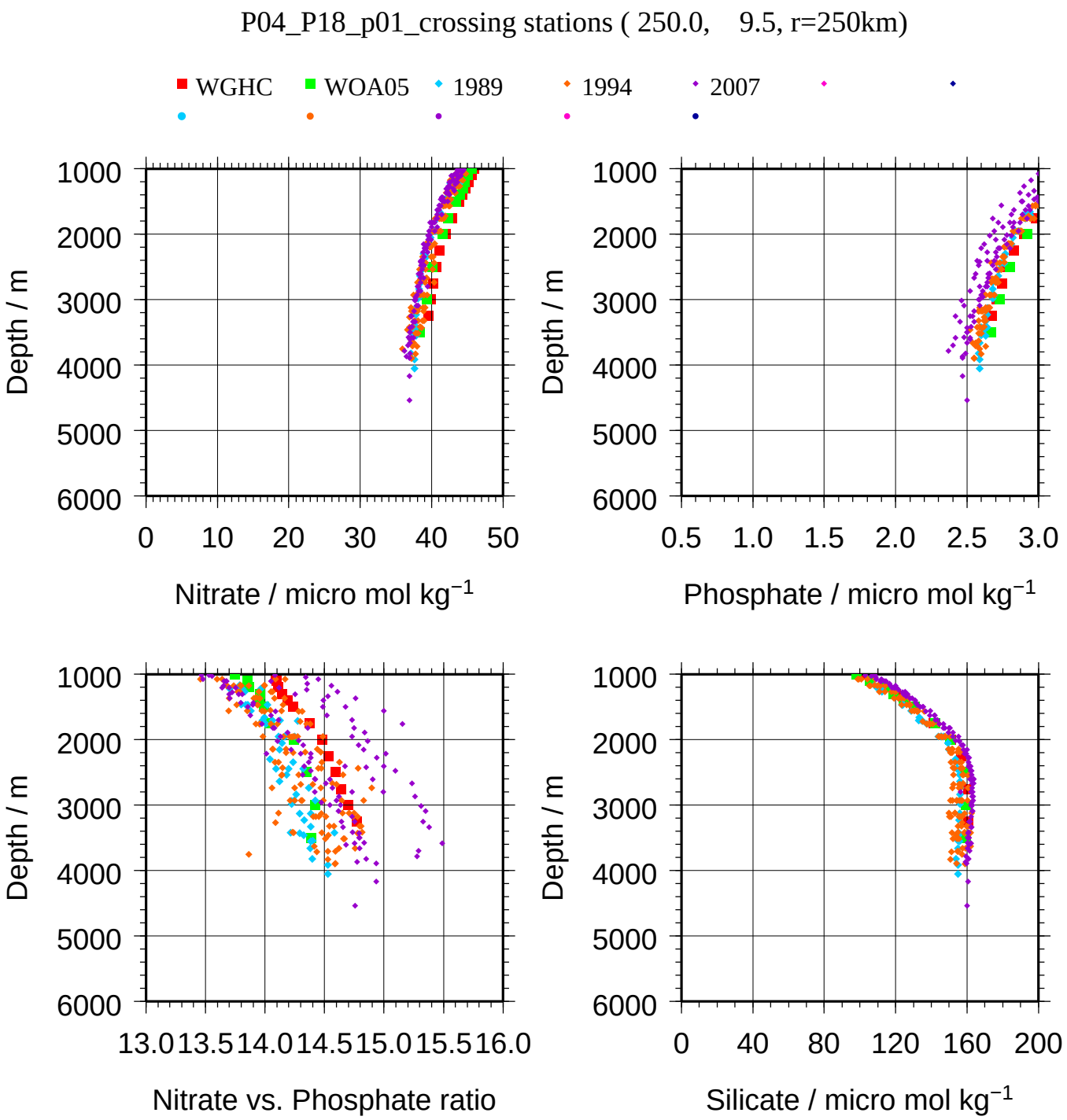

P04_P14_p01_crossing stations (179.0, 9.5, r=250km)
WGHC
WOA05
1989
1993
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

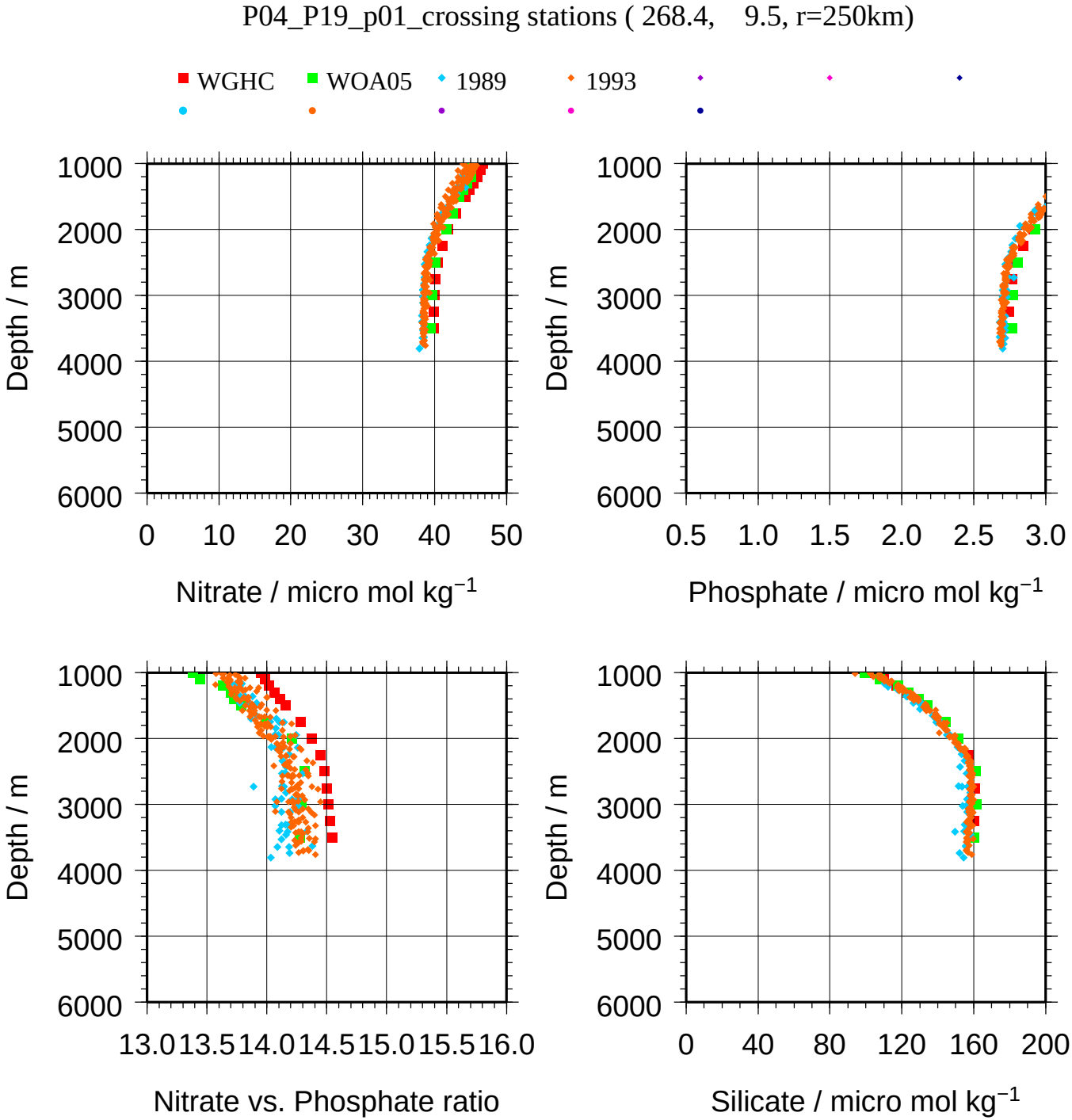

P04_P15_p01_crossing stations (191.3, 9.5, r=250km)
WGHC
WOA05
1989
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

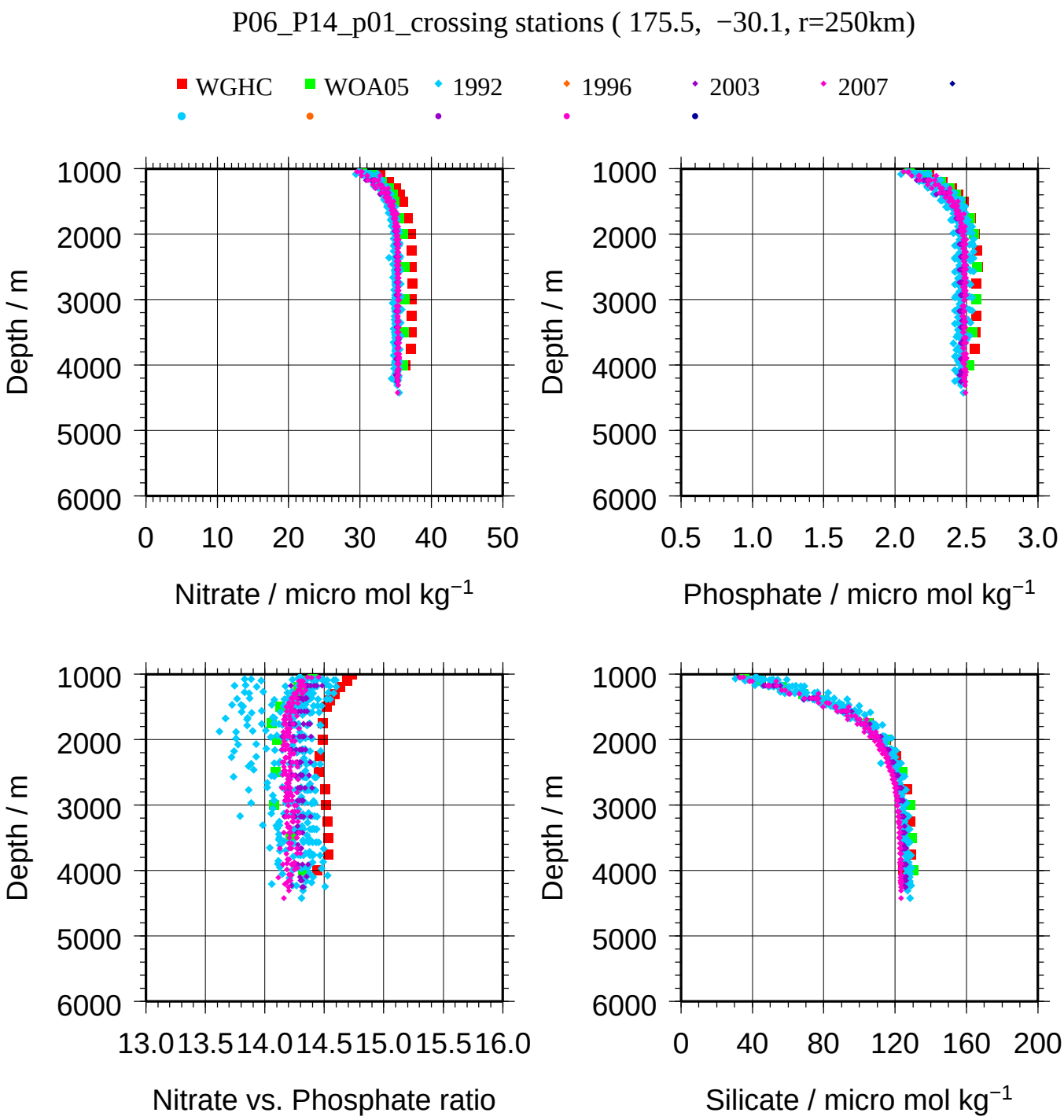

P04_P16_p01_crossing stations (208.1, 9.5, r=250km)
WGHC
WOA05
1989
1991
2006
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

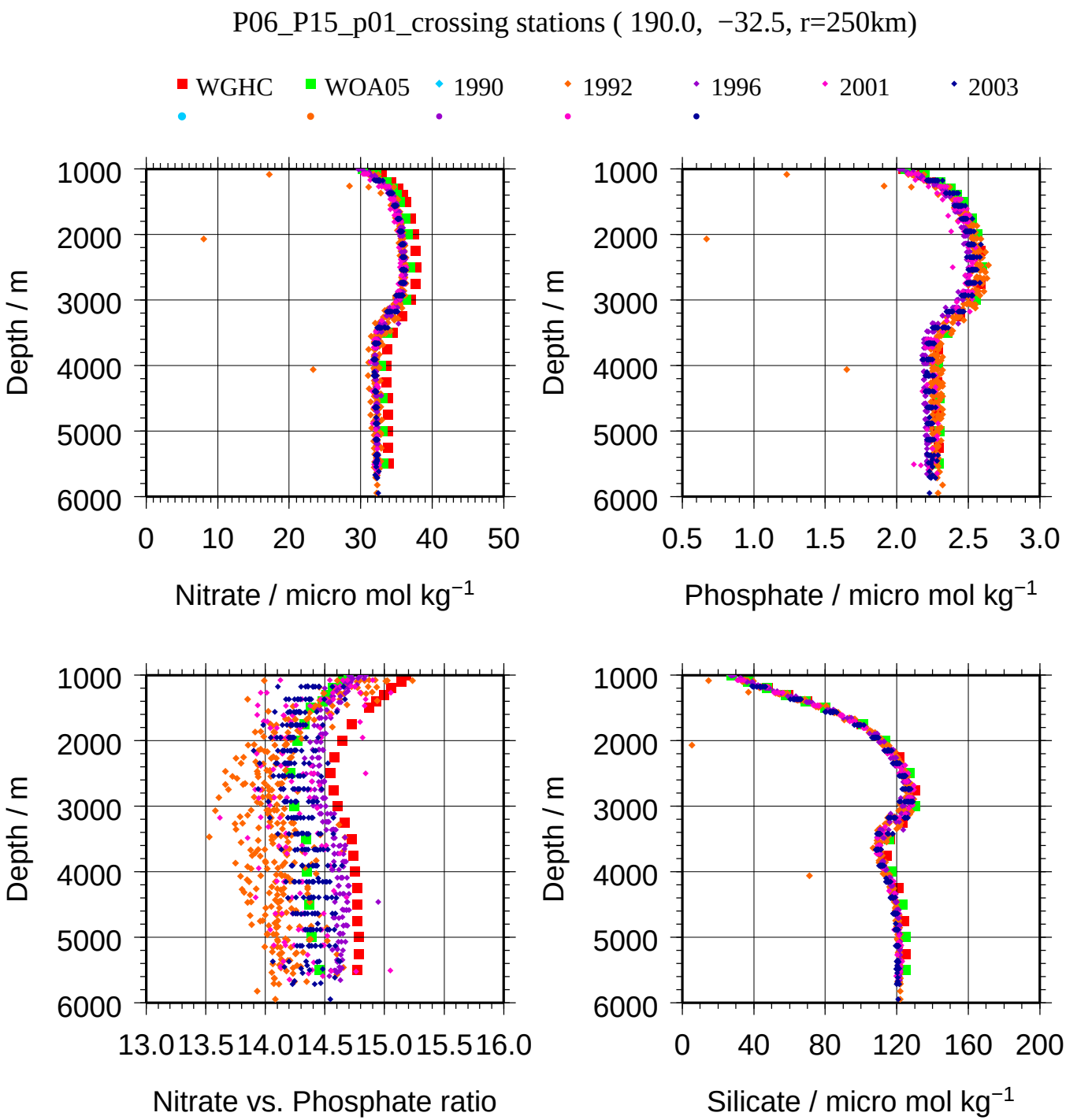

P04_P17_a_p01_crossing stations (225.0, 9.5, r=250km)
WGHC
WOA05
1989
1991
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

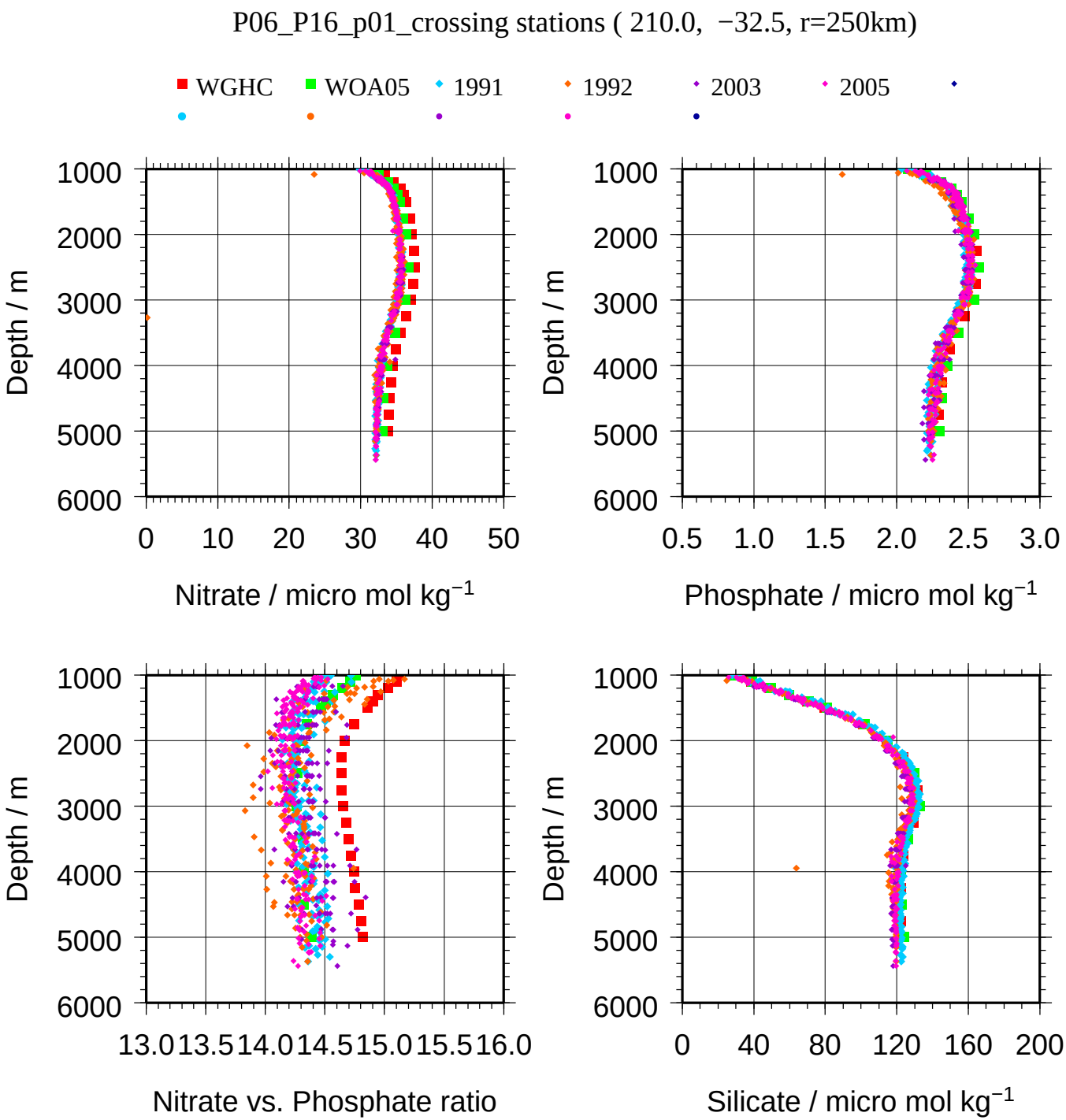

P04_P17_b_p01_crossing stations (225.0, 9.5, r=250km)
WGHC
WOA05
1989
1991
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

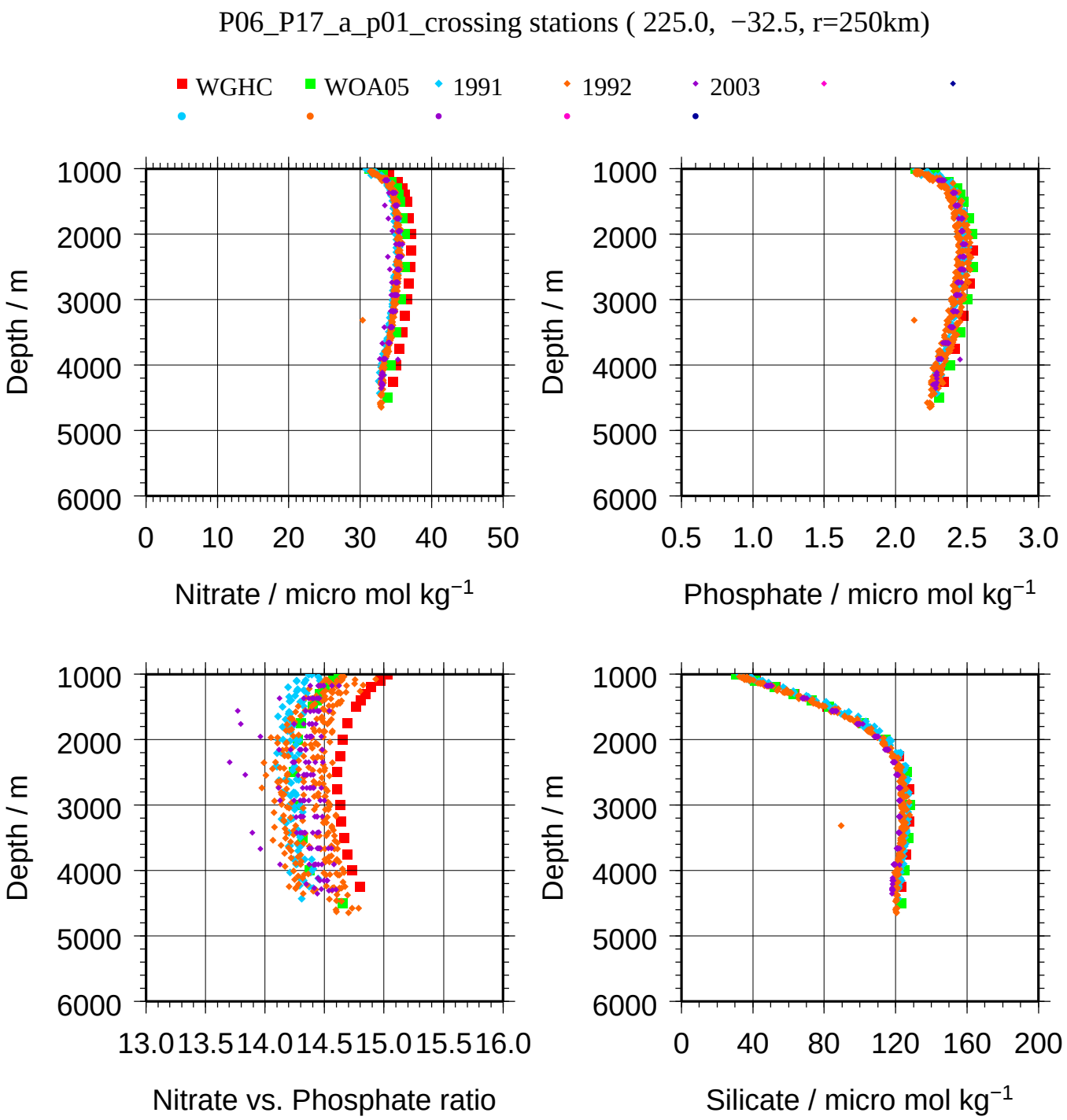

P04_P18_p01_crossing stations (250.0, 9.5, r=250km)
WGHC
WOA05
1989
1994
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

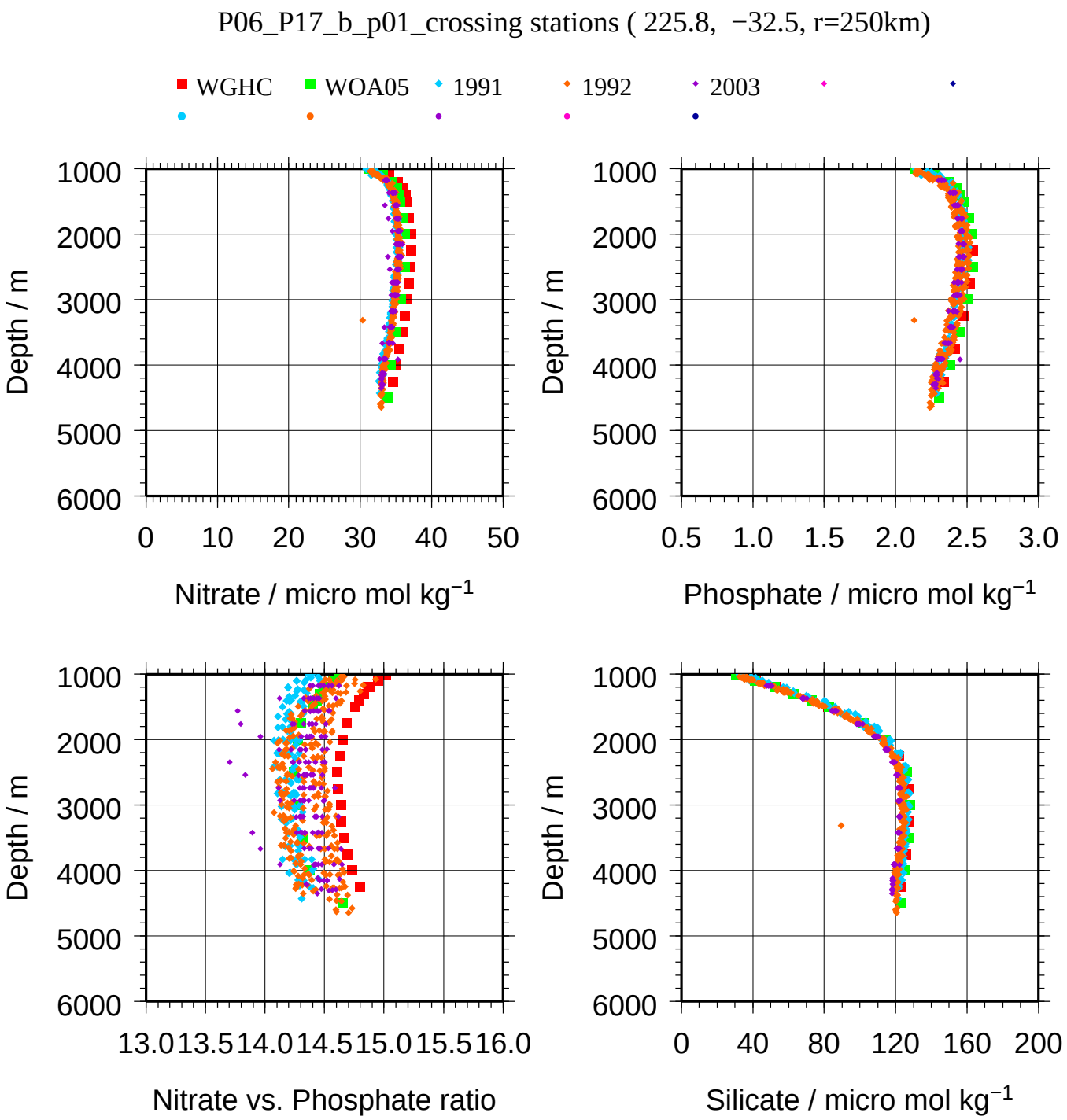

P04_P19_p01_crossing stations (268.4, 9.5, r=250km)
WGHC
WOA05
1989
1993
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

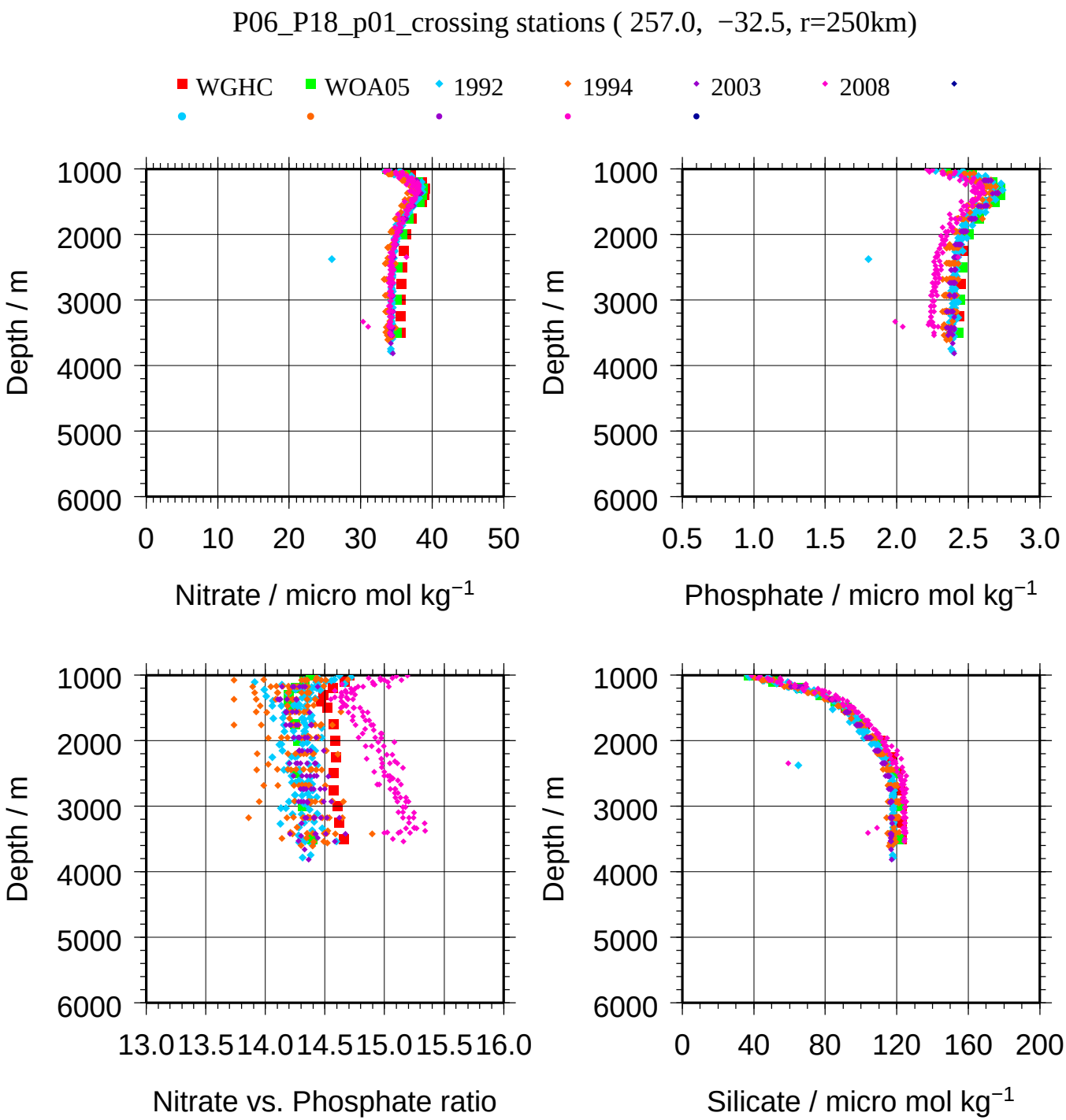

P06_P14_p01_crossing stations (175.5, −30.1, r=250km)
WGHC
WOA05
1992
1996
2003
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

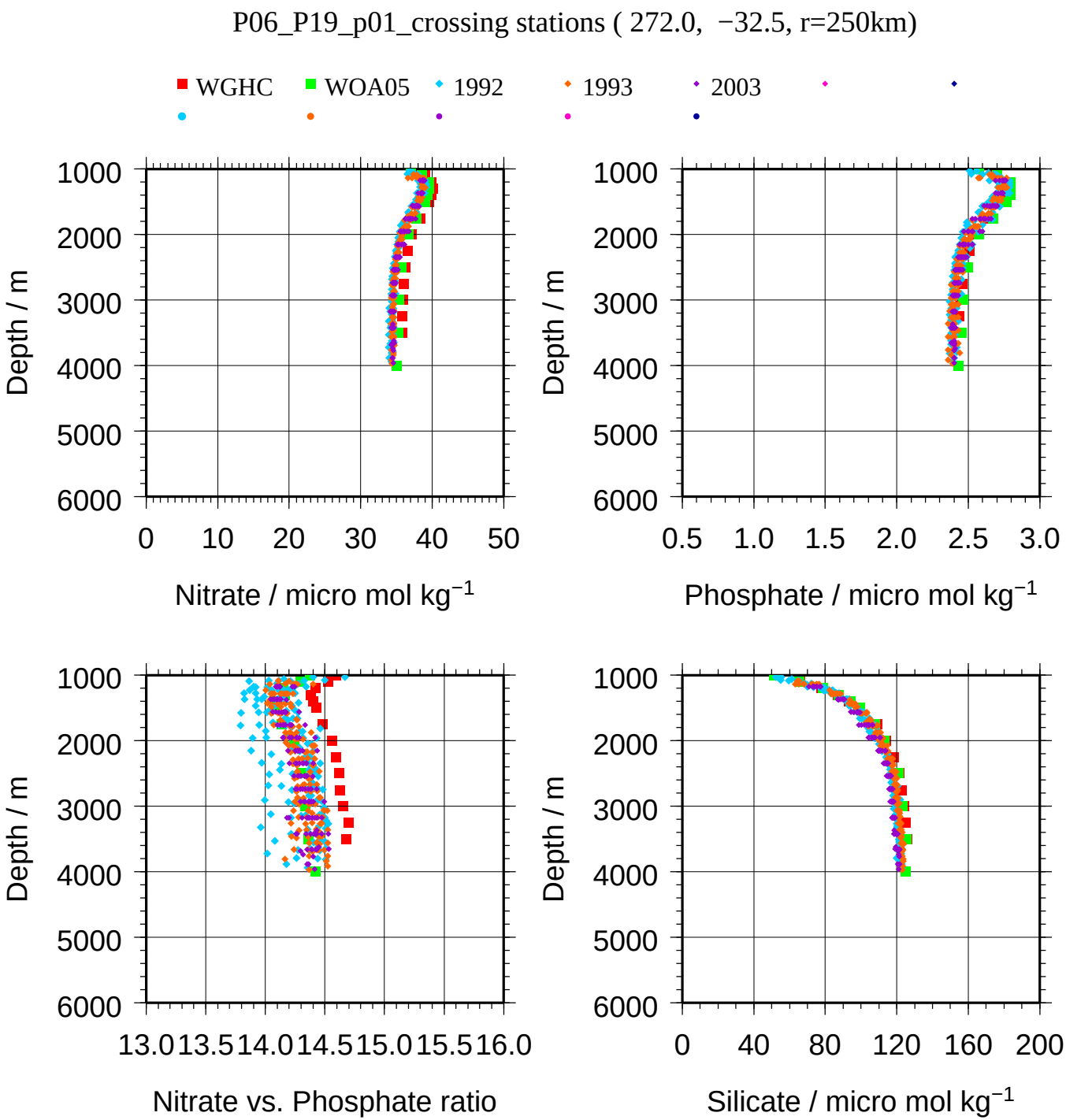

P06_P15_p01_crossing stations (190.0, −32.5, r=250km)
WGHC
WOA05
1990
1992
1996
2001
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

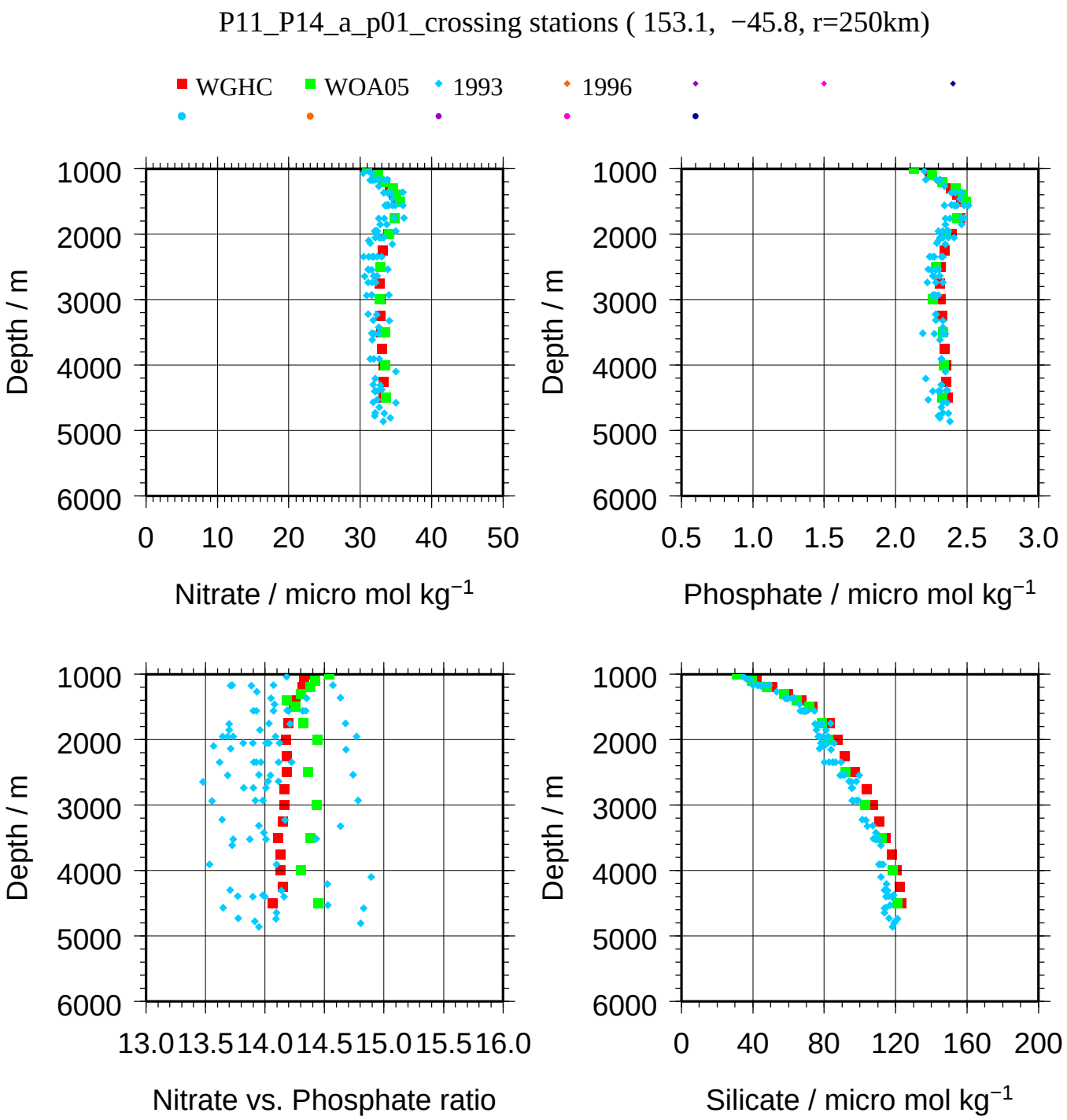

P06_P16_p01_crossing stations (210.0, −32.5, r=250km)
WGHC
WOA05
1991
1992
2003
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

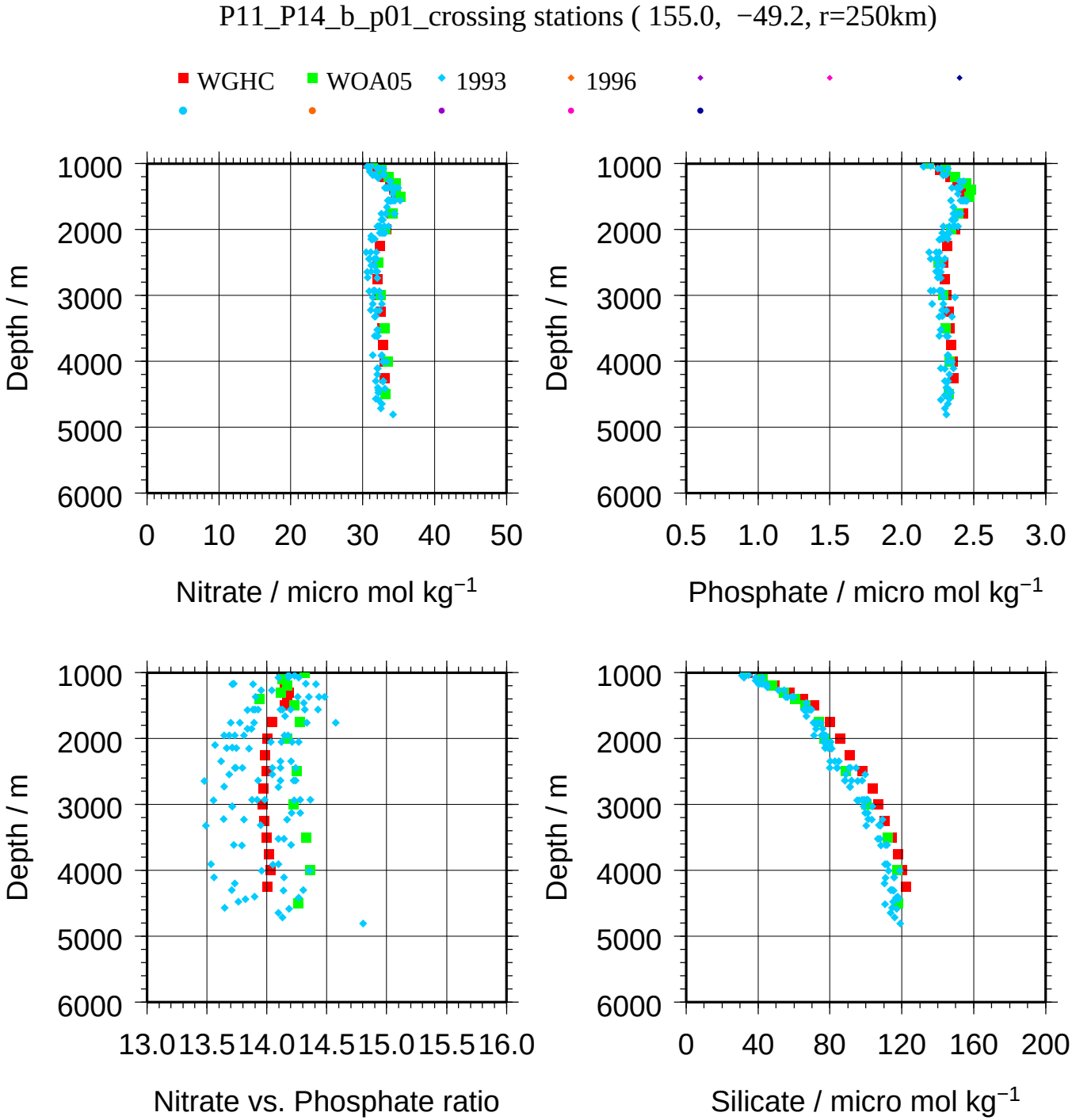

P06_P17_a_p01_crossing stations (225.0, −32.5, r=250km)
WGHC
WOA05
1991
1992
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

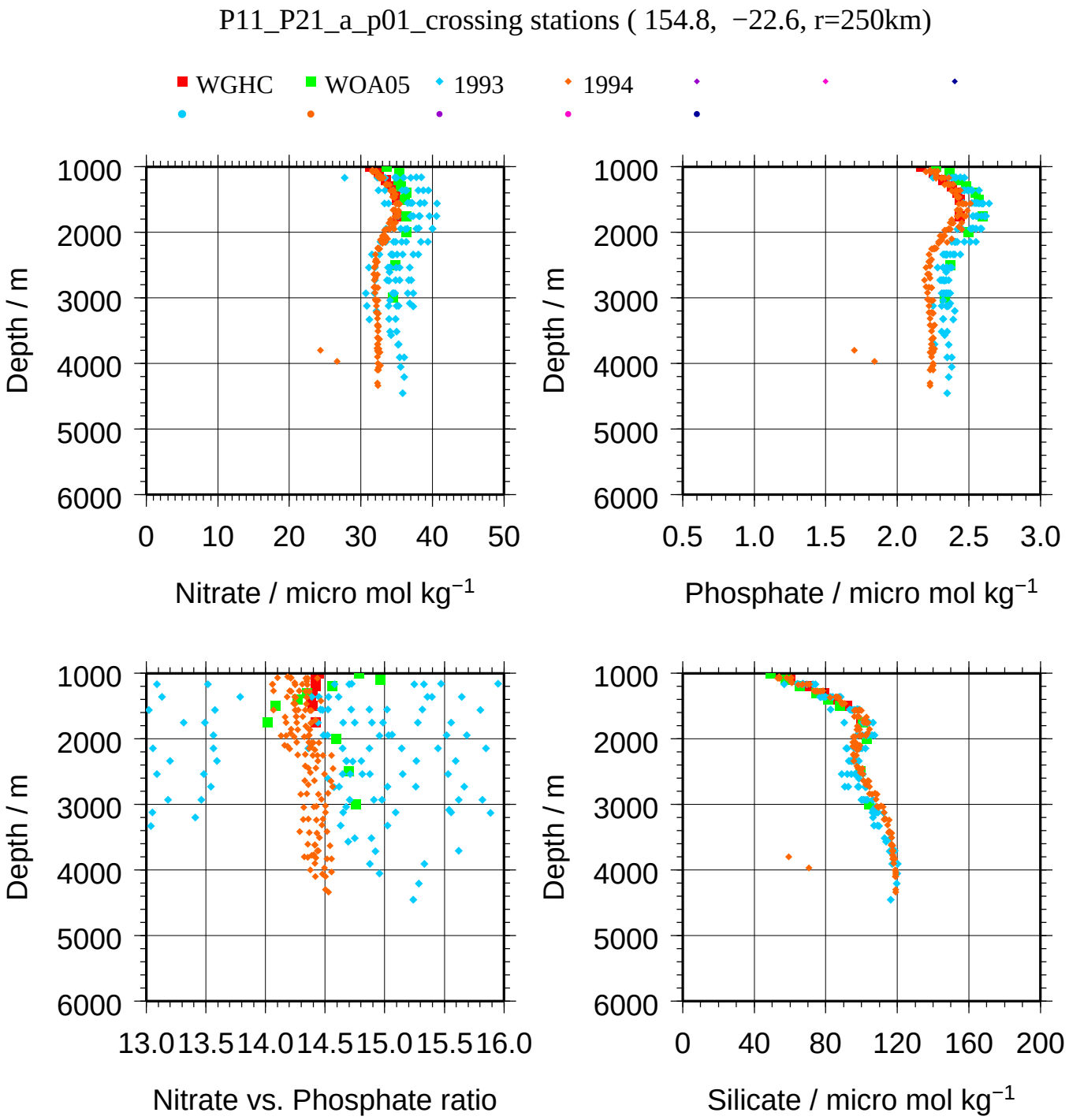

P06_P17_b_p01_crossing stations (225.8, −32.5, r=250km)
WGHC
WOA05
1991
1992
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

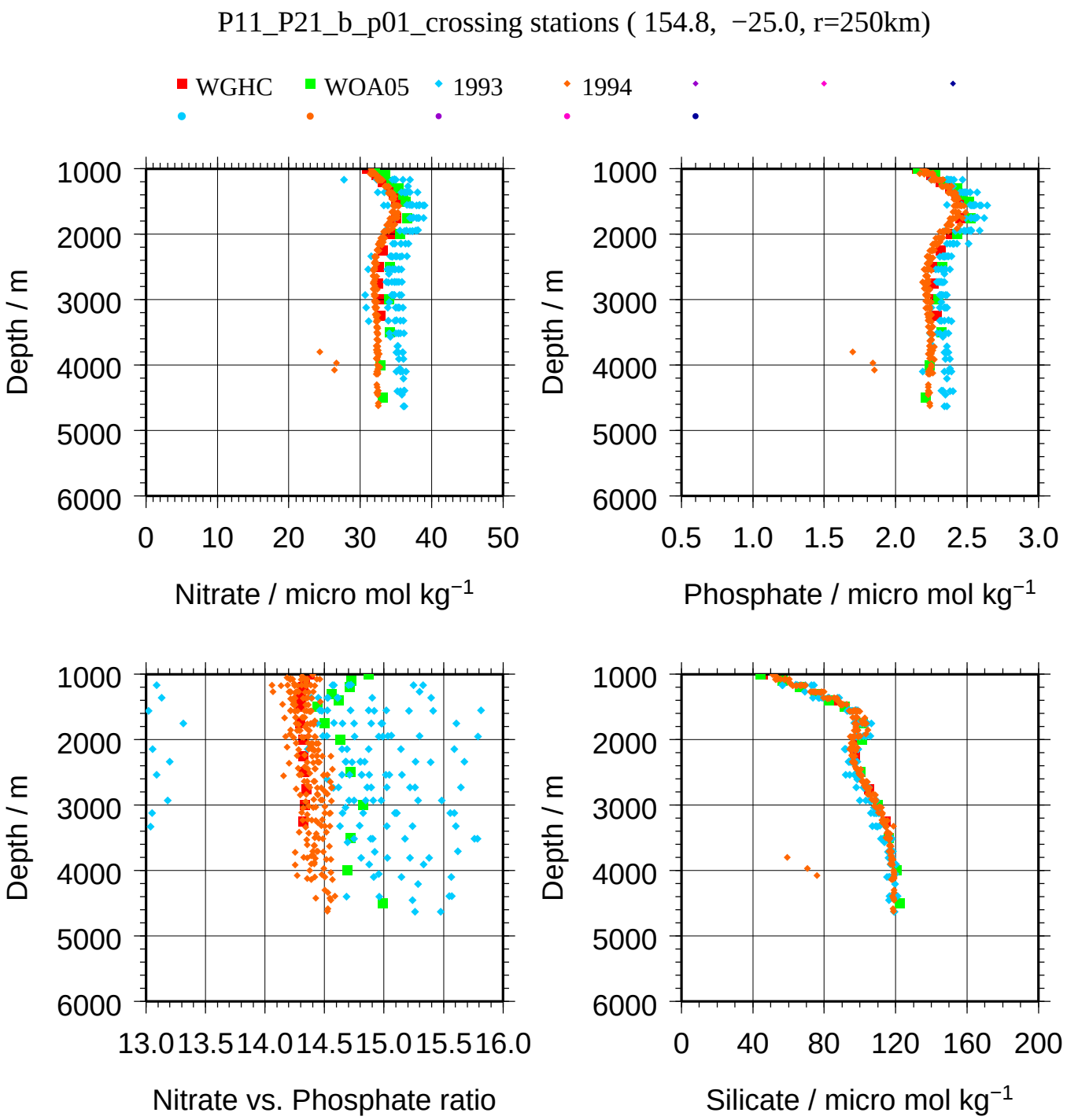

P06_P18_p01_crossing stations (257.0, −32.5, r=250km)
WGHC
WOA05
1992
1994
2003
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

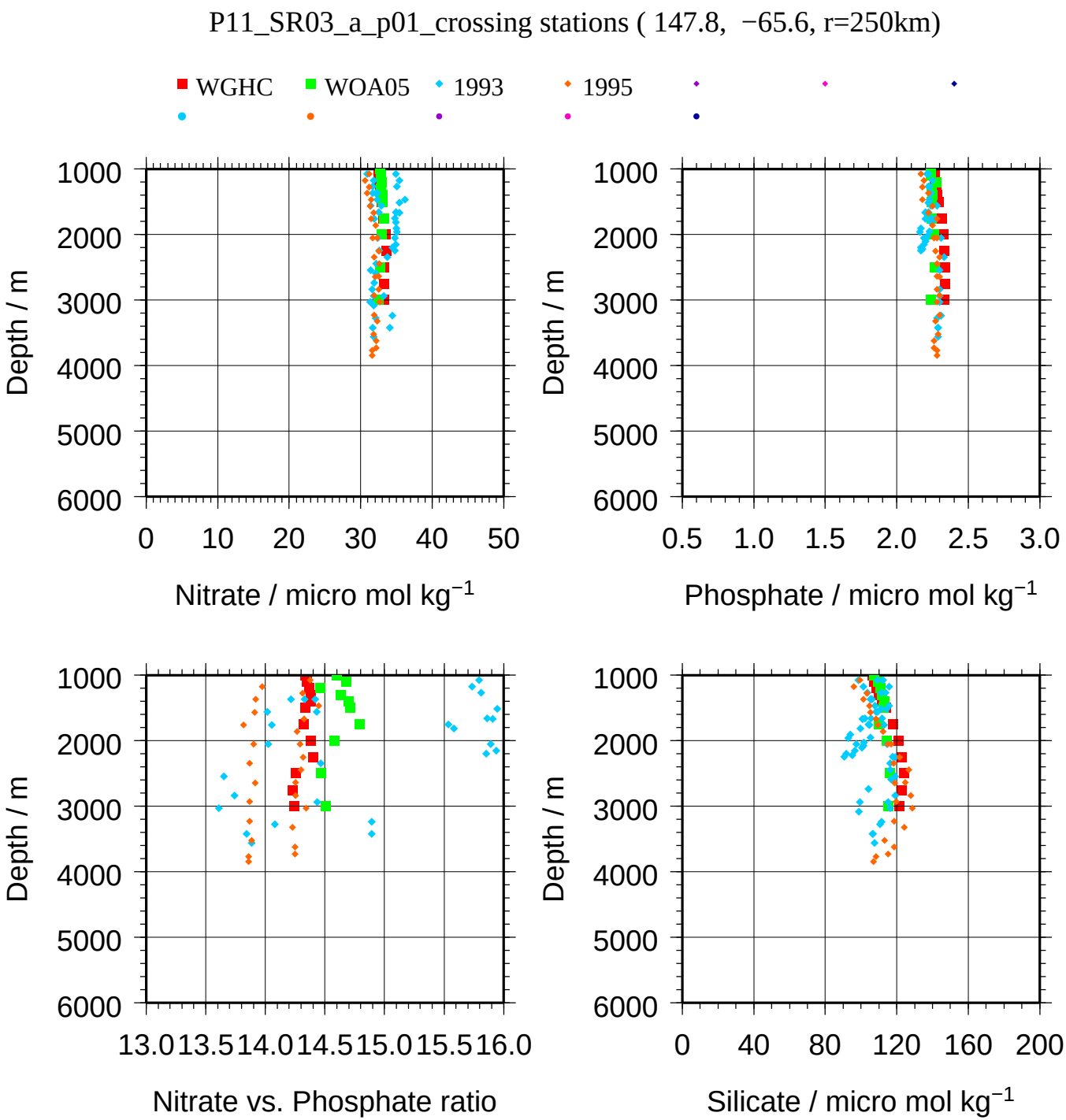

P06_P19_p01_crossing stations (272.0, −32.5, r=250km)
WGHC
WOA05
1992
1993
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

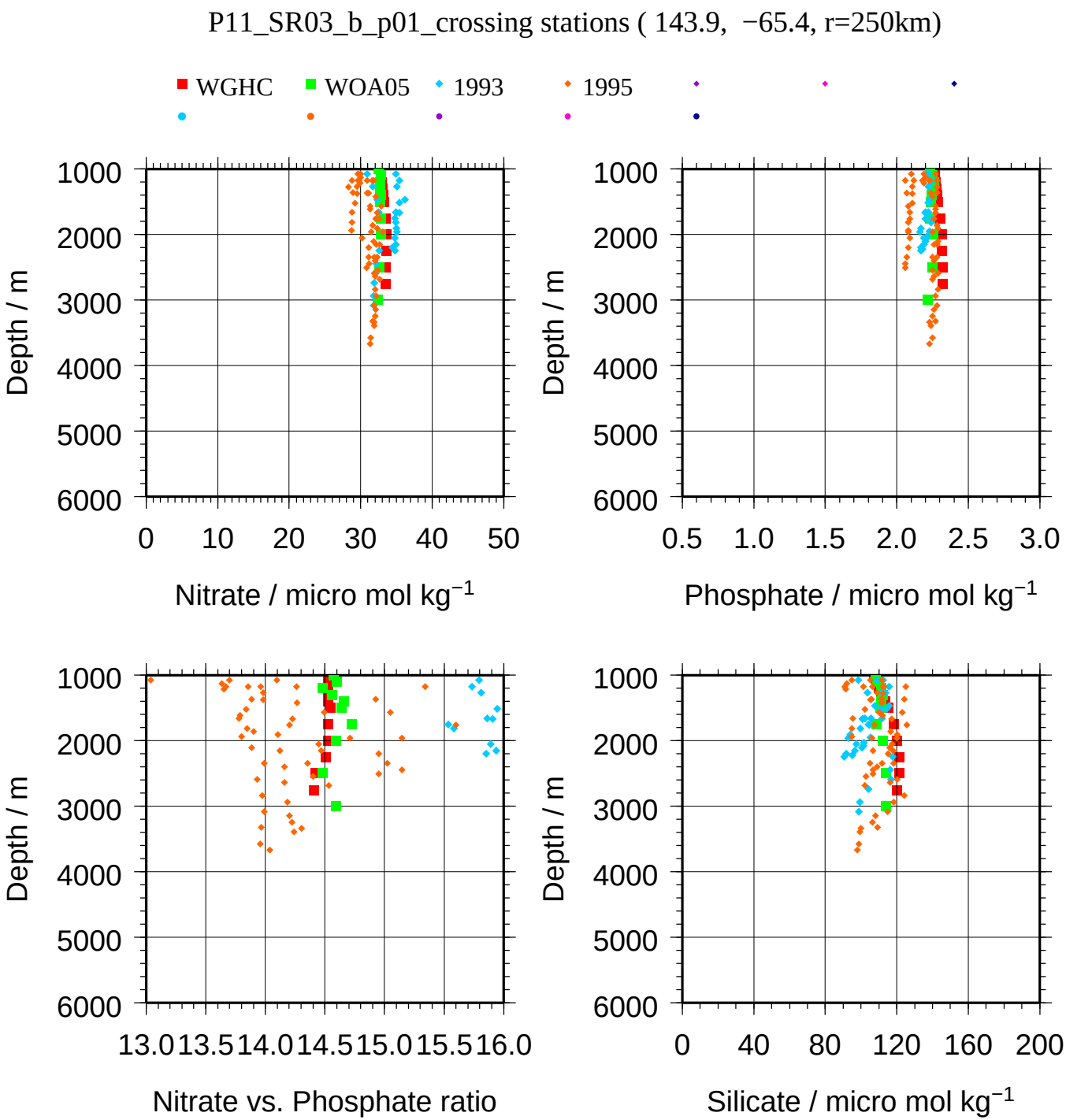

P11_P14_a_p01_crossing stations (153.1, −45.8, r=250km)
WGHC
WOA05
1993
1996
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

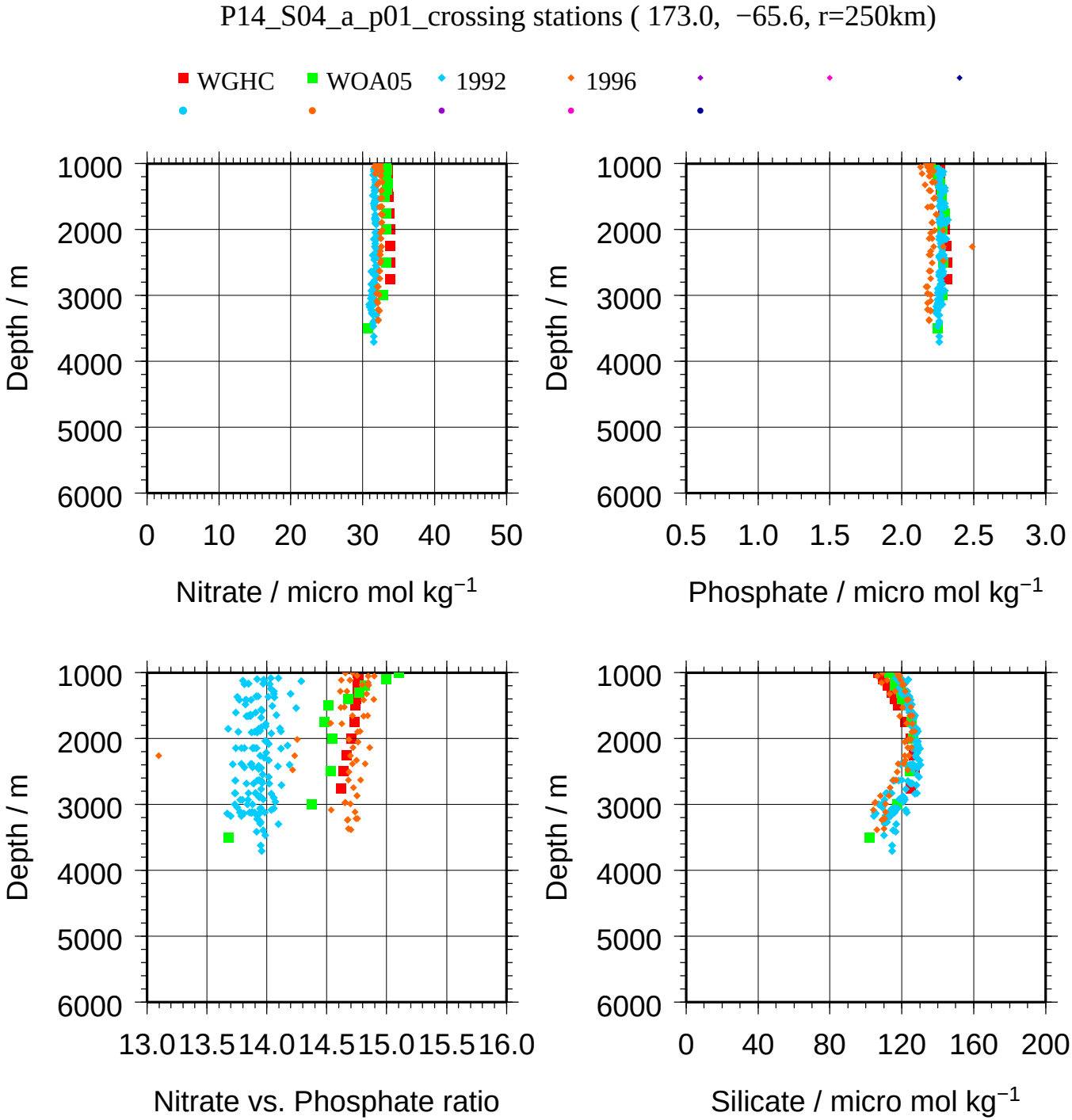

P11_P14_b_p01_crossing stations (155.0, −49.2, r=250km)
WGHC
WOA05
1993
1996
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

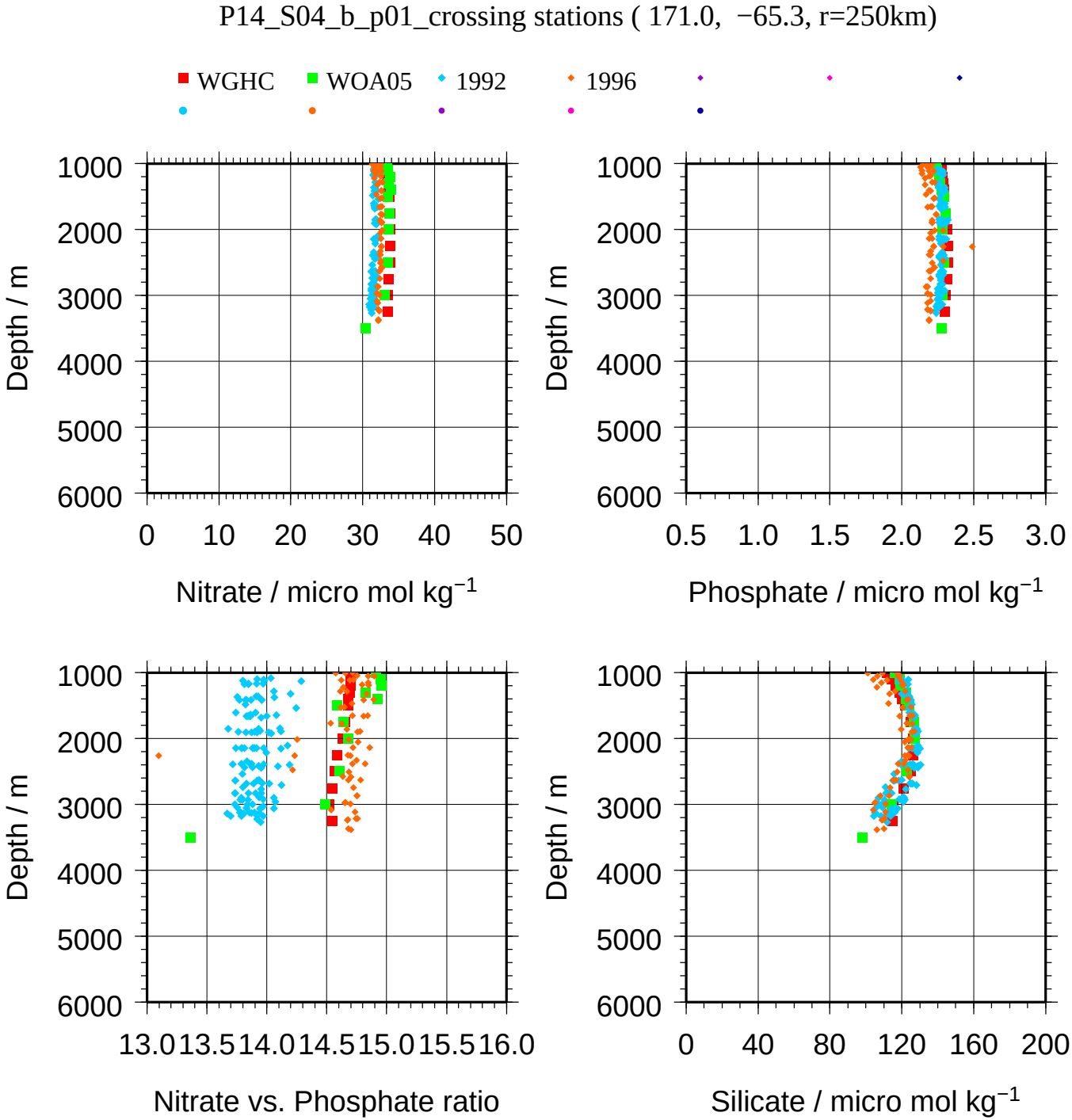

P11_P21_a_p01_crossing stations (154.8, −22.6, r=250km)
WGHC
WOA05
1993
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

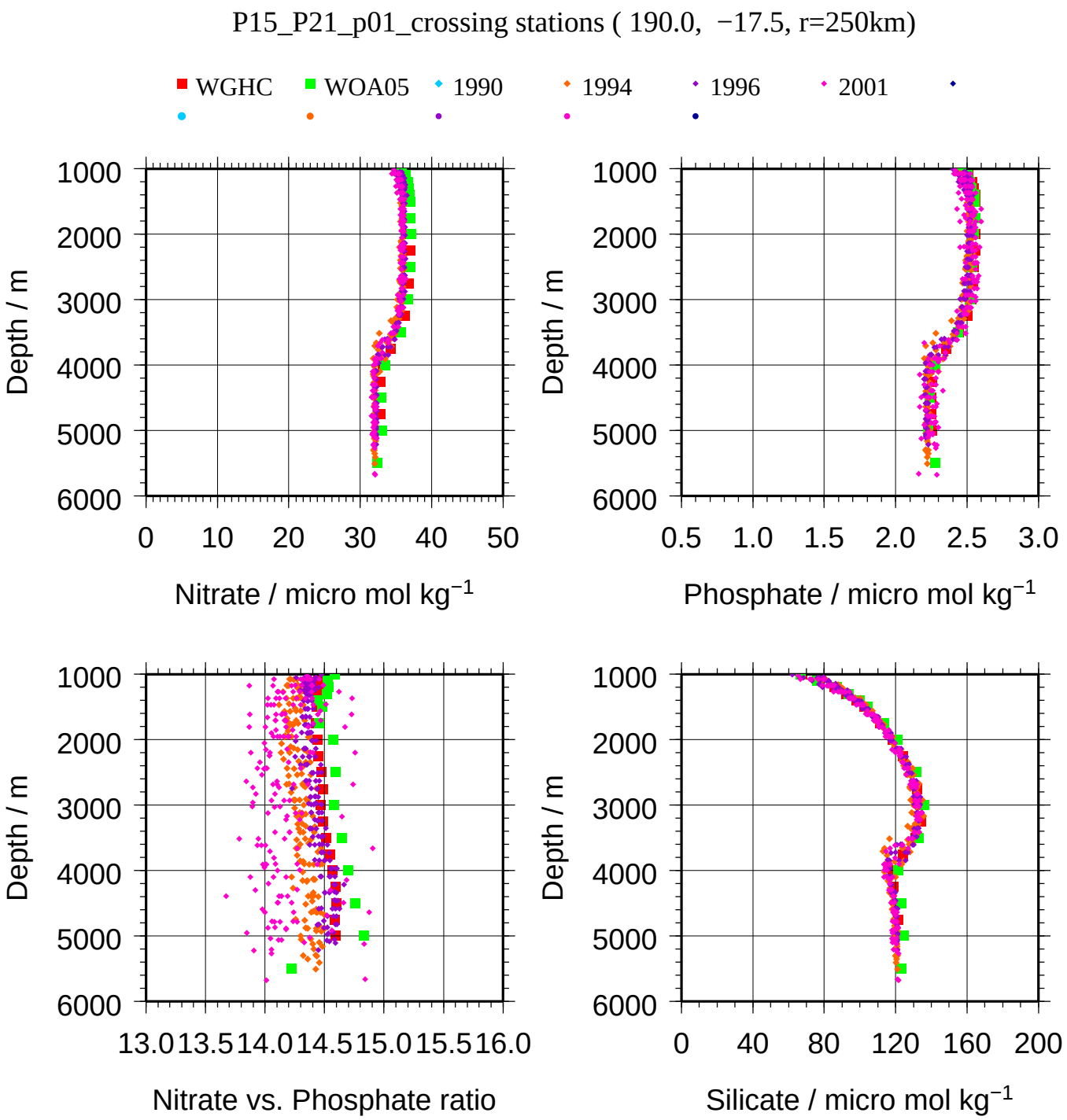

P11_P21_b_p01_crossing stations (154.8, −25.0, r=250km)
WGHC
WOA05
1993
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

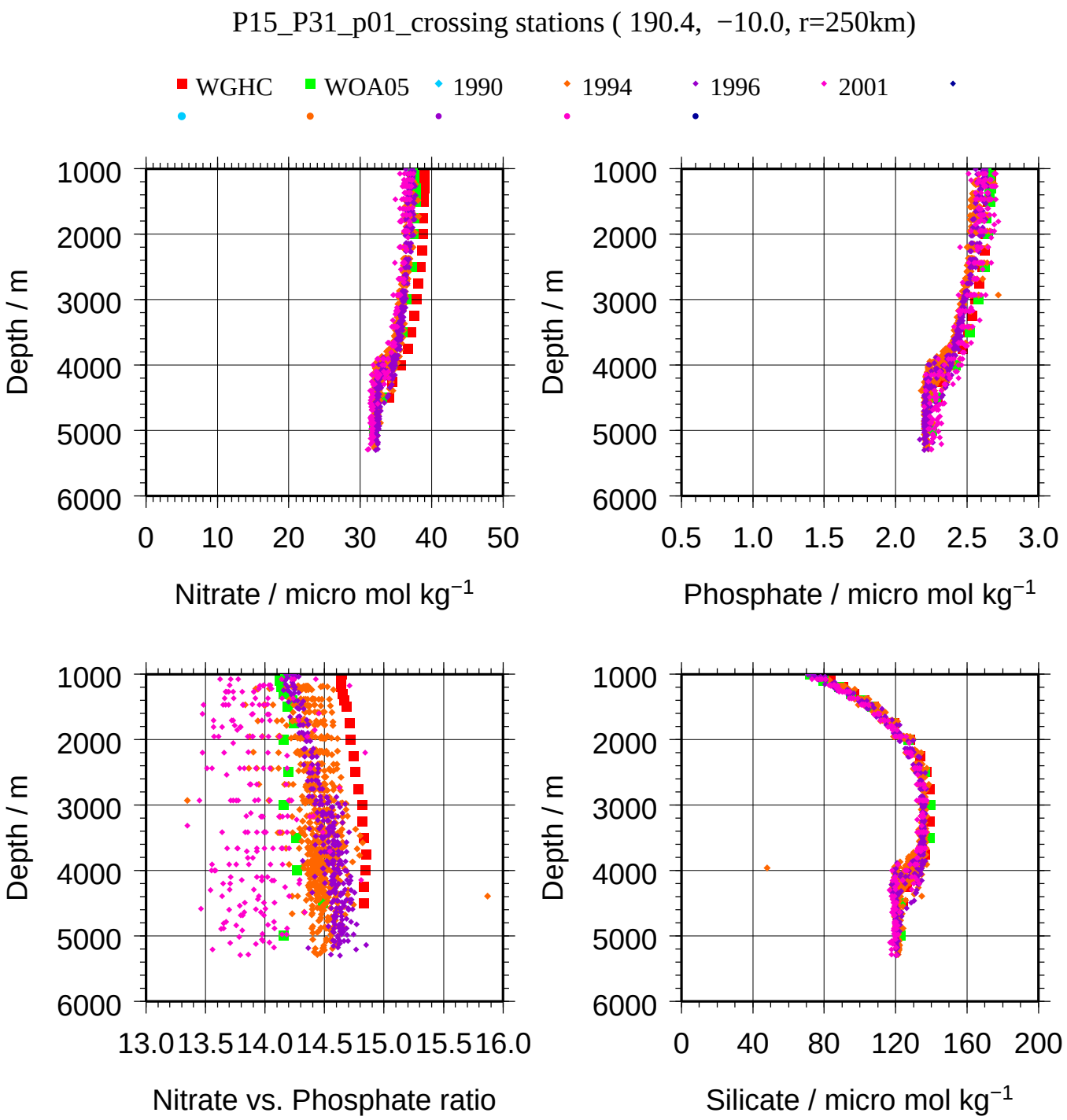

P11_SR03_a_p01_crossing stations (147.8, −65.6, r=250km)
WGHC
WOA05
1993
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

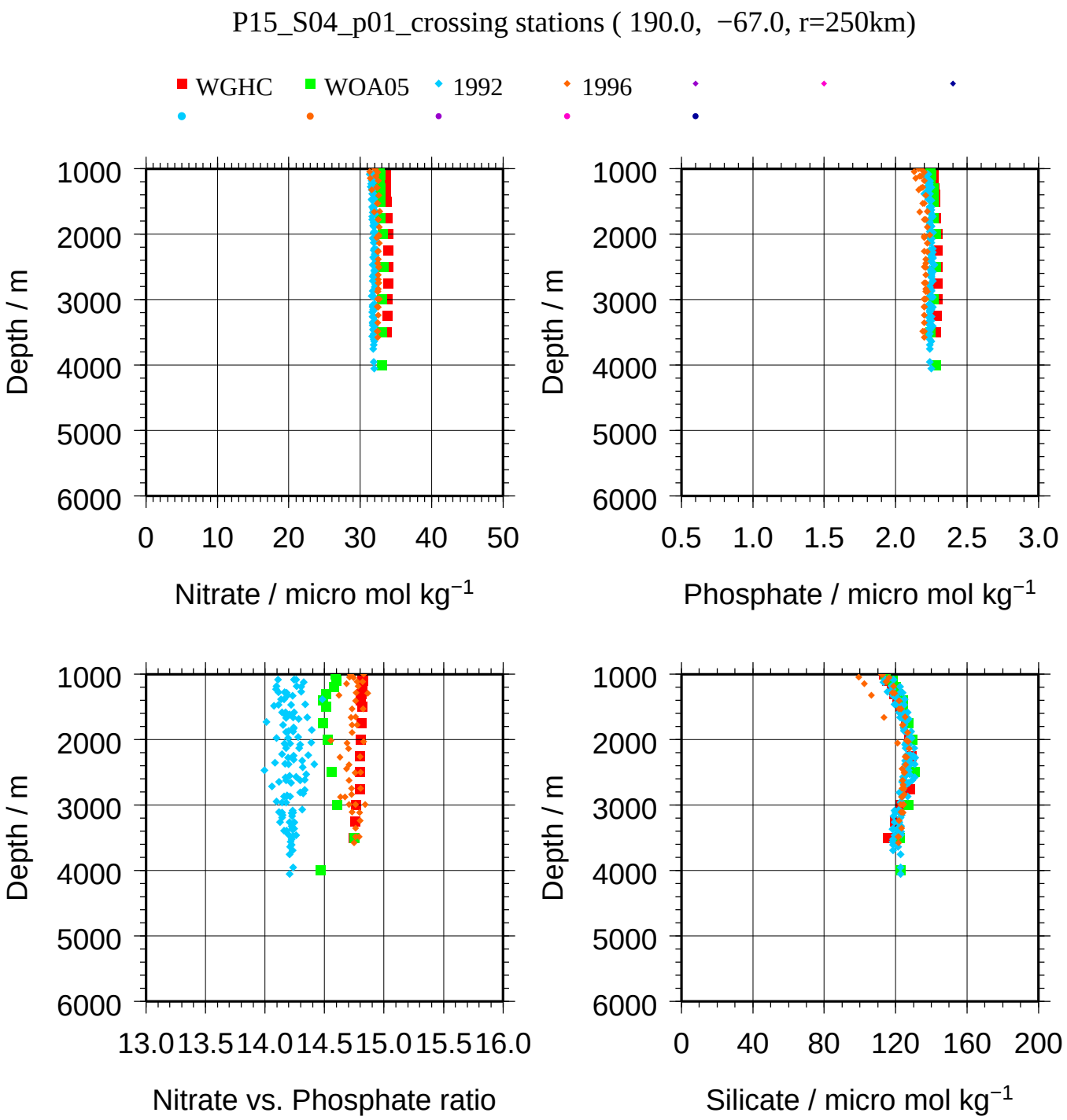

P11_SR03_b_p01_crossing stations (143.9, −65.4, r=250km)
WGHC
WOA05
1993
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

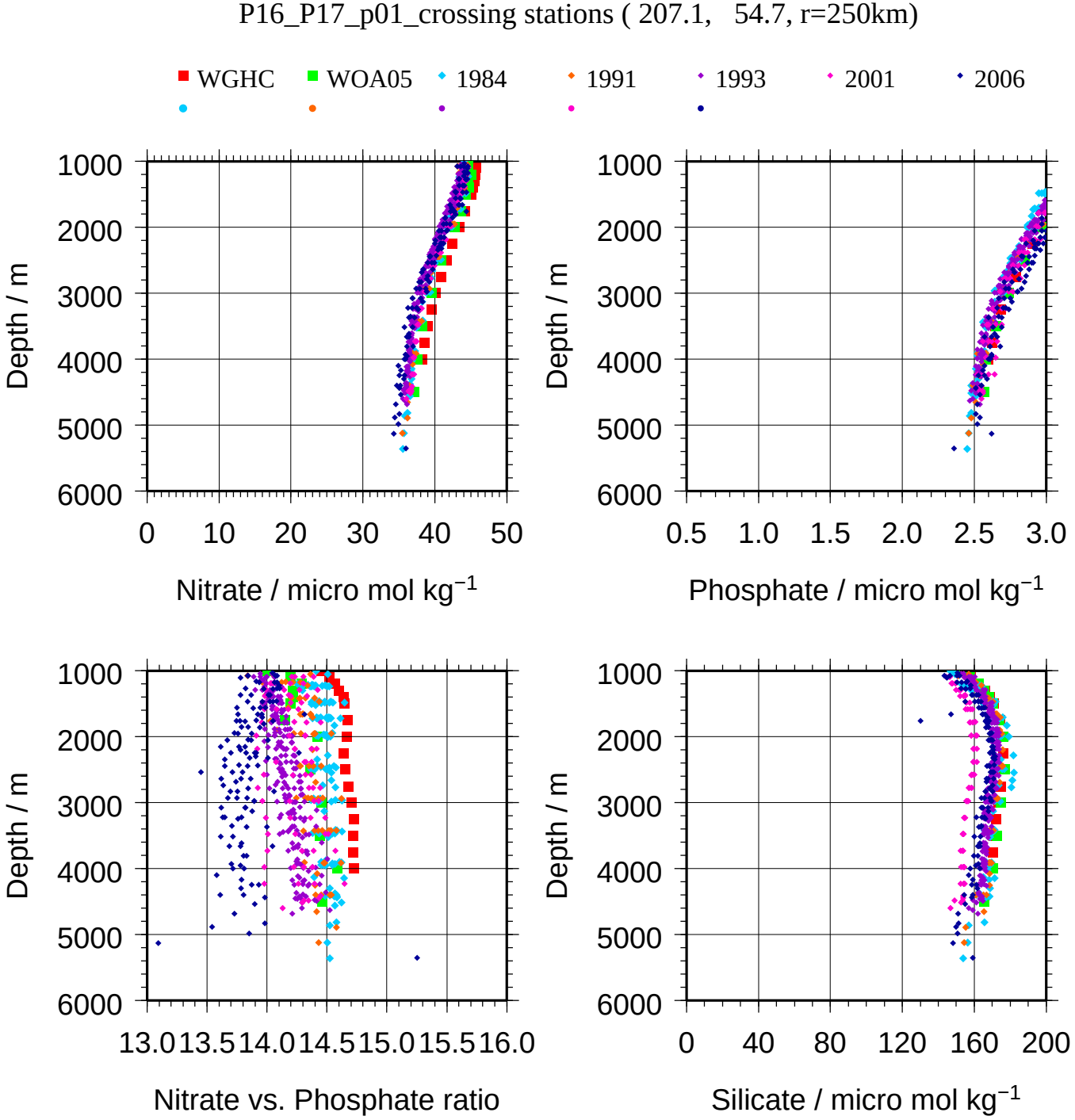

P14_S04_a_p01_crossing stations (173.0, −65.6, r=250km)
WGHC
WOA05
1992
1996
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

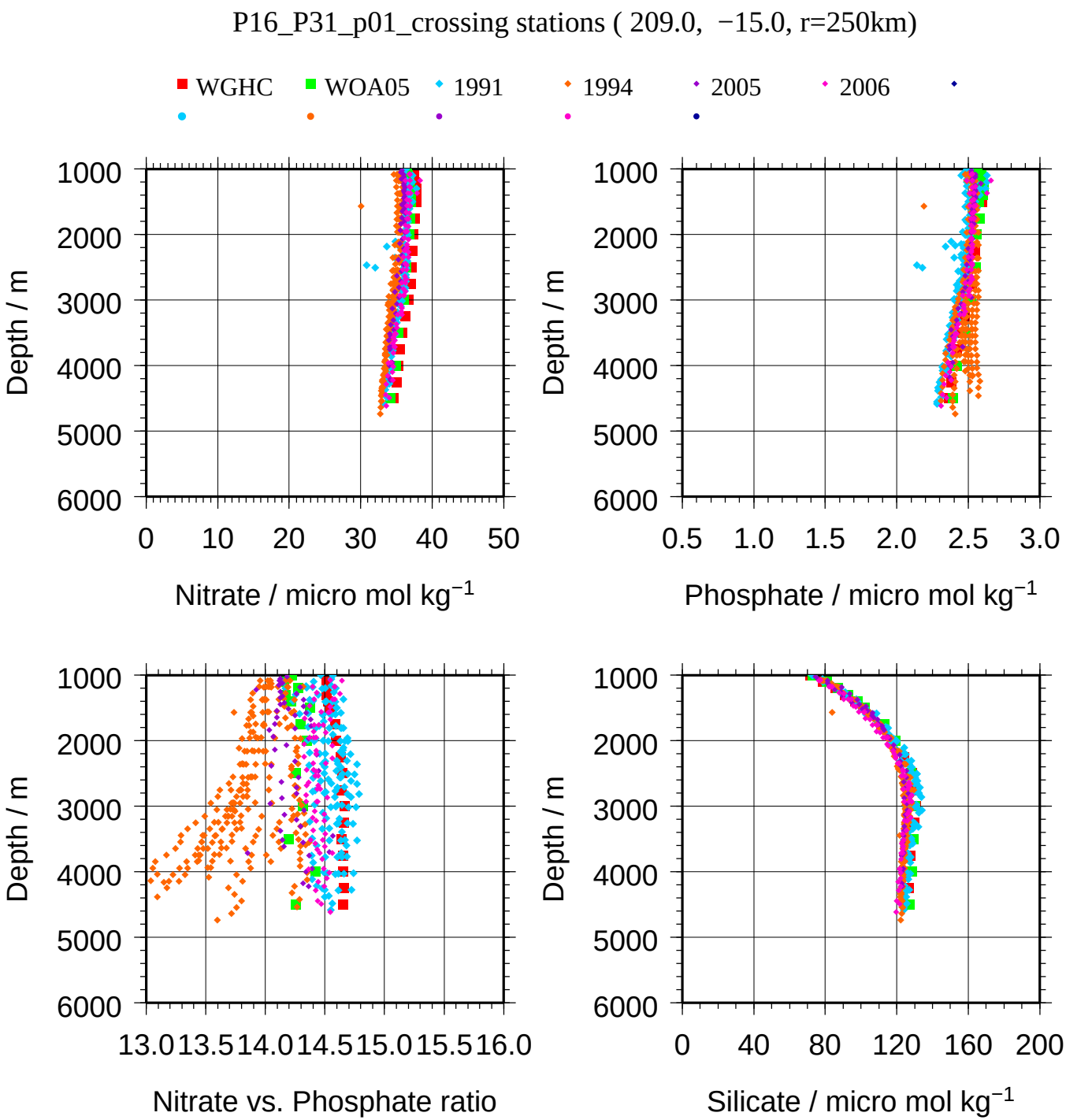

P14_S04_b_p01_crossing stations (171.0, −65.3, r=250km)
WGHC
WOA05
1992
1996
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

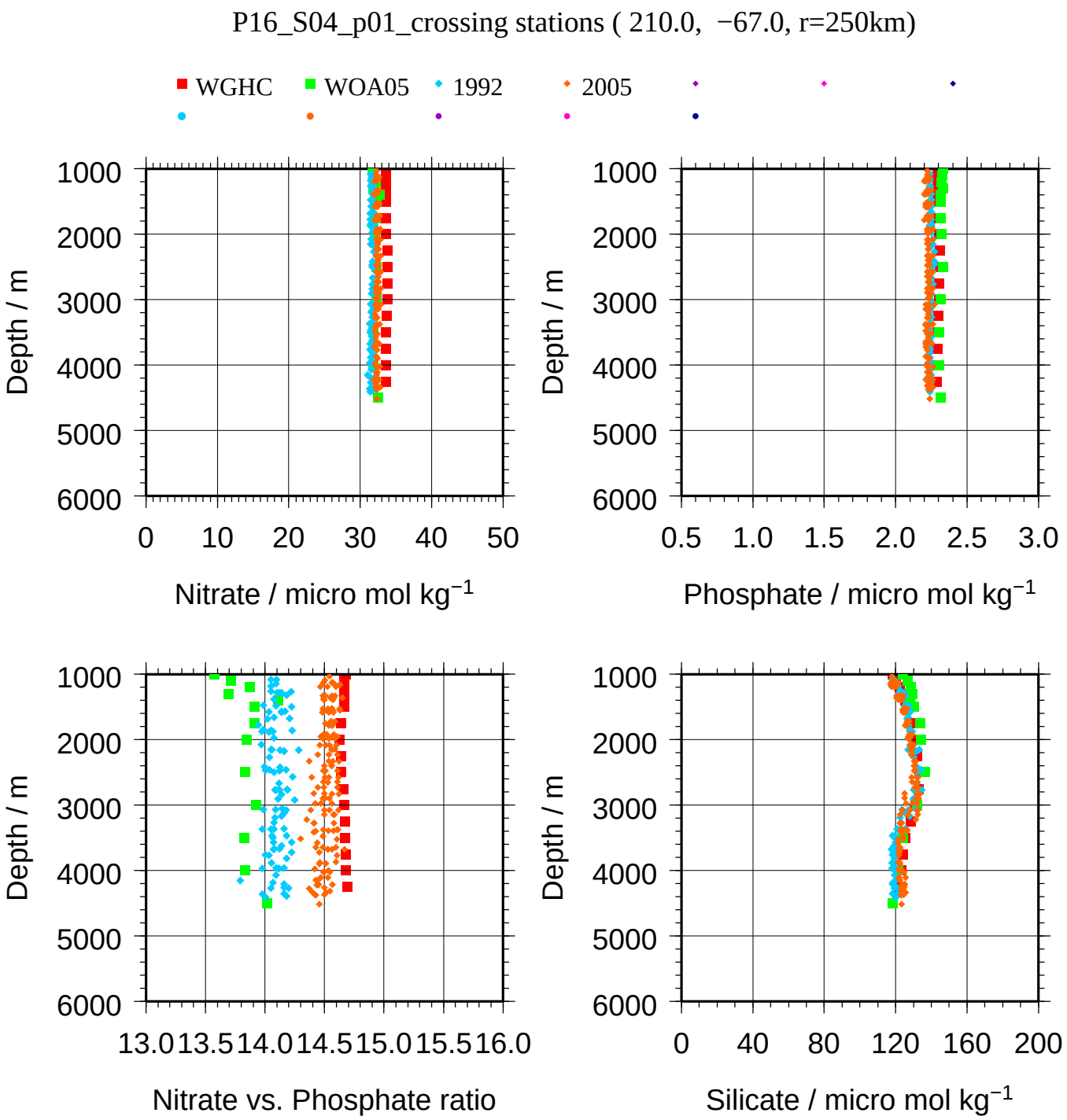

P15_P21_p01_crossing stations (190.0, −17.5, r=250km)
WGHC
WOA05
1990
1994
1996
2001
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

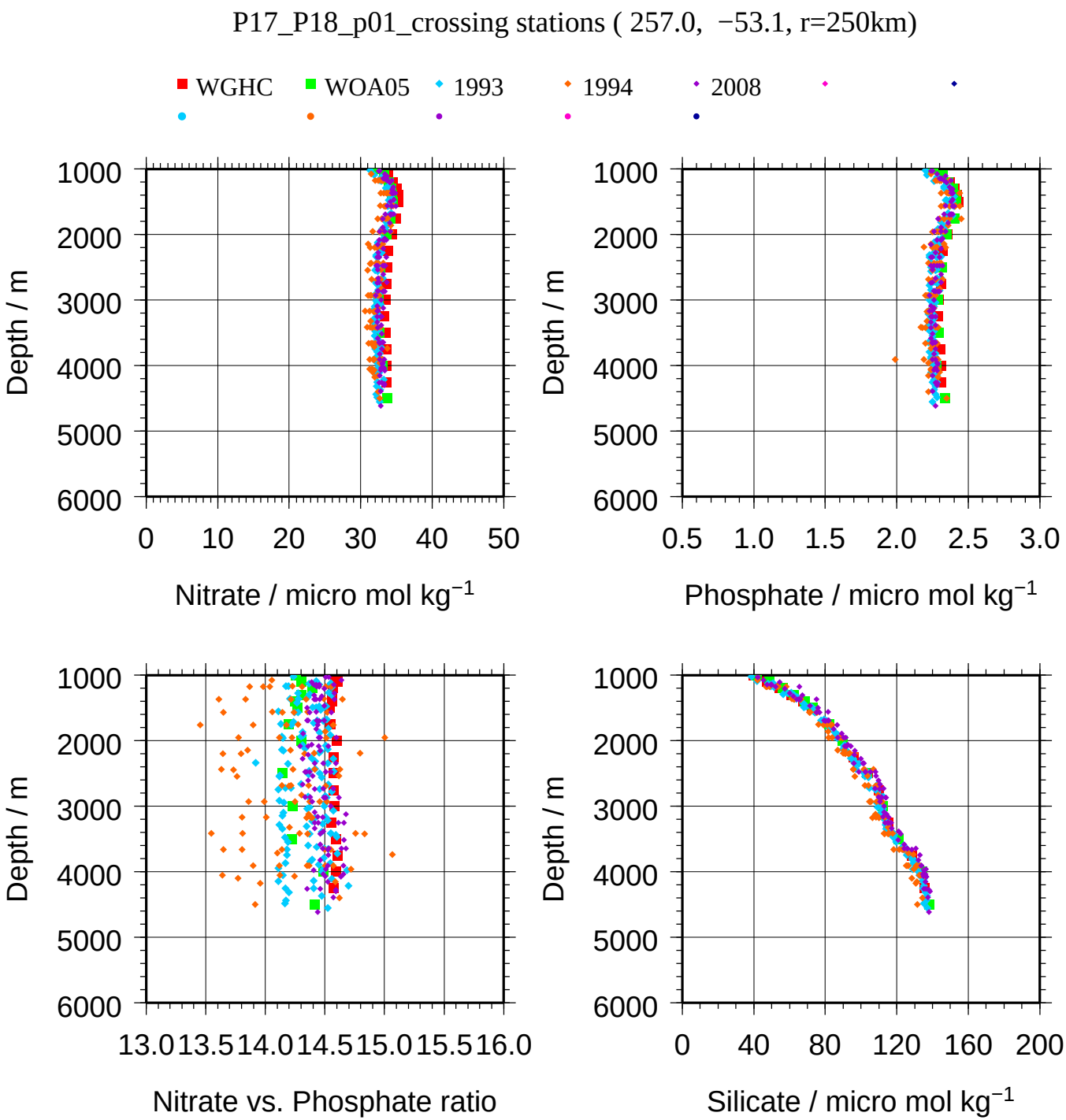

P15_P31_p01_crossing stations (190.4, −10.0, r=250km)
WGHC
WOA05
1990
1994
1996
2001
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

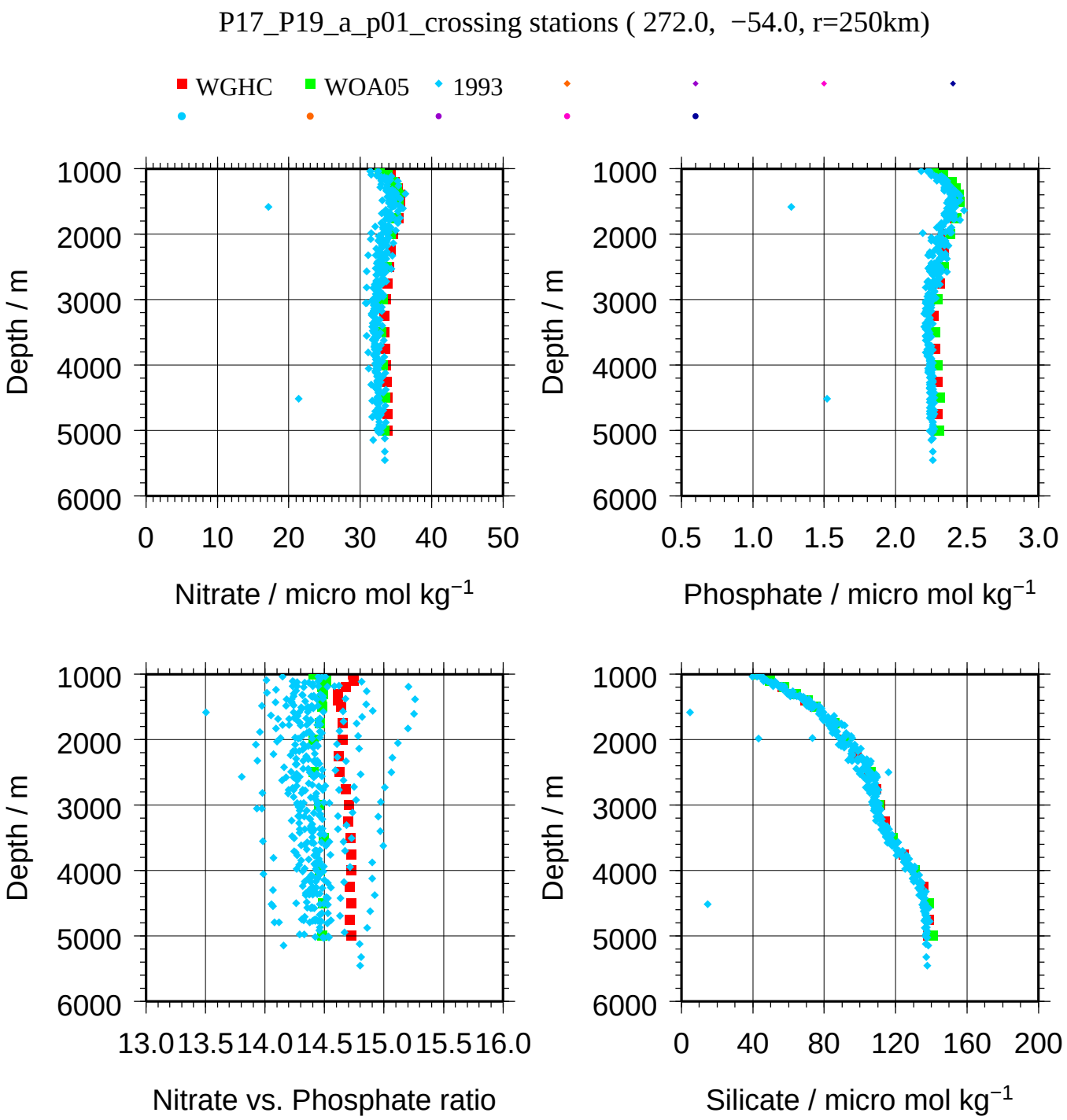

P15_S04_p01_crossing stations (190.0, −67.0, r=250km)
WGHC
WOA05
1992
1996
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

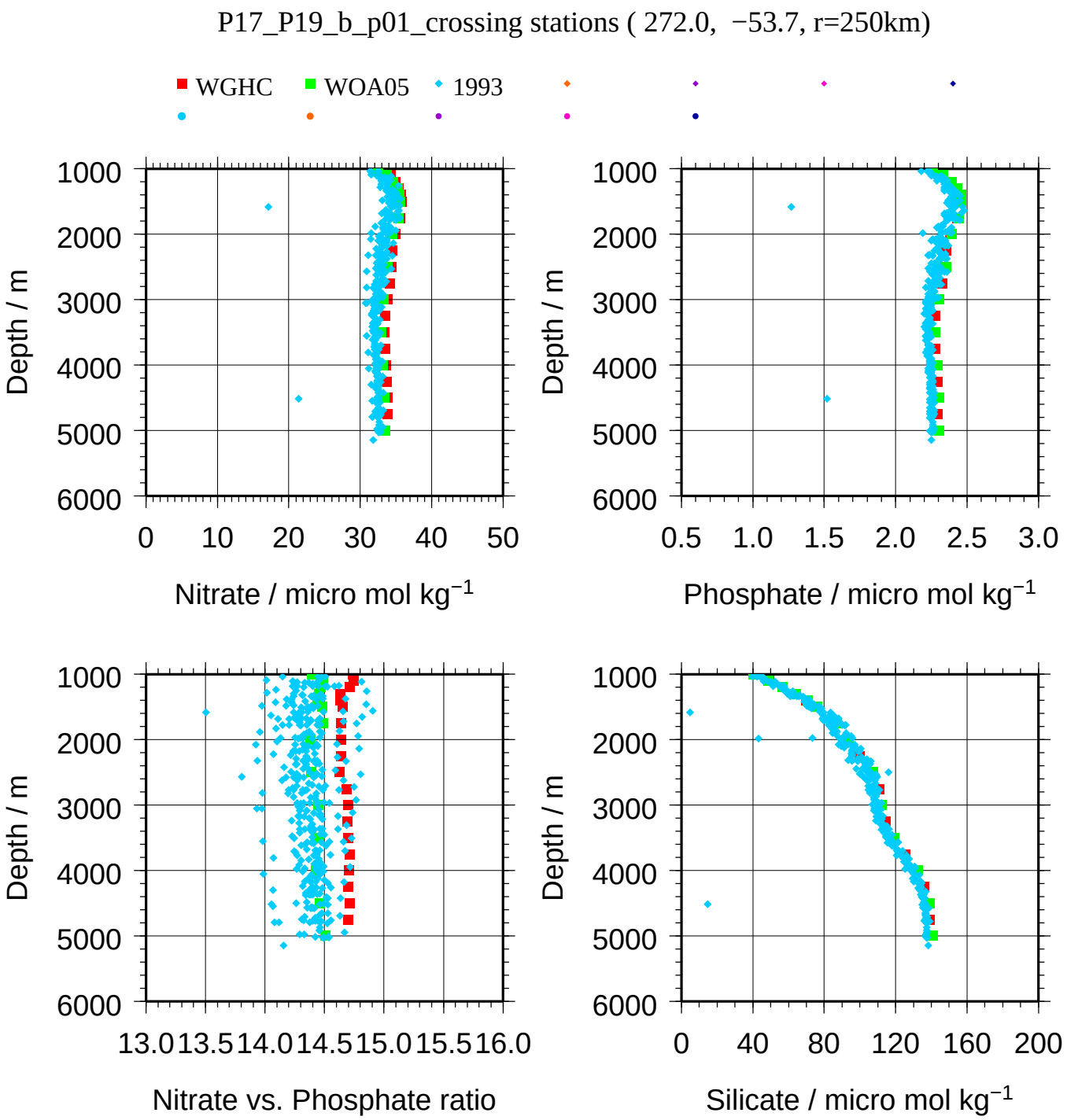

P16_P17_p01_crossing stations (207.1, 54.7, r=250km)
WGHC
WOA05
1984
1991
1993
2001
2006
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

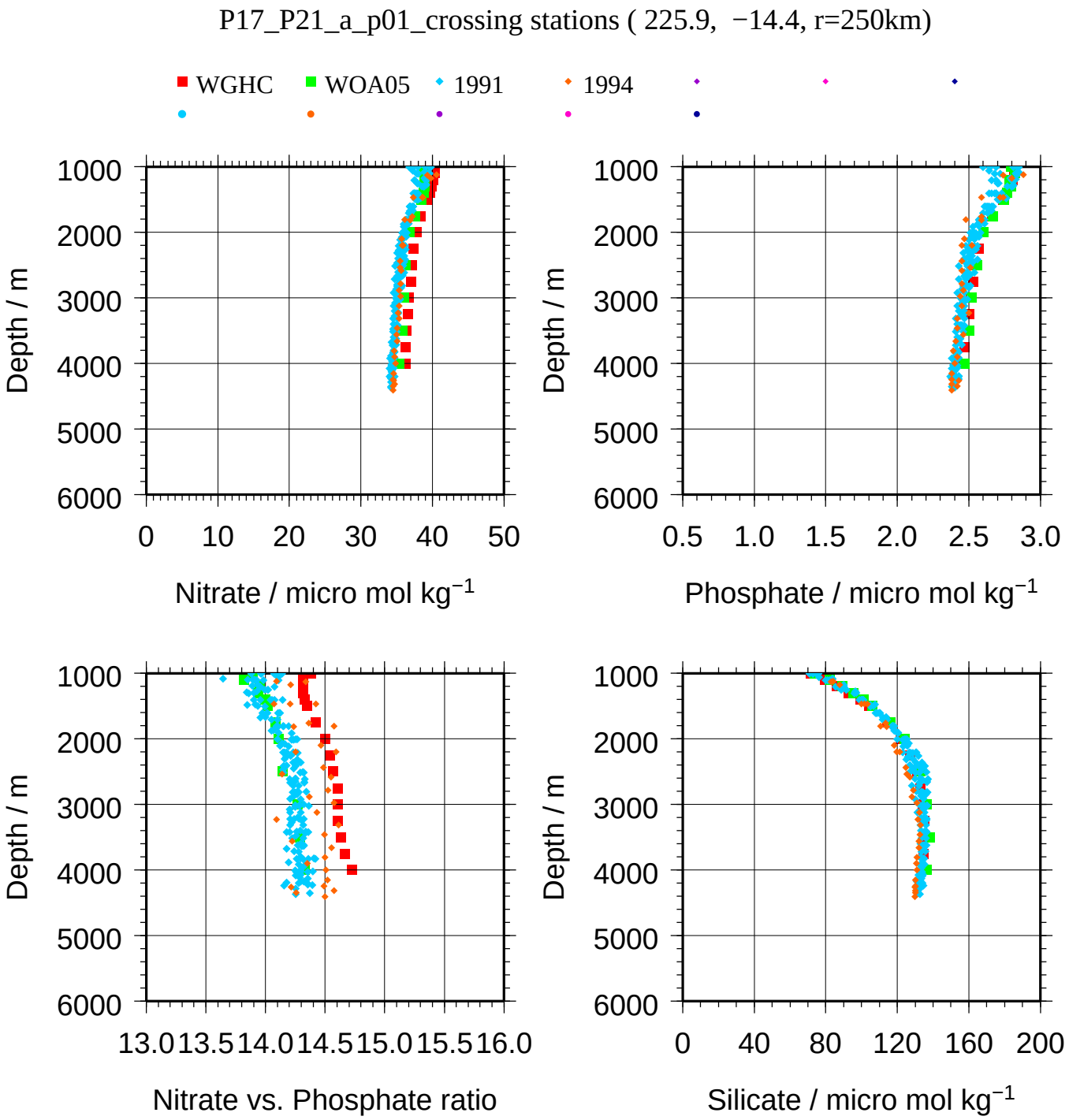

P16_P31_p01_crossing stations (209.0, −15.0, r=250km)
WGHC
WOA05
1991
1994
2005
2006
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

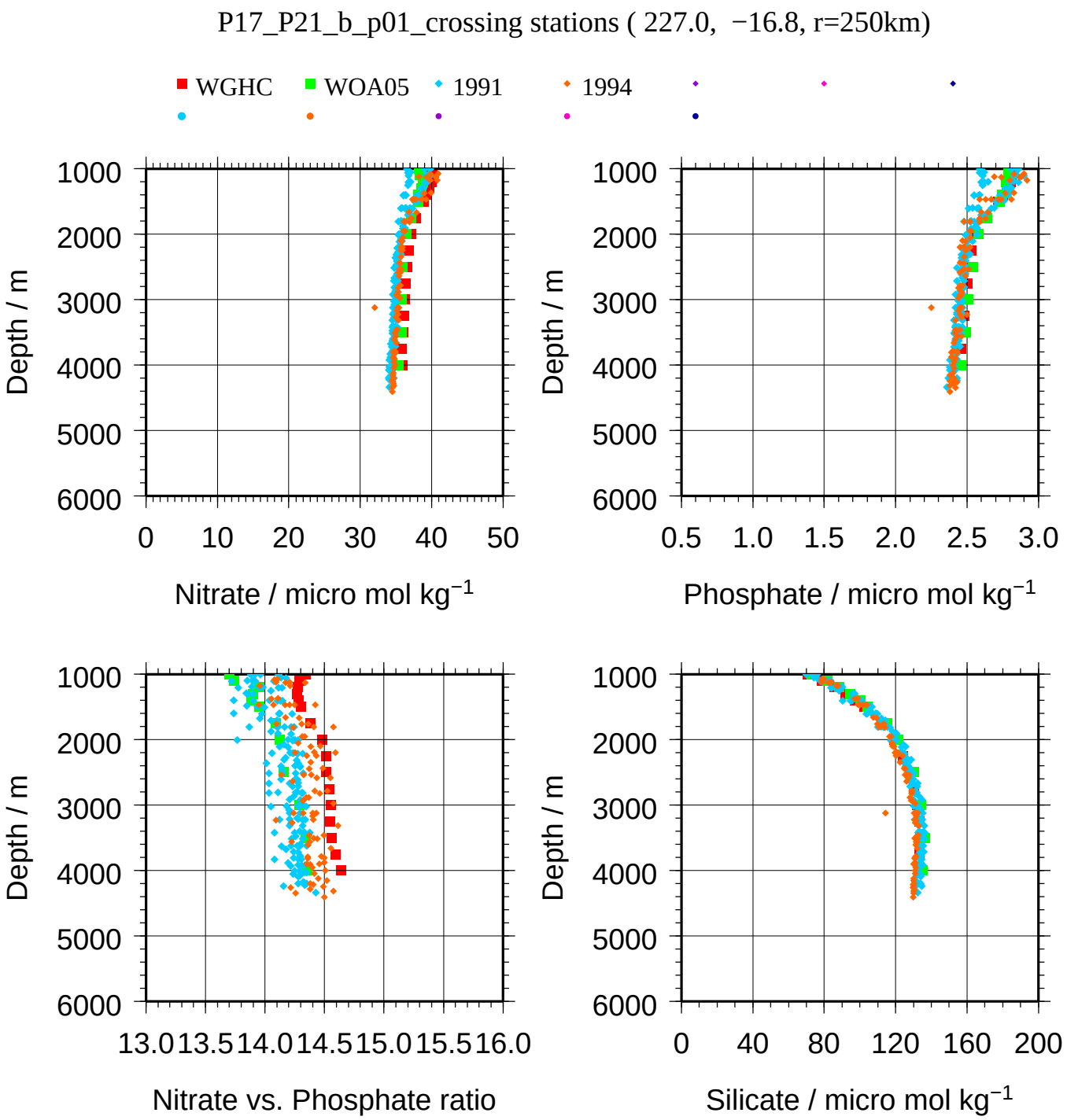

P16_S04_p01_crossing stations (210.0, −67.0, r=250km)
WGHC
WOA05
1992
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

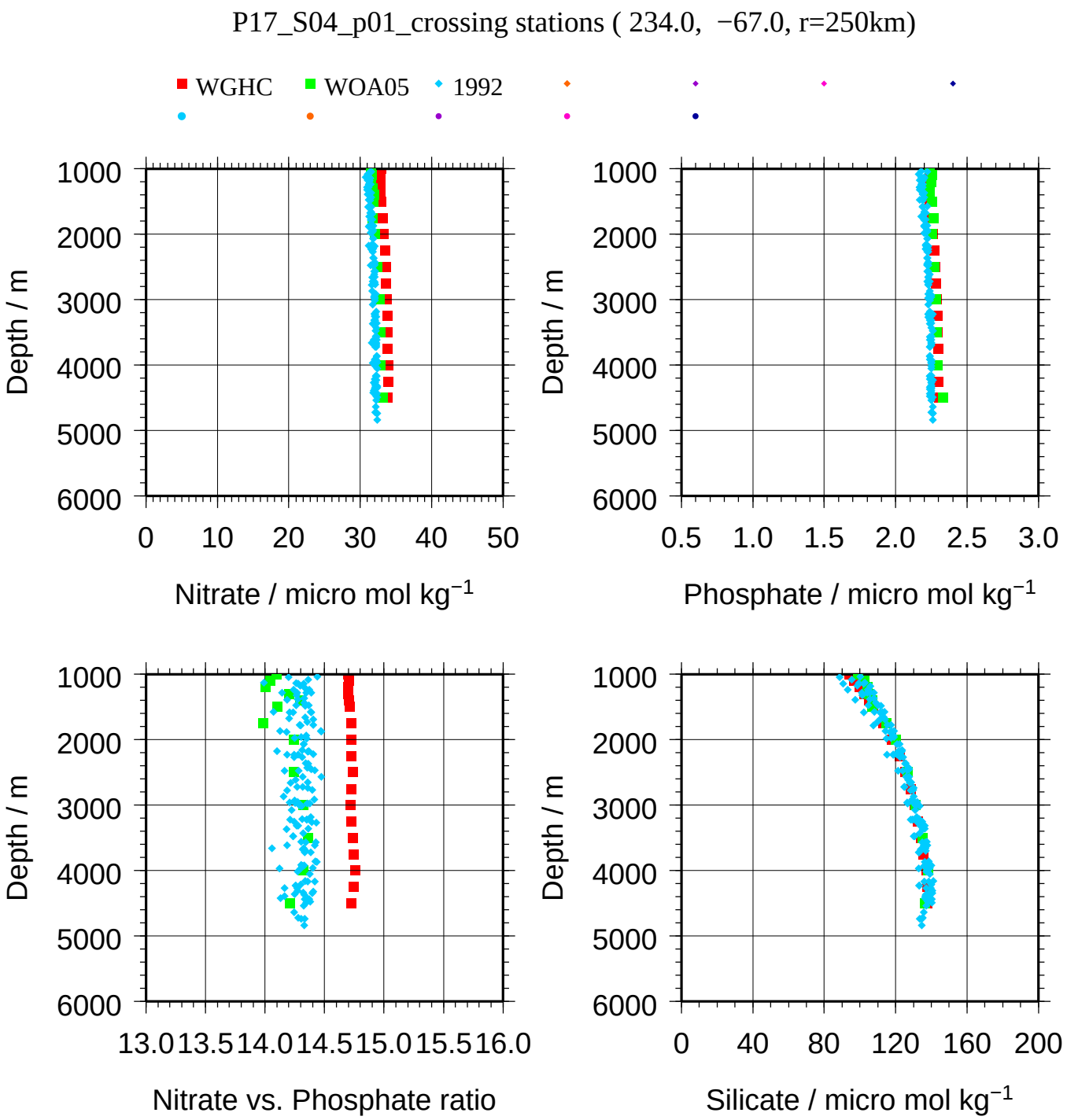

P17_P18_p01_crossing stations (257.0, −53.1, r=250km)
WGHC
WOA05
1993
1994
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

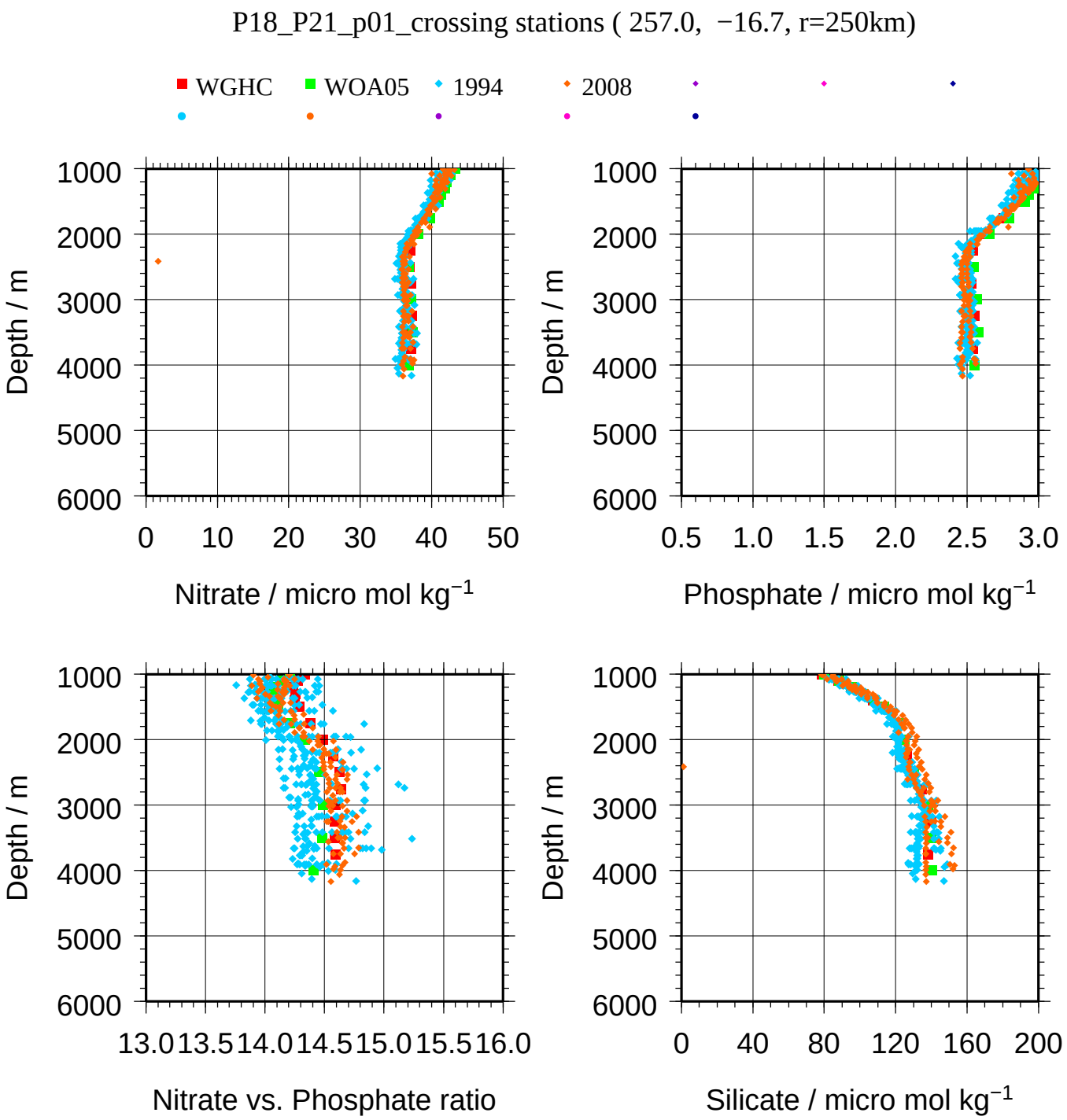

P17_P19_a_p01_crossing stations (272.0, −54.0, r=250km)
WGHC
WOA05
1993
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

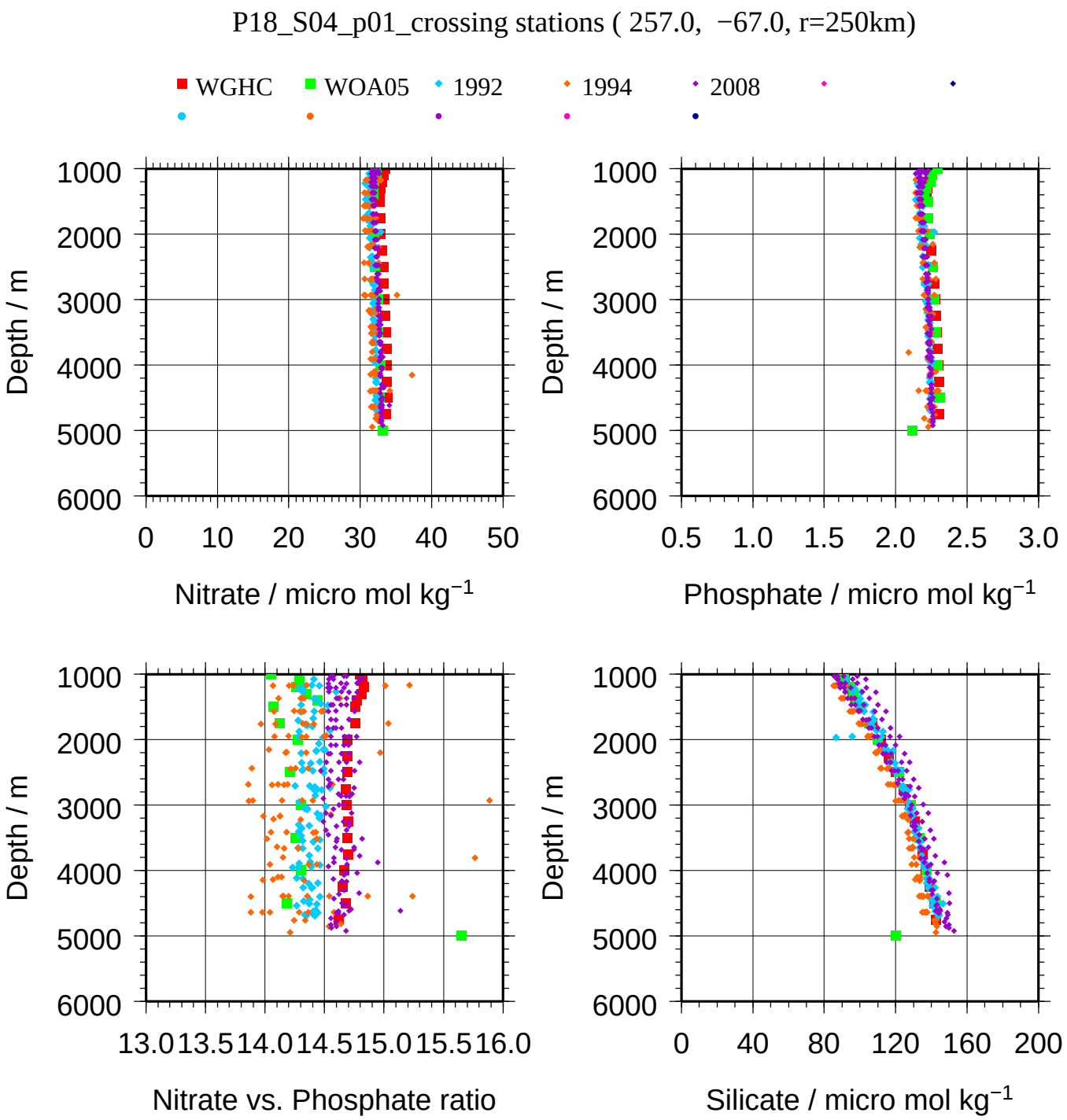

P17_P19_b_p01_crossing stations (272.0, −53.7, r=250km)
WGHC
WOA05
1993
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
80
120
160
200
Silicate / micro mol kg−1

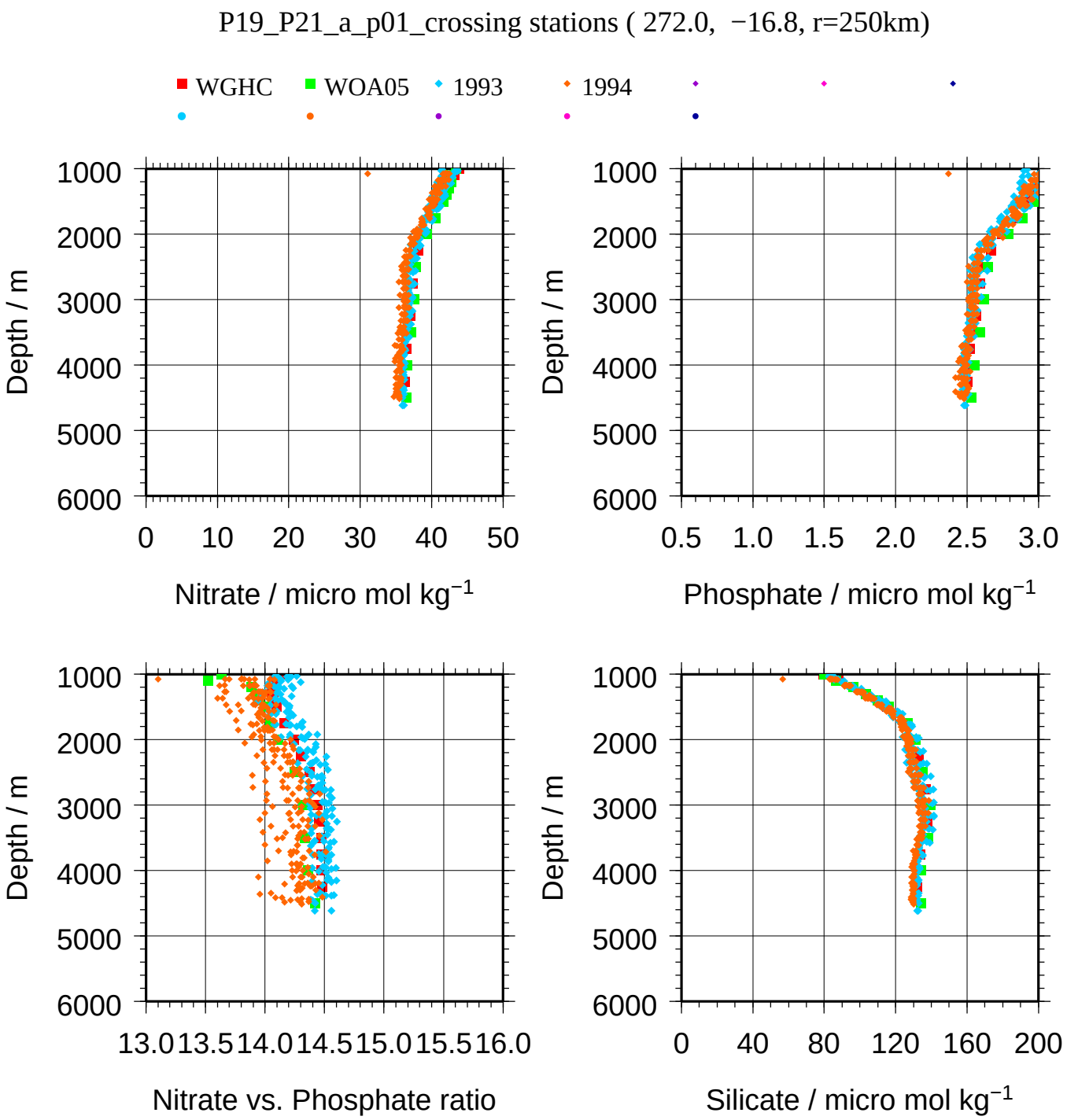

P17_P21_a_p01_crossing stations (225.9, −14.4, r=250km)
WGHC
WOA05
1991
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

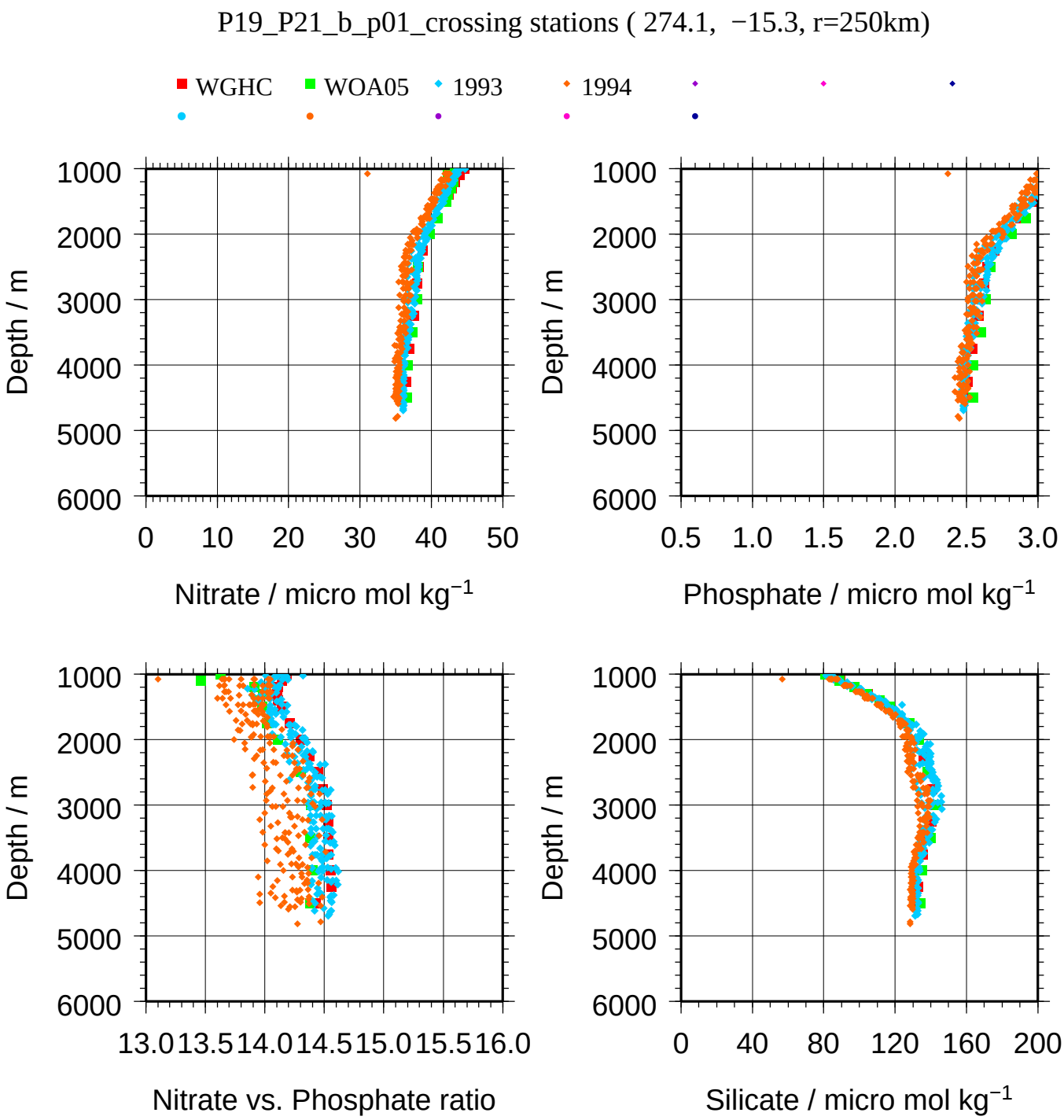

P17_P21_b_p01_crossing stations (227.0, −16.8, r=250km)
WGHC
WOA05
1991
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

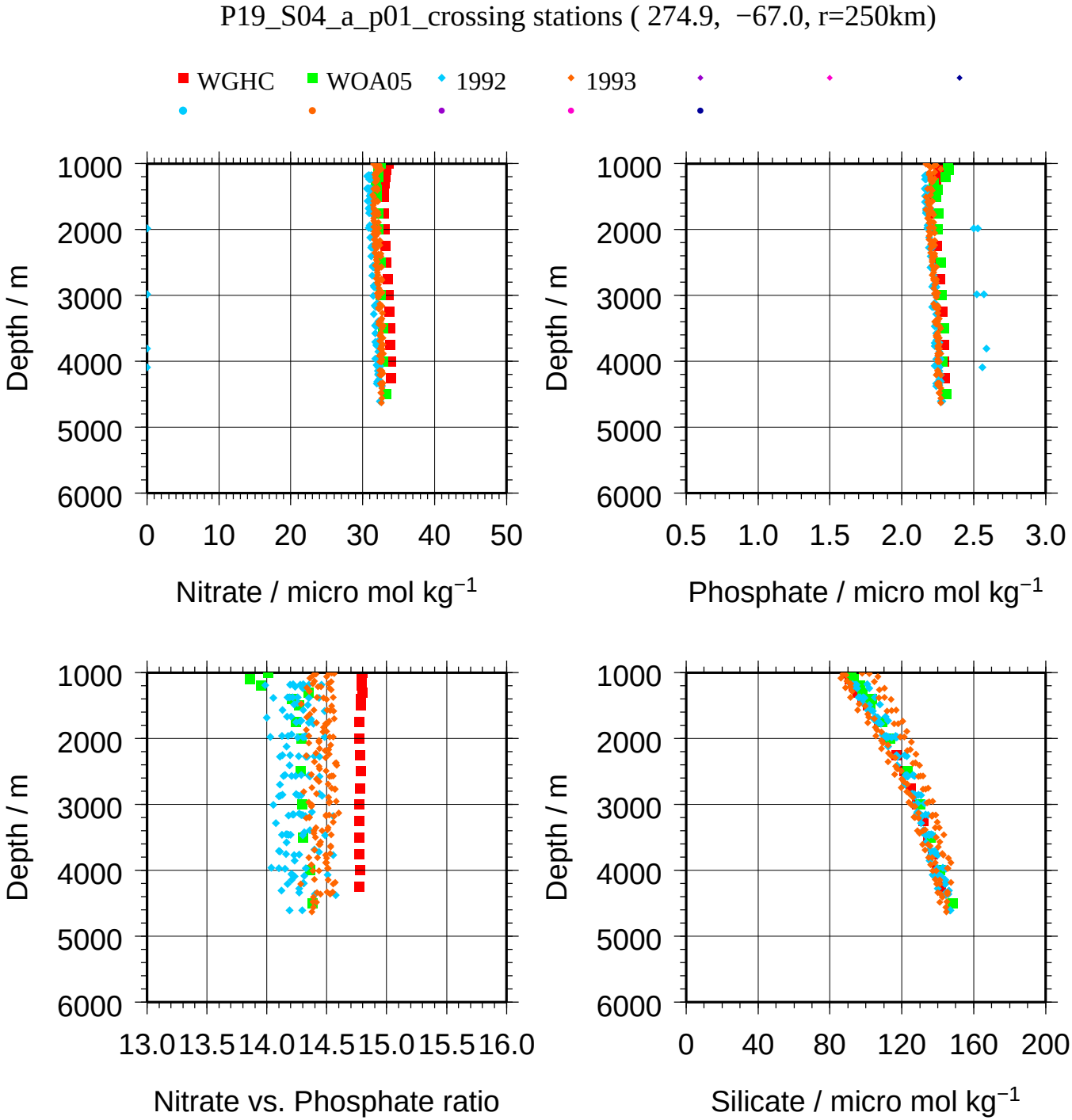

P17_S04_p01_crossing stations (234.0, −67.0, r=250km)
WGHC
WOA05
1992
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

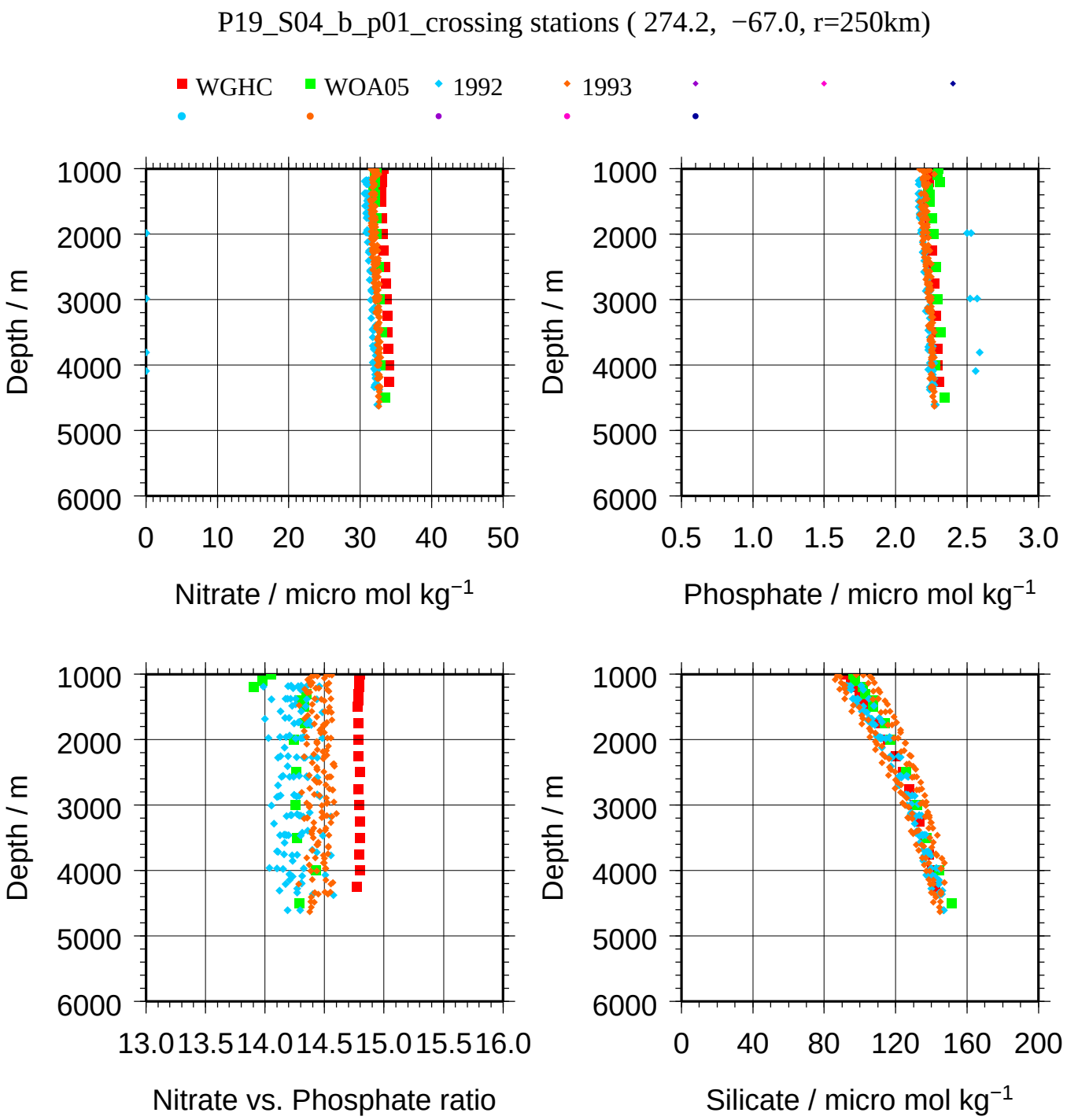

P18_P21_p01_crossing stations (257.0, −16.7, r=250km)
WGHC
WOA05
1994
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

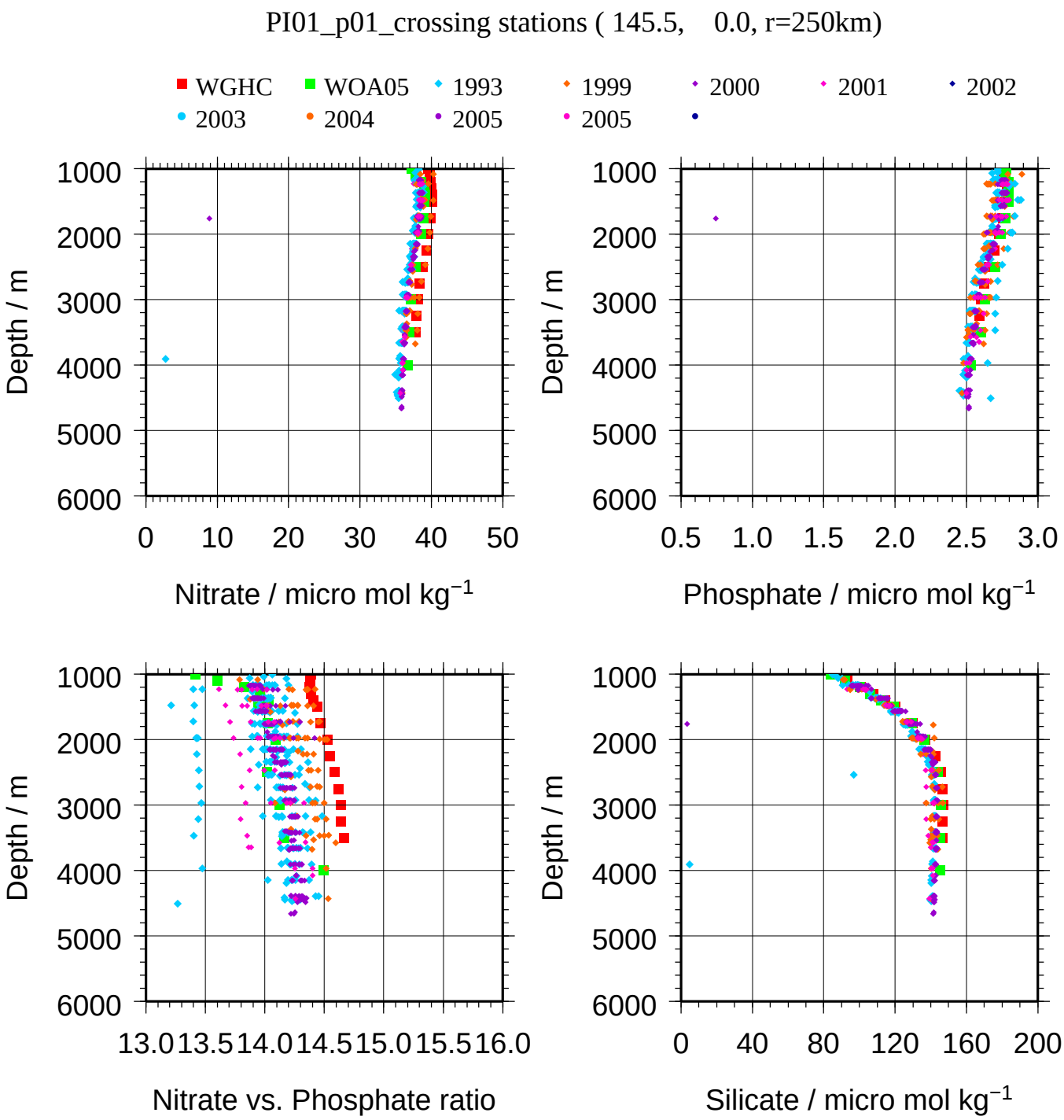

P18_S04_p01_crossing stations (257.0, −67.0, r=250km)
WGHC
WOA05
1992
1994
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

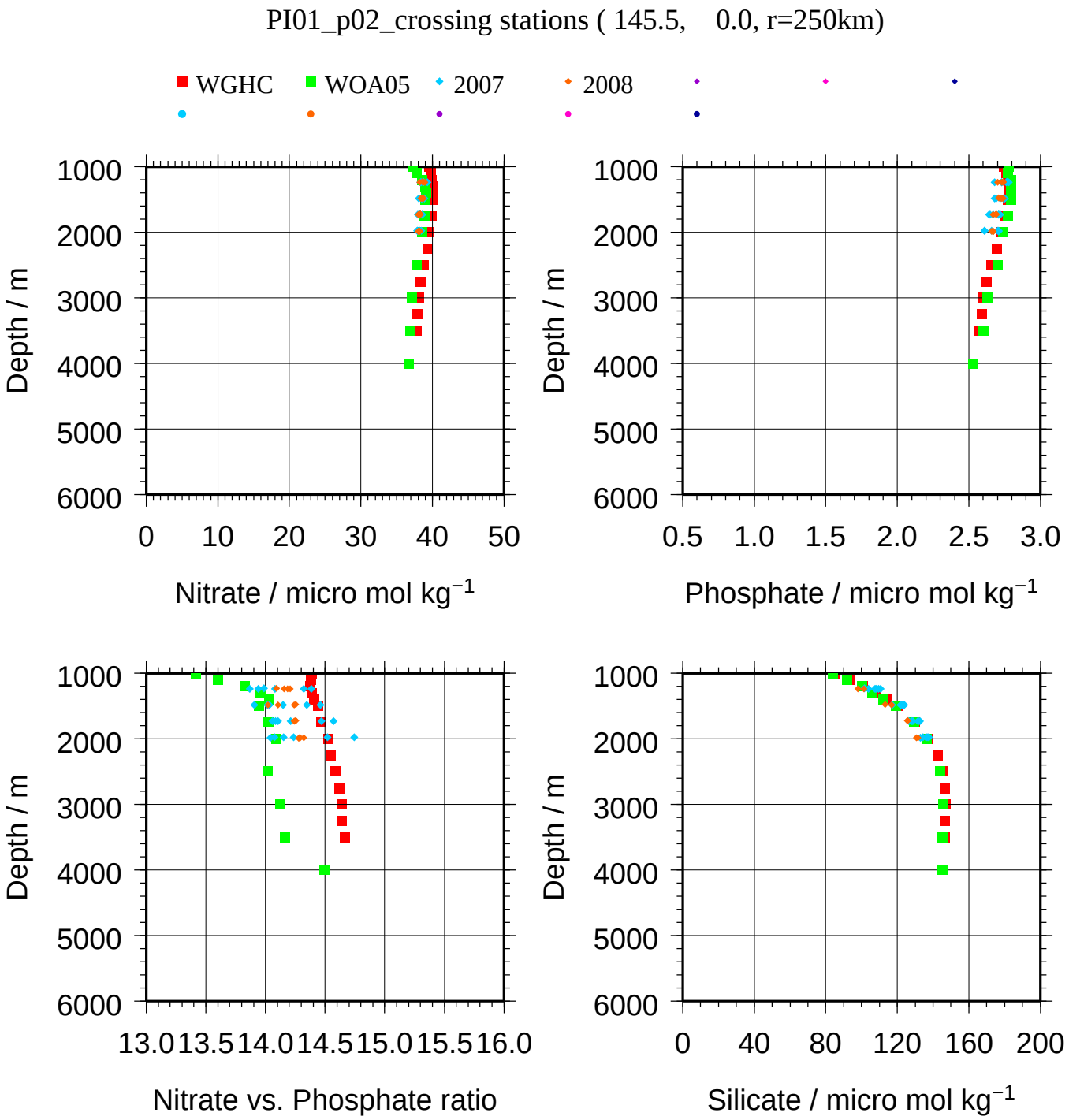

P19_P21_a_p01_crossing stations (272.0, −16.8, r=250km)
WGHC
WOA05
1993
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

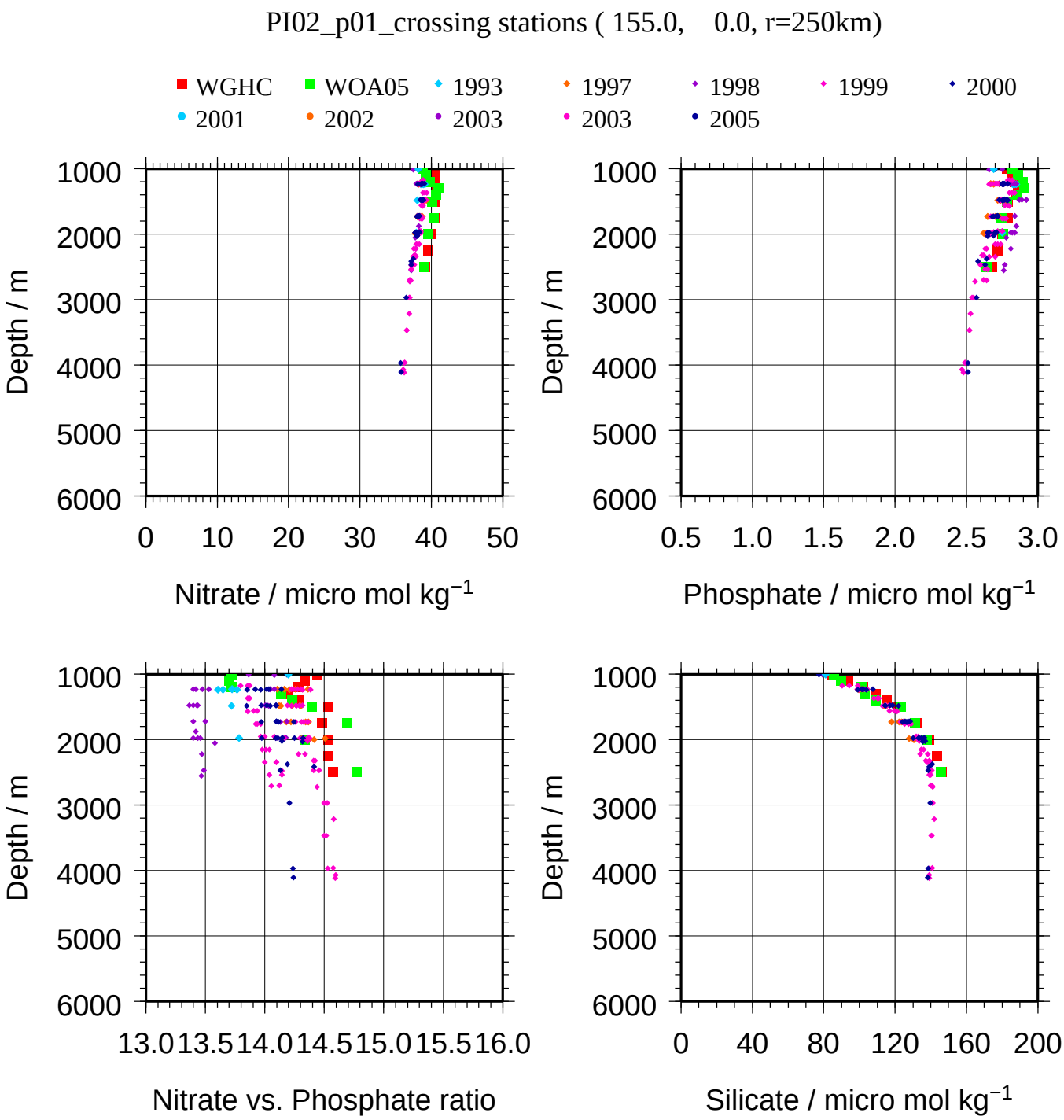

P19_P21_b_p01_crossing stations (274.1, −15.3, r=250km)
WGHC
WOA05
1993
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

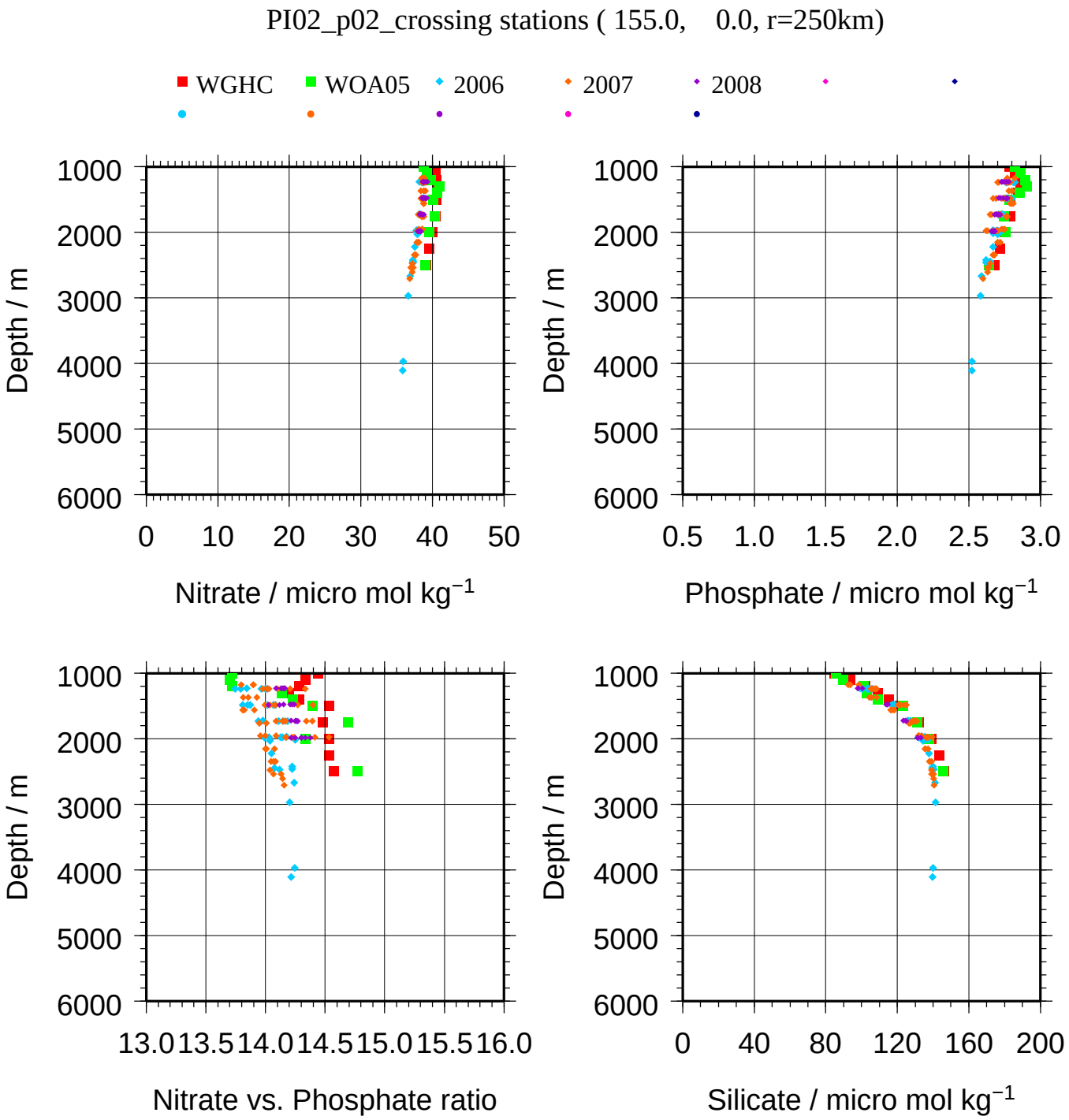

P19_S04_a_p01_crossing stations (274.9, −67.0, r=250km)
WGHC
WOA05
1992
1993
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

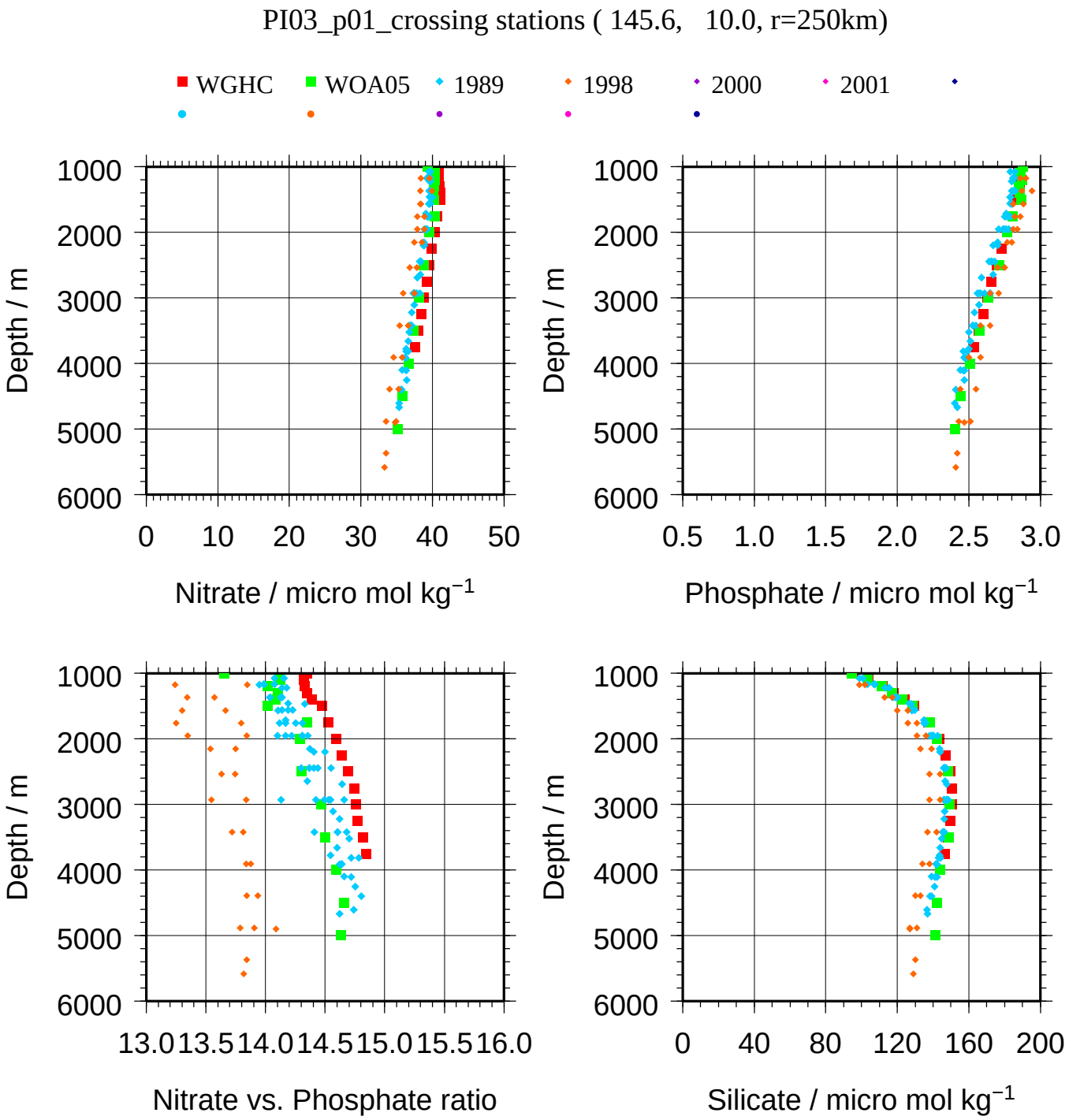

P19_S04_b_p01_crossing stations (274.2, −67.0, r=250km)
WGHC
WOA05
1992
1993
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

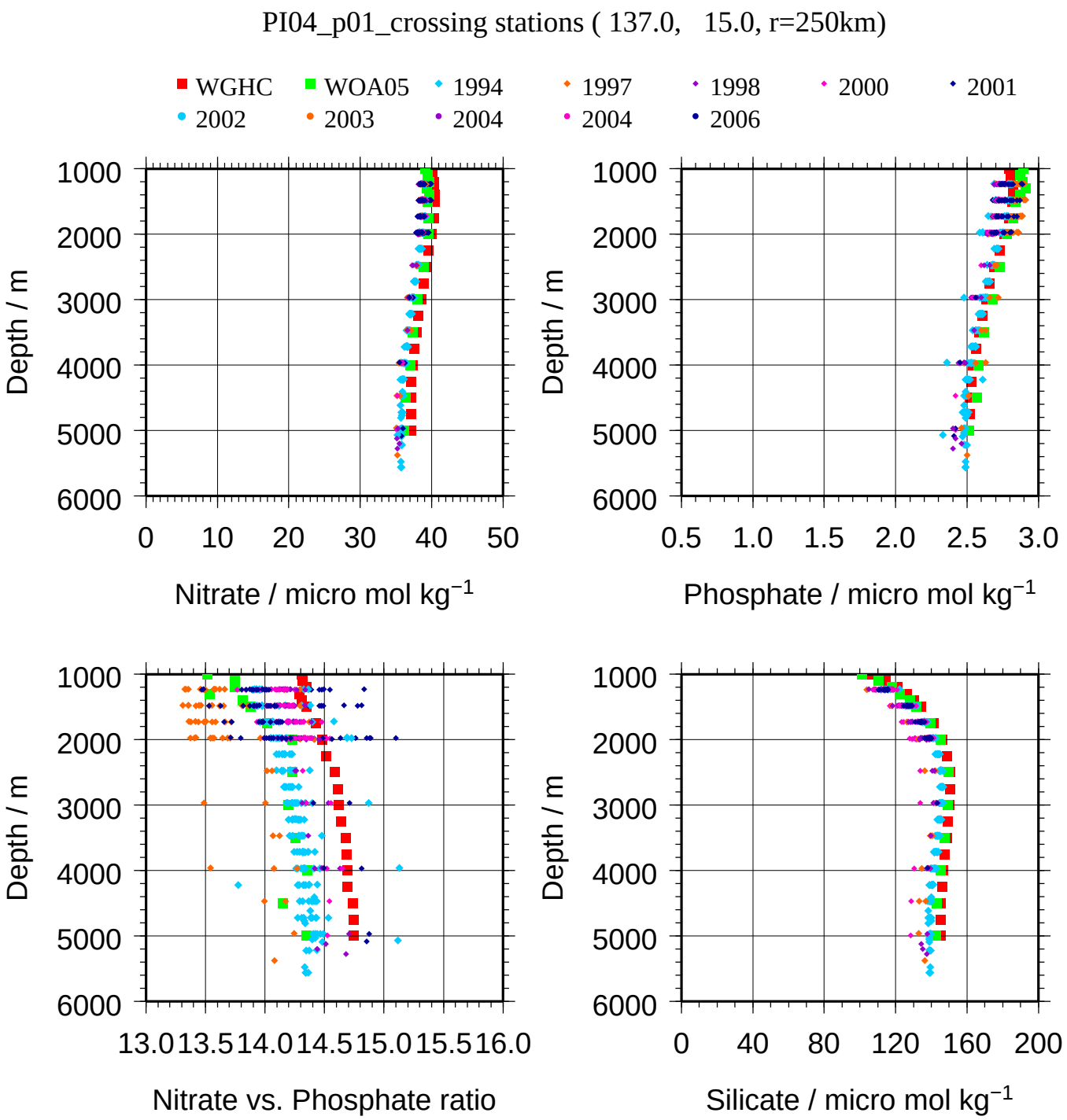

PI01_p01_crossing stations (145.5, 0.0, r=250km)
WGHC
WOA05
1993
1999
2000
2001
2002
2003
2004
2005
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1


PI01_p02_crossing stations (145.5, 0.0, r=250km)
WGHC
WOA05
2007
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

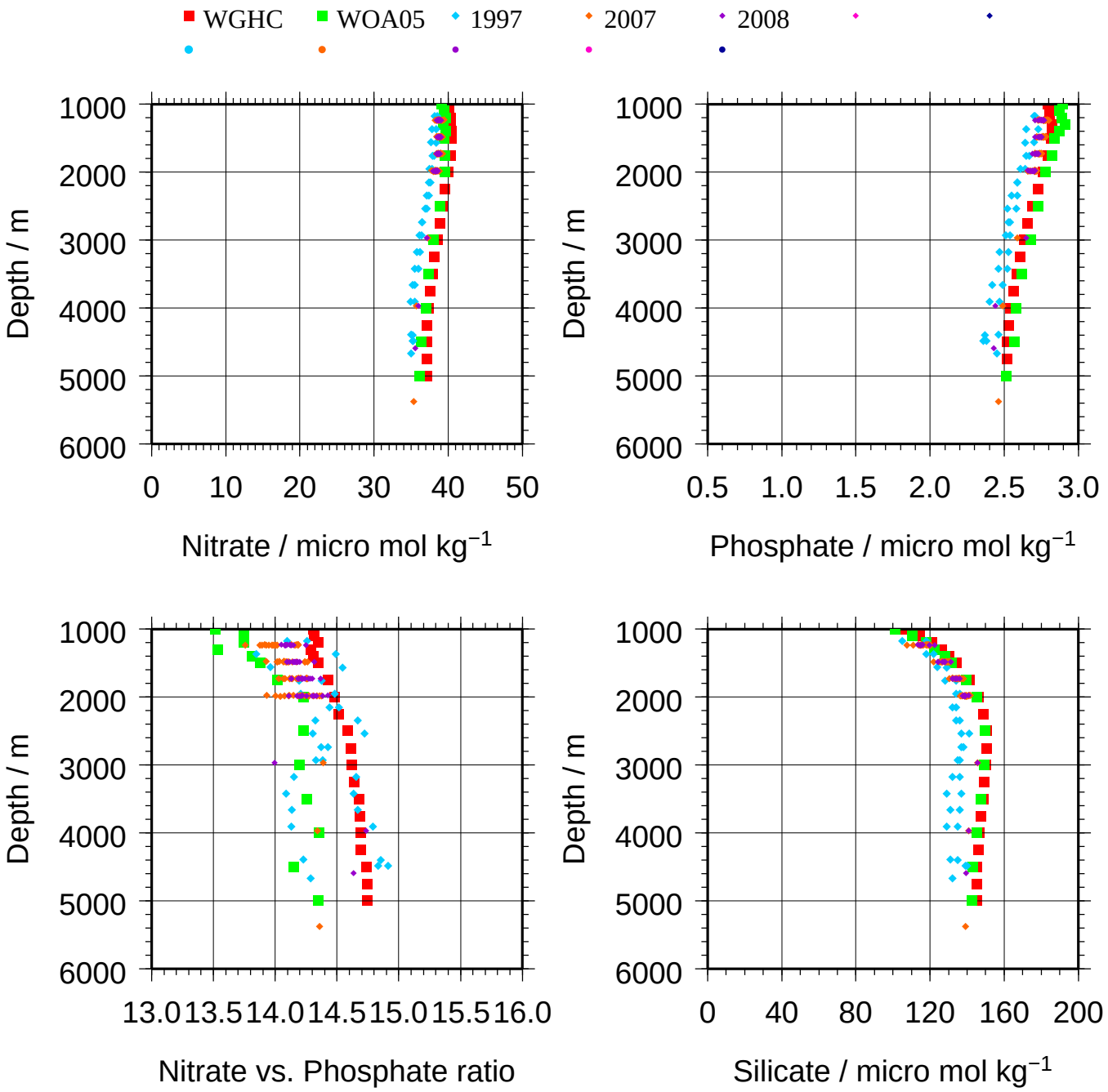

PI02_p01_crossing stations (155.0, 0.0, r=250km)
WGHC
WOA05
1993
1997
1998
1999
2000
2001
2002
2003
2003
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

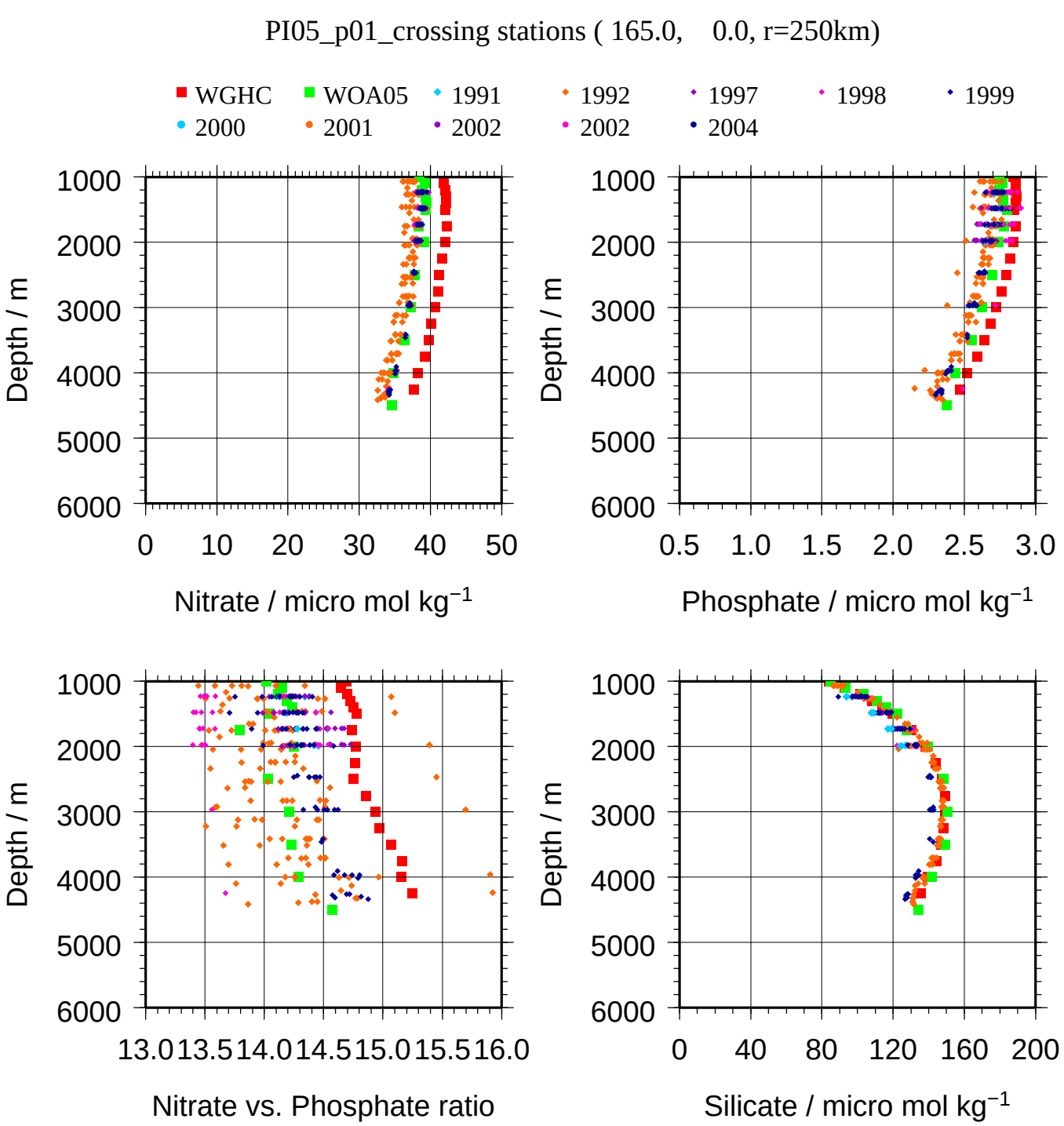

PI02_p02_crossing stations (155.0, 0.0, r=250km)
WGHC
WOA05
2006
2007
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

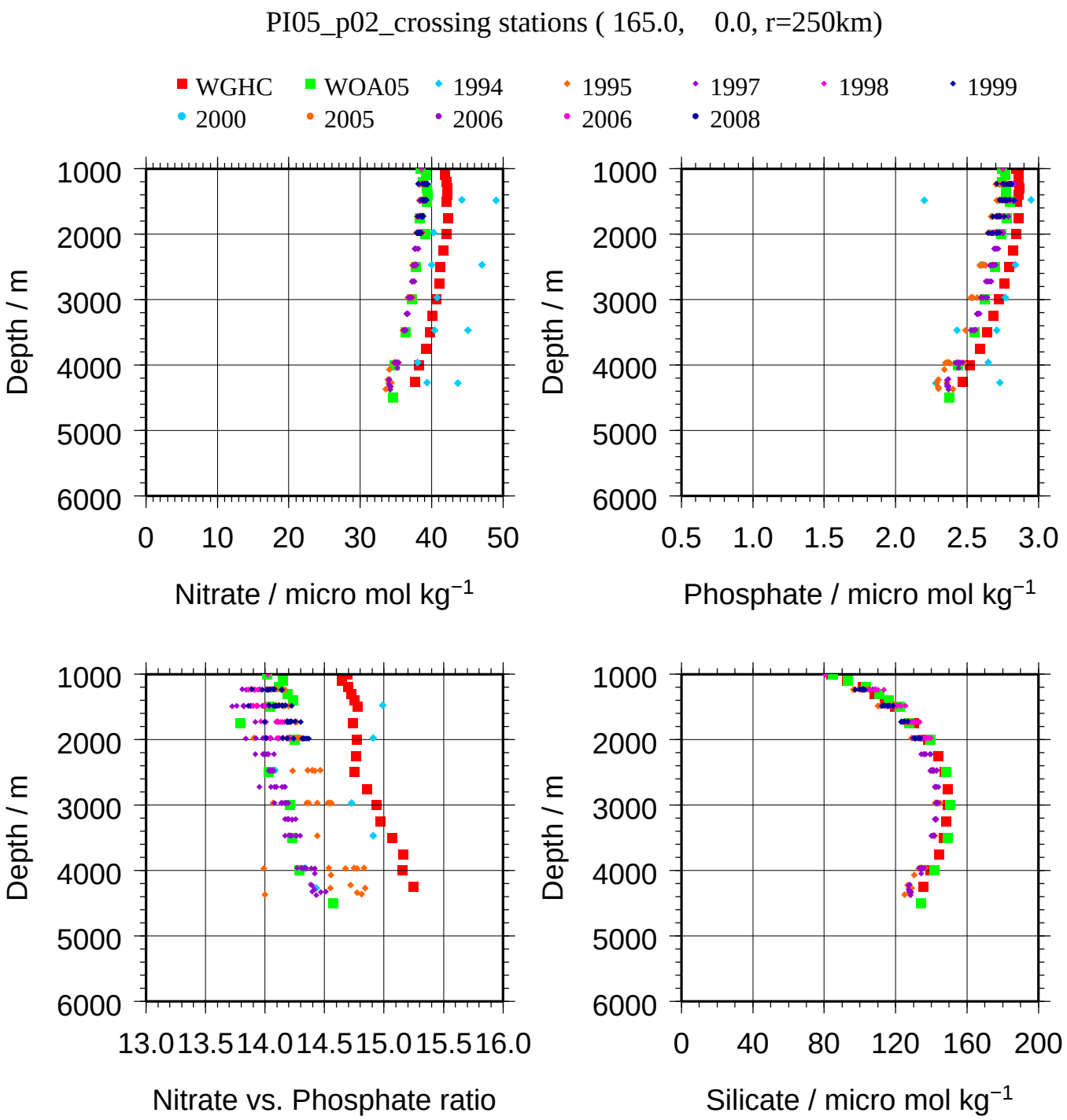

PI03_p01_crossing stations (145.6, 10.0, r=250km)
WGHC
WOA05
1989
1998
2000
2001
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

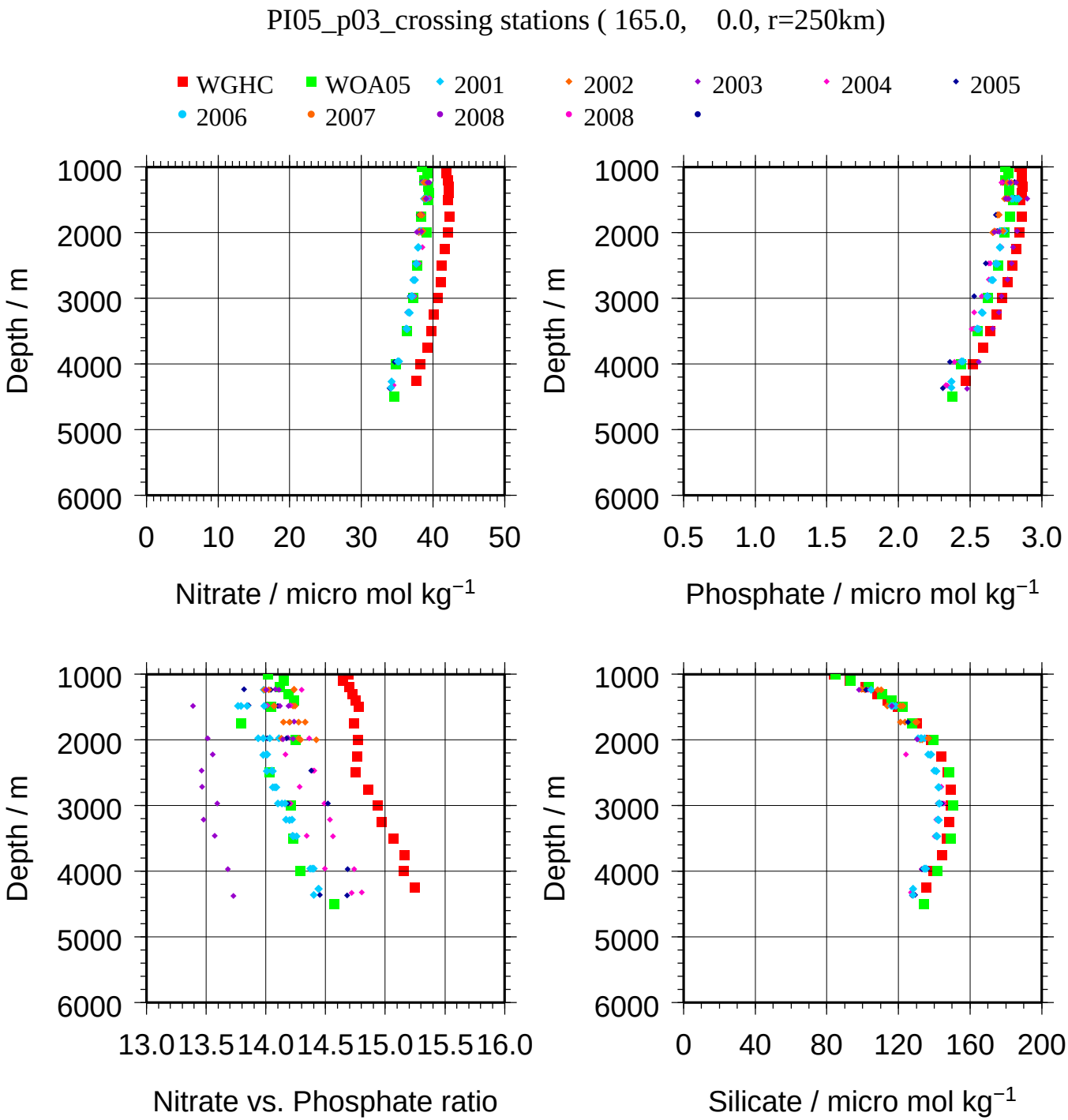

PI04_p01_crossing stations (137.0, 15.0, r=250km)
WGHC
WOA05
1994
1997
1998
2000
2001
2002
2003
2004
2004
2006
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

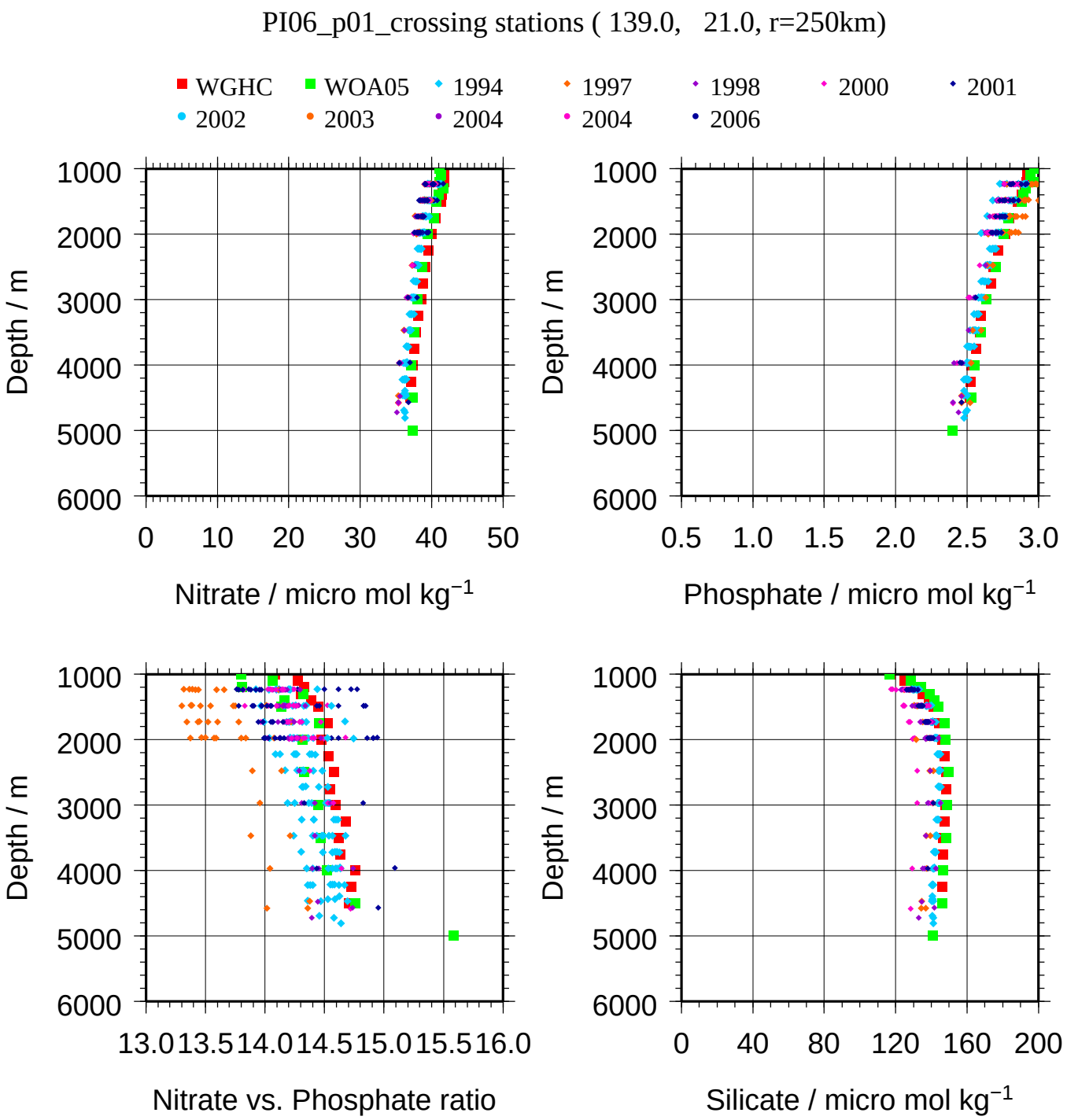
PI04_p02_crossing stations (137.0, 15.0, r=250km)

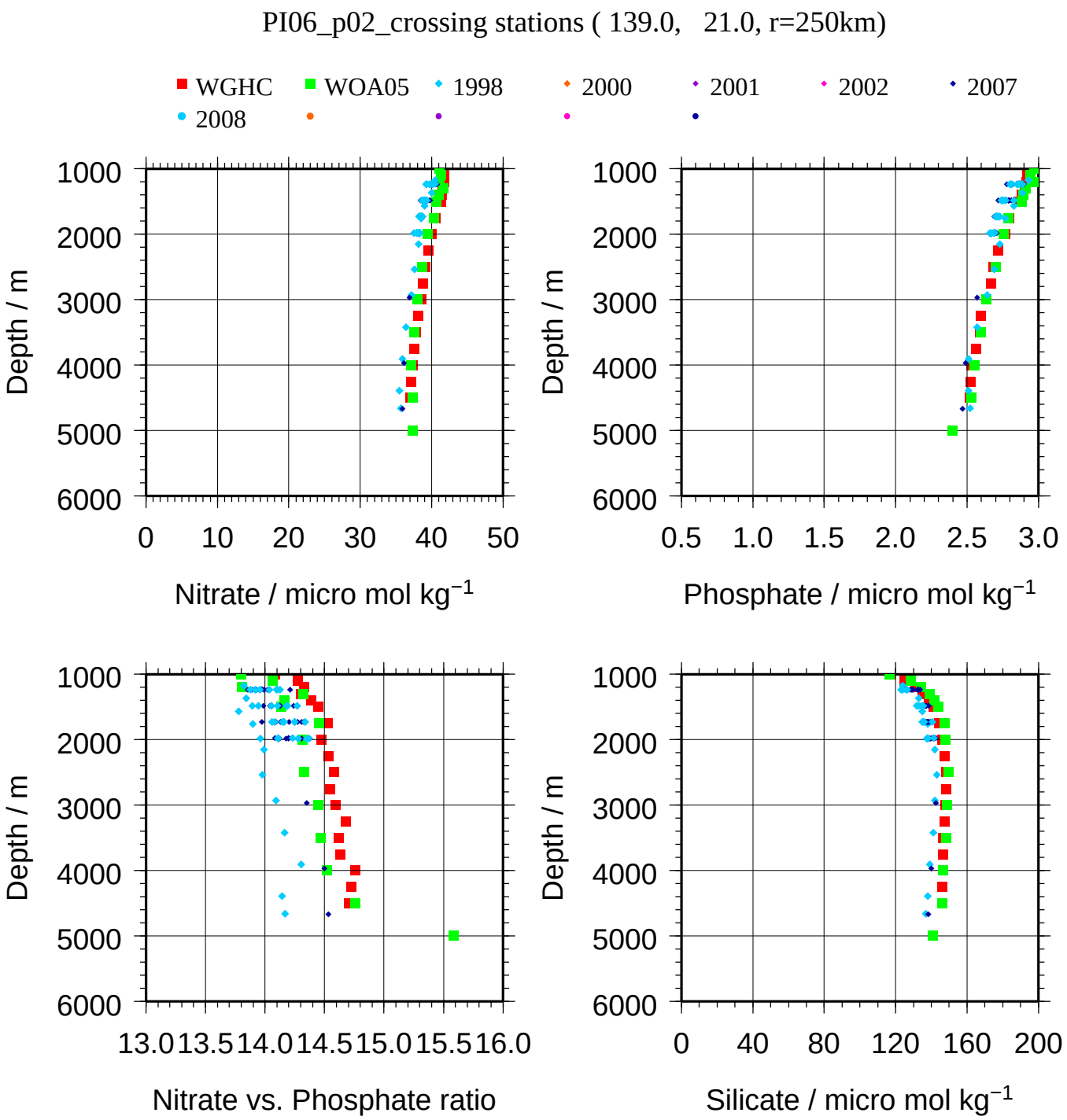


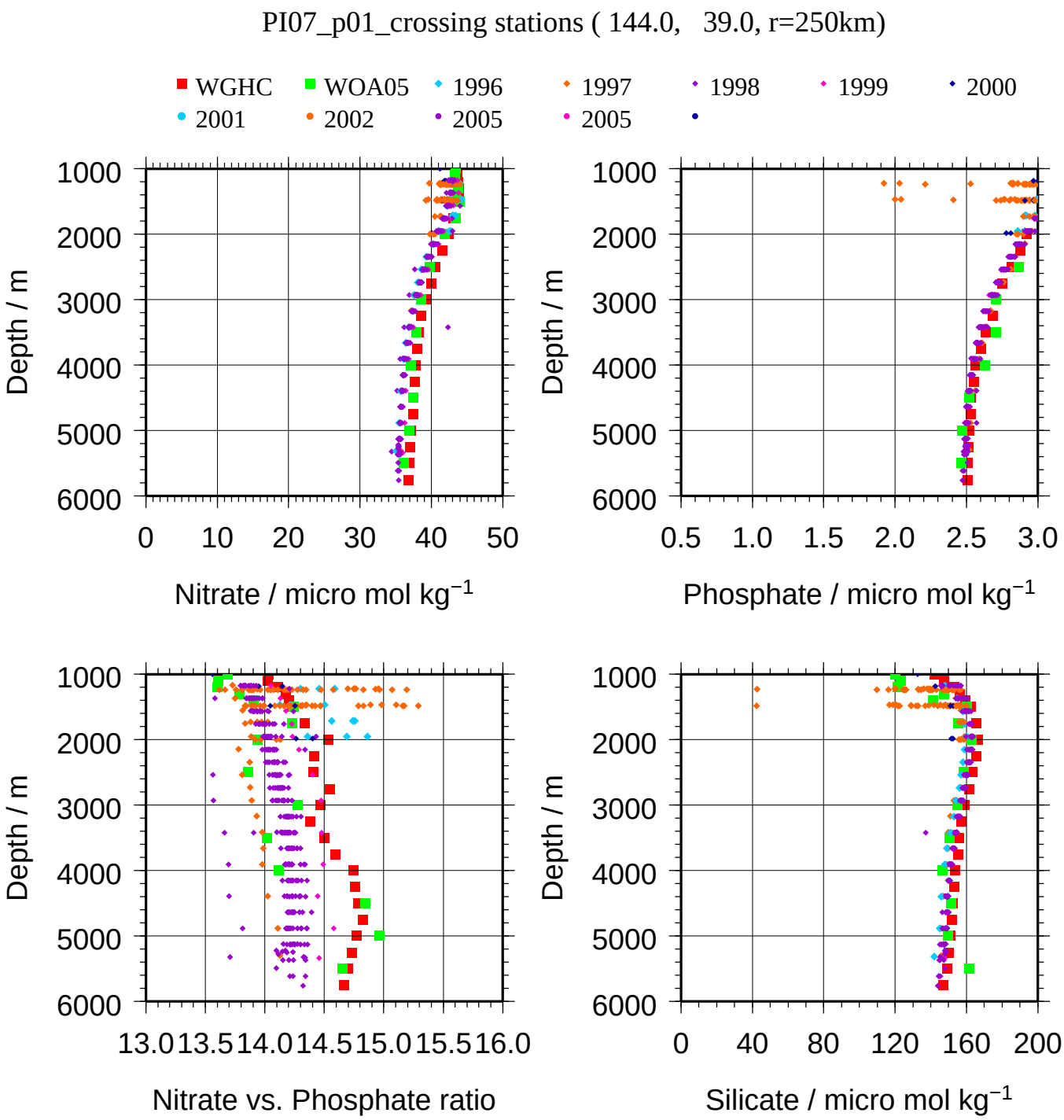

PI05_p01_crossing stations (165.0, 0.0, r=250km)
WGHC
WOA05
1991
1992
1997
1998
1999
2000
2001
2002
2002
2004
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

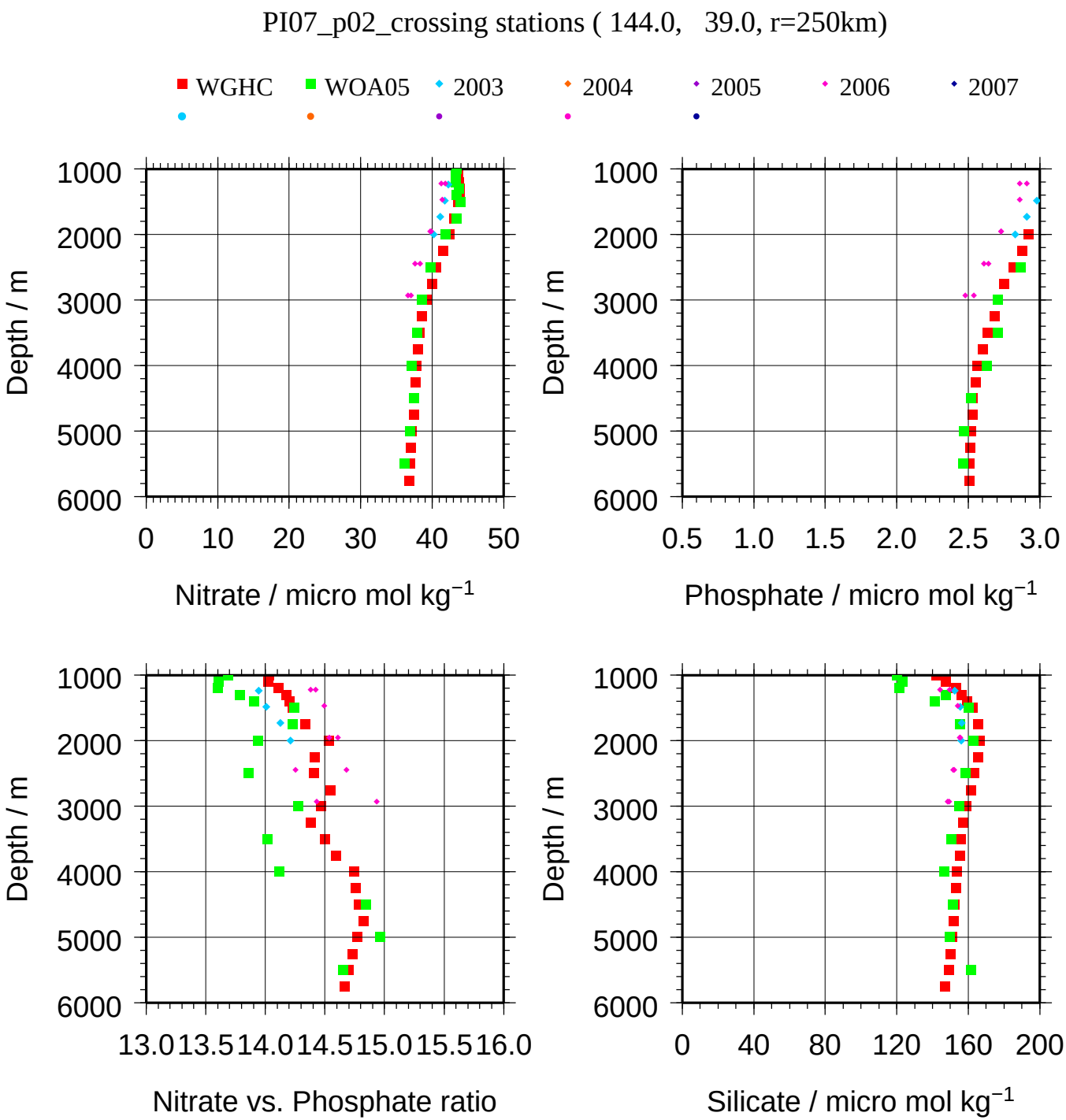

PI05_p02_crossing stations (165.0, 0.0, r=250km)
WGHC
WOA05
1994
1995
1997
1998
1999
2000
2005
2006
2006
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

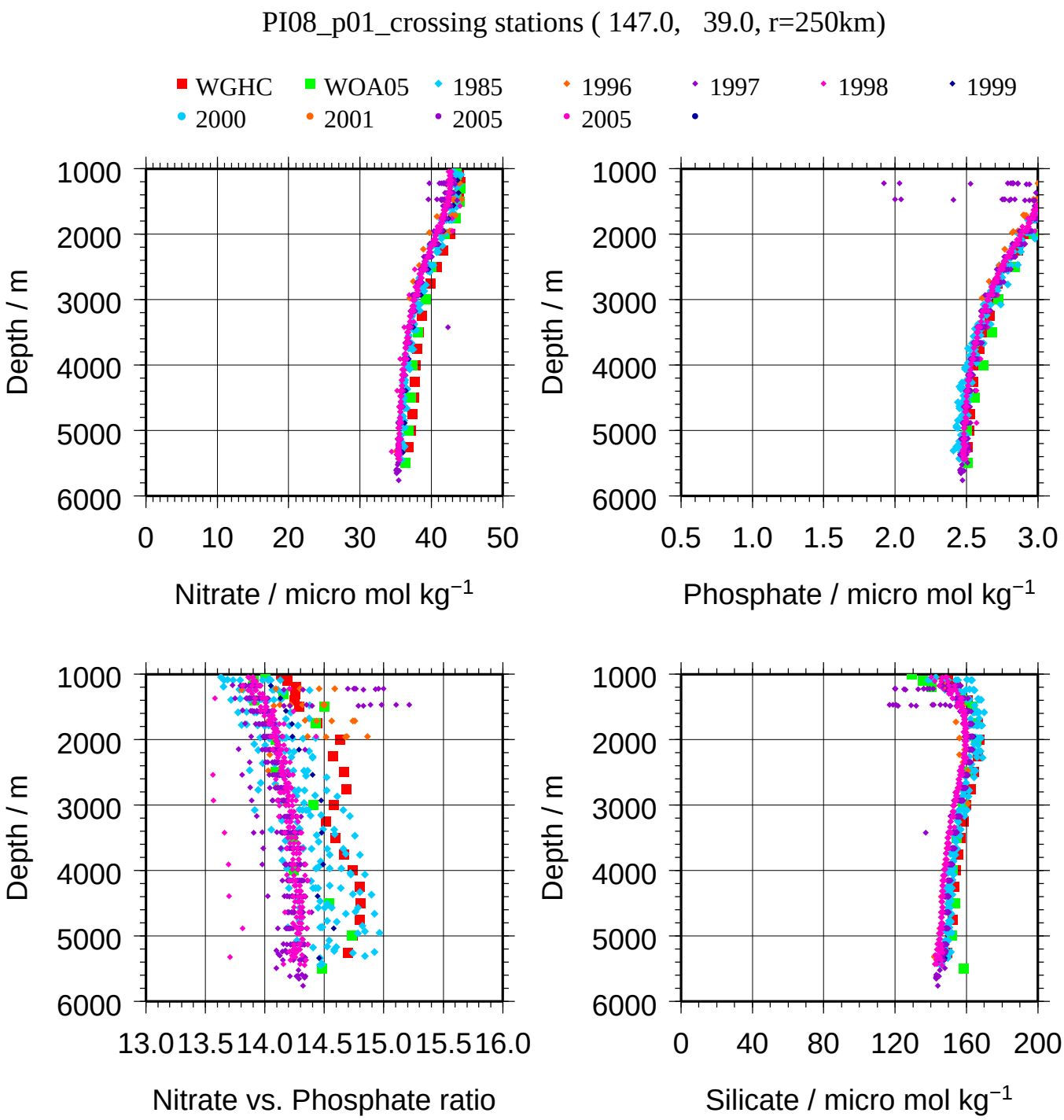

PI05_p03_crossing stations (165.0, 0.0, r=250km)
WGHC
WOA05
2001
2002
2003
2004
2005
2006
2007
2008
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

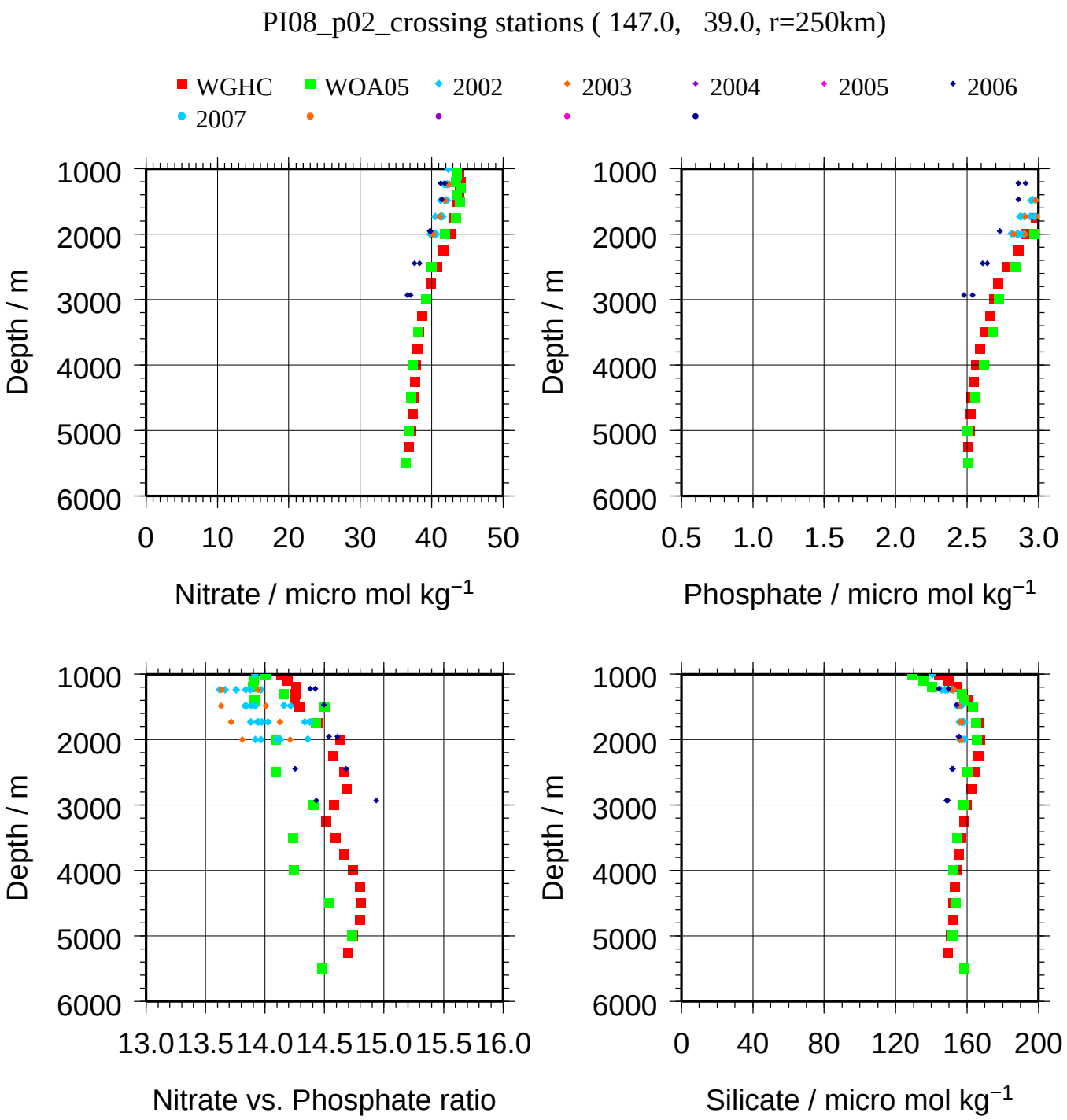

PI06_p01_crossing stations (139.0, 21.0, r=250km)
WGHC
WOA05
1994
1997
1998
2000
2001
2002
2003
2004
2004
2006
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

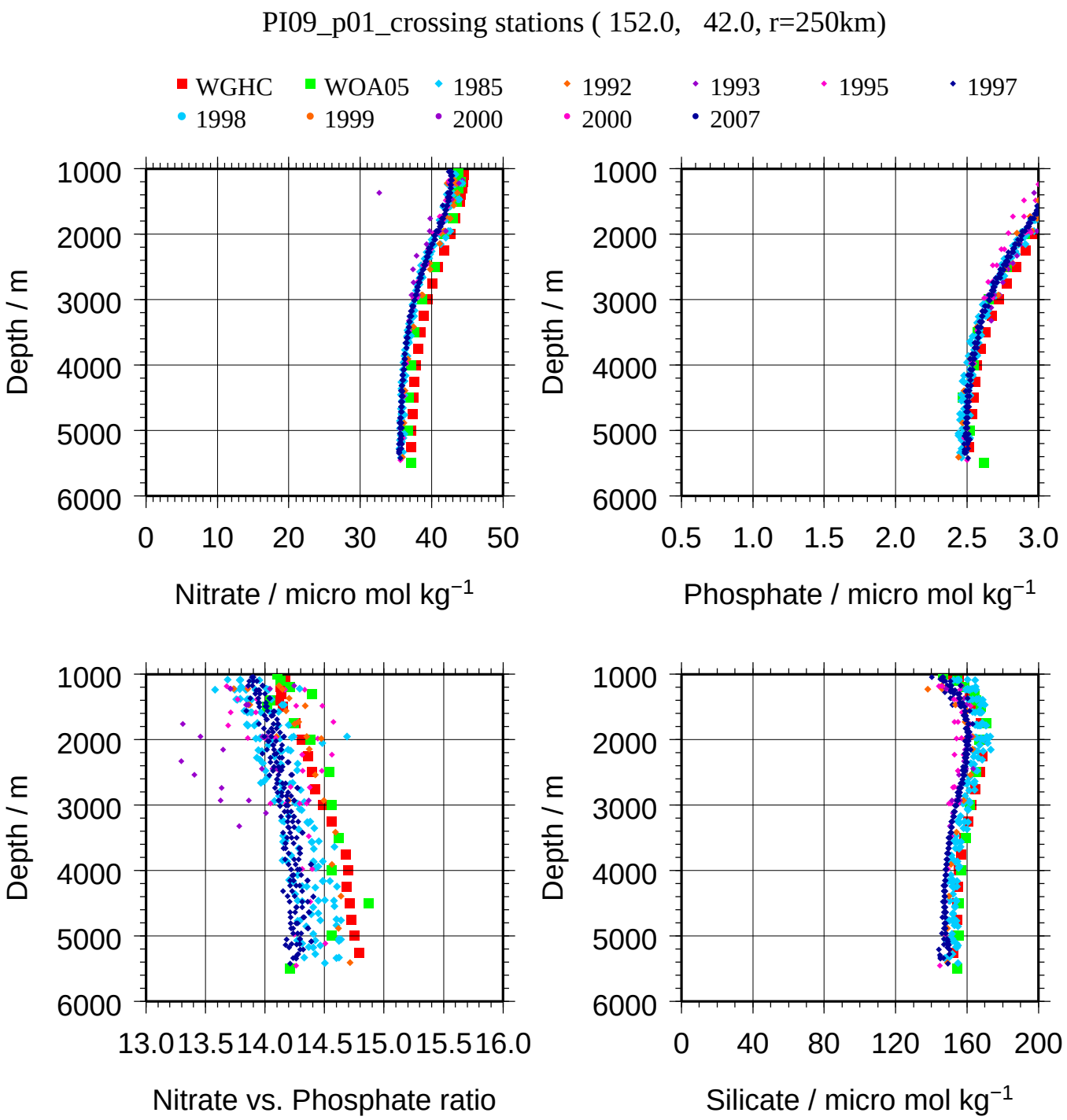

PI06_p02_crossing stations (139.0, 21.0, r=250km)
WGHC
WOA05
1998
2000
2001
2002
2007
2008
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

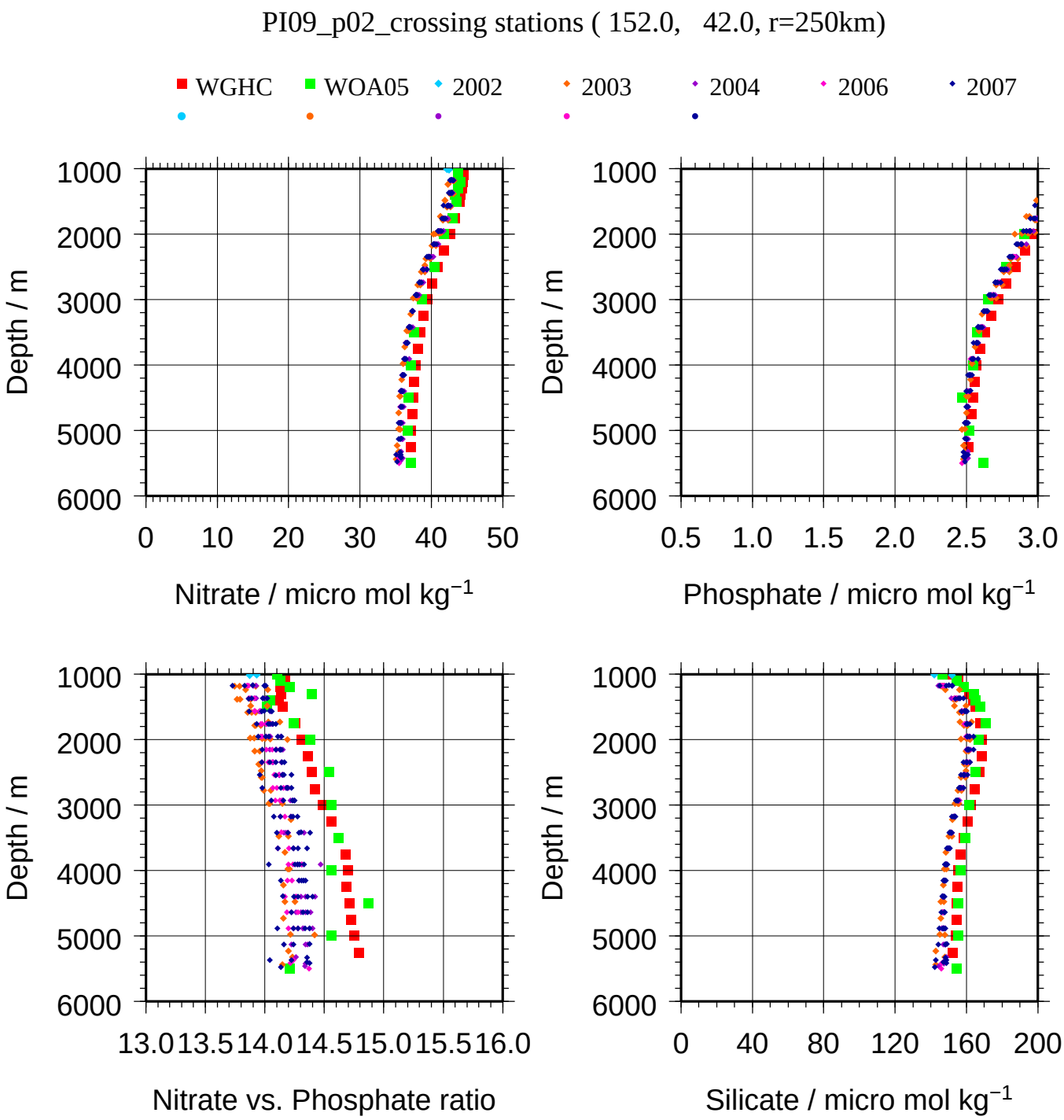

PI07_p01_crossing stations (144.0, 39.0, r=250km)
WGHC
WOA05
1996
1997
1998
1999
2000
2001
2002
2005
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

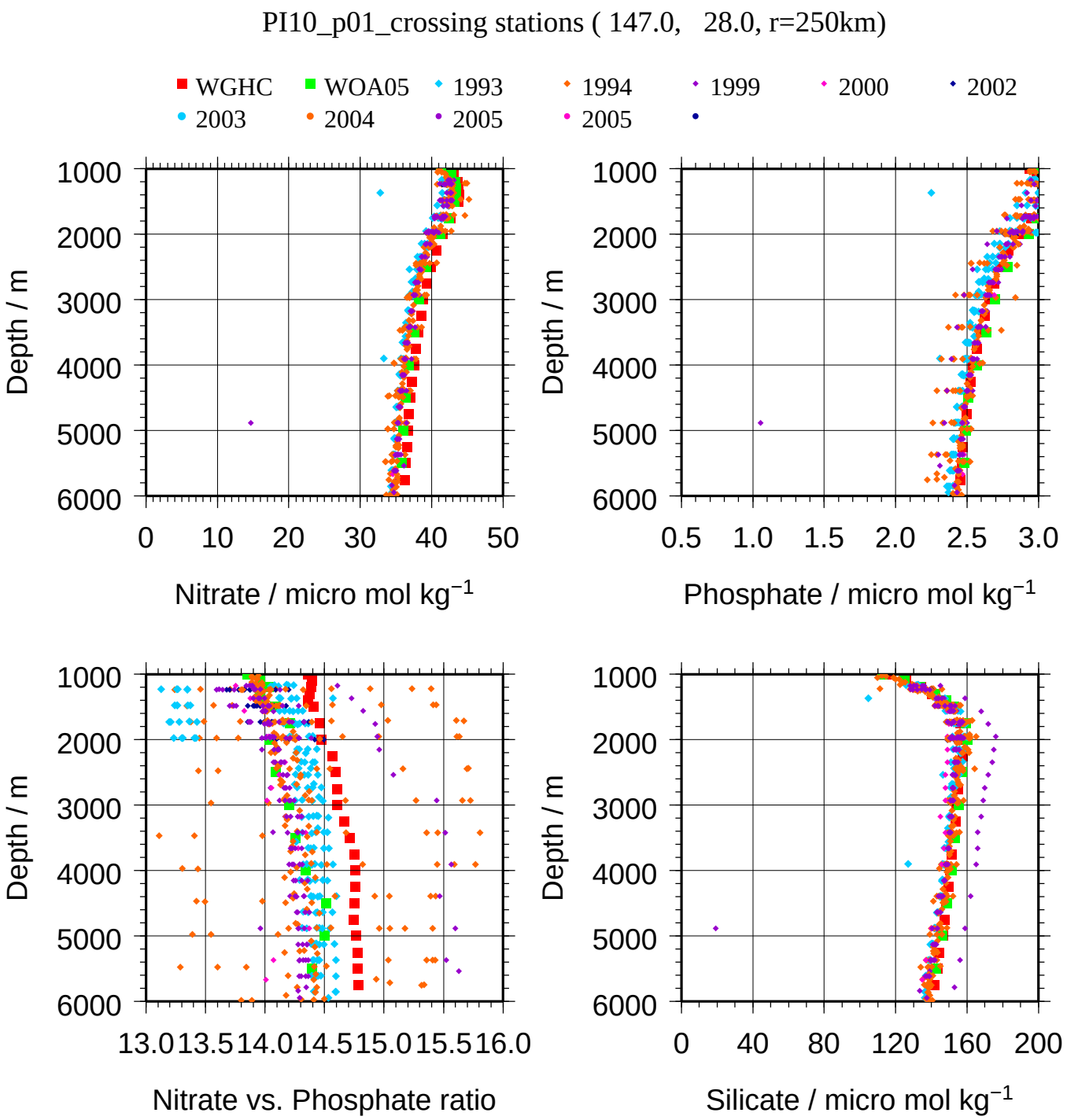

PI07_p02_crossing stations (144.0, 39.0, r=250km)
WGHC
WOA05
2003
2004
2005
2006
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

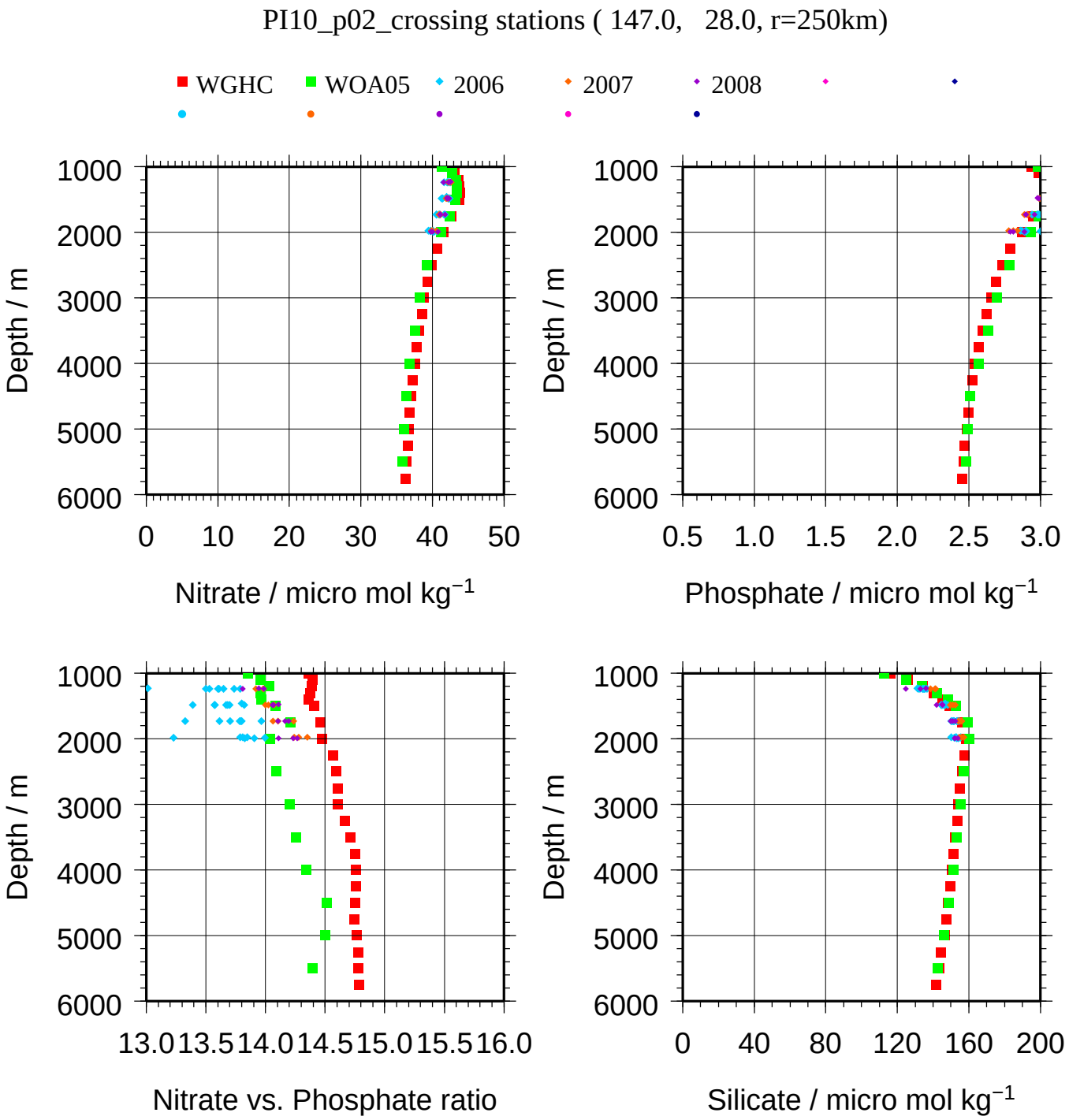

PI08_p01_crossing stations (147.0, 39.0, r=250km)
WGHC
WOA05
1985
1996
1997
1998
1999
2000
2001
2005
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

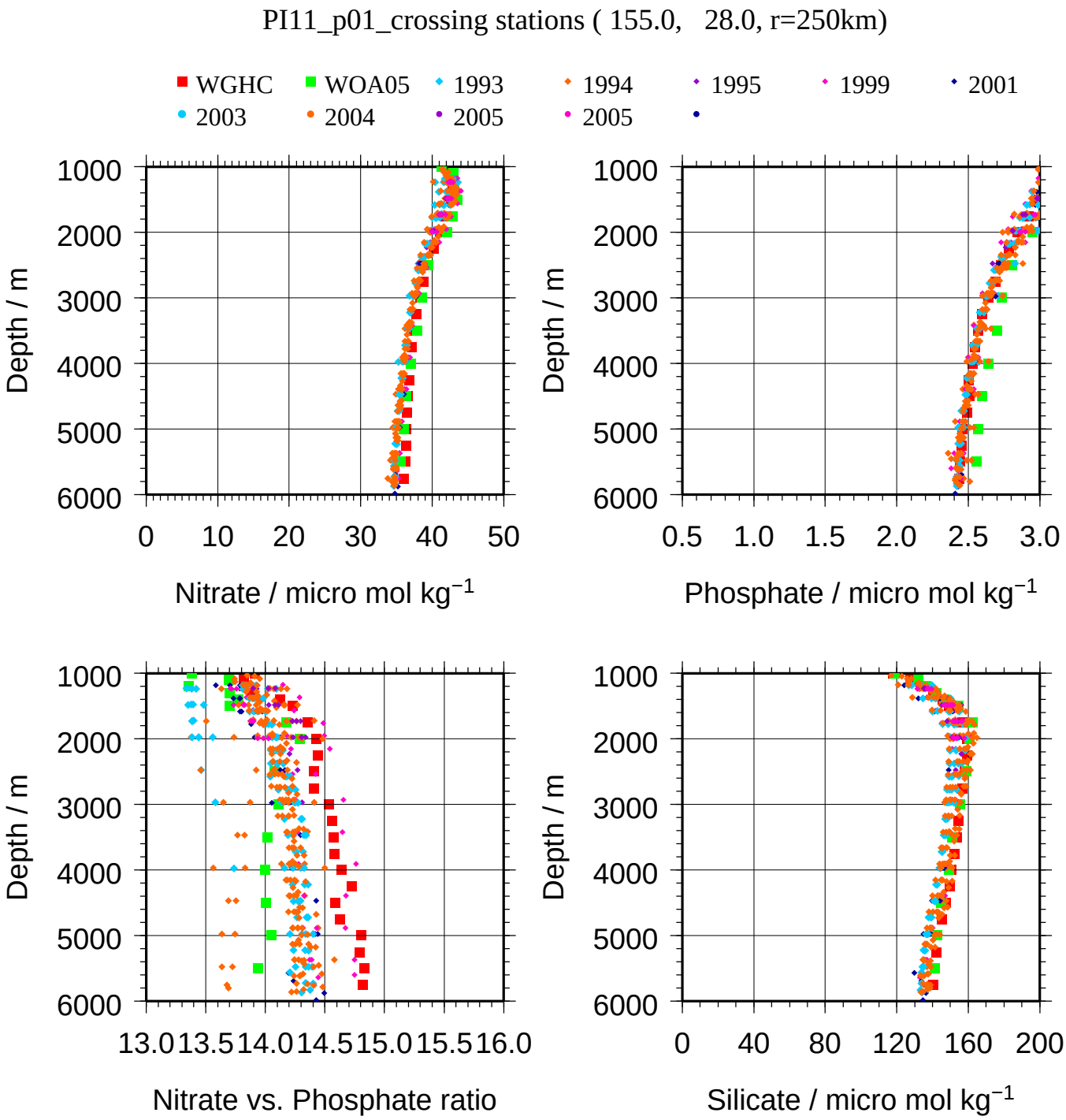

PI08_p02_crossing stations (147.0, 39.0, r=250km)
WGHC
WOA05
2002
2003
2004
2005
2006
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

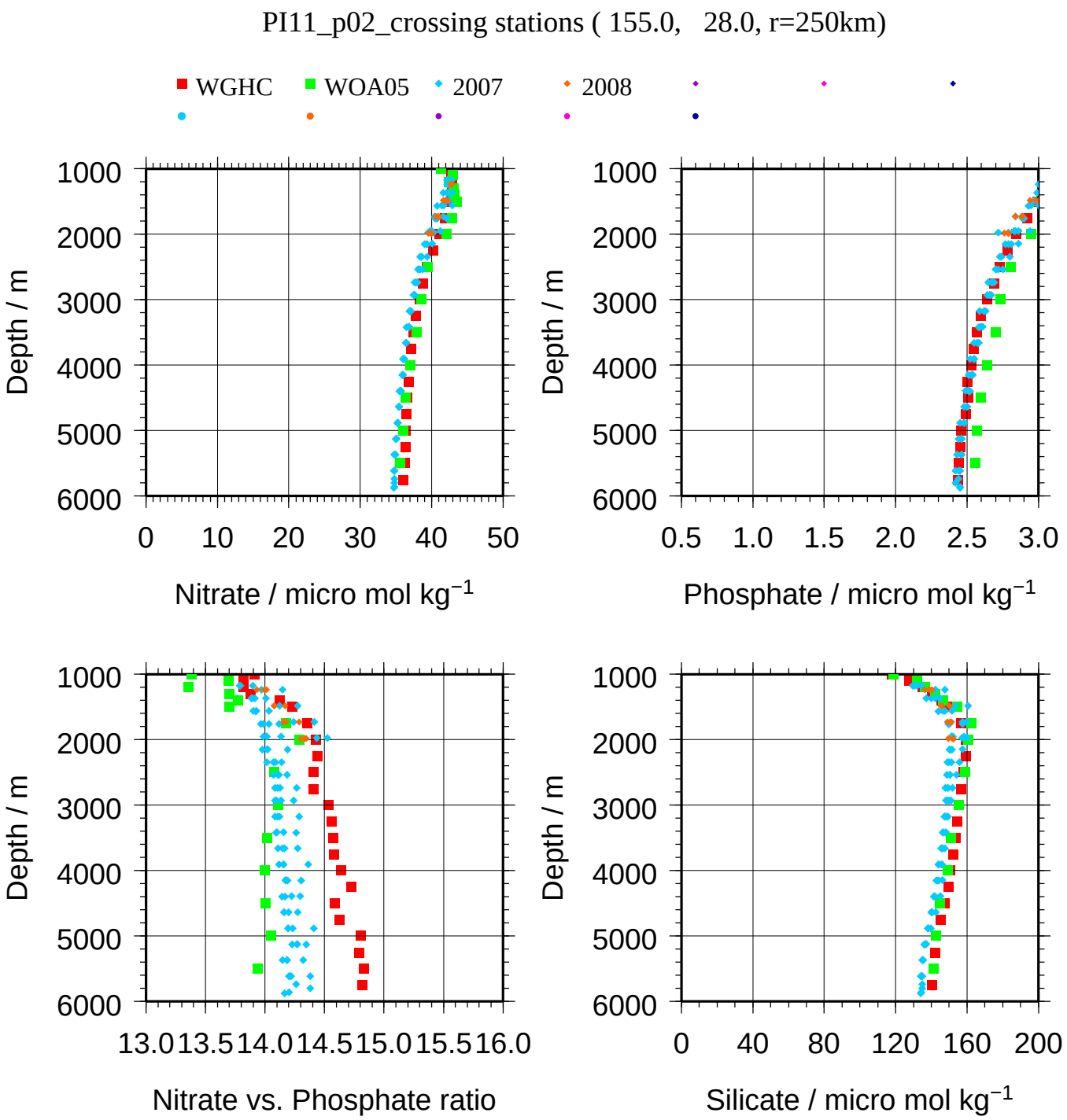

PI09_p01_crossing stations (152.0, 42.0, r=250km)
WGHC
WOA05
1985
1992
1993
1995
1997
1998
1999
2000
2000
2007
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

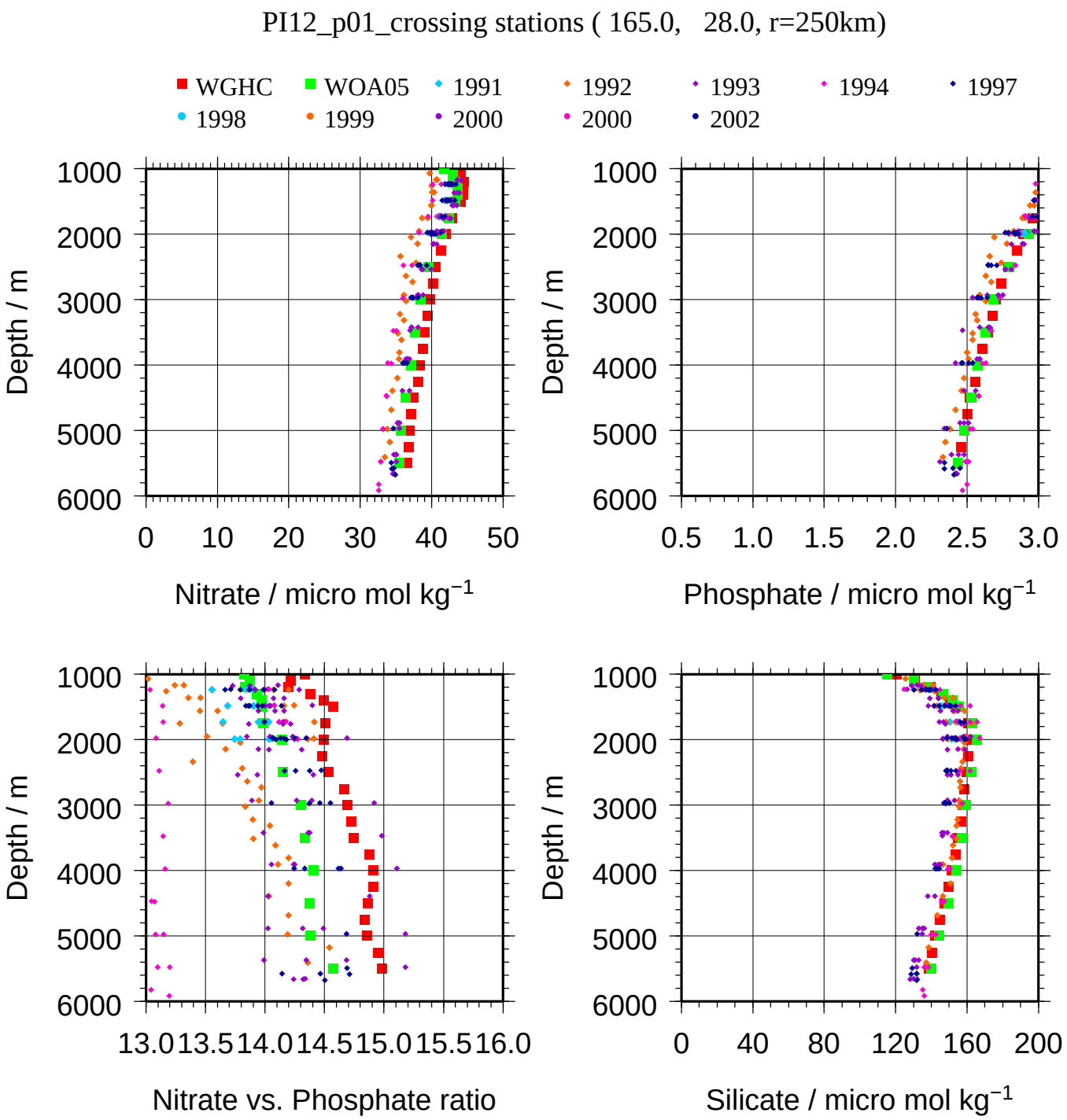

PI09_p02_crossing stations (152.0, 42.0, r=250km)
WGHC
WOA05
2002
2003
2004
2006
2007
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

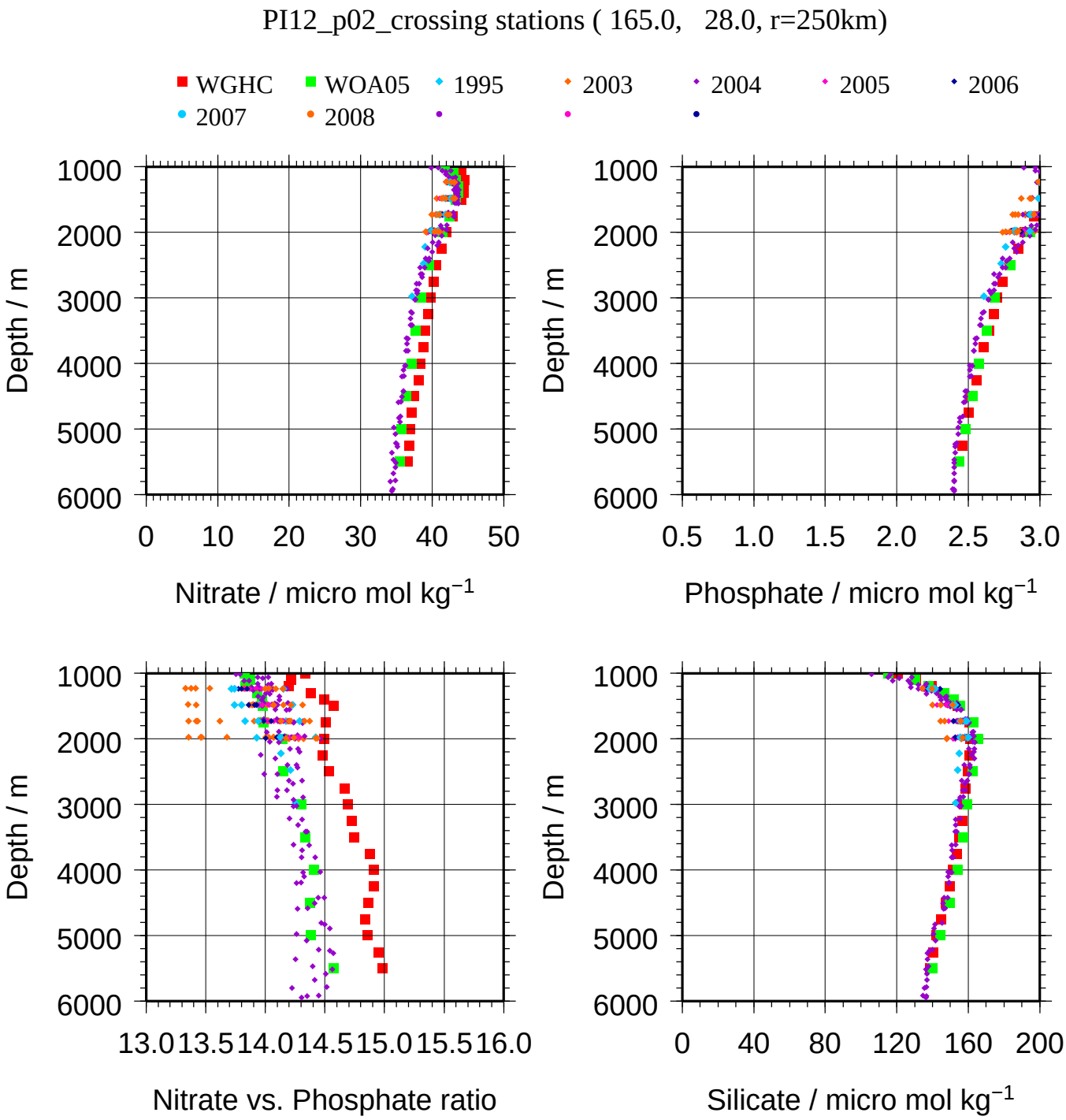

PI10_p01_crossing stations (147.0, 28.0, r=250km)
WGHC
WOA05
1993
1994
1999
2000
2002
2003
2004
2005
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

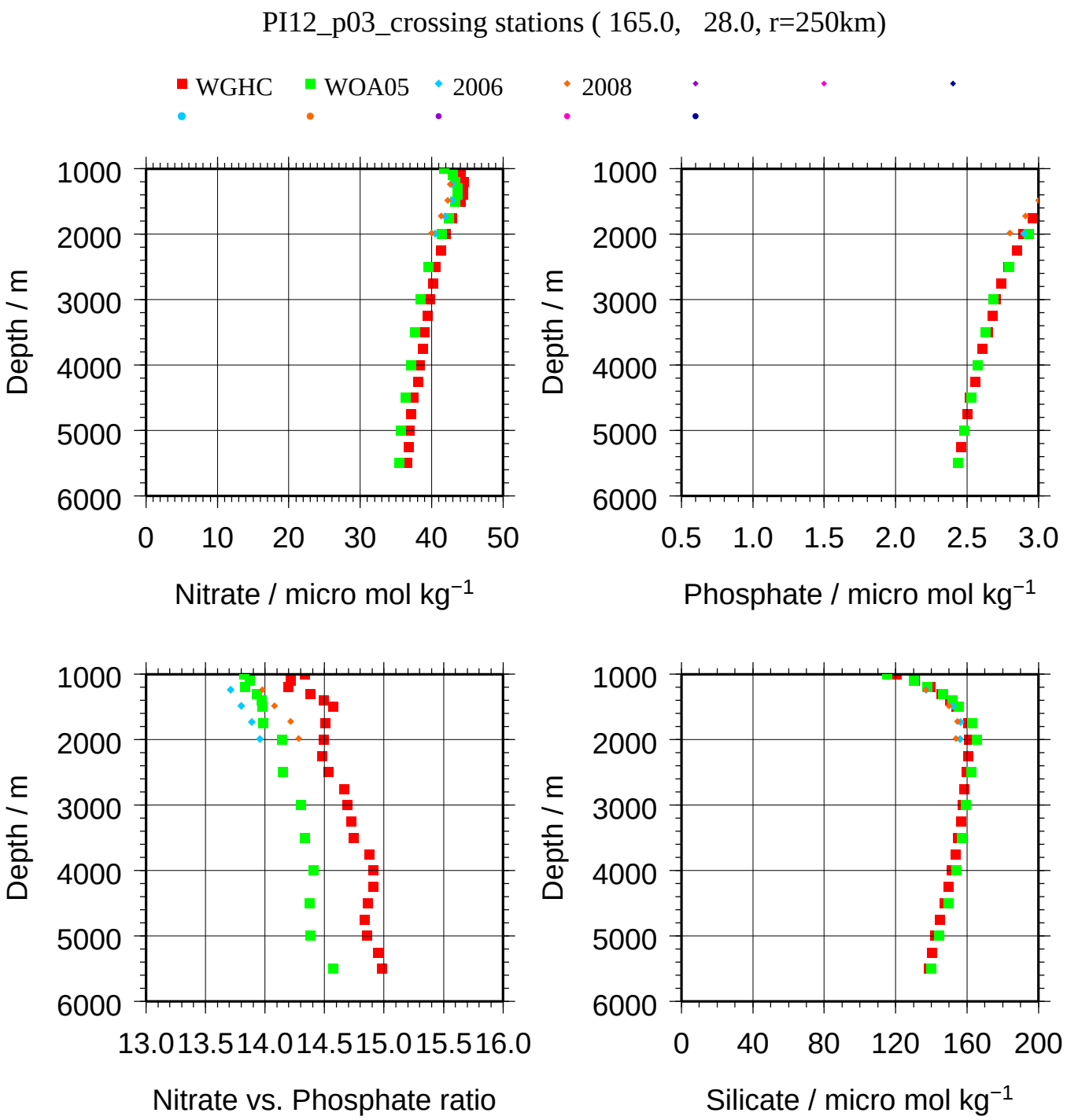

PI10_p02_crossing stations (147.0, 28.0, r=250km)
WGHC
WOA05
2006
2007
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

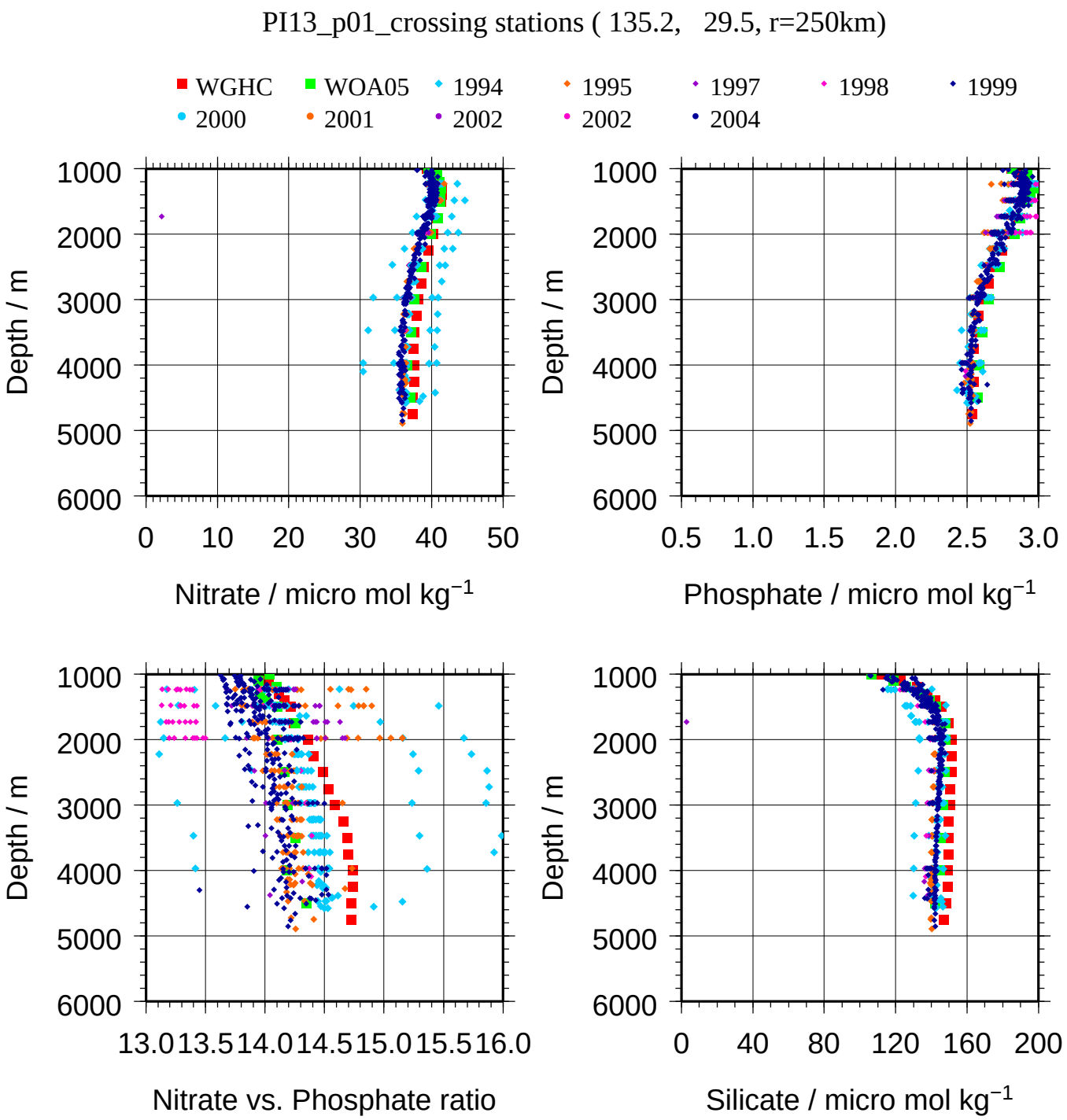

PI11_p01_crossing stations (155.0, 28.0, r=250km)
WGHC
WOA05
1993
1994
1995
1999
2001
2003
2004
2005
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1


PI11_p02_crossing stations (155.0, 28.0, r=250km)
WGHC
WOA05
2007
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

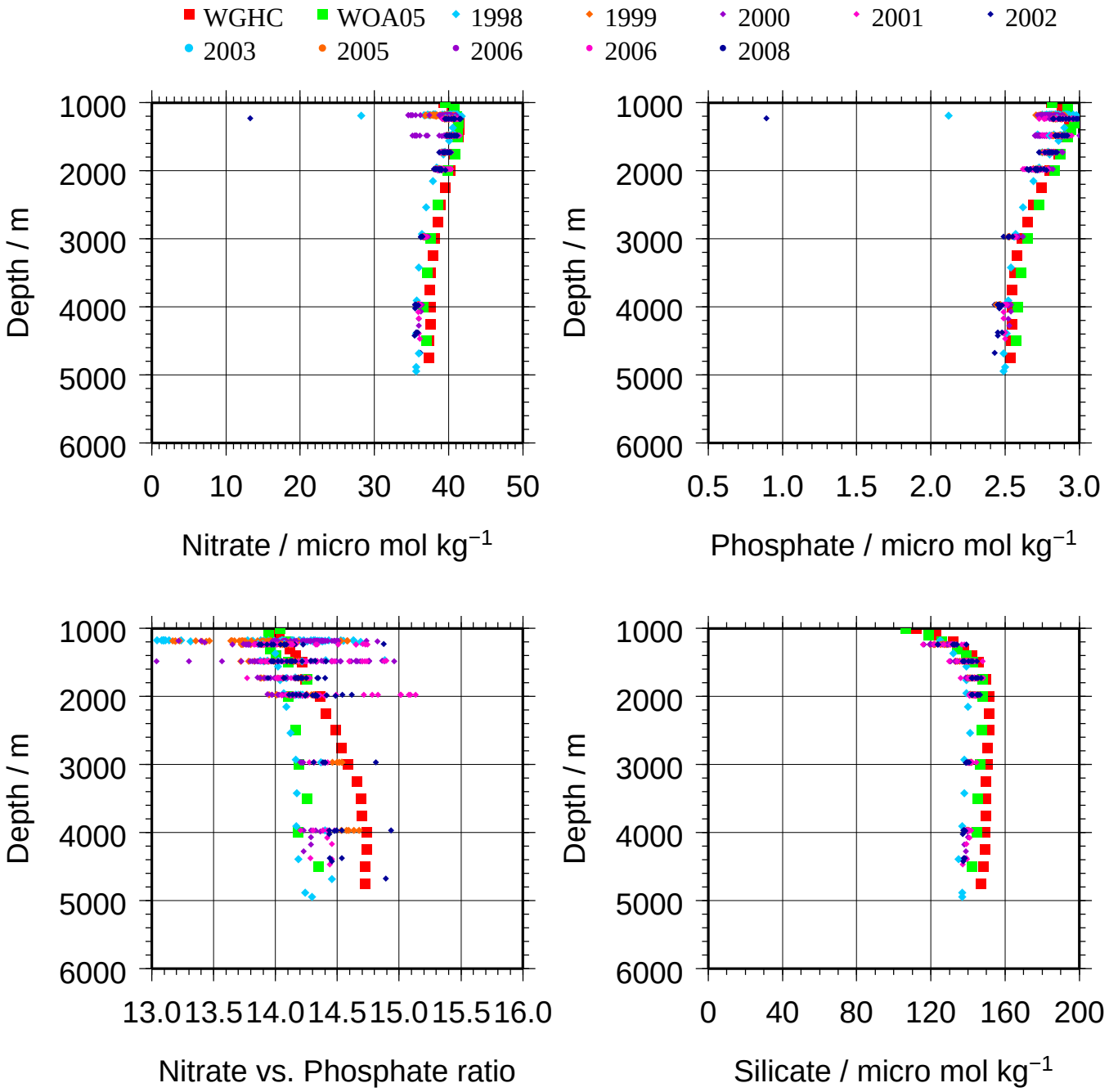

PI12_p01_crossing stations (165.0, 28.0, r=250km)
WGHC
WOA05
1991
1992
1993
1994
1997
1998
1999
2000
2000
2002
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

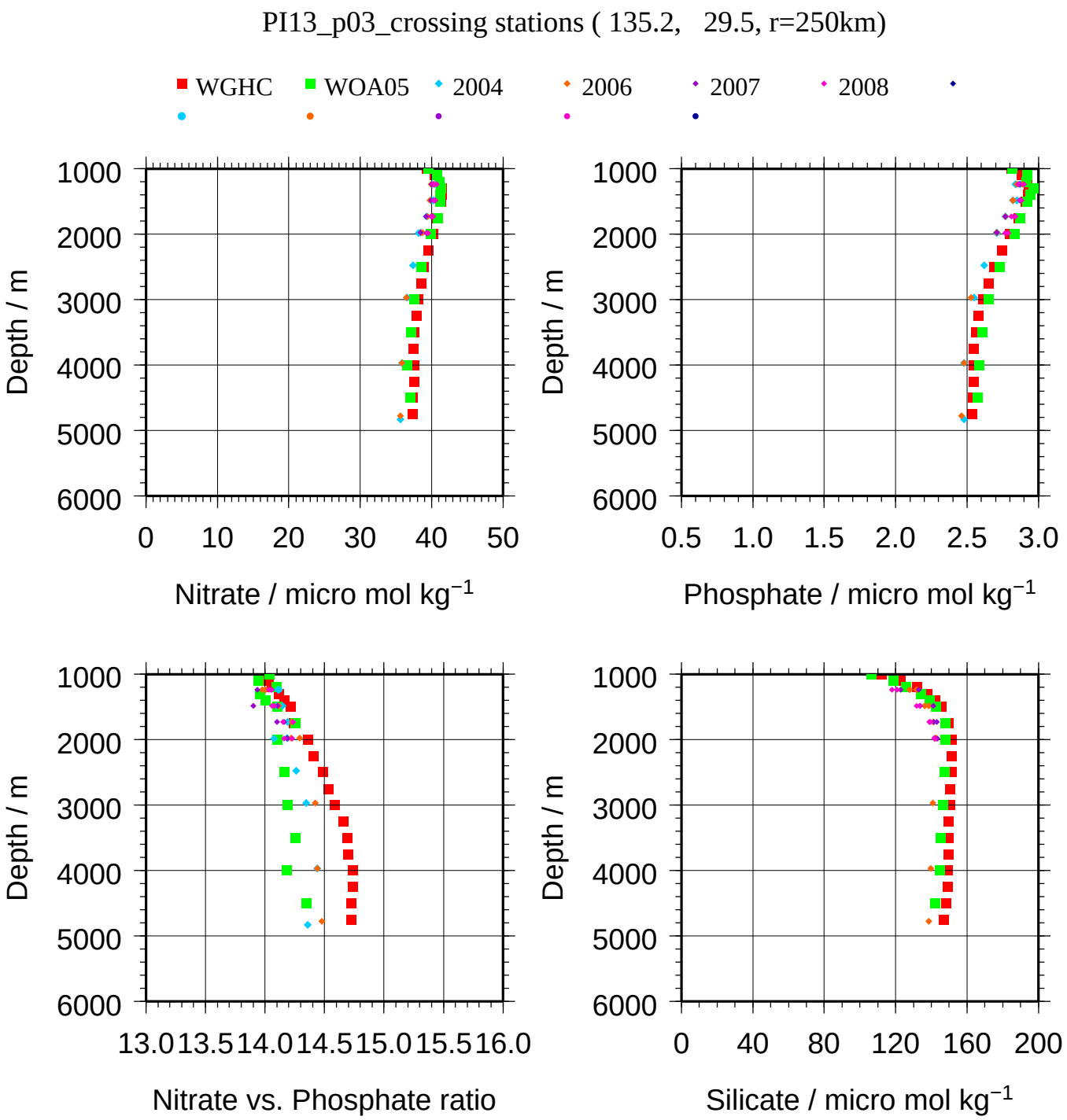

PI12_p02_crossing stations (165.0, 28.0, r=250km)
WGHC
WOA05
1995
2003
2004
2005
2006
2007
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

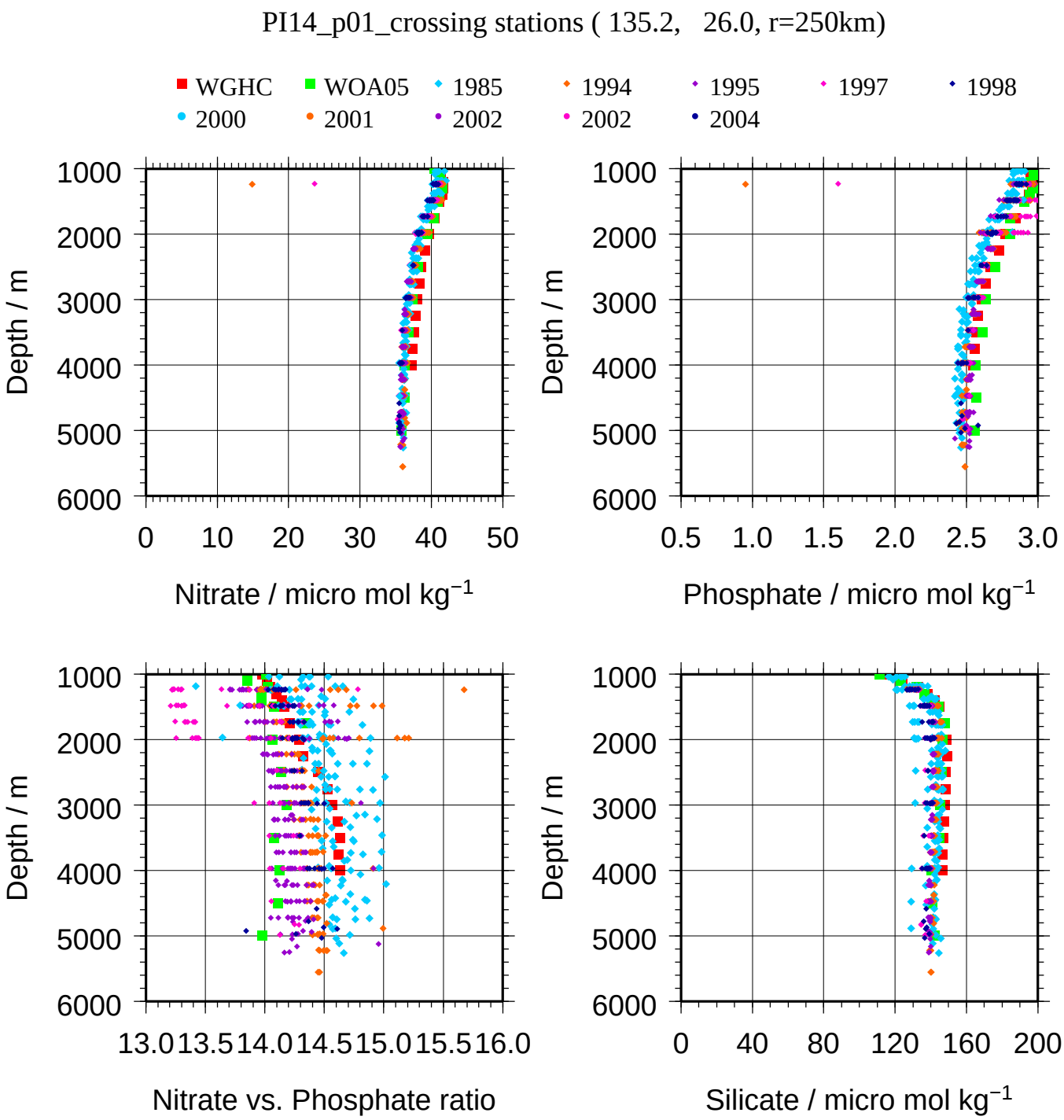

PI12_p03_crossing stations (165.0, 28.0, r=250km)
WGHC
WOA05
2006
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

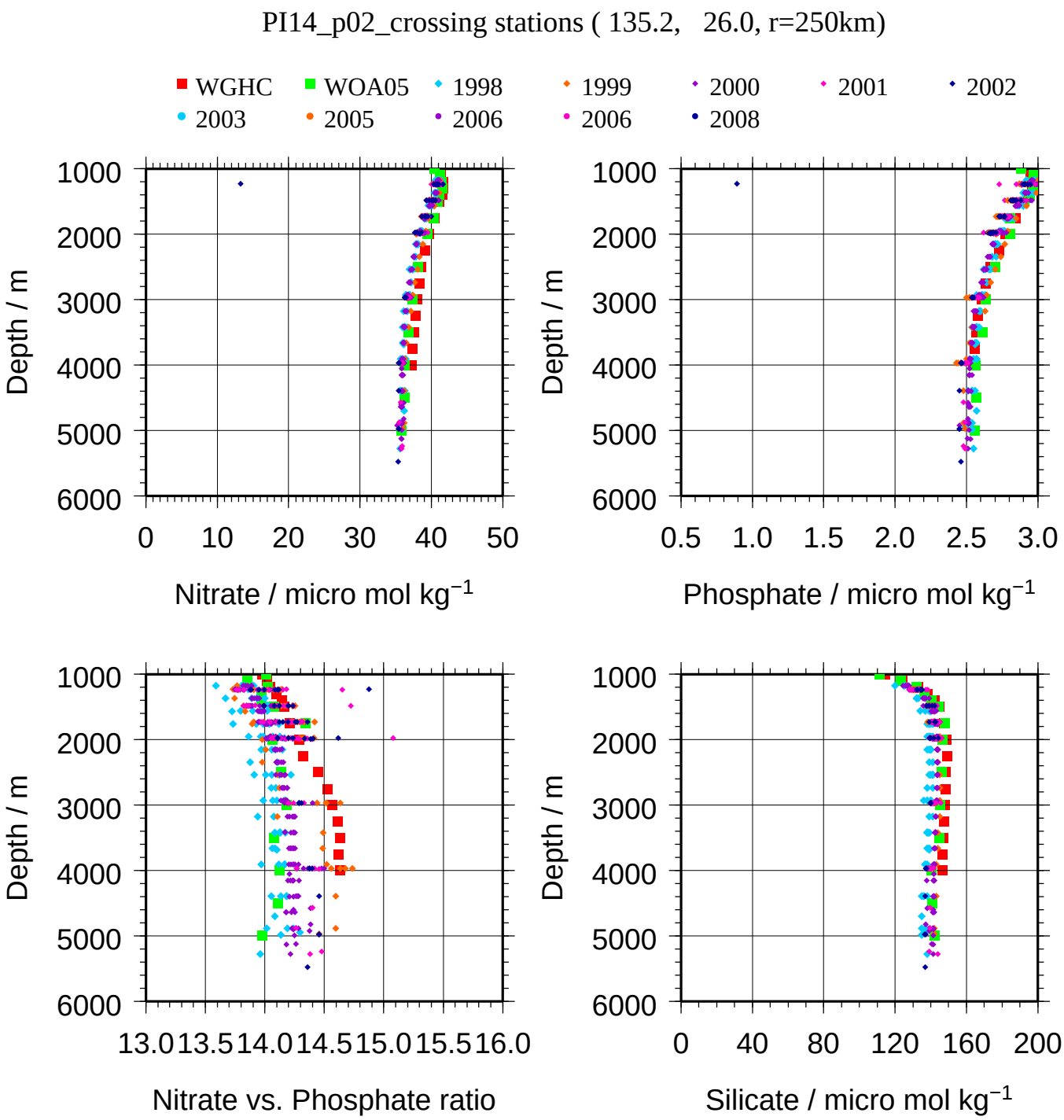

PI13_p01_crossing stations (135.2, 29.5, r=250km)
WGHC
WOA05
1994
1995
1997
1998
1999
2000
2001
2002
2002
2004
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

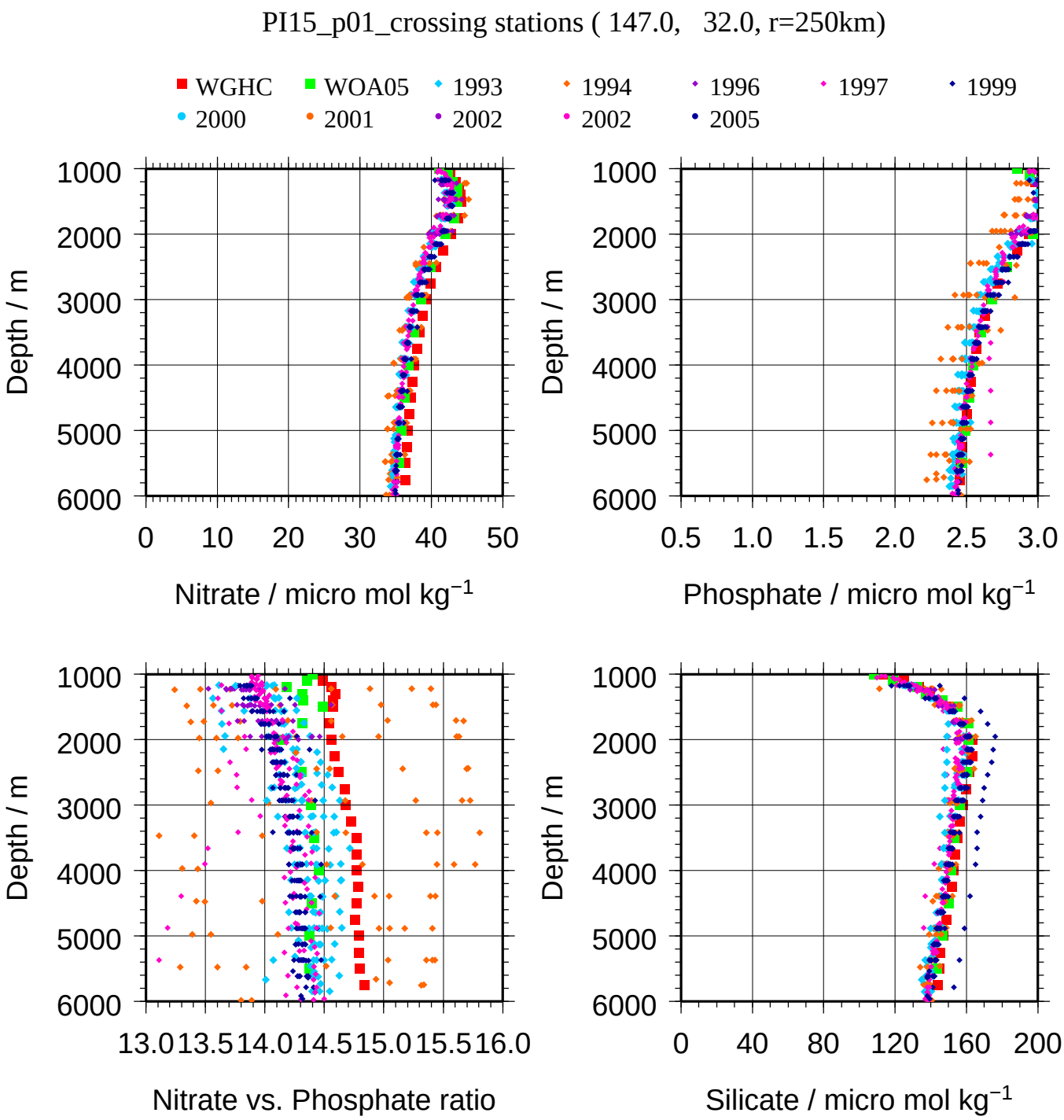
PI13_p02_crossing stations (135.2, 29.5, r=250km)

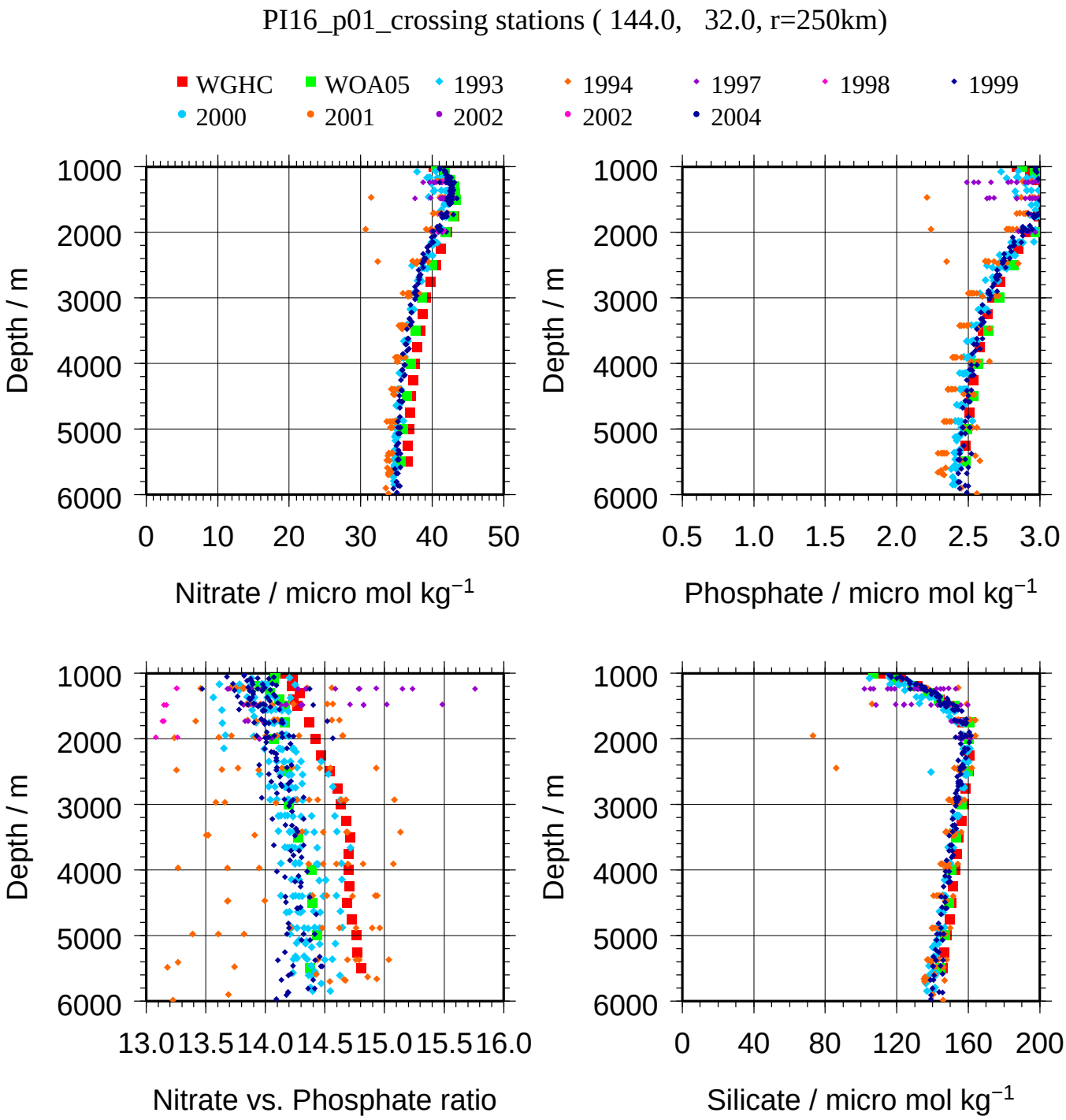


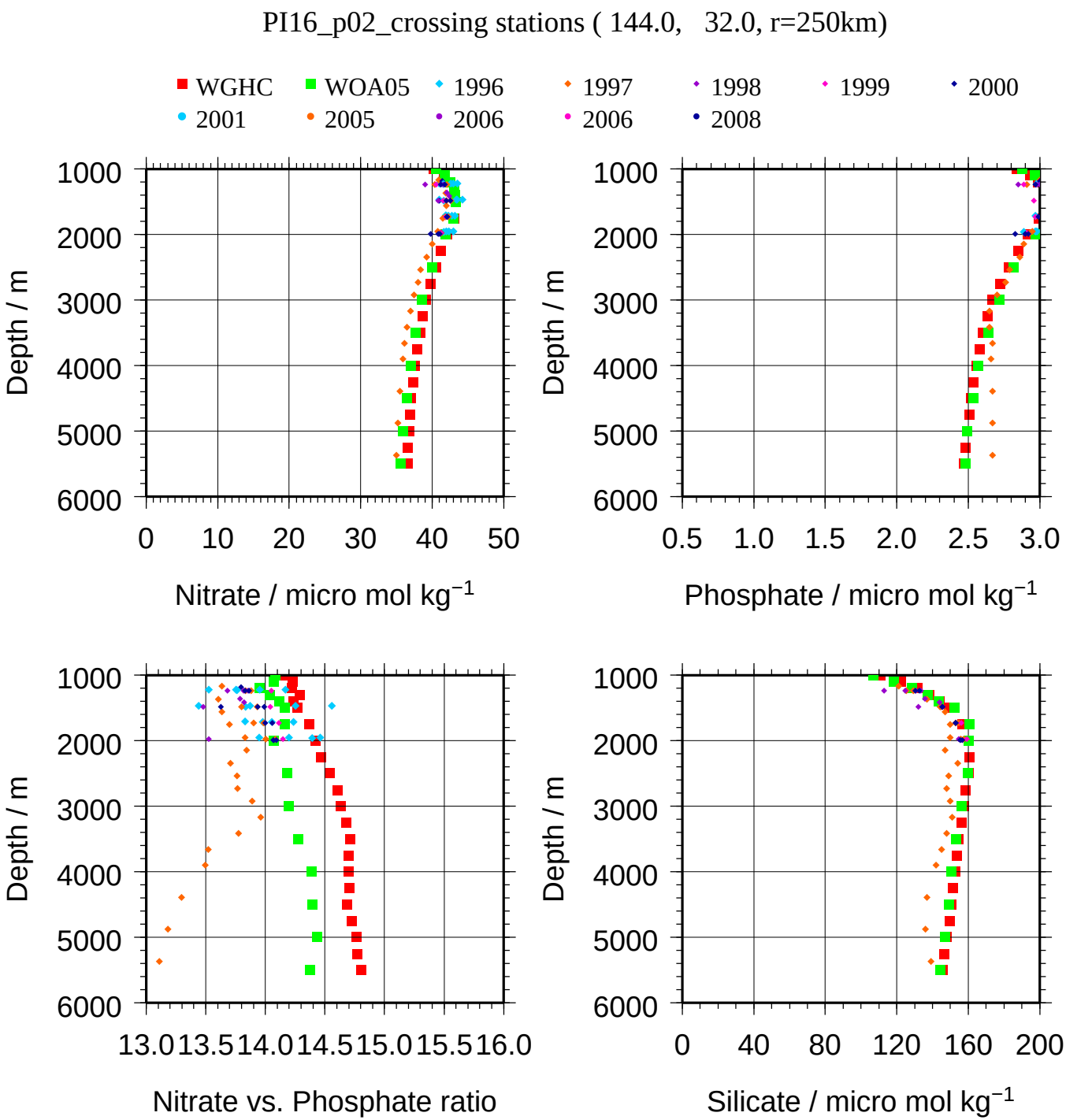

PI13_p03_crossing stations (135.2, 29.5, r=250km)
WGHC
WOA05
2004
2006
2007
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

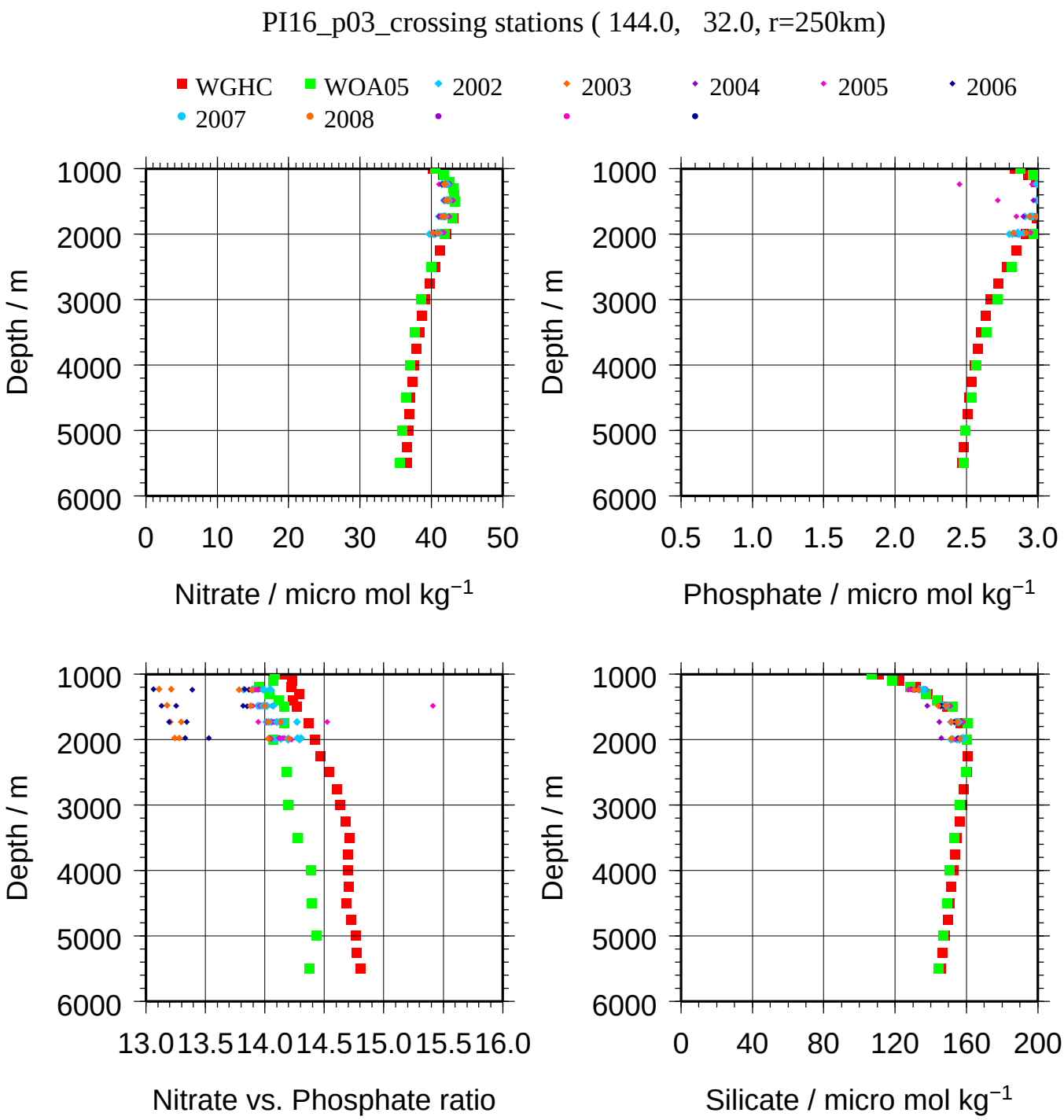

PI14_p01_crossing stations (135.2, 26.0, r=250km)
WGHC
WOA05
1985
1994
1995
1997
1998
2000
2001
2002
2002
2004
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

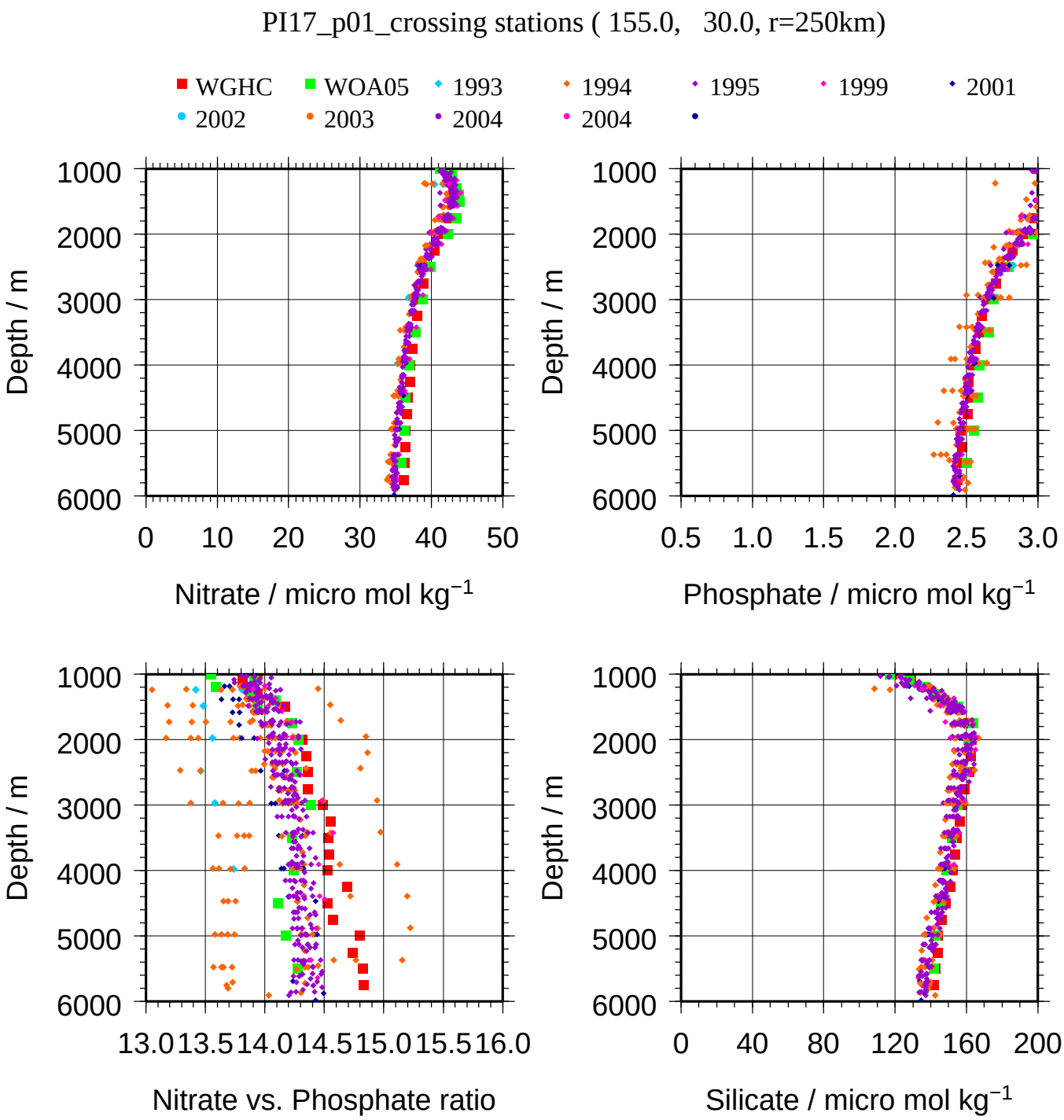

PI14_p02_crossing stations (135.2, 26.0, r=250km)
WGHC
WOA05
1998
1999
2000
2001
2002
2003
2005
2006
2006
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

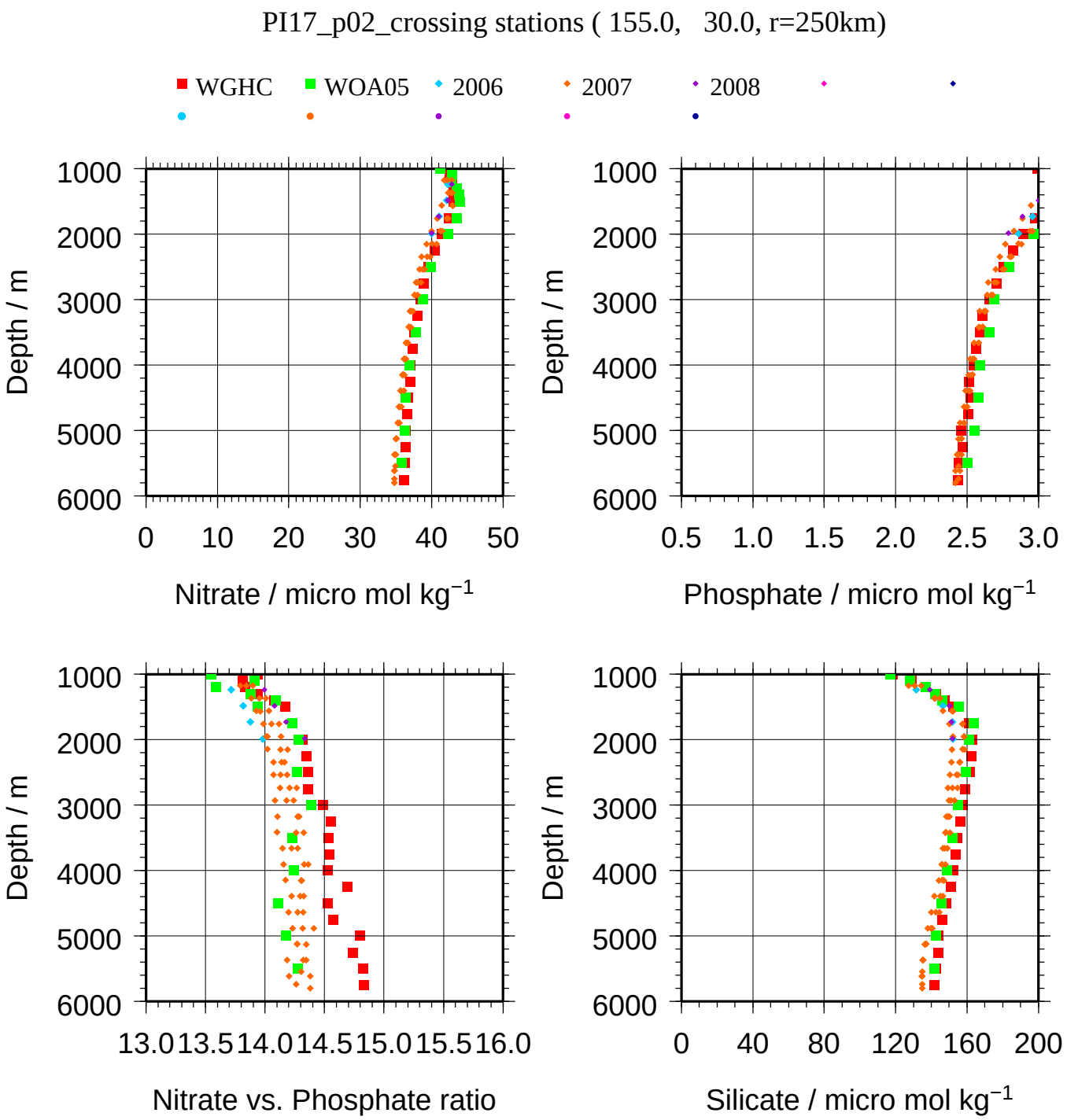

PI15_p01_crossing stations (147.0, 32.0, r=250km)
WGHC
WOA05
1993
1994
1996
1997
1999
2000
2001
2002
2002
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

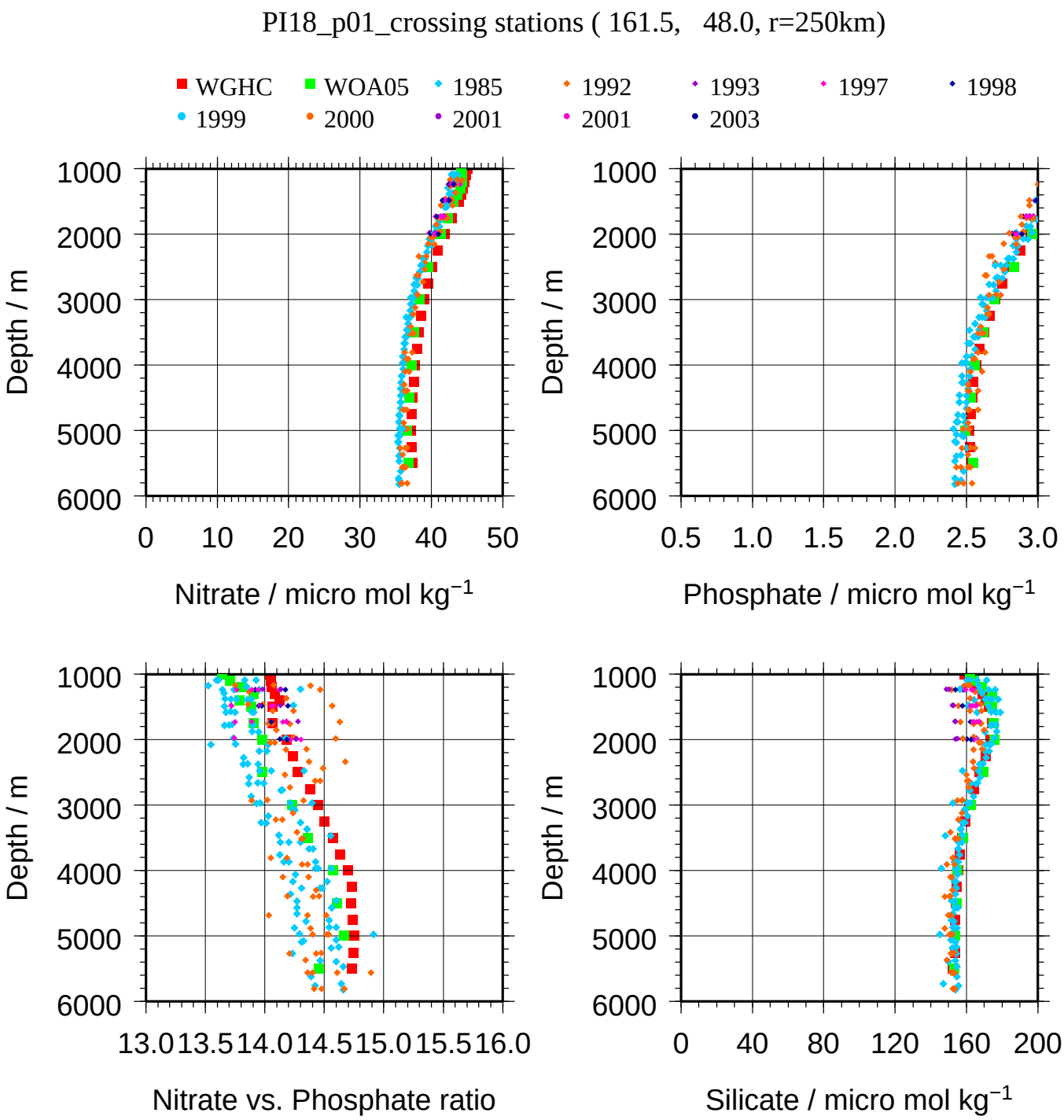

PI16_p01_crossing stations (144.0, 32.0, r=250km)
WGHC
WOA05
1993
1994
1997
1998
1999
2000
2001
2002
2002
2004
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

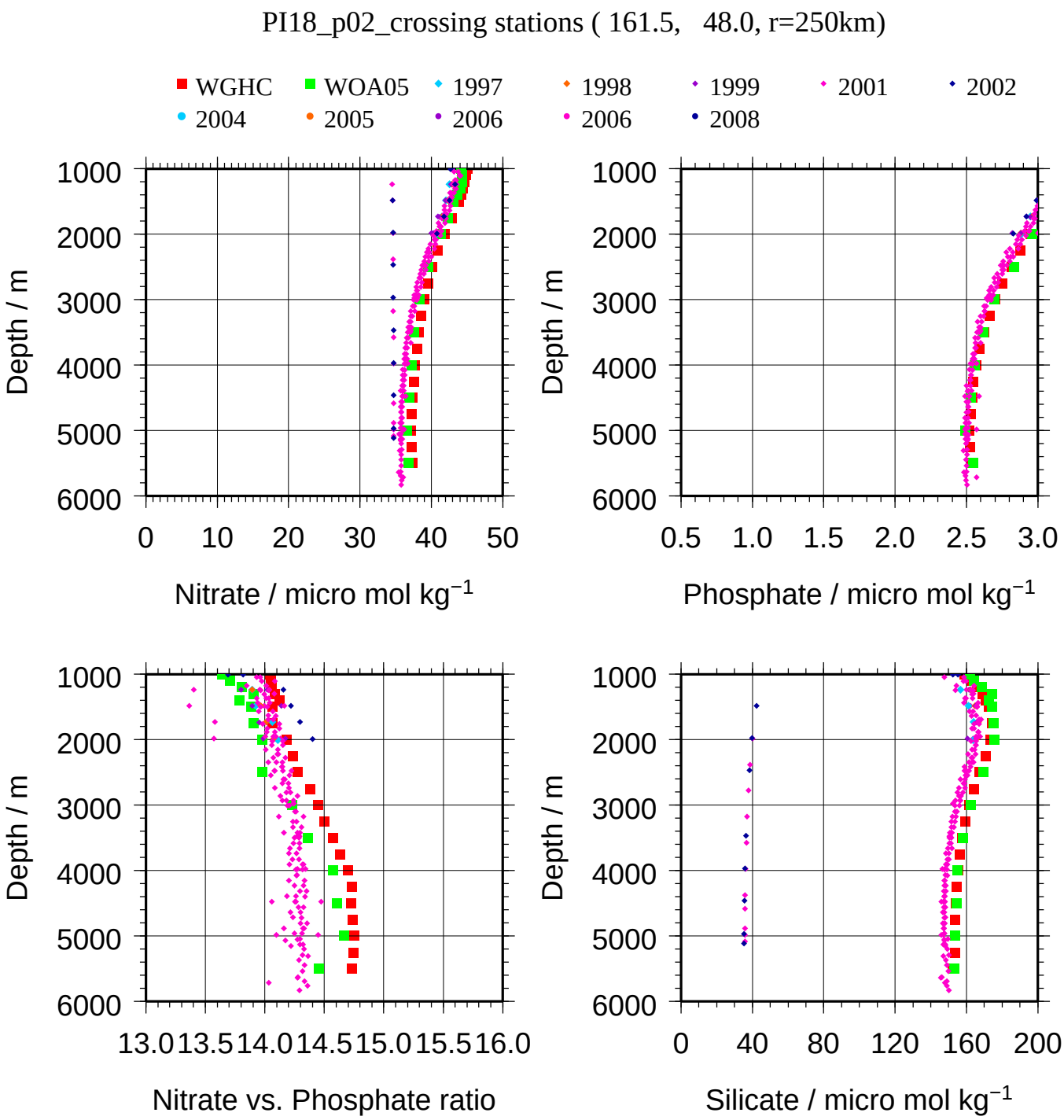

PI16_p02_crossing stations (144.0, 32.0, r=250km)
WGHC
WOA05
1996
1997
1998
1999
2000
2001
2005
2006
2006
2008
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

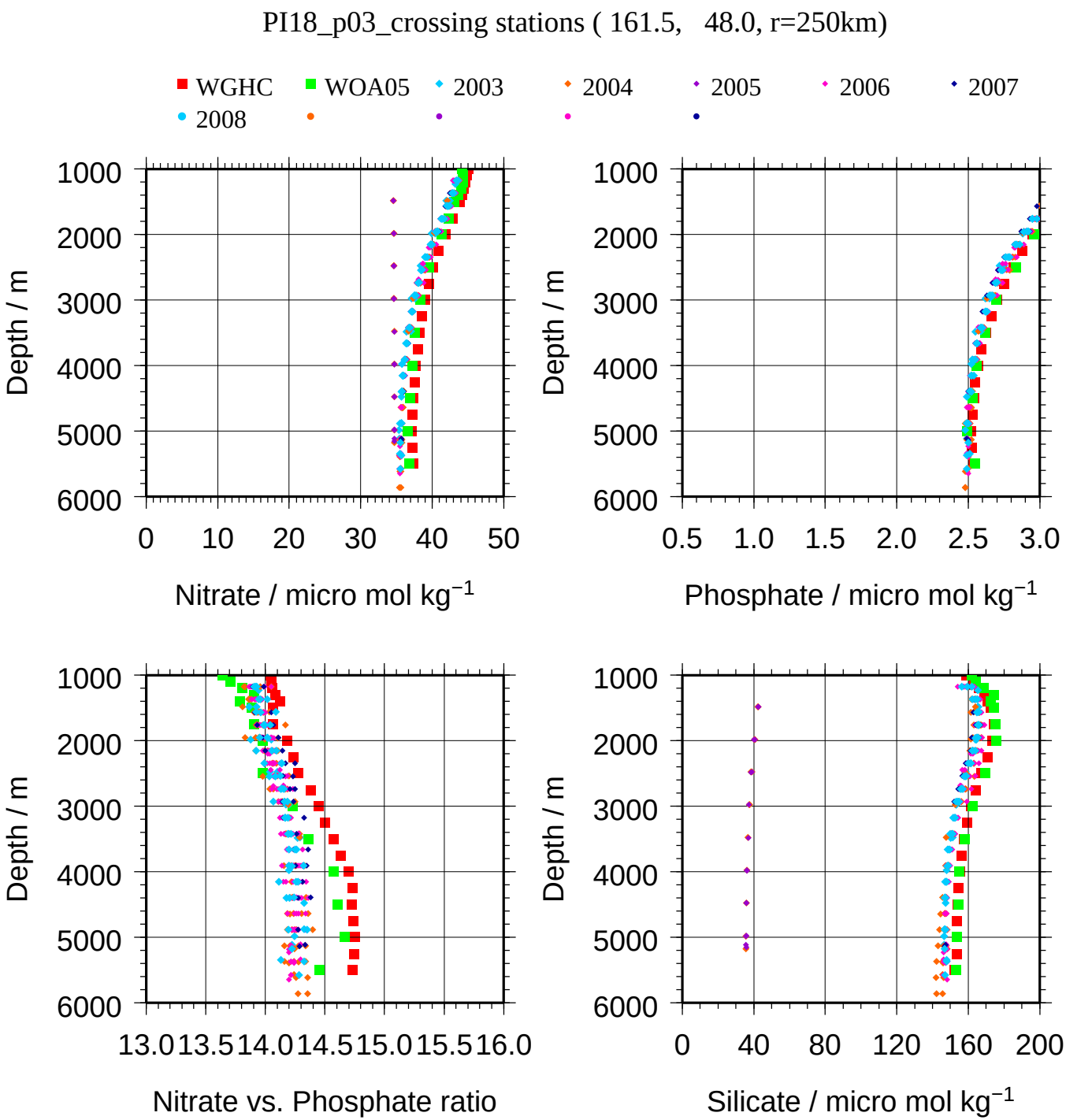

PI16_p03_crossing stations (144.0, 32.0, r=250km)
WGHC
WOA05
2002
2003
2004
2005
2006
2007
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

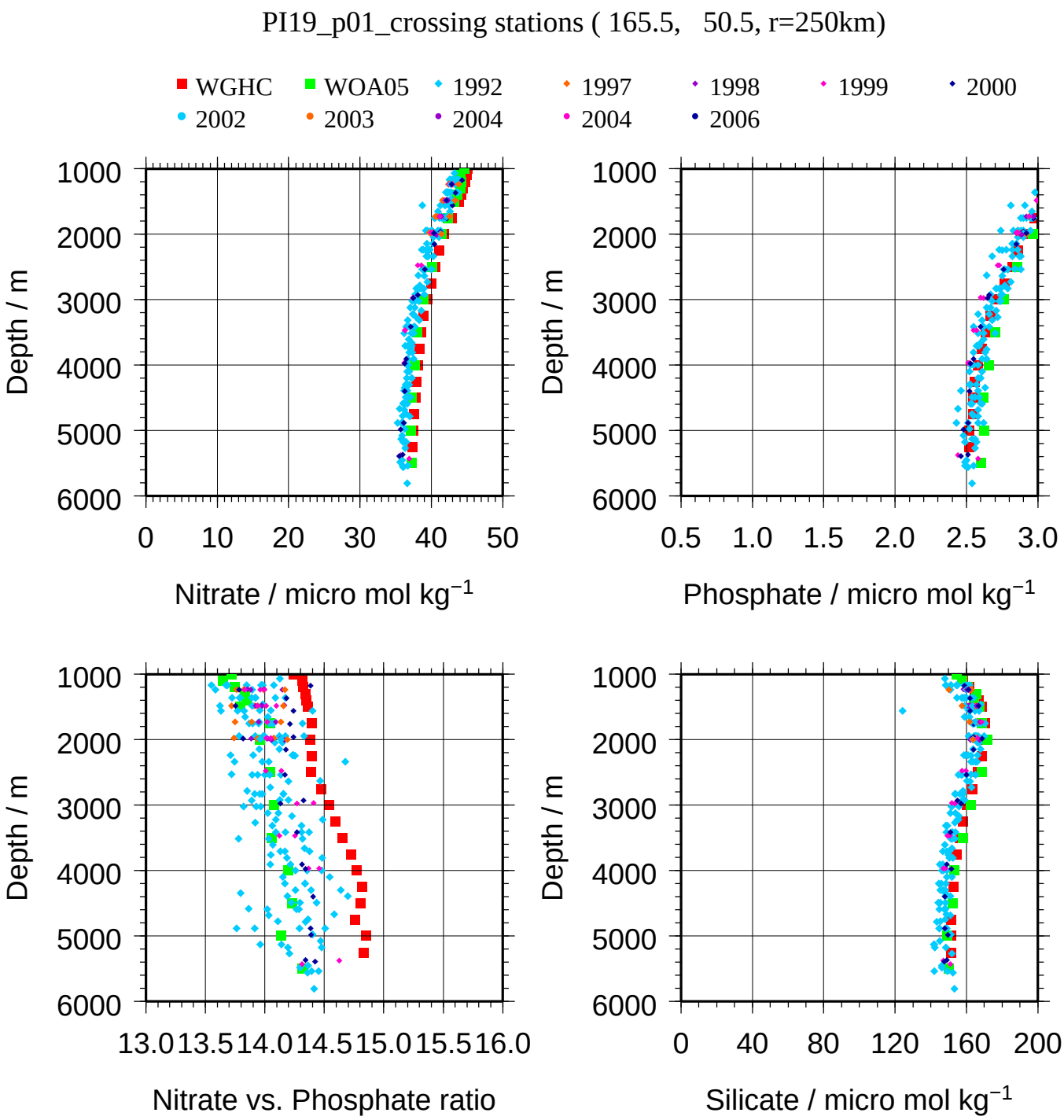

PI17_p01_crossing stations (155.0, 30.0, r=250km)
WGHC
WOA05
1993
1994
1995
1999
2001
2002
2003
2004
2004
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

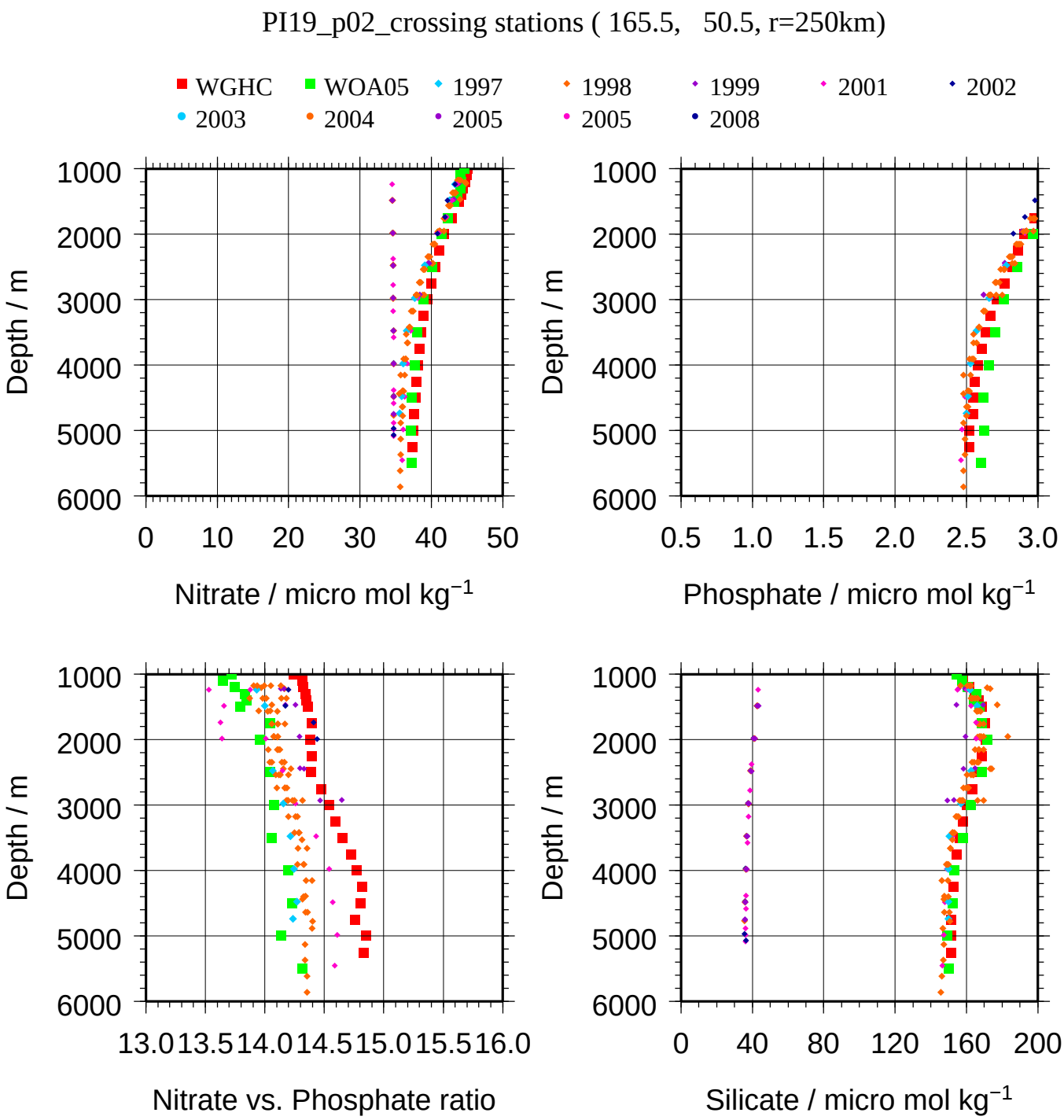

PI17_p02_crossing stations (155.0, 30.0, r=250km)
WGHC
WOA05
2006
2007
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

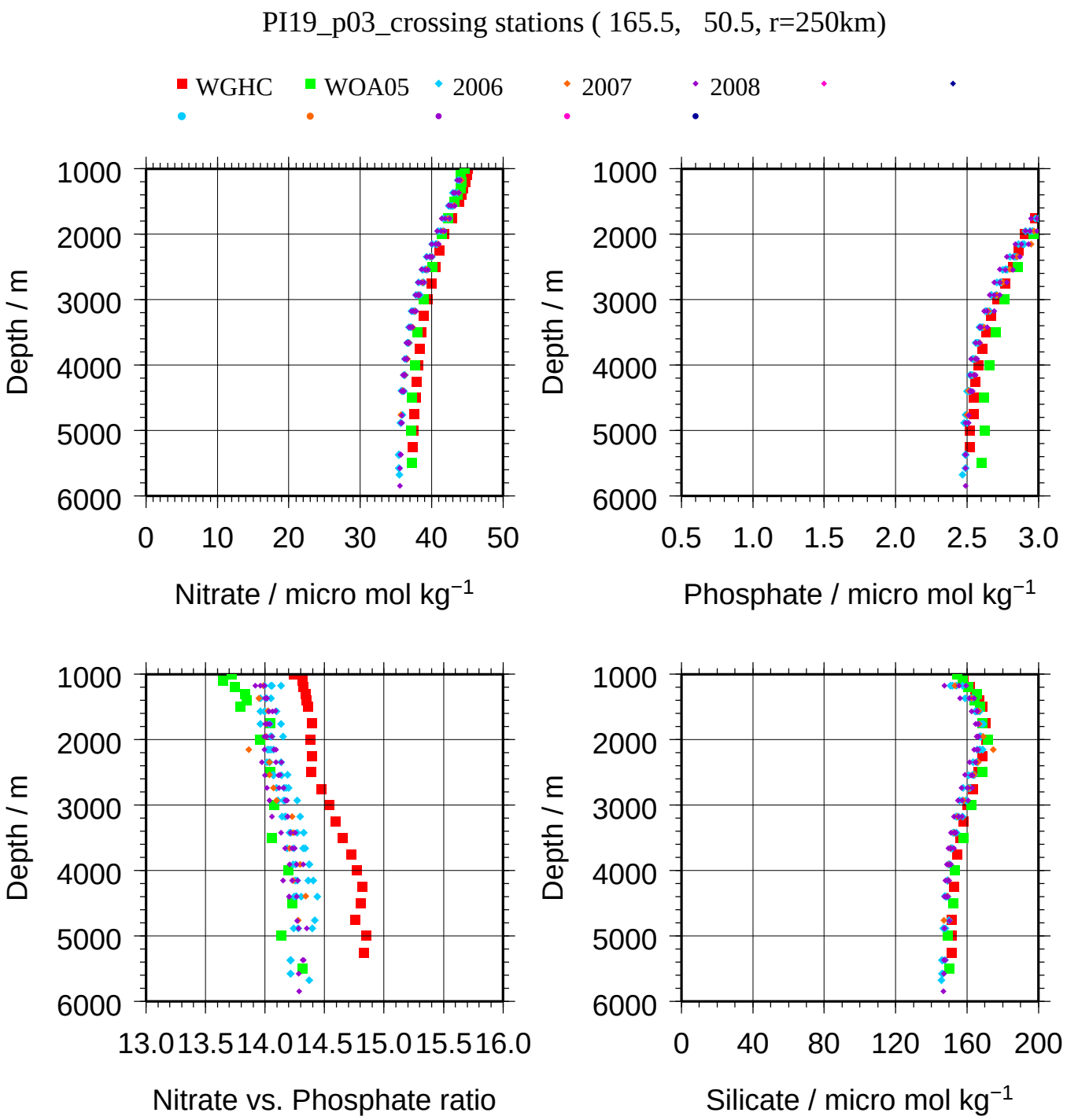

PI18_p01_crossing stations (161.5, 48.0, r=250km)
WGHC
WOA05
1985
1992
1993
1997
1998
1999
2000
2001
2001
2003
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

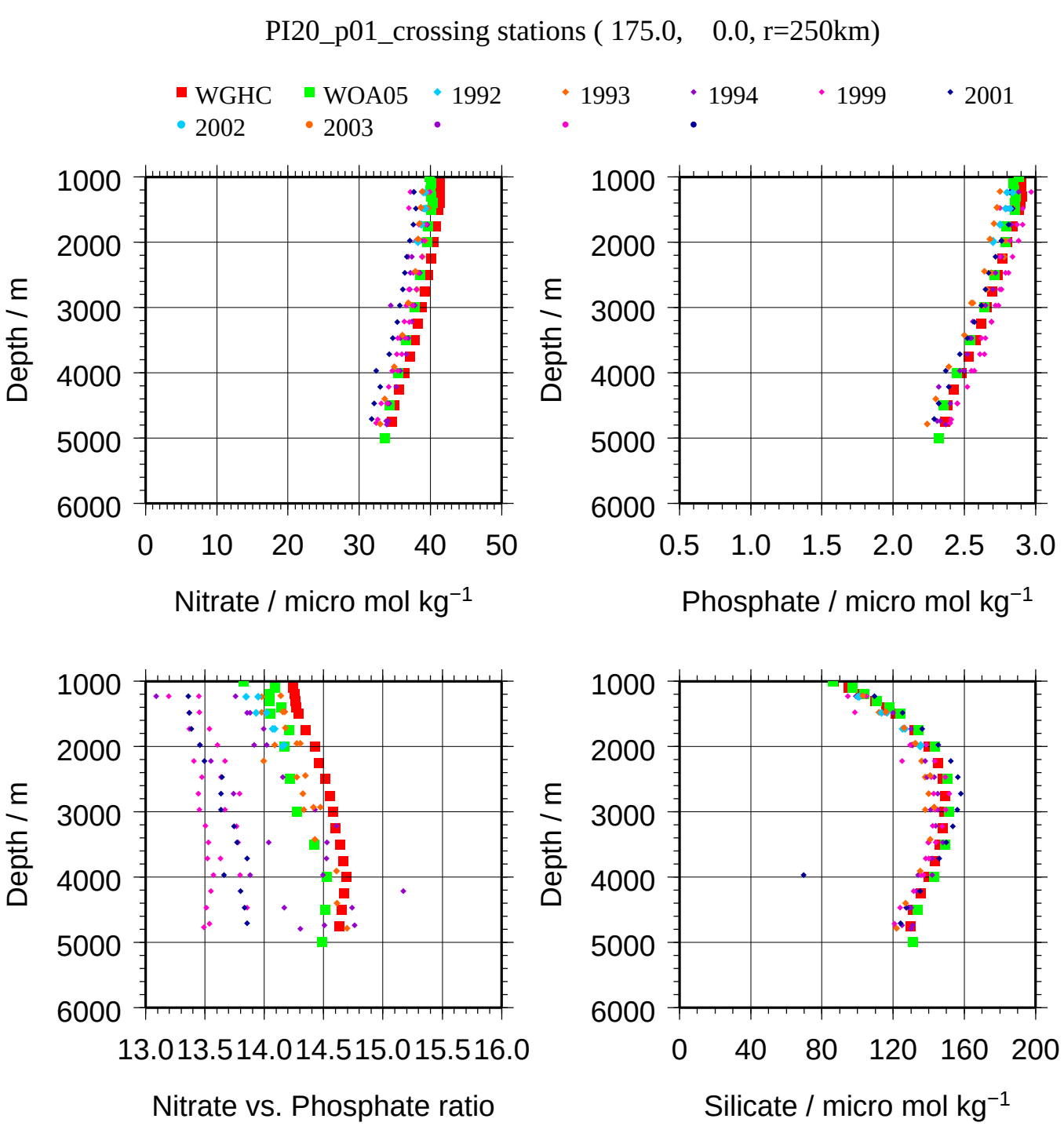

PI18_p02_crossing stations (161.5, 48.0, r=250km)
WGHC
WOA05
1997
1998
1999
2001
2002
2004
2005
2006
2006
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

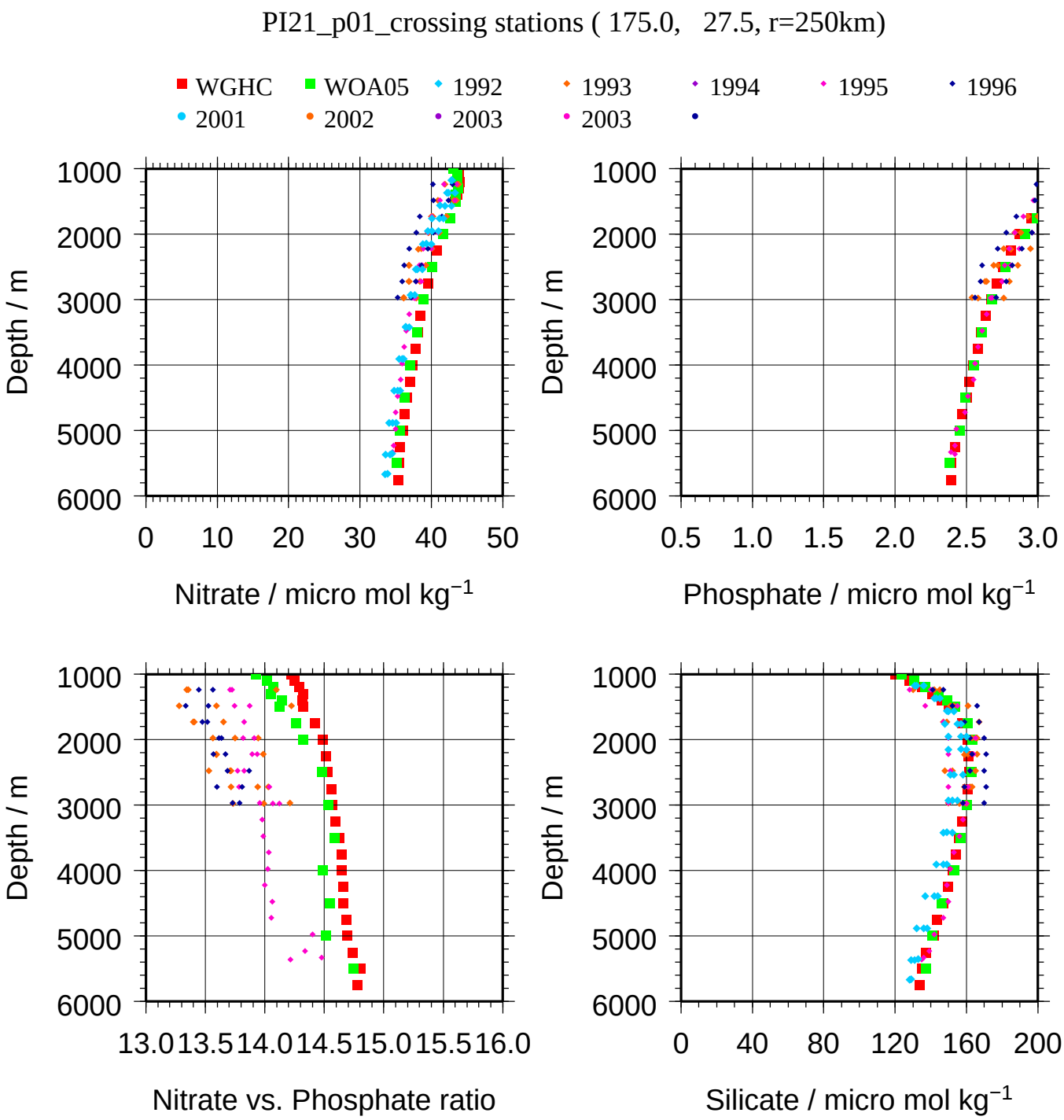

PI18_p03_crossing stations (161.5, 48.0, r=250km)
WGHC
WOA05
2003
2004
2005
2006
2007
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

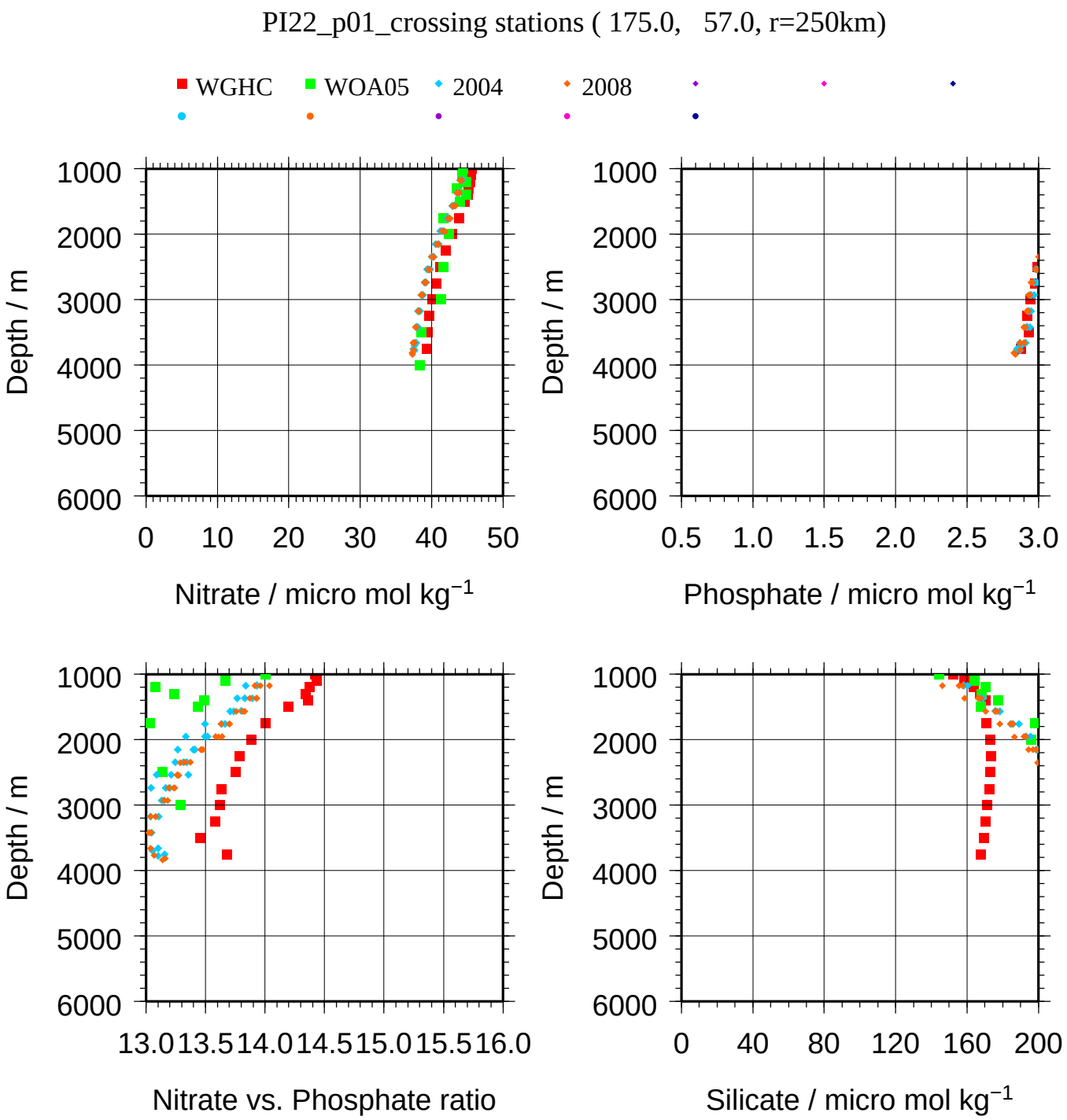

PI19_p01_crossing stations (165.5, 50.5, r=250km)
WGHC
WOA05
1992
1997
1998
1999
2000
2002
2003
2004
2004
2006
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

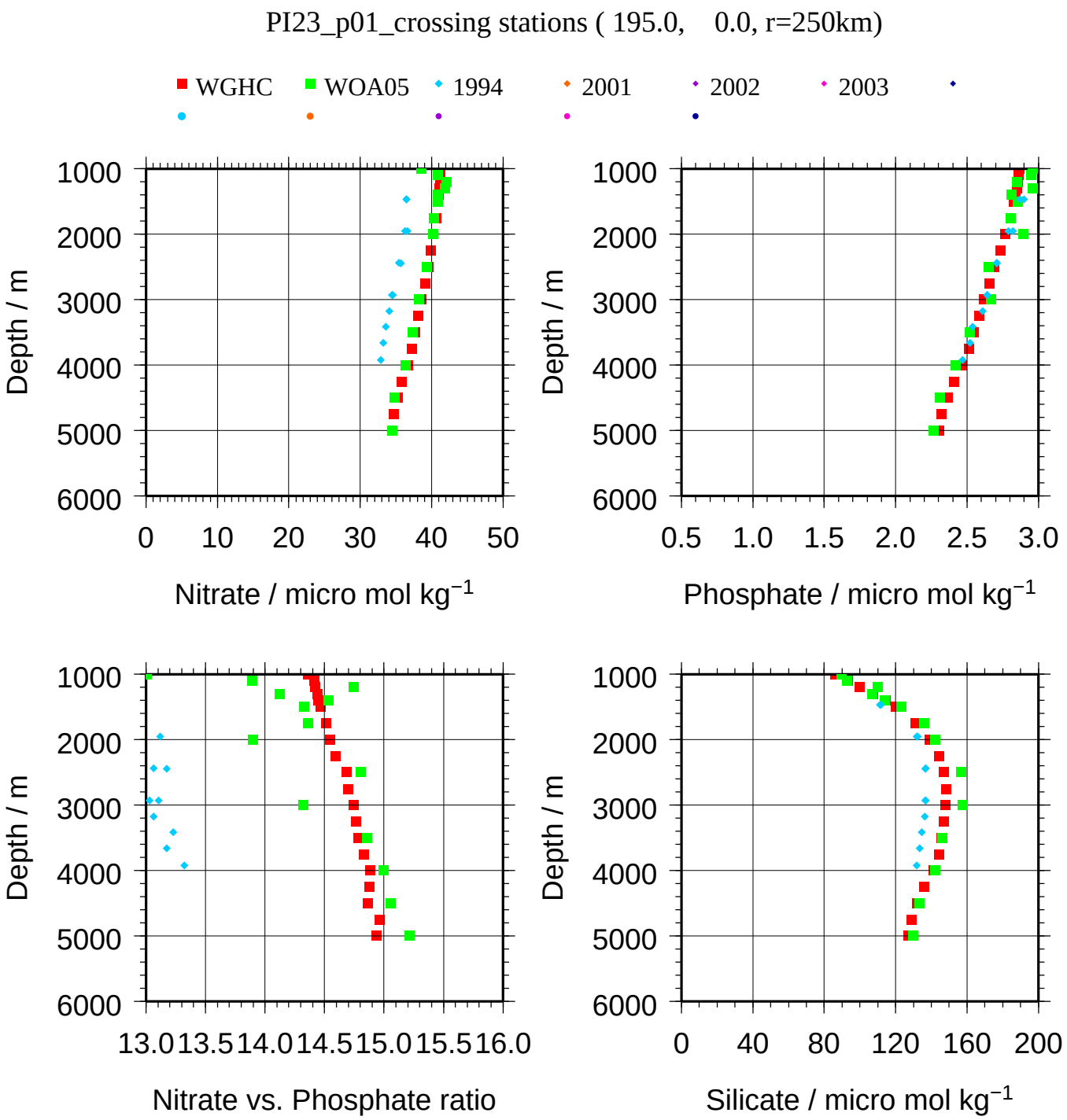

PI19_p02_crossing stations (165.5, 50.5, r=250km)
WGHC
WOA05
1997
1998
1999
2001
2002
2003
2004
2005
2005
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

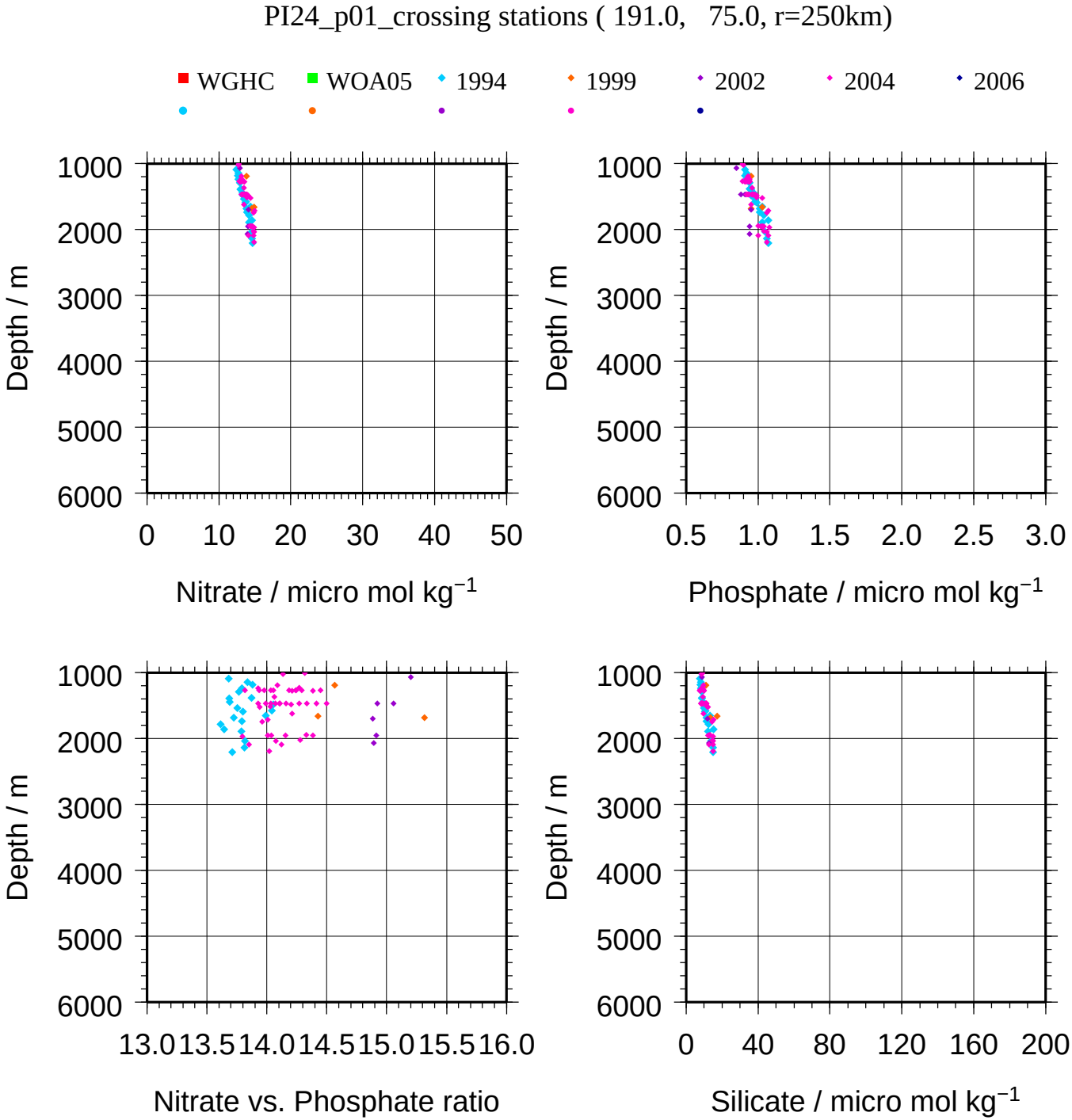

PI19_p03_crossing stations (165.5, 50.5, r=250km)
WGHC
WOA05
2006
2007
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

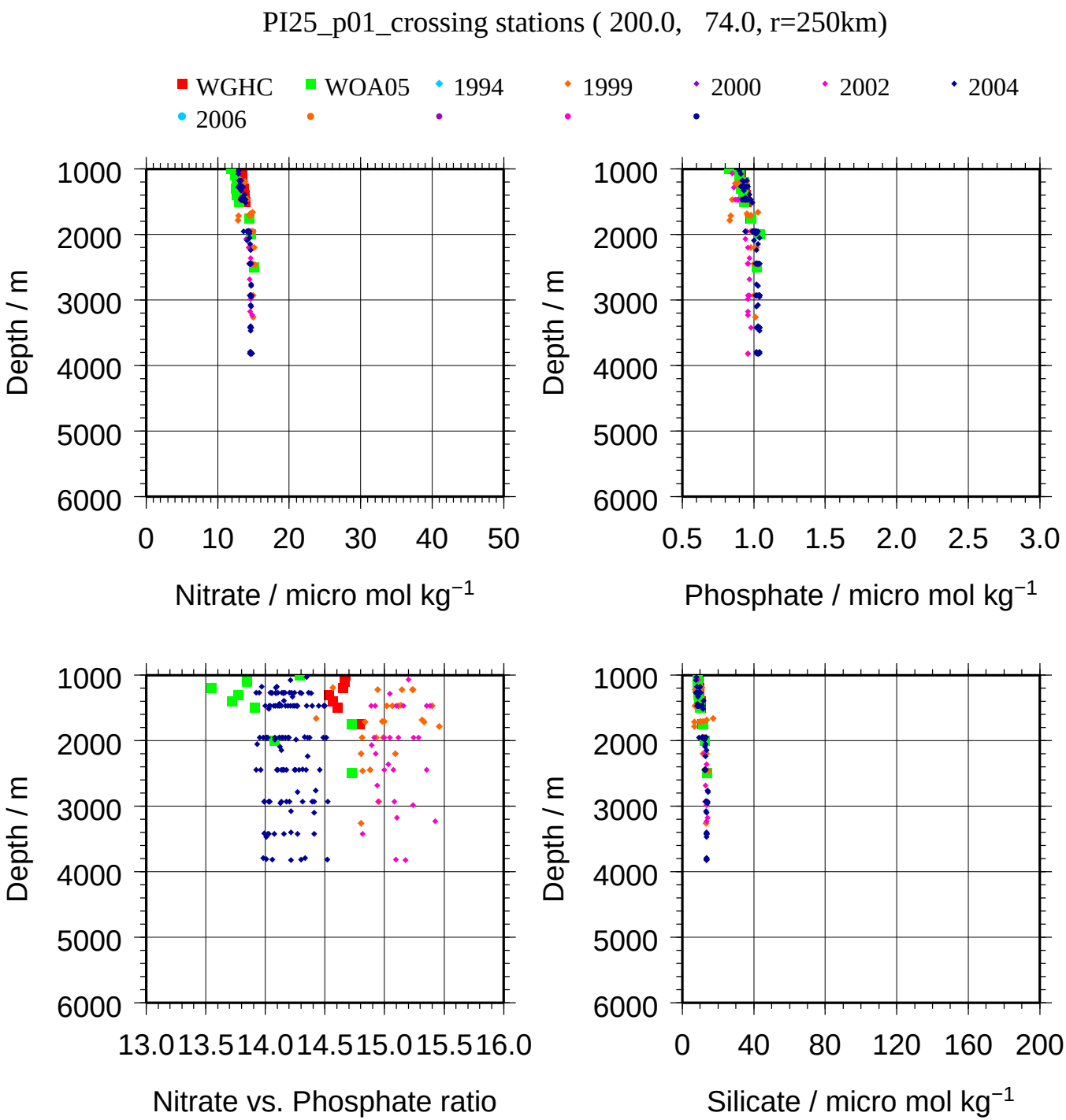

PI20_p01_crossing stations (175.0, 0.0, r=250km)
WGHC
WOA05
1992
1993
1994
1999
2001
2002
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

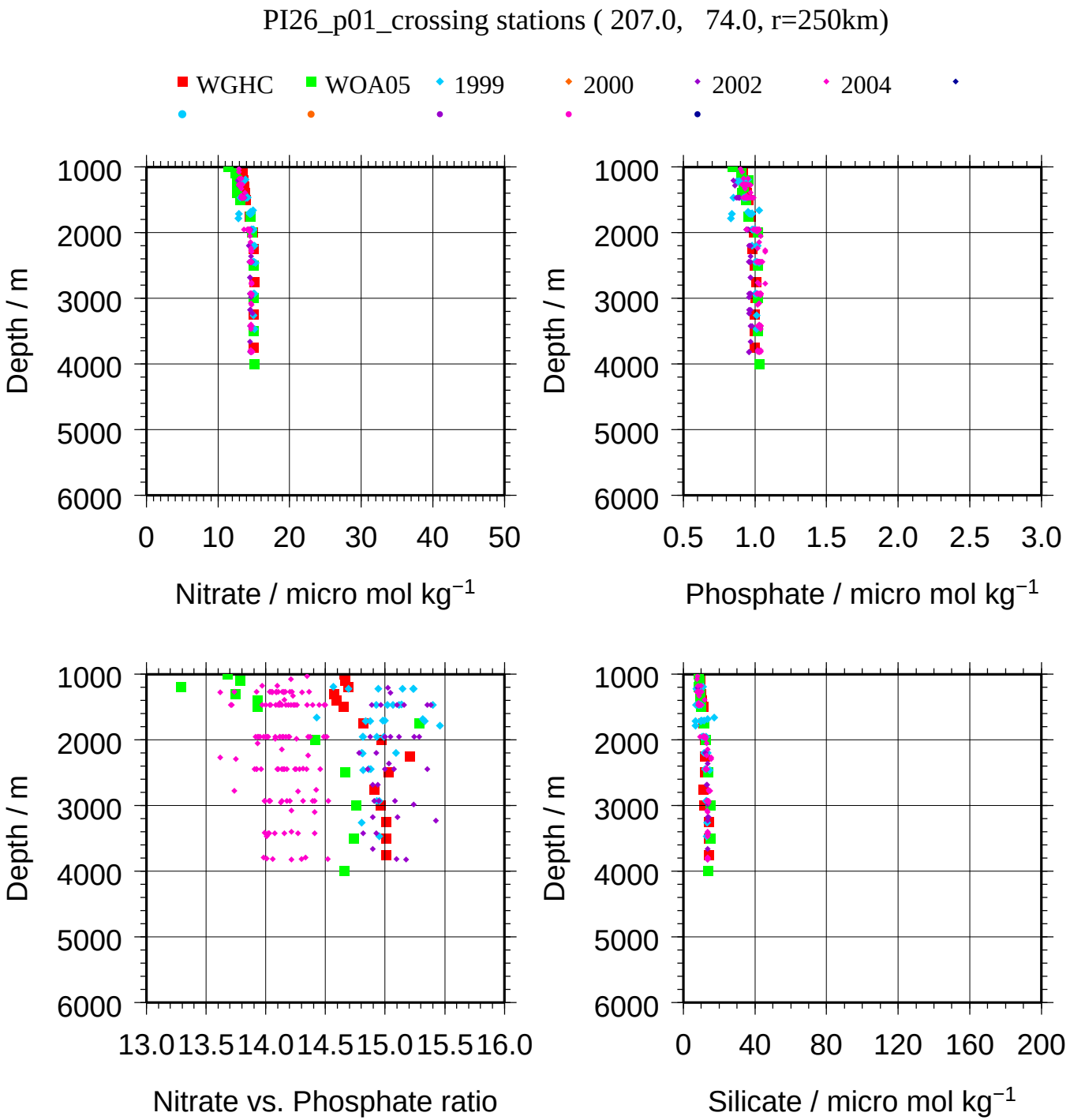

PI21_p01_crossing stations (175.0, 27.5, r=250km)
WGHC
WOA05
1992
1993
1994
1995
1996
2001
2002
2003
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

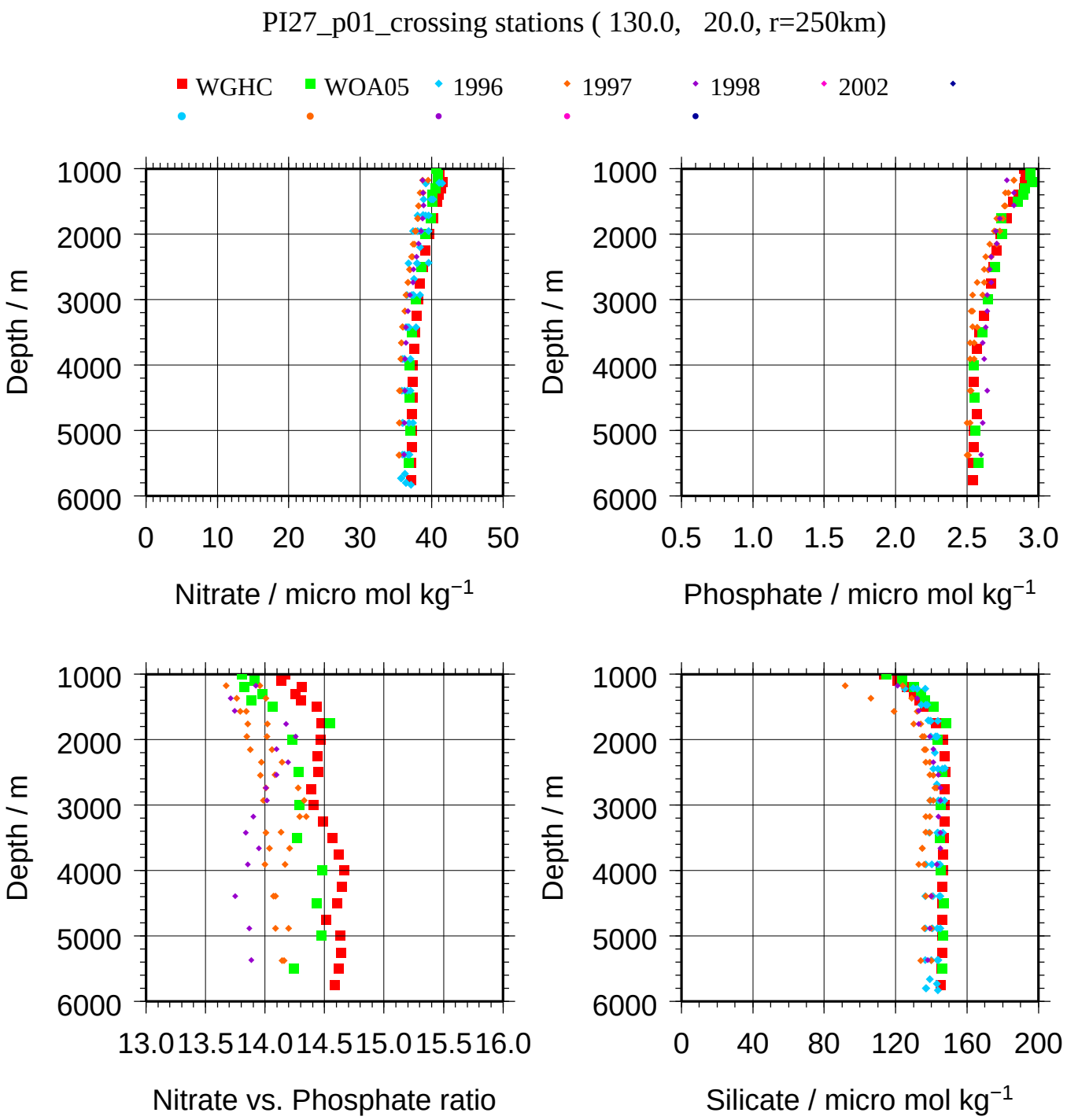

PI22_p01_crossing stations (175.0, 57.0, r=250km)
WGHC
WOA05
2004
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1


PI23_p01_crossing stations (195.0, 0.0, r=250km)
WGHC
WOA05
1994
2001
2002
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

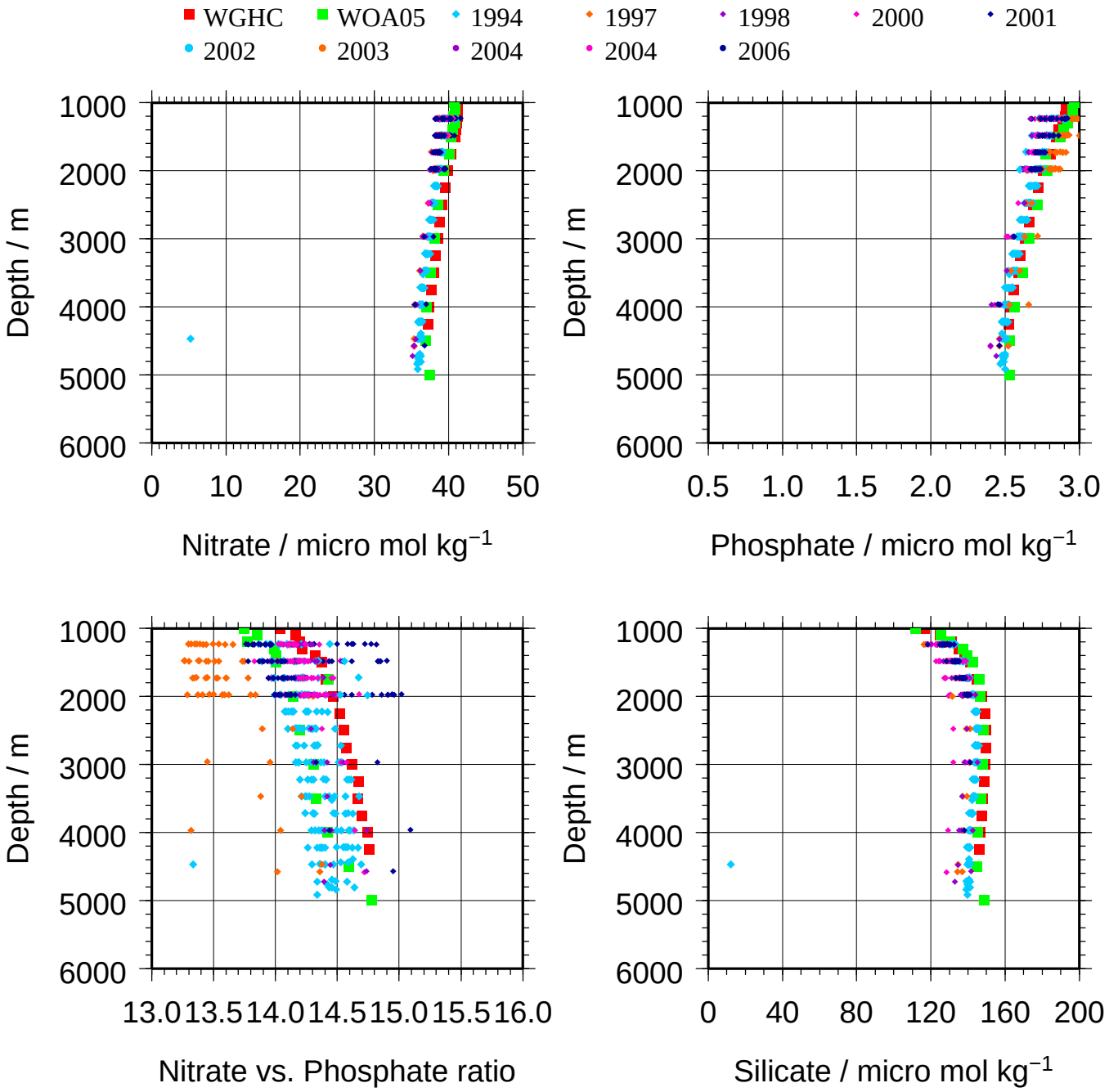

PI24_p01_crossing stations (191.0, 75.0, r=250km)
WGHC
WOA05
1994
1999
2002
2004
2006
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
80
120
160
200
Silicate / micro mol kg−1

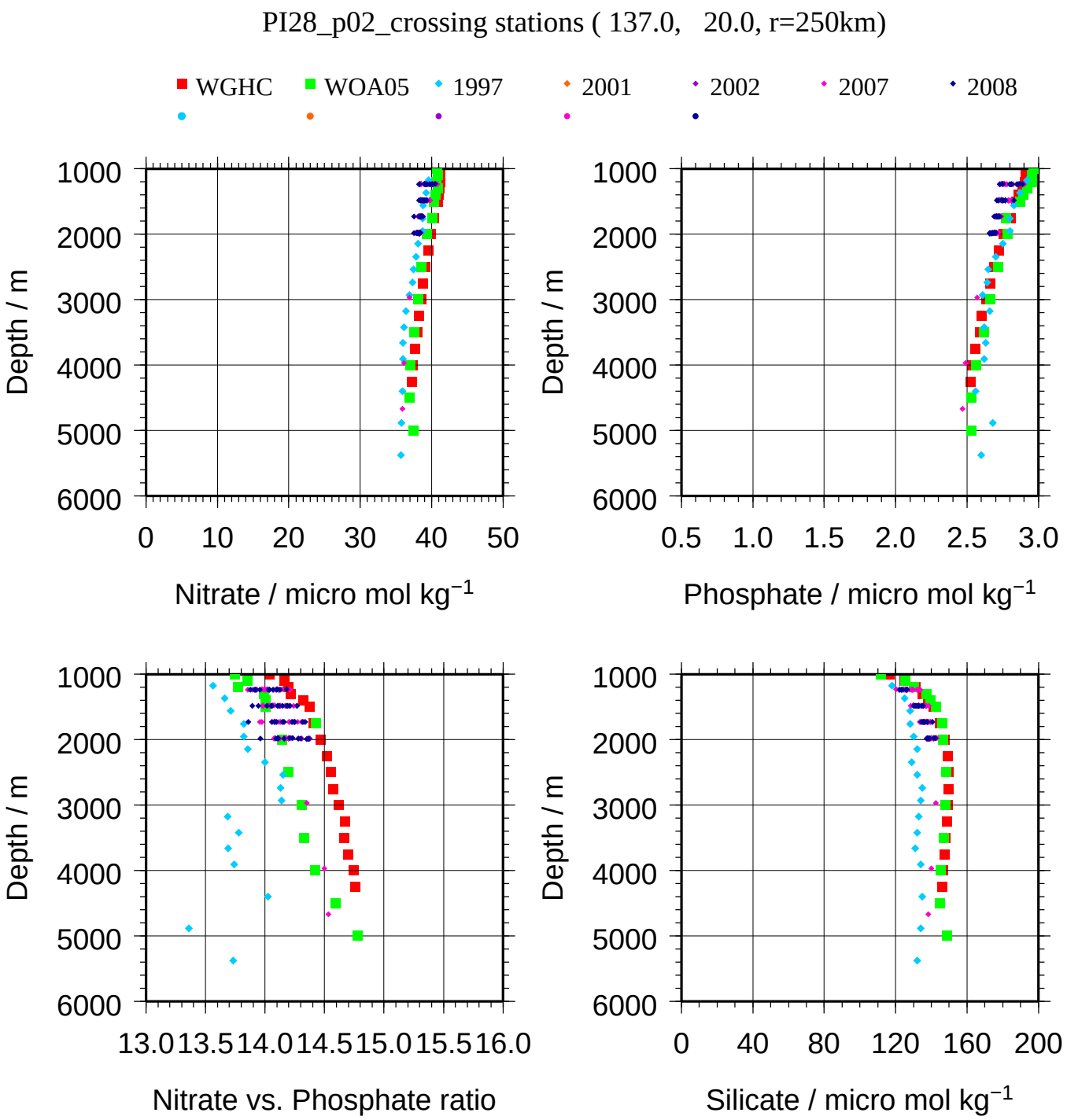

PI25_p01_crossing stations (200.0, 74.0, r=250km)
WGHC
WOA05
1994
1999
2000
2002
2004
2006
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

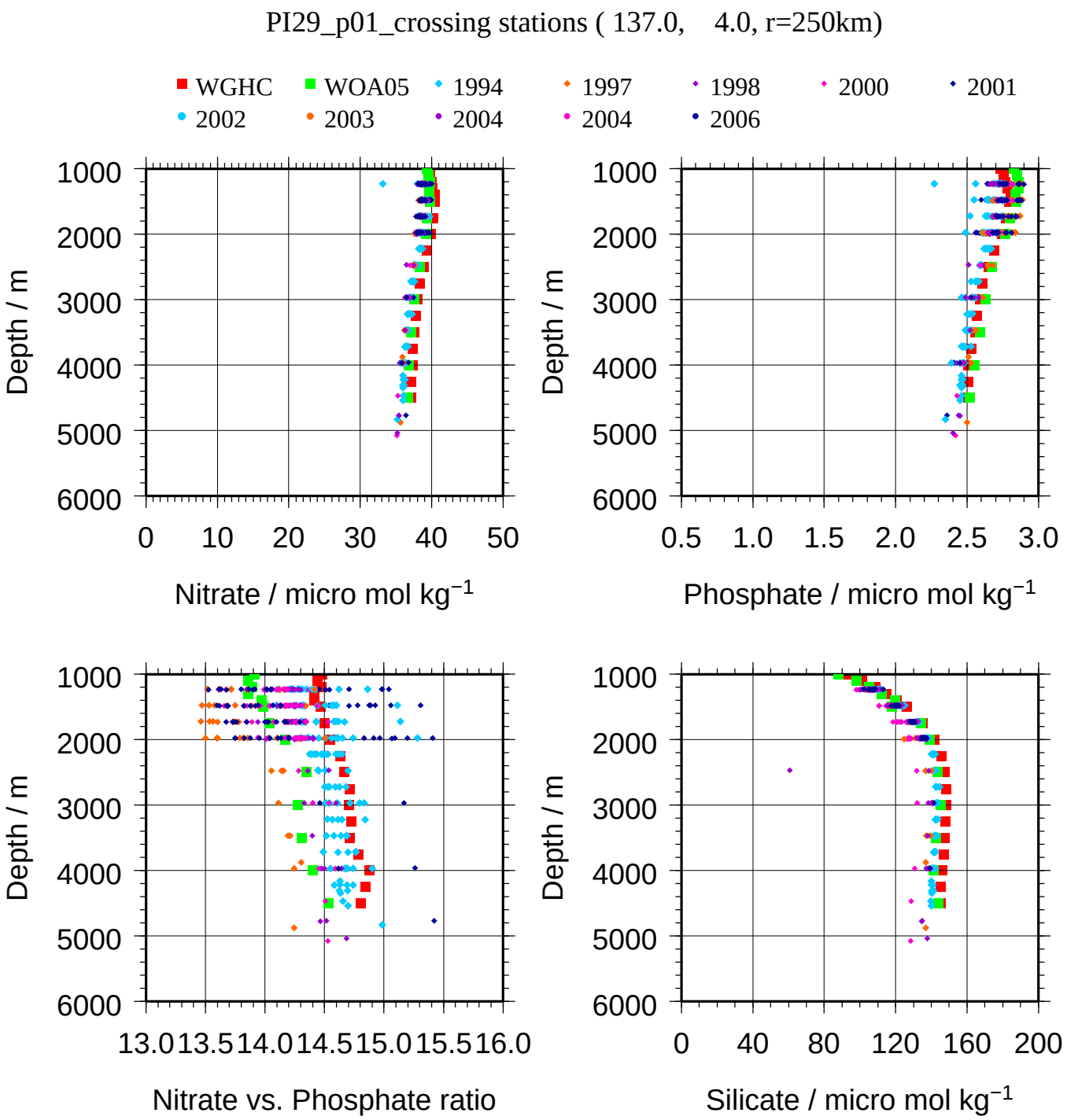

PI26_p01_crossing stations (207.0, 74.0, r=250km)
WGHC
WOA05
1999
2000
2002
2004
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

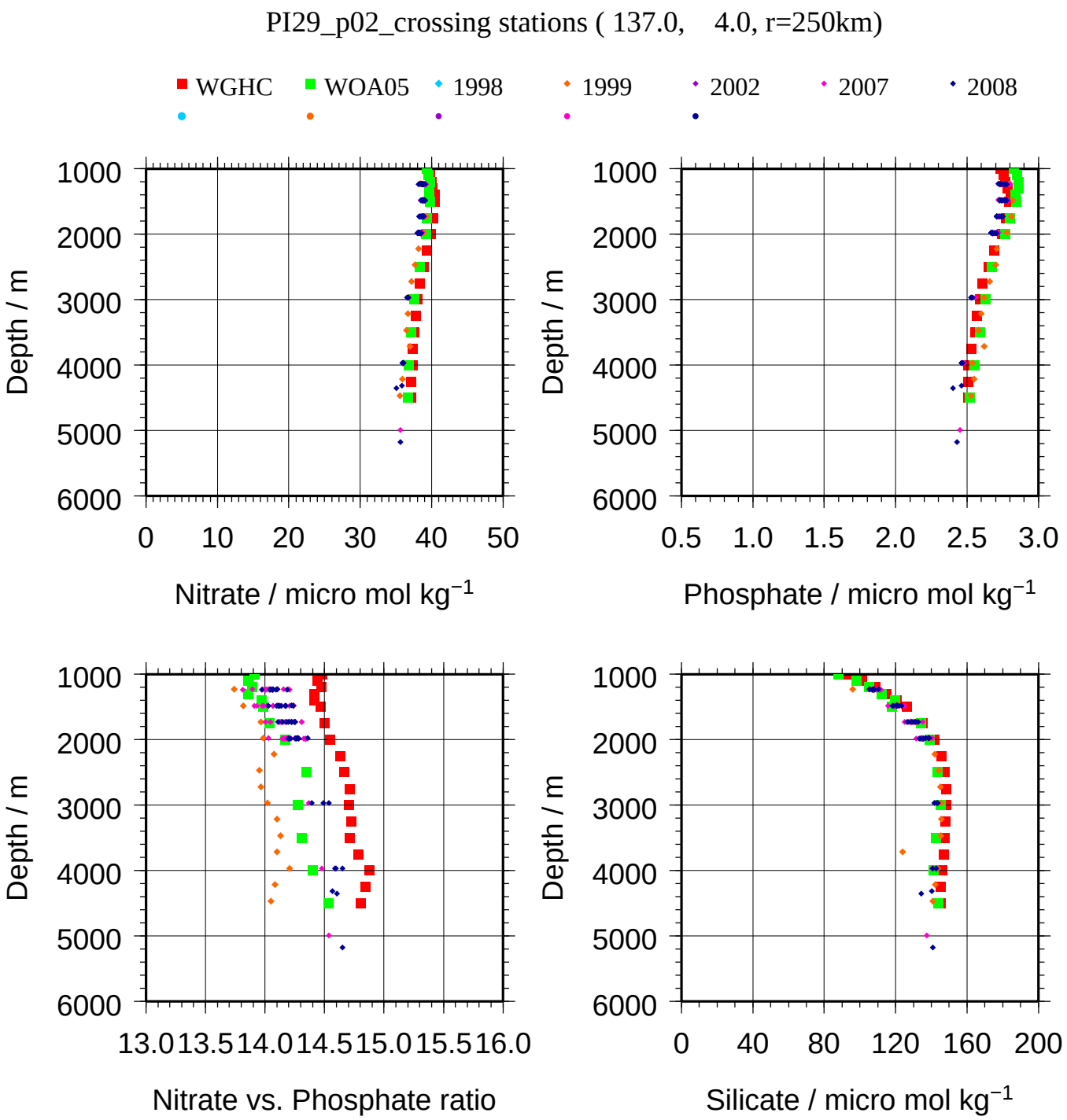

PI27_p01_crossing stations (130.0, 20.0, r=250km)
WGHC
WOA05
1996
1997
1998
2002
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

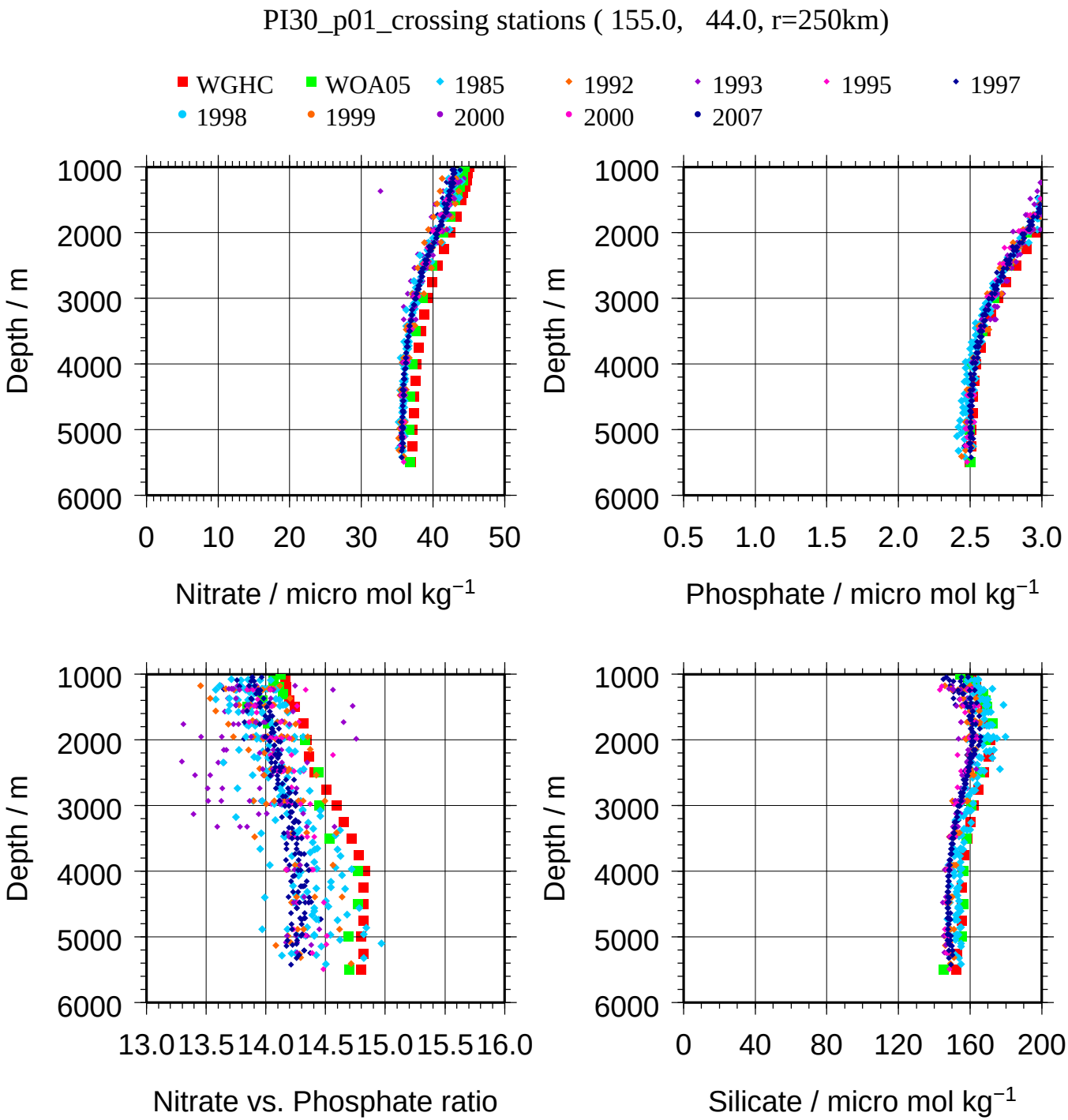
PI28_p01_crossing stations (137.0, 20.0, r=250km)

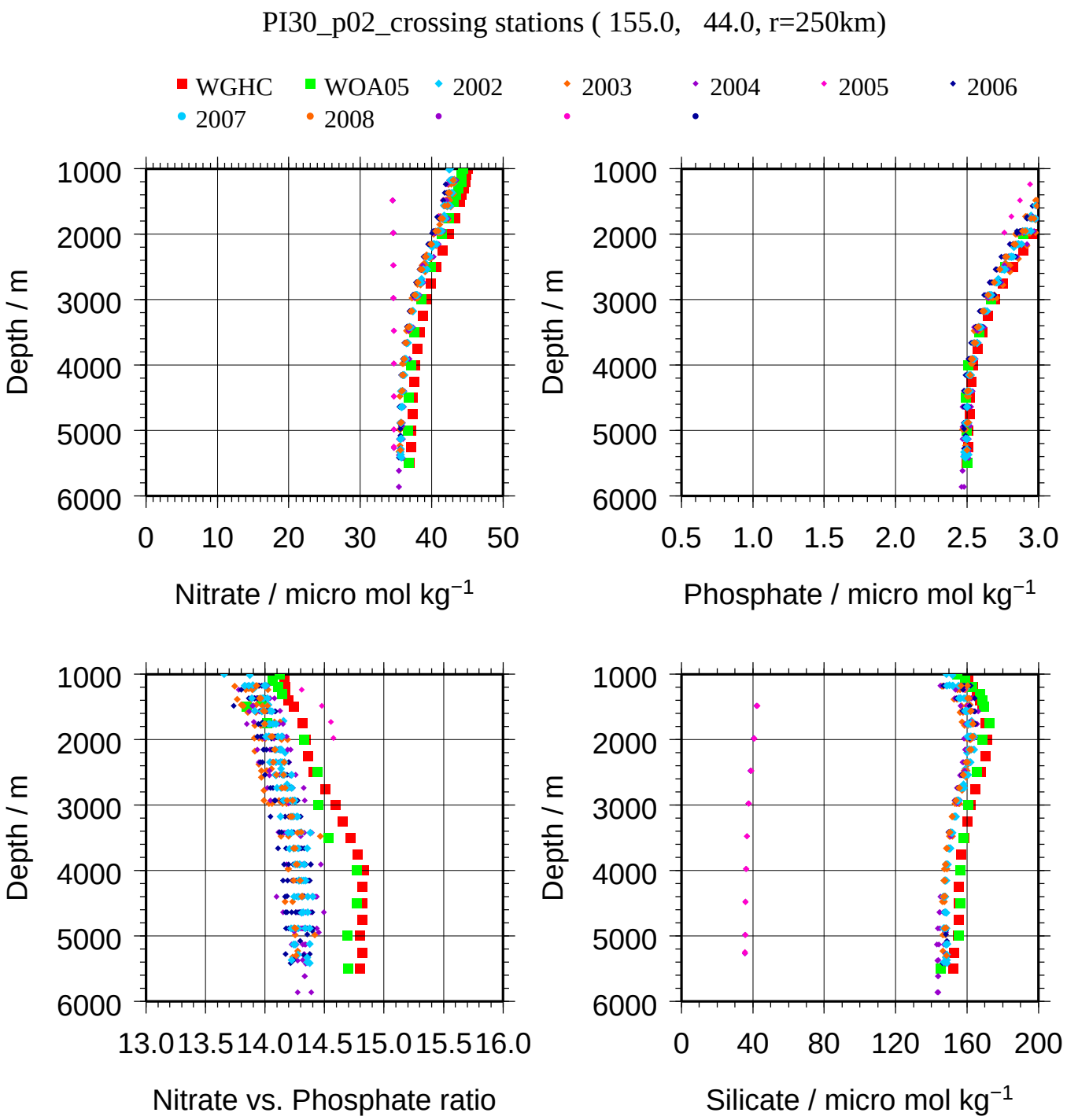


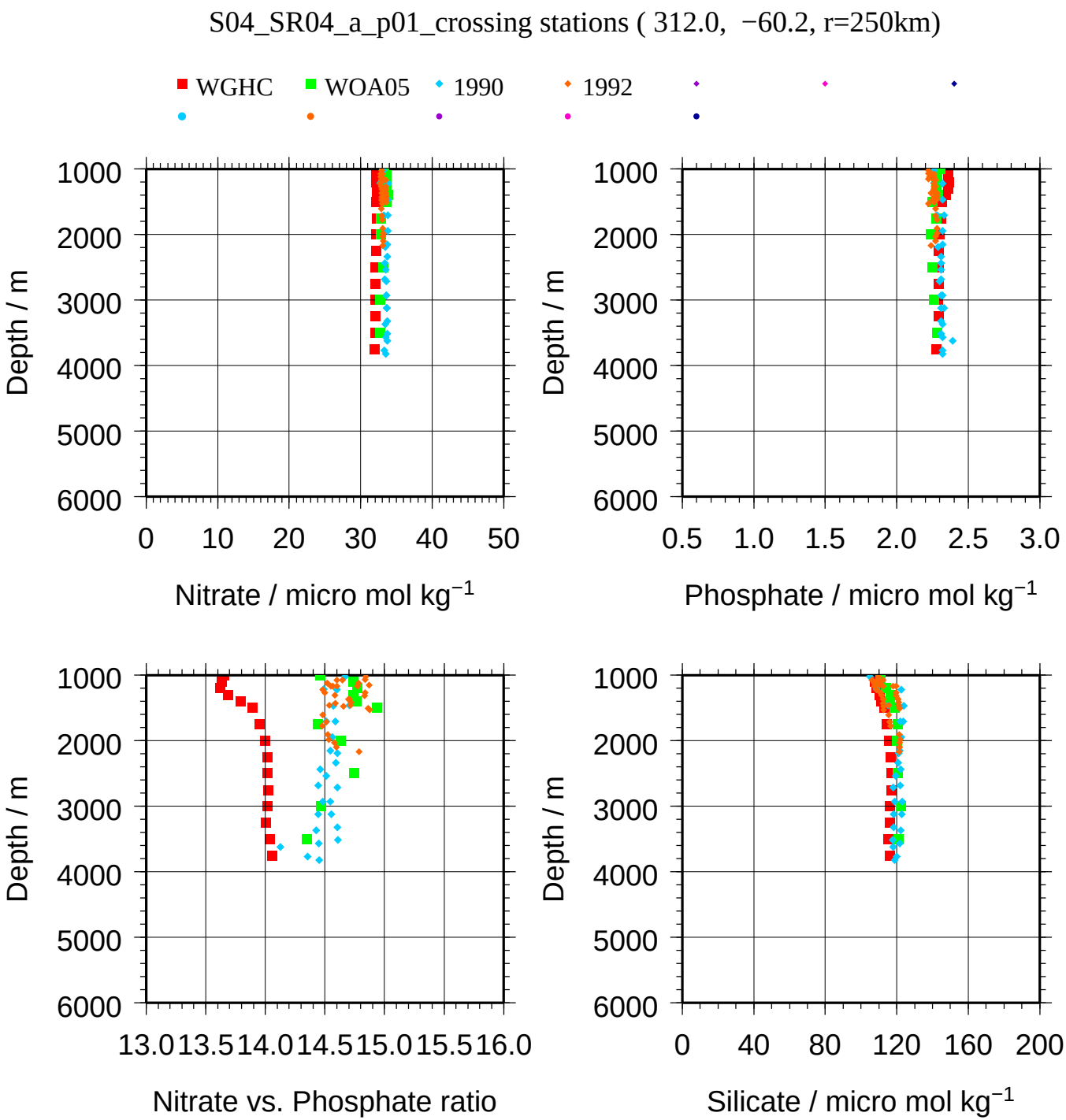

PI28_p02_crossing stations (137.0, 20.0, r=250km)
WGHC
WOA05
1997
2001
2002
2007
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

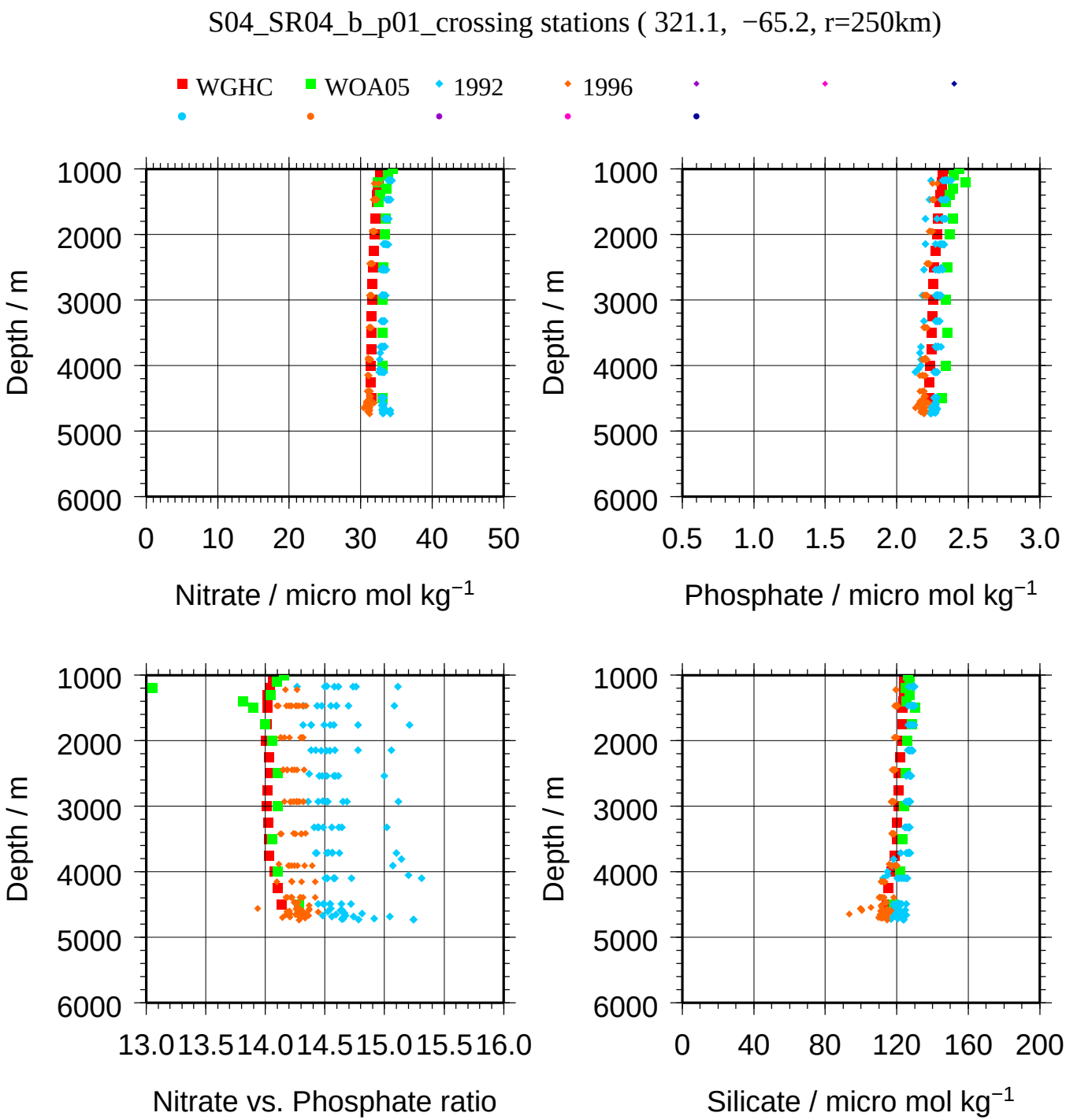

PI29_p01_crossing stations (137.0, 4.0, r=250km)
WGHC
WOA05
1994
1997
1998
2000
2001
2002
2003
2004
2004
2006
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

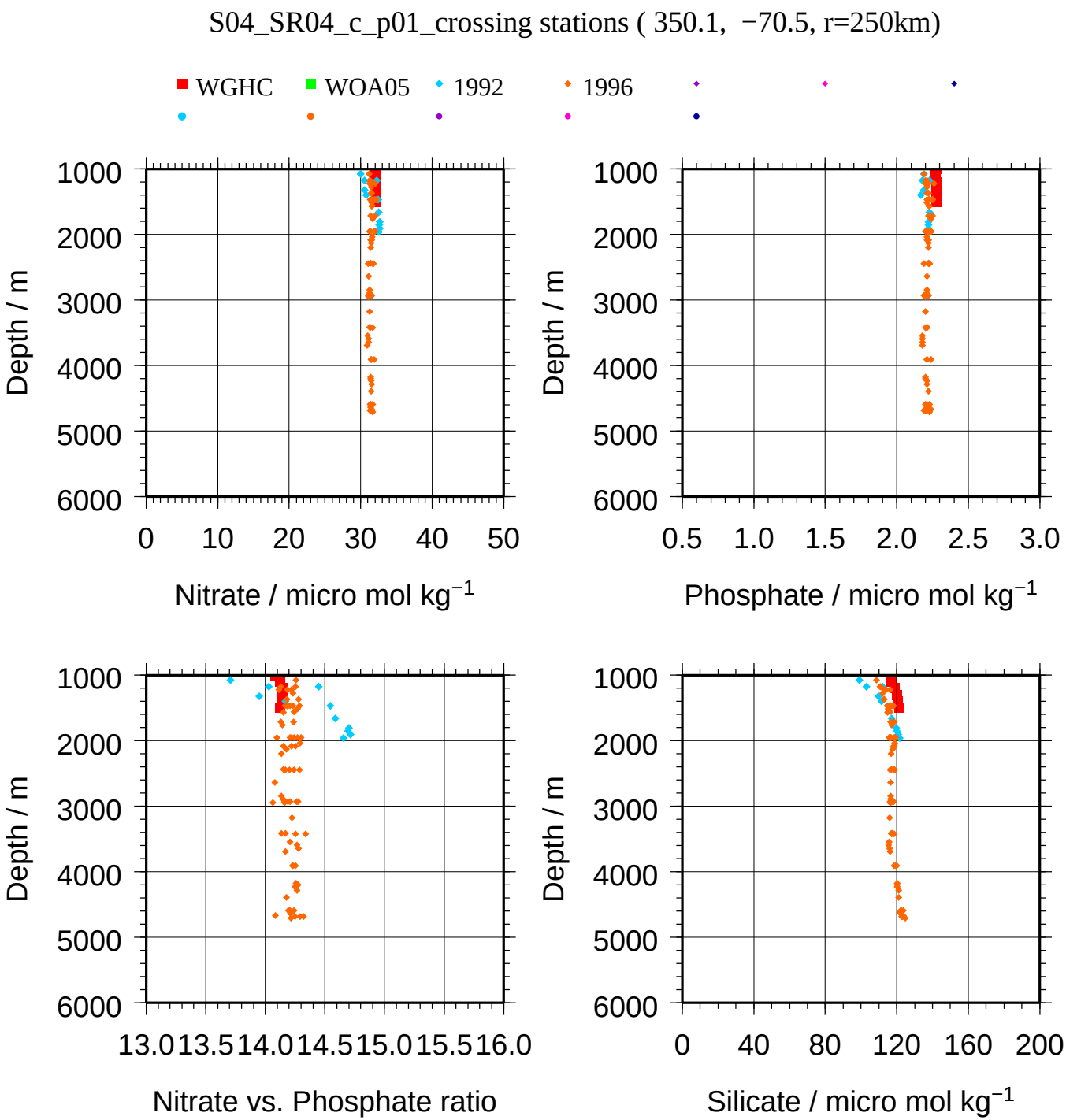

PI29_p02_crossing stations (137.0, 4.0, r=250km)
WGHC
WOA05
1998
1999
2002
2007
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
80
120
160
200
Silicate / micro mol kg−1

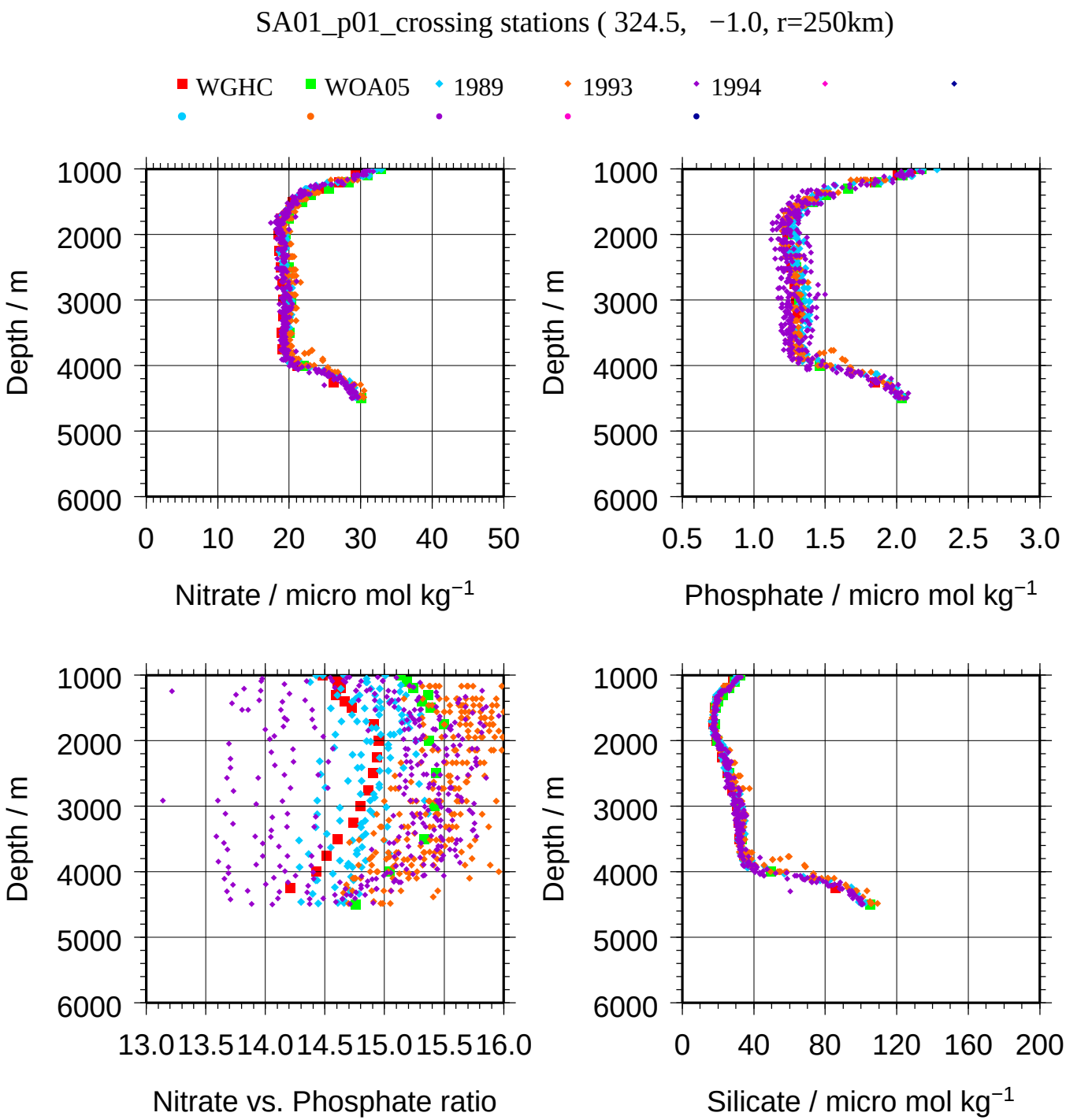

PI30_p01_crossing stations (155.0, 44.0, r=250km)
WGHC
WOA05
1985
1992
1993
1995
1997
1998
1999
2000
2000
2007
Depth / m
Nitrate / micro mol kg−1
Phosphate / micro mol kg−1
Nitrate vs. Phosphate ratio
Silicate / micro mol kg−1

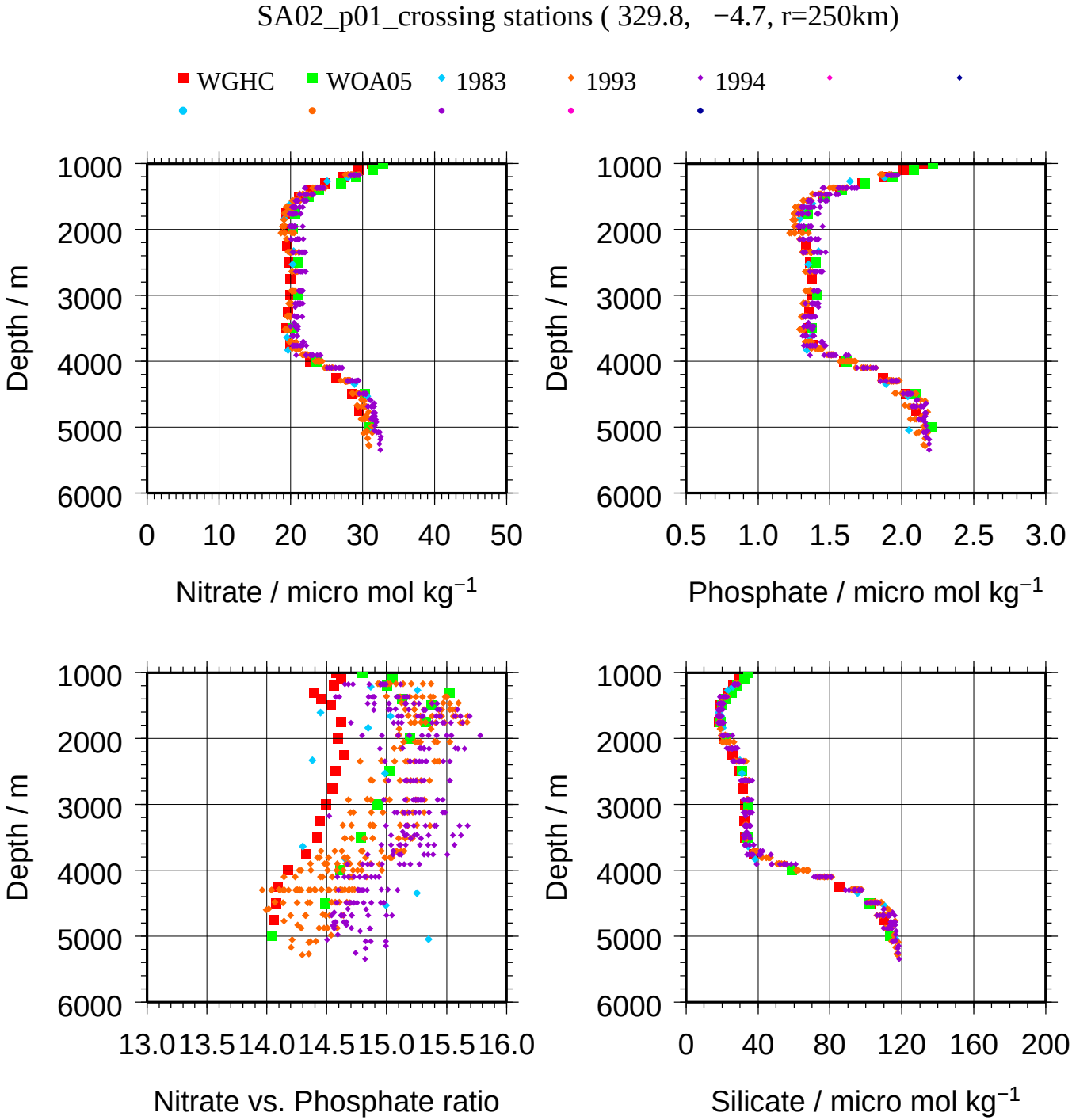

PI30_p02_crossing stations (155.0, 44.0, r=250km)
WGHC
WOA05
2002
2003
2004
2005
2006
2007
2008
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

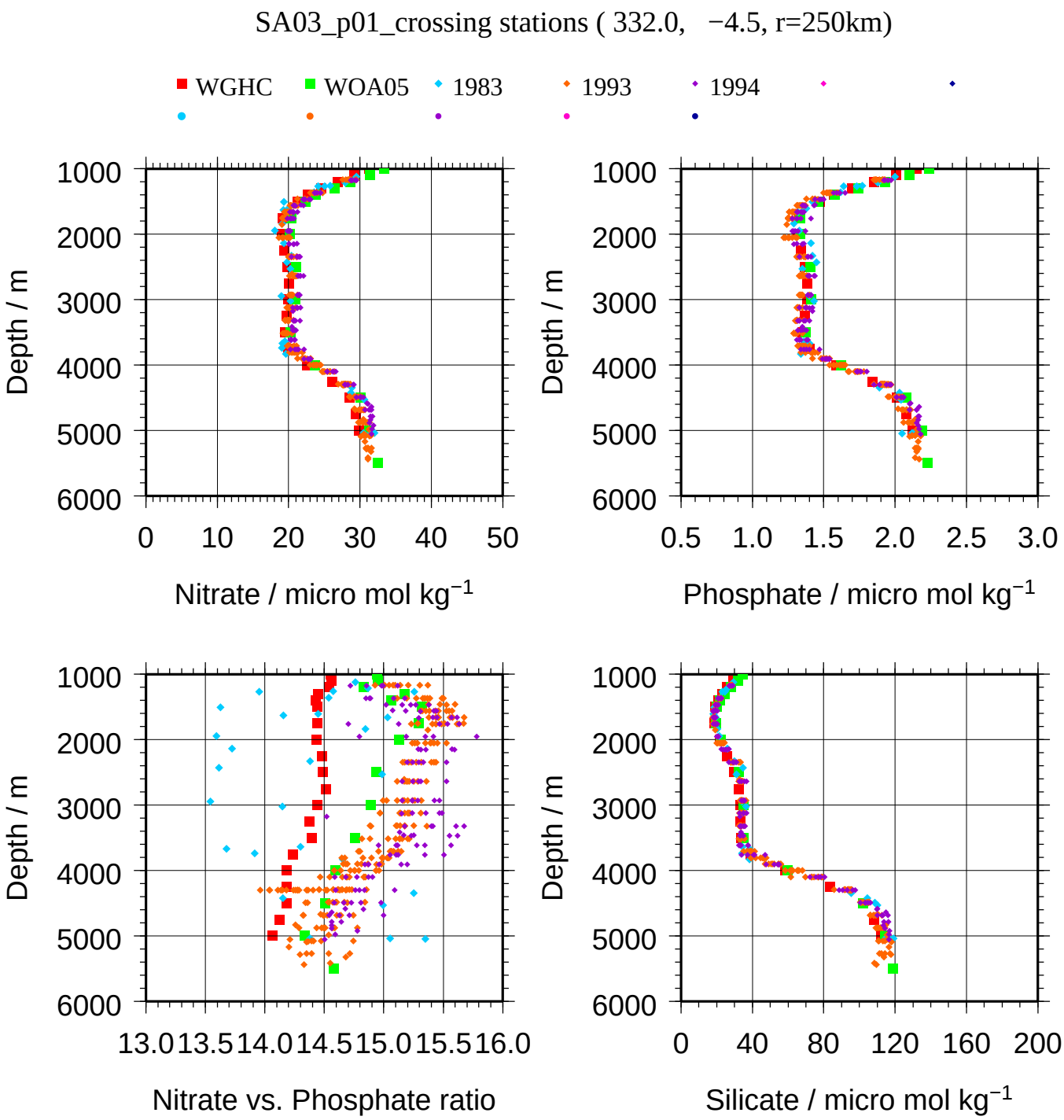

S04_SR04_a_p01_crossing stations (312.0, −60.2, r=250km)
WGHC
WOA05
1990
1992
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

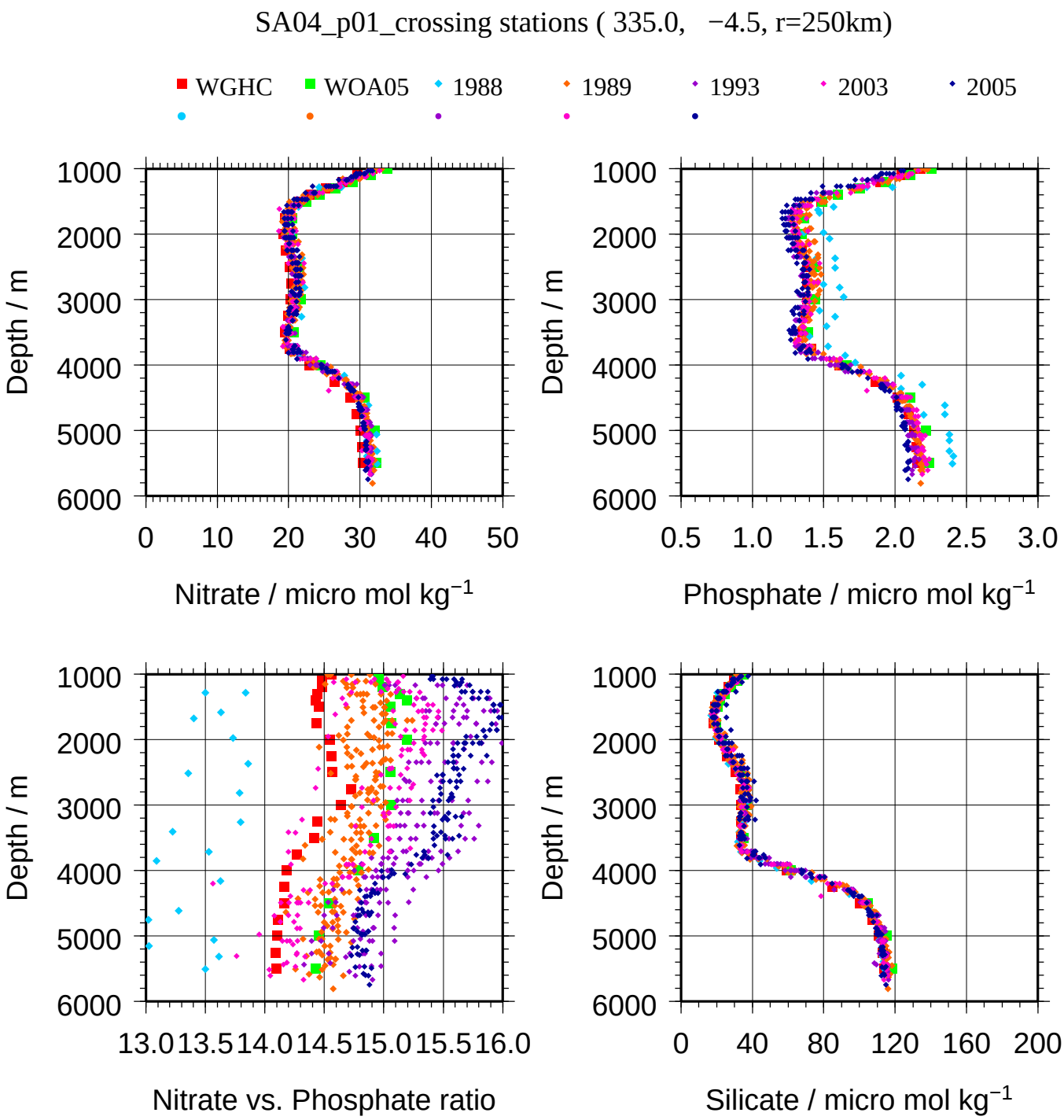

S04_SR04_b_p01_crossing stations (321.1, −65.2, r=250km)
WGHC
WOA05
1992
1996
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

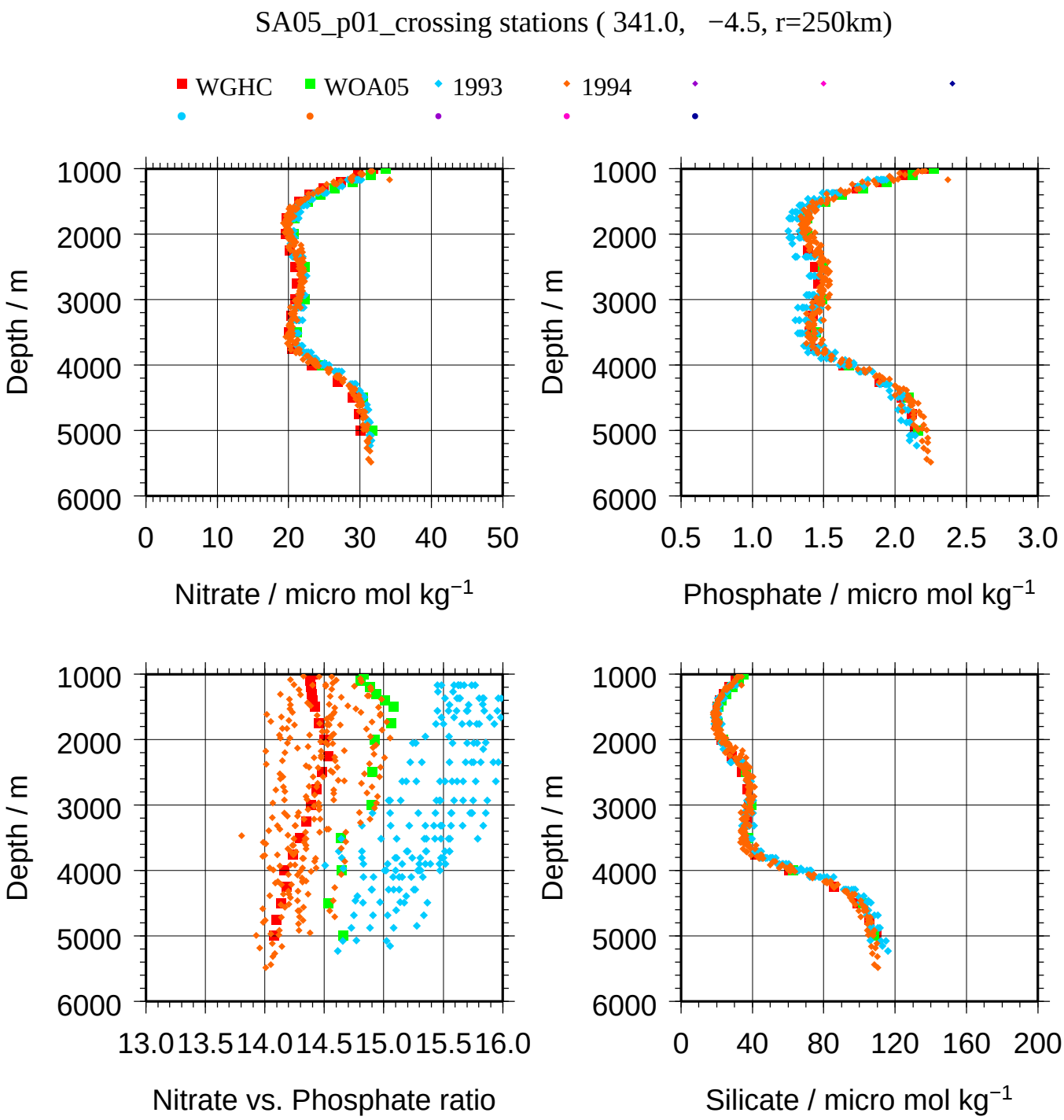

S04_SR04_c_p01_crossing stations (350.1, −70.5, r=250km)
WGHC
WOA05
1992
1996
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

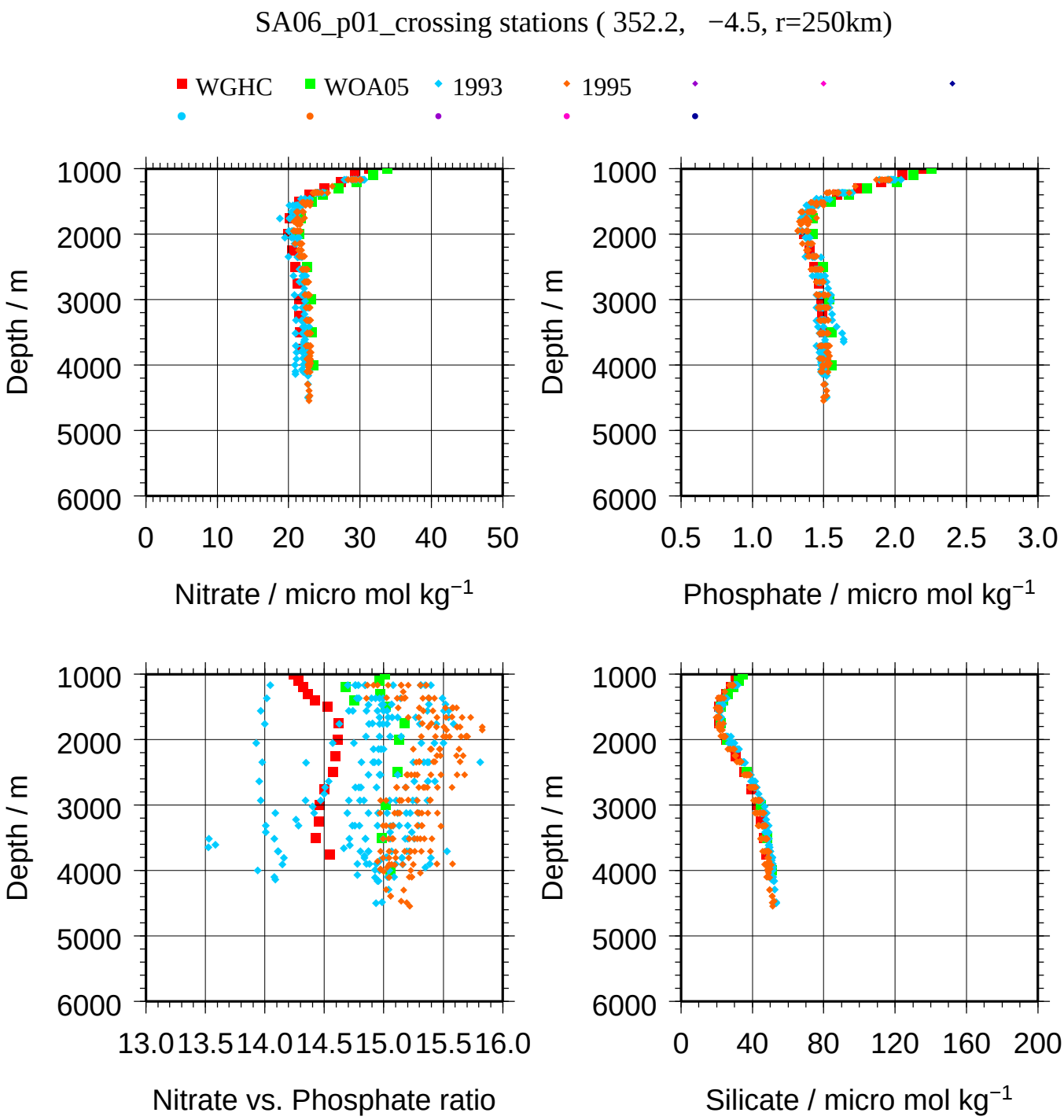

SA01_p01_crossing stations (324.5, −1.0, r=250km)
WGHC
WOA05
1989
1993
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

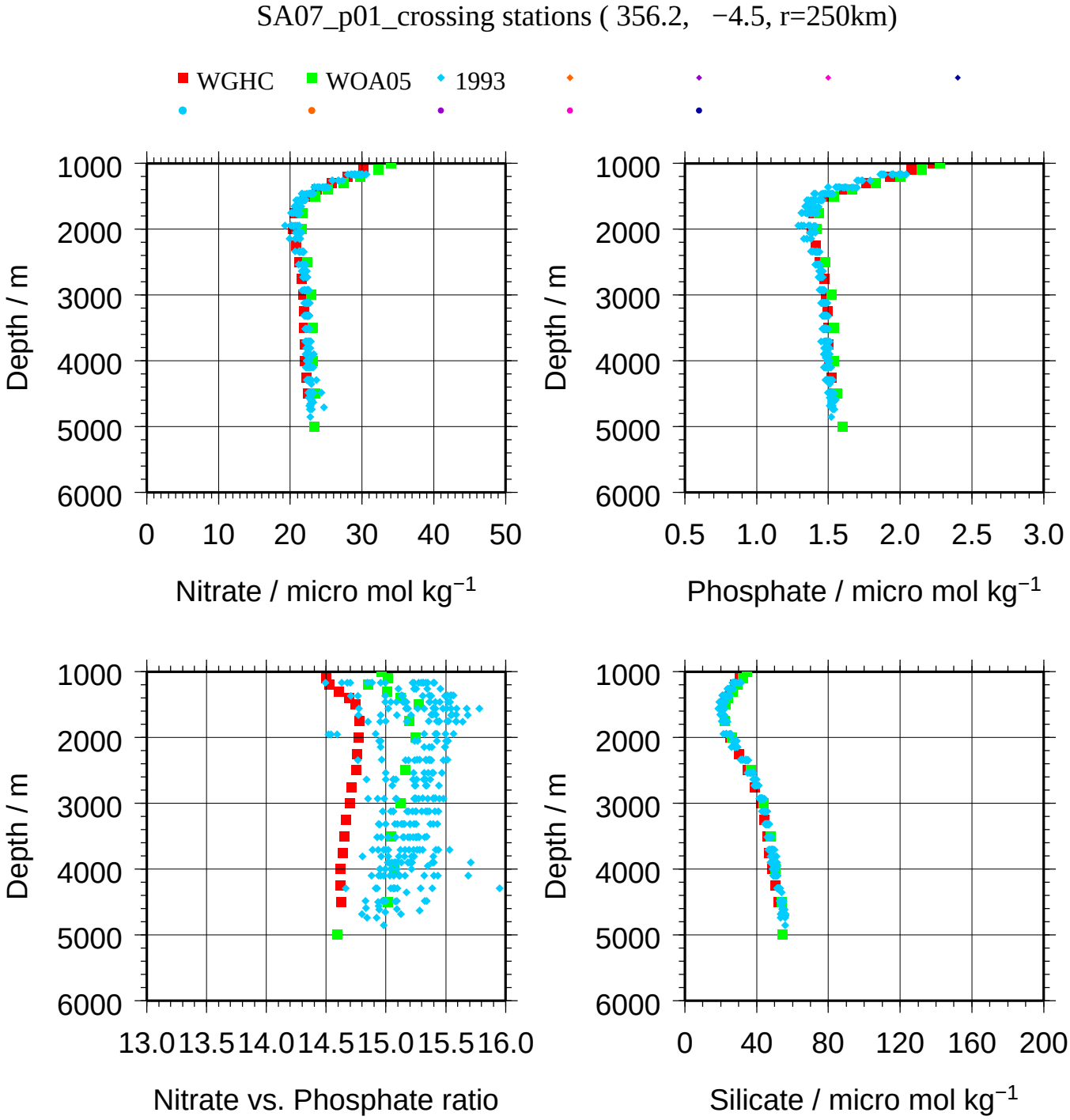

SA02_p01_crossing stations (329.8, −4.7, r=250km)
WGHC
WOA05
1983
1993
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

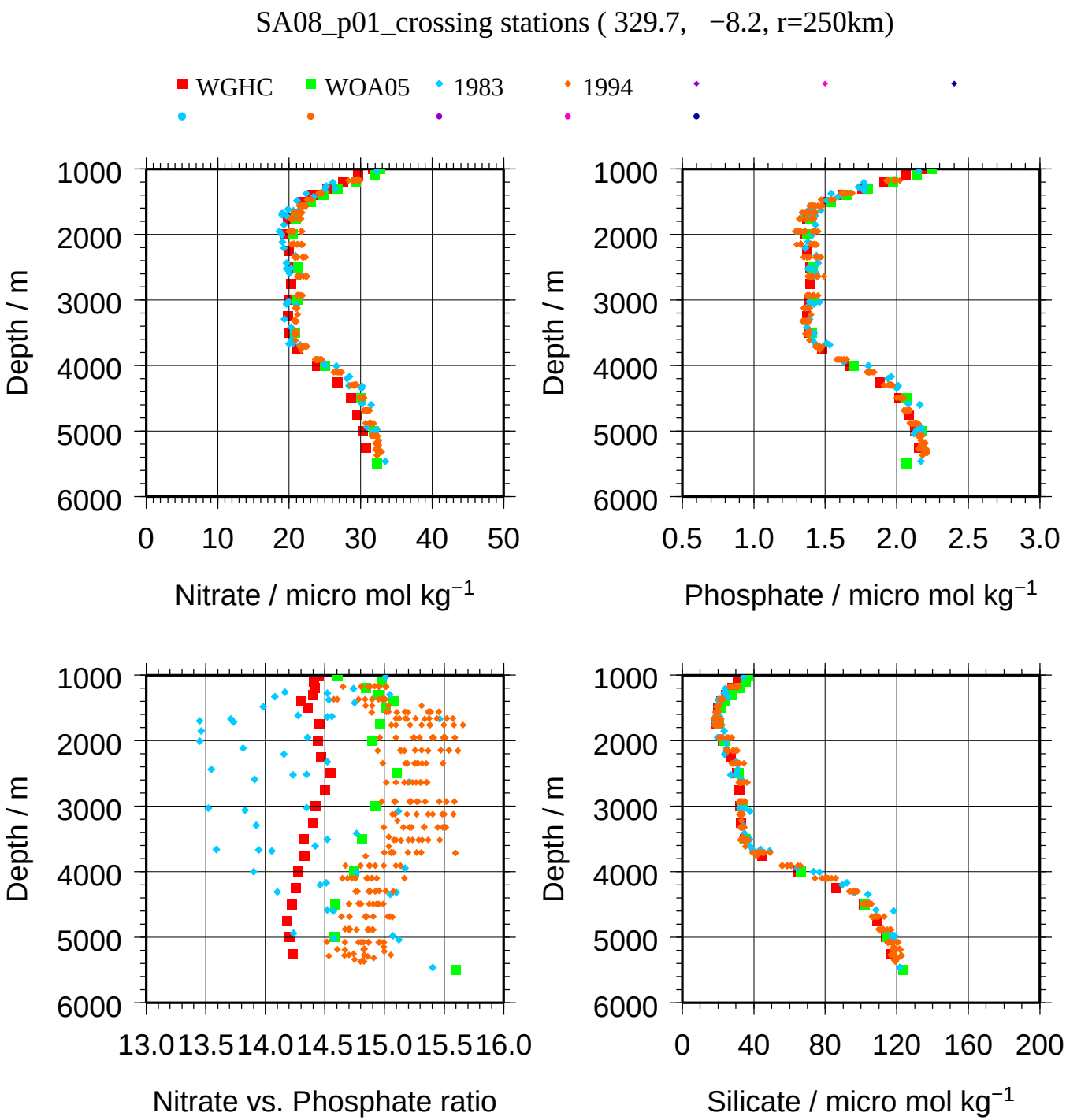

SA03_p01_crossing stations (332.0, −4.5, r=250km)
WGHC
WOA05
1983
1993
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

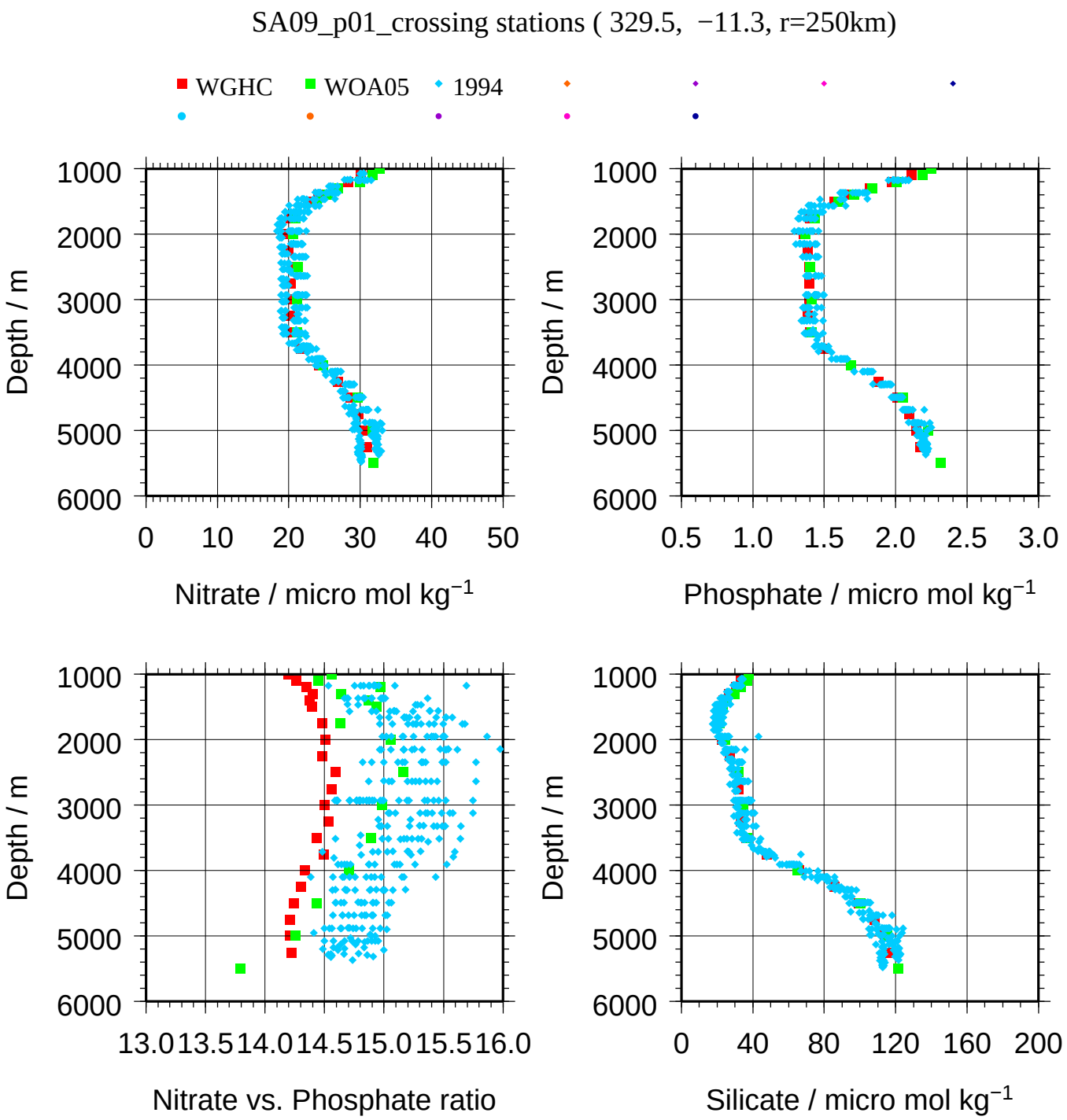

SA04_p01_crossing stations (335.0, −4.5, r=250km)
WGHC
WOA05
1988
1989
1993
2003
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

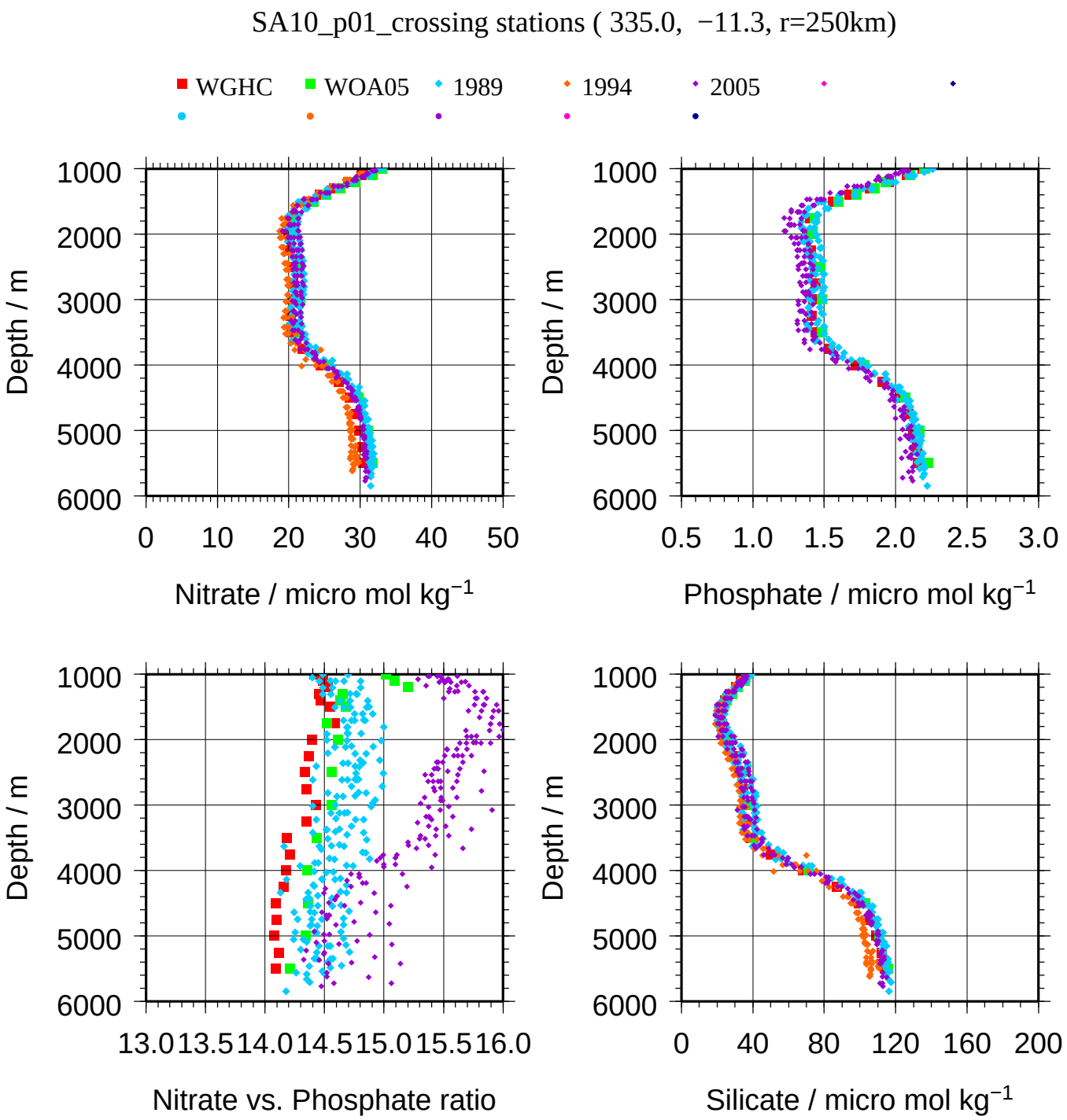

SA05_p01_crossing stations (341.0, −4.5, r=250km)
WGHC
WOA05
1993
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

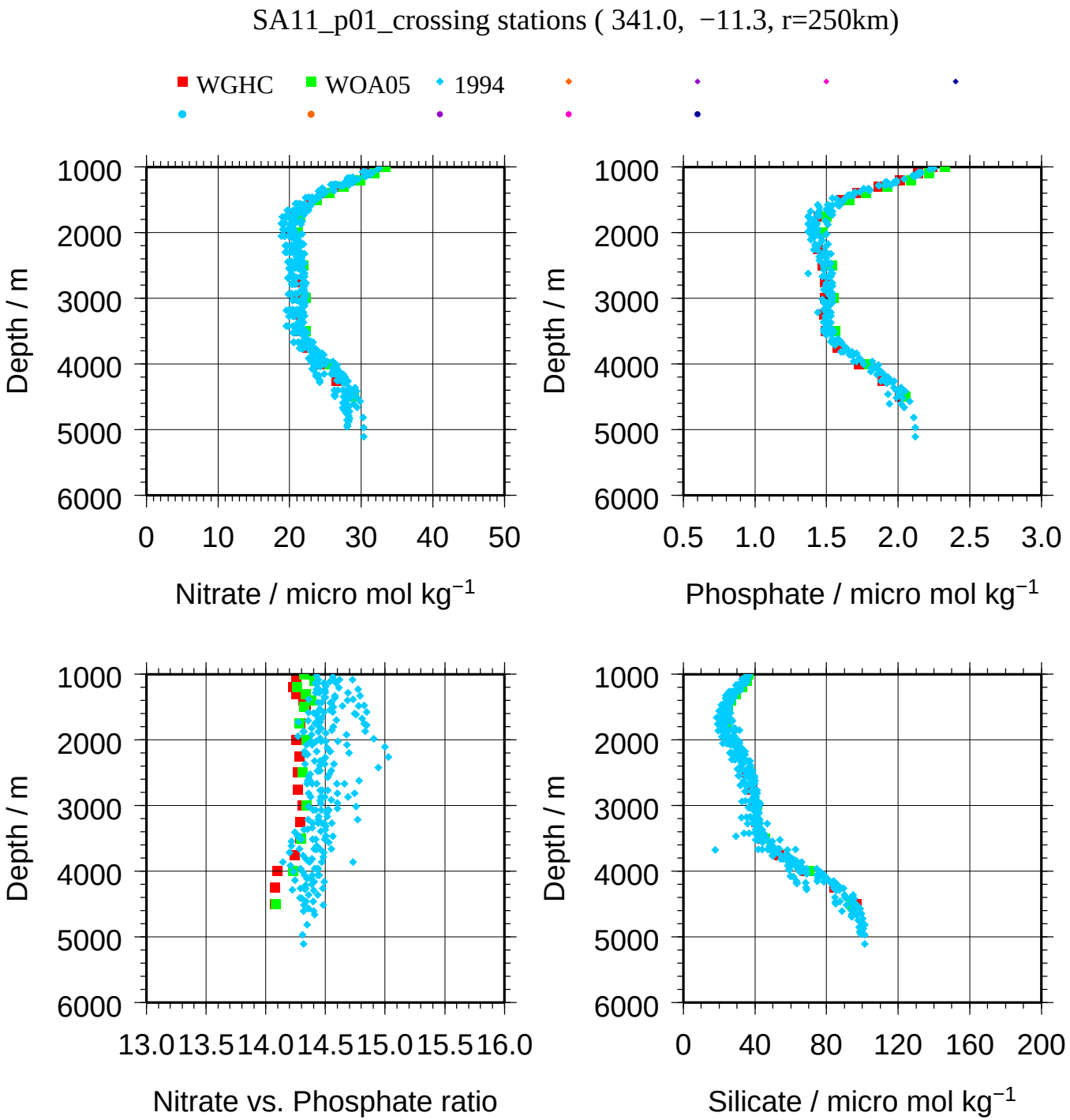

SA06_p01_crossing stations (352.2, −4.5, r=250km)
WGHC
WOA05
1993
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

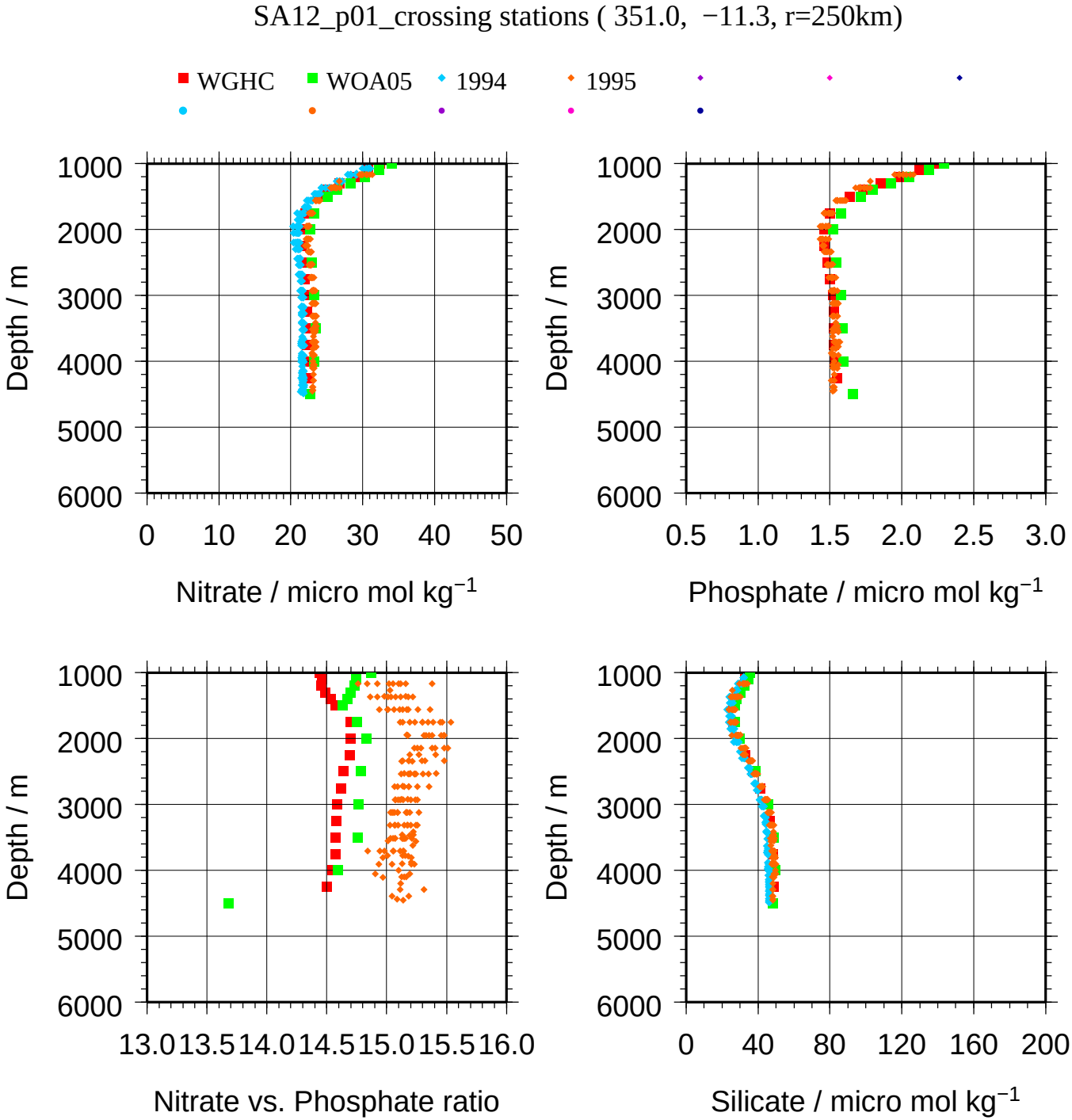

SA07_p01_crossing stations (356.2, −4.5, r=250km)
WGHC
WOA05
1993
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

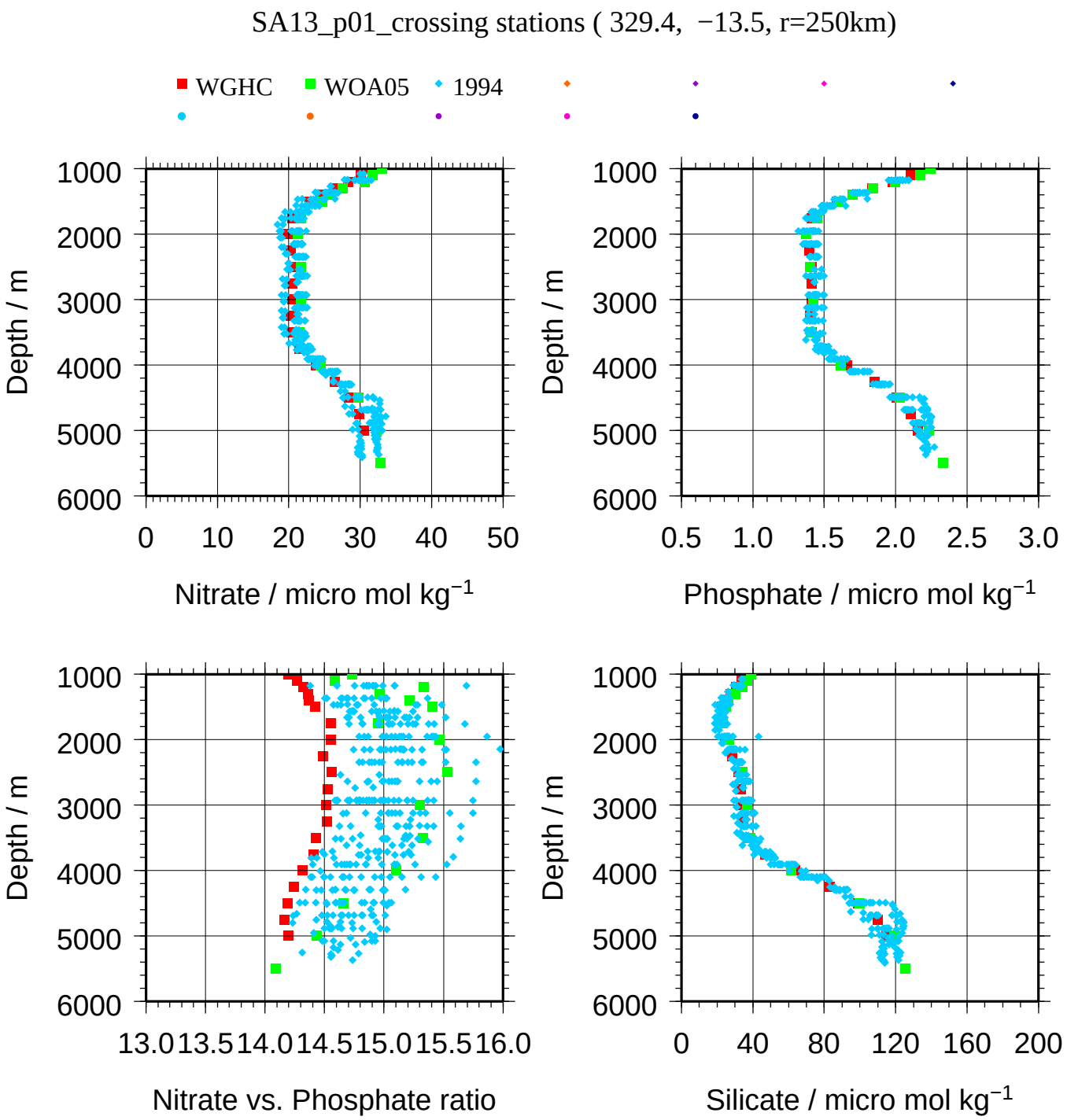

SA08_p01_crossing stations (329.7, −8.2, r=250km)
WGHC
WOA05
1983
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

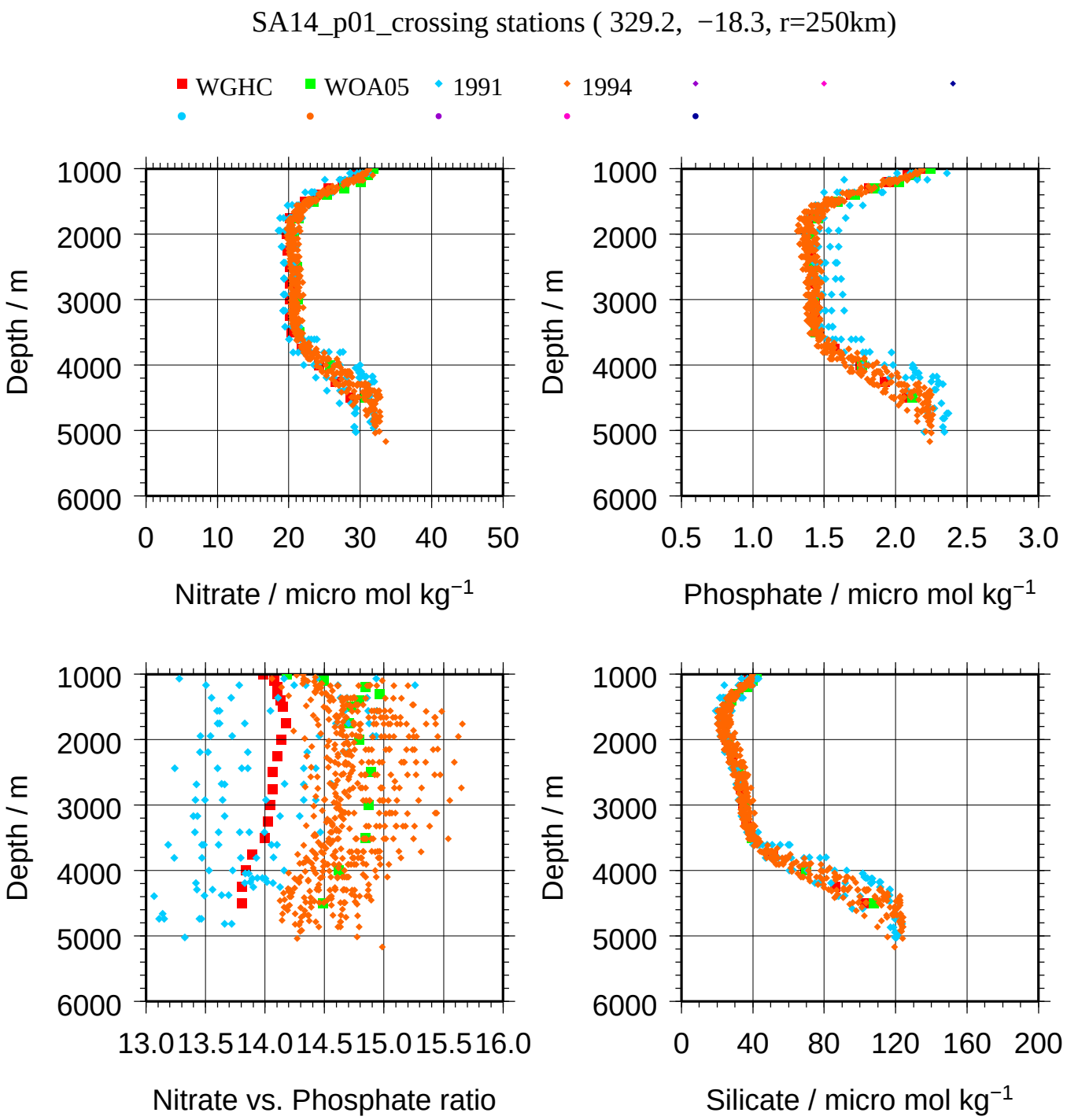

SA09_p01_crossing stations (329.5, −11.3, r=250km)
WGHC
WOA05
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

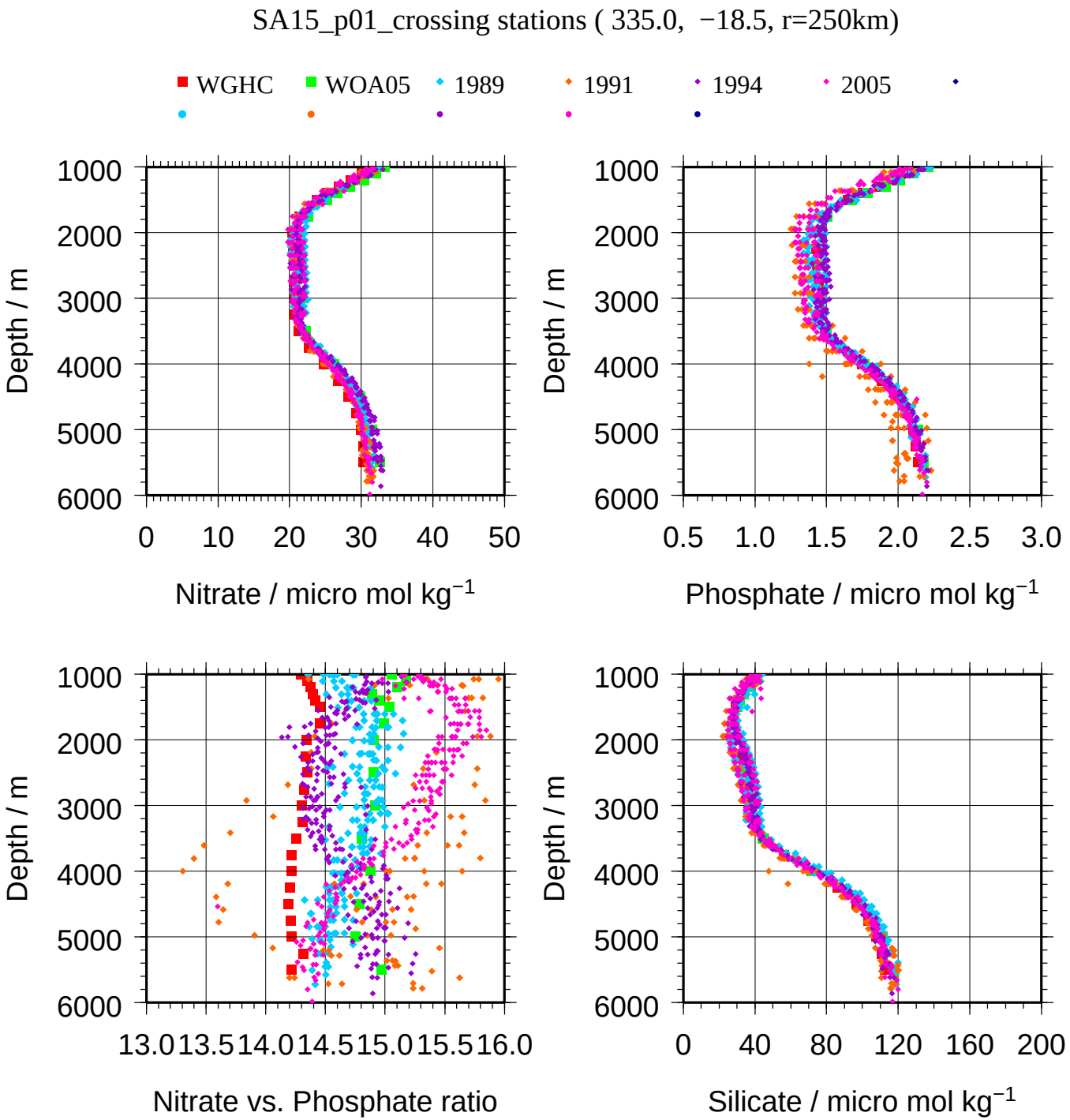

SA10_p01_crossing stations (335.0, −11.3, r=250km)
WGHC
WOA05
1989
1994
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

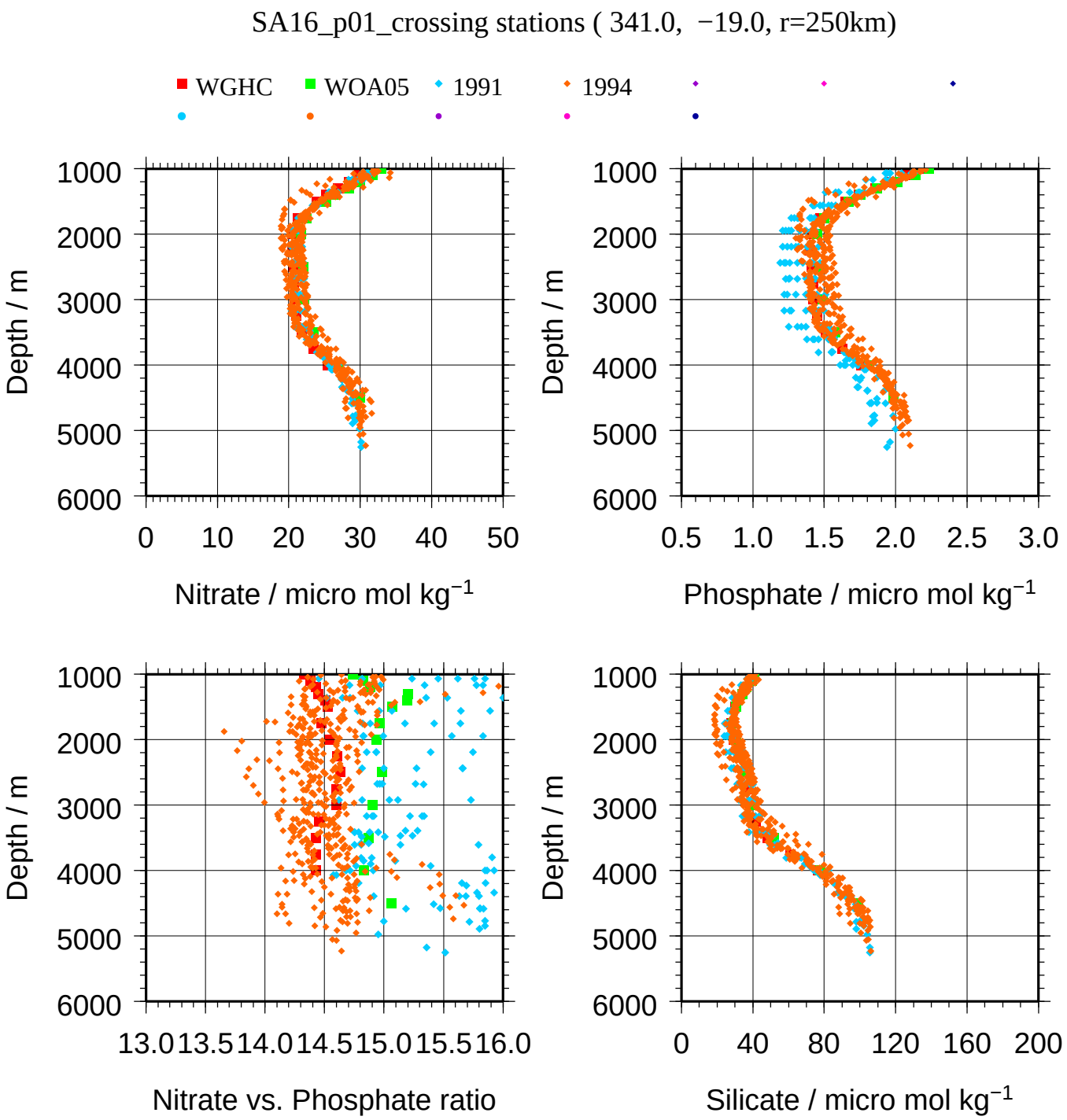

SA11_p01_crossing stations (341.0, −11.3, r=250km)
WGHC
WOA05
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

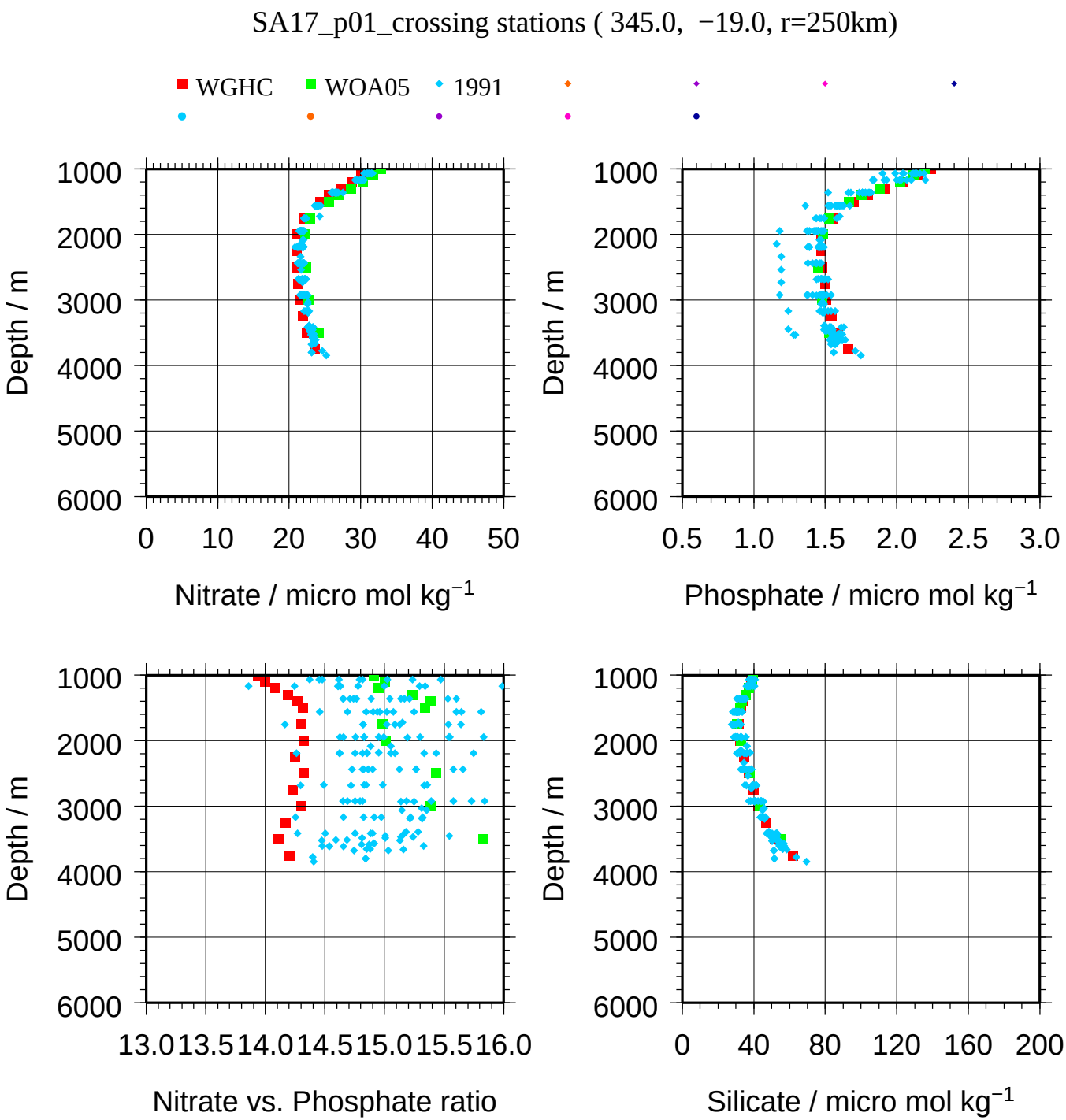

SA12_p01_crossing stations (351.0, −11.3, r=250km)
WGHC
WOA05
1994
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

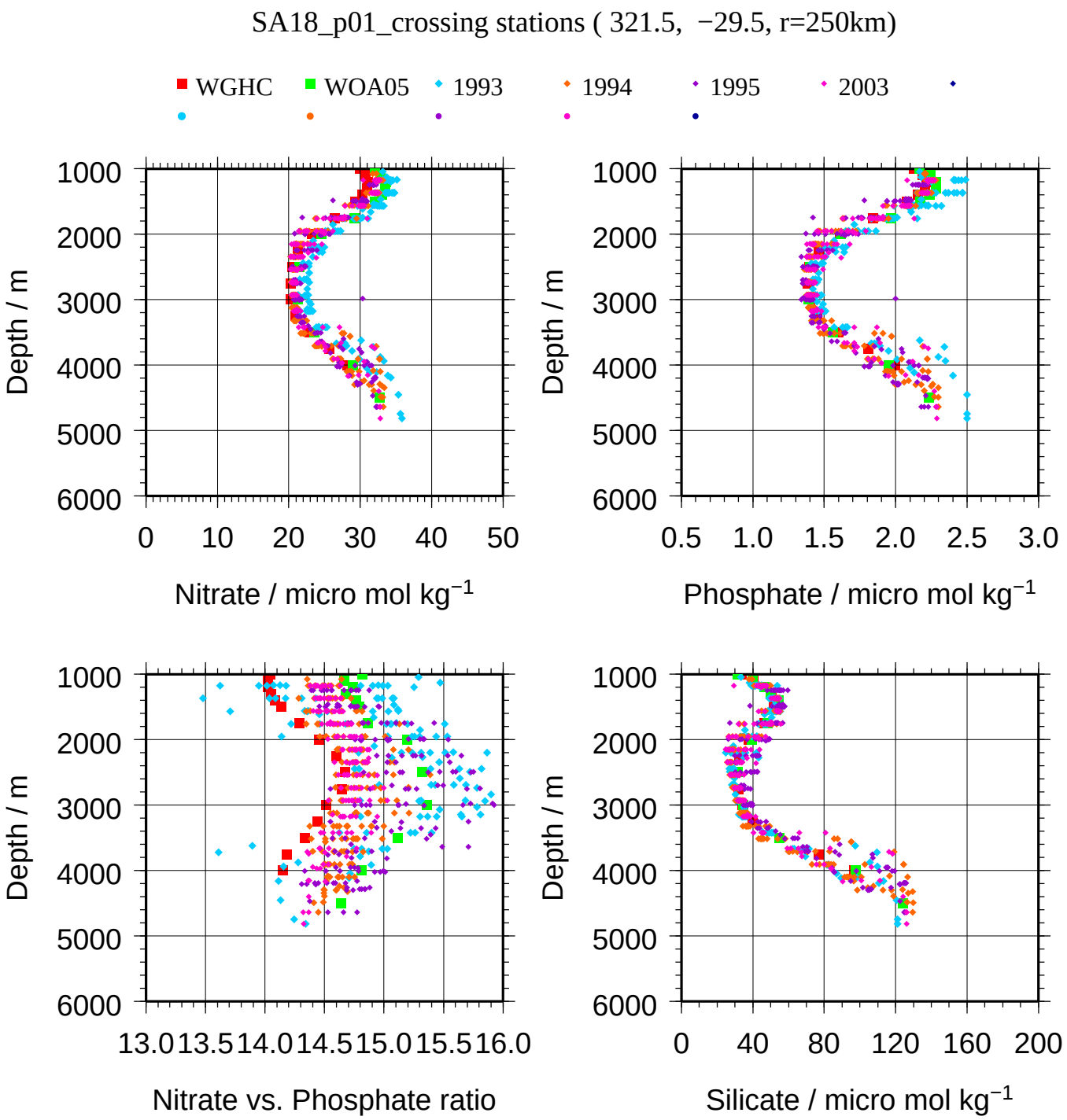

SA13_p01_crossing stations (329.4, −13.5, r=250km)
WGHC
WOA05
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

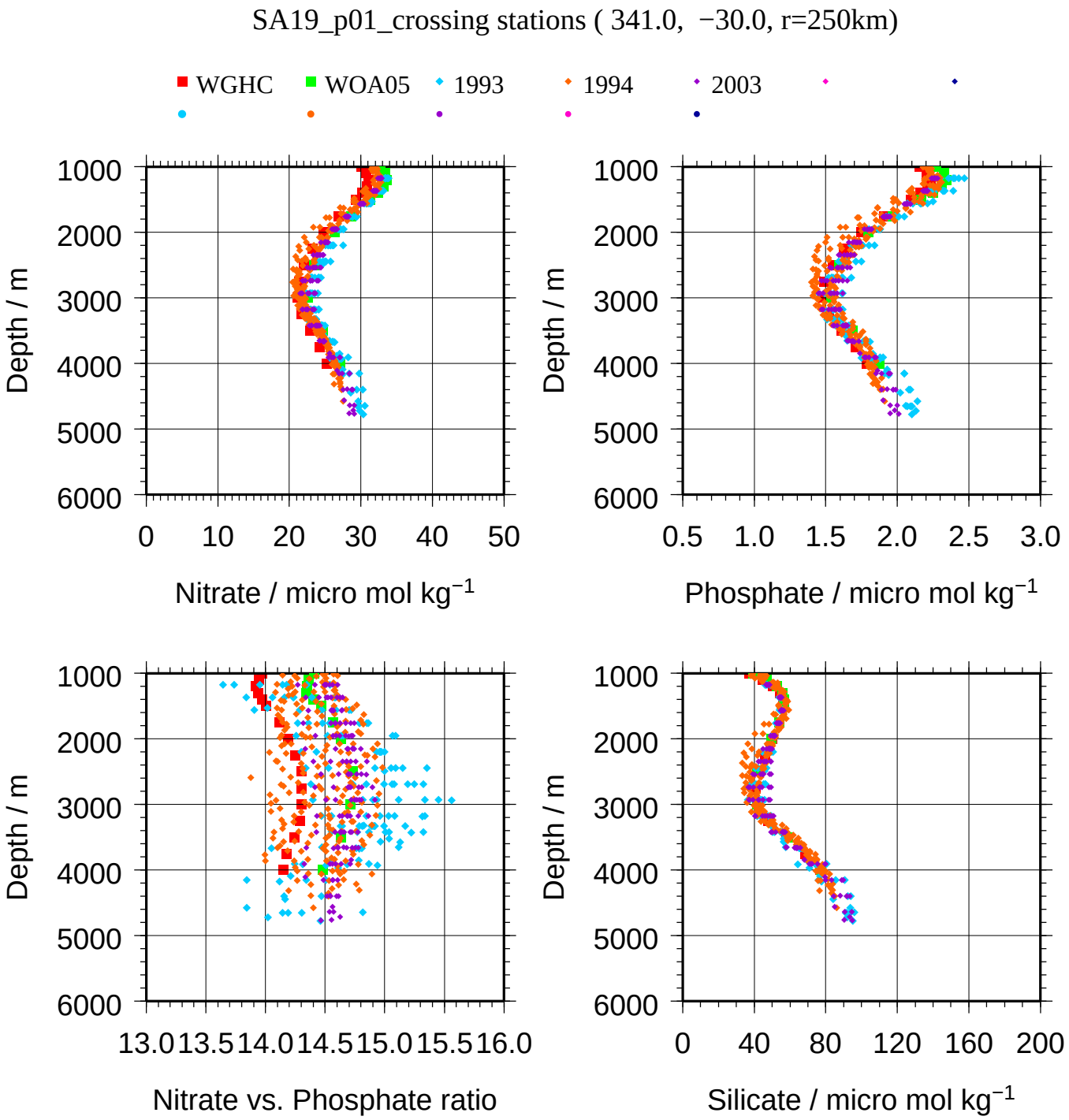

SA14_p01_crossing stations (329.2, −18.3, r=250km)
WGHC
WOA05
1991
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

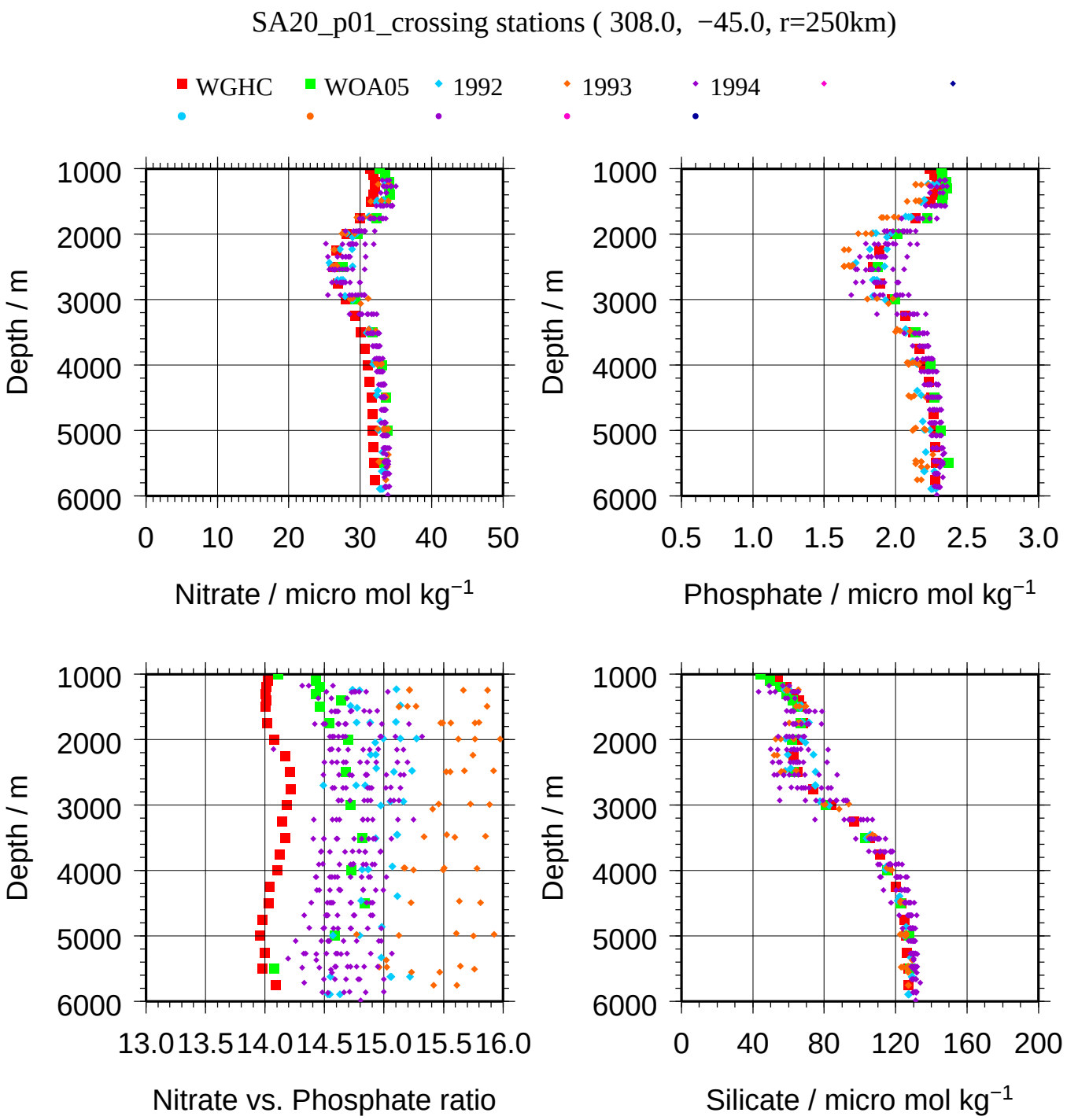

SA15_p01_crossing stations (335.0, −18.5, r=250km)
WGHC
WOA05
1989
1991
1994
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

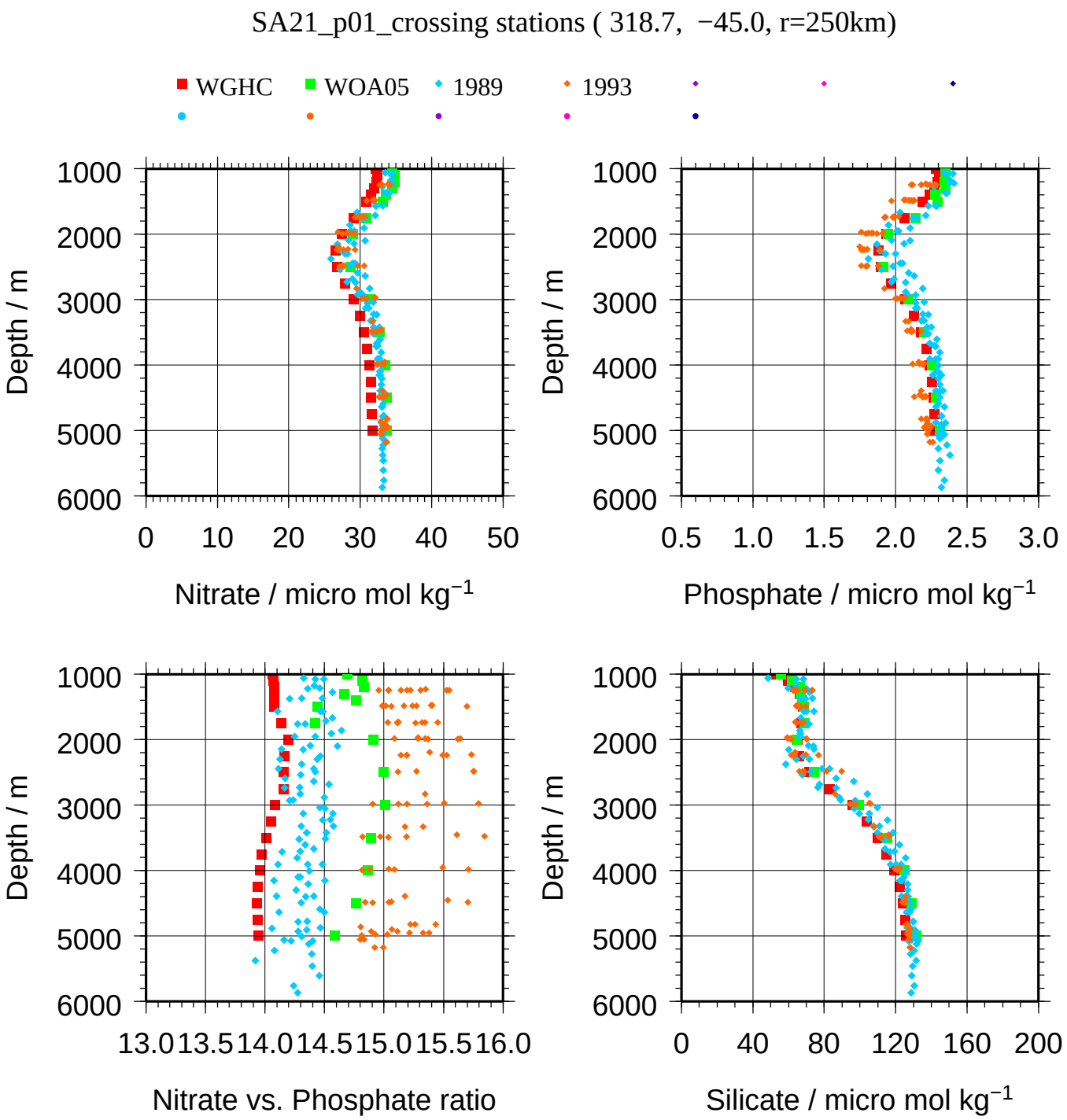

SA16_p01_crossing stations (341.0, −19.0, r=250km)
WGHC
WOA05
1991
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

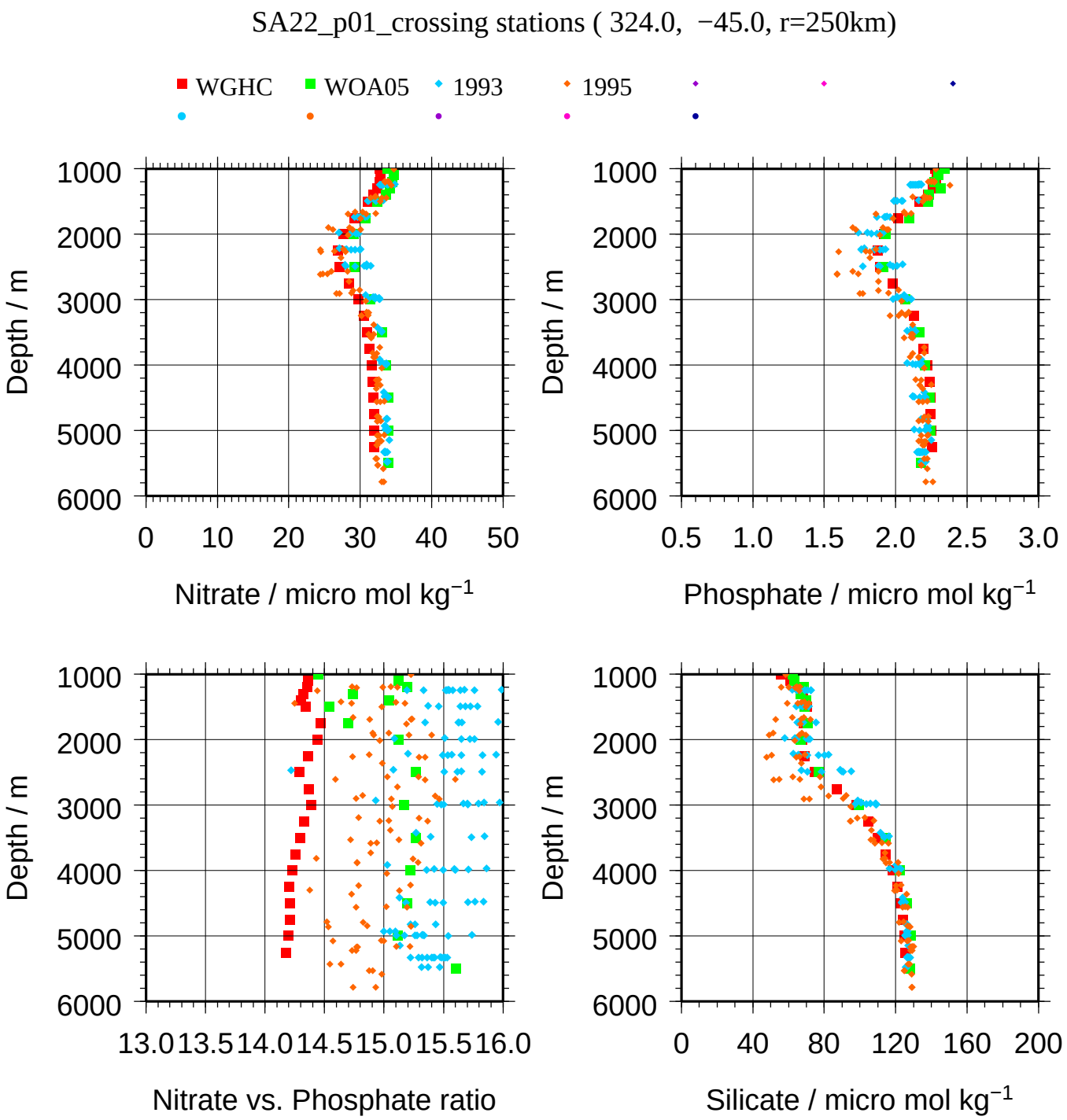

SA17_p01_crossing stations (345.0, −19.0, r=250km)
WGHC
WOA05
1991
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

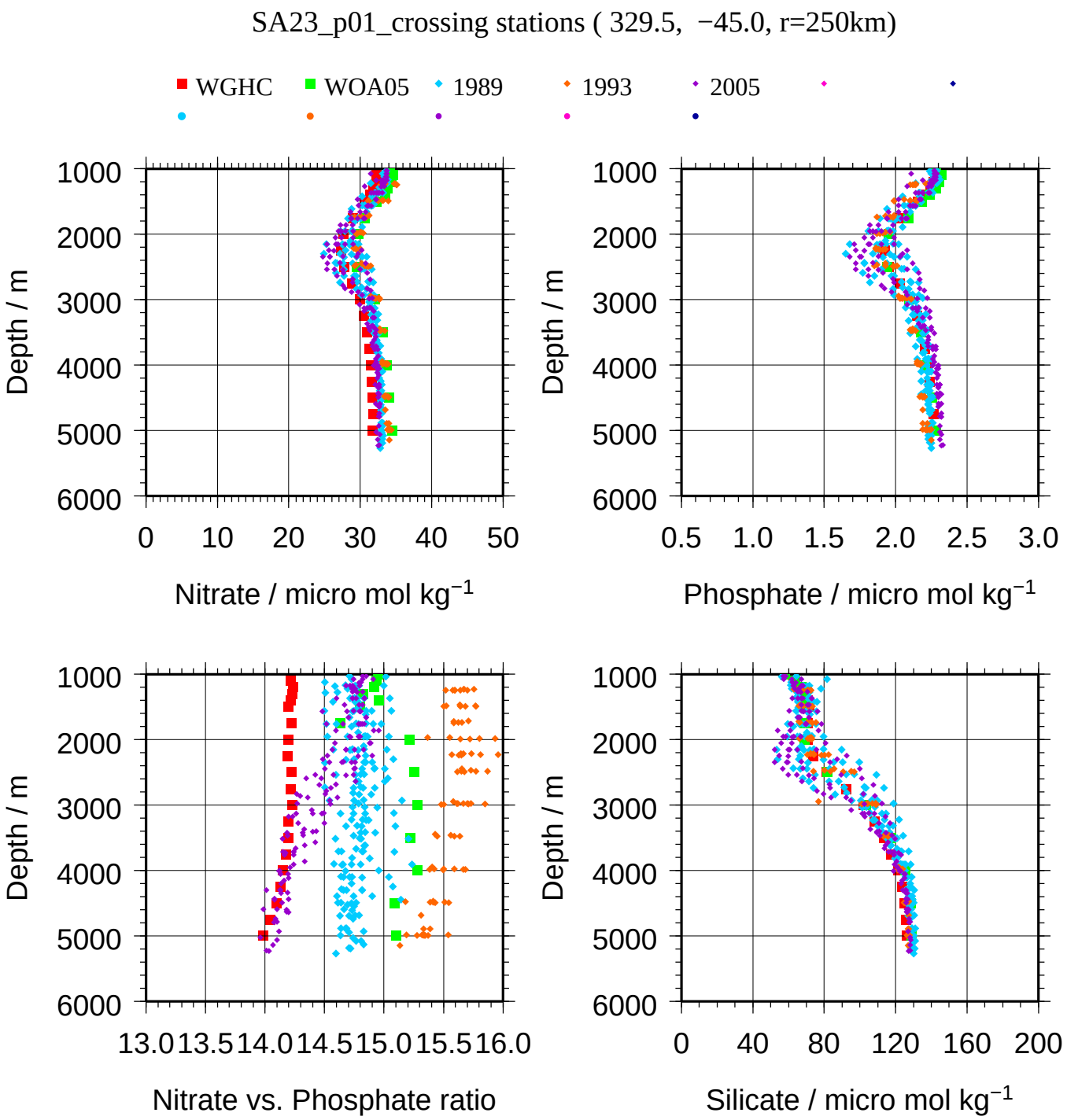

SA18_p01_crossing stations (321.5, −29.5, r=250km)
WGHC
WOA05
1993
1994
1995
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

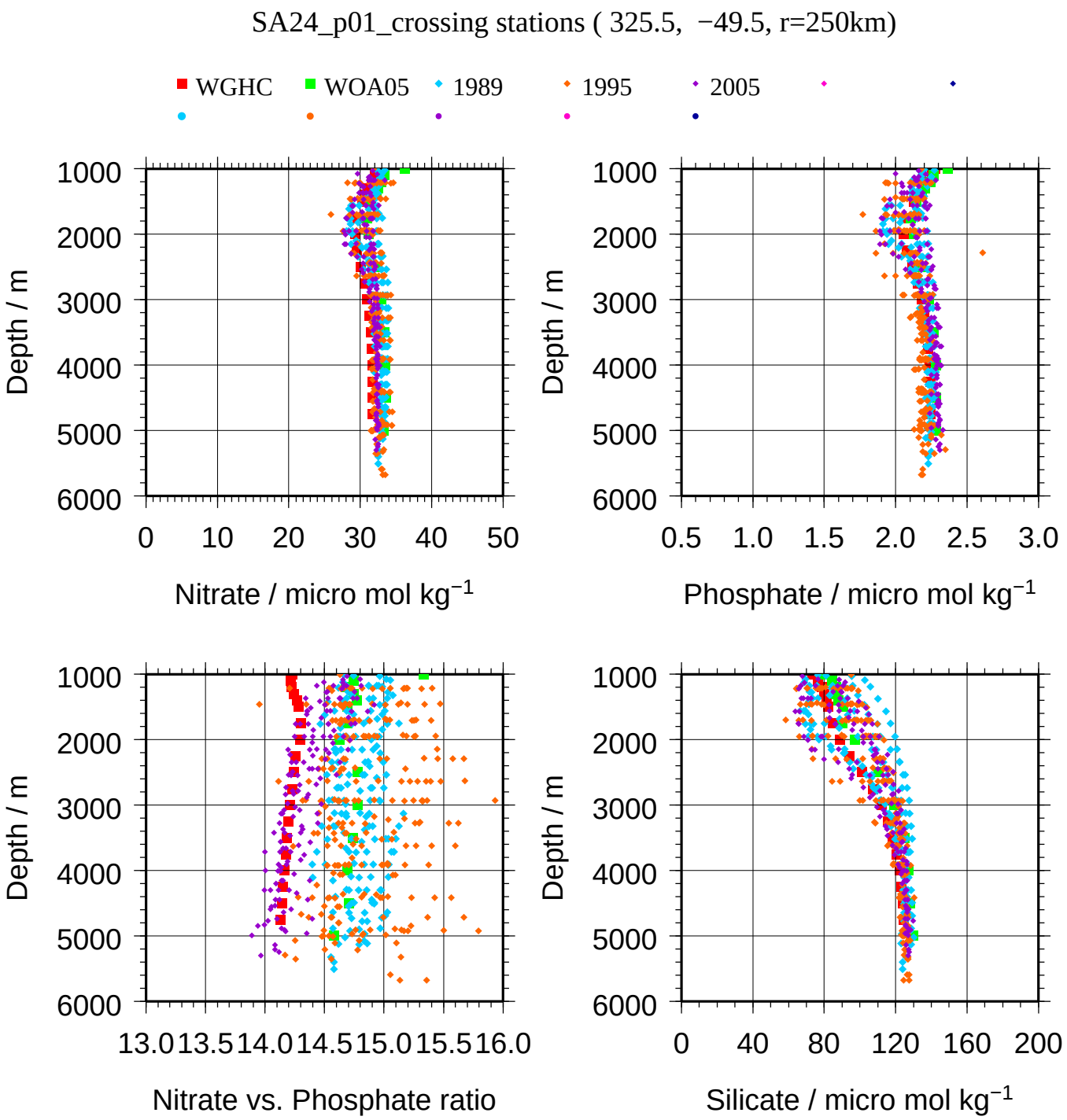

SA19_p01_crossing stations (341.0, −30.0, r=250km)
WGHC
WOA05
1993
1994
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

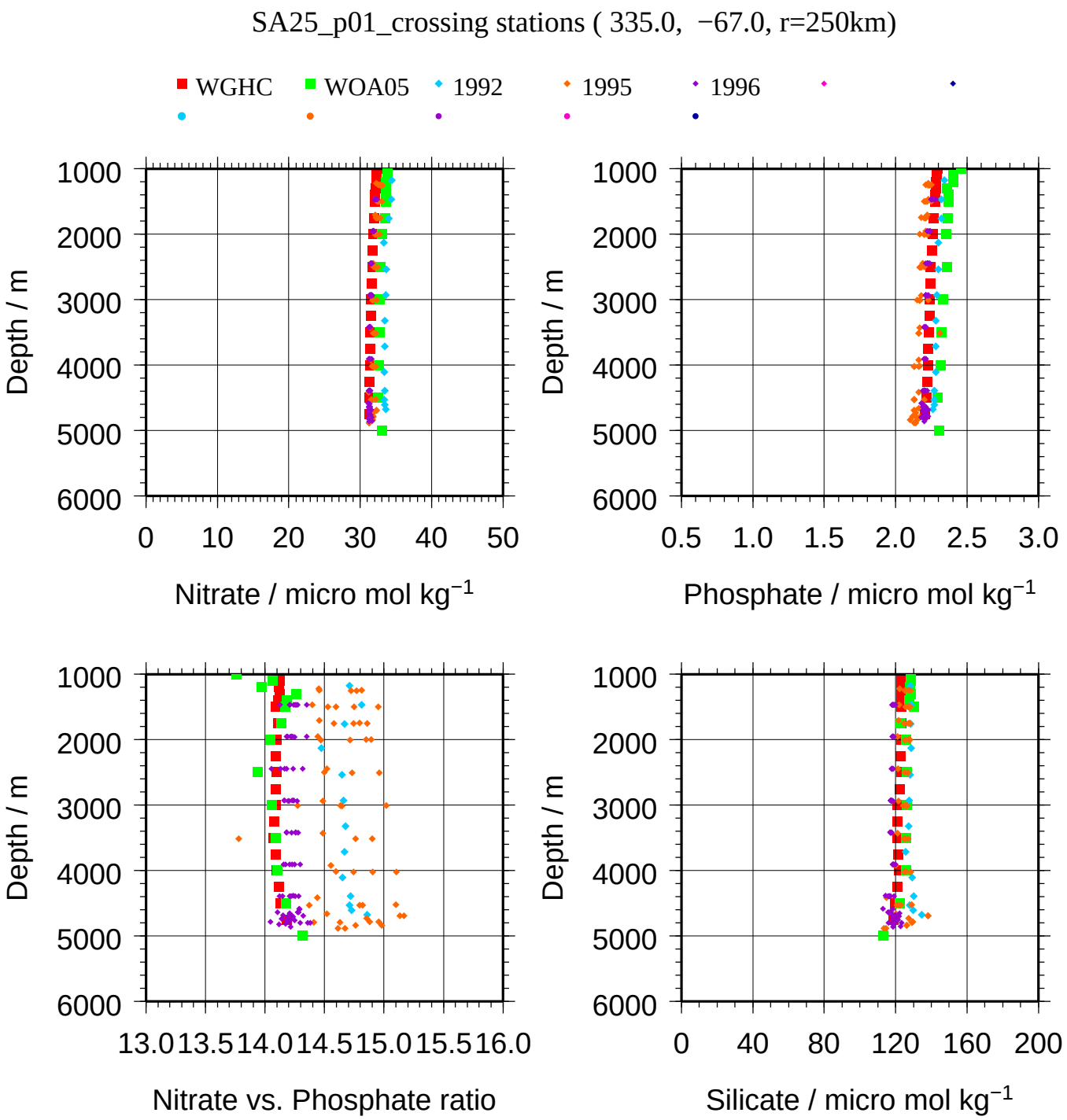

SA20_p01_crossing stations (308.0, −45.0, r=250km)
WGHC
WOA05
1992
1993
1994
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

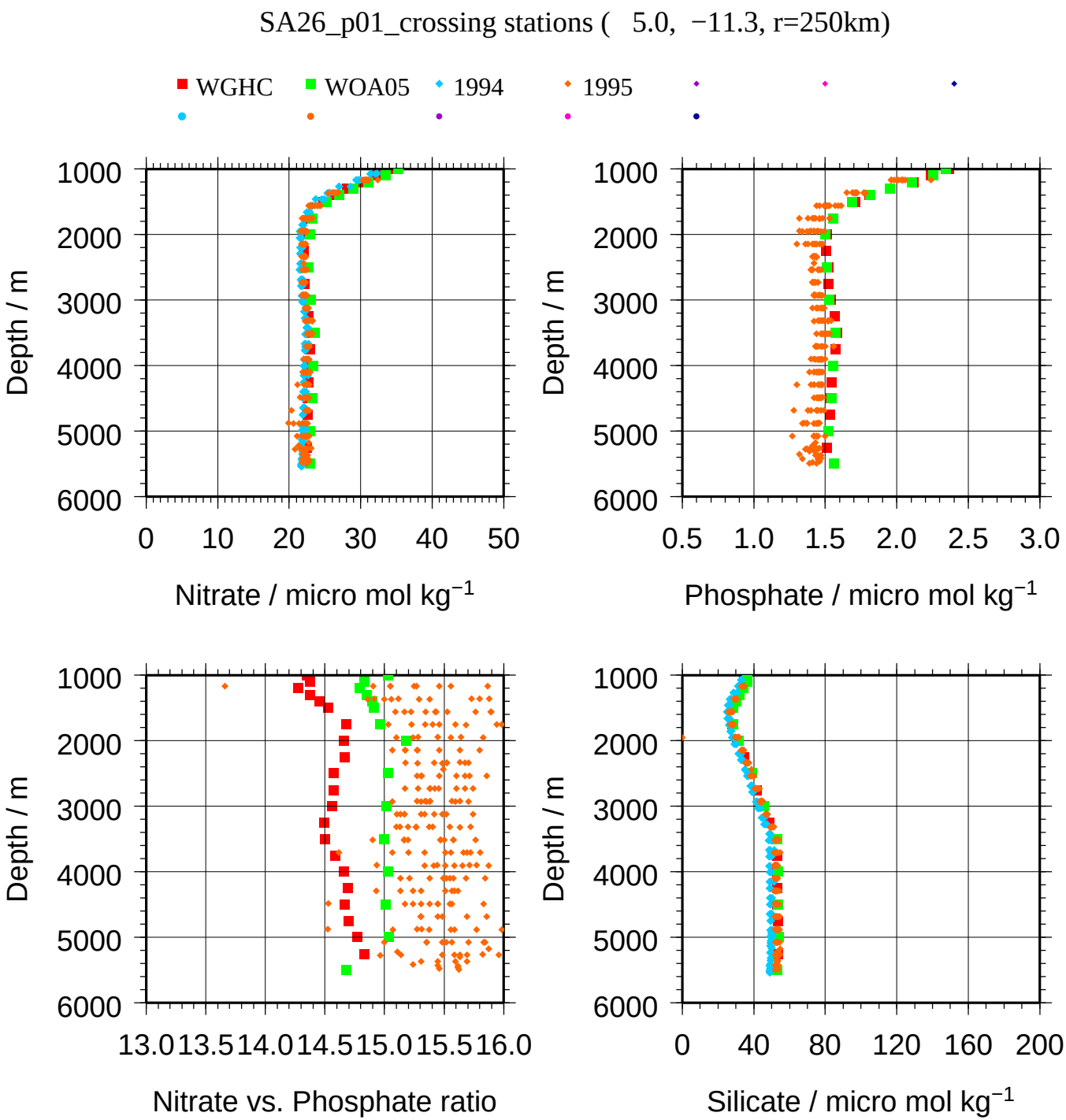

SA21_p01_crossing stations (318.7, −45.0, r=250km)
WGHC
WOA05
1989
1993
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

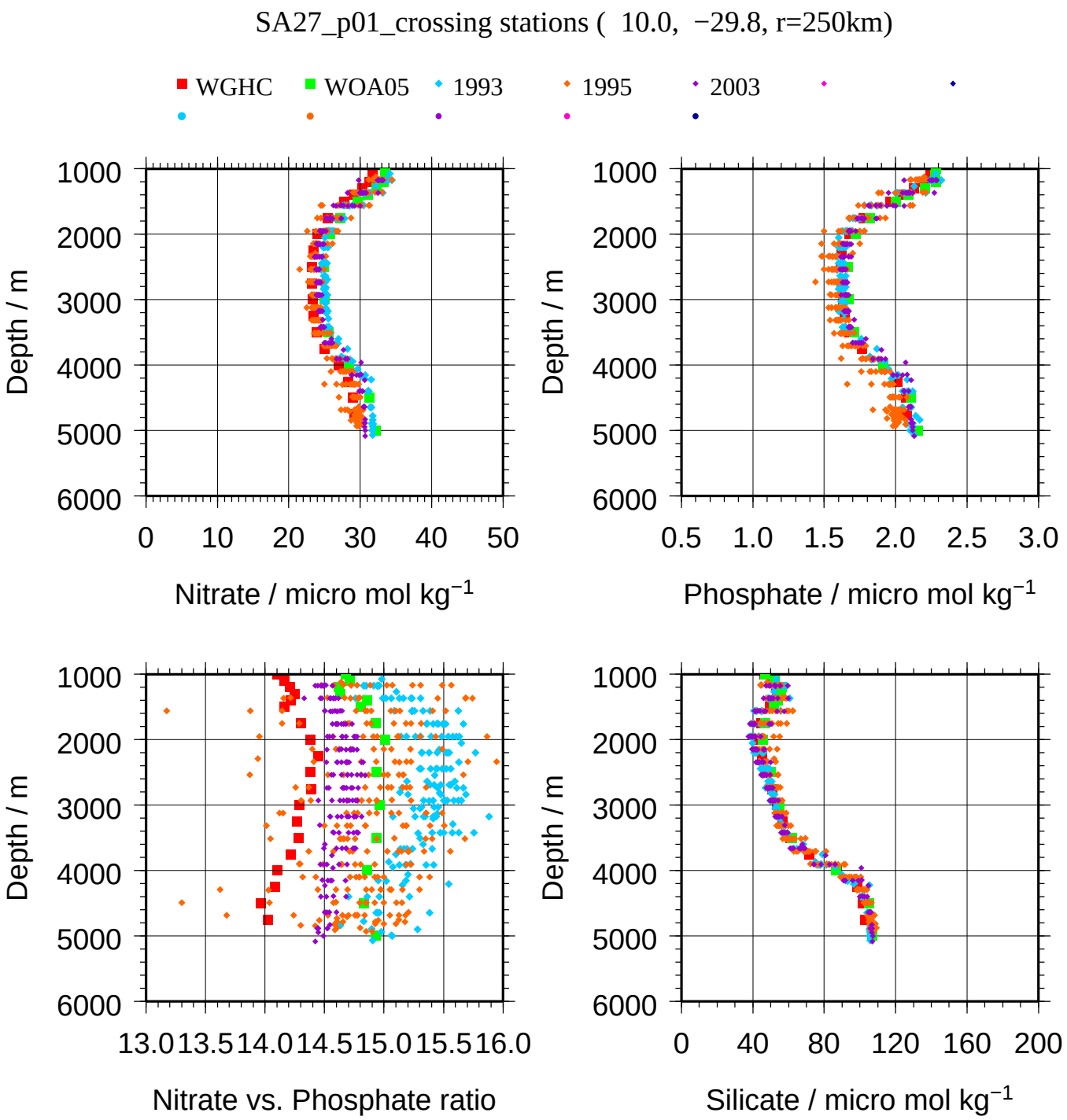

SA22_p01_crossing stations (324.0, −45.0, r=250km)
WGHC
WOA05
1993
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

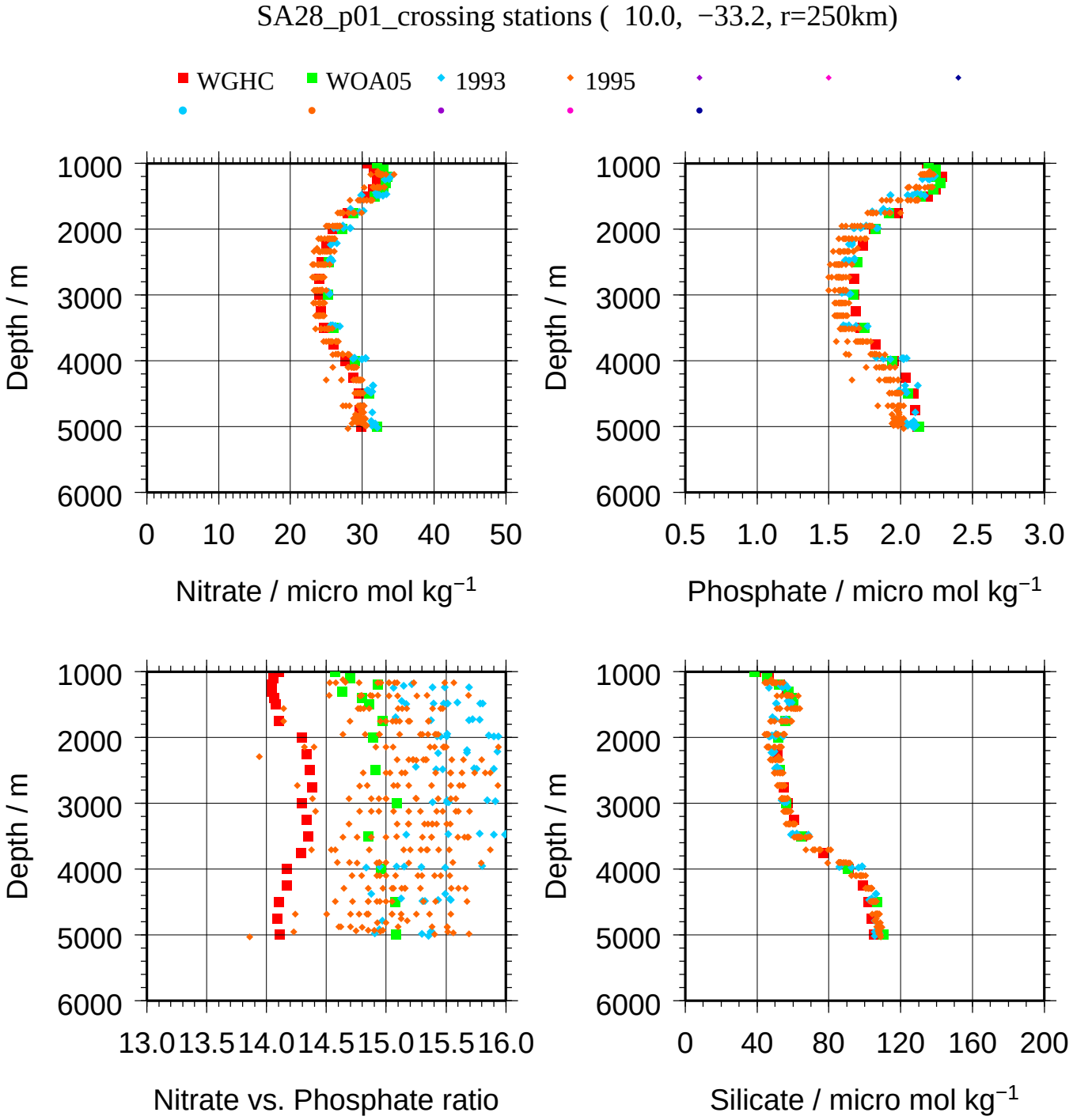

SA23_p01_crossing stations (329.5, −45.0, r=250km)
WGHC
WOA05
1989
1993
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

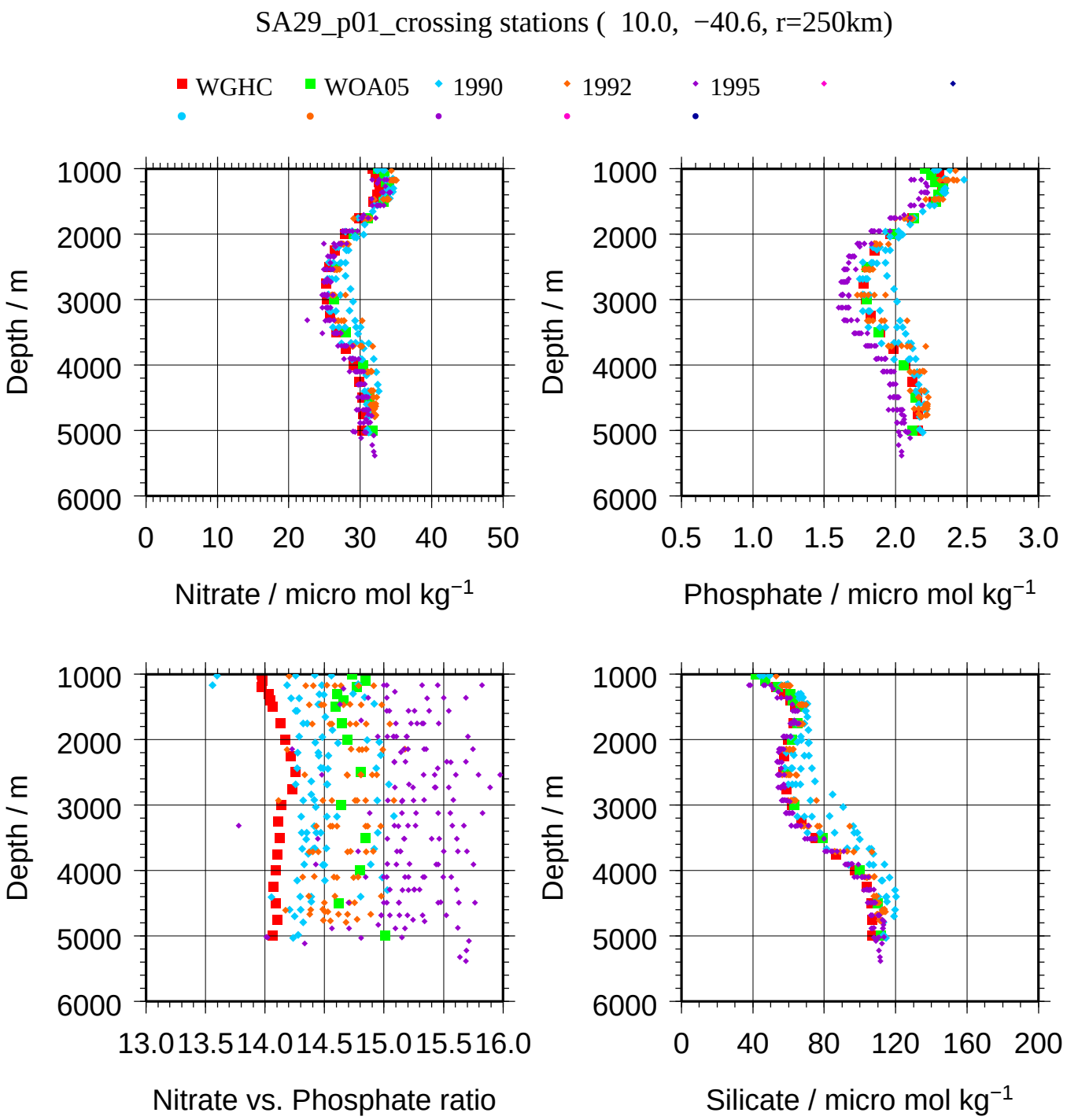

SA24_p01_crossing stations (325.5, −49.5, r=250km)
WGHC
WOA05
1989
1995
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

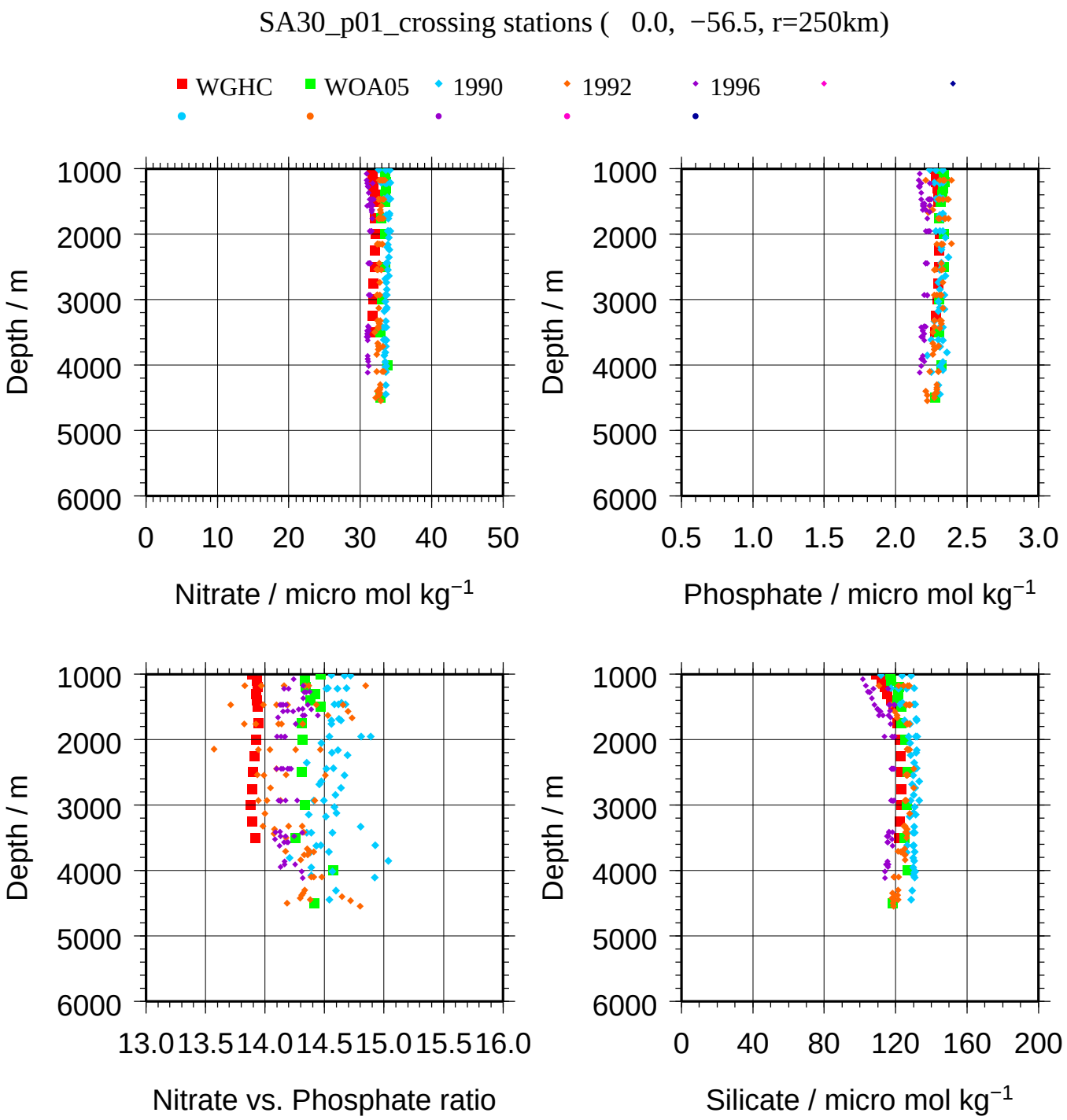

SA25_p01_crossing stations (335.0, −67.0, r=250km)
WGHC
WOA05
1992
1995
1996
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

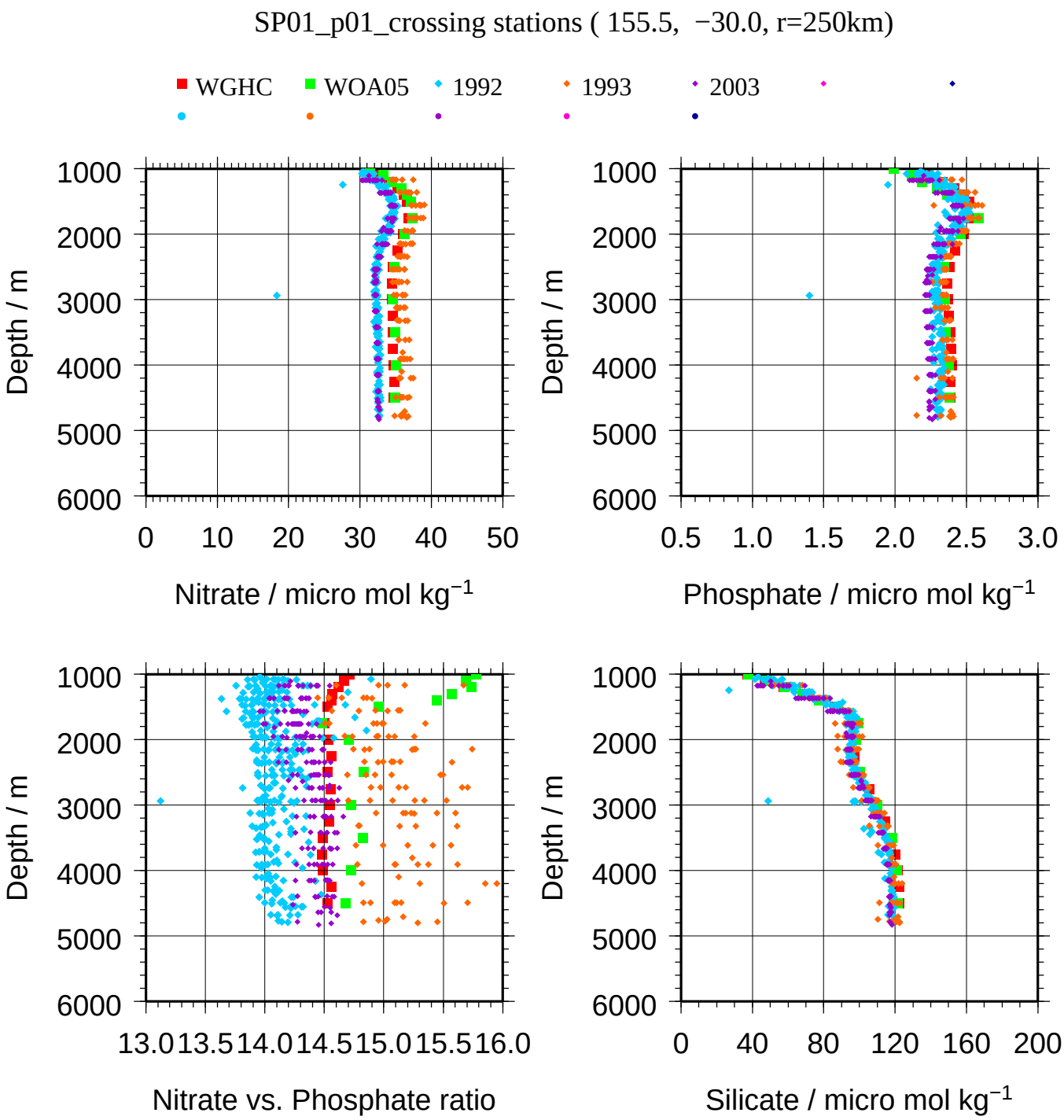

SA26_p01_crossing stations (5.0, −11.3, r=250km)
WGHC
WOA05
1994
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

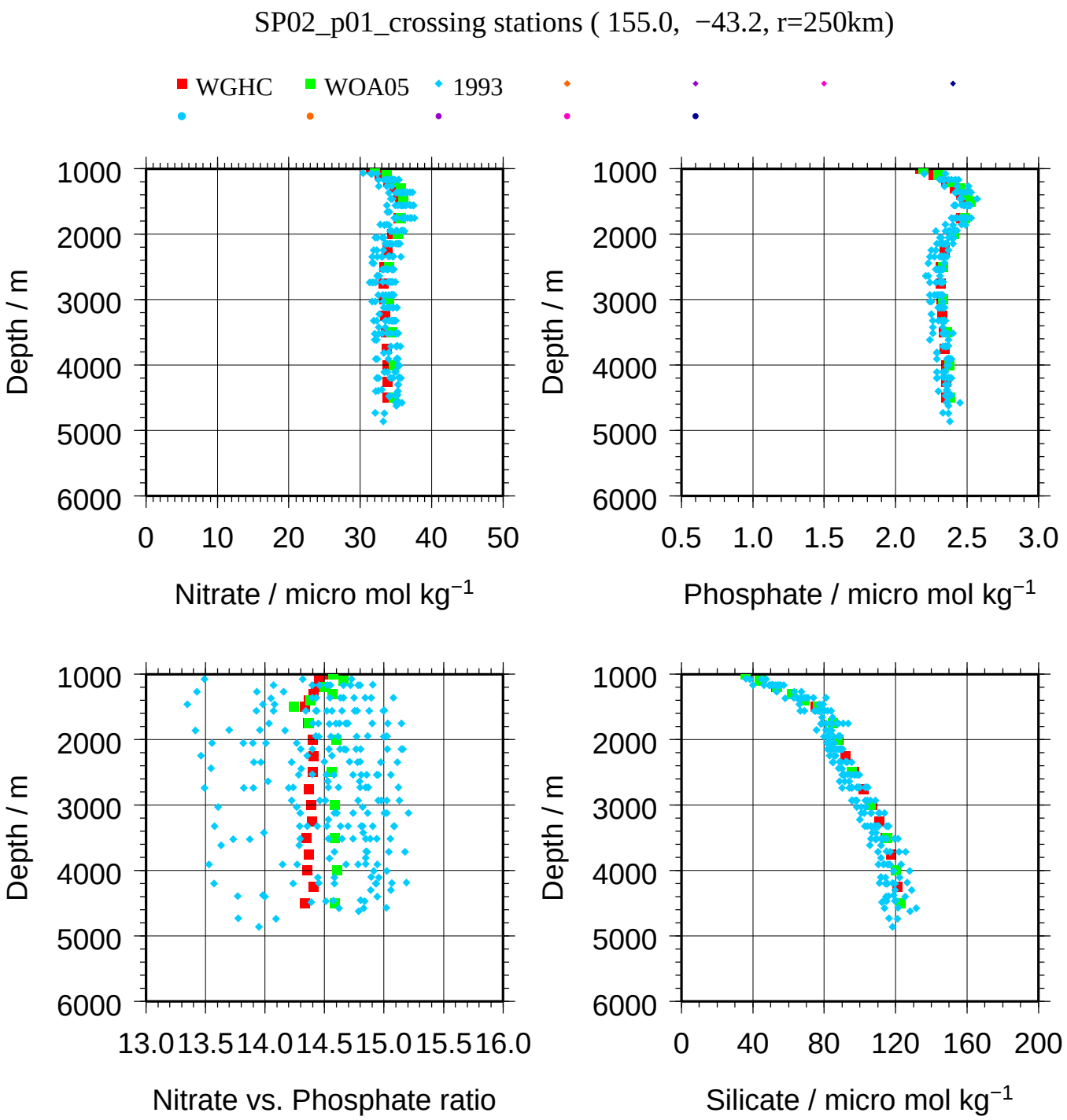

SA27_p01_crossing stations (10.0, −29.8, r=250km)
WGHC
WOA05
1993
1995
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

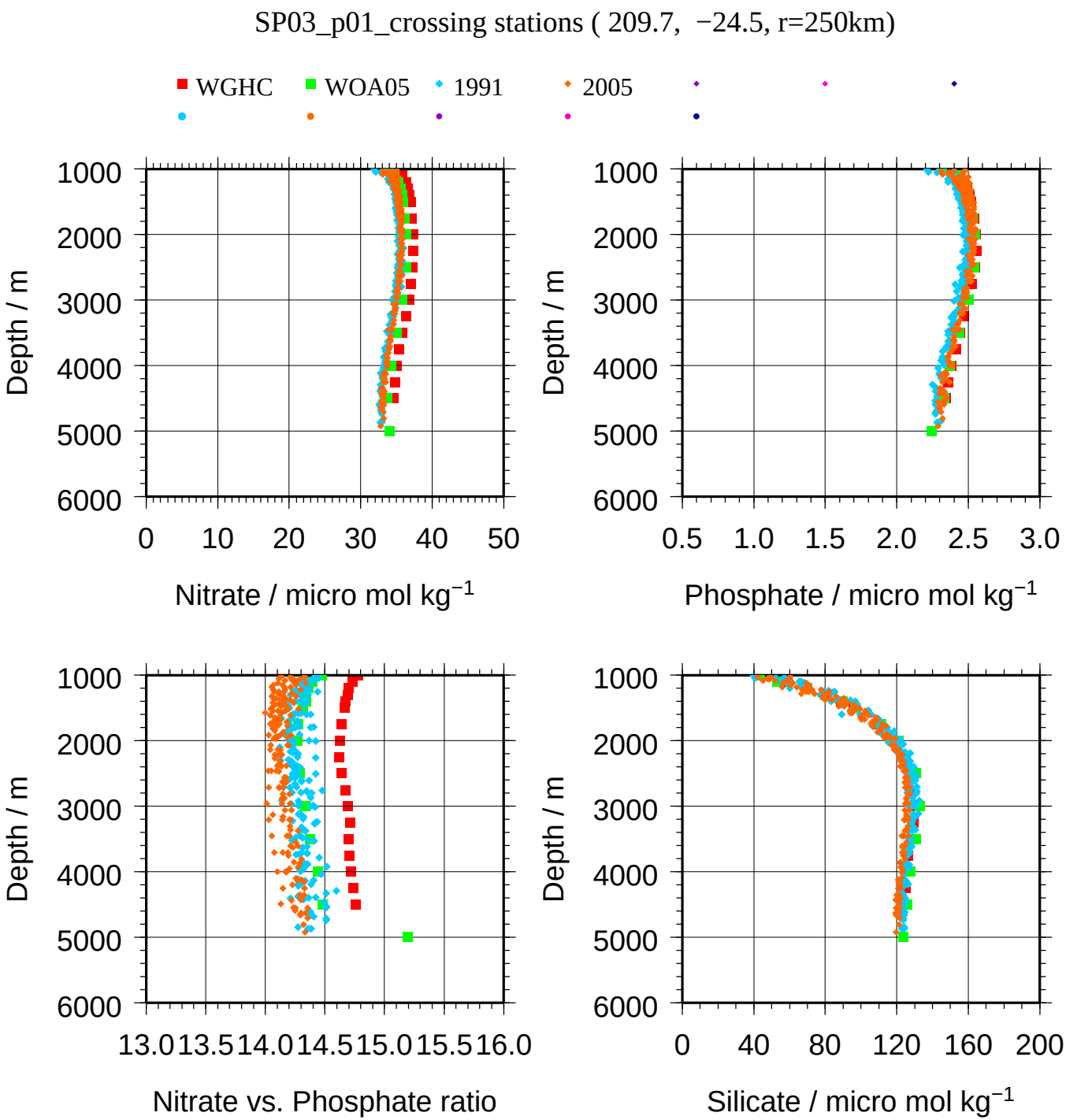

SA28_p01_crossing stations (10.0, −33.2, r=250km)
WGHC
WOA05
1993
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

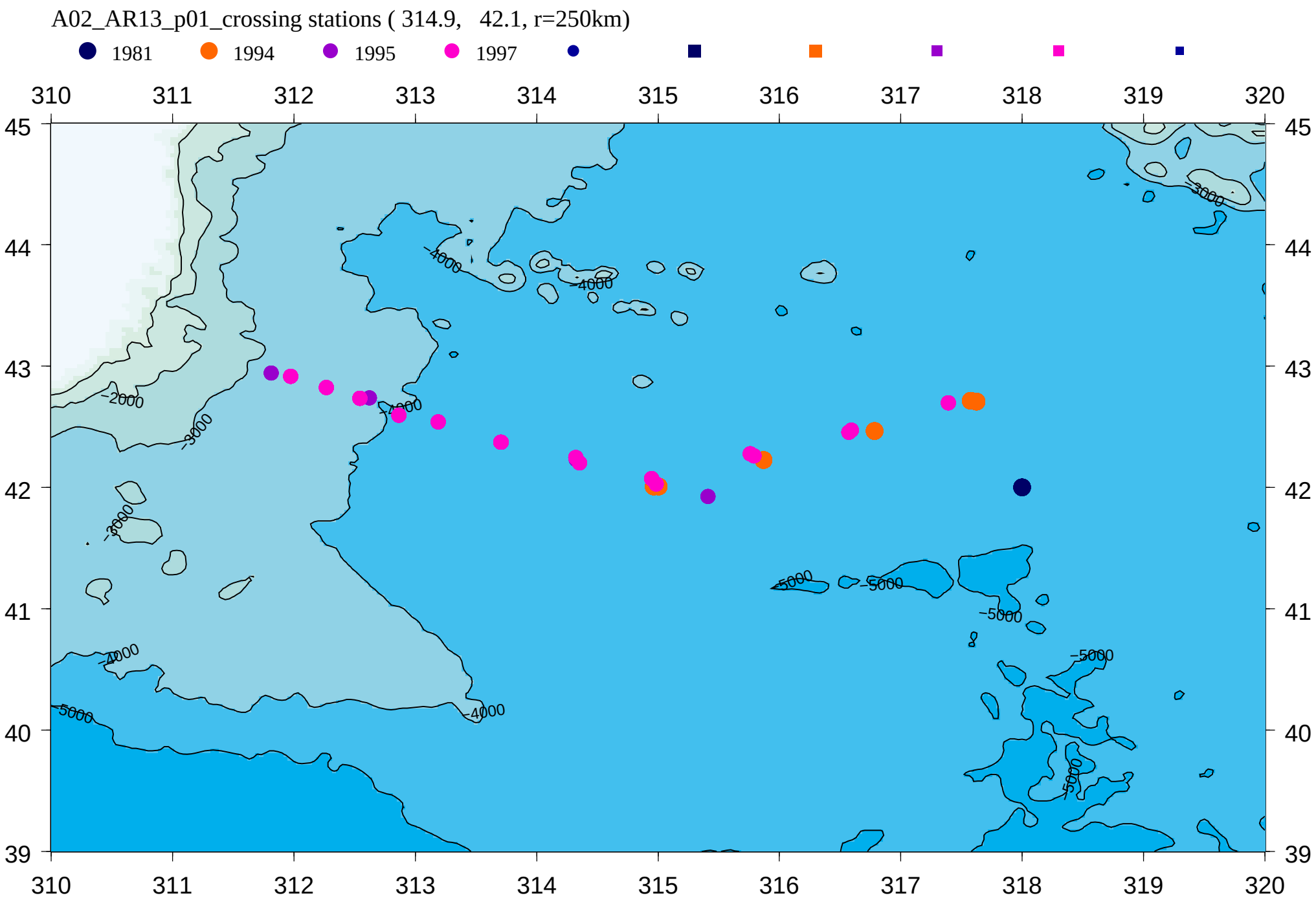

SA29_p01_crossing stations (10.0, −40.6, r=250km)
WGHC
WOA05
1990
1992
1995
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

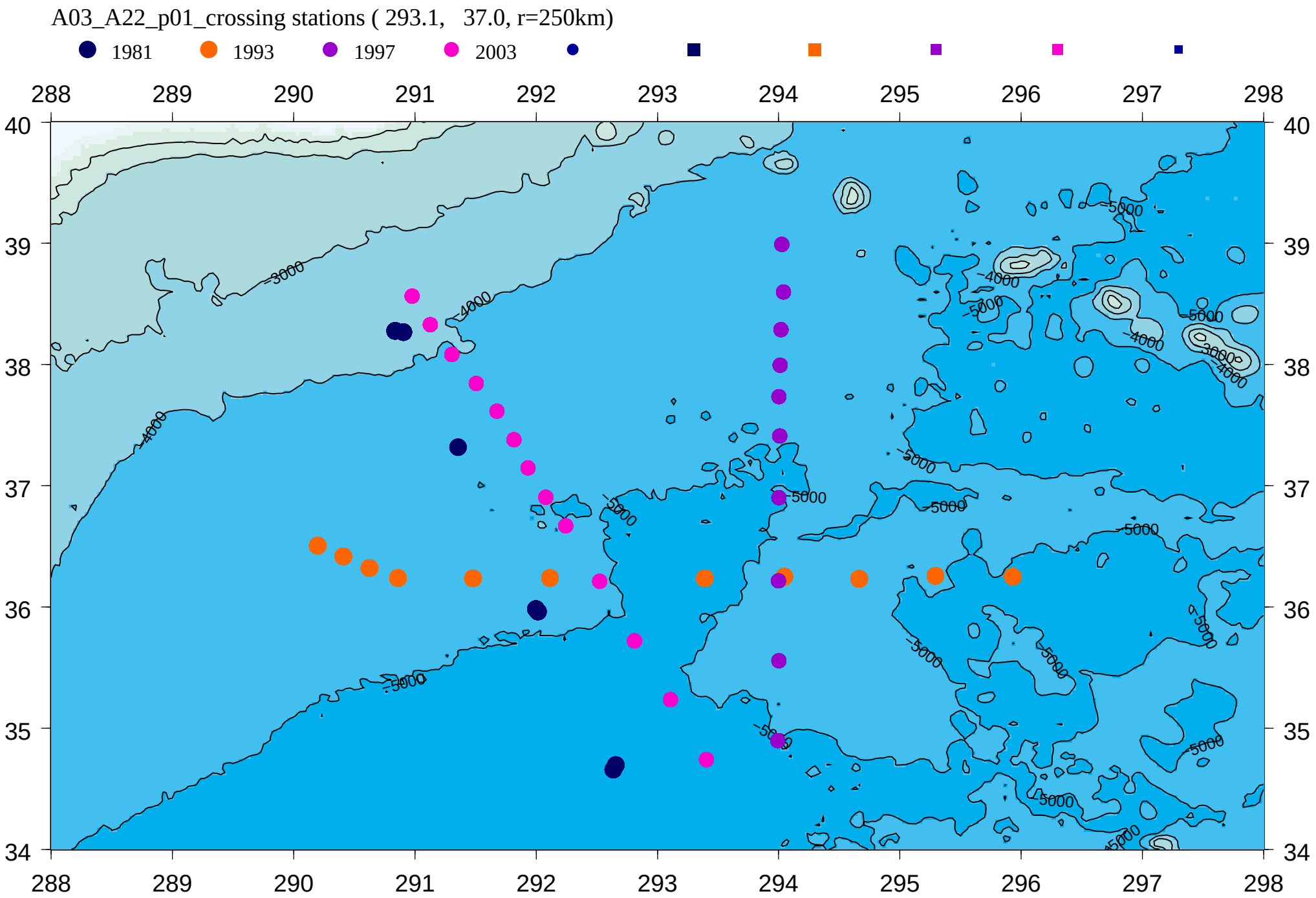

SA30_p01_crossing stations (0.0, −56.5, r=250km)
WGHC
WOA05
1990
1992
1996
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

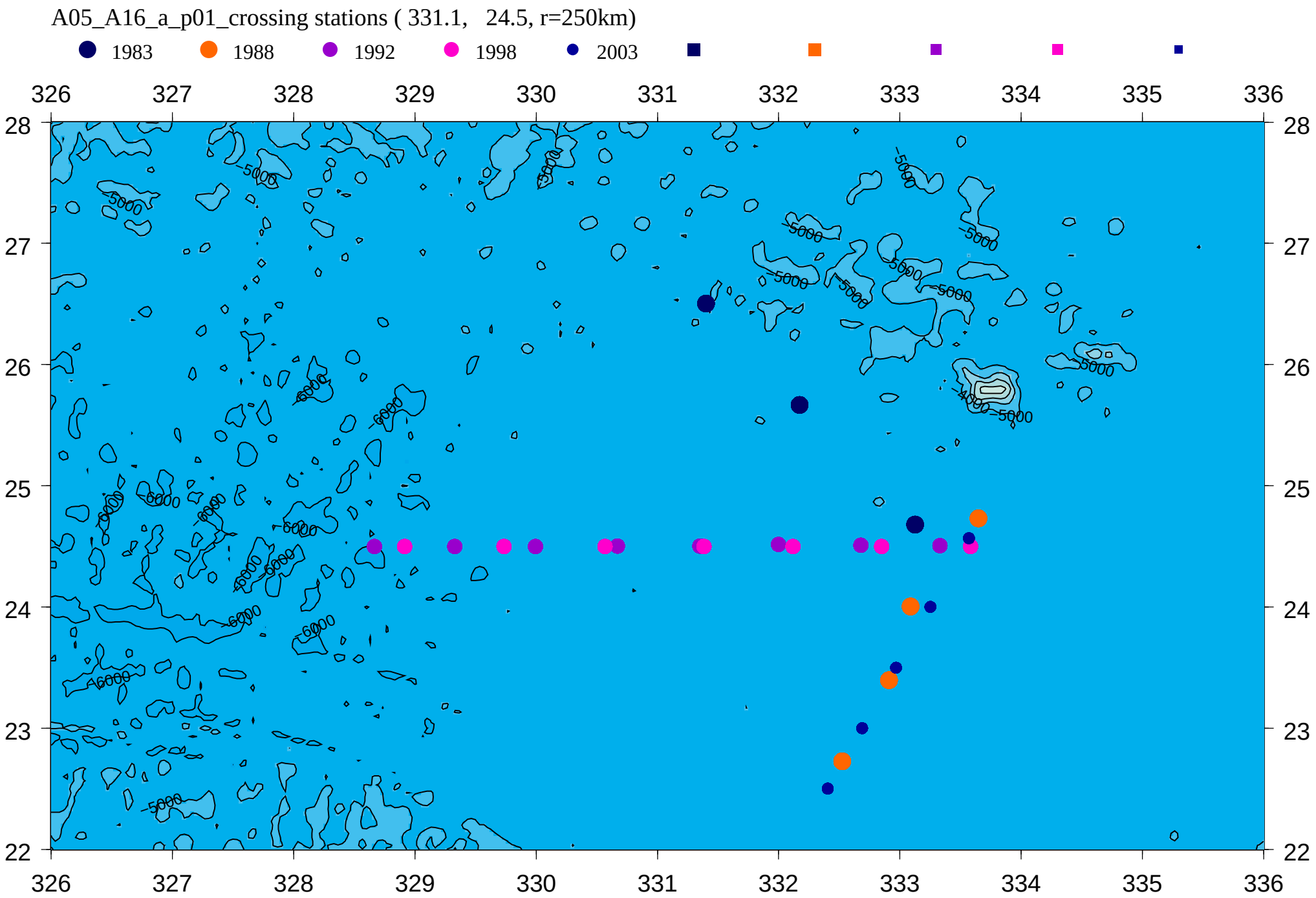

SP01_p01_crossing stations (155.5, −30.0, r=250km)
WGHC
WOA05
1992
1993
2003
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

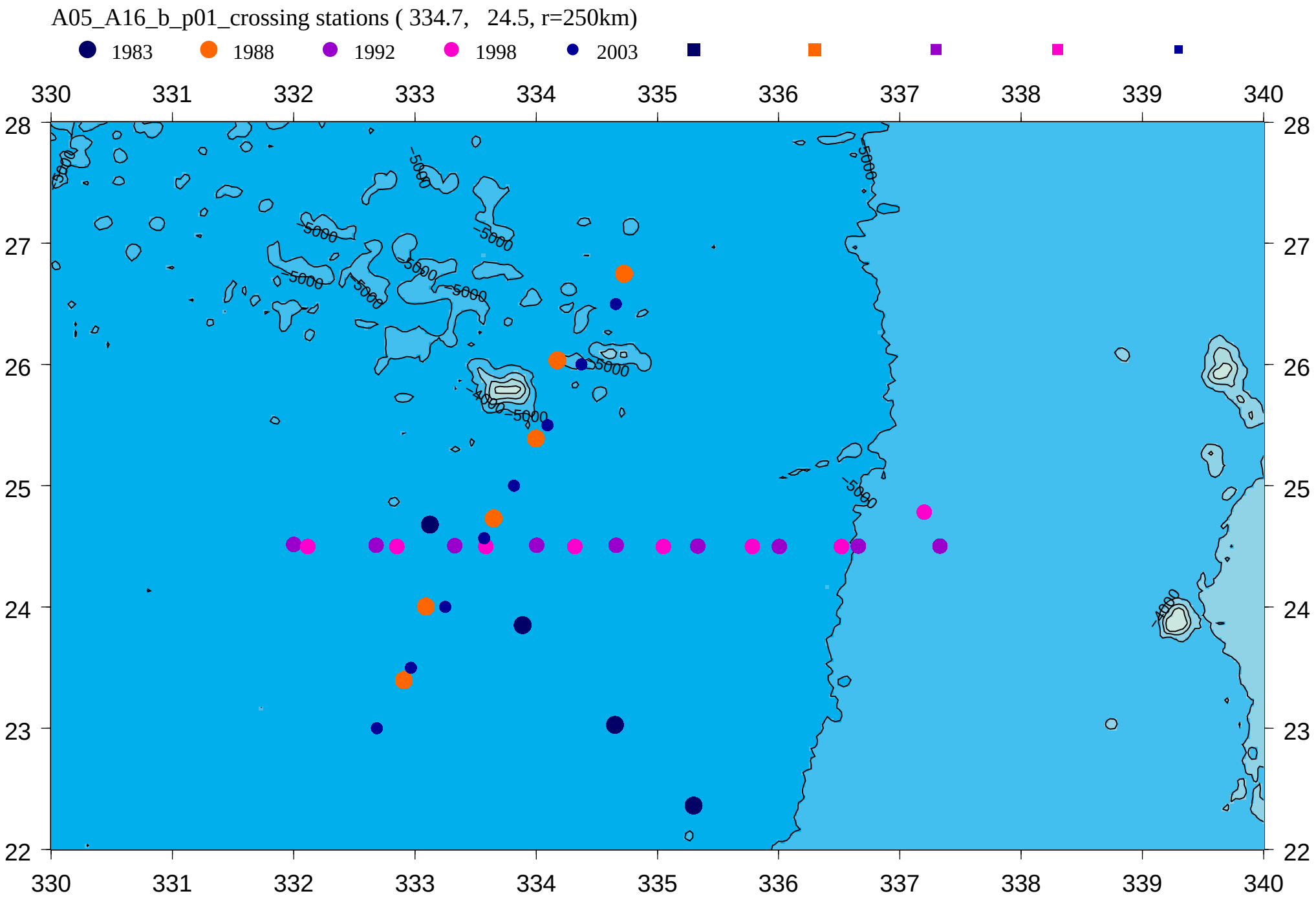

SP02_p01_crossing stations (155.0, −43.2, r=250km)
WGHC
WOA05
1993
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

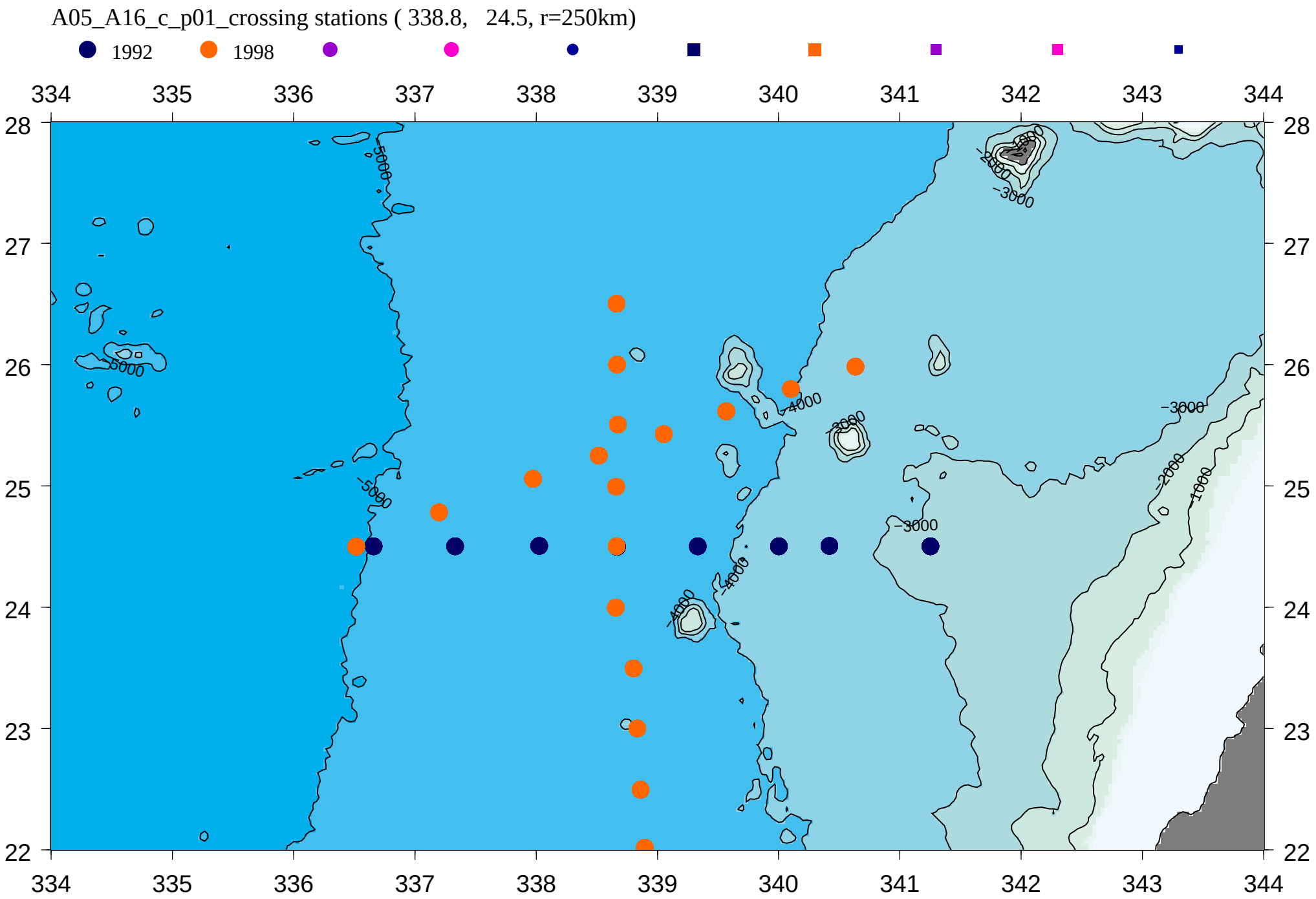

SP03_p01_crossing stations (209.7, −24.5, r=250km)
WGHC
WOA05
1991
2005
Depth / m
1000
2000
3000
4000
5000
6000
0
10
20
30
40
50
Nitrate / micro mol kg−1
0.5
1.0
1.5
2.0
2.5
3.0
Phosphate / micro mol kg−1
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Nitrate vs. Phosphate ratio
0
40
80
120
160
200
Silicate / micro mol kg−1

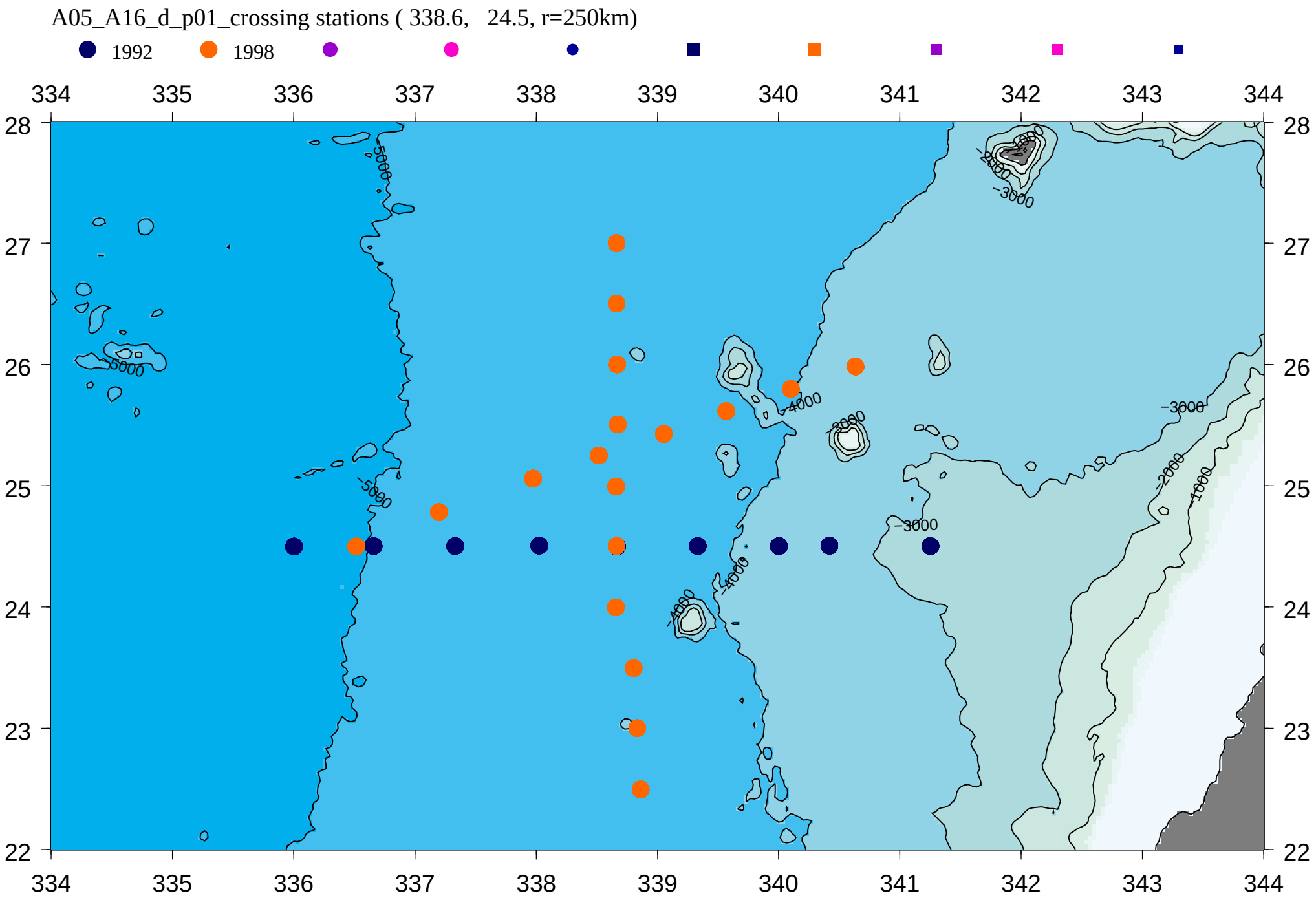

A02_AR13_p01_crossing stations (314.9, 42.1, r=250km)
1981
1994
1995
1997
310
311
312
313
314
315
316
317
318
319
320
45
44
43
42
41
40
39
-2000
-3000
-4000
-5000

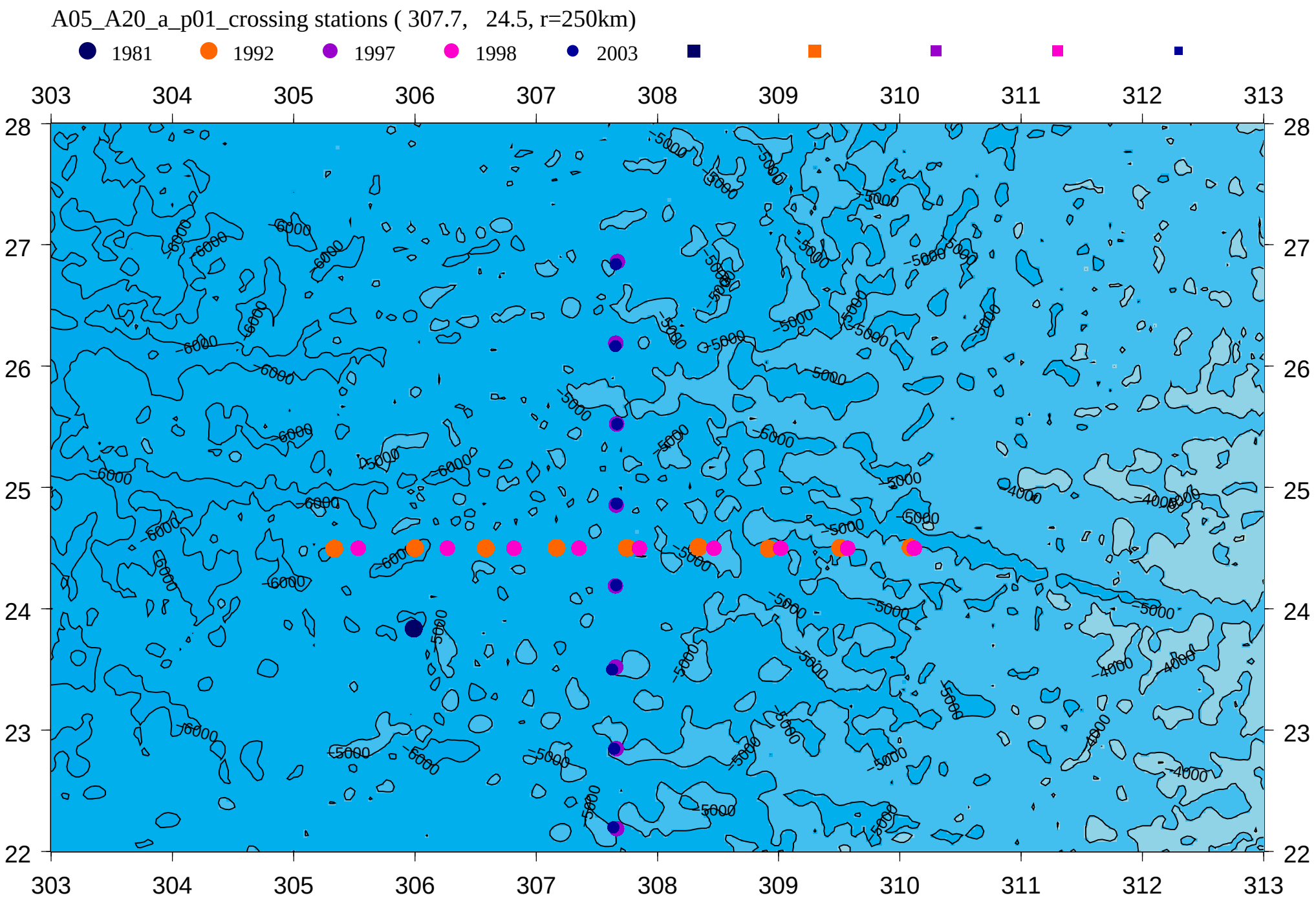

A03_A22_p01_crossing stations (293.1, 37.0, r=250km)
1981
1993
1997
2003
288
289
290
291
292
293
294
295
296
297
298
40
39
38
37
36
35
34
-3000
-4000
-5000

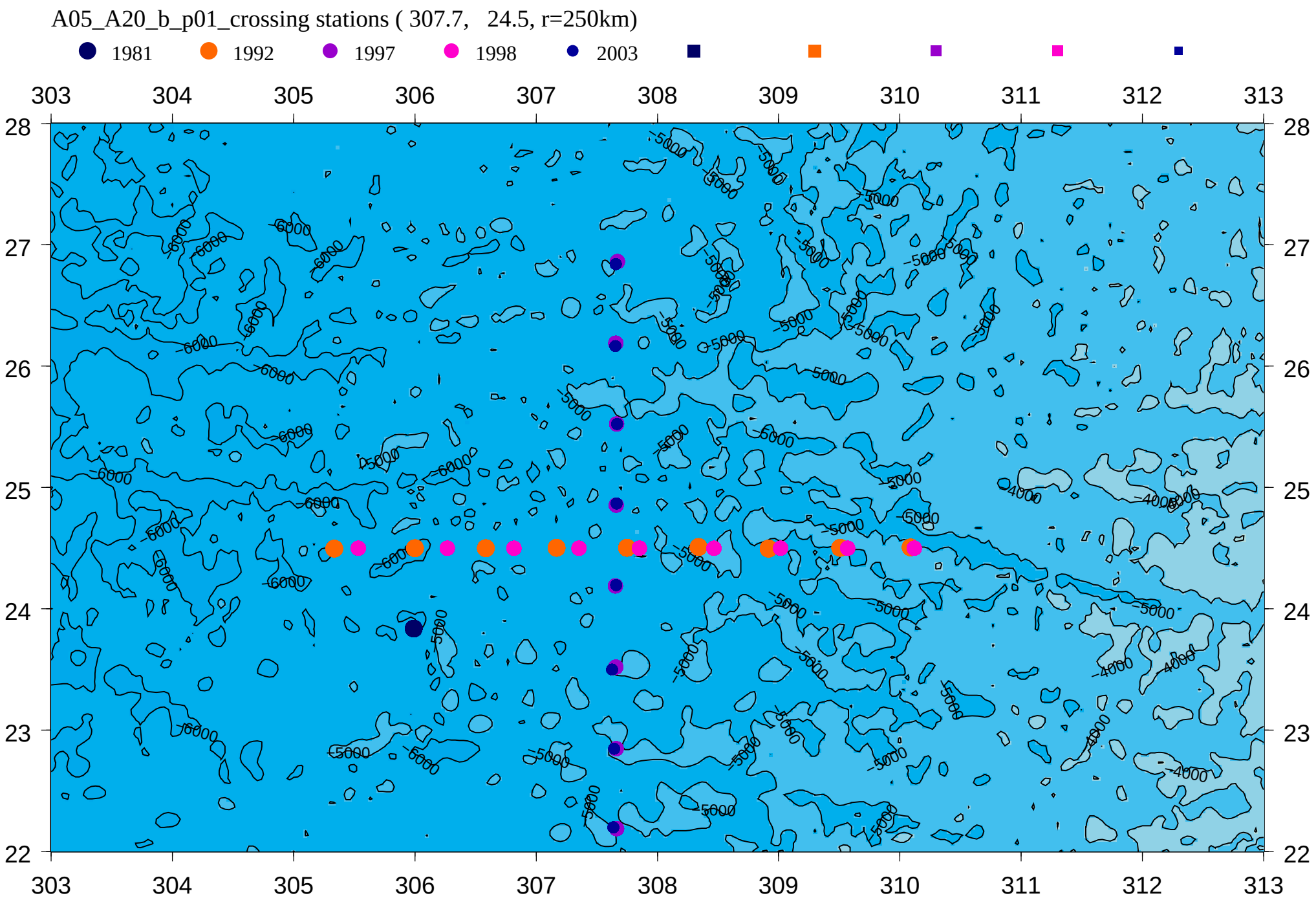

A05_A16_a_p01_crossing stations (331.1, 24.5, r=250km)
1983
1988
1992
1998
2003
326
327
328
329
330
331
332
333
334
335
336
28
27
26
25
24
23
22
-5000
-6000
-4000

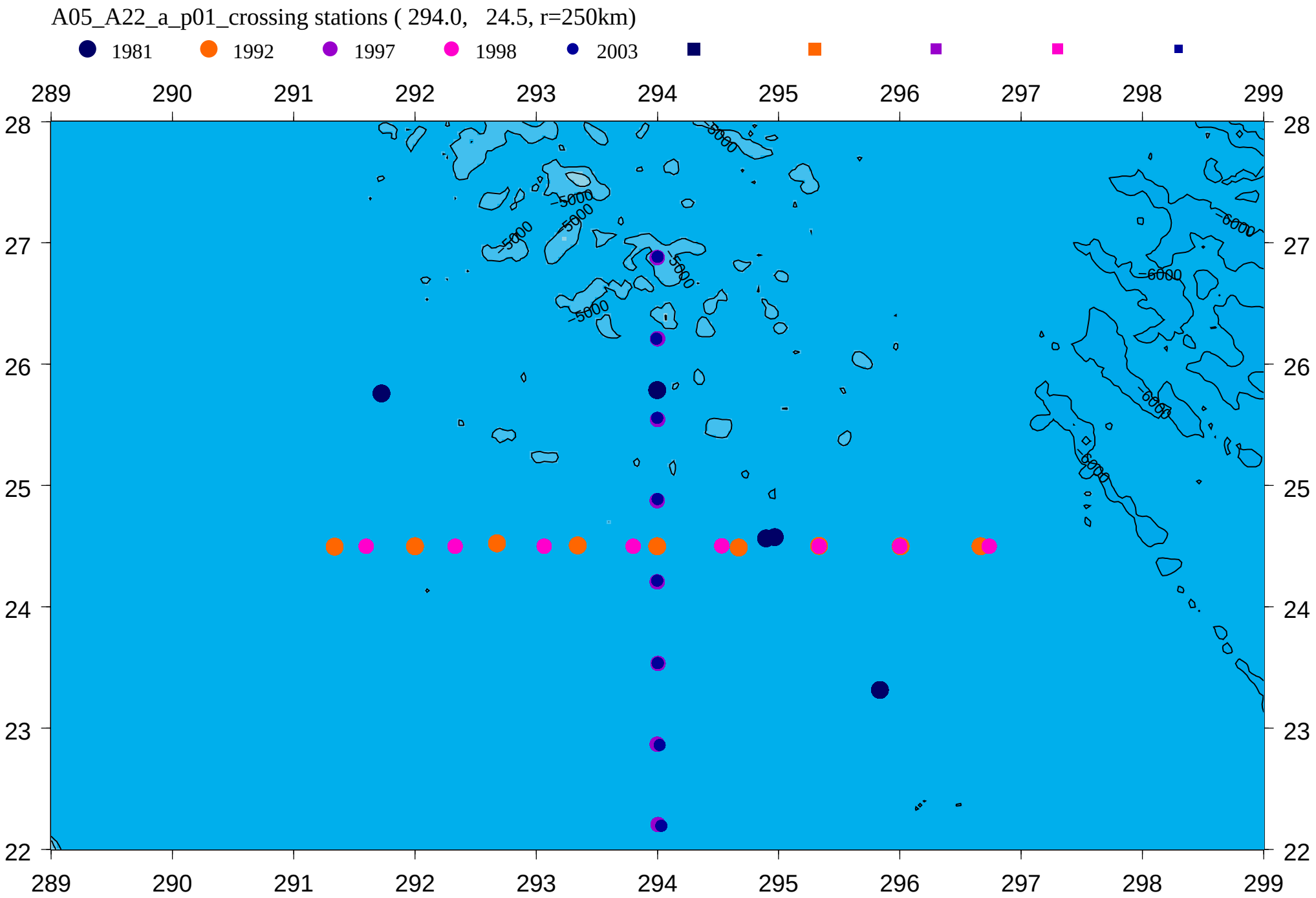

A05_A16_b_p01_crossing stations (334.7, 24.5, r=250km)
1983
1988
1992
1998
2003
330
331
332
333
334
335
336
337
338
339
340
28
27
26
25
24
23
22
-5000
-4000

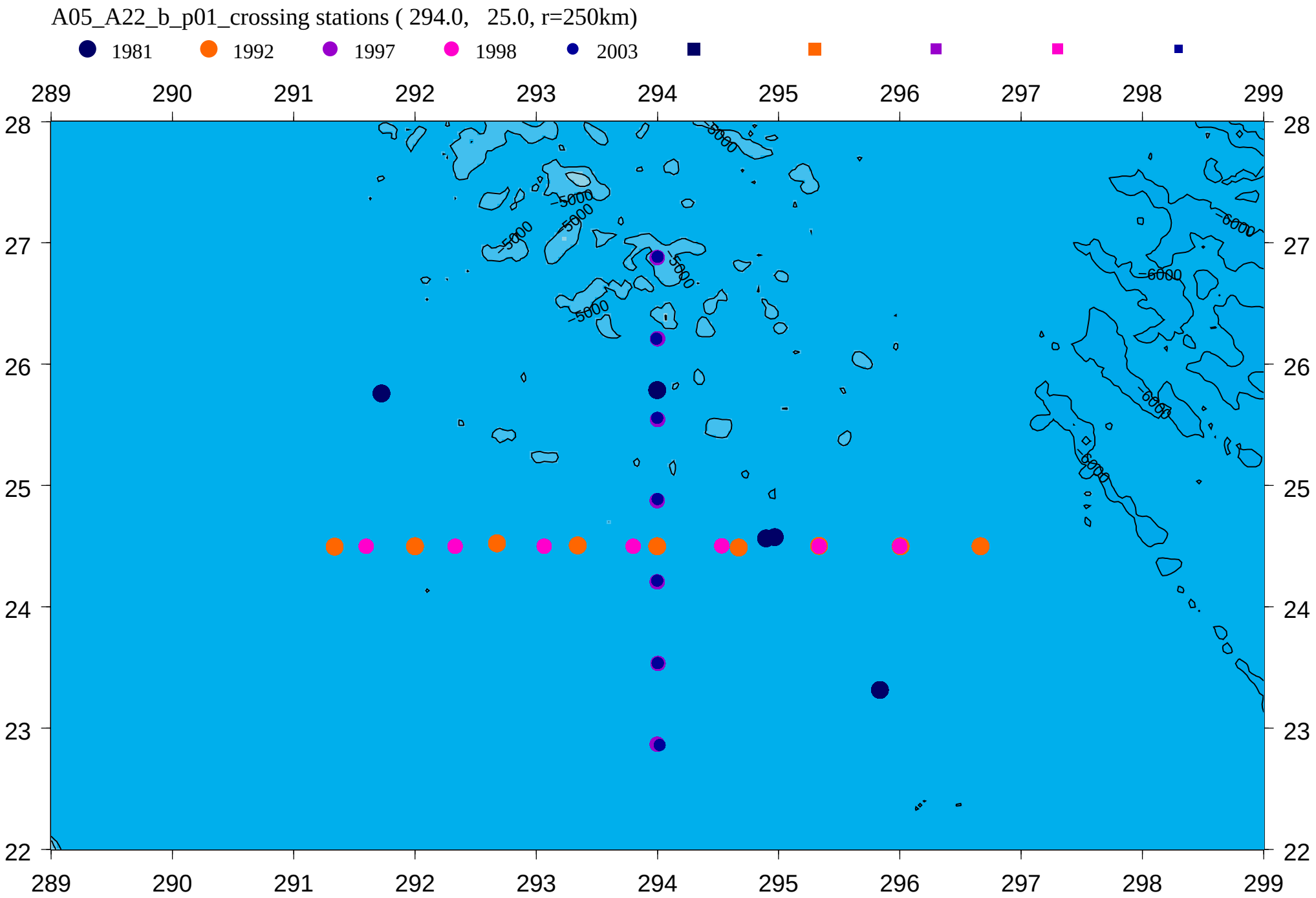

A05_A16_c_p01_crossing stations (338.8, 24.5, r=250km)
1992
1998
334
335
336
337
338
339
340
341
342
343
344
28
27
26
25
24
23
22
-5000
-4000
-3000
-2000
-1000

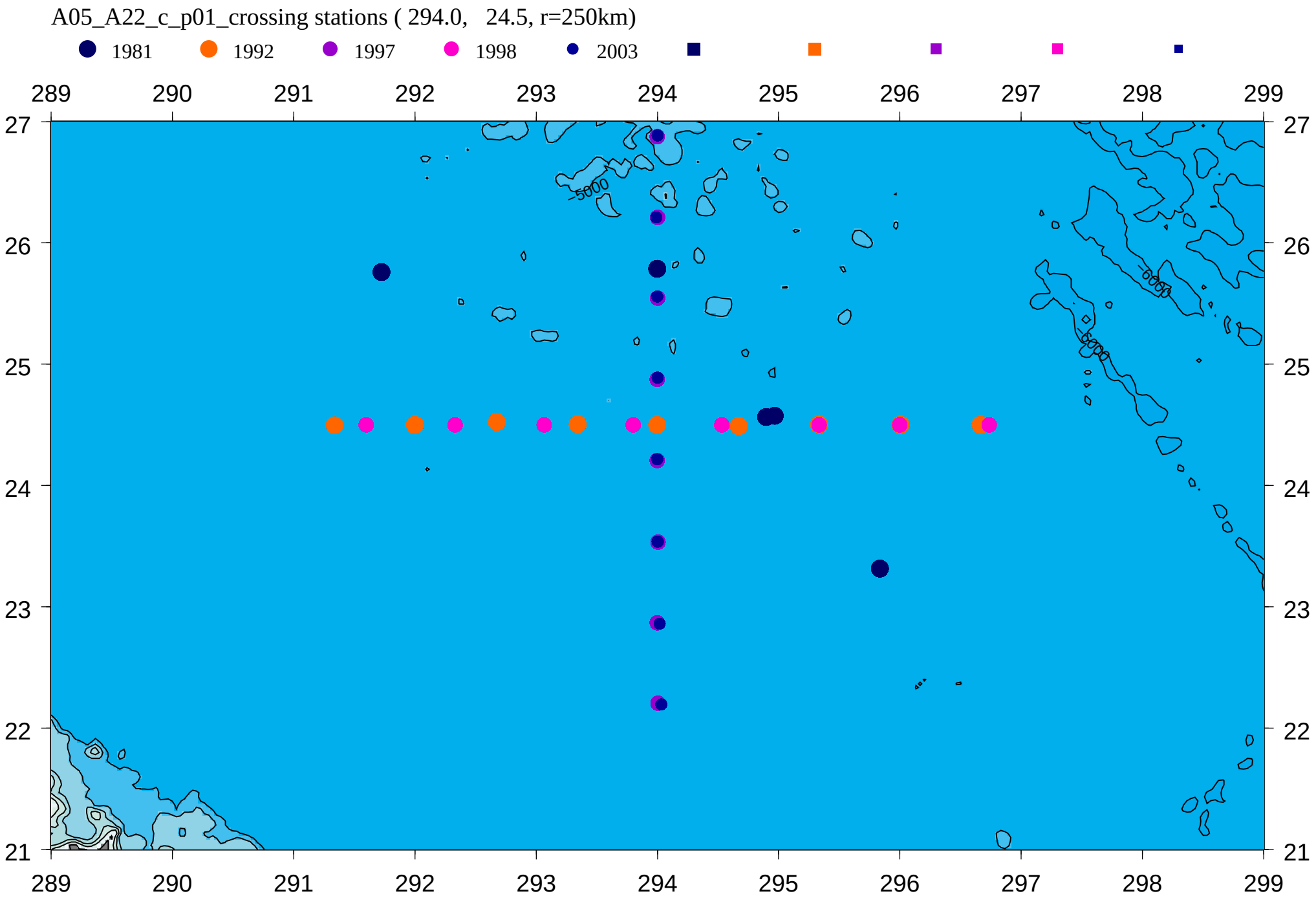

A05_A16_d_p01_crossing stations (338.6, 24.5, r=250km)
1992
1998
334
335
336
337
338
339
340
341
342
343
344
28
27
26
25
24
23
22
-5000
-4000
-3000
-2000
-1000

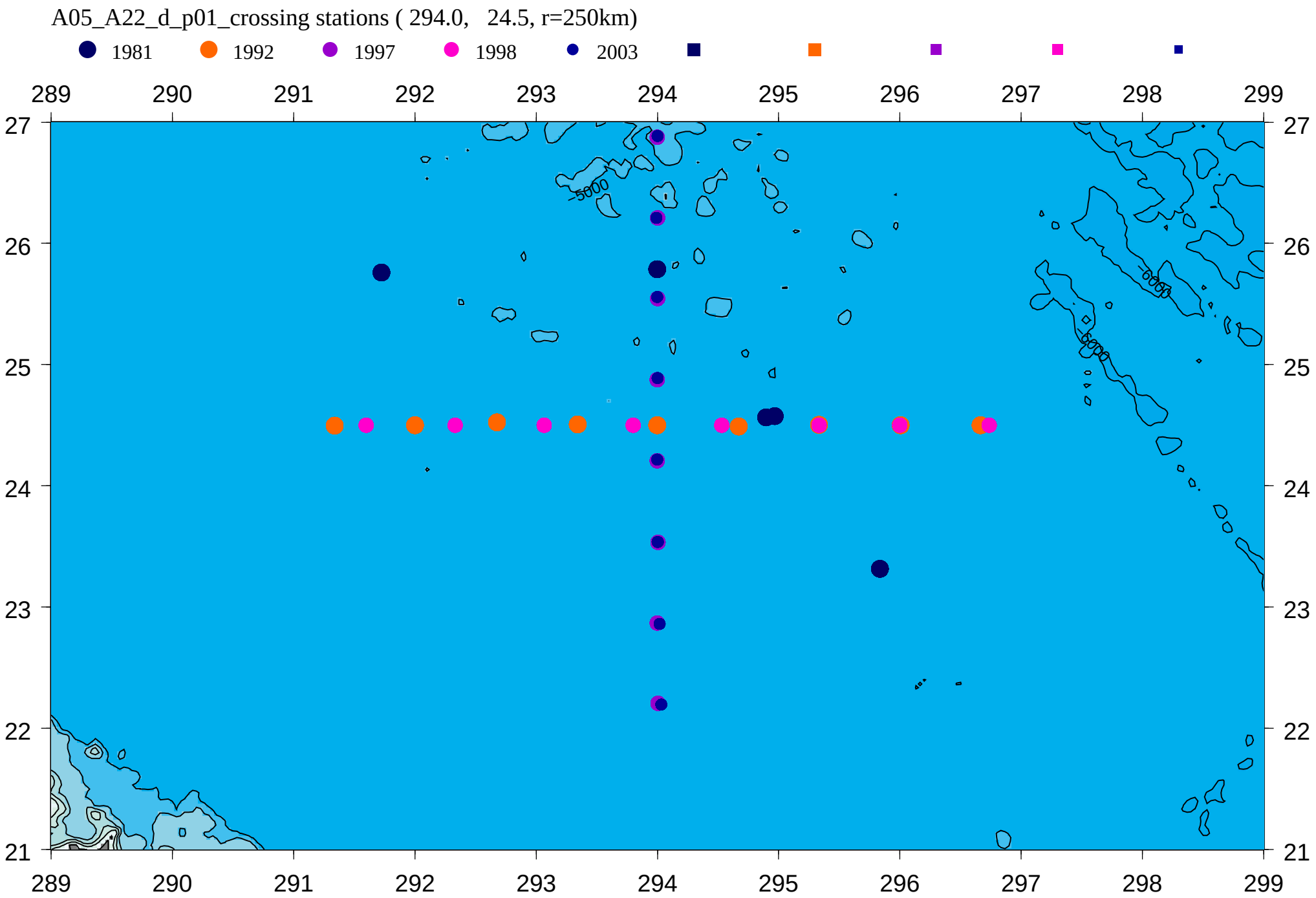

A05_A20_a_p01_crossing stations (307.7, 24.5, r=250km)
1981
1992
1997
1998
2003
303
304
305
306
307
308
309
310
311
312
313
28
27
26
25
24
23
22
-6000
-5000
-4000

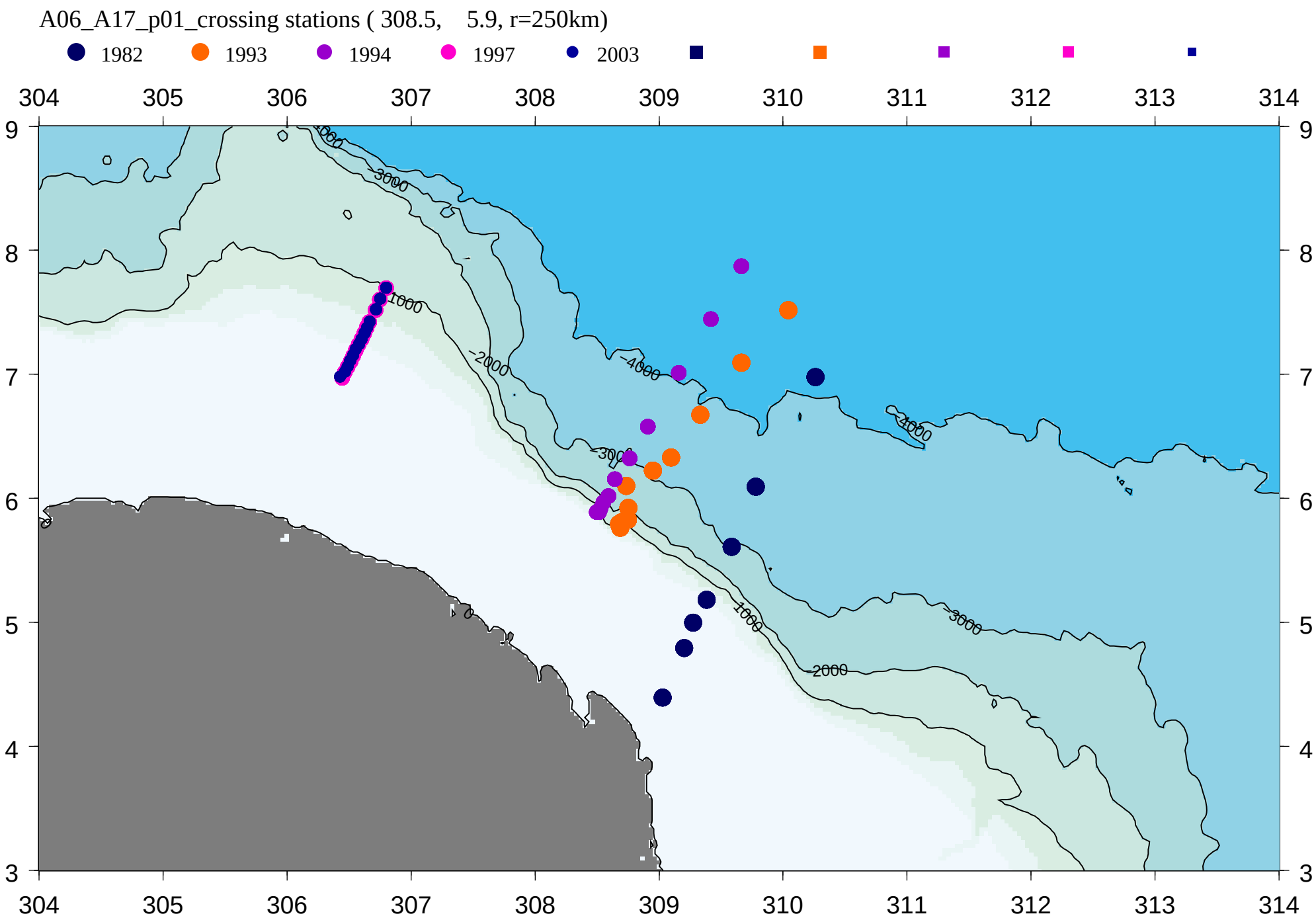

A05_A20_b_p01_crossing stations (307.7, 24.5, r=250km)
1981
1992
1997
1998
2003
303
304
305
306
307
308
309
310
311
312
313
28
27
26
25
24
23
22

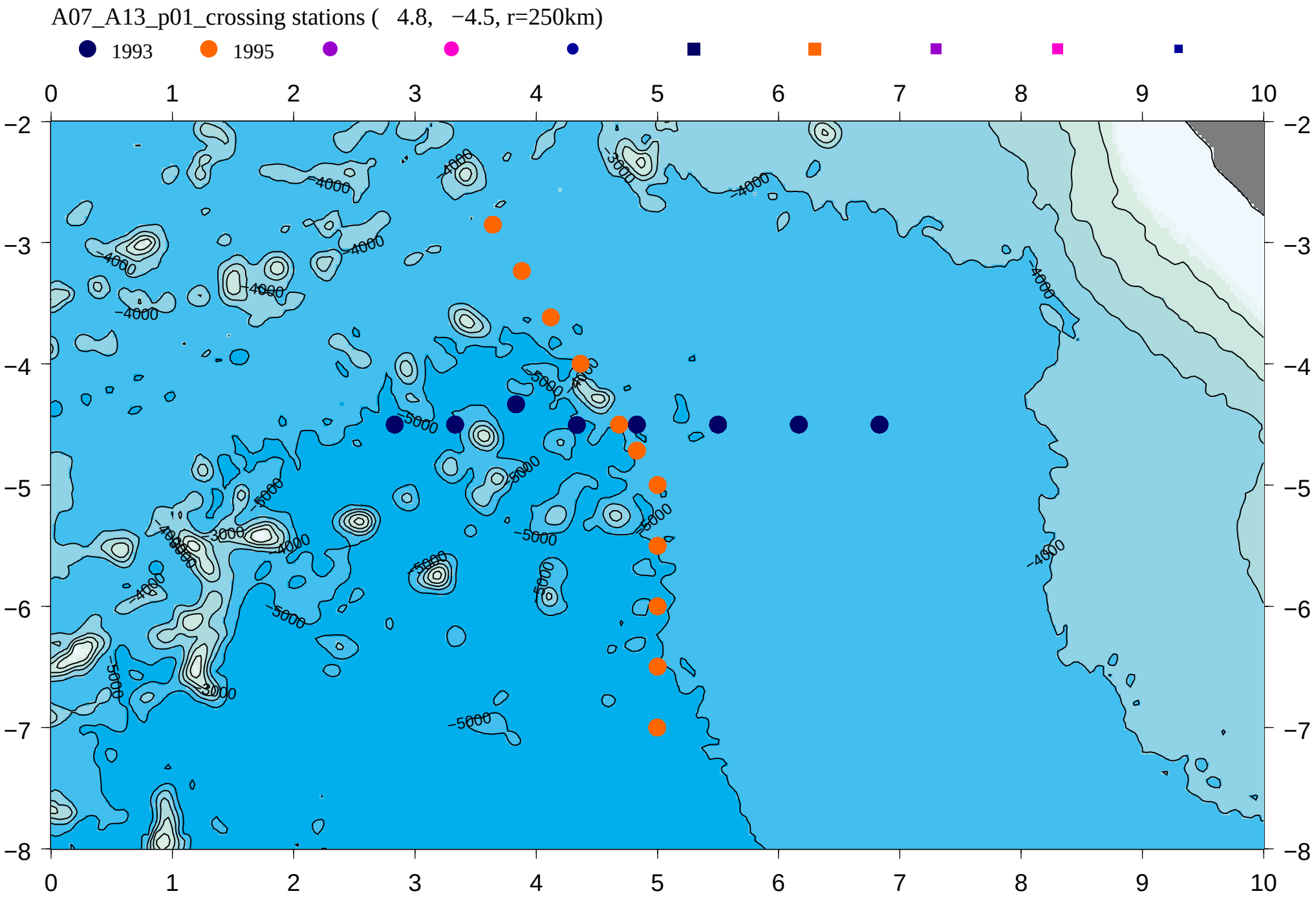

A05_A22_a_p01_crossing stations (294.0, 24.5, r=250km)
1981
1992
1997
1998
2003
289
290
291
292
293
294
295
296
297
298
299
28
27
26
25
24
23
22
-5000
-6000

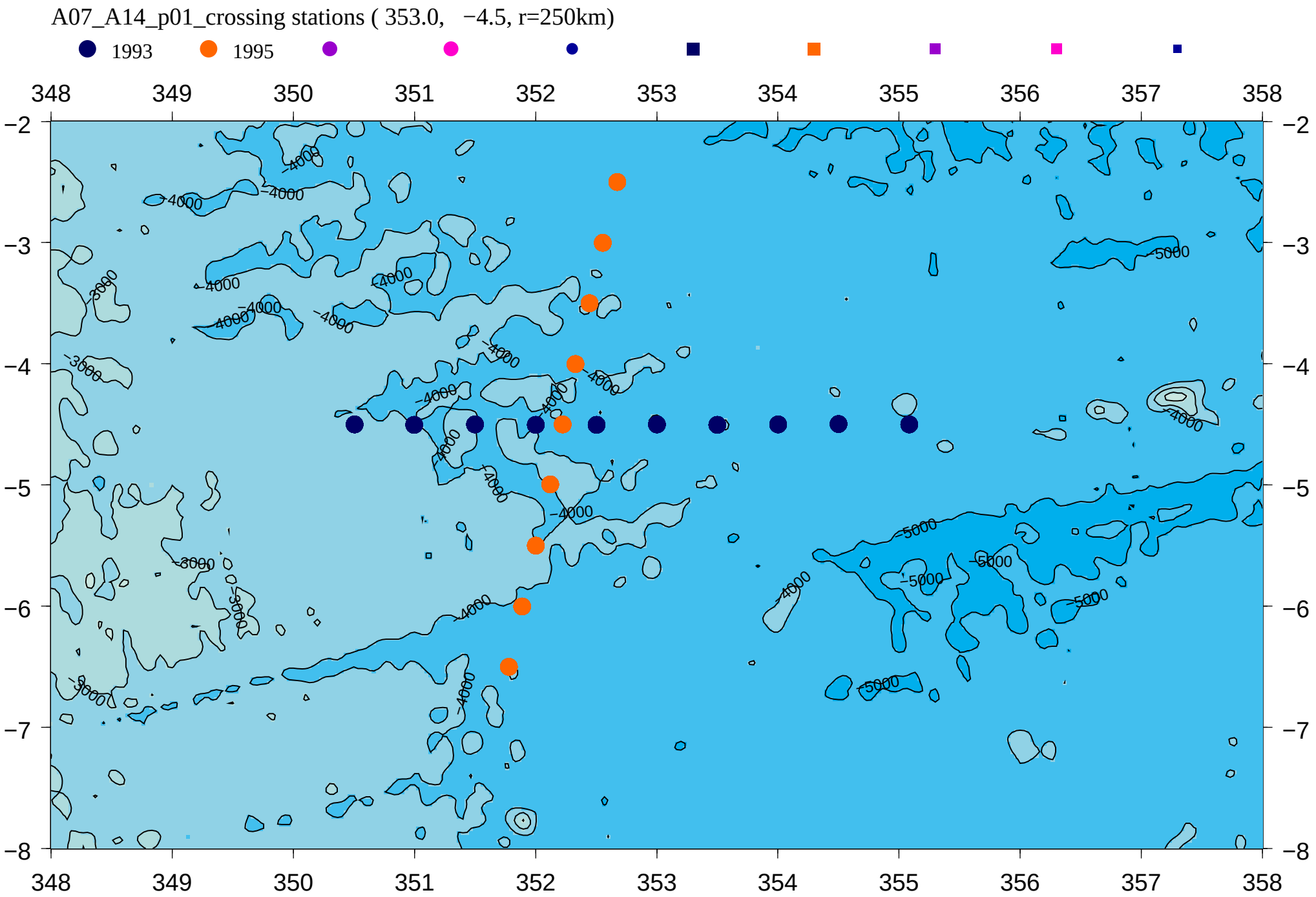

A05_A22_b_p01_crossing stations (294.0, 25.0, r=250km)
1981
1992
1997
1998
2003
289
290
291
292
293
294
295
296
297
298
299
28
27
26
25
24
23
22
-5000
-6000

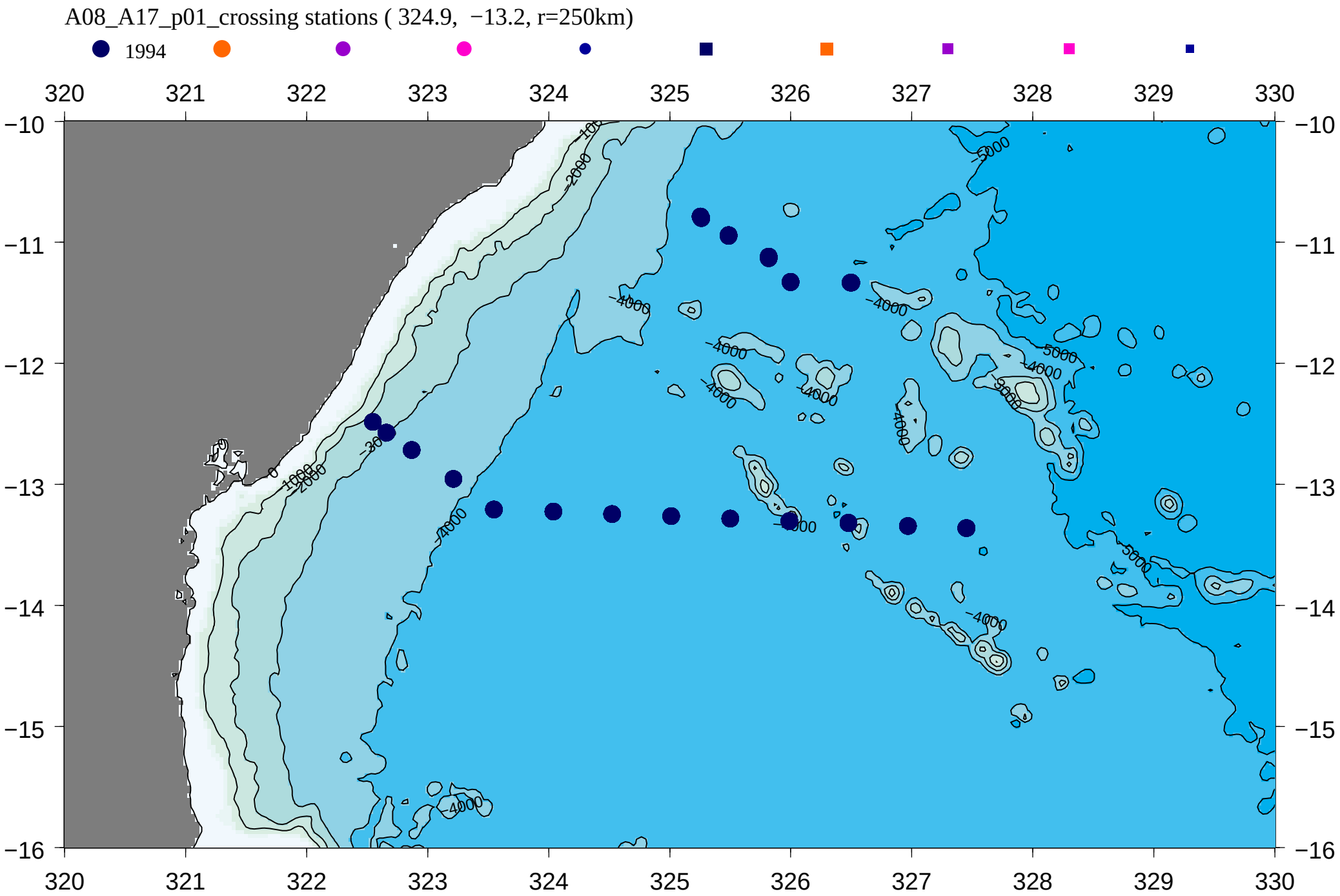

A05_A22_c_p01_crossing stations (294.0, 24.5, r=250km)
1981
1992
1997
1998
2003
289
290
291
292
293
294
295
296
297
298
299
27
26
25
24
23
22
21
-5000
-6000

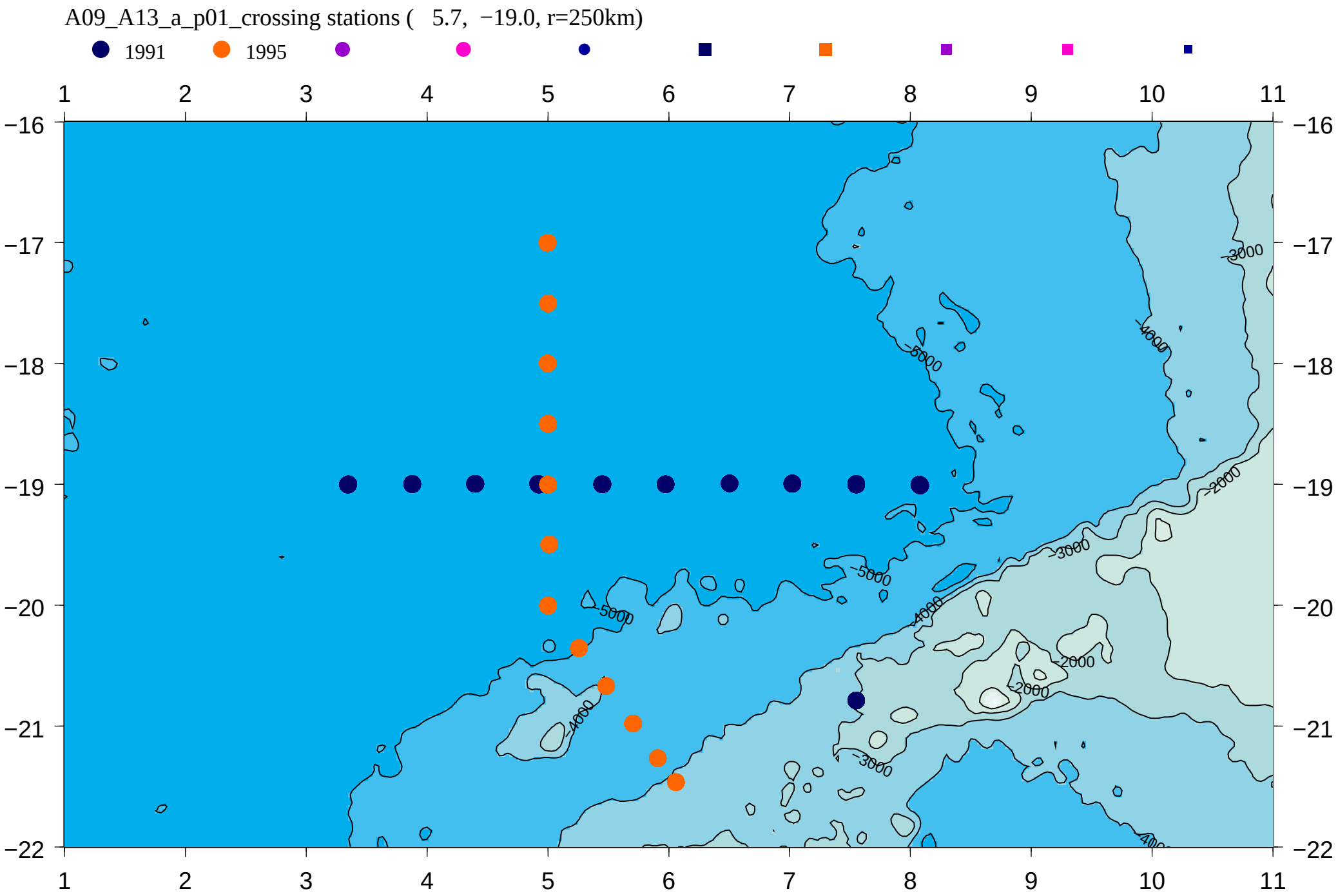

A05_A22_d_p01_crossing stations (294.0, 24.5, r=250km)
1981
1992
1997
1998
2003
289
290
291
292
293
294
295
296
297
298
299
27
26
25
24
23
22
21
-5000
-6000
-6000

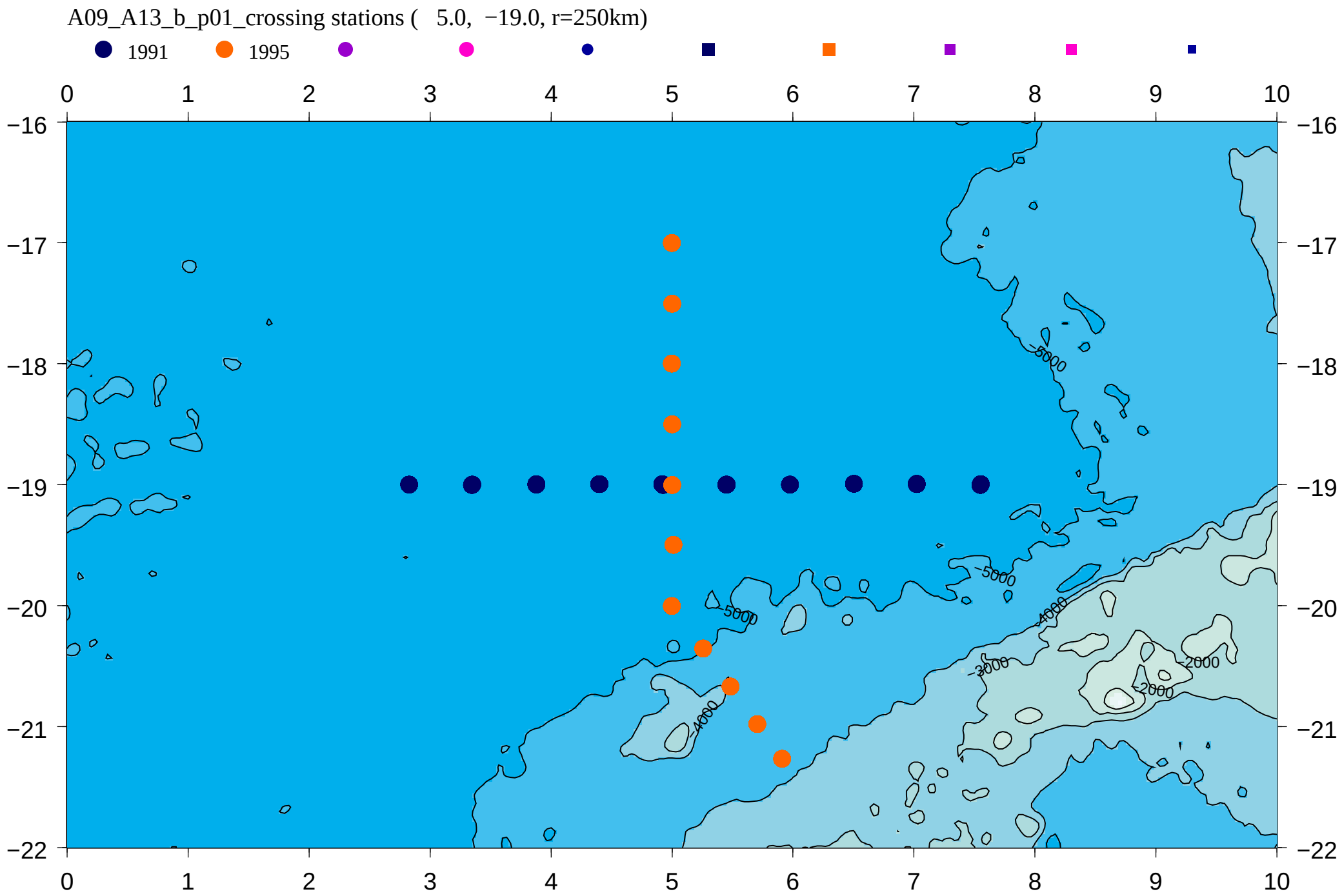

A06_A17_p01_crossing stations (308.5, 5.9, r=250km)
1982
1993
1994
1997
2003
304
305
306
307
308
309
310
311
312
313
314
9
8
7
6
5
4
3
-1000
-2000
-3000
-4000
0

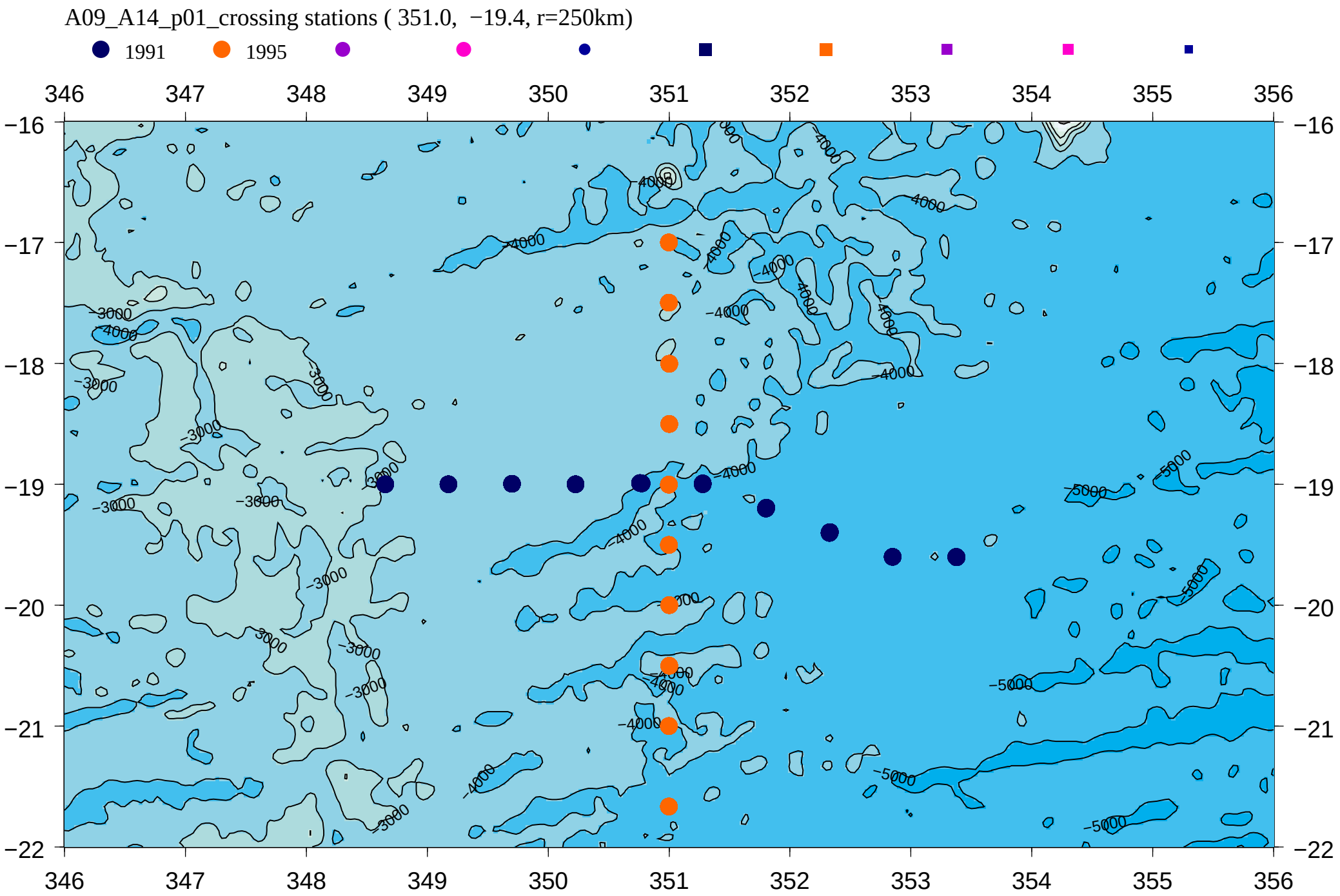

A07_A13_p01_crossing stations (4.8, −4.5, r=250km)
1993
1995
0
1
2
3
4
5
6
7
8
9
10
−2
−3
−4
−5
−6
−7
−8
−4000
−5000
−3000

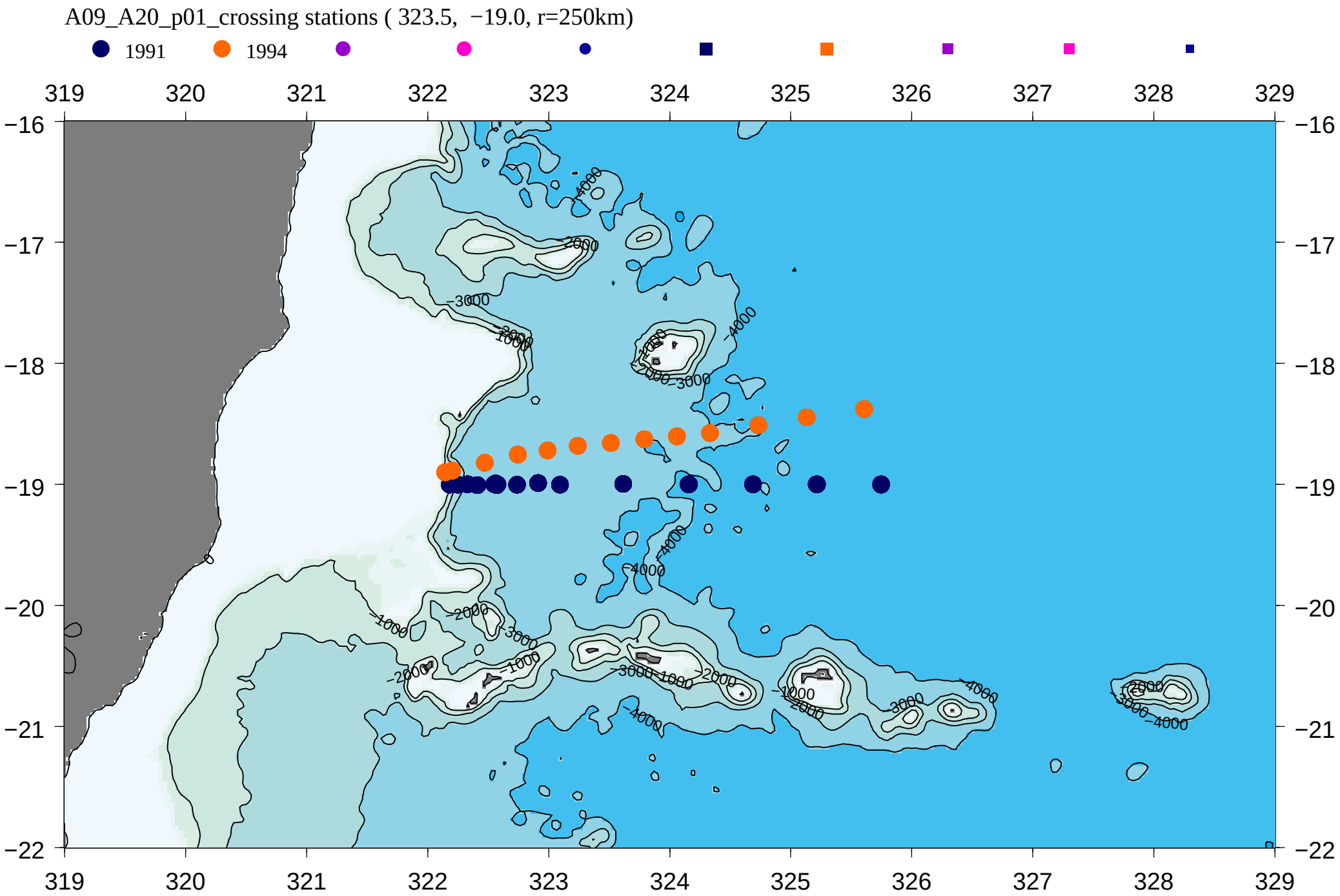

A07_A14_p01_crossing stations (353.0, −4.5, r=250km)
1993
1995
348
349
350
351
352
353
354
355
356
357
358
−2
−3
−4
−5
−6
−7
−8
−4000
−3000
−5000

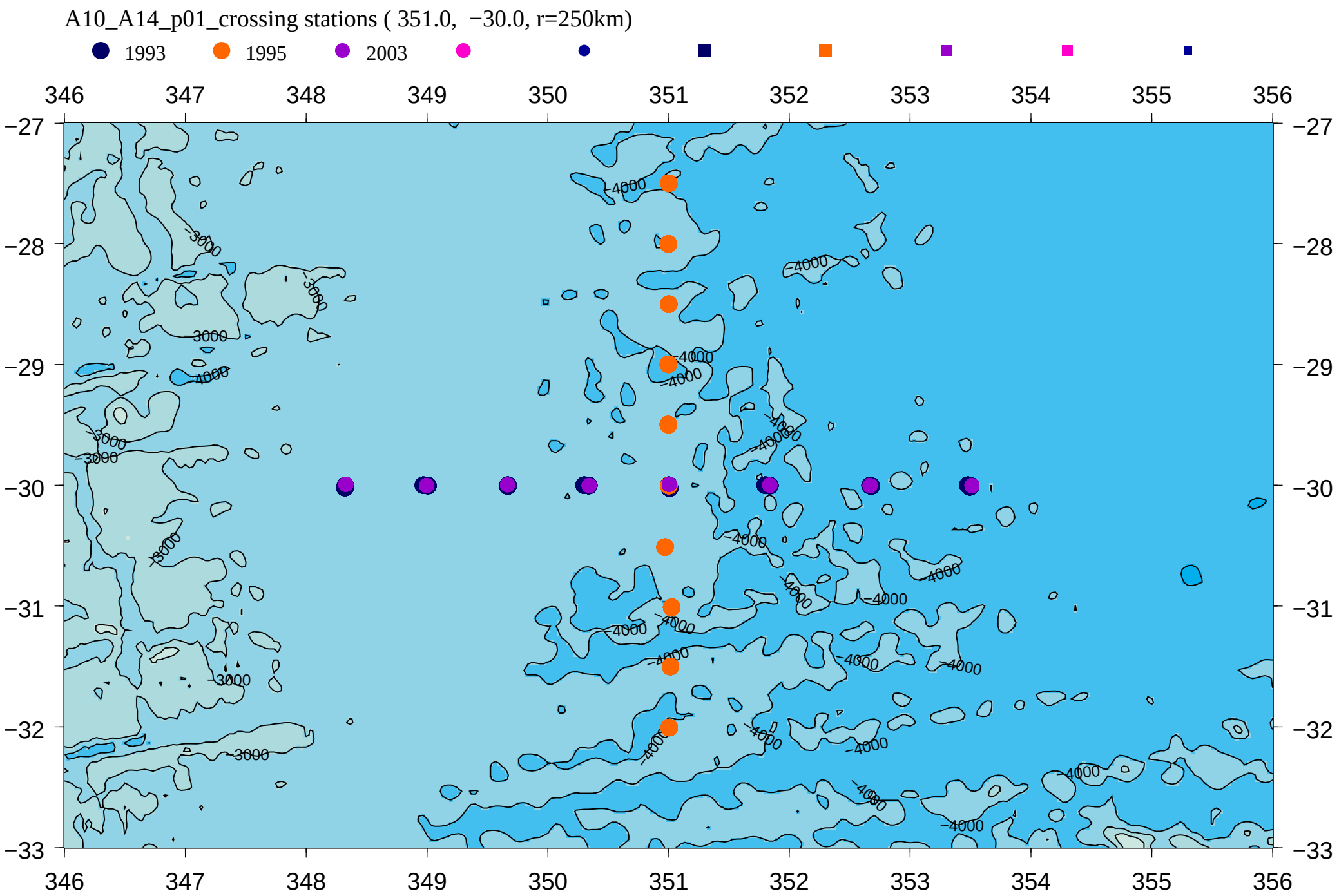

A08_A17_p01_crossing stations (324.9, −13.2, r=250km)
1994
320
321
322
323
324
325
326
327
328
329
330
−10
−11
−12
−13
−14
−15
−16
0
1000
2000
3000
4000
5000

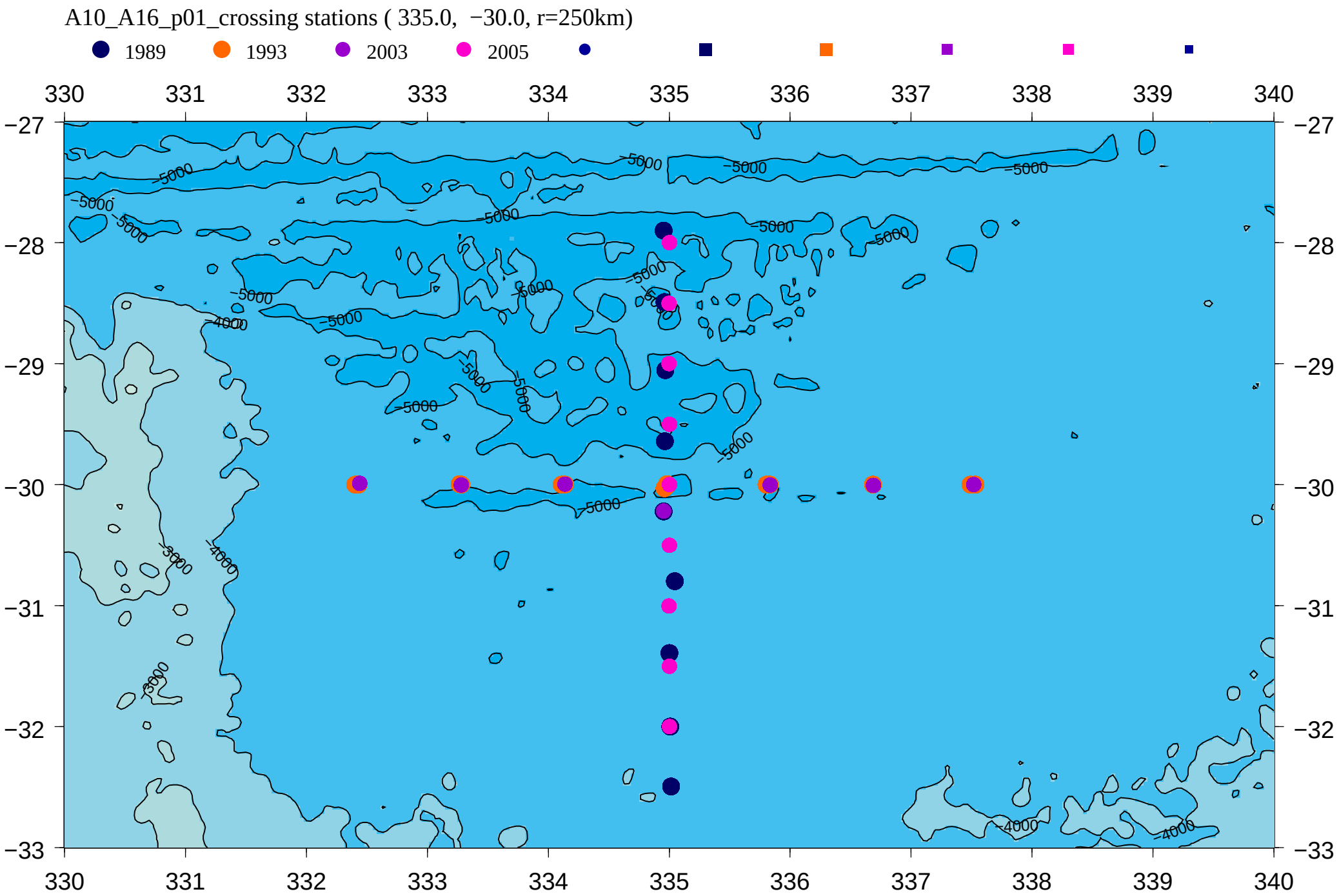

A09_A13_a_p01_crossing stations (5.7, −19.0, r=250km)
1991
1995
1
2
3
4
5
6
7
8
9
10
11
−16
−17
−18
−19
−20
−21
−22
−5000
−4000
−3000
−2000

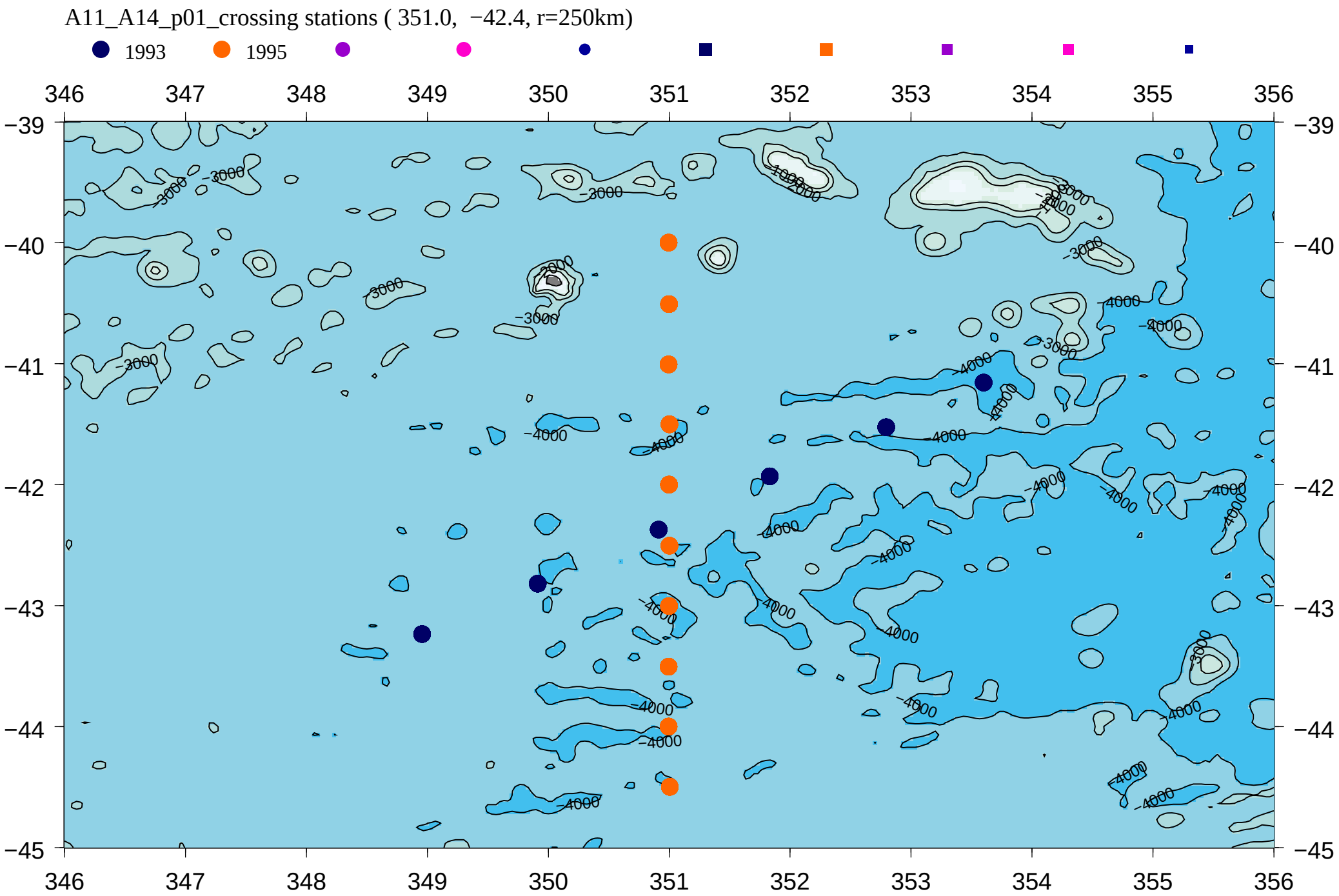

A09_A13_b_p01_crossing stations (5.0, −19.0, r=250km)
1991
1995
0
1
2
3
4
5
6
7
8
9
10
−16
−17
−18
−19
−20
−21
−22
-5000
-4000
-3000
-2000

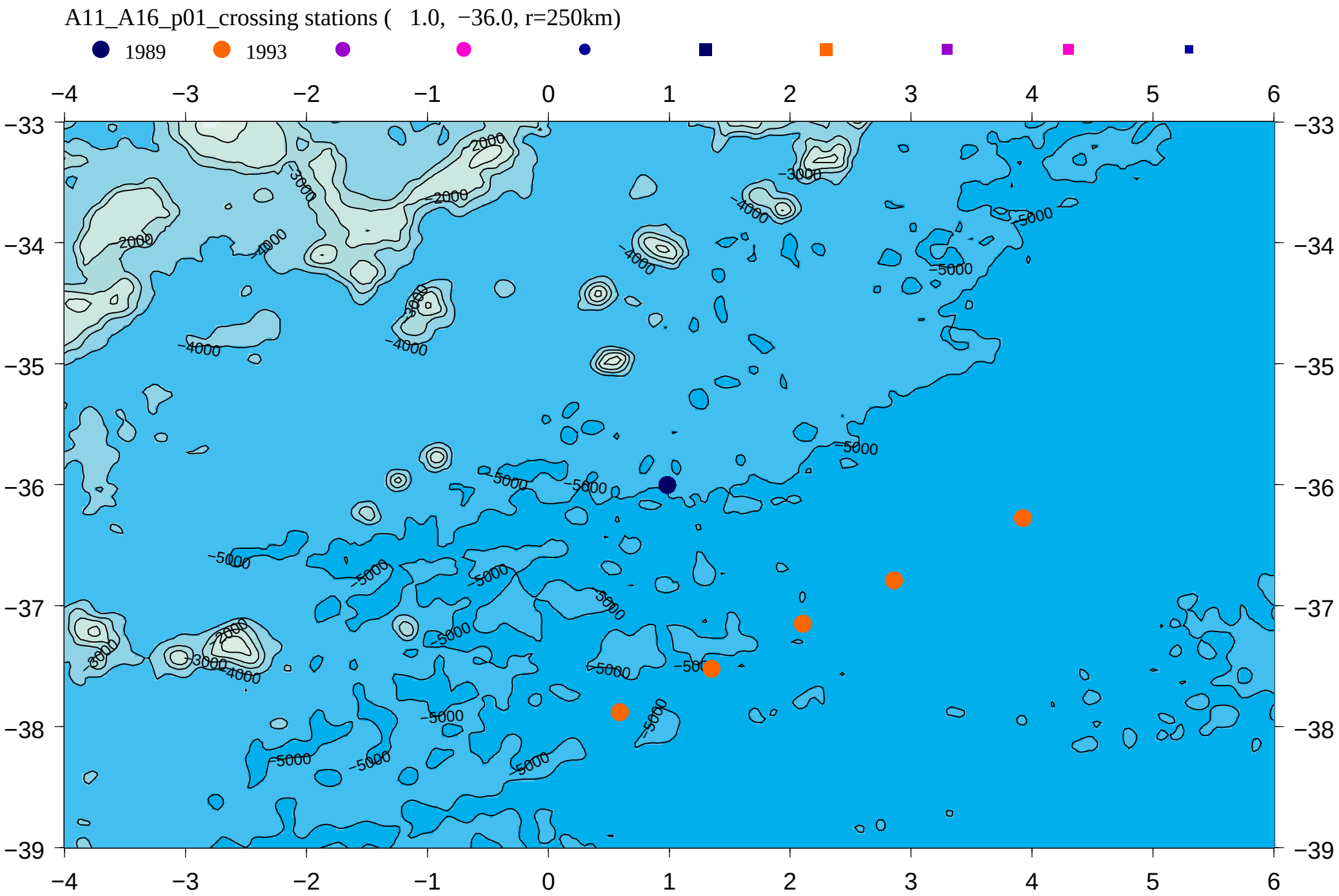

A09_A14_p01_crossing stations (351.0, −19.4, r=250km)
1991
1995
346
347
348
349
350
351
352
353
354
355
356
−16
−17
−18
−19
−20
−21
−22
−3000
−4000
−5000

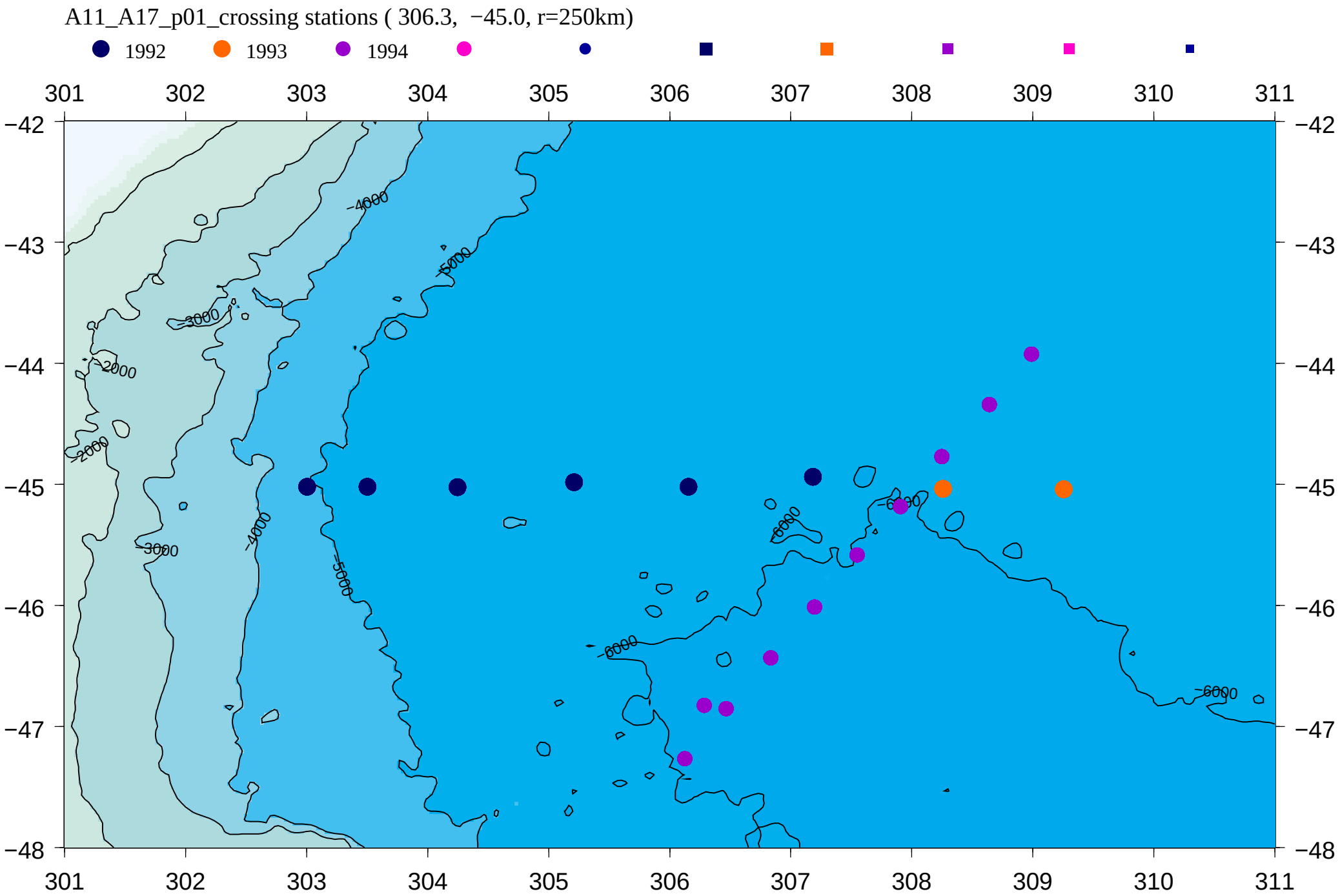

A09_A20_p01_crossing stations (323.5, −19.0, r=250km)
1991
1994
319
320
321
322
323
324
325
326
327
328
329
−16
−17
−18
−19
−20
−21
−22
0
−1000
−2000
−3000
−4000

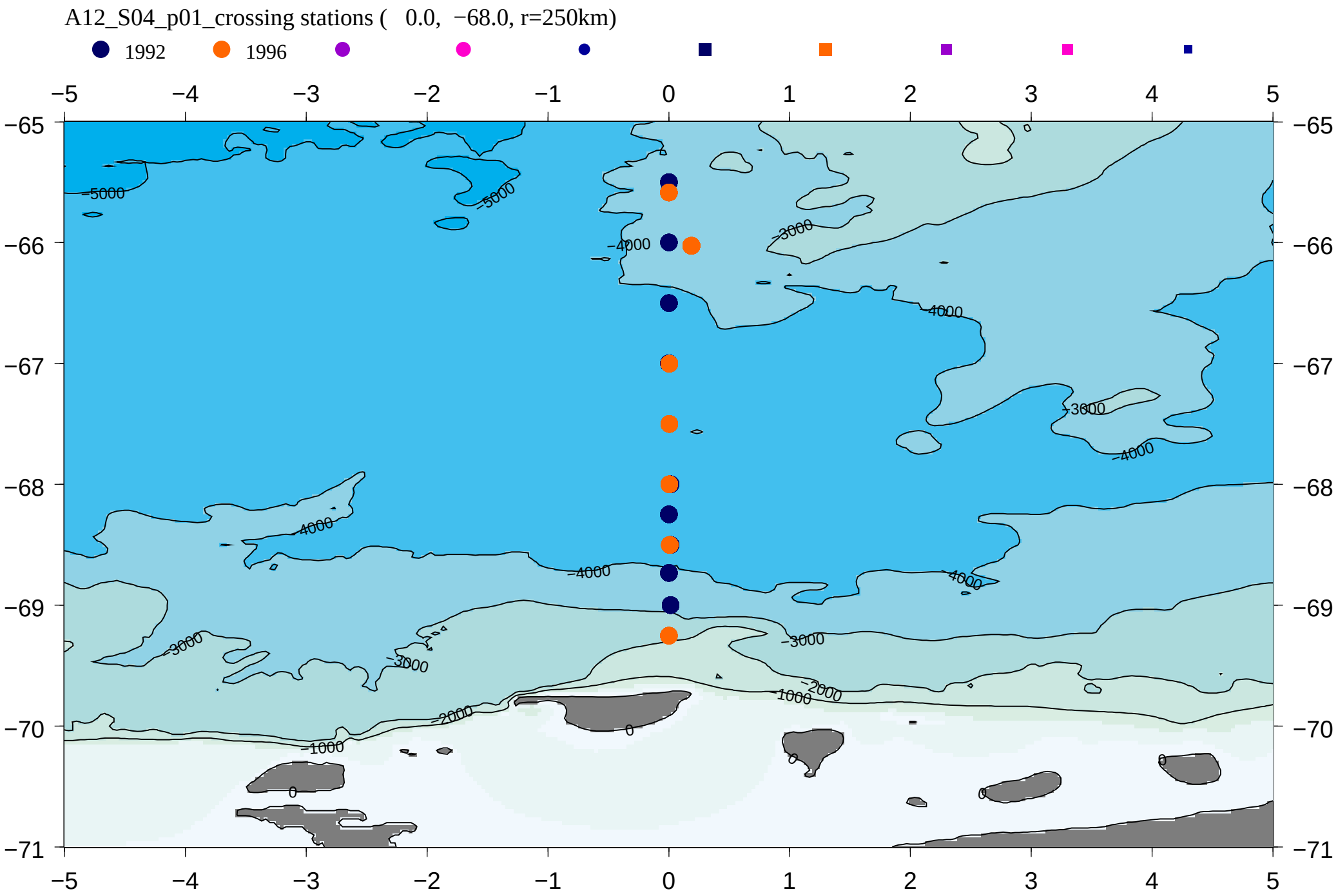

A10_A14_p01_crossing stations (351.0, −30.0, r=250km)
1993
1995
2003
346
347
348
349
350
351
352
353
354
355
356
−27
−28
−29
−30
−31
−32
−33
−3000
−4000

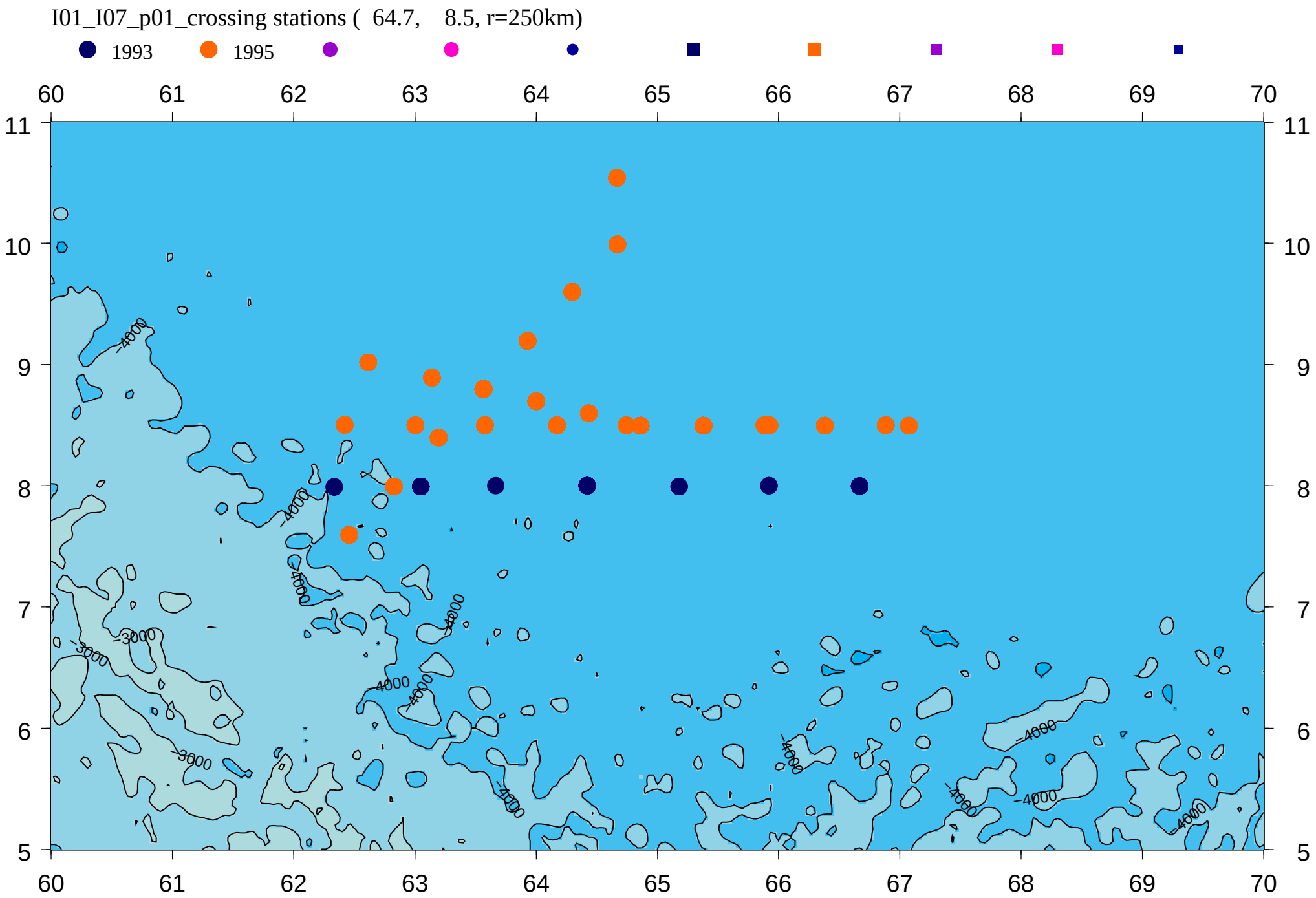

A10_A16_p01_crossing stations (335.0, −30.0, r=250km)
1989
1993
2003
2005
330
331
332
333
334
335
336
337
338
339
340
−27
−28
−29
−30
−31
−32
−33
−5000
−4000

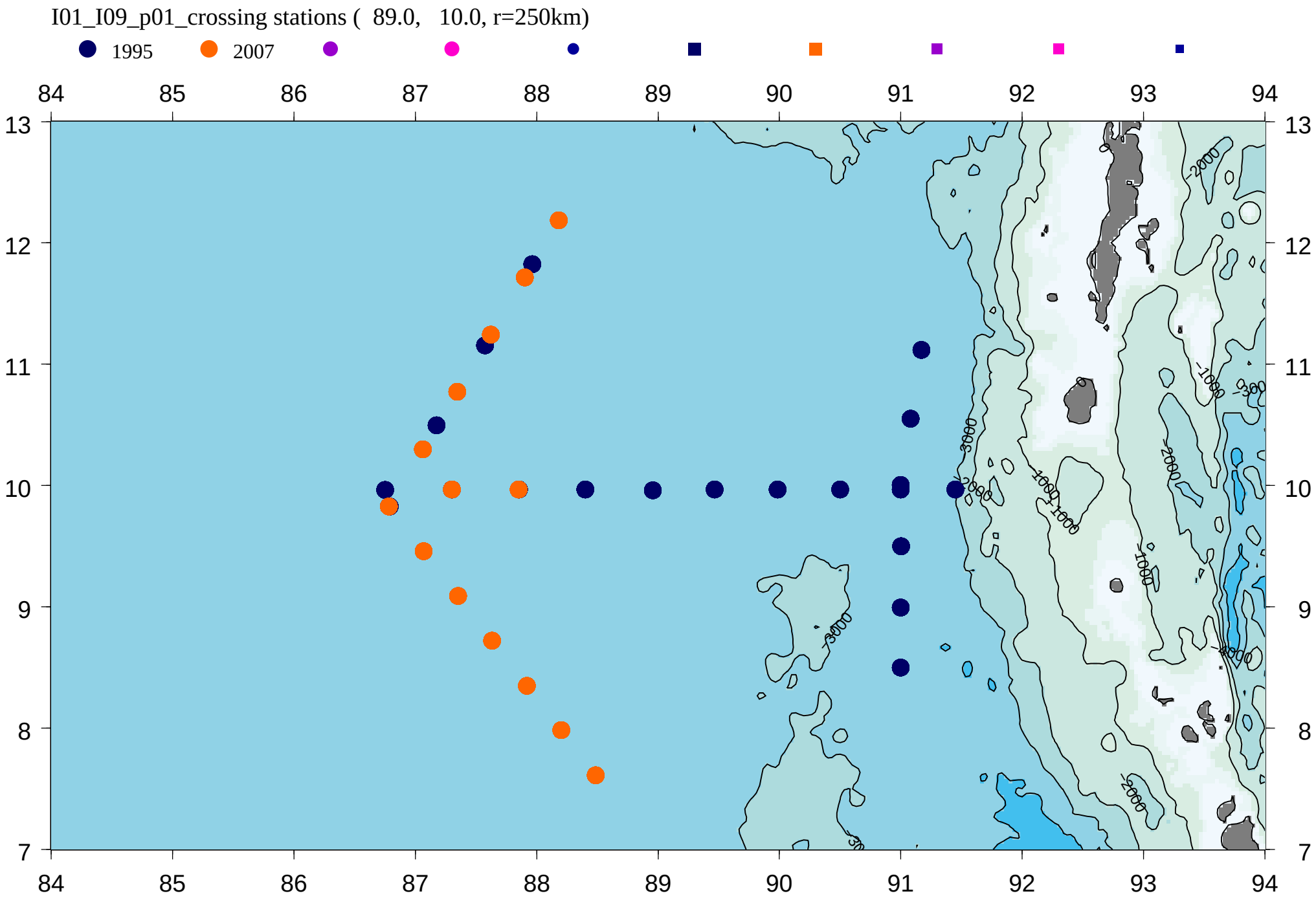

A11_A14_p01_crossing stations (351.0, −42.4, r=250km)
1993
1995
346
347
348
349
350
351
352
353
354
355
356
−39
−40
−41
−42
−43
−44
−45
−3000
−4000

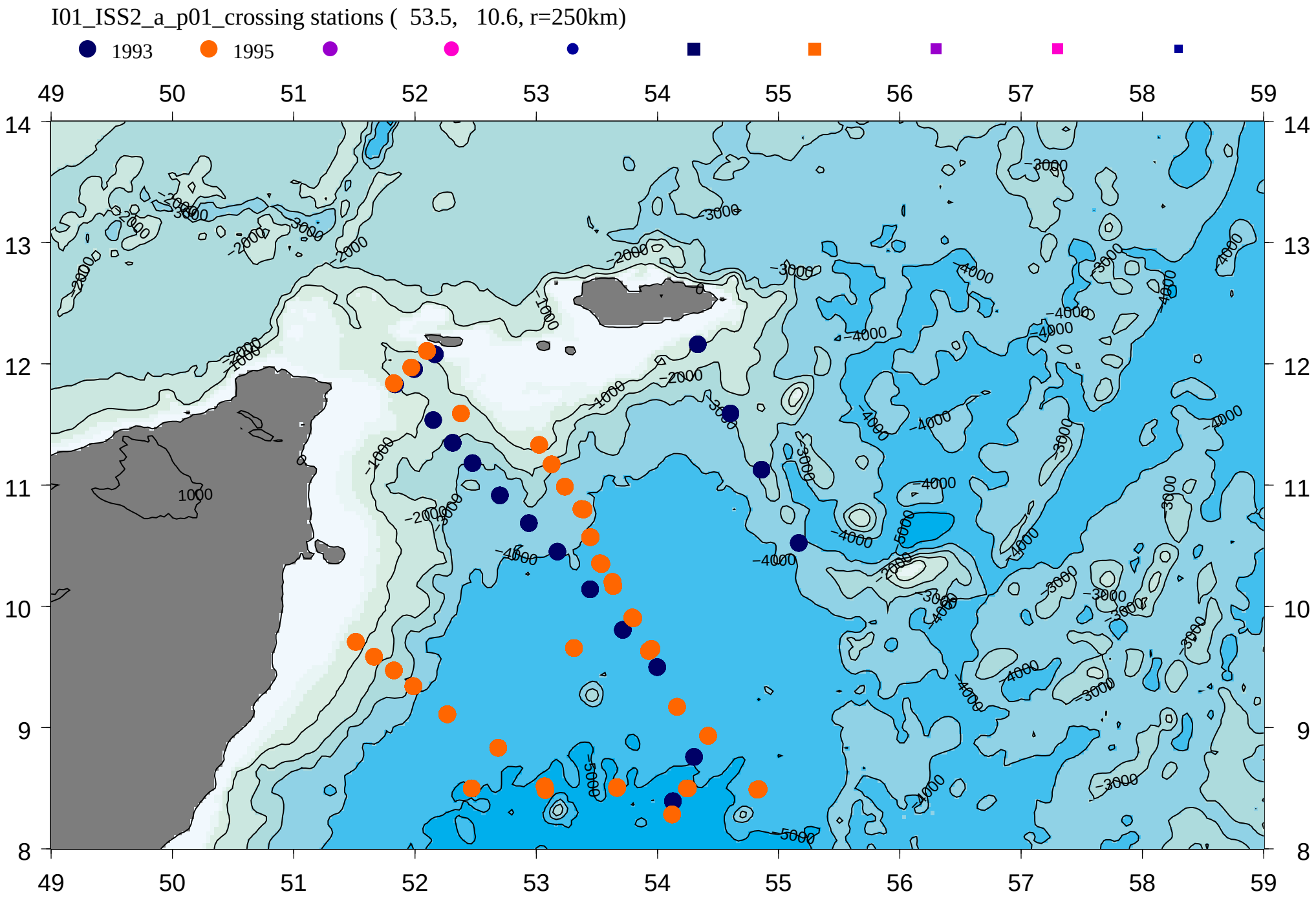

A11_A16_p01_crossing stations (1.0, −36.0, r=250km)
1989
1993
−4
−3
−2
−1
0
1
2
3
4
5
6
−33
−34
−35
−36
−37
−38
−39
2000
−3000
−4000
−5000

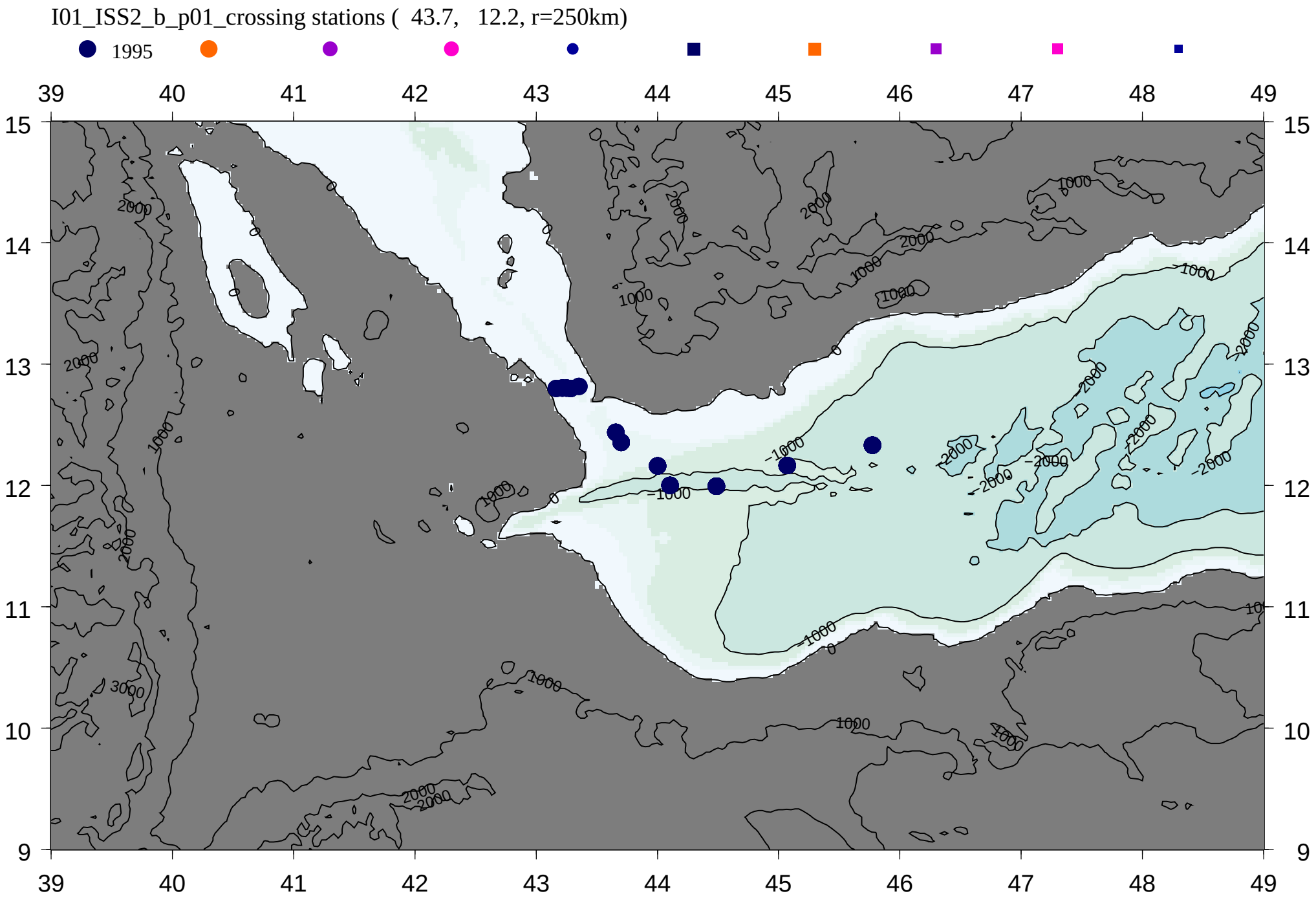

A11_A17_p01_crossing stations (306.3, −45.0, r=250km)
1992
1993
1994
301
302
303
304
305
306
307
308
309
310
311
−42
−43
−44
−45
−46
−47
−48
−2000
−3000
−4000
−5000
−6000

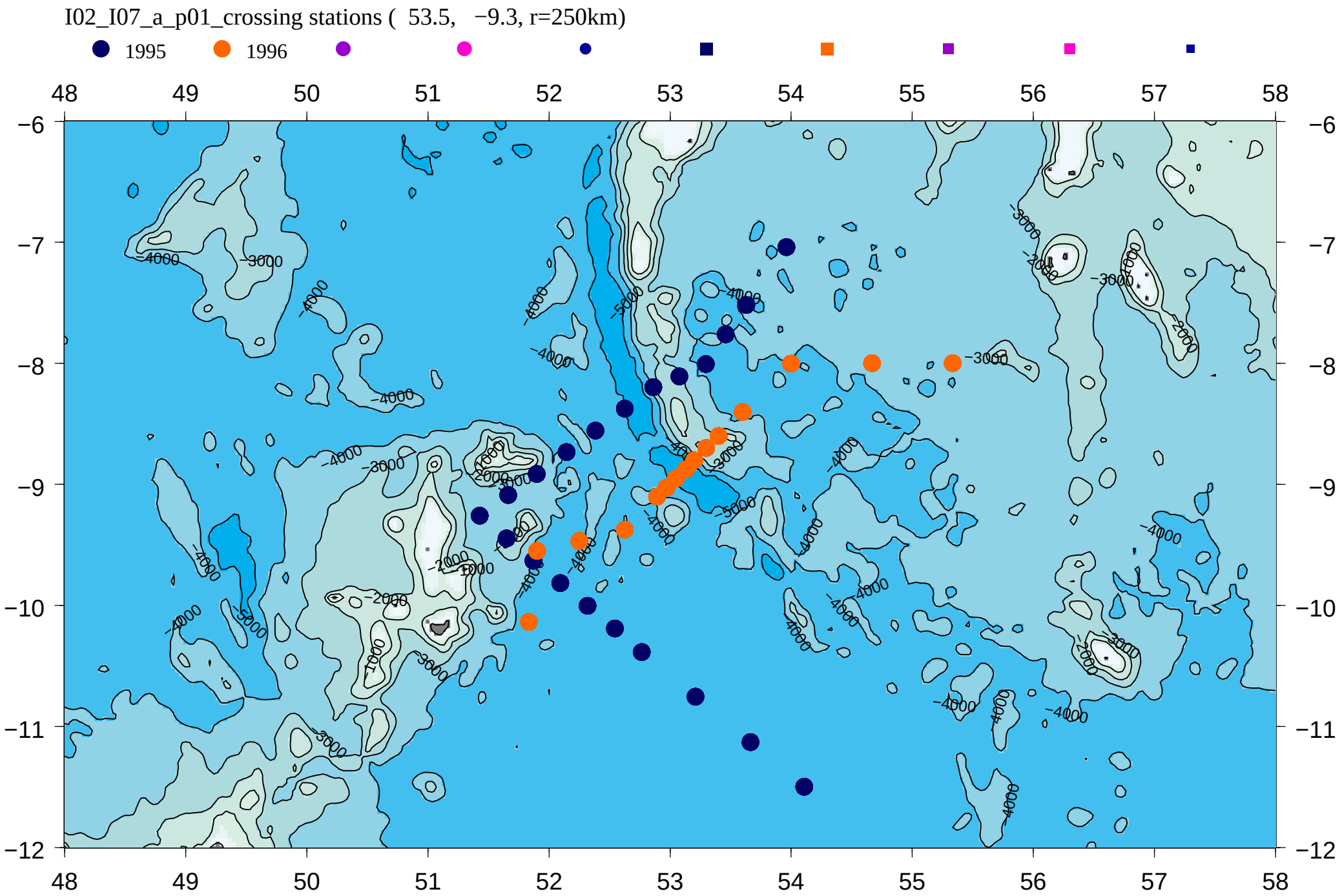

A12_S04_p01_crossing stations (0.0, −68.0, r=250km)
1992
1996
−5
−4
−3
−2
−1
0
1
2
3
4
5
−65
−66
−67
−68
−69
−70
−71
−5000
−4000
−3000
−2000
−1000
0
4000

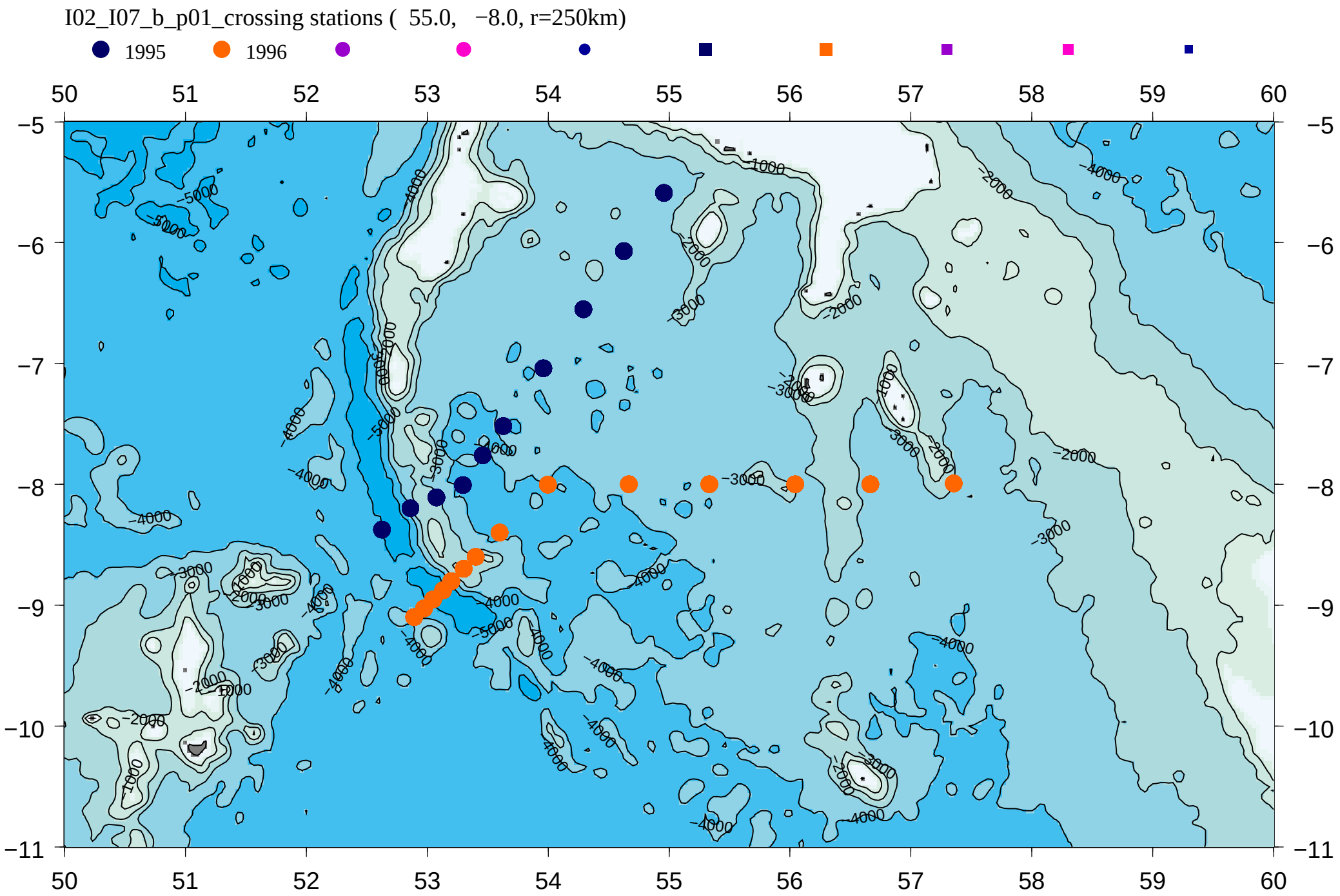

I01_I07_p01_crossing stations (64.7, 8.5, r=250km)
1993
1995
60
61
62
63
64
65
66
67
68
69
70
11
10
9
8
7
6
5
-4000
-3000

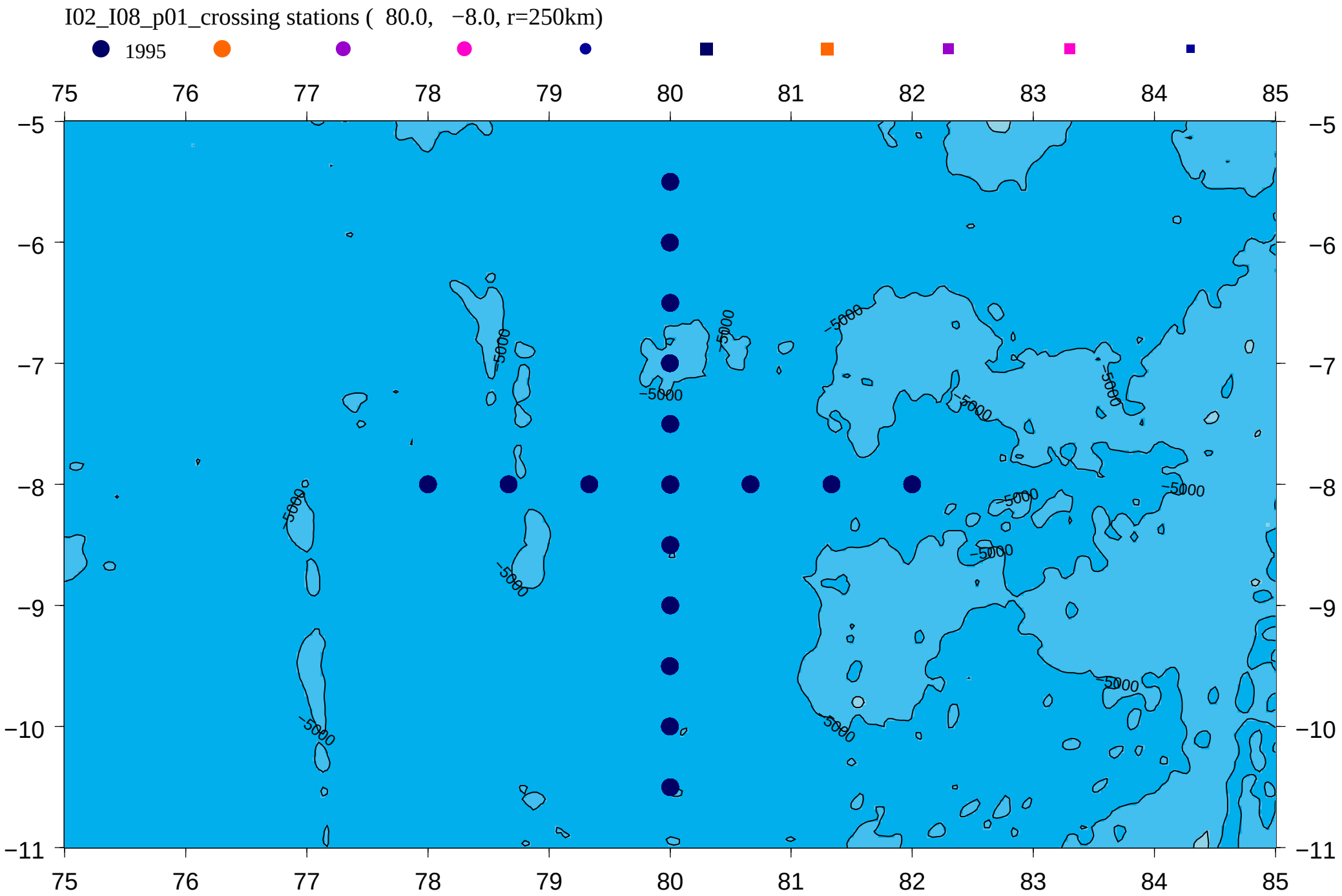

I01_I09_p01_crossing stations (89.0, 10.0, r=250km)
1995
2007
84
85
86
87
88
89
90
91
92
93
94
13
12
11
10
9
8
7
-2000
-1000
-3000

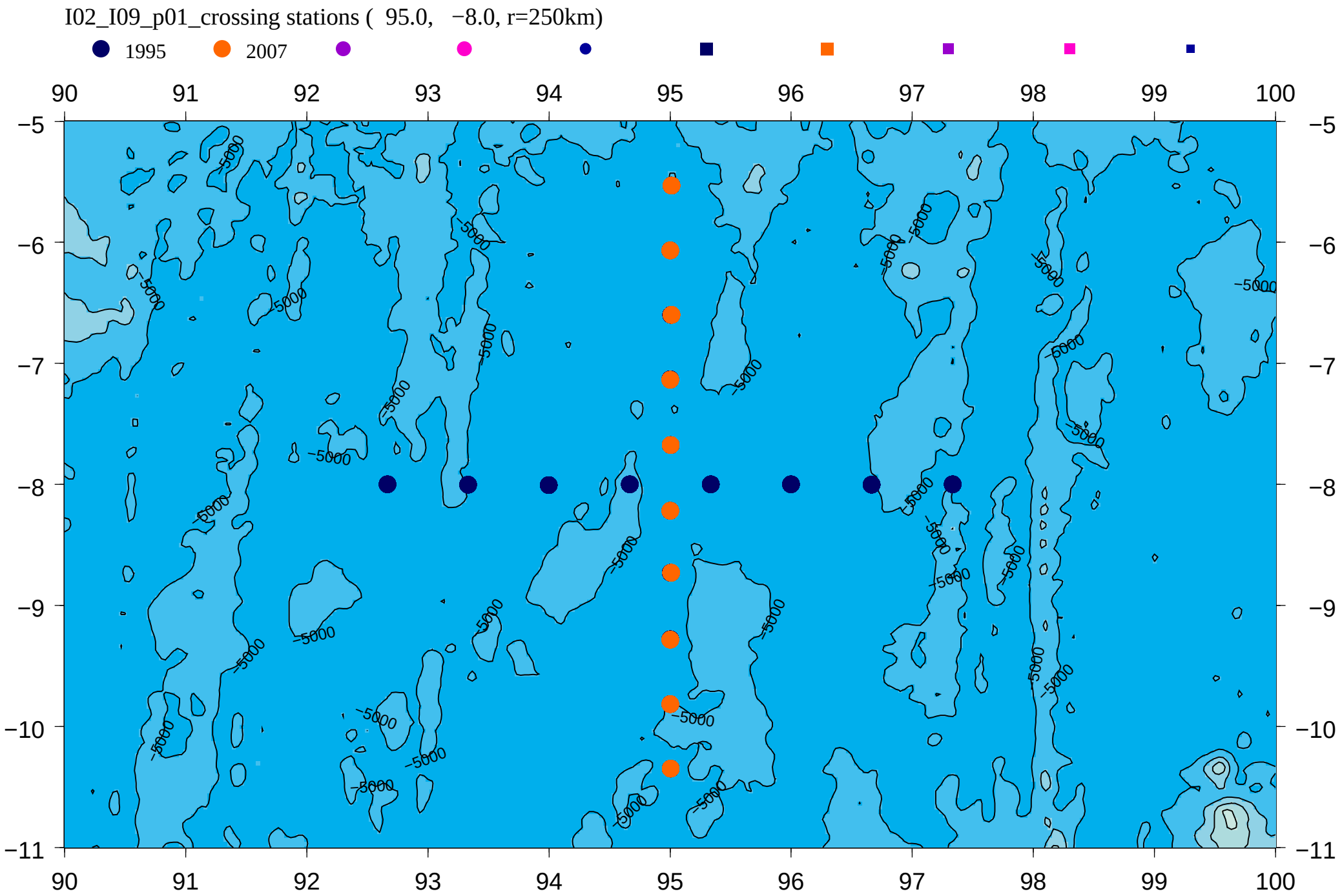

I01_ISS2_a_p01_crossing stations (53.5, 10.6, r=250km)
1993
1995
49
50
51
52
53
54
55
56
57
58
59
14
13
12
11
10
9
8
1000
2000
3000
4000
5000

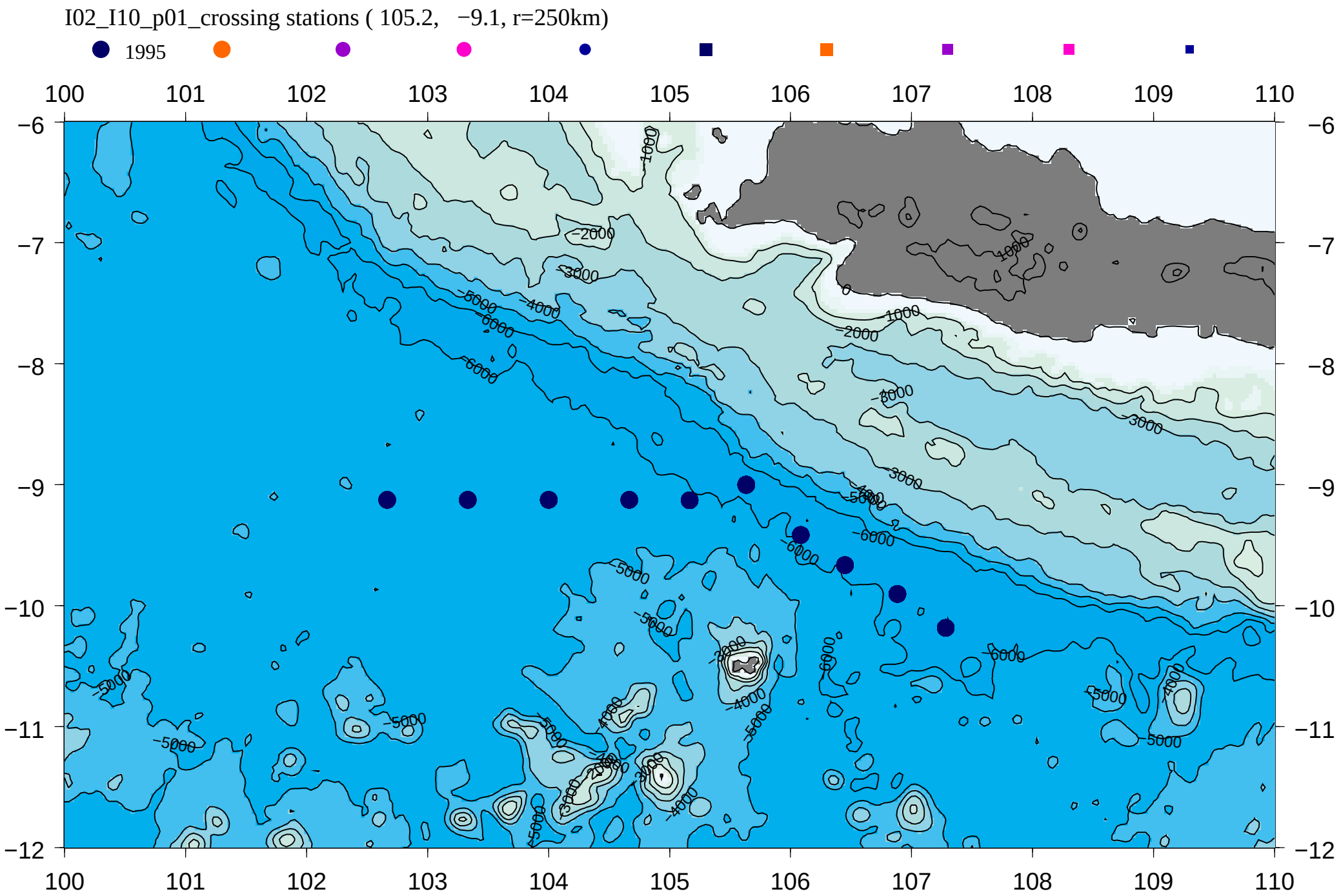

I01_ISS2_b_p01_crossing stations (43.7, 12.2, r=250km)
1995
39
40
41
42
43
44
45
46
47
48
49
15
14
13
12
11
10
9
0
1000
2000
3000
-1000
-2000

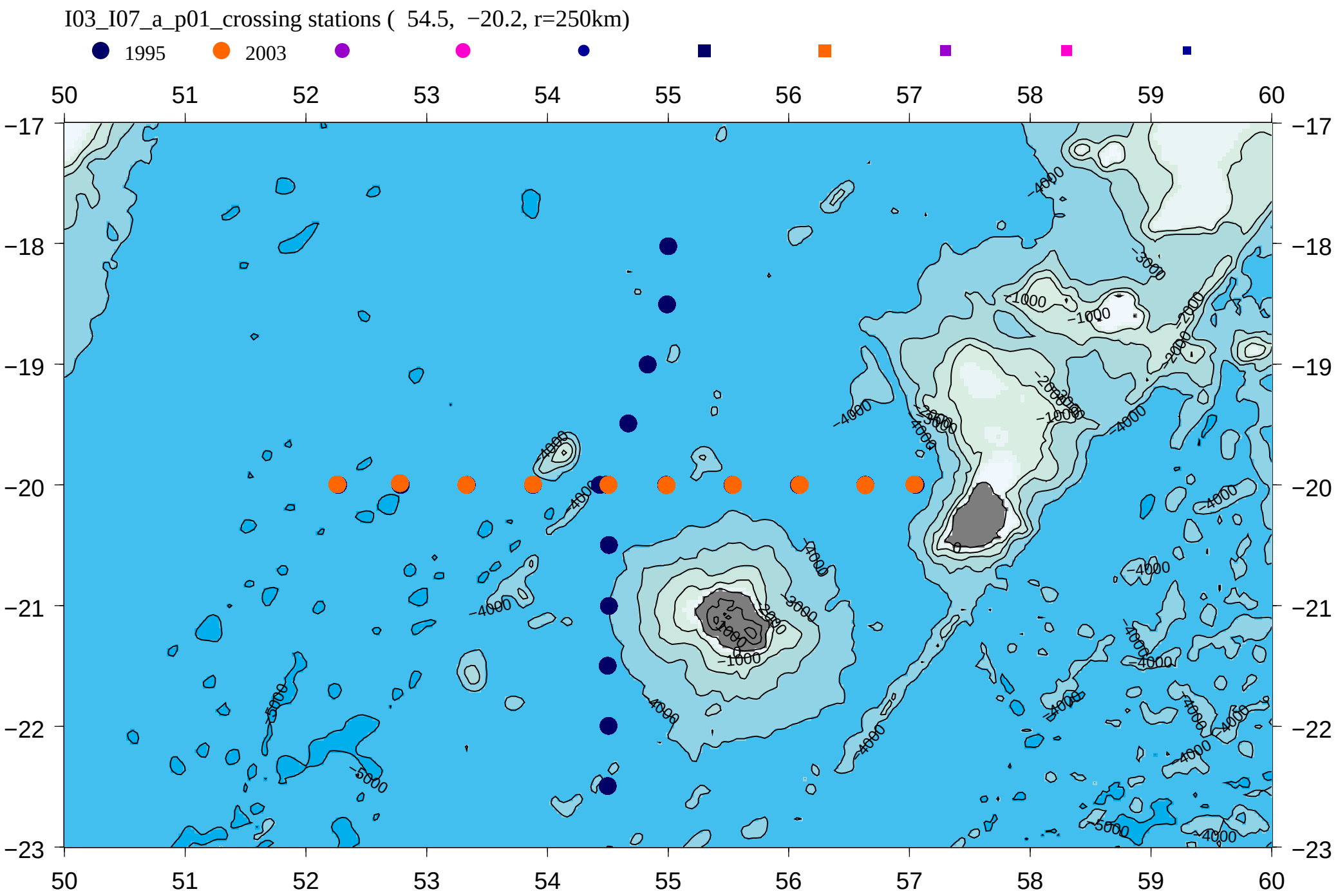

I02_I07_a_p01_crossing stations (53.5, −9.3, r=250km)
1995
1996
48
49
50
51
52
53
54
55
56
57
58
−6
−7
−8
−9
−10
−11
−12

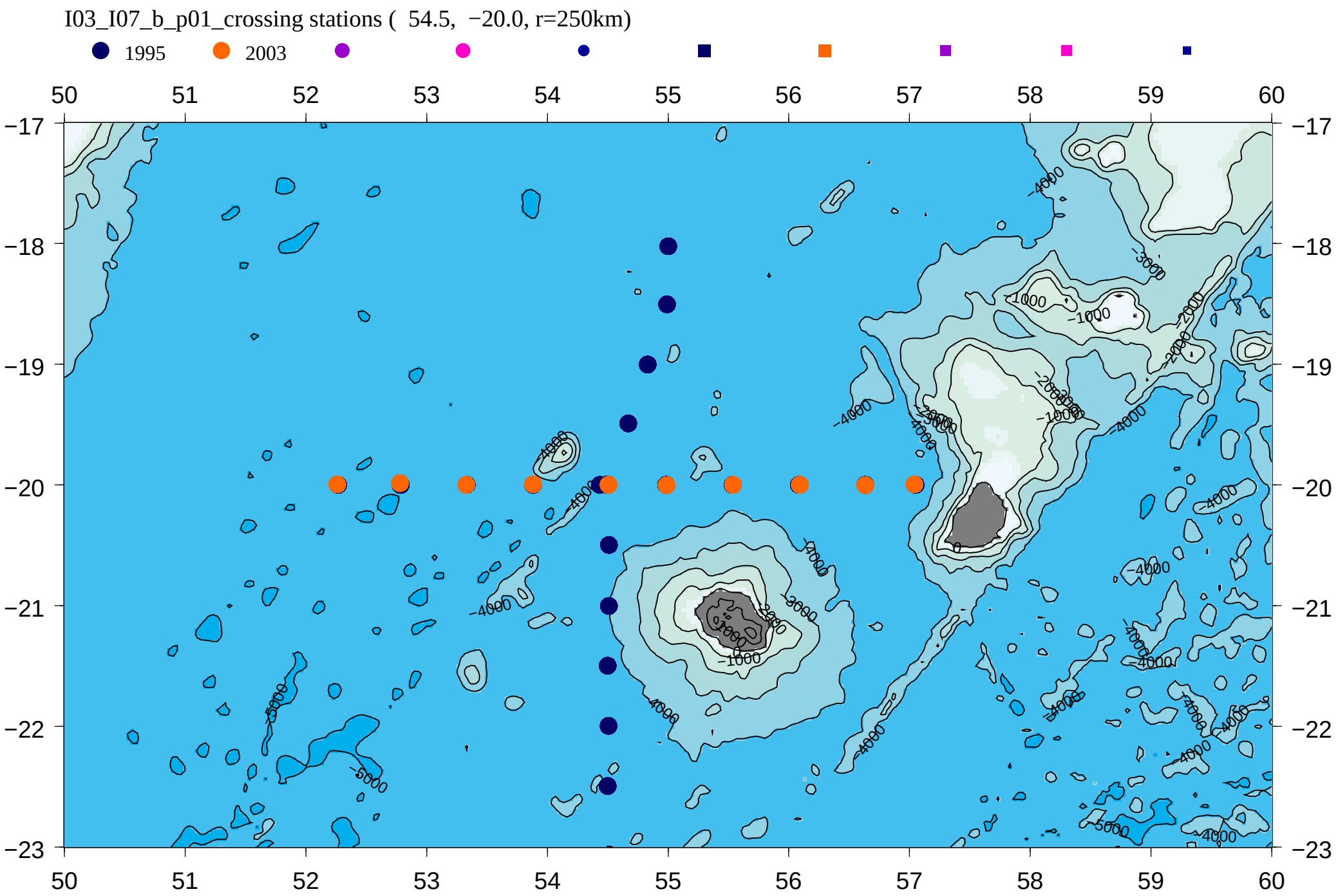

I02_I07_b_p01_crossing stations (55.0, −8.0, r=250km)
1995
1996
50
51
52
53
54
55
56
57
58
59
60
−5
−6
−7
−8
−9
−10
−11

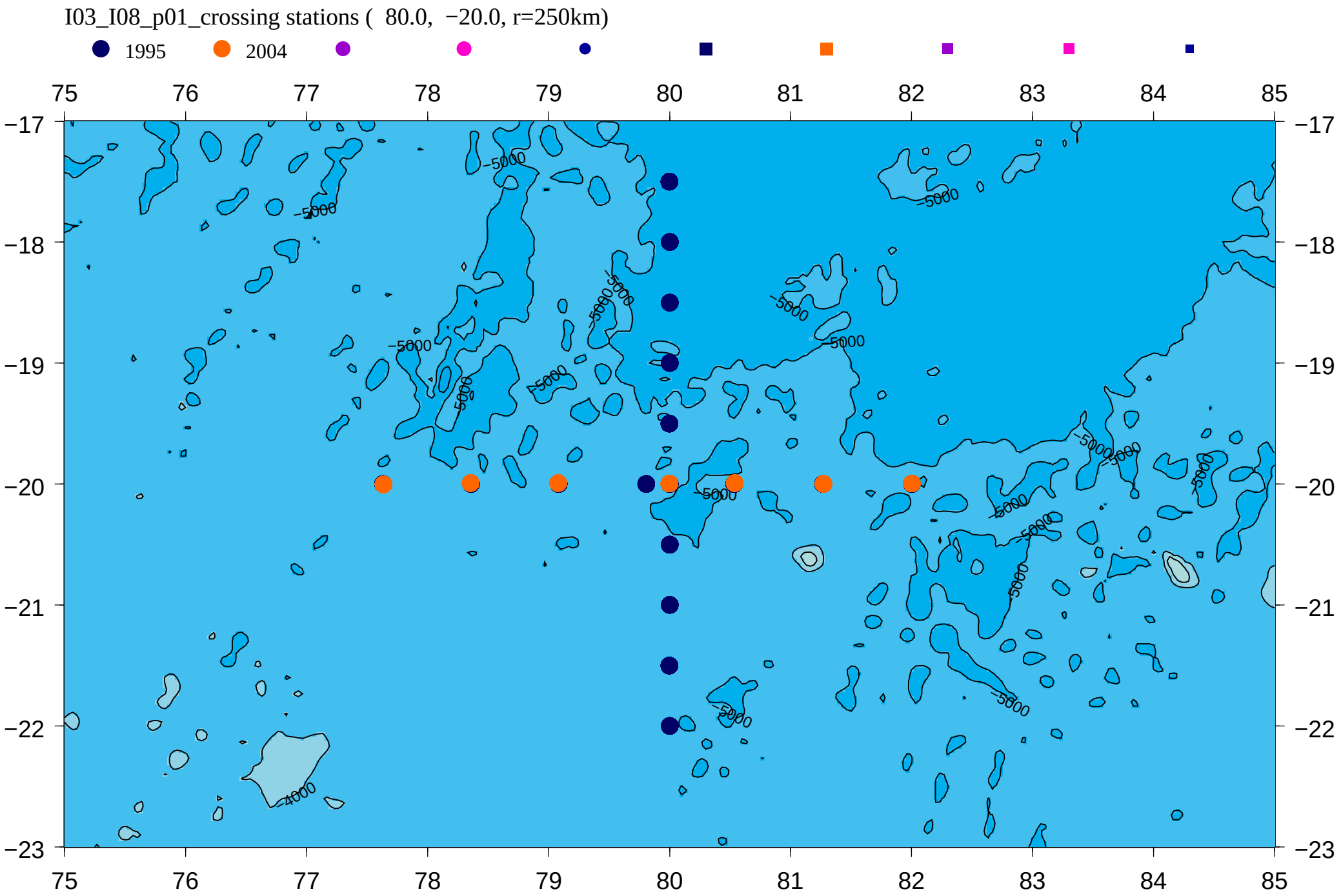

I02_I08_p01_crossing stations (80.0, −8.0, r=250km)
1995
75
76
77
78
79
80
81
82
83
84
85
−5
−6
−7
−8
−9
−10
−11
−5000

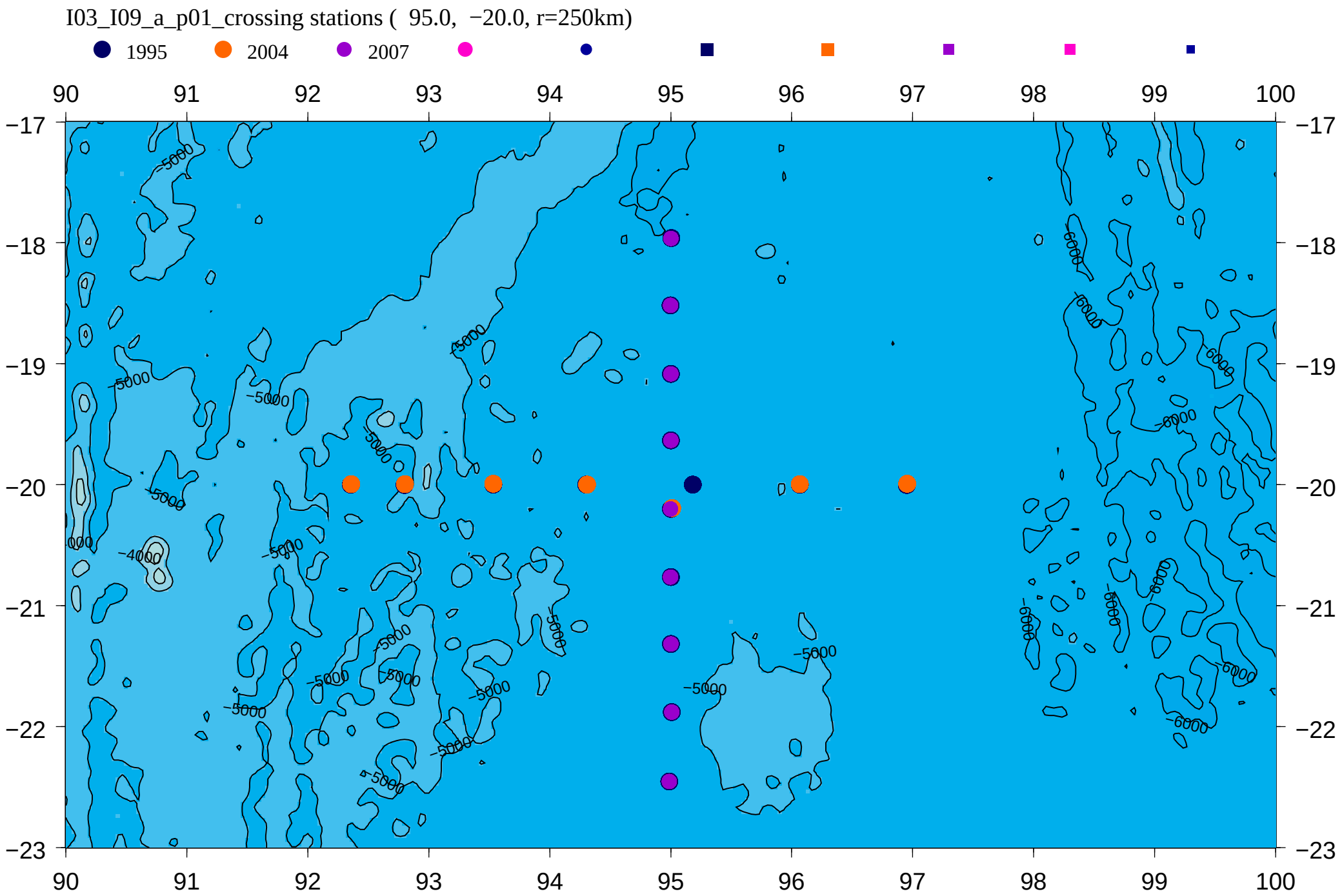

I02_I09_p01_crossing stations (95.0, −8.0, r=250km)
1995
2007
90
91
92
93
94
95
96
97
98
99
100
−5
−6
−7
−8
−9
−10
−11
−5000

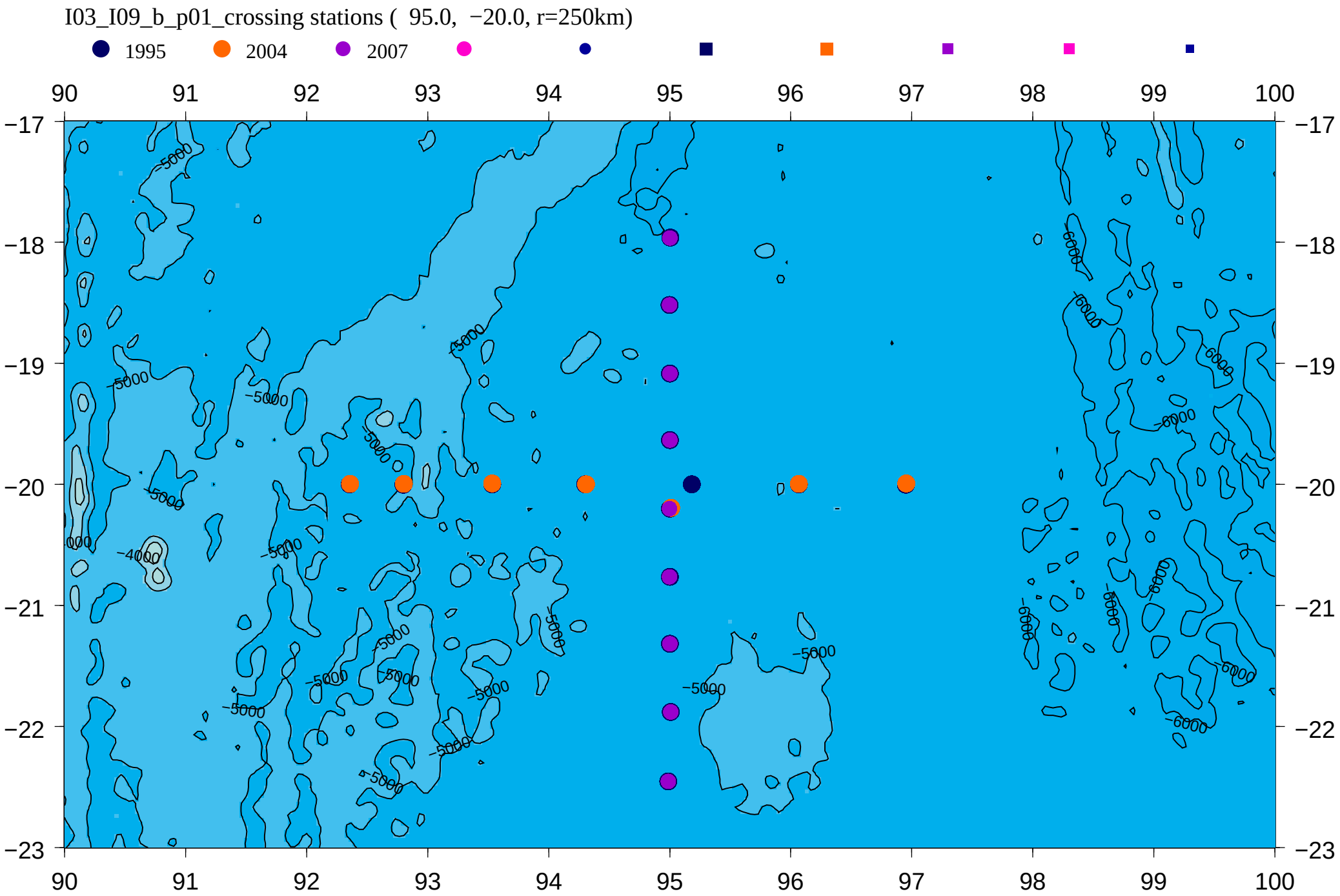

I02_I10_p01_crossing stations (105.2, −9.1, r=250km)
1995
100
101
102
103
104
105
106
107
108
109
110
−6
−7
−8
−9
−10
−11
−12
1000
2000
3000
4000
5000
6000
0

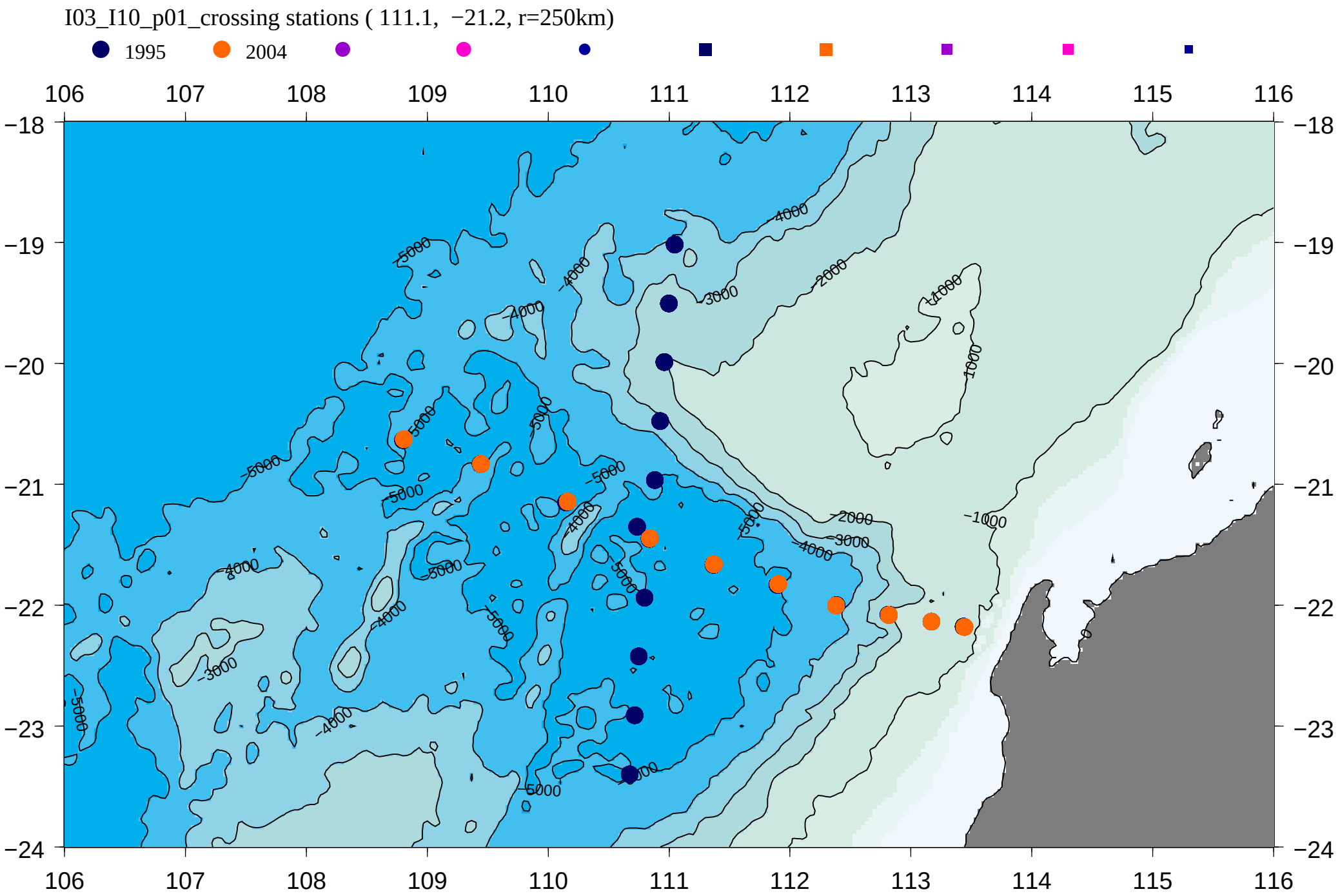

I03_I07_a_p01_crossing stations (54.5, −20.2, r=250km)
1995
2003
50
51
52
53
54
55
56
57
58
59
60
−17
−18
−19
−20
−21
−22
−23

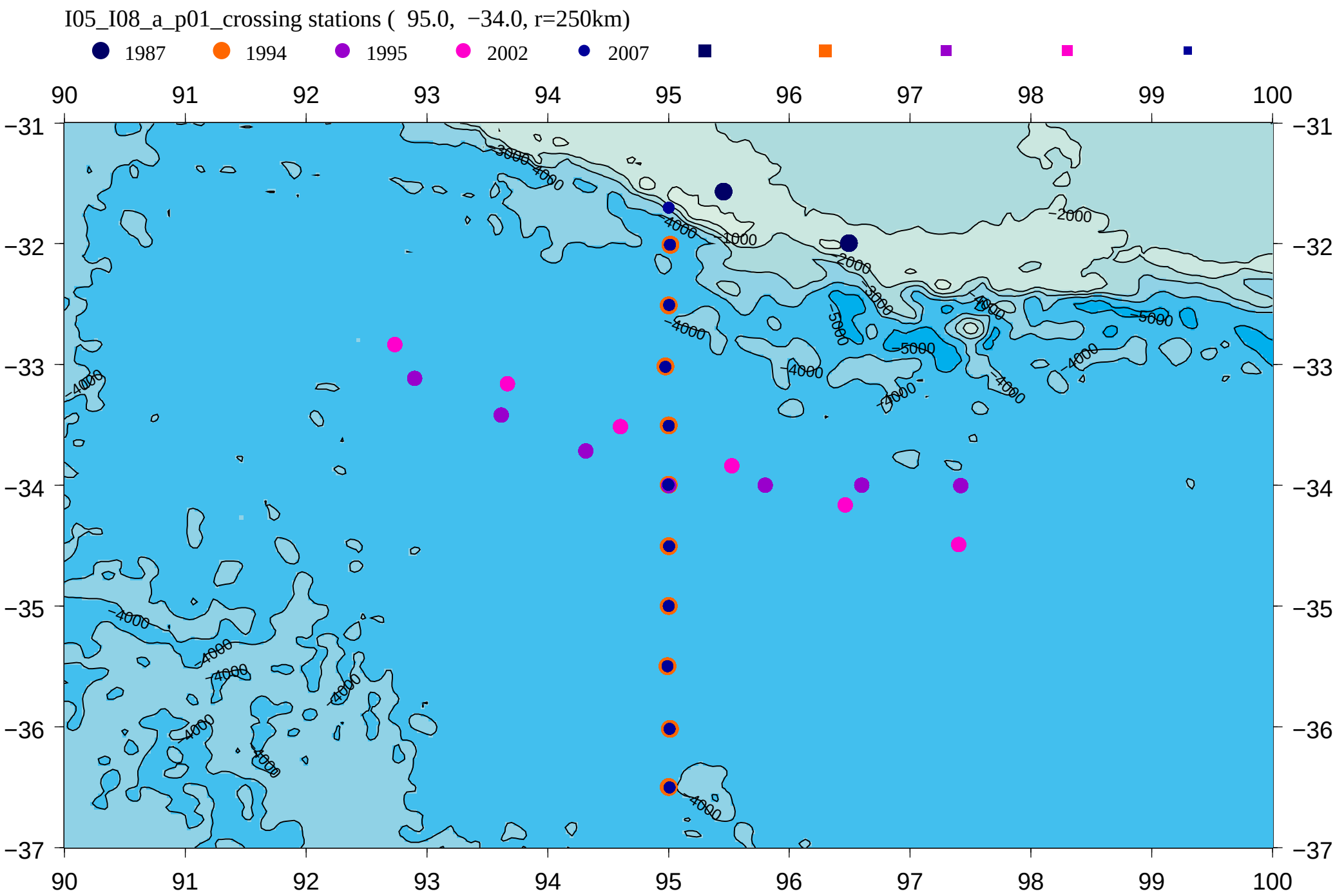

I03_I07_b_p01_crossing stations (54.5, −20.0, r=250km)
1995
2003
50
51
52
53
54
55
56
57
58
59
60
−17
−18
−19
−20
−21
−22
−23

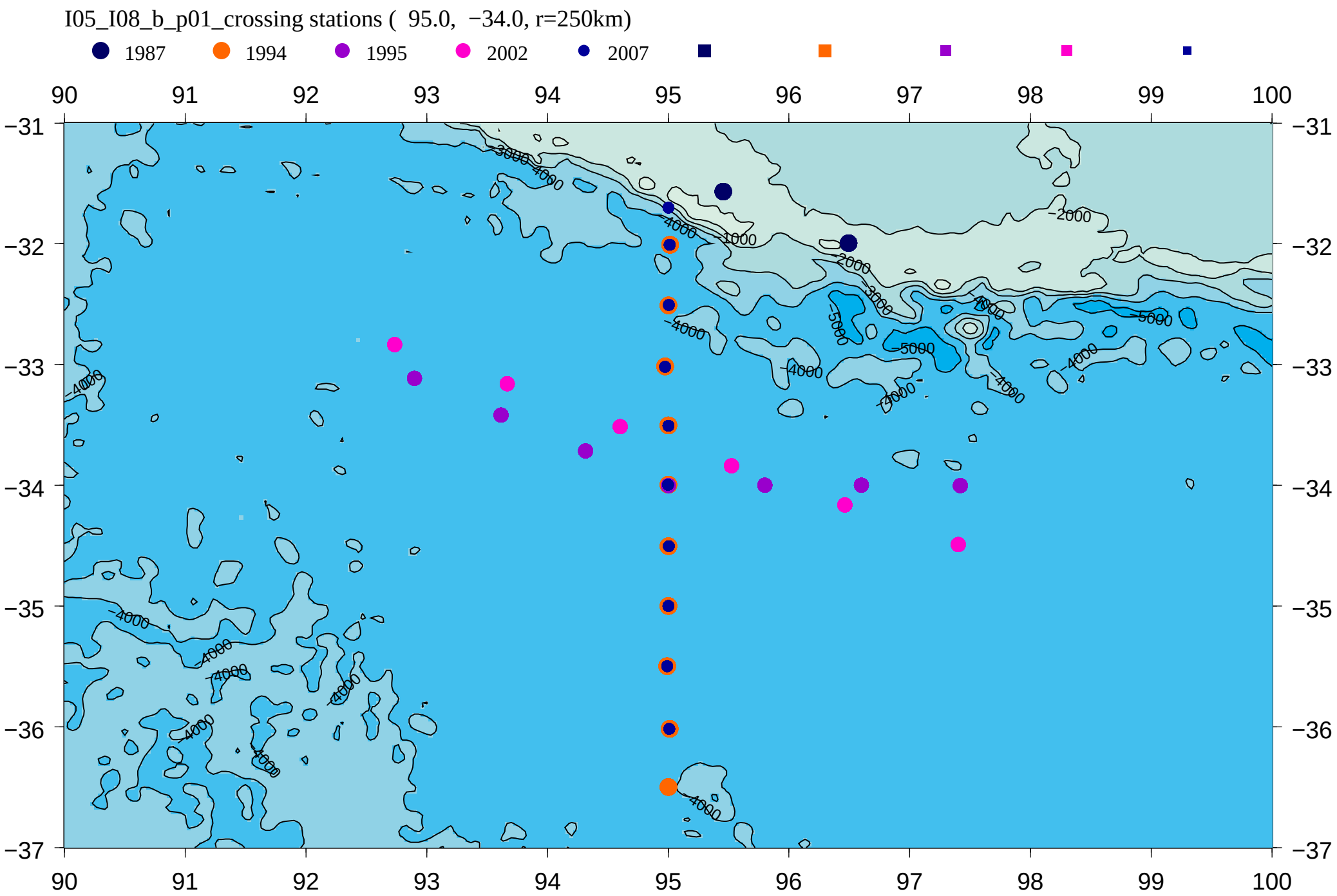

I03_I08_p01_crossing stations (80.0, −20.0, r=250km)
1995
2004
75
76
77
78
79
80
81
82
83
84
85
−17
−18
−19
−20
−21
−22
−23
−5000
−4000

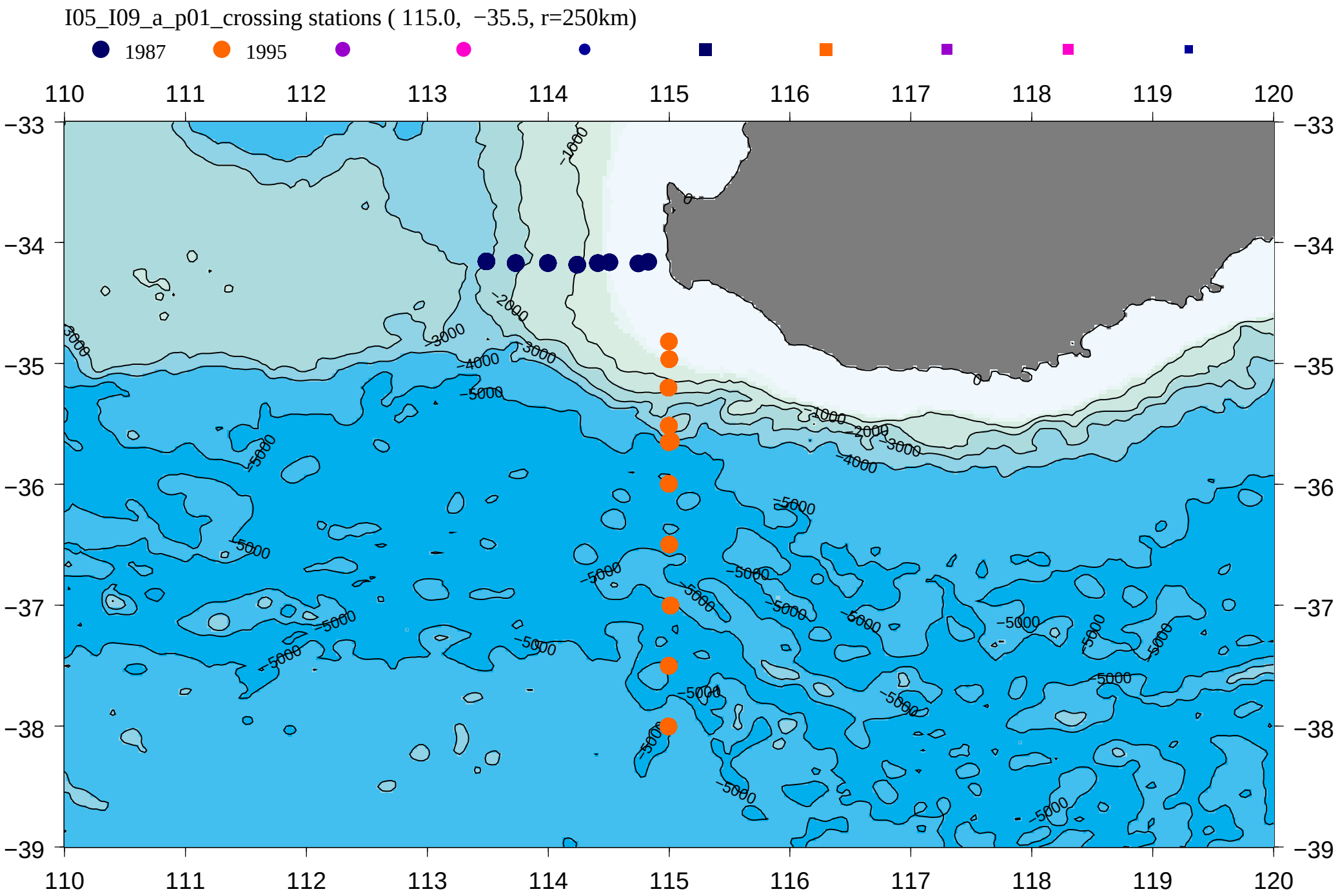

I03_I09_a_p01_crossing stations (95.0, −20.0, r=250km)
1995
2004
2007
90
91
92
93
94
95
96
97
98
99
100
−17
−18
−19
−20
−21
−22
−23
−5000
−6000
−4000

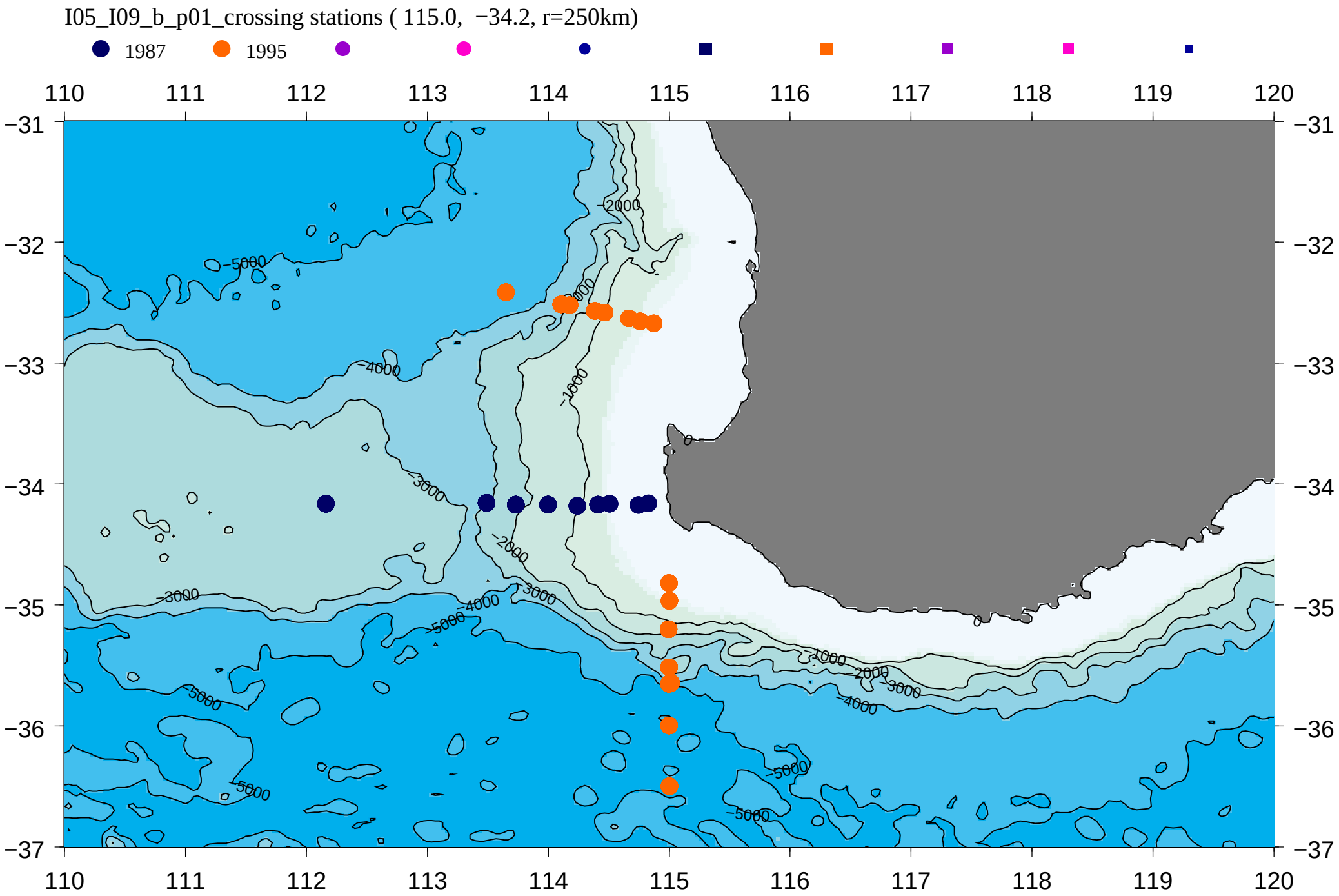

I03_I09_b_p01_crossing stations (95.0, −20.0, r=250km)
1995
2004
2007
90
91
92
93
94
95
96
97
98
99
100
−17
−18
−19
−20
−21
−22
−23
−5000
−6000
−4000

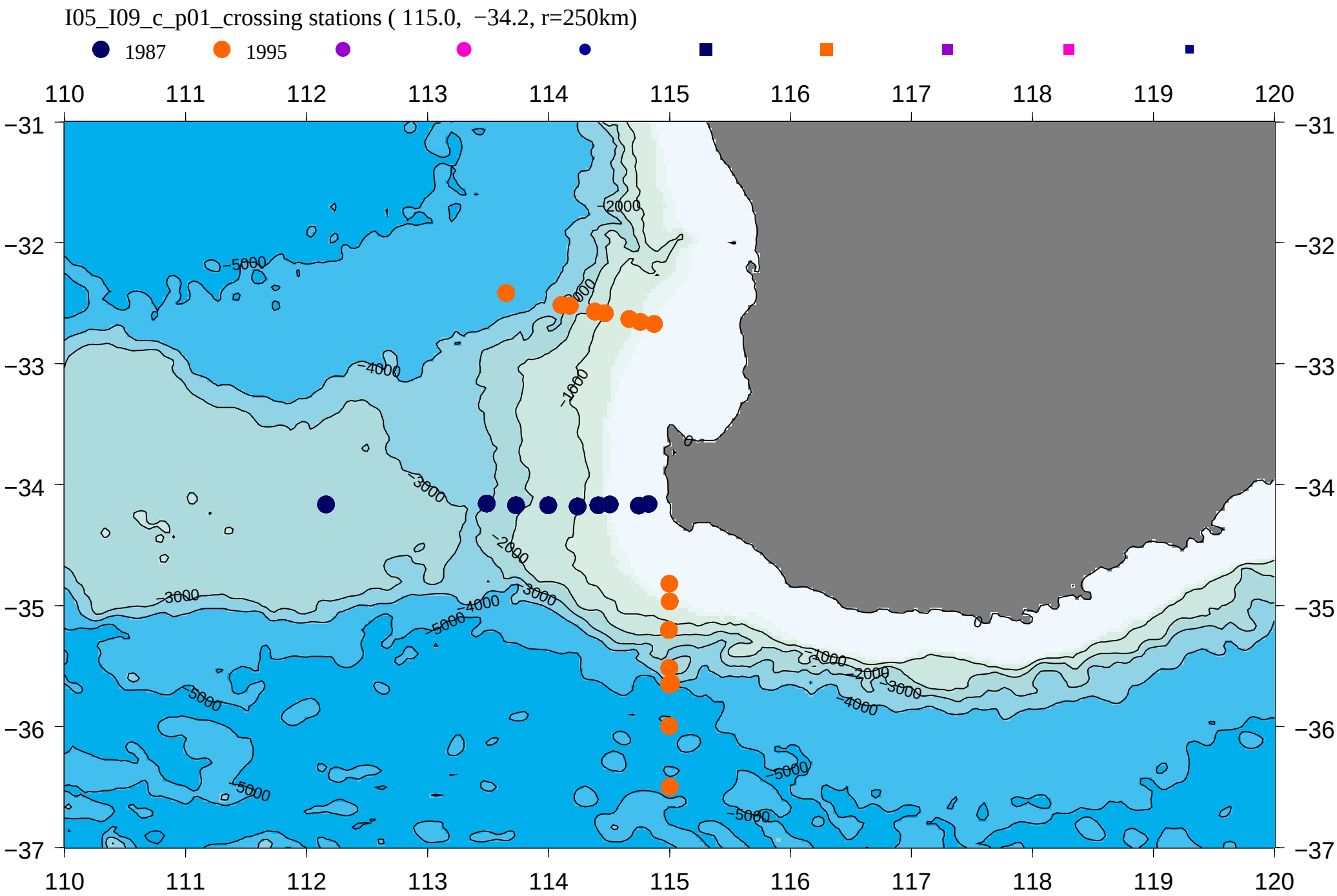

I03_I10_p01_crossing stations (111.1, −21.2, r=250km)
1995
2004
106
107
108
109
110
111
112
113
114
115
116
−18
−19
−20
−21
−22
−23
−24
−5000
−4000
−3000
−2000
−1000
0

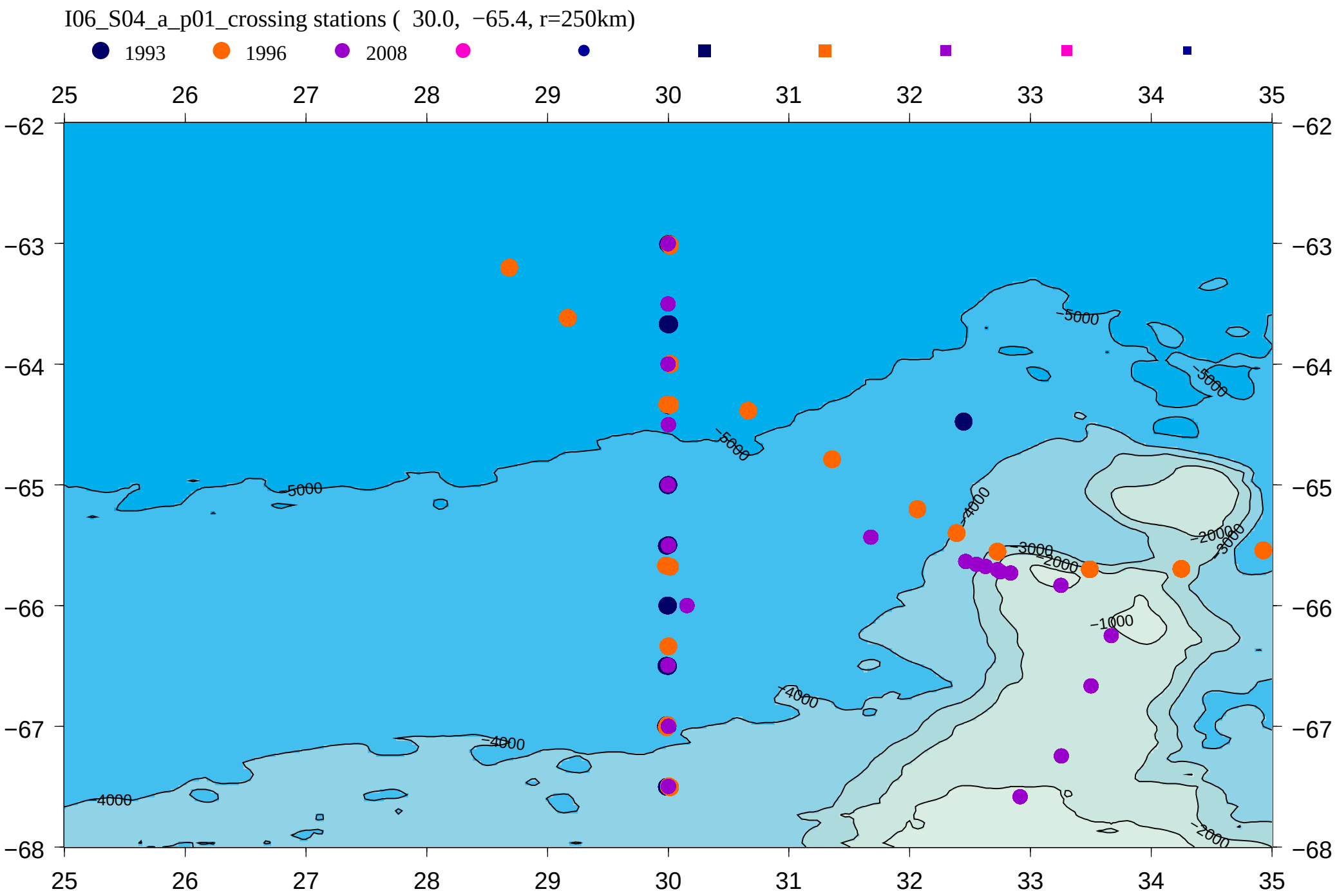

I05_I08_a_p01_crossing stations (95.0, −34.0, r=250km)
1987
1994
1995
2002
2007
90
91
92
93
94
95
96
97
98
99
100
−31
−32
−33
−34
−35
−36
−37
−1000
−2000
−3000
−4000
−5000

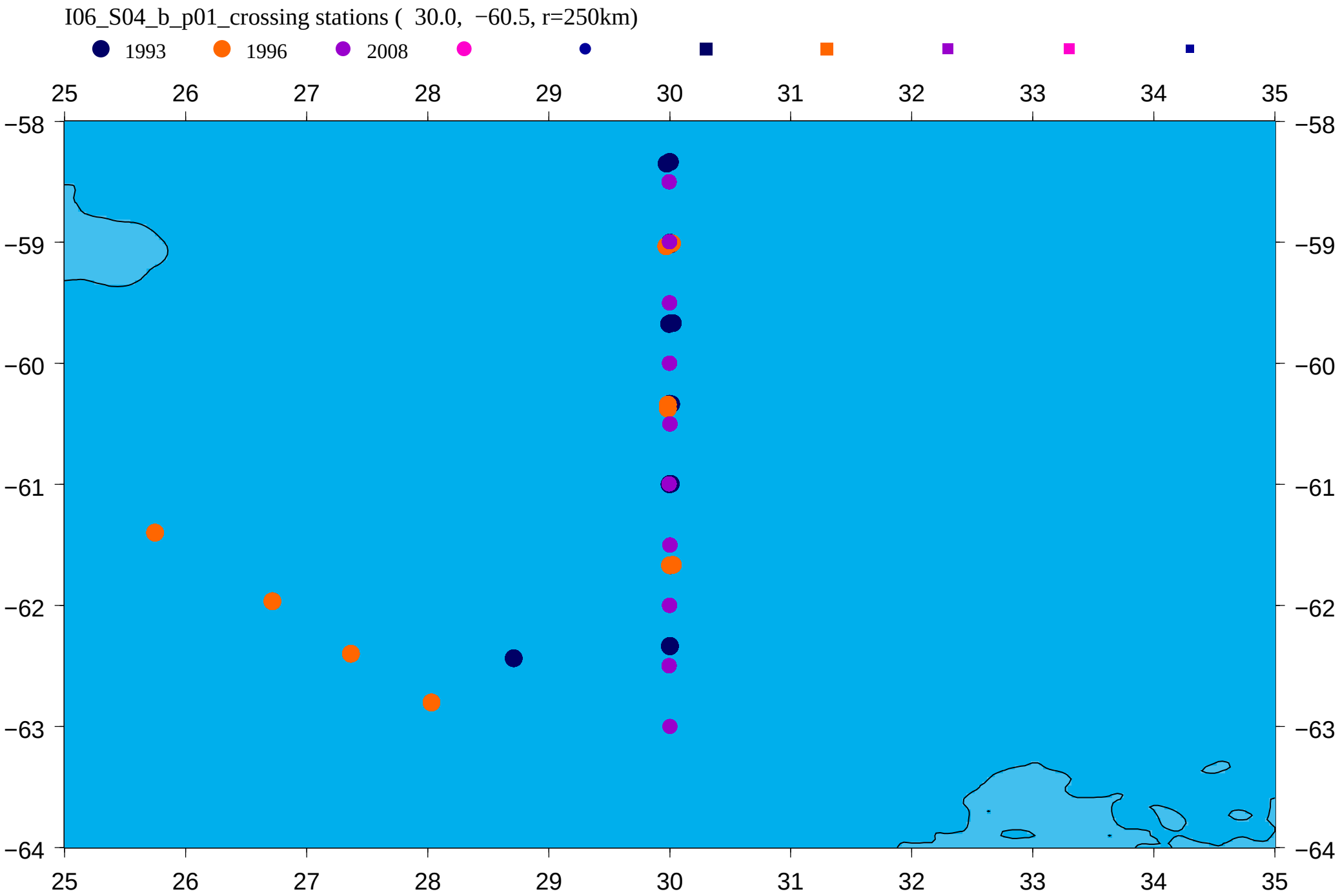

I05_I08_b_p01_crossing stations (95.0, −34.0, r=250km)
1987
1994
1995
2002
2007
90
91
92
93
94
95
96
97
98
99
100
−31
−32
−33
−34
−35
−36
−37
−1000
−2000
−3000
−4000
−5000

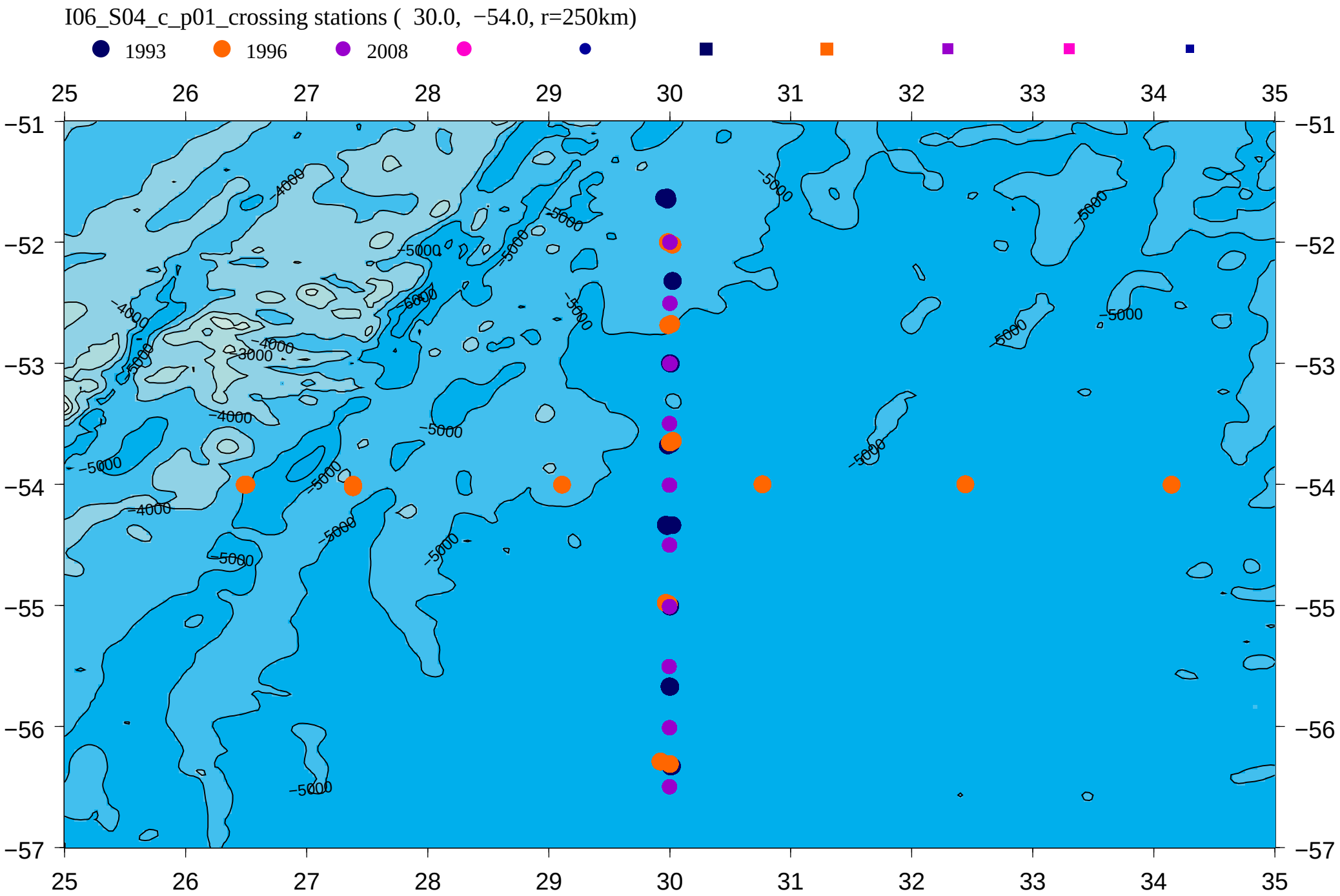

I05_I09_a_p01_crossing stations (115.0, −35.5, r=250km)
1987
1995
110
111
112
113
114
115
116
117
118
119
120
−33
−34
−35
−36
−37
−38
−39
−1000
0
−2000
−3000
−4000
−5000

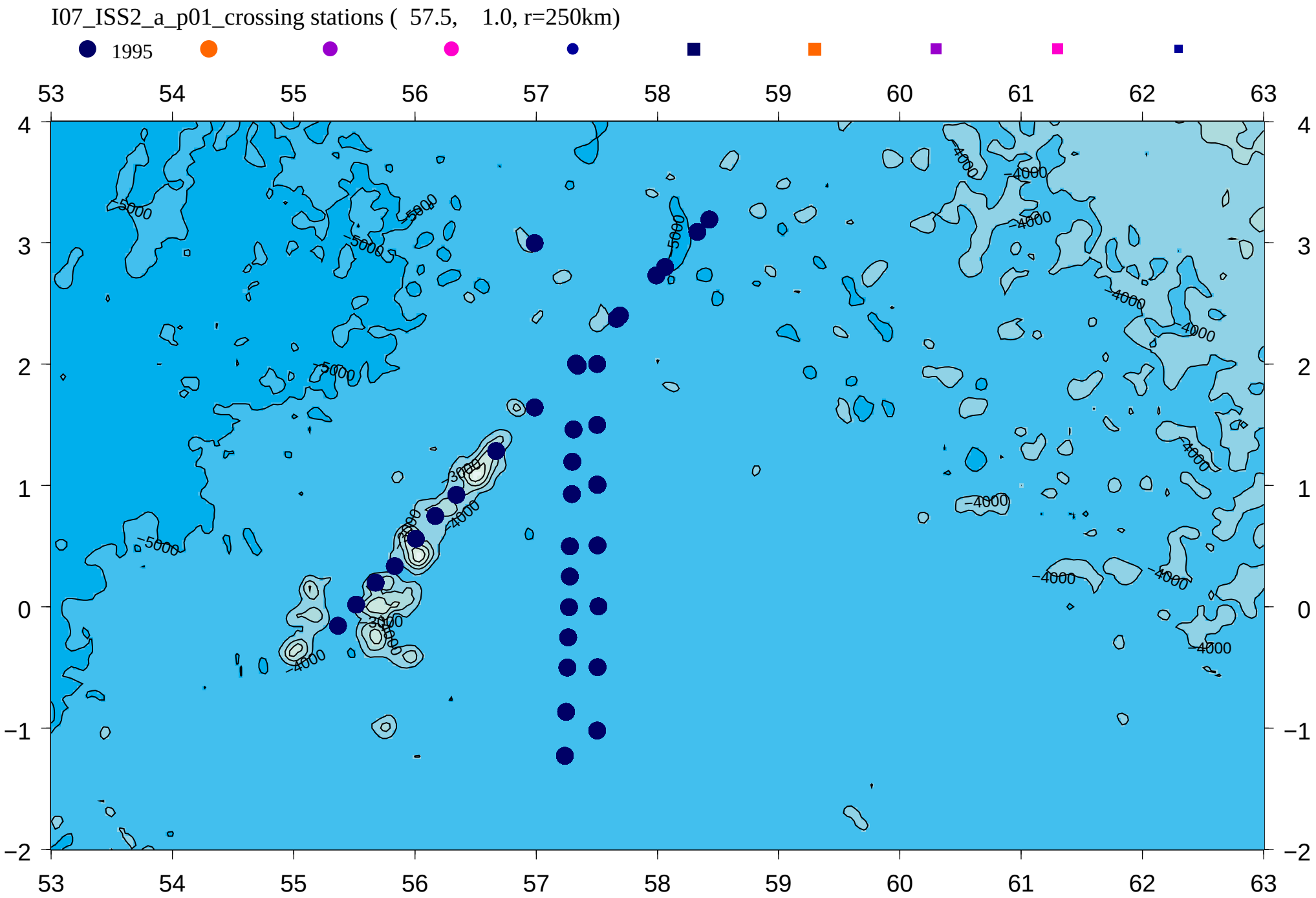

I05_I09_b_p01_crossing stations (115.0, −34.2, r=250km)
1987
1995
110
111
112
113
114
115
116
117
118
119
120
−31
−32
−33
−34
−35
−36
−37
−5000
−4000
−3000
−2000
−1000
0

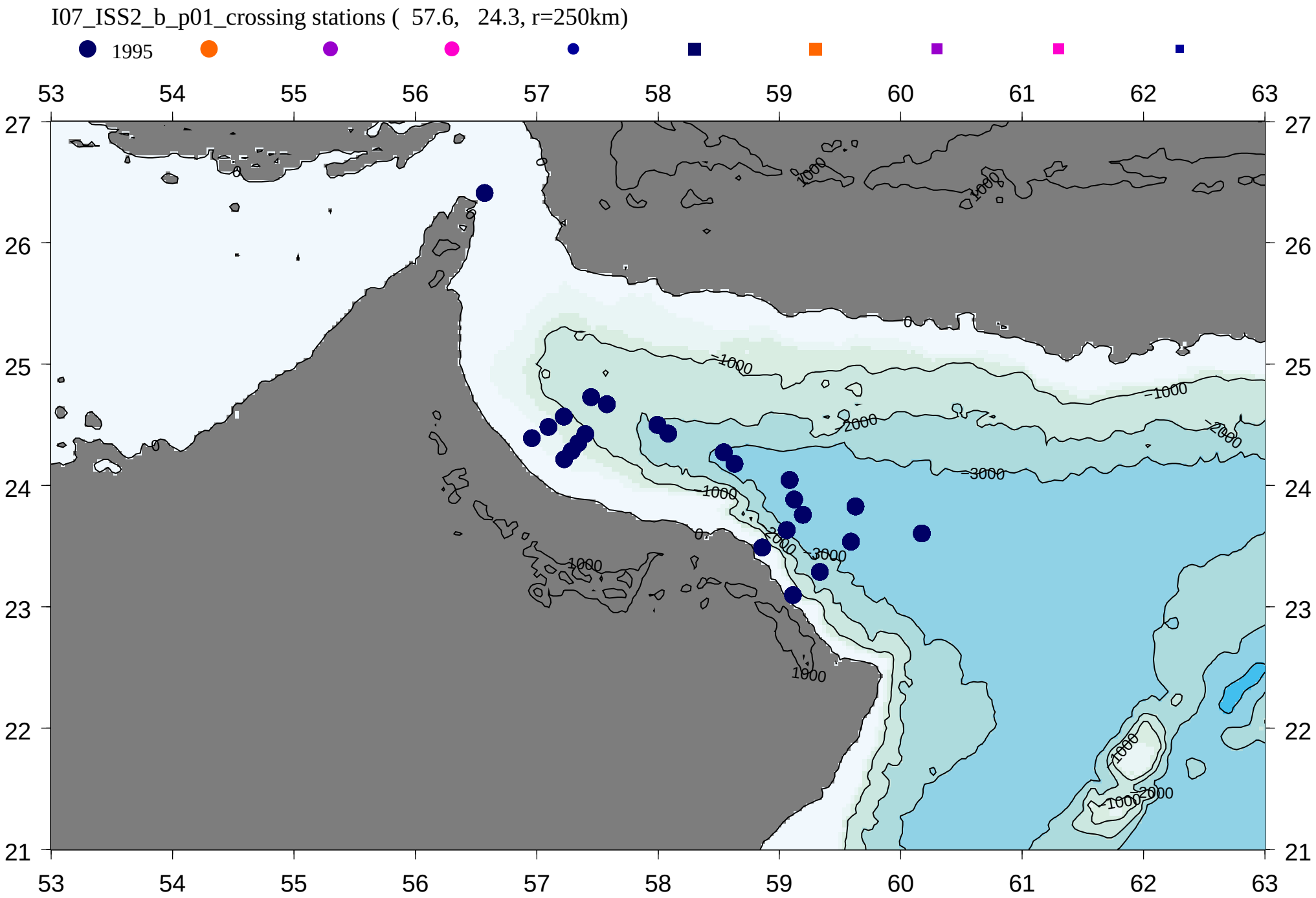

I05_I09_c_p01_crossing stations (115.0, −34.2, r=250km)
1987
1995
110
111
112
113
114
115
116
117
118
119
120
−31
−32
−33
−34
−35
−36
−37
−5000
−4000
−3000
−2000
−1000
0

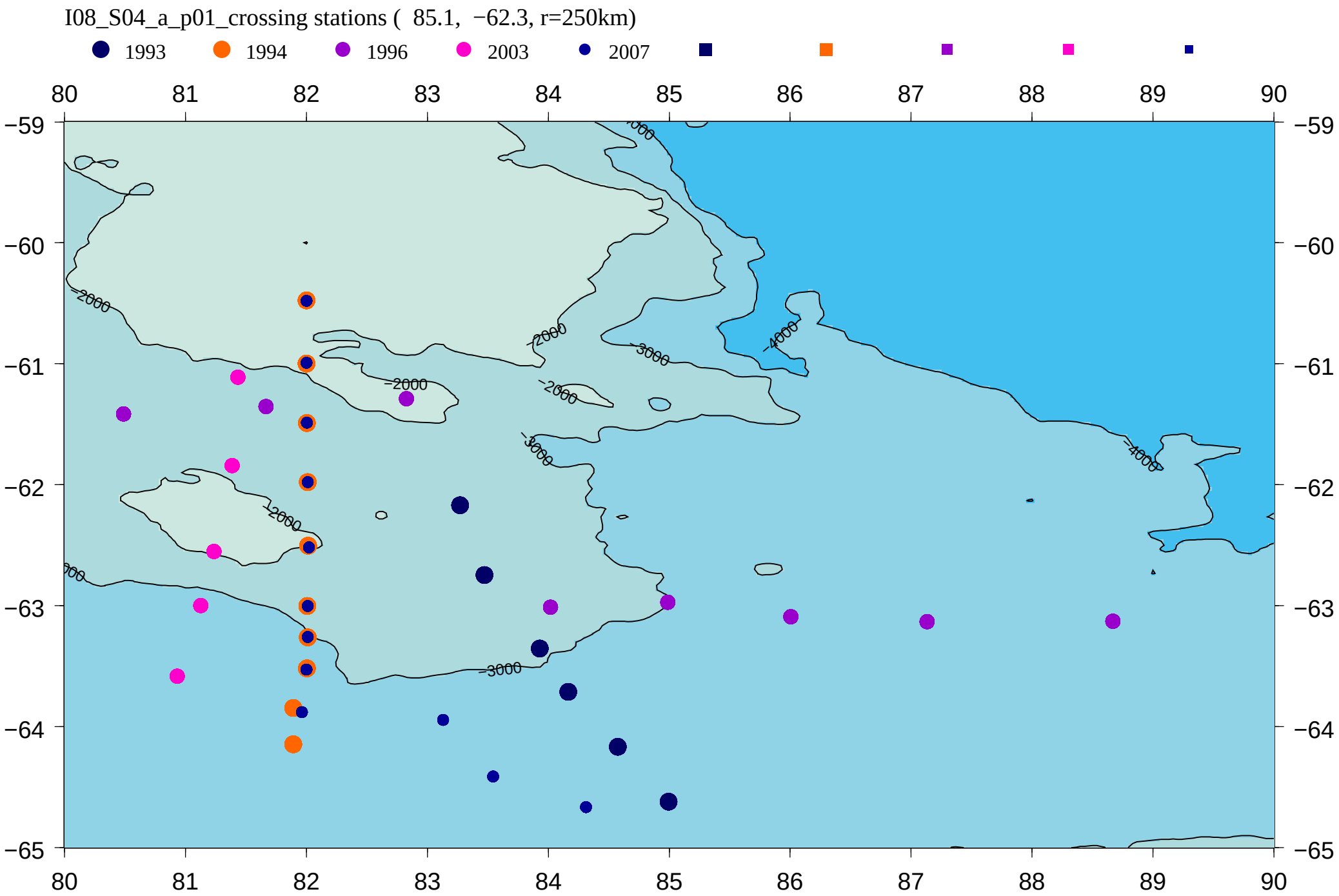

I06_S04_a_p01_crossing stations (30.0, −65.4, r=250km)
1993
1996
2008
25
26
27
28
29
30
31
32
33
34
35
−62
−63
−64
−65
−66
−67
−68
5000
4000
3000
2000
1000

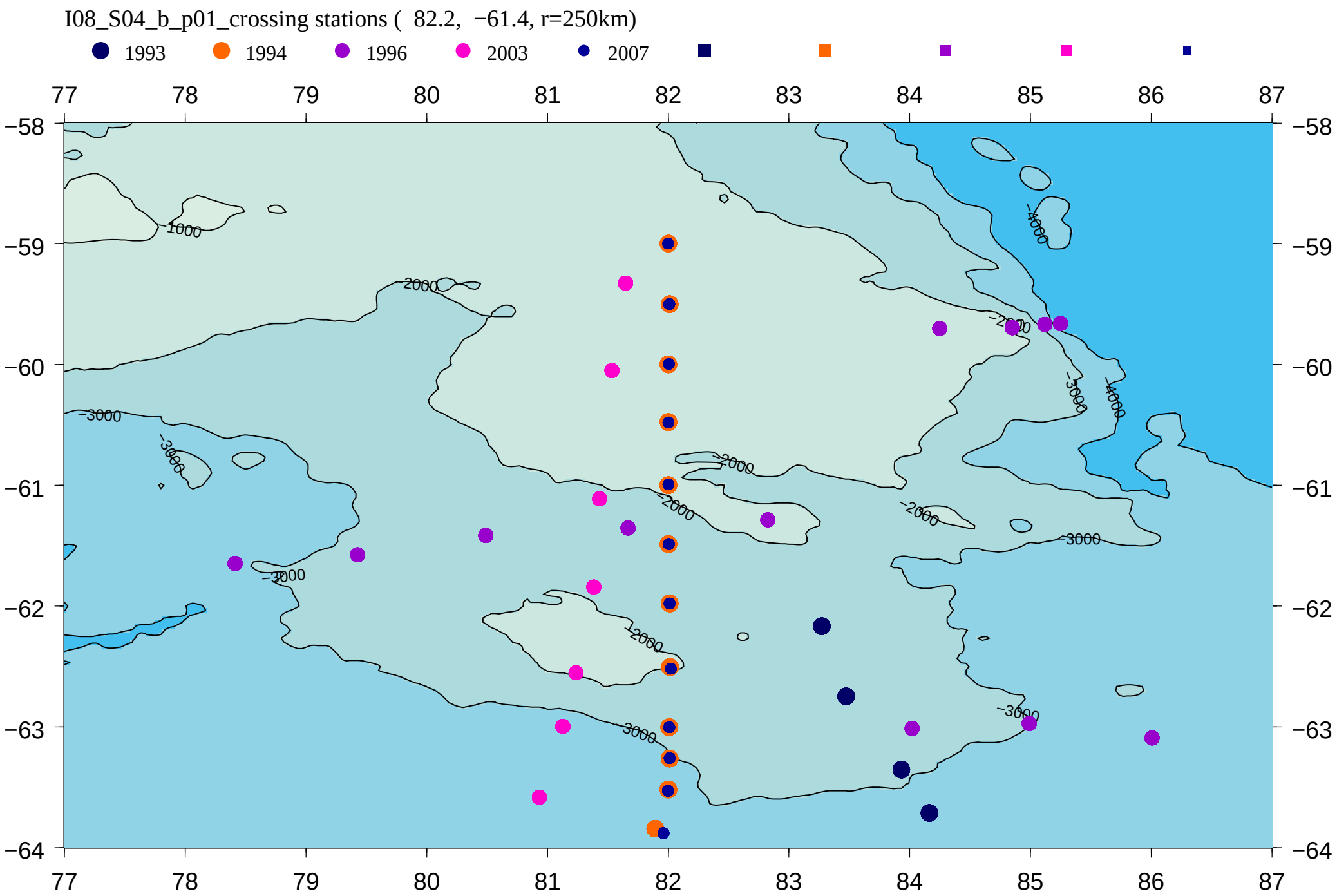

I06_S04_b_p01_crossing stations (30.0, −60.5, r=250km)
1993
1996
2008
25
26
27
28
29
30
31
32
33
34
35
−58
−59
−60
−61
−62
−63
−64

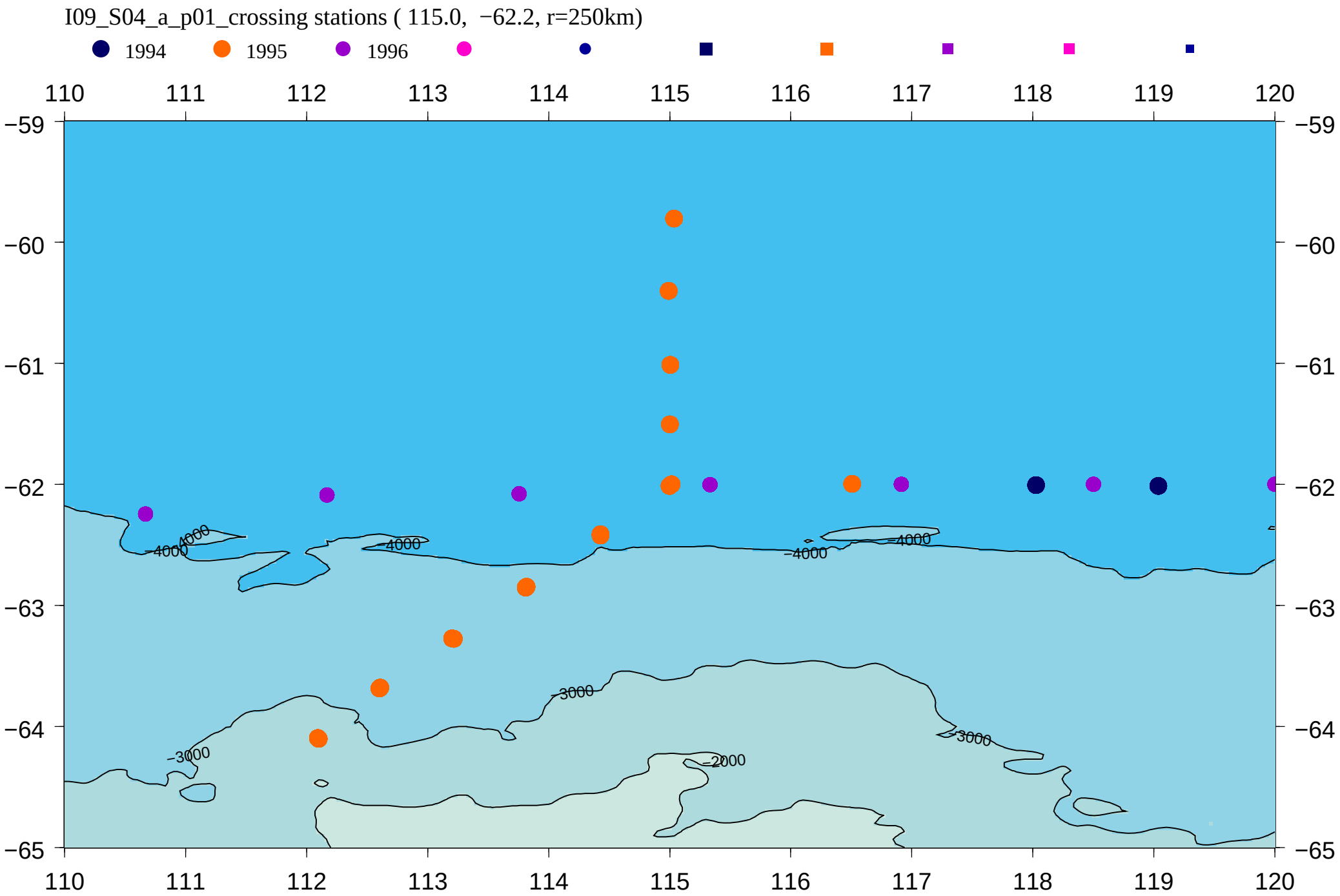

I06_S04_c_p01_crossing stations (30.0, −54.0, r=250km)
1993
1996
2008
25
26
27
28
29
30
31
32
33
34
35
−51
−52
−53
−54
−55
−56
−57
−3000
−4000
−5000
−6000

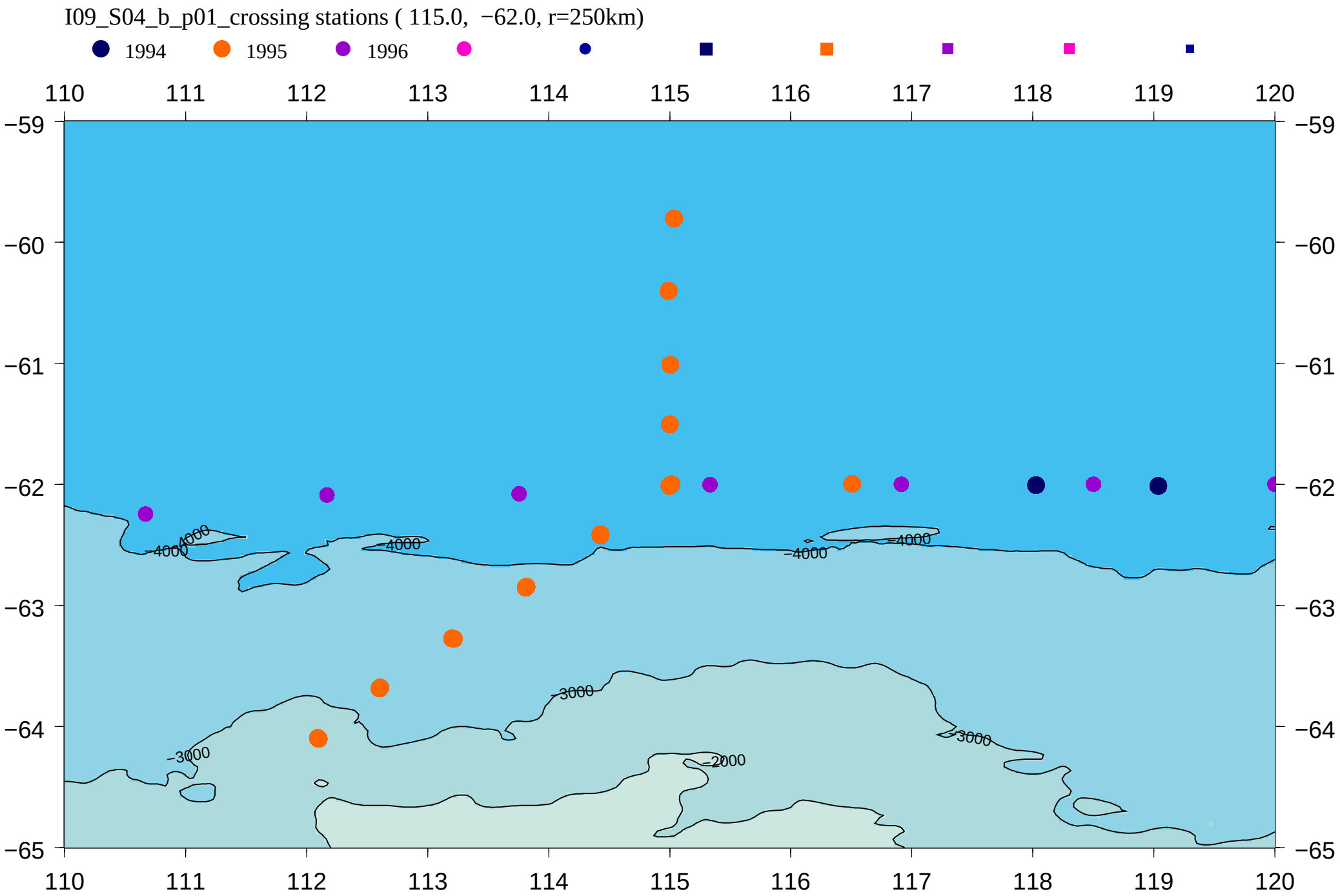

I07_ISS2_a_p01_crossing stations (57.5, 1.0, r=250km)
1995
53
54
55
56
57
58
59
60
61
62
63
4
3
2
1
0
−1
−2
−5000
−4000
−3000

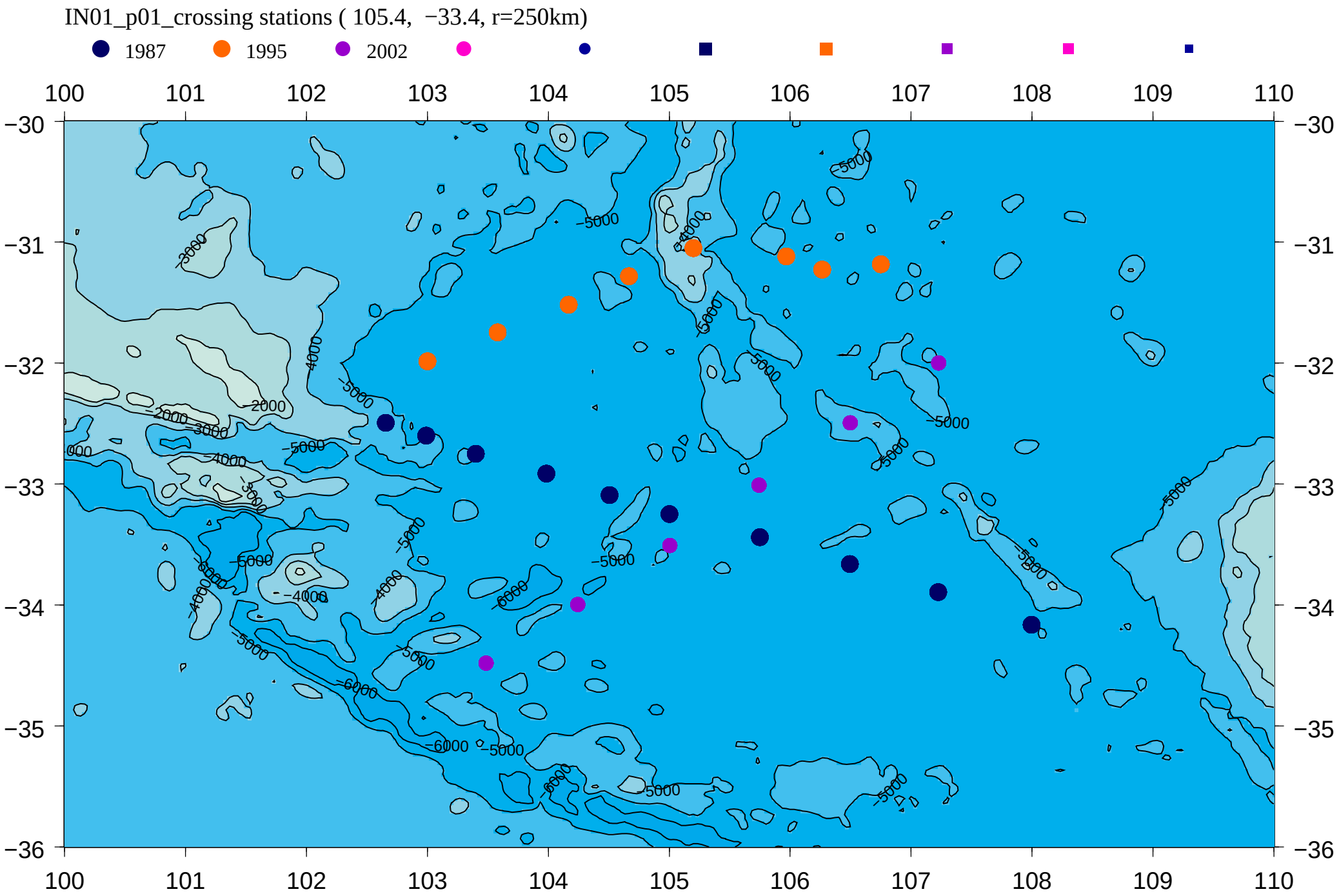

I07_ISS2_b_p01_crossing stations (57.6, 24.3, r=250km)
1995
53
54
55
56
57
58
59
60
61
62
63
27
26
25
24
23
22
21
0
1000
2000
3000

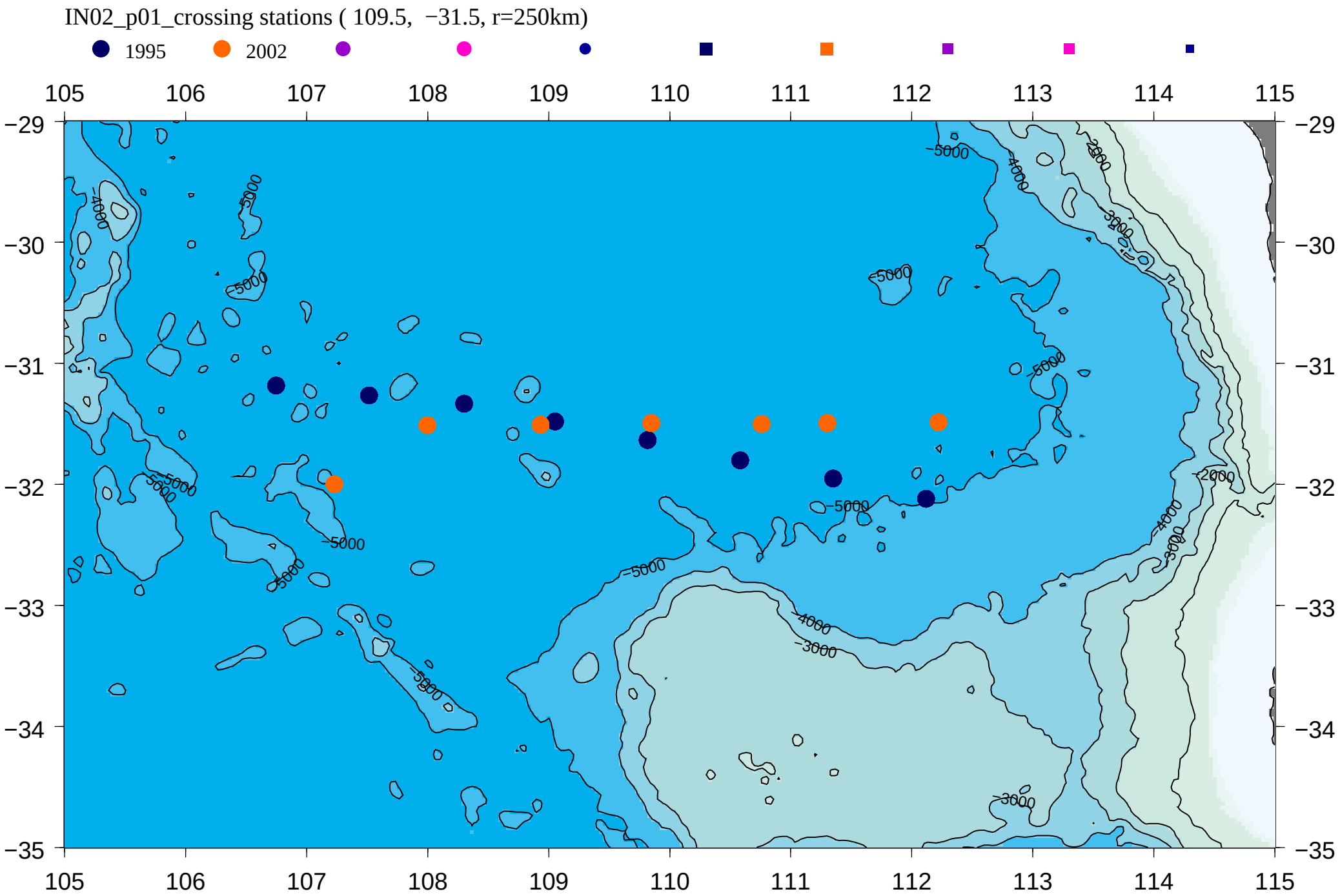

I08_S04_a_p01_crossing stations (85.1, −62.3, r=250km)
1993
1994
1996
2003
2007
80
81
82
83
84
85
86
87
88
89
90
−59
−60
−61
−62
−63
−64
−65
−2000
−3000
−4000

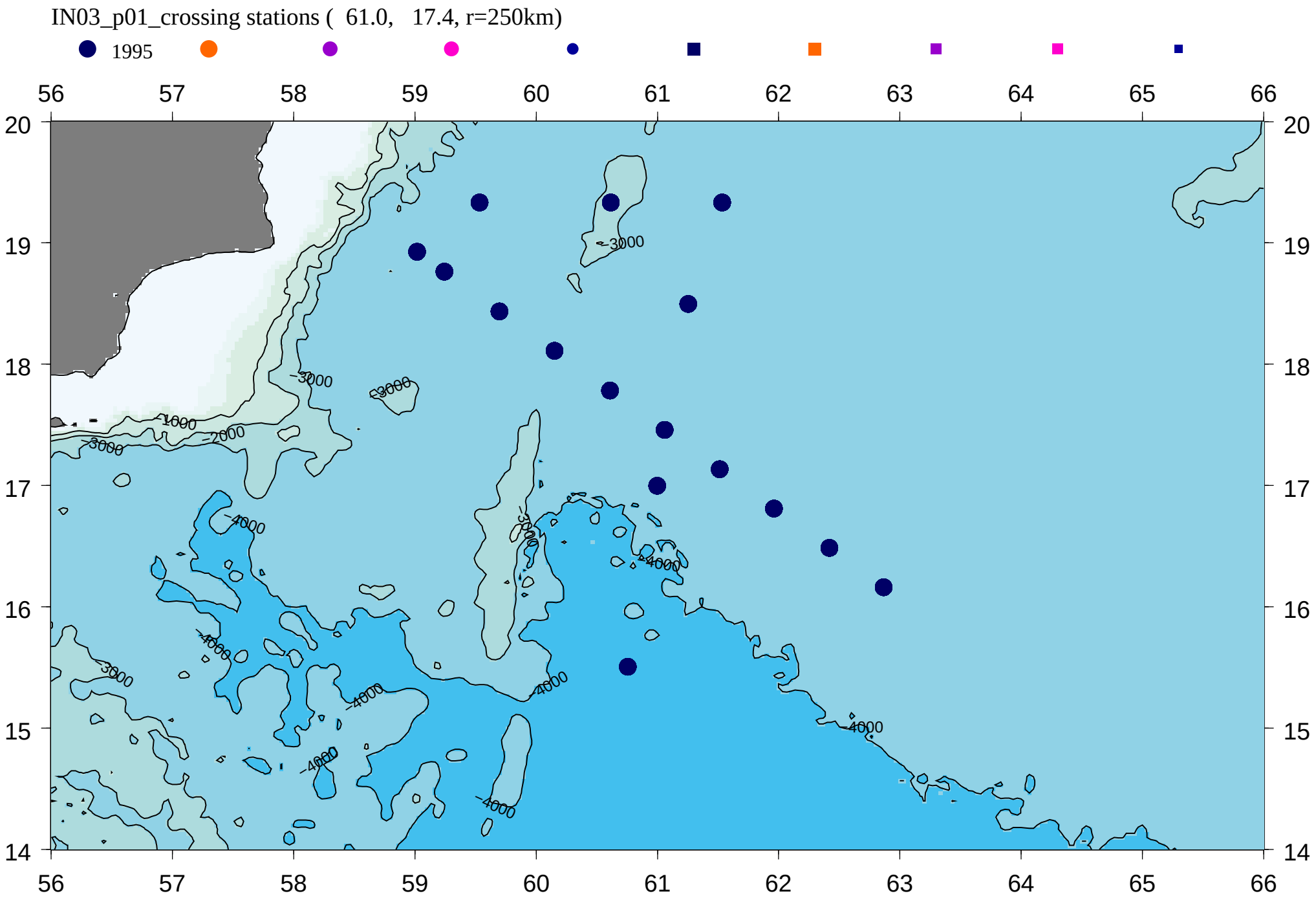

I08_S04_b_p01_crossing stations (82.2, −61.4, r=250km)
1993
1994
1996
2003
2007
77
78
79
80
81
82
83
84
85
86
87
−58
−59
−60
−61
−62
−63
−64
−1000
−2000
−3000
−4000

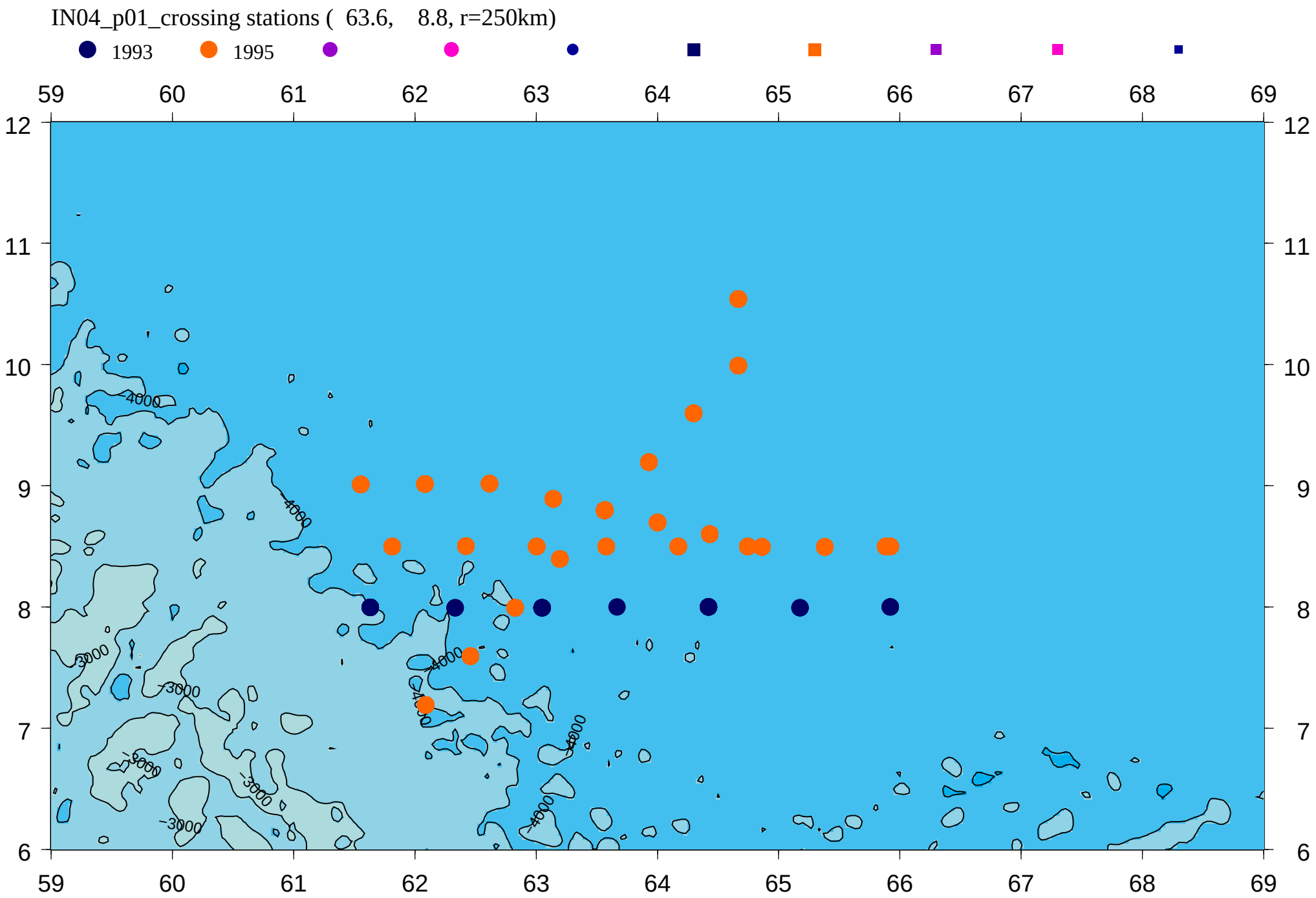

I09_S04_a_p01_crossing stations (115.0, −62.2, r=250km)
1994
1995
1996
110
111
112
113
114
115
116
117
118
119
120
−59
−60
−61
−62
−63
−64
−65
−4000
−3000
−2000
3000

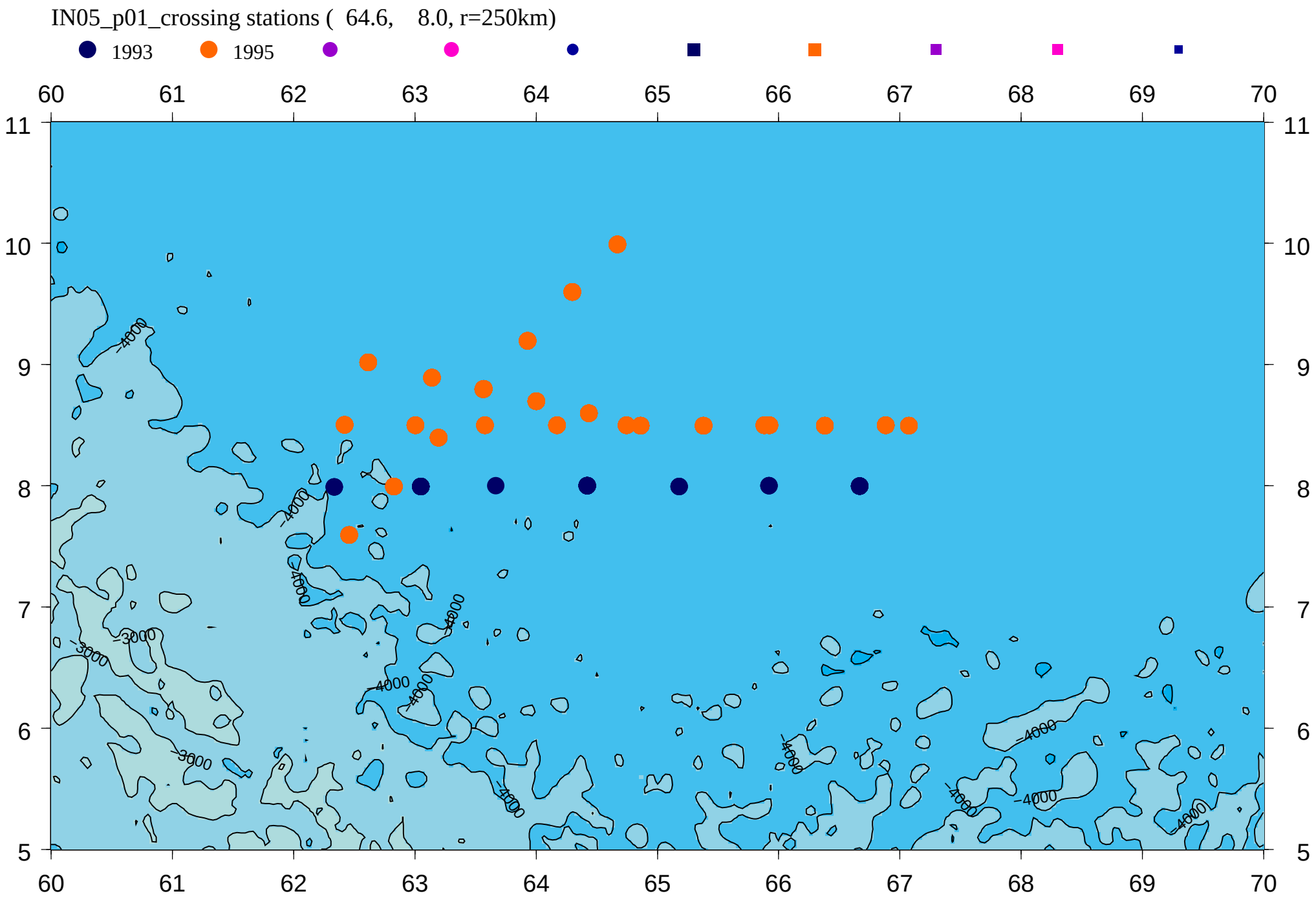

I09_S04_b_p01_crossing stations (115.0, −62.0, r=250km)
1994
1995
1996
110
111
112
113
114
115
116
117
118
119
120
−59
−60
−61
−62
−63
−64
−65
−4000
−3000
−2000
3000

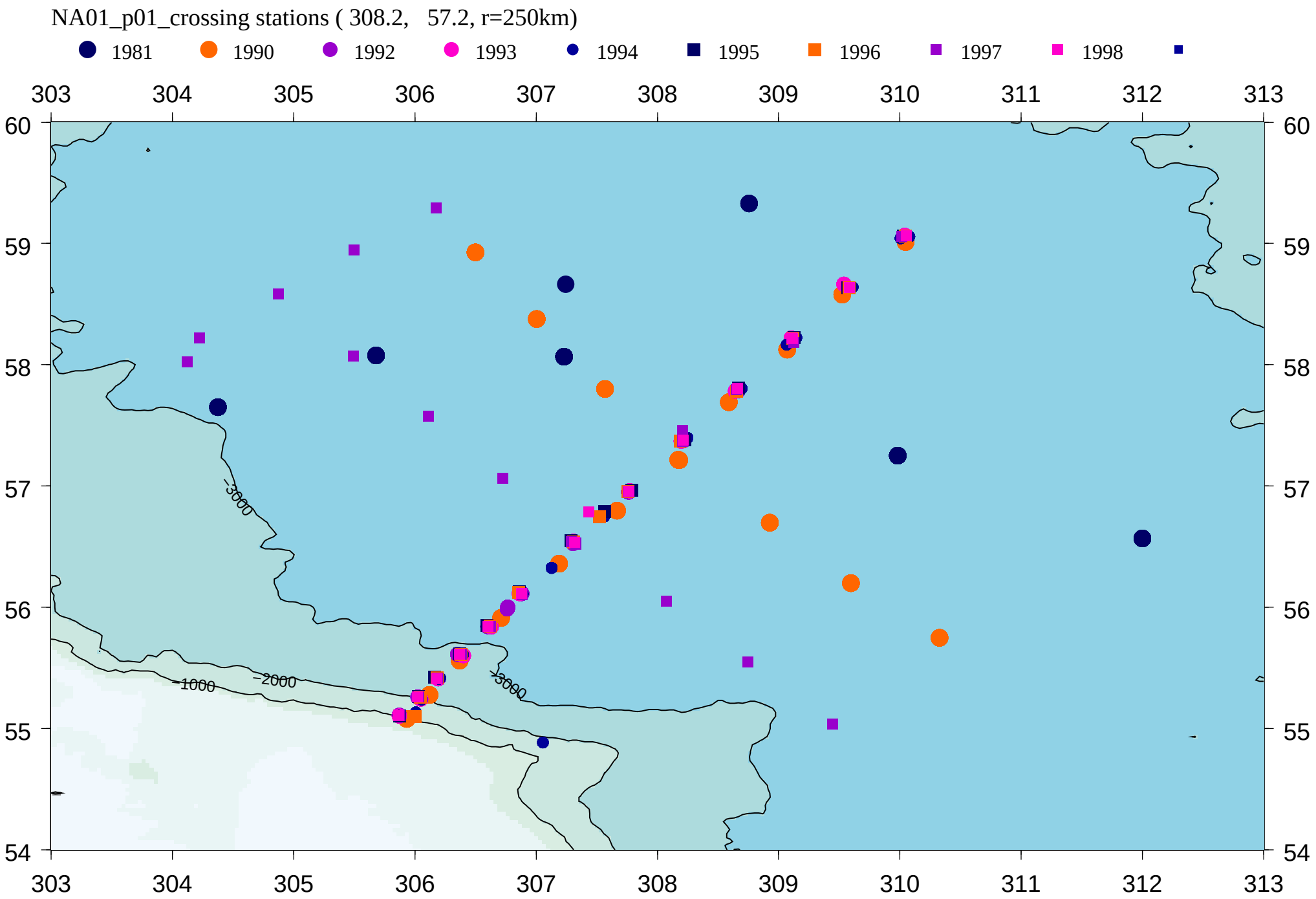

IN01_p01_crossing stations (105.4, −33.4, r=250km)
1987
1995
2002
100
101
102
103
104
105
106
107
108
109
110
−30
−31
−32
−33
−34
−35
−36

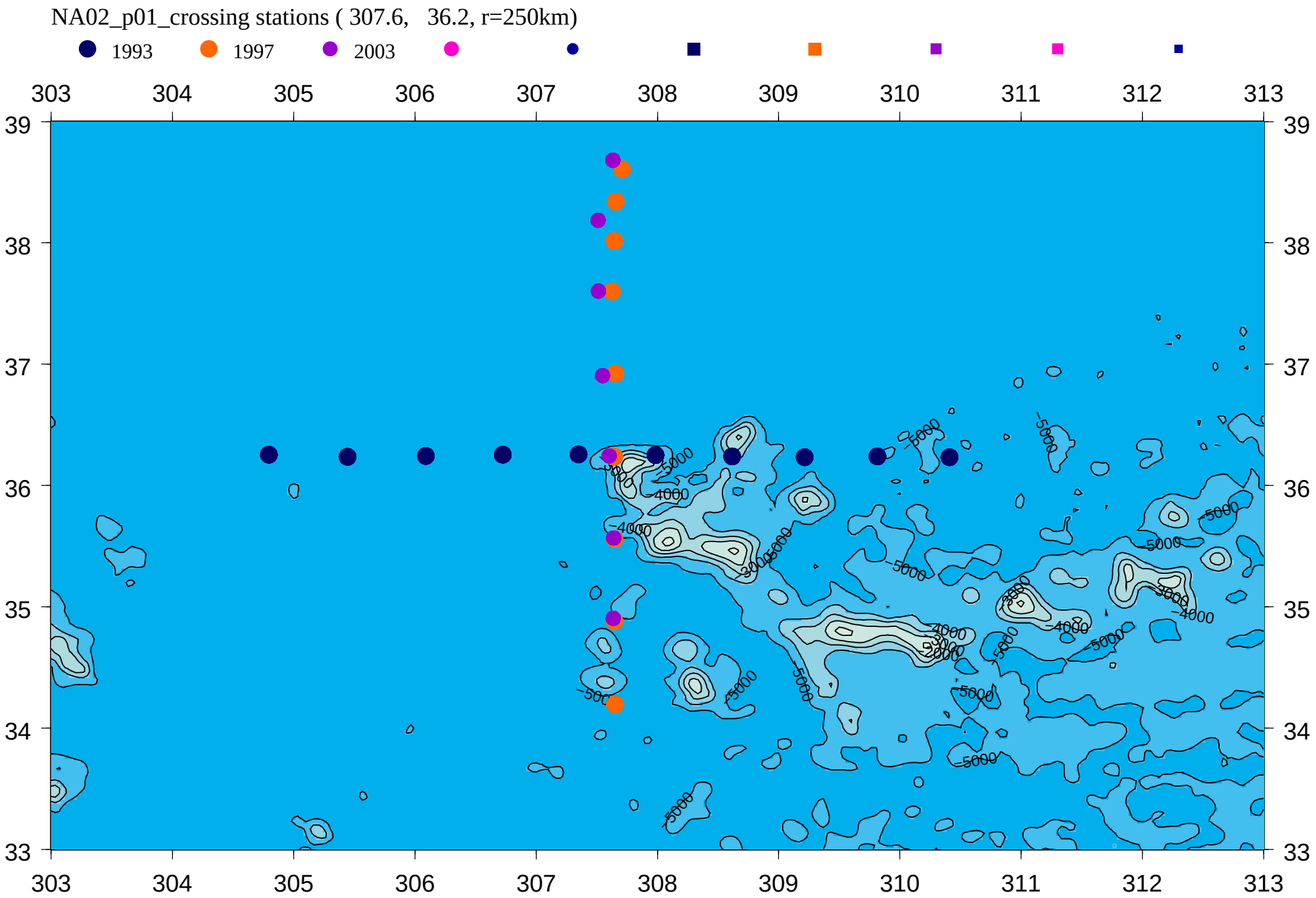

IN02_p01_crossing stations (109.5, −31.5, r=250km)
1995
2002
105
106
107
108
109
110
111
112
113
114
115
−29
−30
−31
−32
−33
−34
−35
−5000
−4000
−3000
−2000

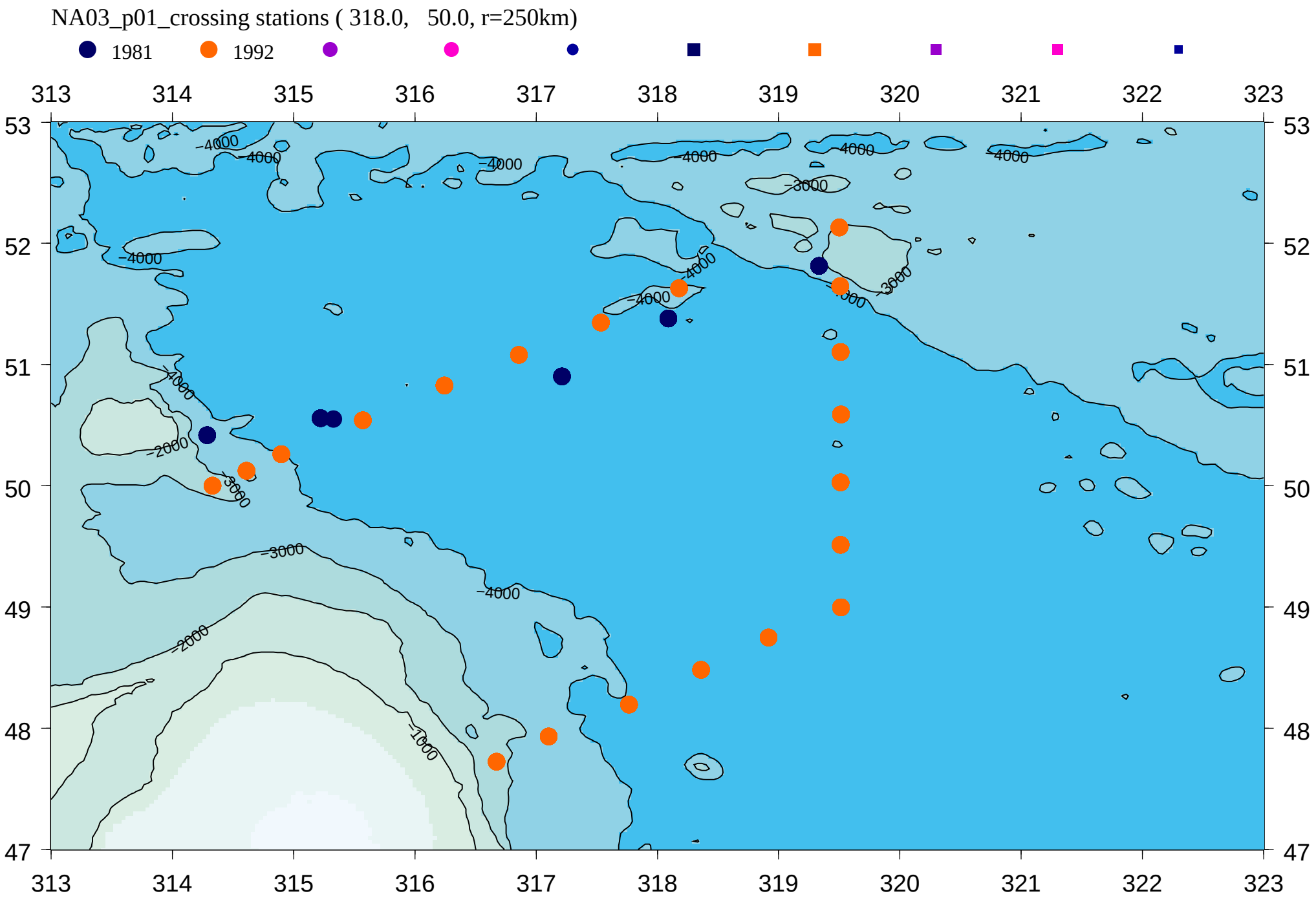

IN03_p01_crossing stations (61.0, 17.4, r=250km)
1995
56
57
58
59
60
61
62
63
64
65
66
20
19
18
17
16
15
14
1000
2000
3000
4000

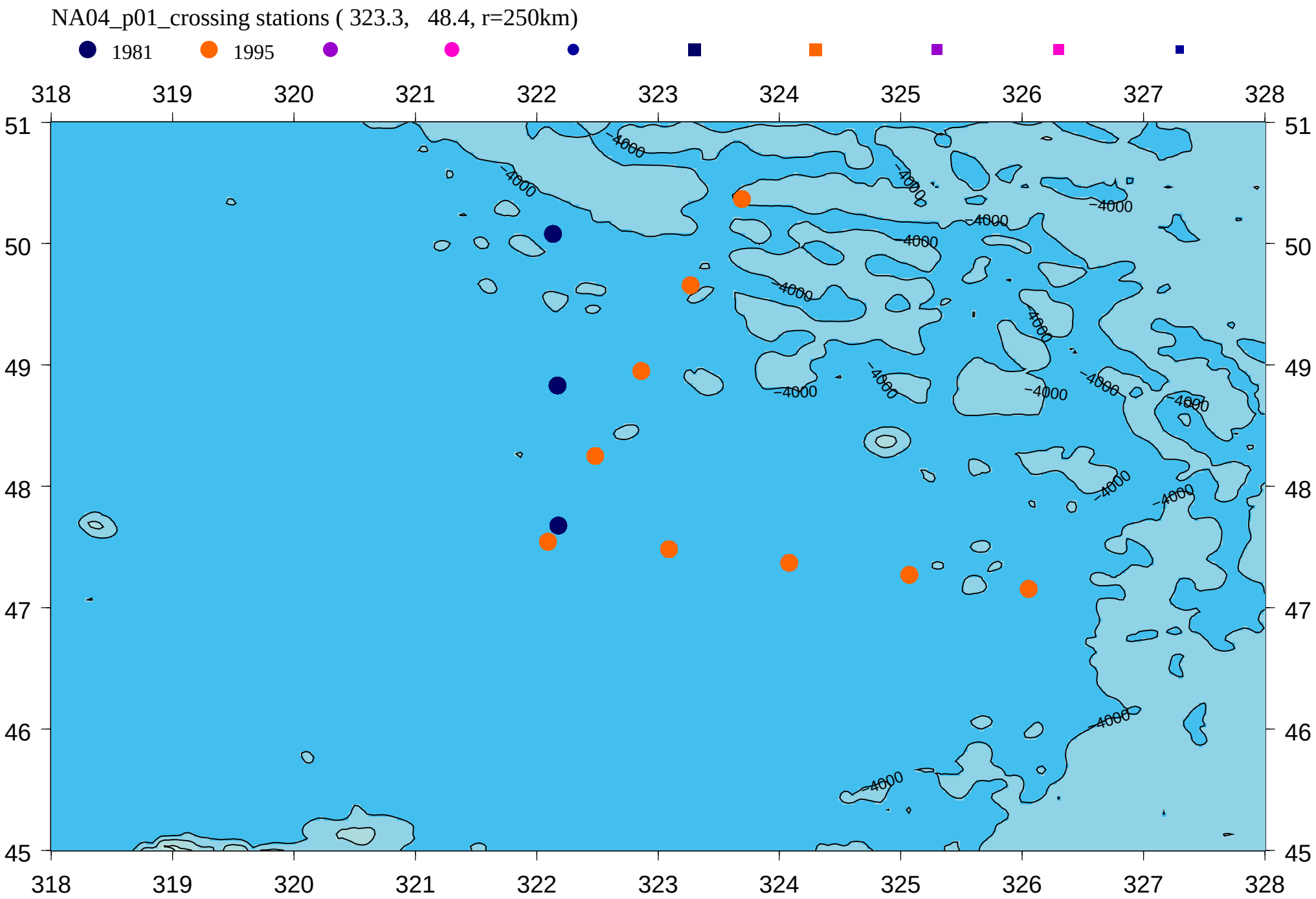

IN04_p01_crossing stations (63.6, 8.8, r=250km)
1993
1995
59
60
61
62
63
64
65
66
67
68
69
12
11
10
9
8
7
6
-4000
-3000

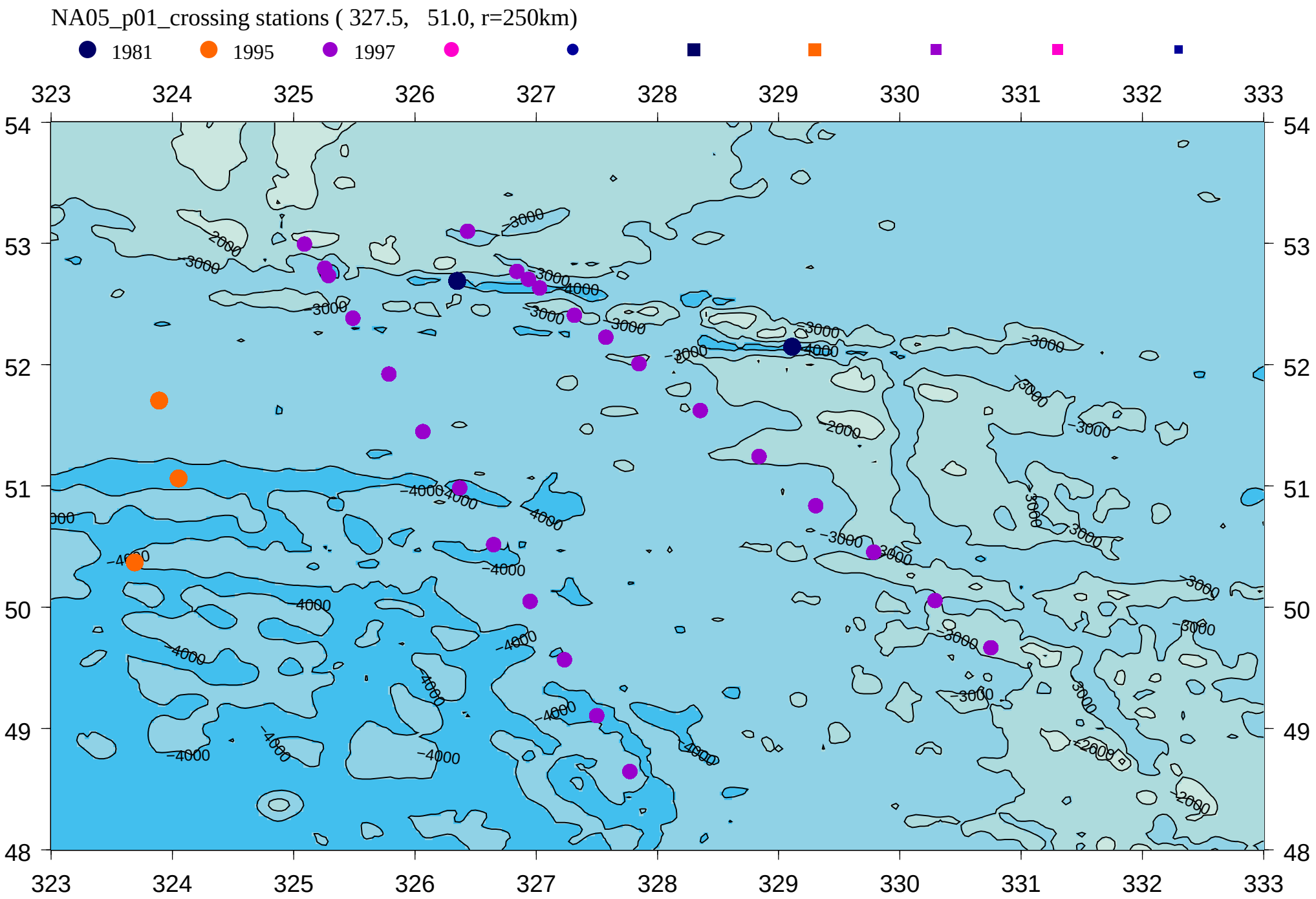

IN05_p01_crossing stations (64.6, 8.0, r=250km)
1993
1995
60
61
62
63
64
65
66
67
68
69
70
11
10
9
8
7
6
5
-4000
-3000

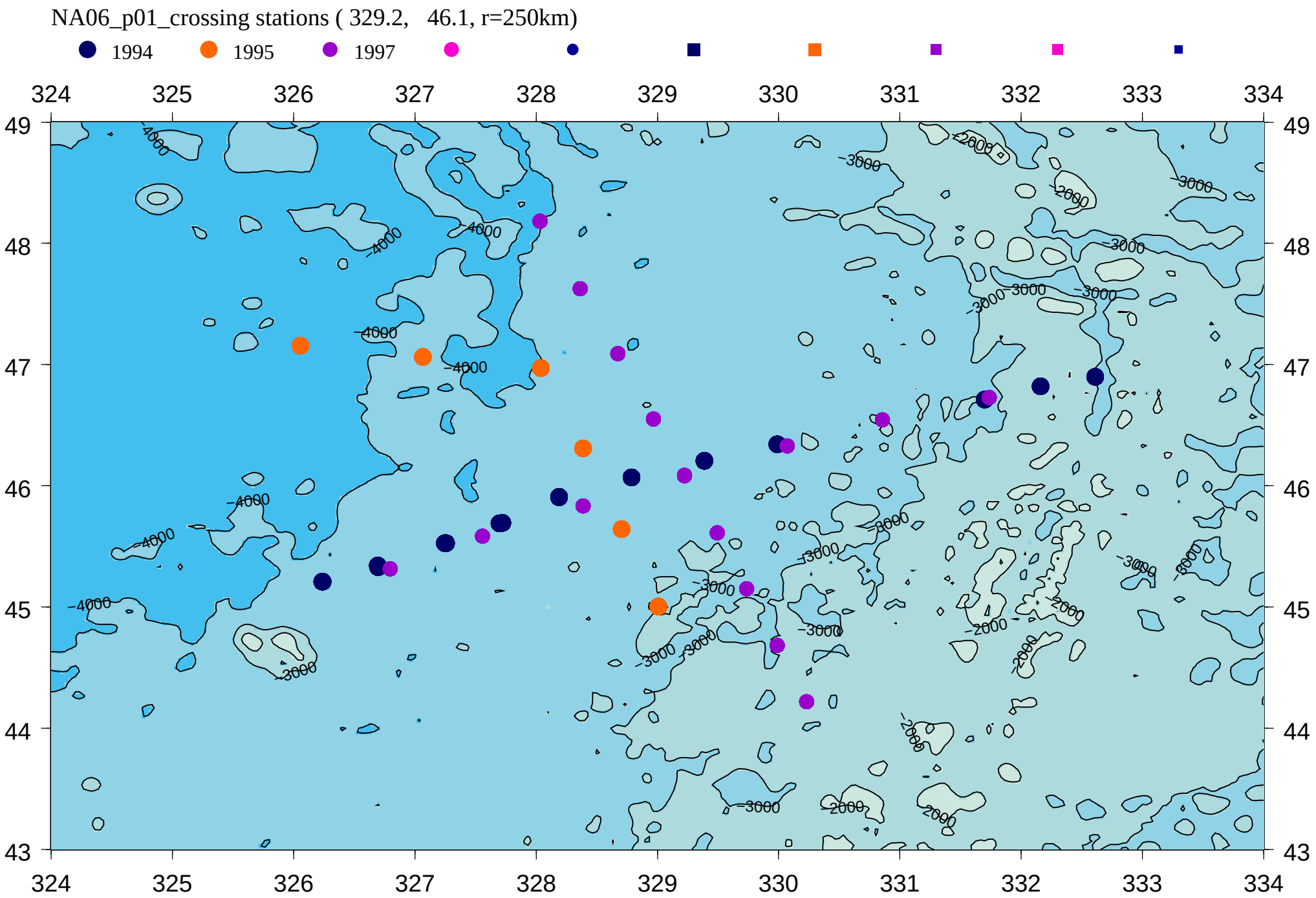

NA01_p01_crossing stations (308.2, 57.2, r=250km)
1981
1990
1992
1993
1994
1995
1996
1997
1998
303
304
305
306
307
308
309
310
311
312
313
60
59
58
57
56
55
54
-3000
-1000
-2000
-3000

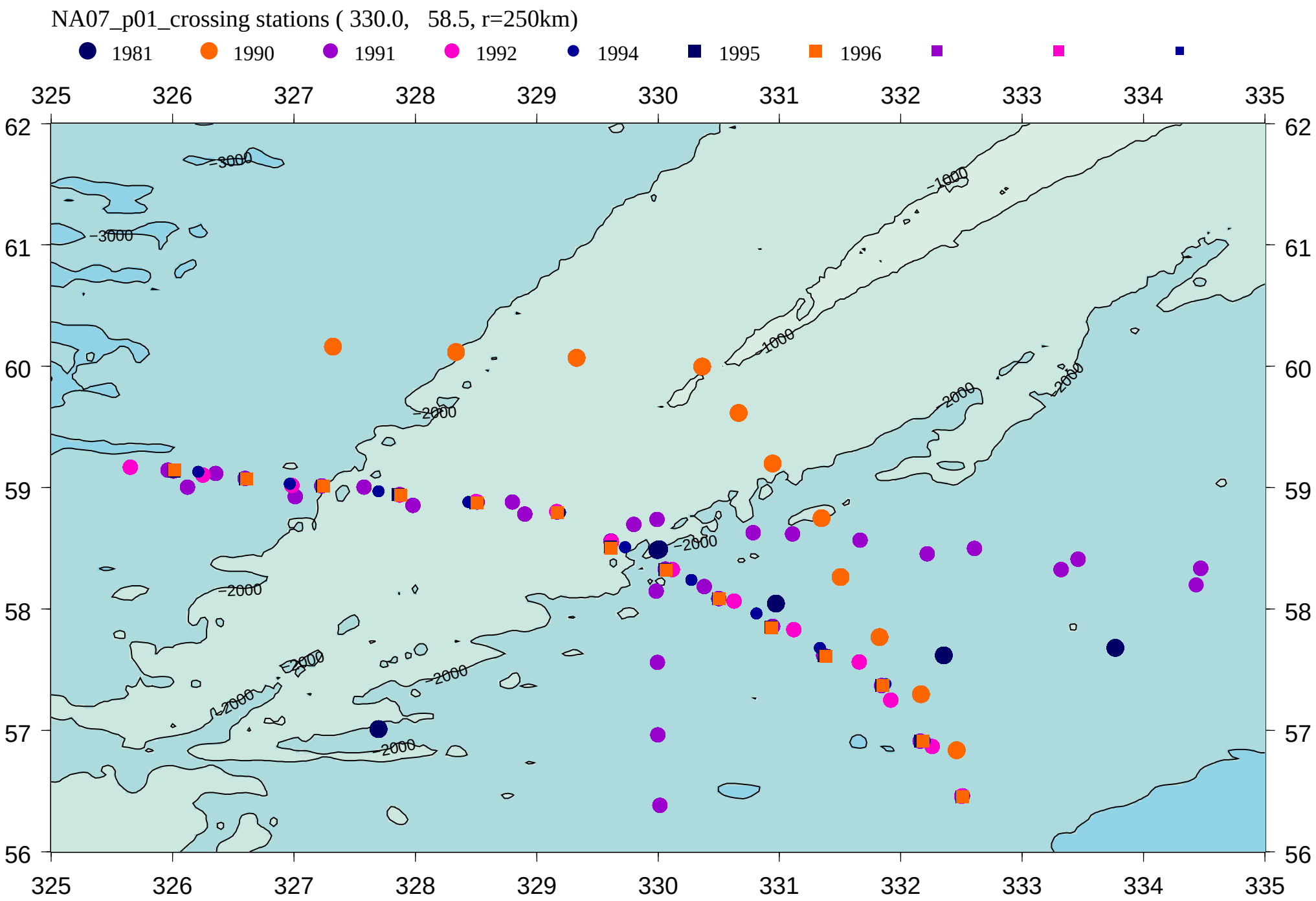

NA02_p01_crossing stations (307.6, 36.2, r=250km)
1993
1997
2003
303
304
305
306
307
308
309
310
311
312
313
39
38
37
36
35
34
33
-5000
-4000
-3000
-2000

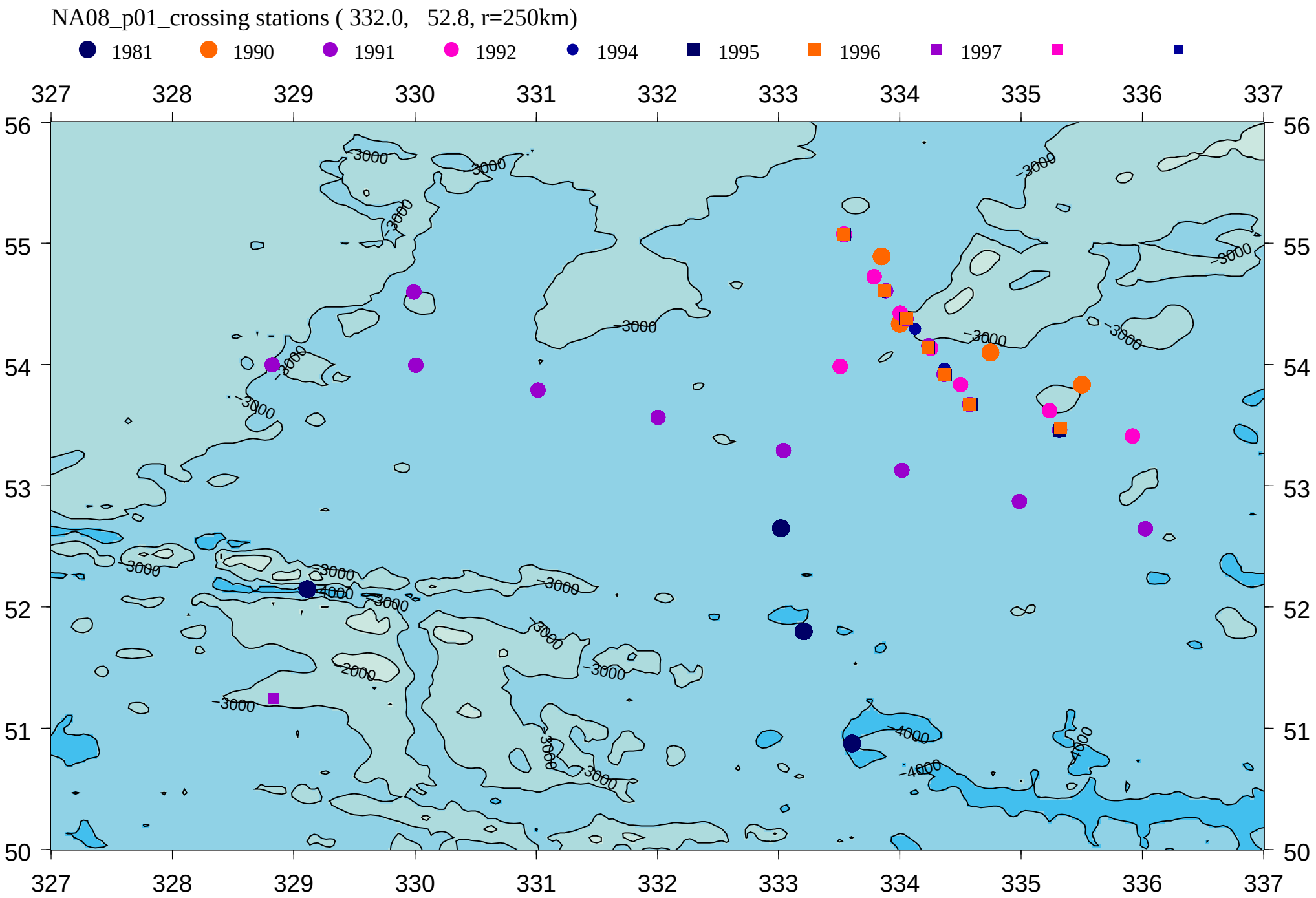

NA03_p01_crossing stations (318.0, 50.0, r=250km)
1981
1992
313
314
315
316
317
318
319
320
321
322
323
53
52
51
50
49
48
47
−4000
−3000
−2000
−1000

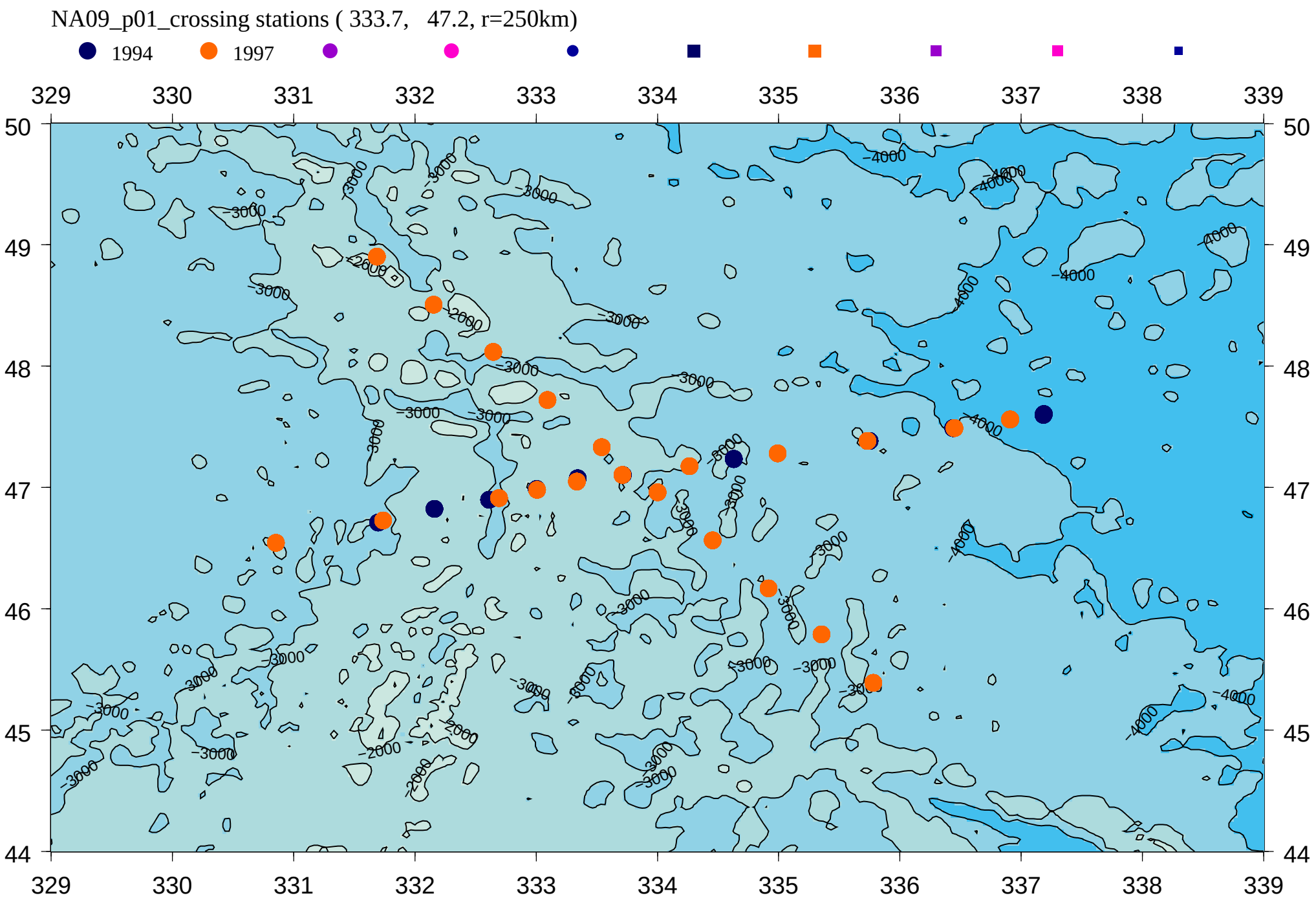

NA04_p01_crossing stations (323.3, 48.4, r=250km)
1981
1995
318
319
320
321
322
323
324
325
326
327
328
51
50
49
48
47
46
45
-4000

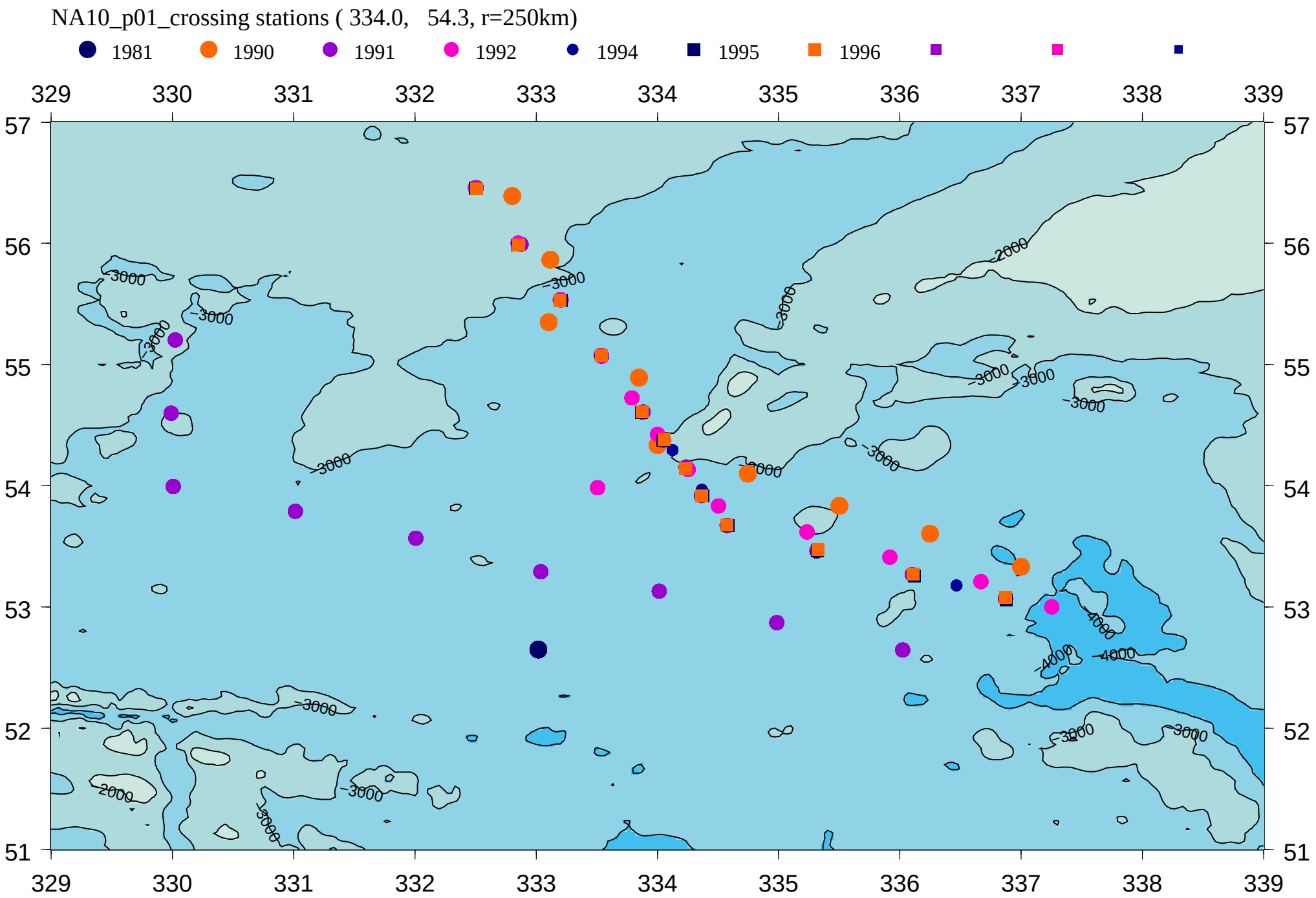

NA05_p01_crossing stations (327.5, 51.0, r=250km)
1981
1995
1997
323
324
325
326
327
328
329
330
331
332
333
54
53
52
51
50
49
48
-2000
-3000
-4000

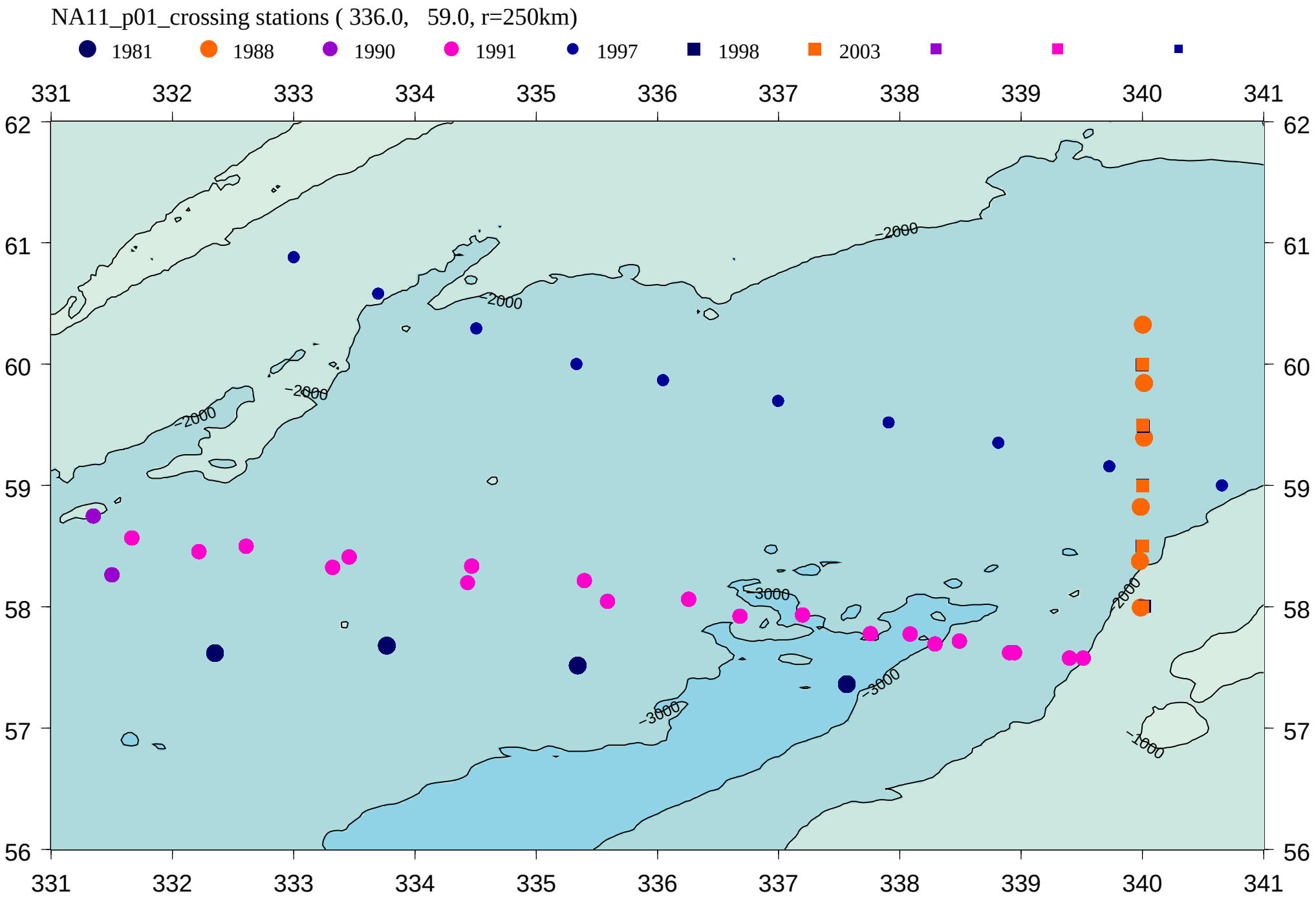

NA06_p01_crossing stations (329.2, 46.1, r=250km)
1994
1995
1997
324
325
326
327
328
329
330
331
332
333
334
49
48
47
46
45
44
43
-4000
-3000
-2000
3000

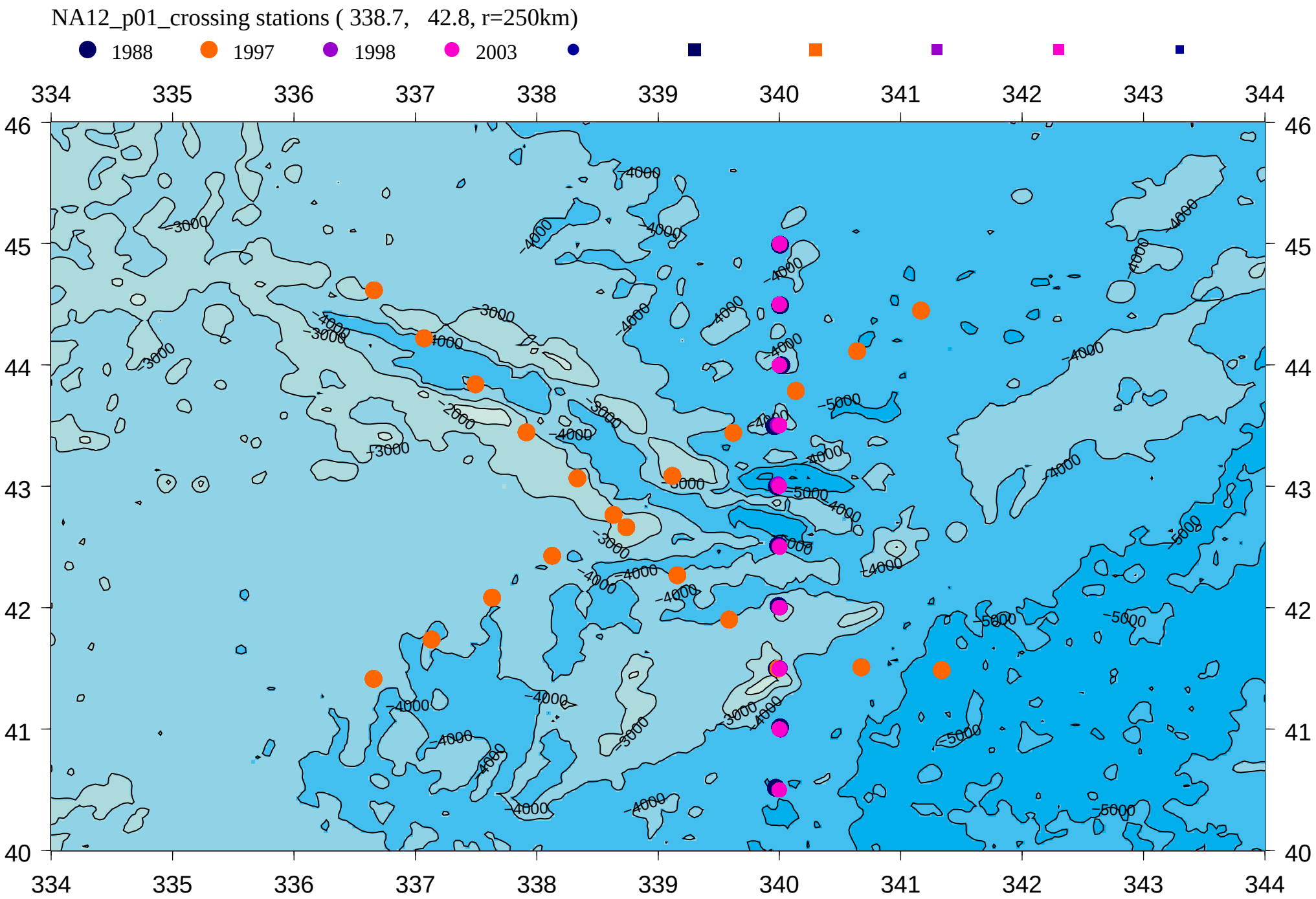

NA07_p01_crossing stations (330.0, 58.5, r=250km)
1981
1990
1991
1992
1994
1995
1996
325
326
327
328
329
330
331
332
333
334
335
62
61
60
59
58
57
56
-3000
-3000
-2000
-1000
-1000
2000
-2000
-2000
-2000
-2000
-2000
-2000
2000

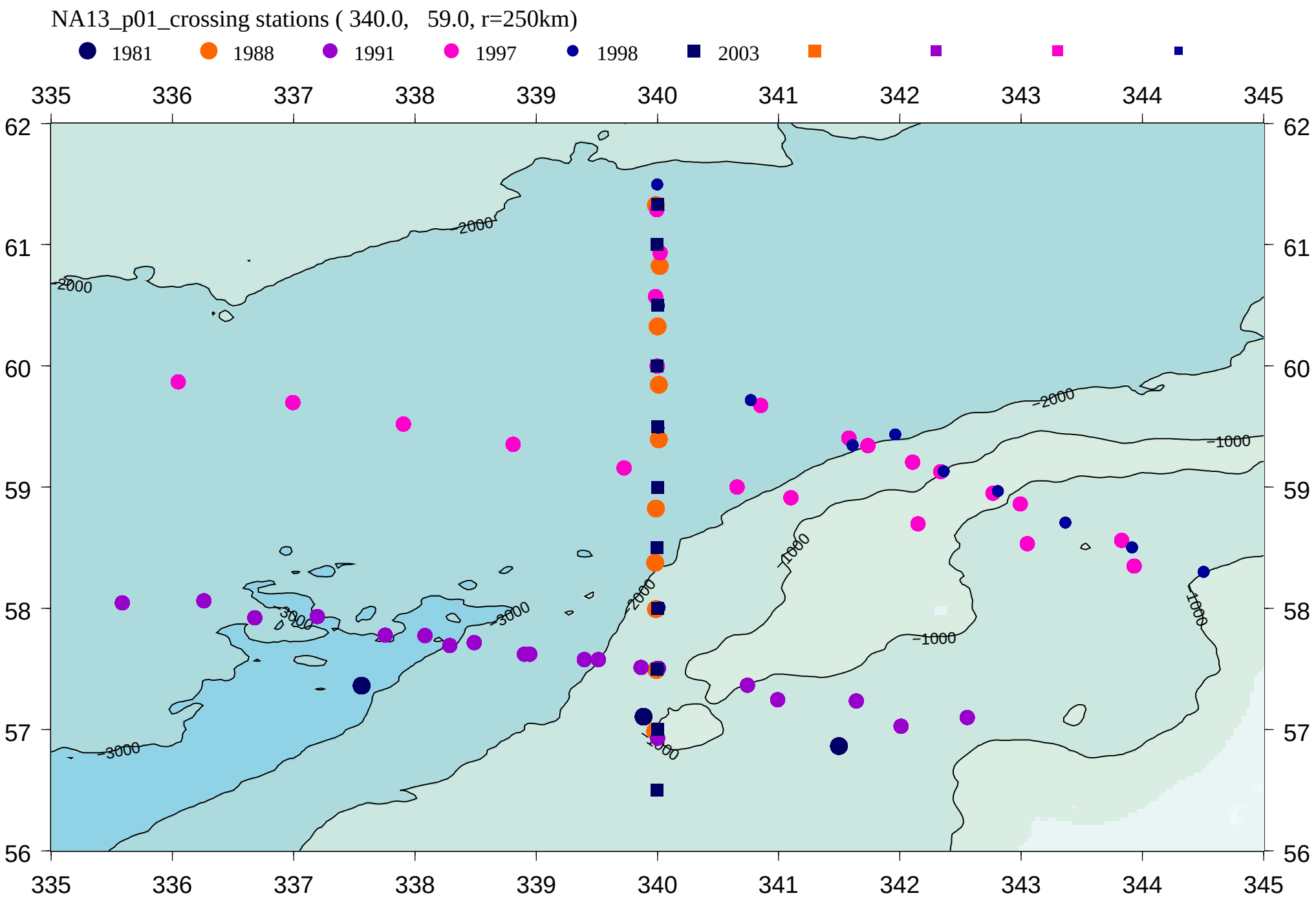

NA08_p01_crossing stations (332.0, 52.8, r=250km)
1981
1990
1991
1992
1994
1995
1996
1997
327
328
329
330
331
332
333
334
335
336
337
56
55
54
53
52
51
50
3000
4000
2000

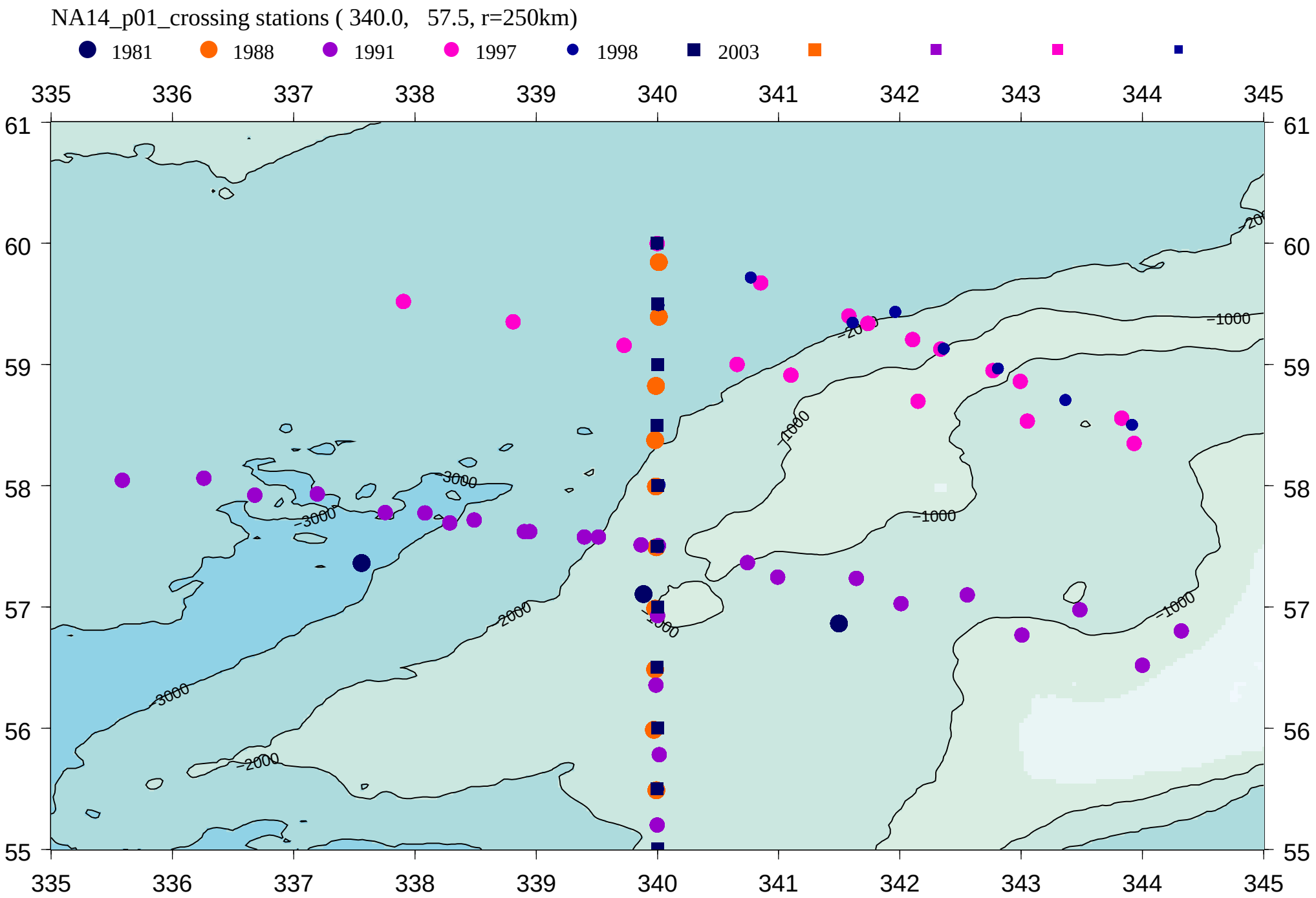

NA09_p01_crossing stations (333.7, 47.2, r=250km)
1994
1997
329
330
331
332
333
334
335
336
337
338
339
50
49
48
47
46
45
44
−2000
−3000
−4000

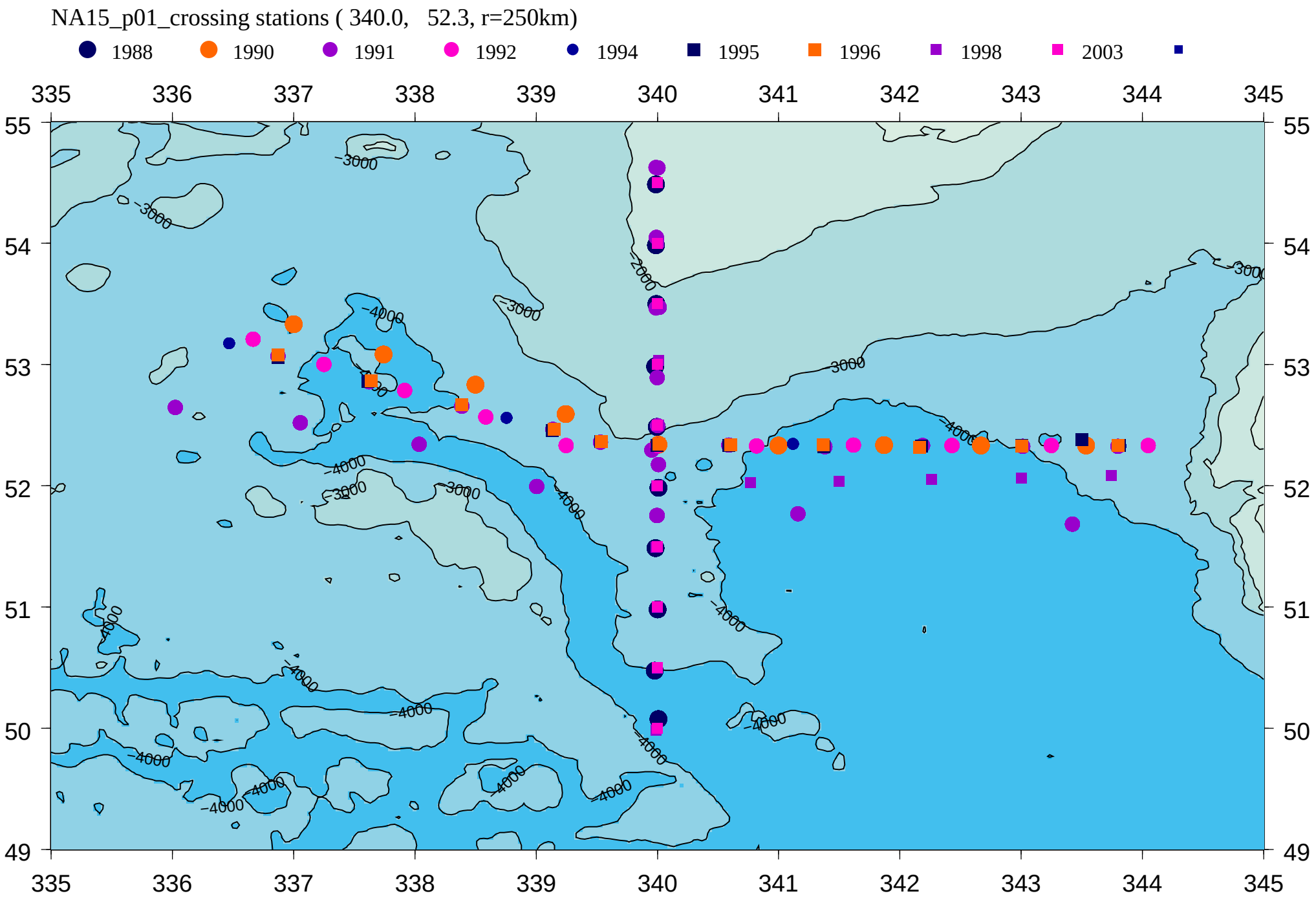

NA10_p01_crossing stations (334.0, 54.3, r=250km)
1981
1990
1991
1992
1994
1995
1996
329
330
331
332
333
334
335
336
337
338
339
57
56
55
54
53
52
51
-2000
-3000
-4000

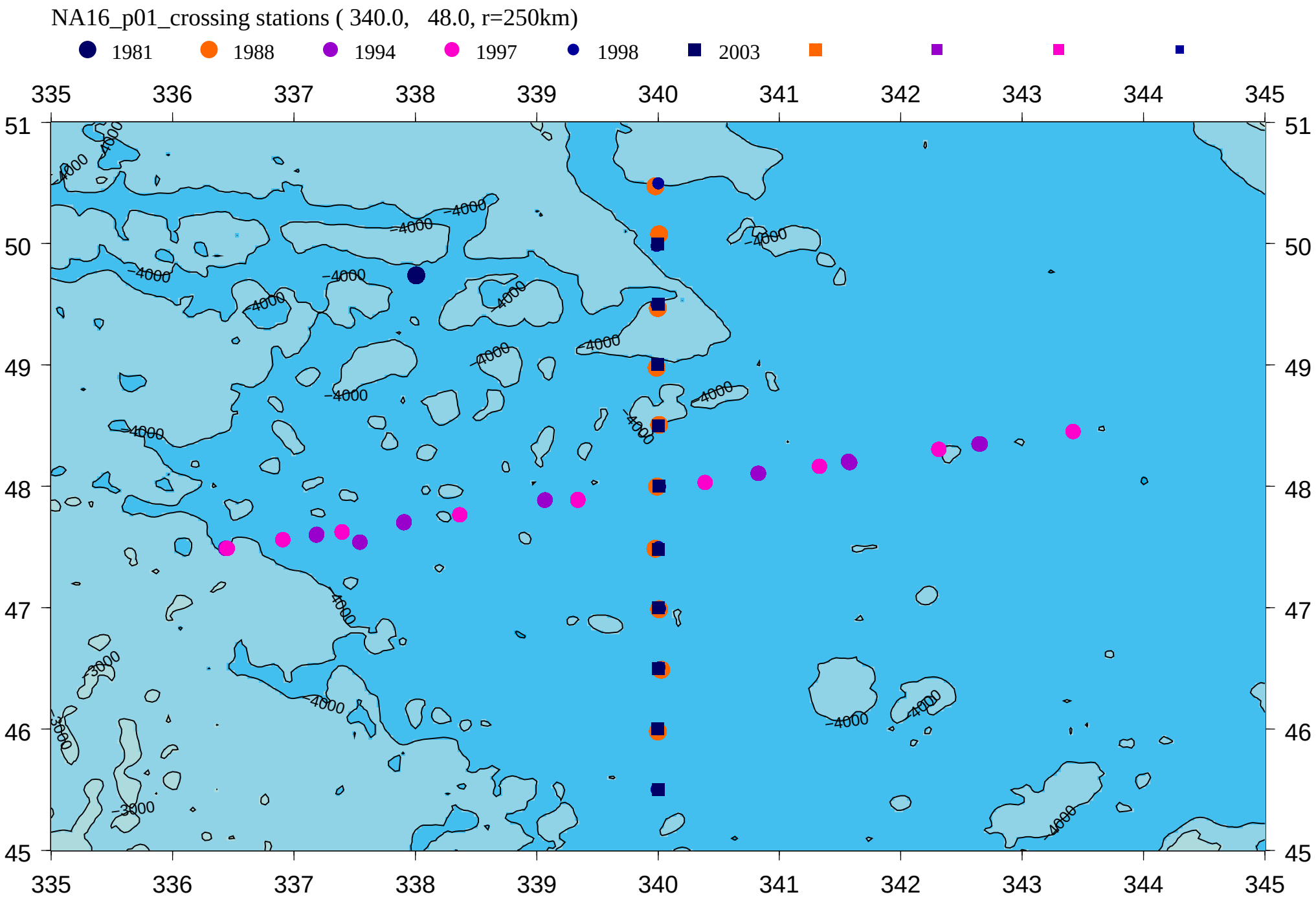

NA11_p01_crossing stations (336.0, 59.0, r=250km)
1981
1988
1990
1991
1997
1998
2003
331
332
333
334
335
336
337
338
339
340
341
62
61
60
59
58
57
56
-2000
-3000
-1000

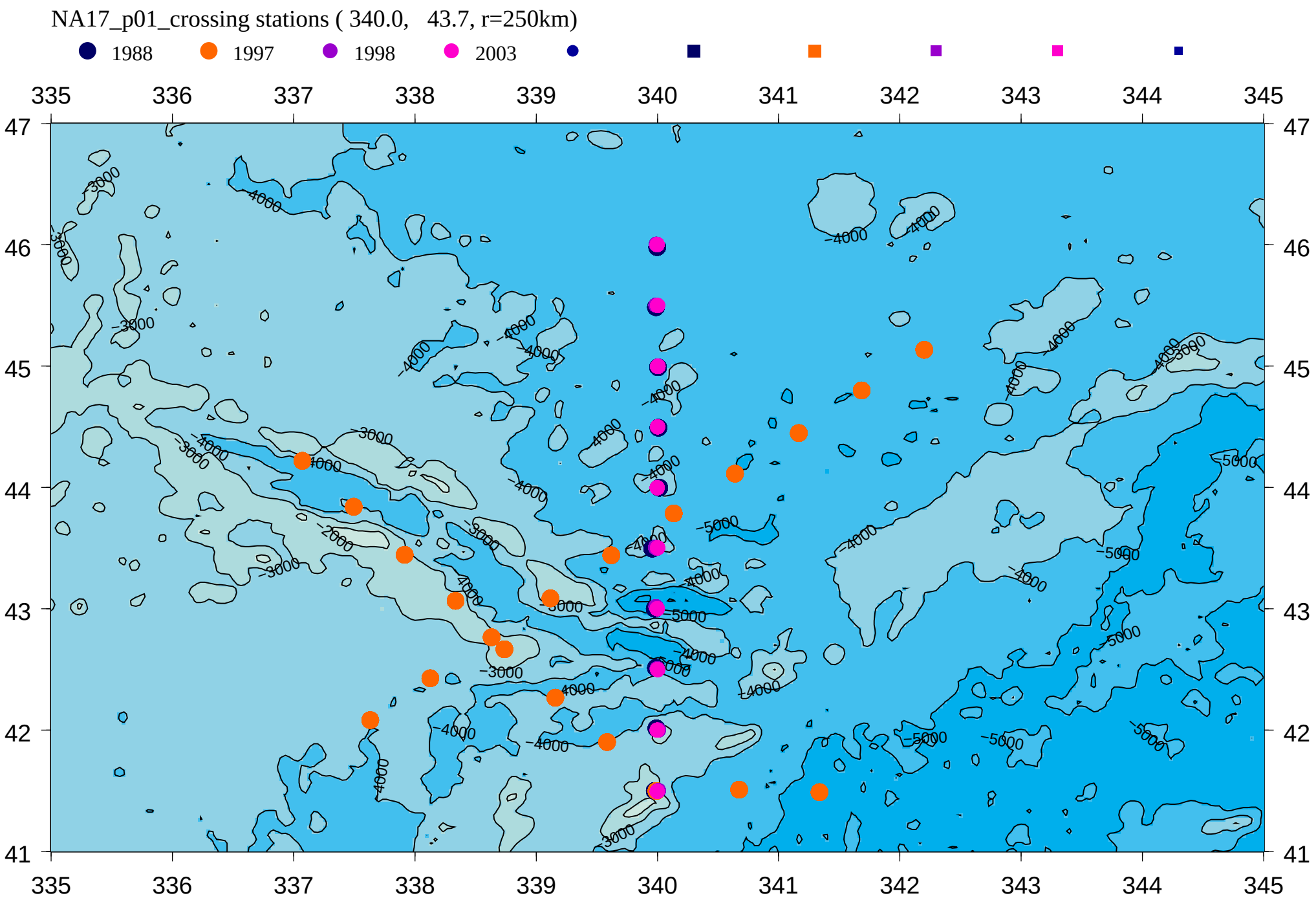

NA12_p01_crossing stations (338.7, 42.8, r=250km)
1988
1997
1998
2003
334
335
336
337
338
339
340
341
342
343
344
46
45
44
43
42
41
40
-3000
-4000
-5000

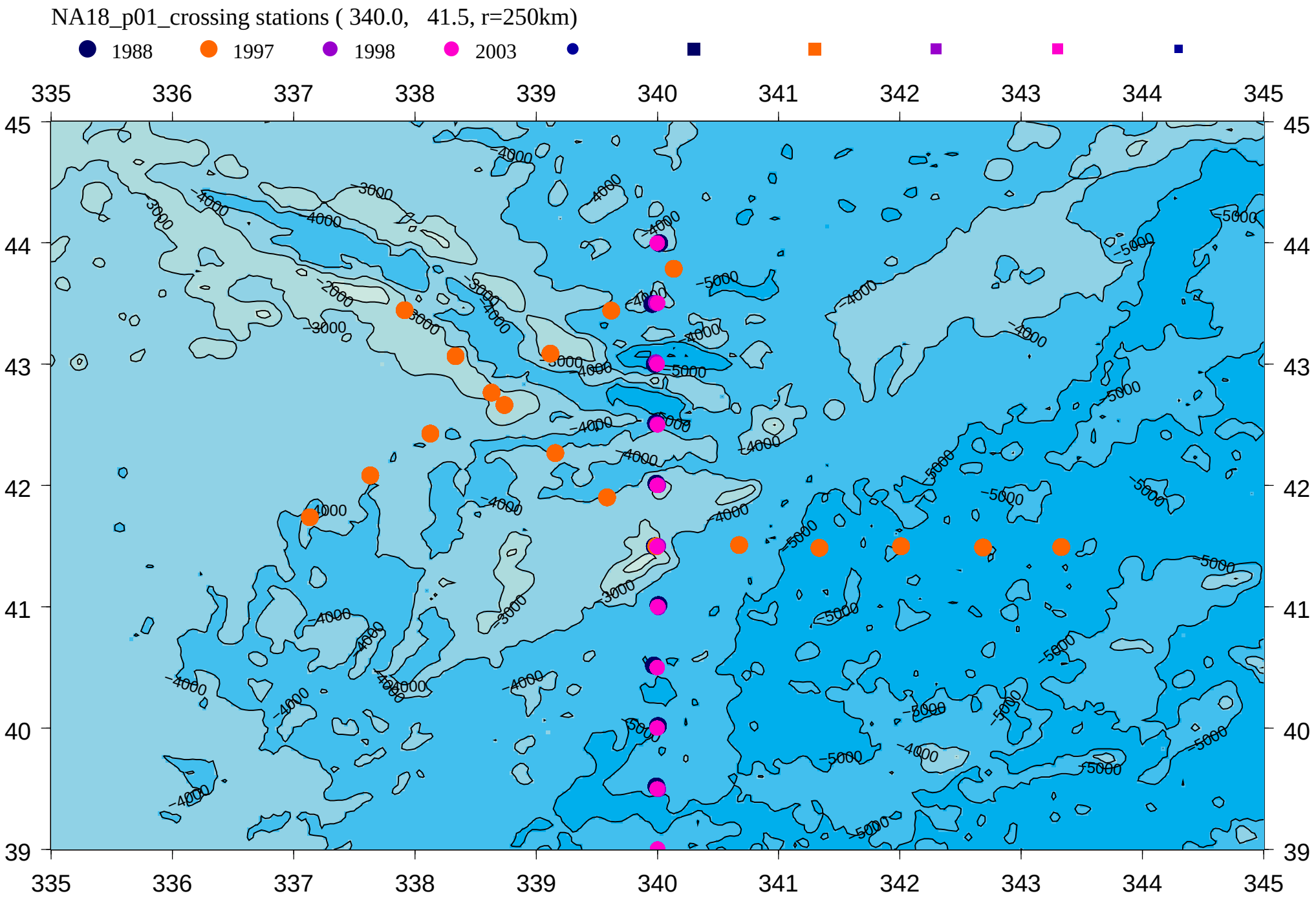

NA13_p01_crossing stations (340.0, 59.0, r=250km)
1981
1988
1991
1997
1998
2003
335
336
337
338
339
340
341
342
343
344
345
62
61
60
59
58
57
56
2000
3000
1000

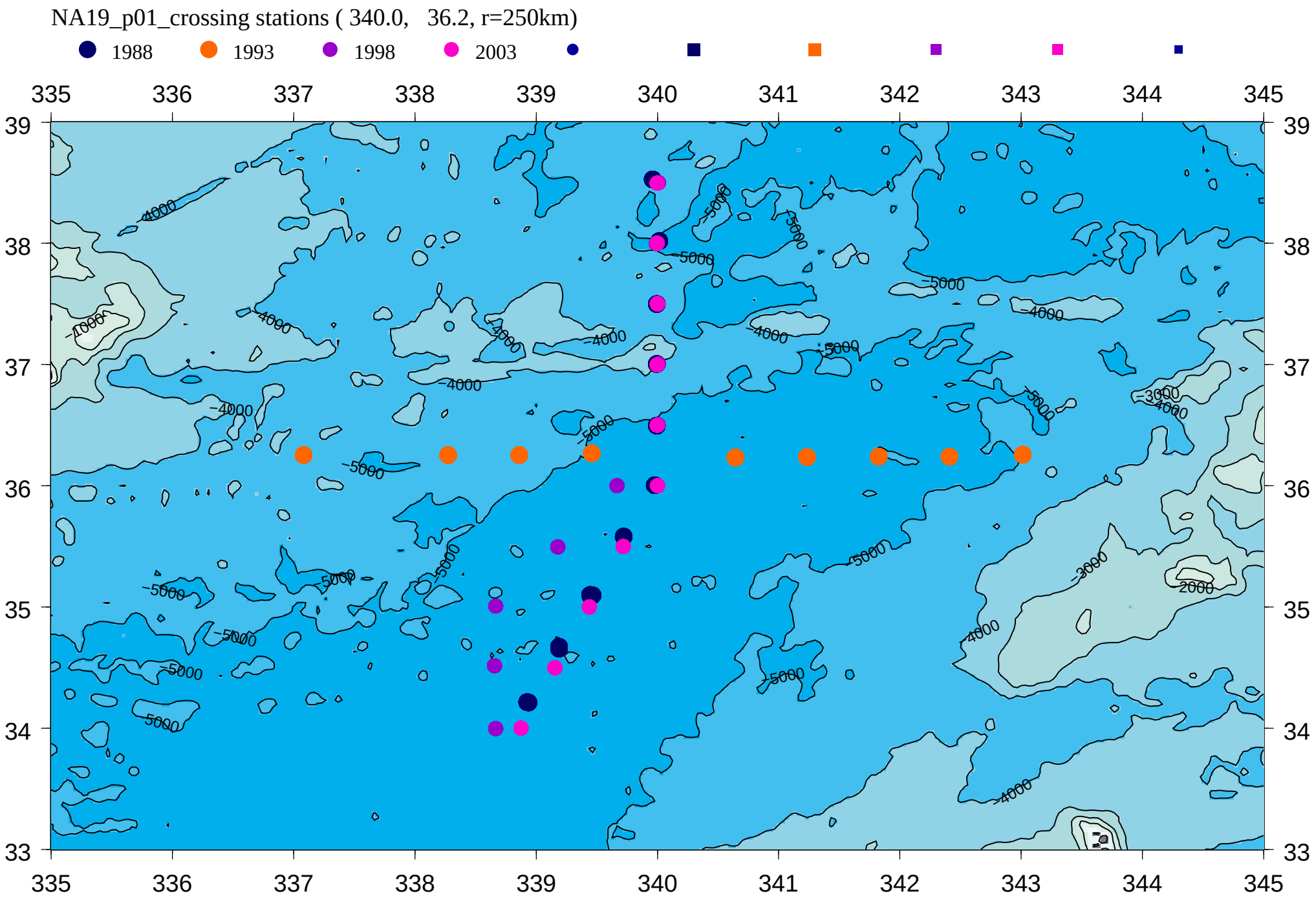

NA14_p01_crossing stations (340.0, 57.5, r=250km)
1981
1988
1991
1997
1998
2003
335
336
337
338
339
340
341
342
343
344
345
61
60
59
58
57
56
55
-3000
-2000
-1000
-20

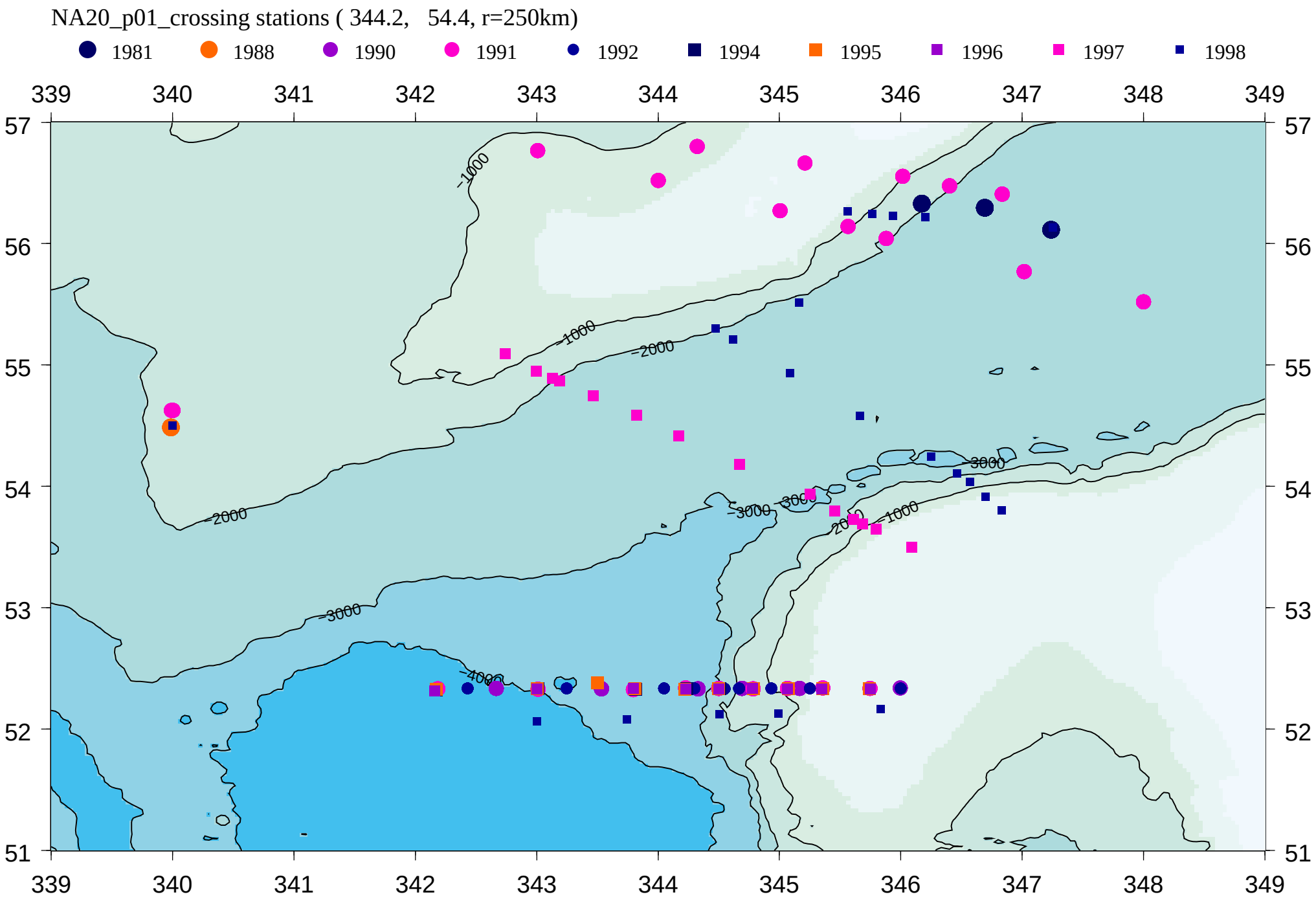

NA15_p01_crossing stations (340.0, 52.3, r=250km)
1988
1990
1991
1992
1994
1995
1996
1998
2003
335
336
337
338
339
340
341
342
343
344
345
55
54
53
52
51
50
49
-3000
-4000

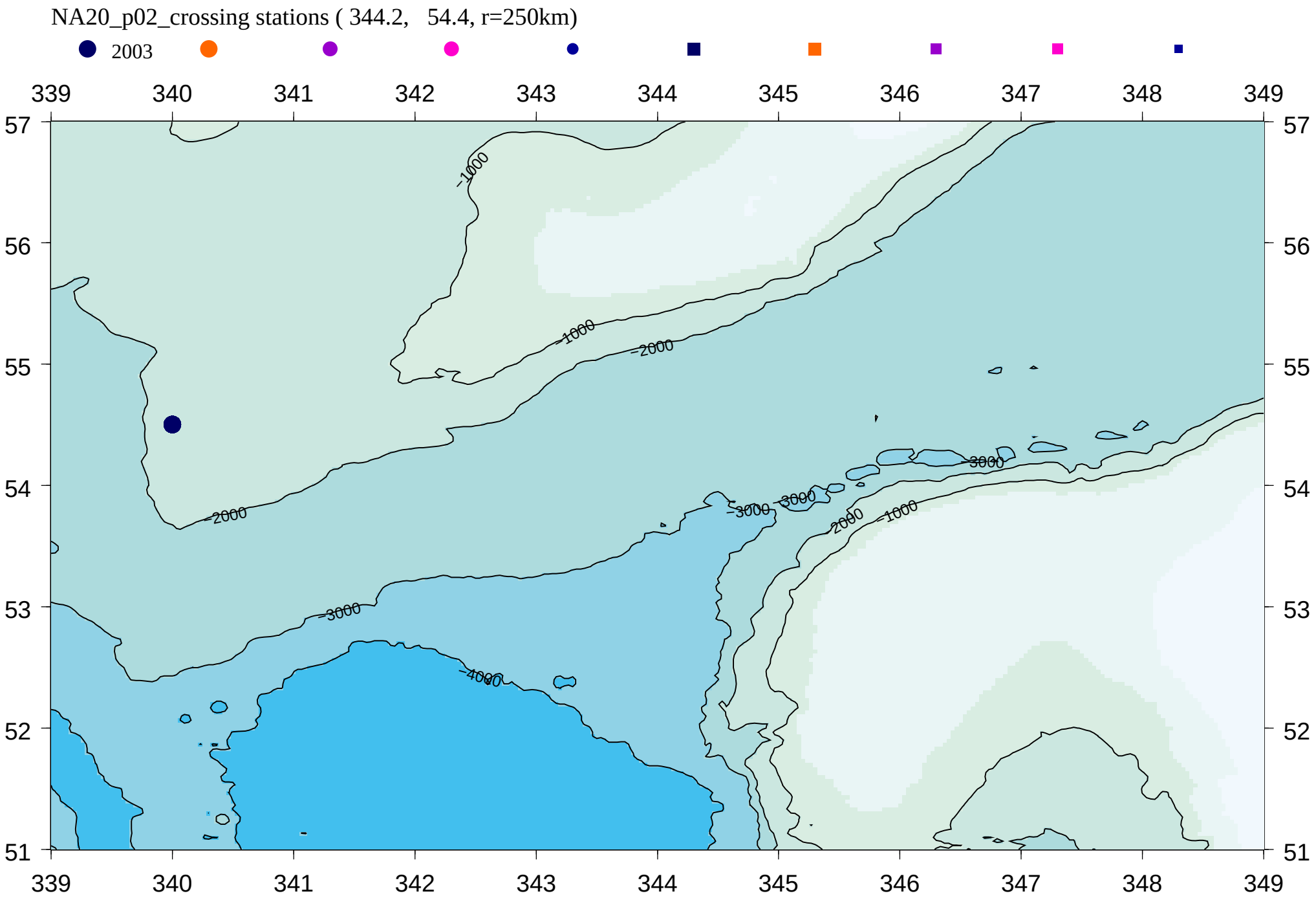

NA16_p01_crossing stations (340.0, 48.0, r=250km)
1981
1988
1994
1997
1998
2003
335
336
337
338
339
340
341
342
343
344
345
51
50
49
48
47
46
45
-4000
-3000

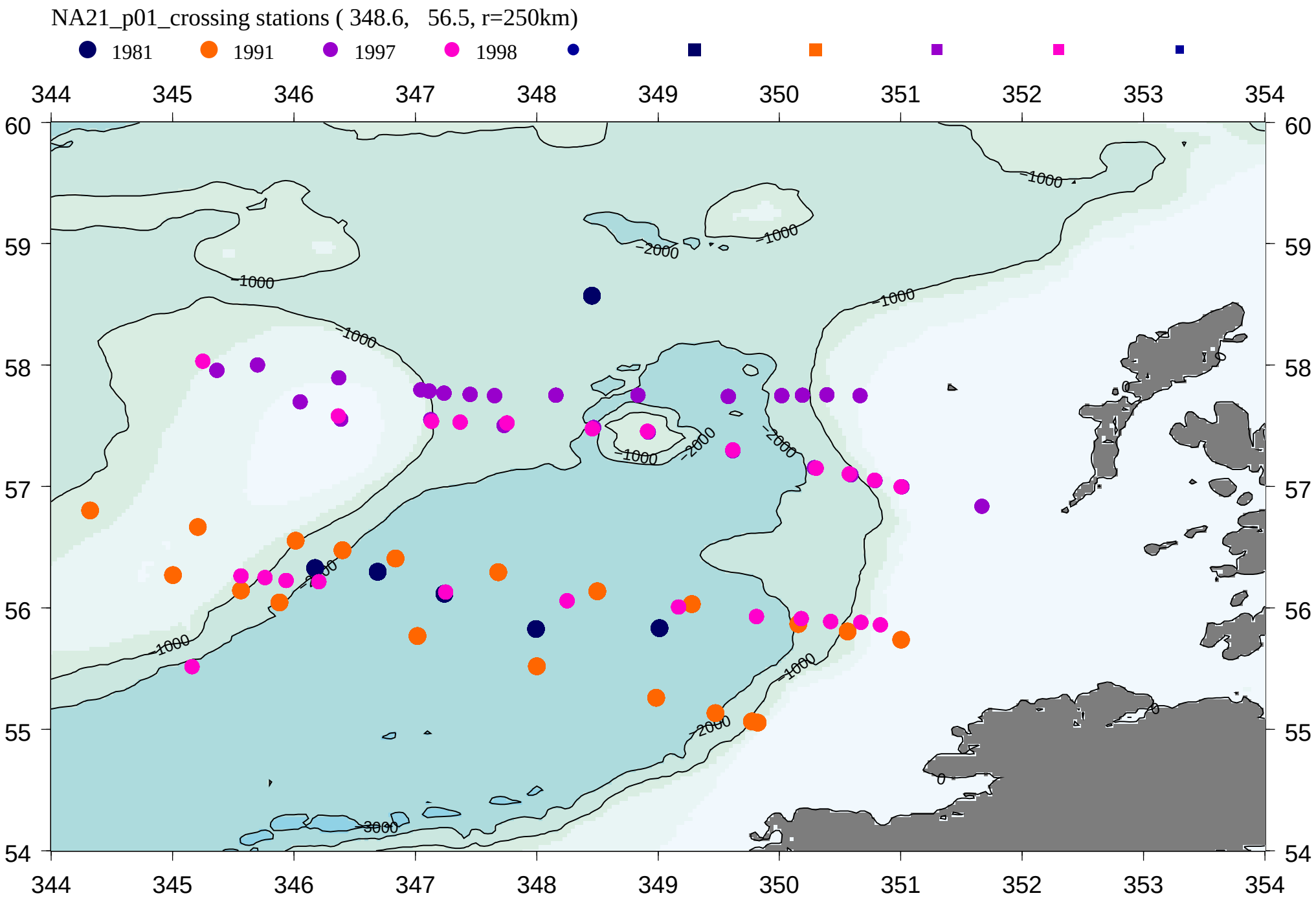

NA17_p01_crossing stations (340.0, 43.7, r=250km)
1988
1997
1998
2003
335
336
337
338
339
340
341
342
343
344
345
47
46
45
44
43
42
41
-3000
-4000
-5000

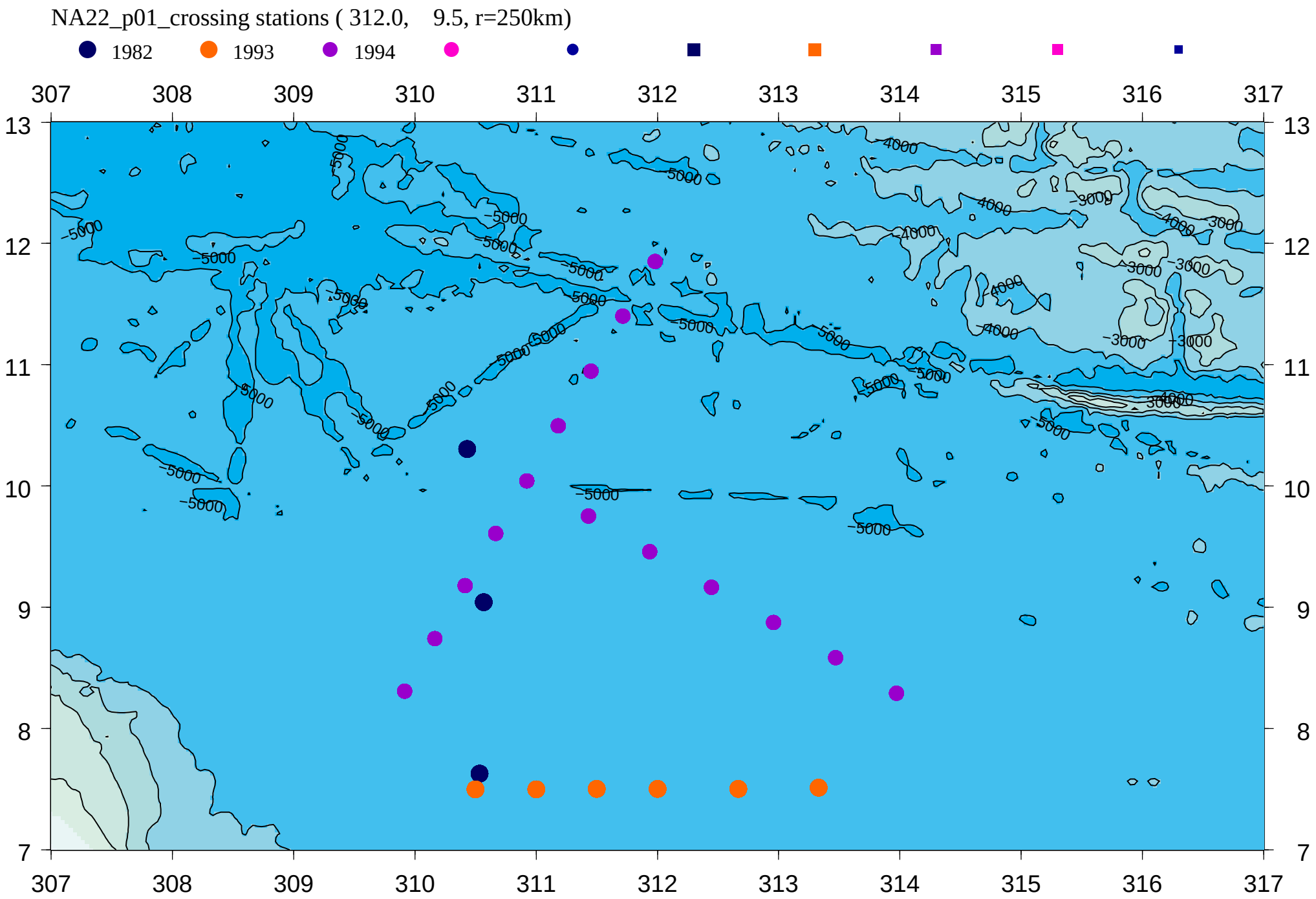

NA18_p01_crossing stations (340.0, 41.5, r=250km)
1988
1997
1998
2003
335
336
337
338
339
340
341
342
343
344
345
45
44
43
42
41
40
39

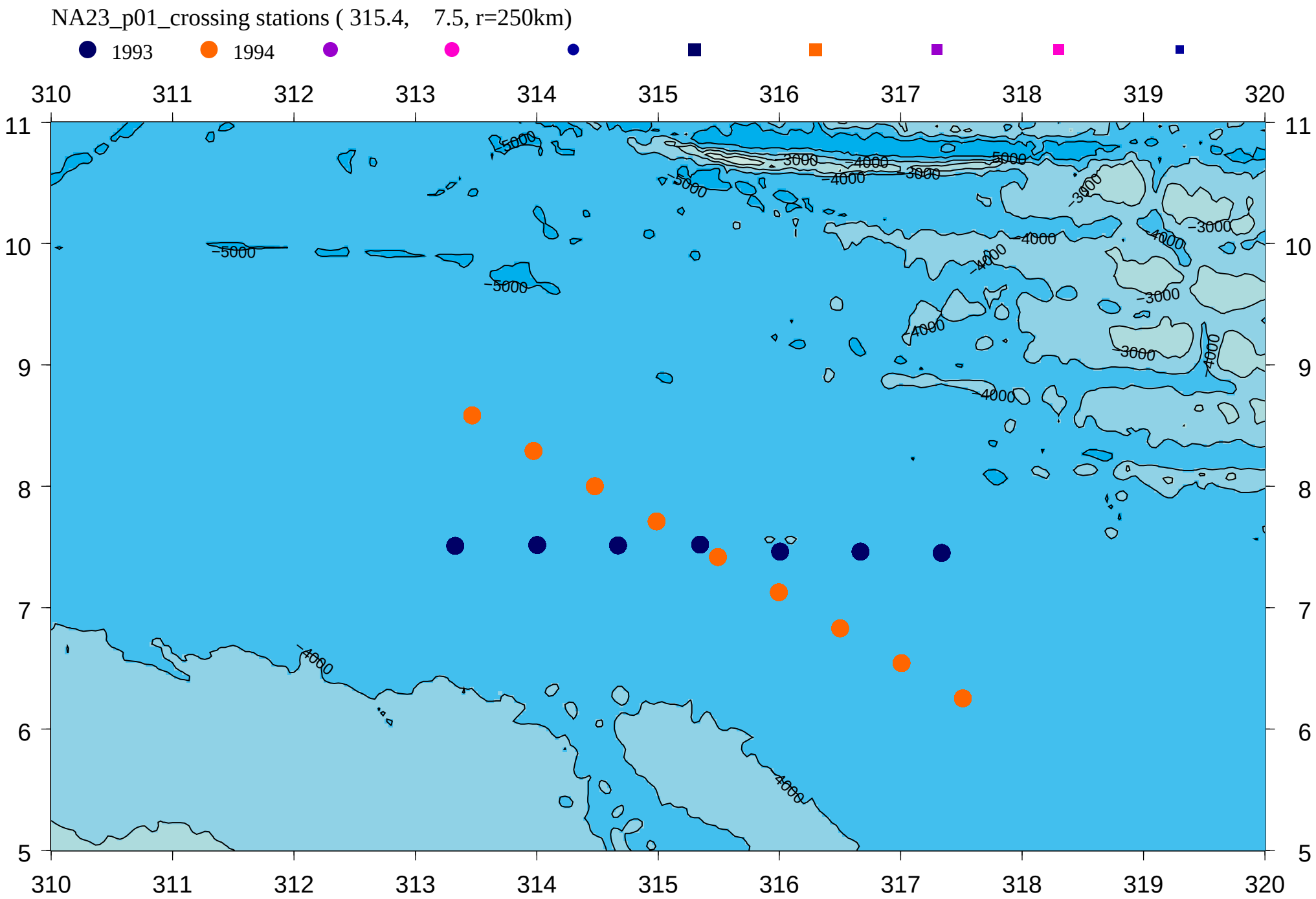

NA19_p01_crossing stations (340.0, 36.2, r=250km)
1988
1993
1998
2003
335
336
337
338
339
340
341
342
343
344
345
39
38
37
36
35
34
33
-4000
-5000
-3000
2000

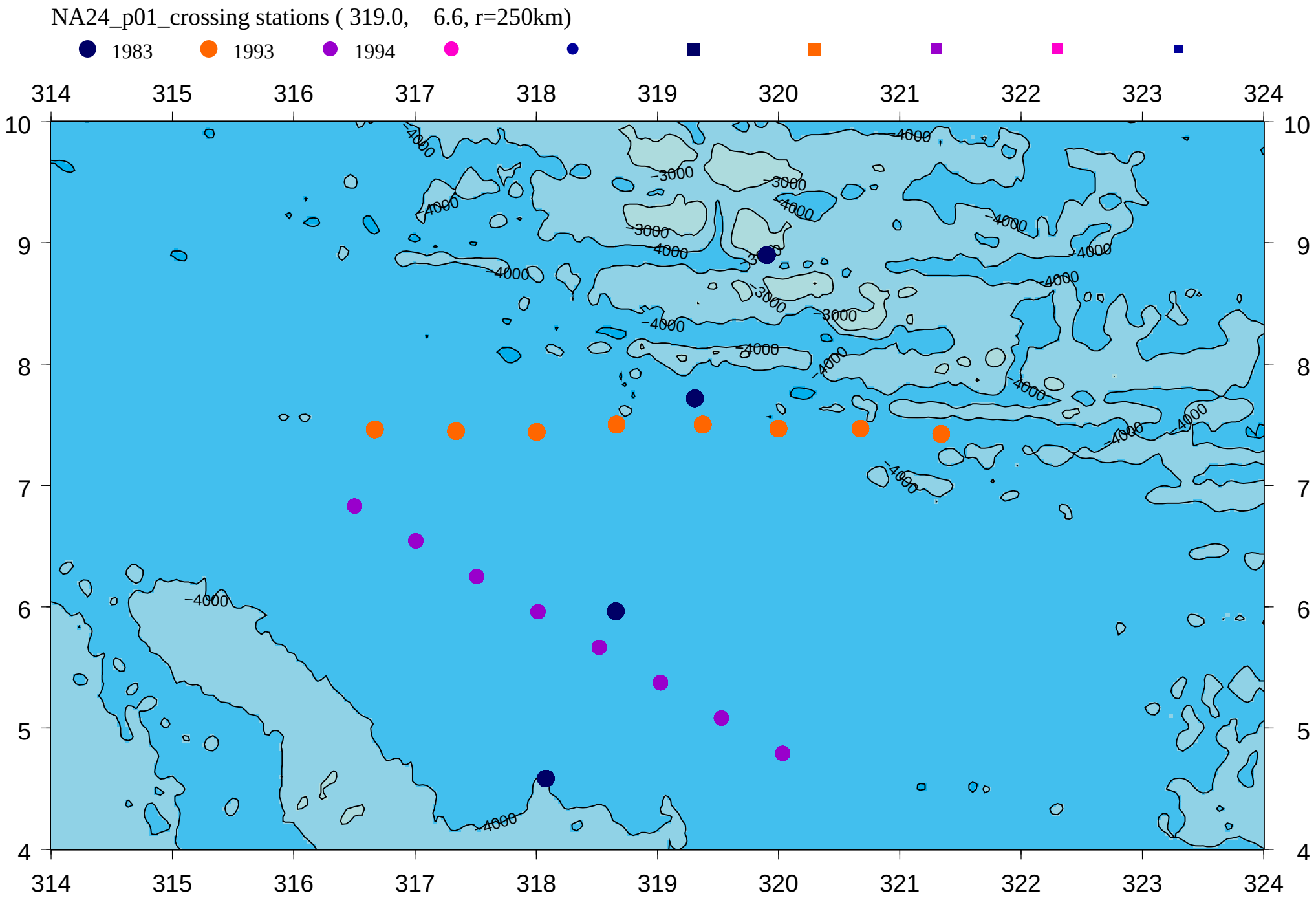

NA20_p01_crossing stations (344.2, 54.4, r=250km)
1981
1988
1990
1991
1992
1994
1995
1996
1997
1998
339
340
341
342
343
344
345
346
347
348
349
57
56
55
54
53
52
51
-1000
-2000
-3000
-4000

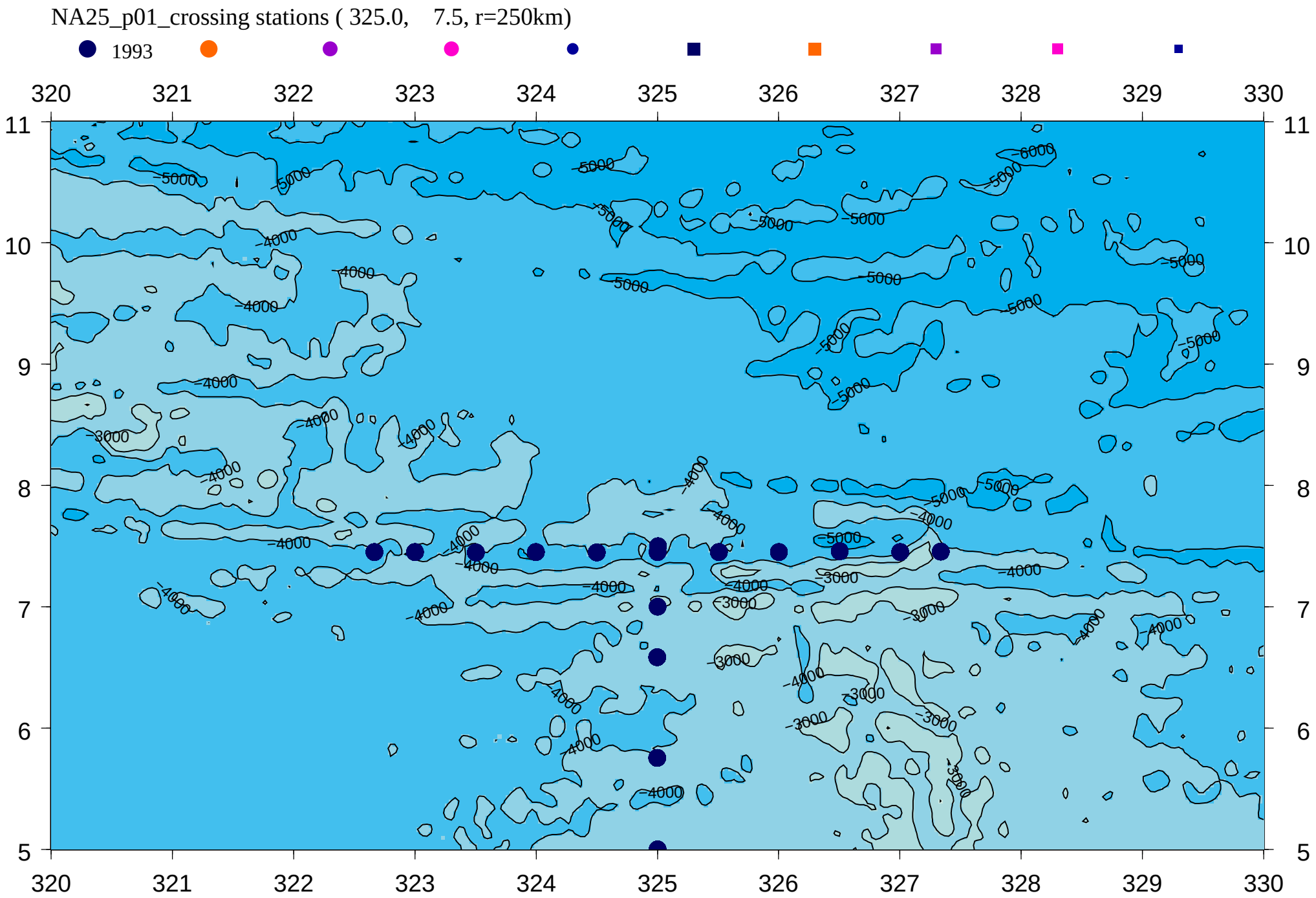

NA20_p02_crossing stations (344.2, 54.4, r=250km)
2003
339
340
341
342
343
344
345
346
347
348
349
57
56
55
54
53
52
51
-1000
-2000
-3000
-4000

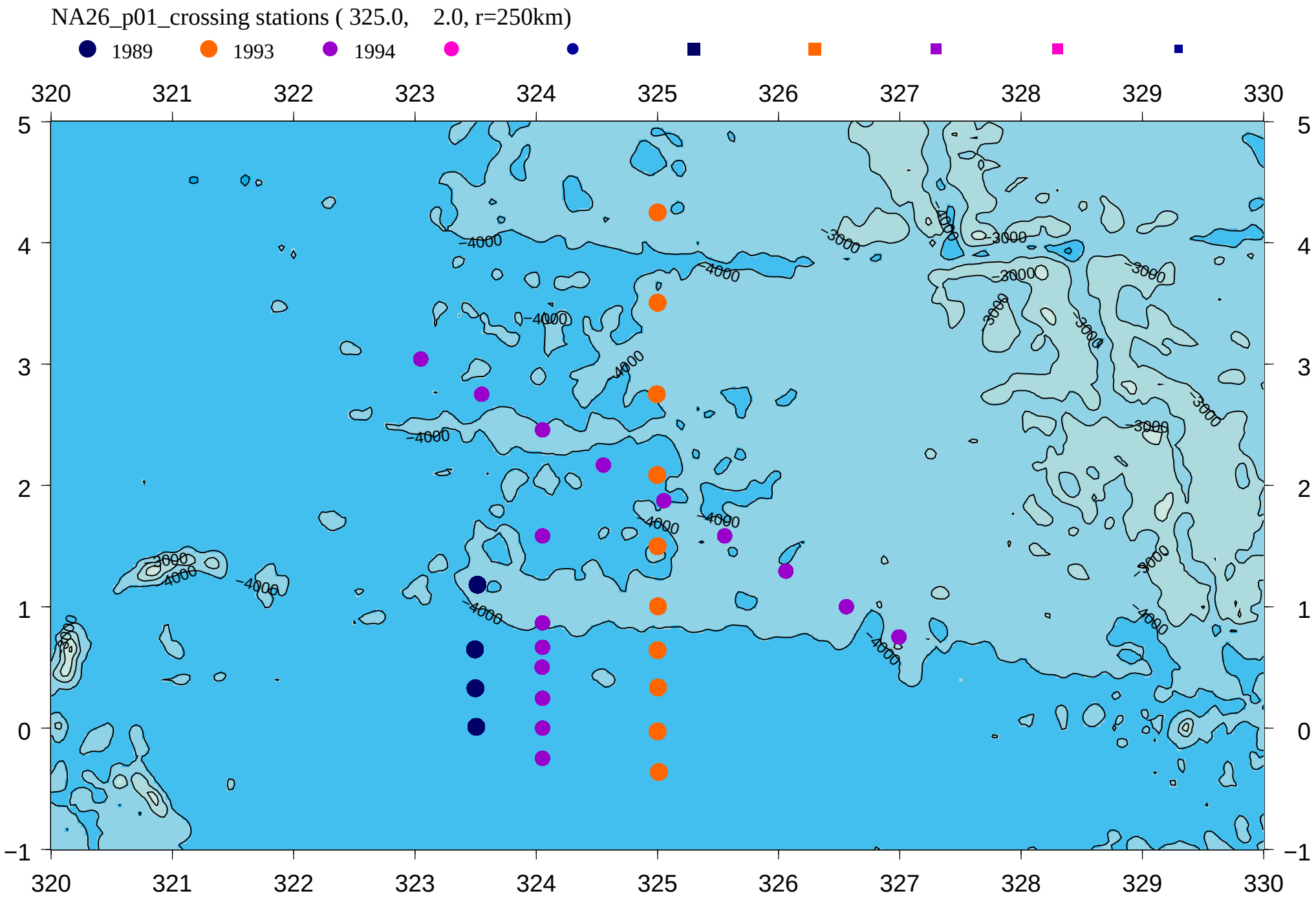

NA21_p01_crossing stations (348.6, 56.5, r=250km)
1981
1991
1997
1998
344
345
346
347
348
349
350
351
352
353
354
60
59
58
57
56
55
54
-1000
-2000
-3000
0

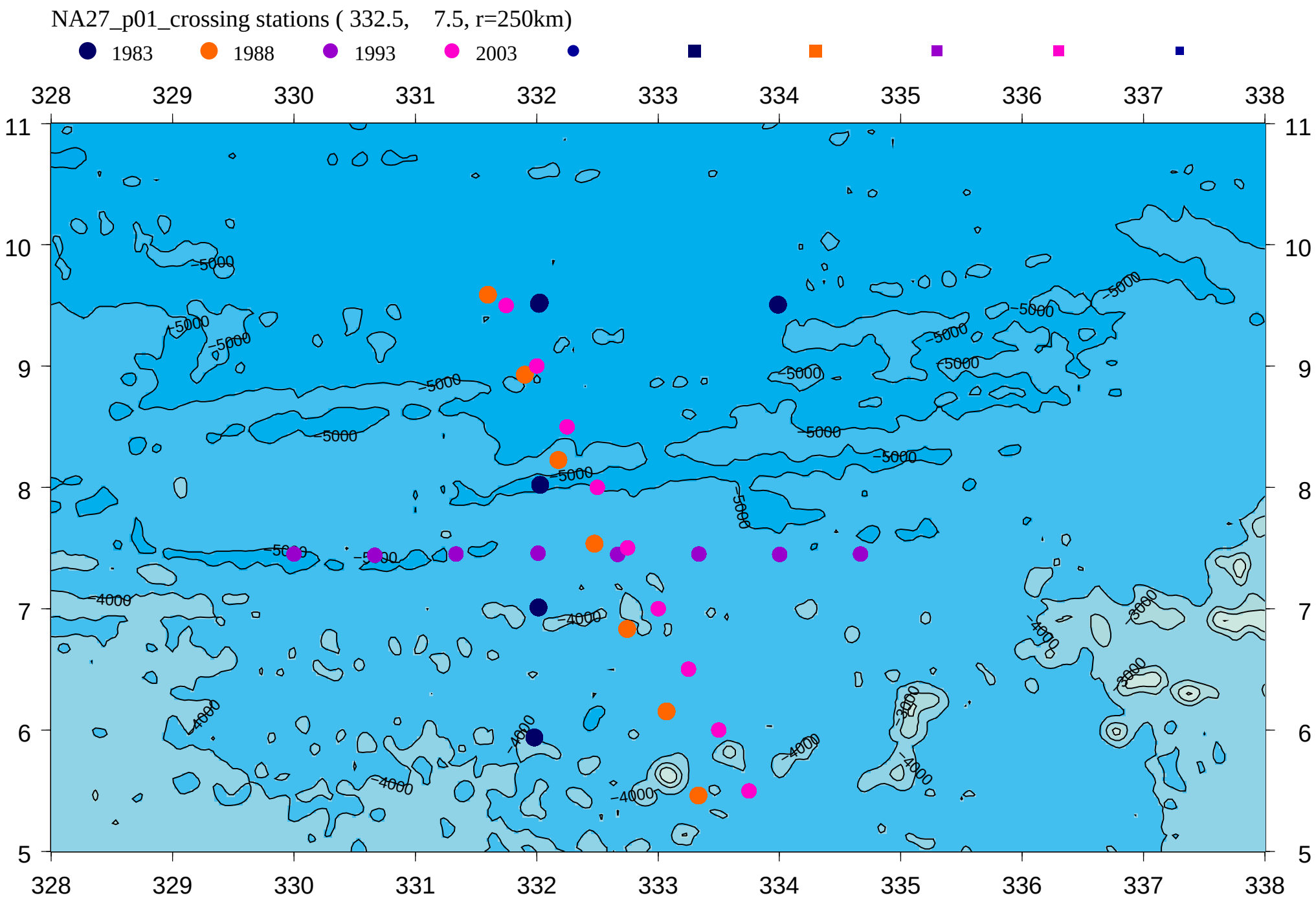

NA22_p01_crossing stations (312.0, 9.5, r=250km)
1982
1993
1994
307
308
309
310
311
312
313
314
315
316
317
13
12
11
10
9
8
7
-5000
-4000
-3000

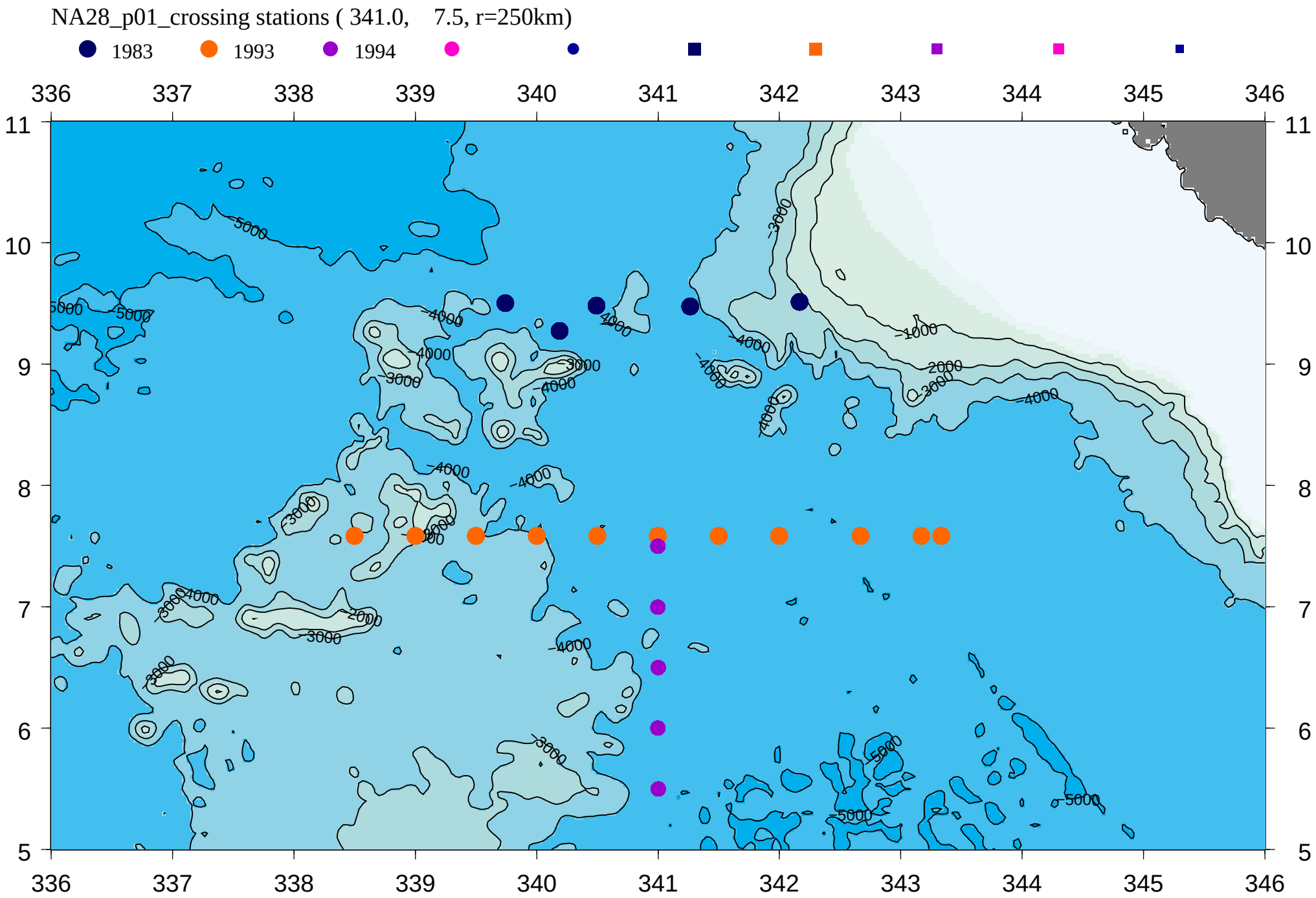

NA23_p01_crossing stations (315.4, 7.5, r=250km)
1993
1994
310
311
312
313
314
315
316
317
318
319
320
11
10
9
8
7
6
5
-5000
-4000
-3000

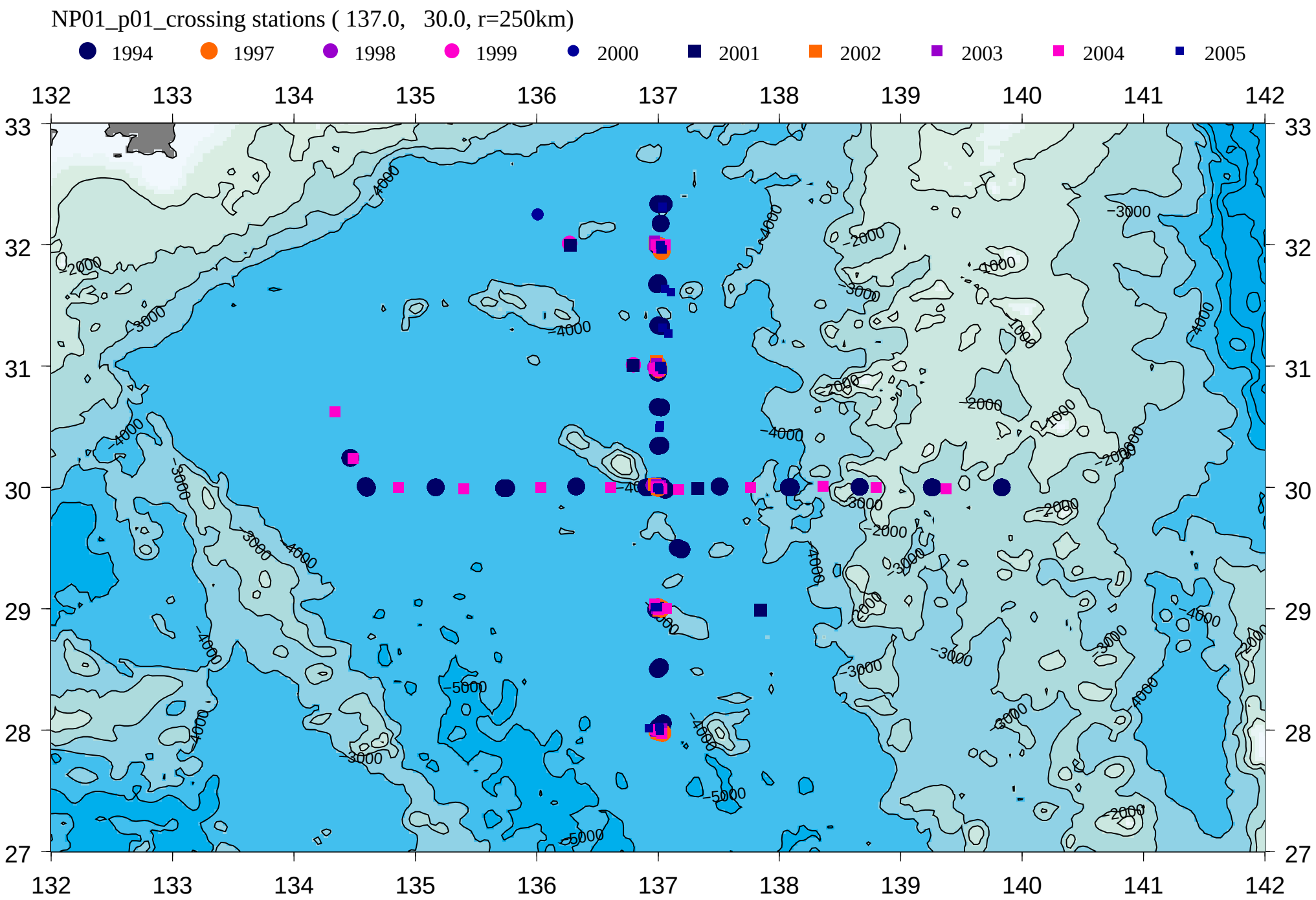

NA24_p01_crossing stations (319.0, 6.6, r=250km)
1983
1993
1994
314
315
316
317
318
319
320
321
322
323
324
10
9
8
7
6
5
4
-4000
-3000

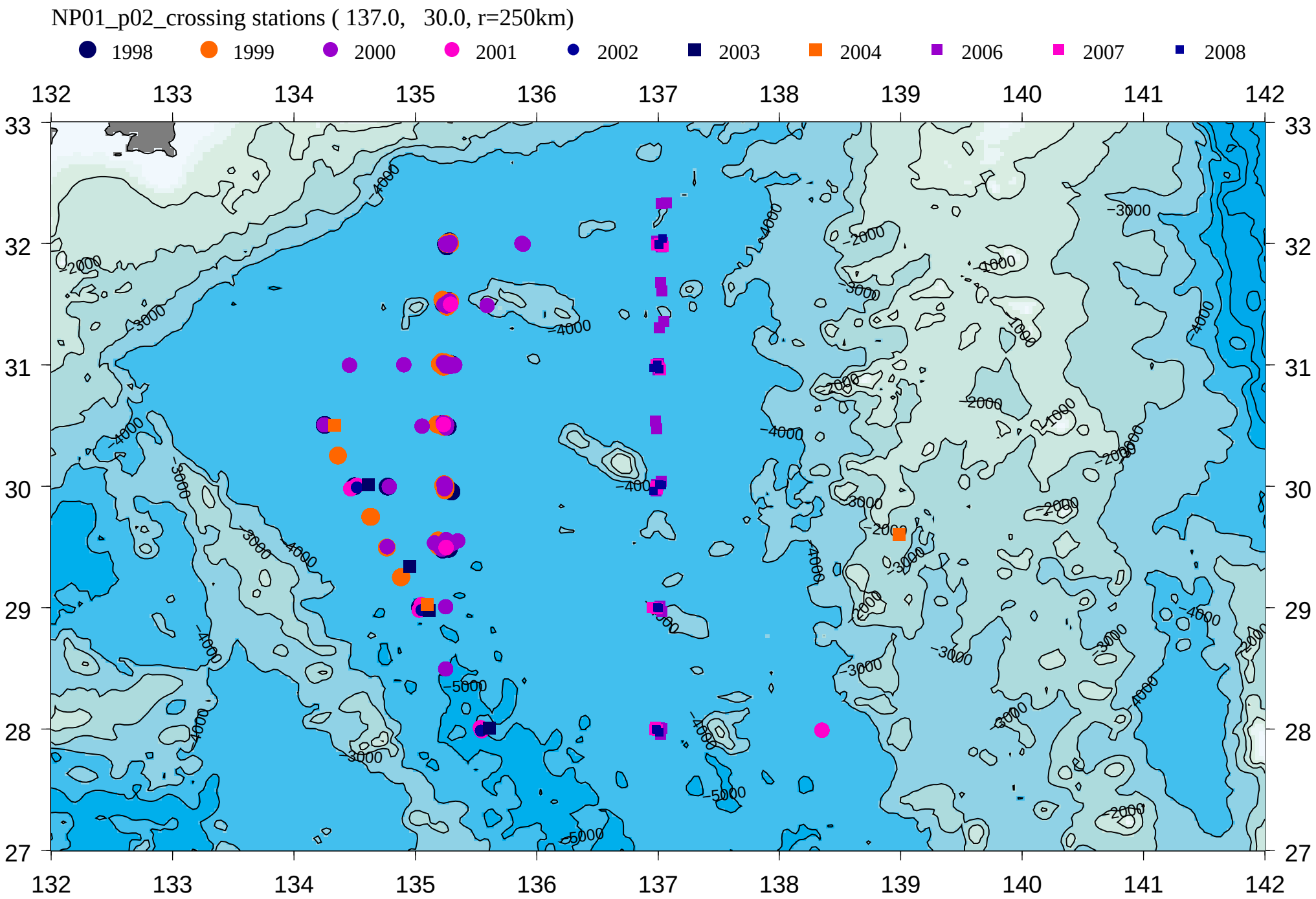

NA25_p01_crossing stations (325.0, 7.5, r=250km)
1993
320
321
322
323
324
325
326
327
328
329
330
11
10
9
8
7
6
5

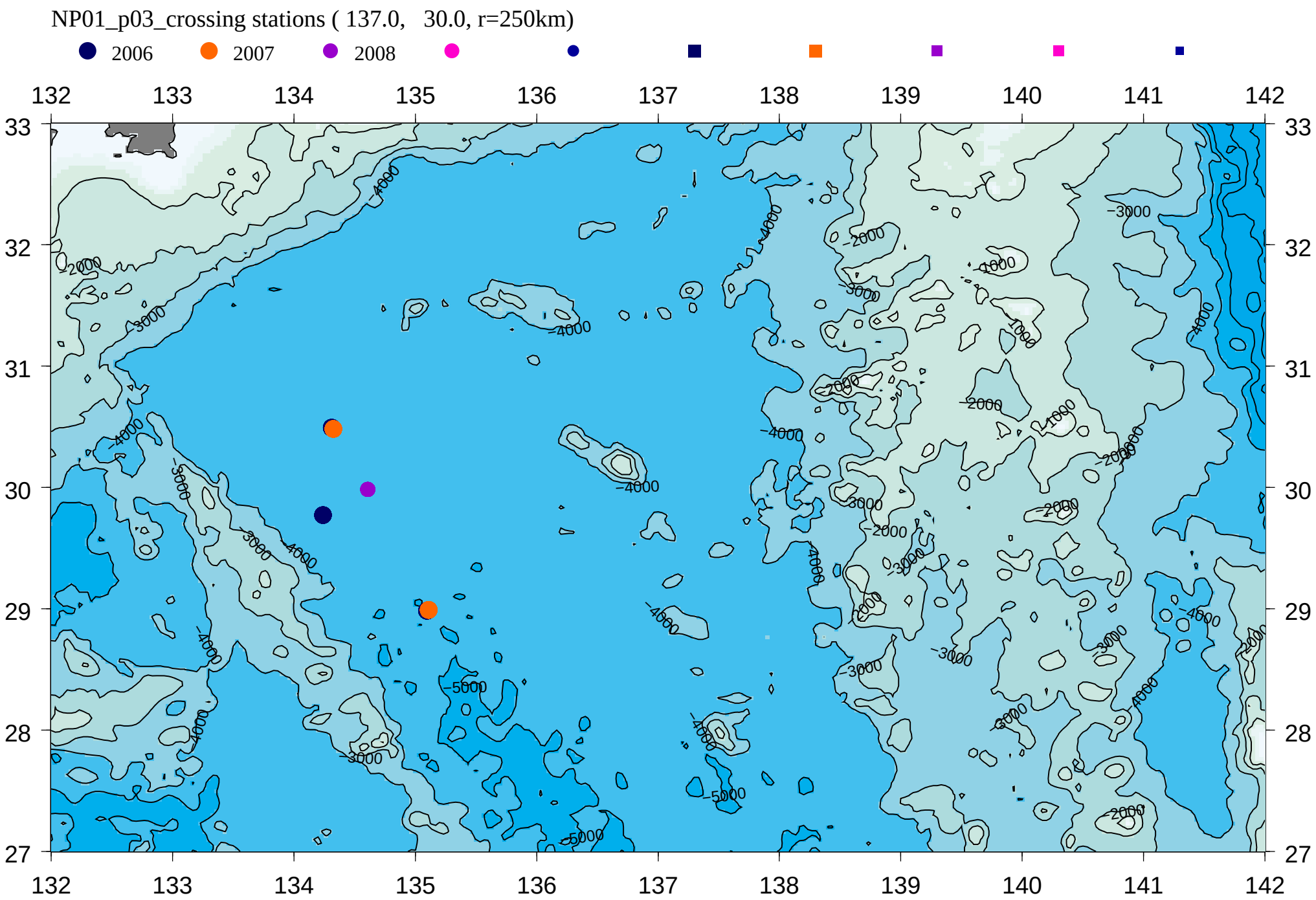

NA26_p01_crossing stations (325.0, 2.0, r=250km)
1989
1993
1994
320
321
322
323
324
325
326
327
328
329
330
5
4
3
2
1
0
−1
−4000
−3000

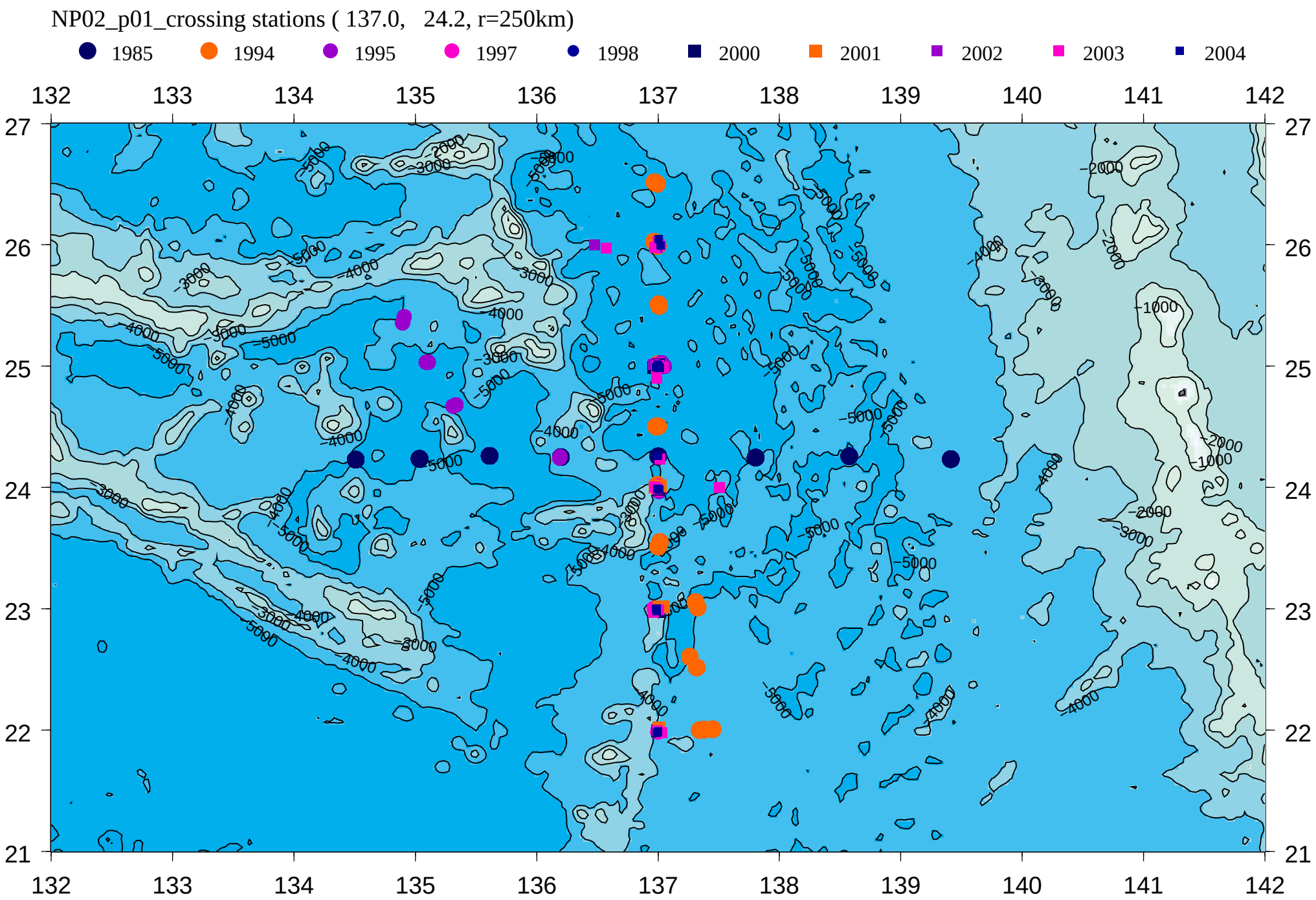

NA27_p01_crossing stations (332.5, 7.5, r=250km)
1983
1988
1993
2003
328
329
330
331
332
333
334
335
336
337
338
11
10
9
8
7
6
5
-5000
-4000
-3000

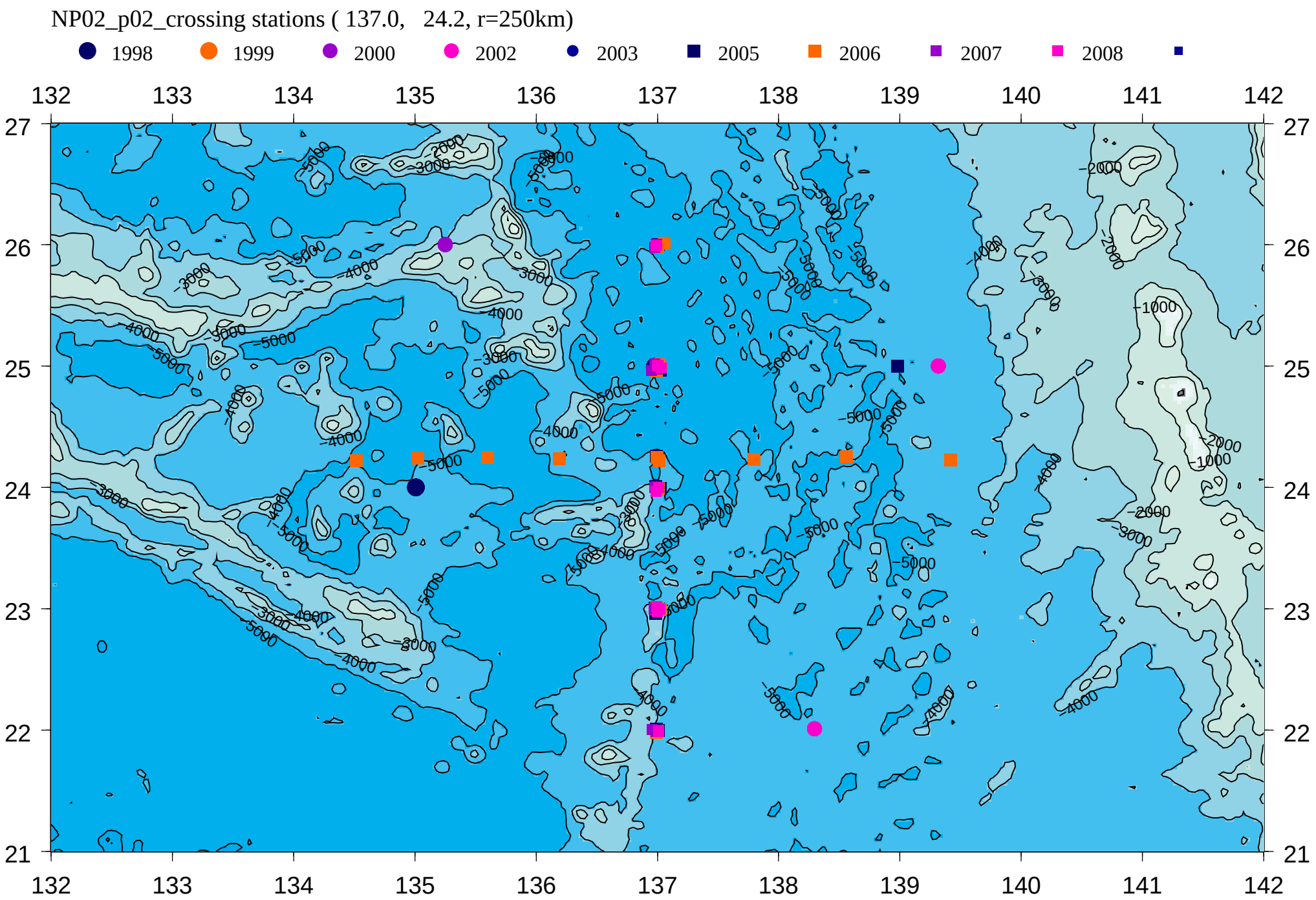

NA28_p01_crossing stations (341.0, 7.5, r=250km)
1983
1993
1994
336
337
338
339
340
341
342
343
344
345
346
11
10
9
8
7
6
5
5000
4000
3000
2000
1000

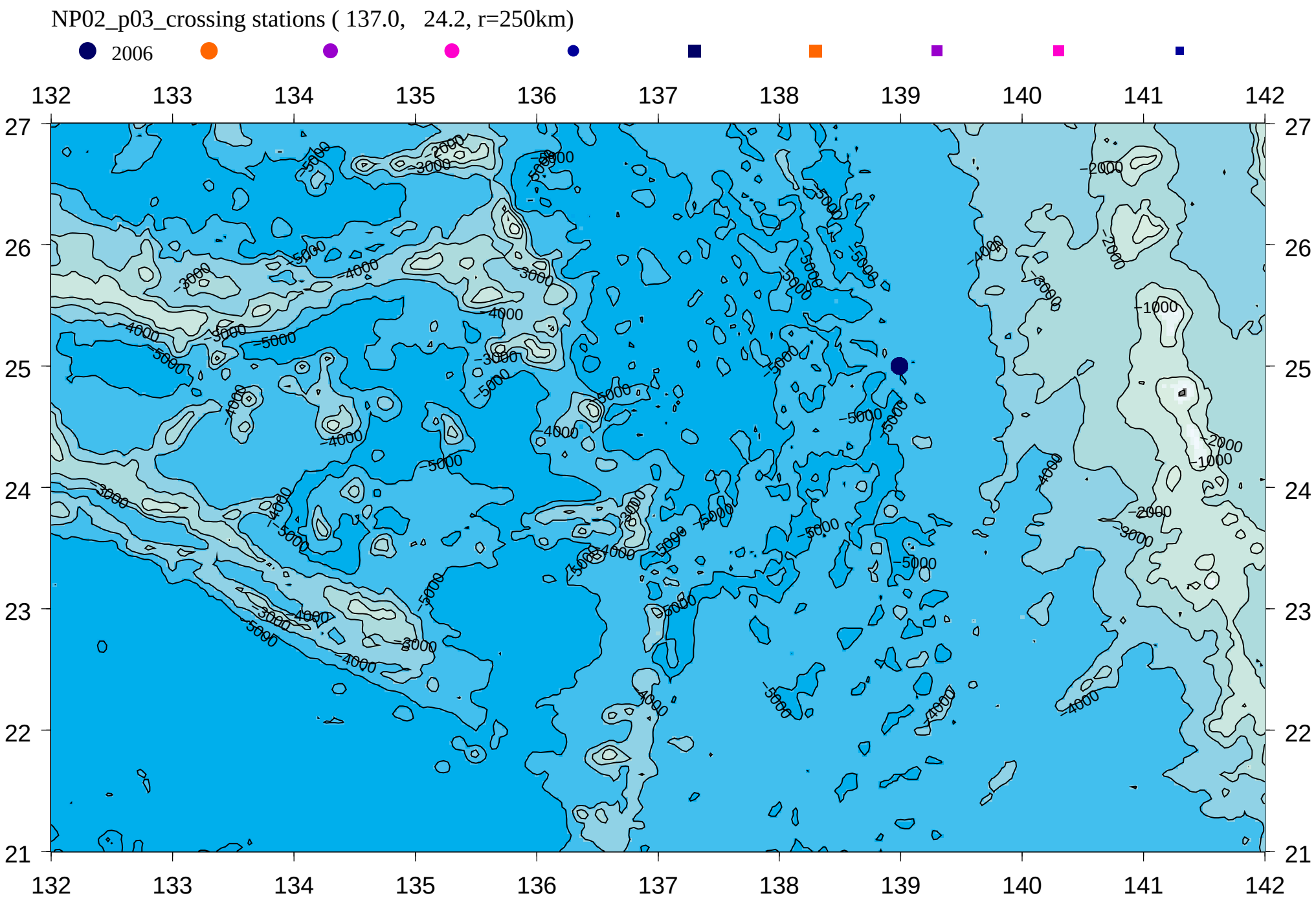

NP01_p01_crossing stations (137.0, 30.0, r=250km)
1994
1997
1998
1999
2000
2001
2002
2003
2004
2005
132
133
134
135
136
137
138
139
140
141
142
33
32
31
30
29
28
27
-1000
-2000
-3000
-4000
-5000

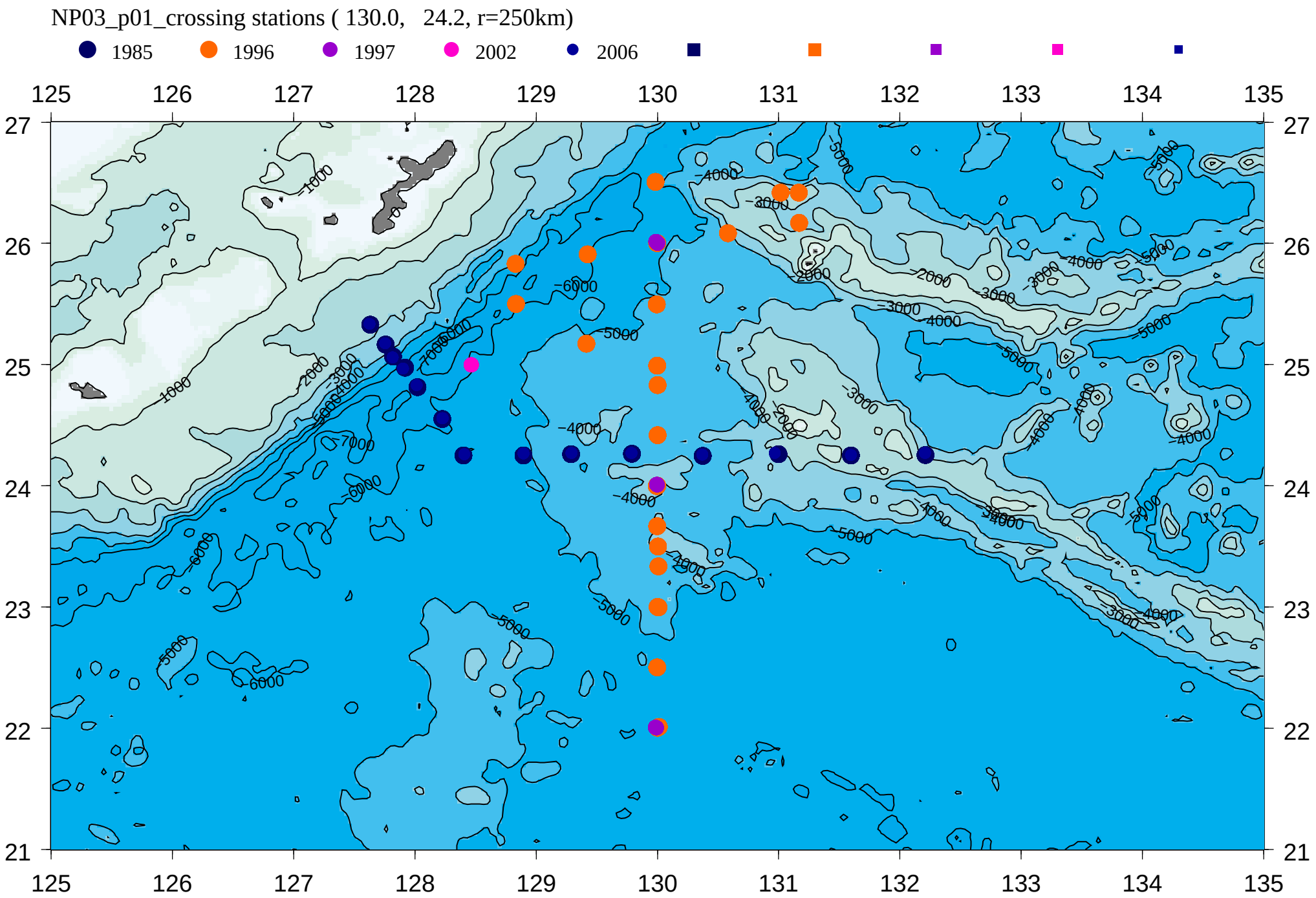

NP01_p02_crossing stations (137.0, 30.0, r=250km)
1998
1999
2000
2001
2002
2003
2004
2006
2007
2008
132
133
134
135
136
137
138
139
140
141
142
33
32
31
30
29
28
27
-1000
-2000
-3000
-4000
-5000

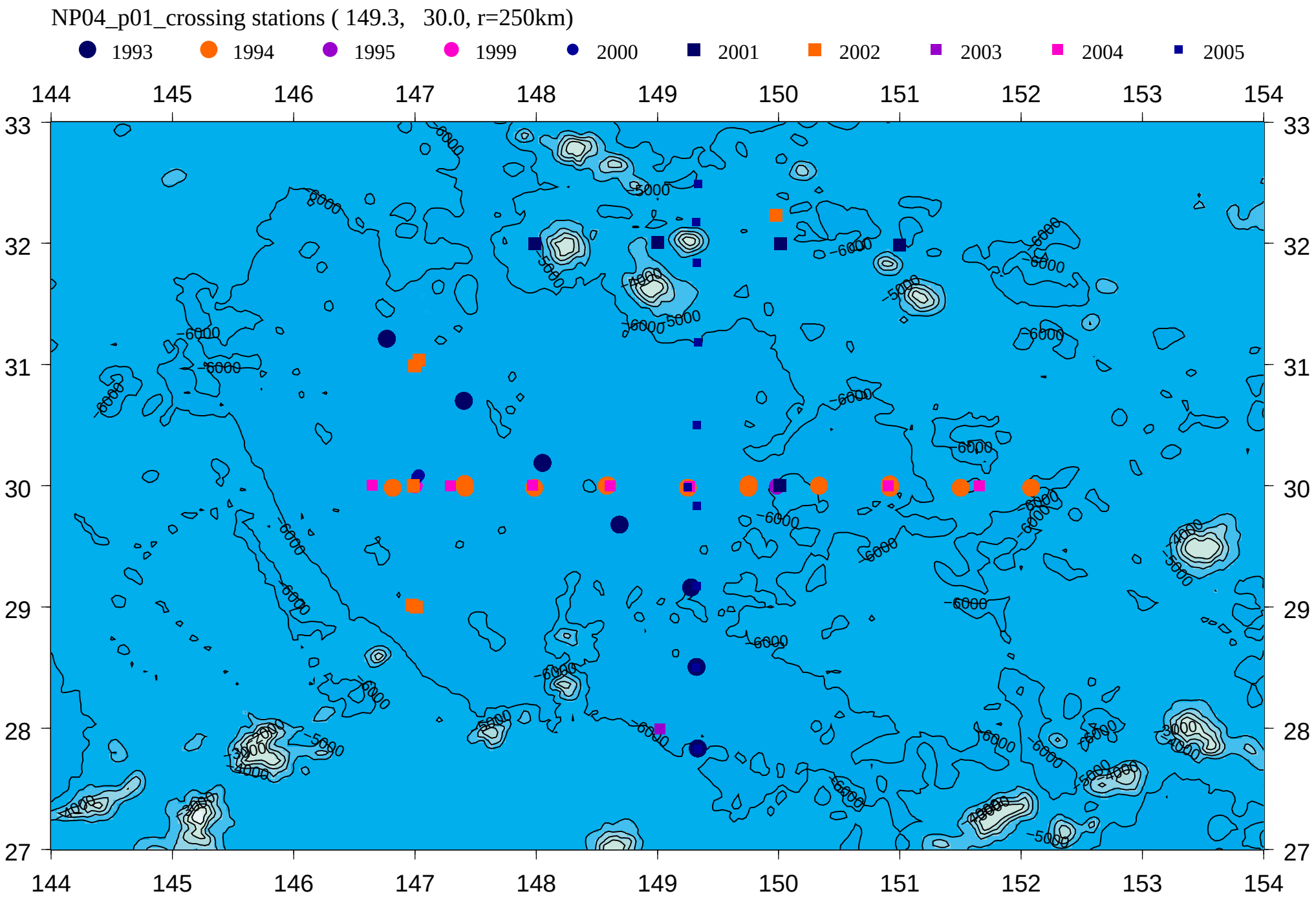

NP01_p03_crossing stations (137.0, 30.0, r=250km)
2006
2007
2008
132
133
134
135
136
137
138
139
140
141
142
33
32
31
30
29
28
27

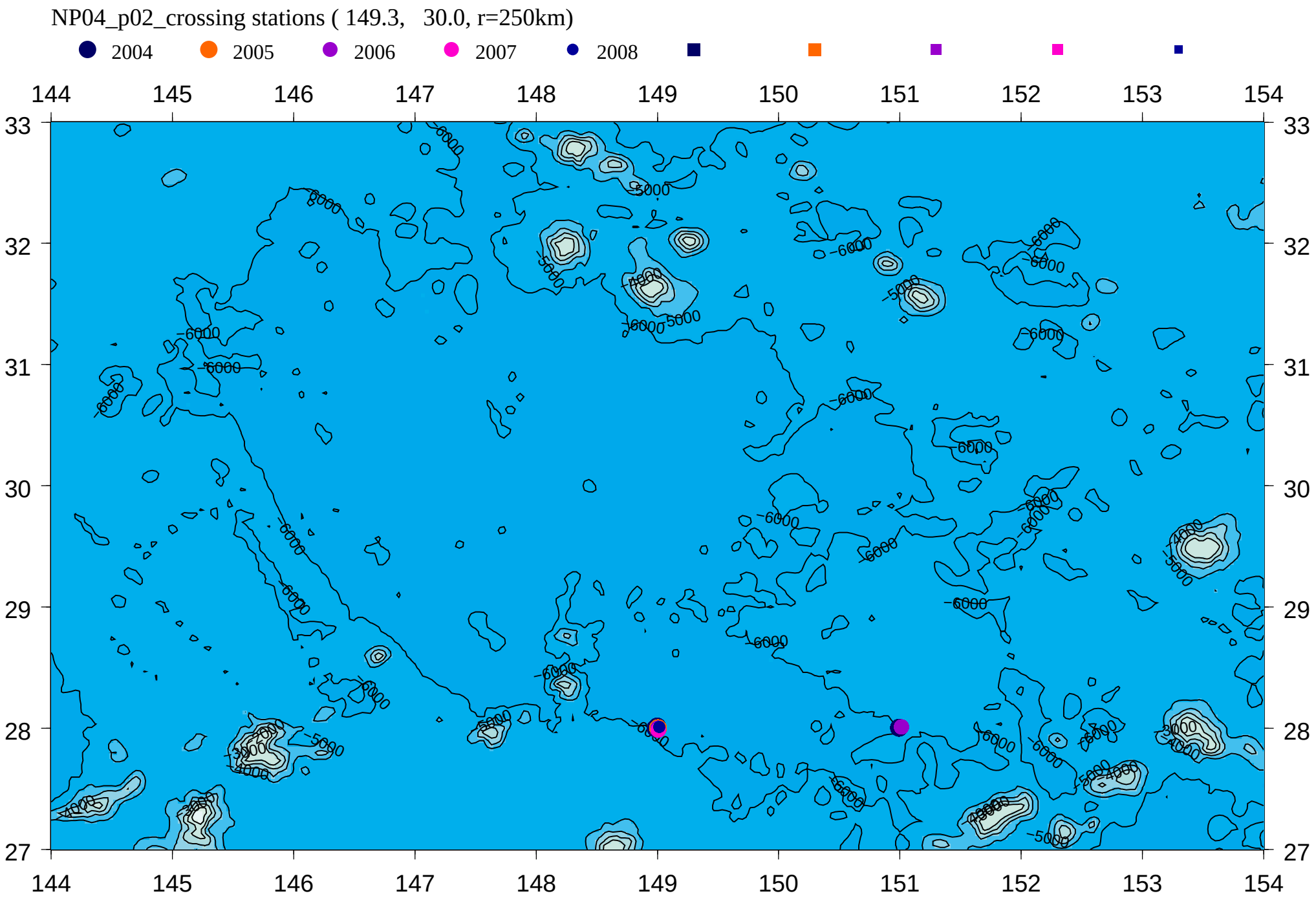

NP02_p01_crossing stations (137.0, 24.2, r=250km)
1985
1994
1995
1997
1998
2000
2001
2002
2003
2004
132
133
134
135
136
137
138
139
140
141
142
27
26
25
24
23
22
21

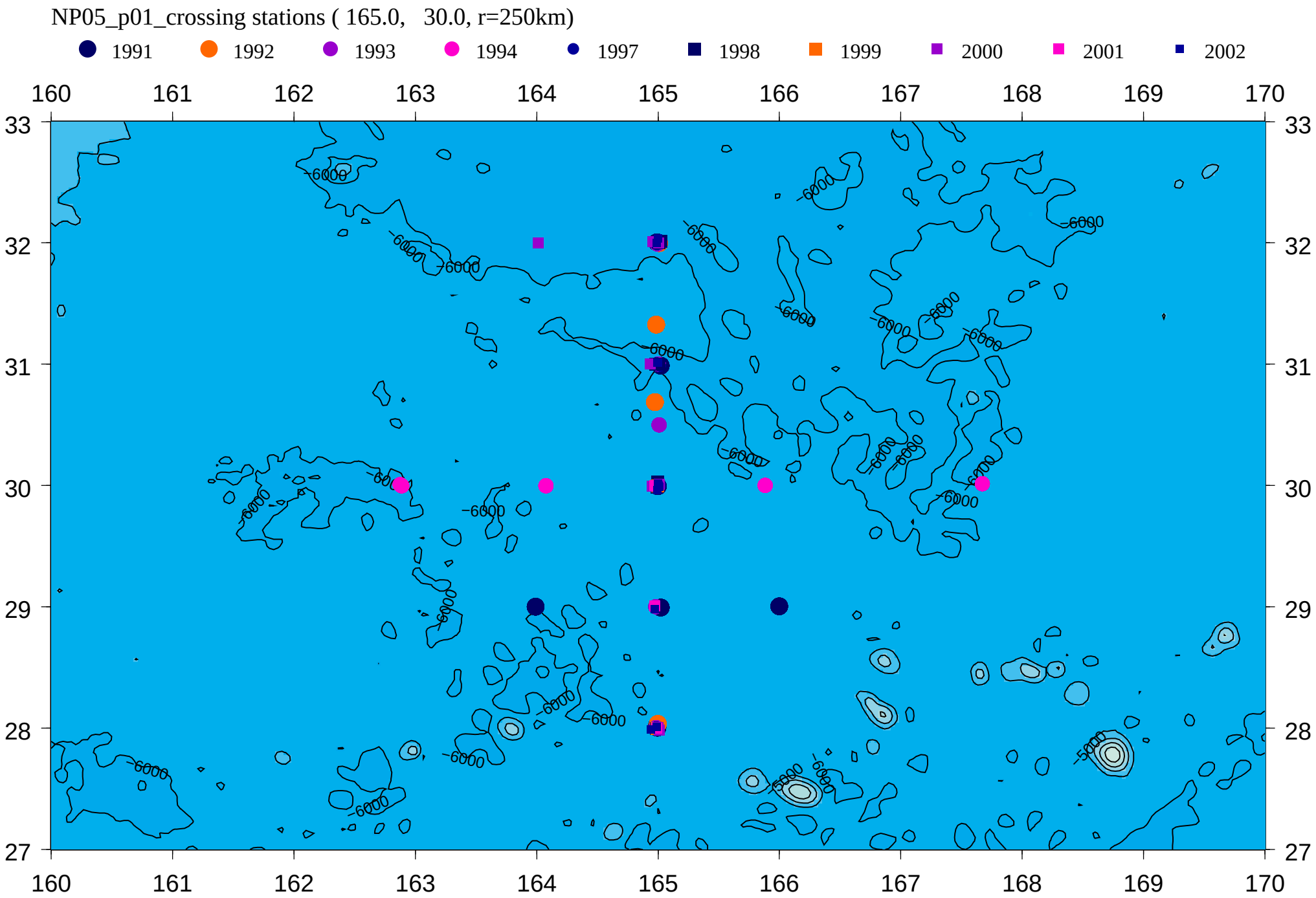

NP02_p02_crossing stations (137.0, 24.2, r=250km)
1998
1999
2000
2002
2003
2005
2006
2007
2008
132
133
134
135
136
137
138
139
140
141
142
27
26
25
24
23
22
21

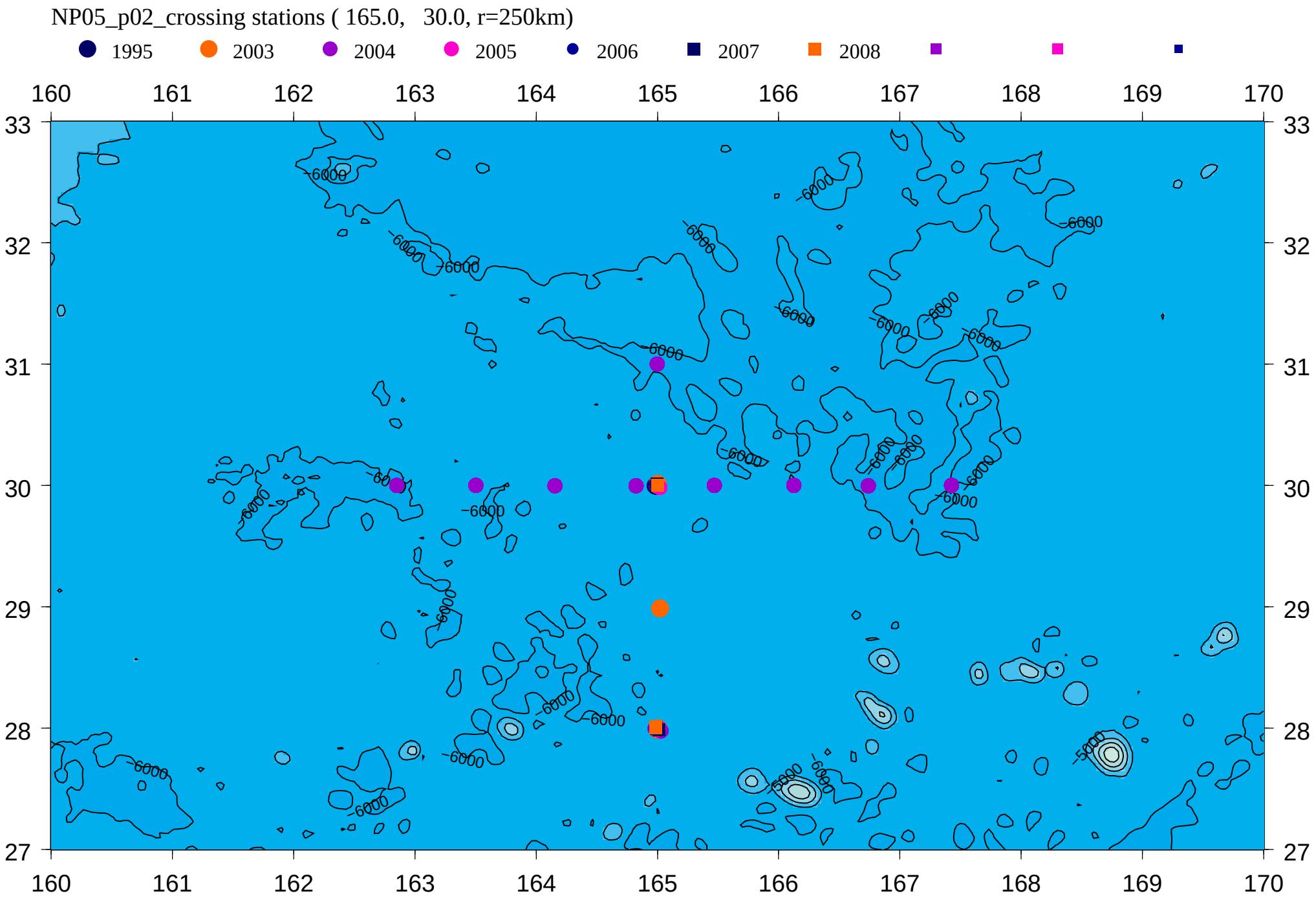

NP02_p03_crossing stations (137.0, 24.2, r=250km)
2006
132
133
134
135
136
137
138
139
140
141
142
27
26
25
24
23
22
21

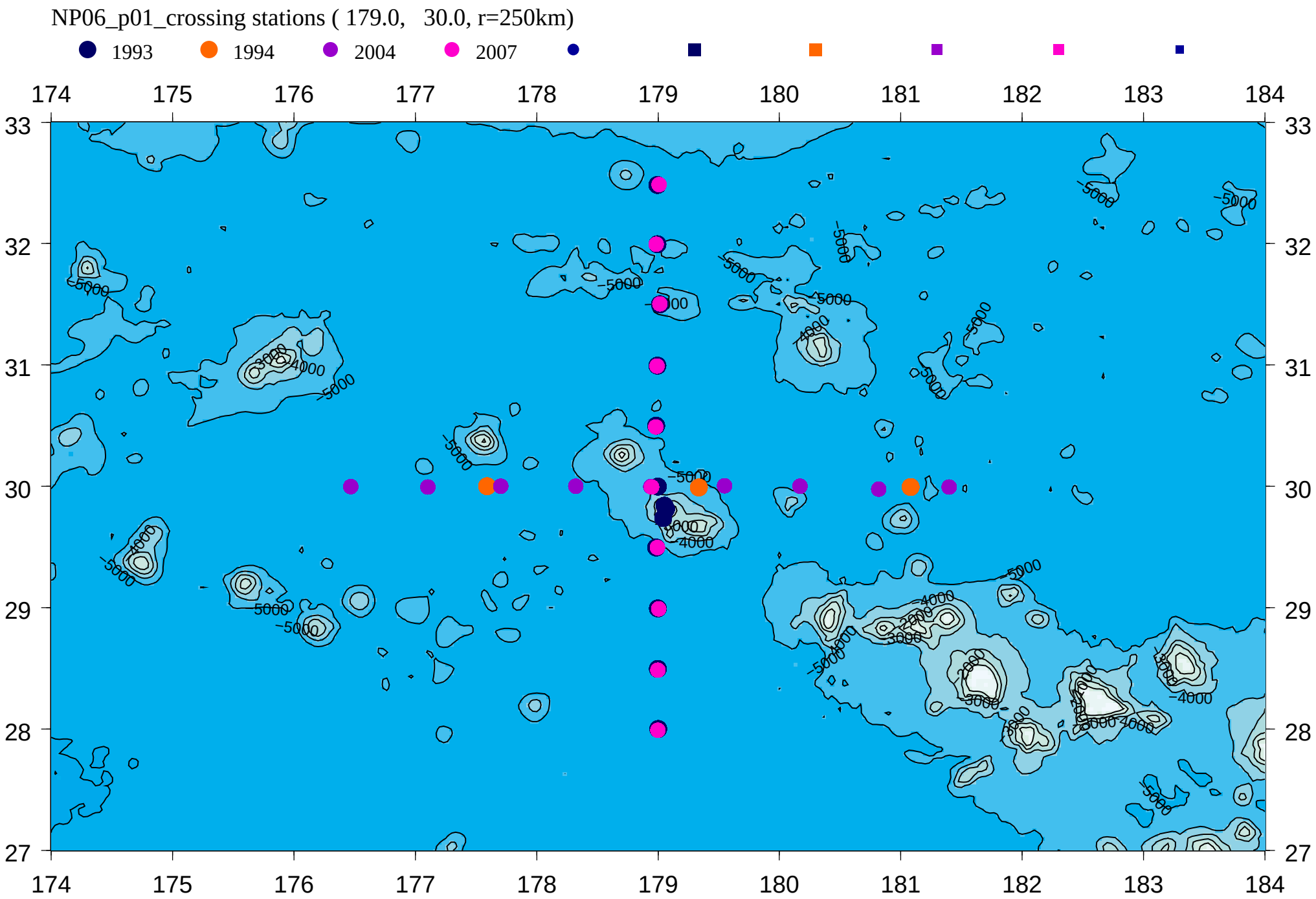

NP03_p01_crossing stations (130.0, 24.2, r=250km)
1985
1996
1997
2002
2006
125
126
127
128
129
130
131
132
133
134
135
27
26
25
24
23
22
21

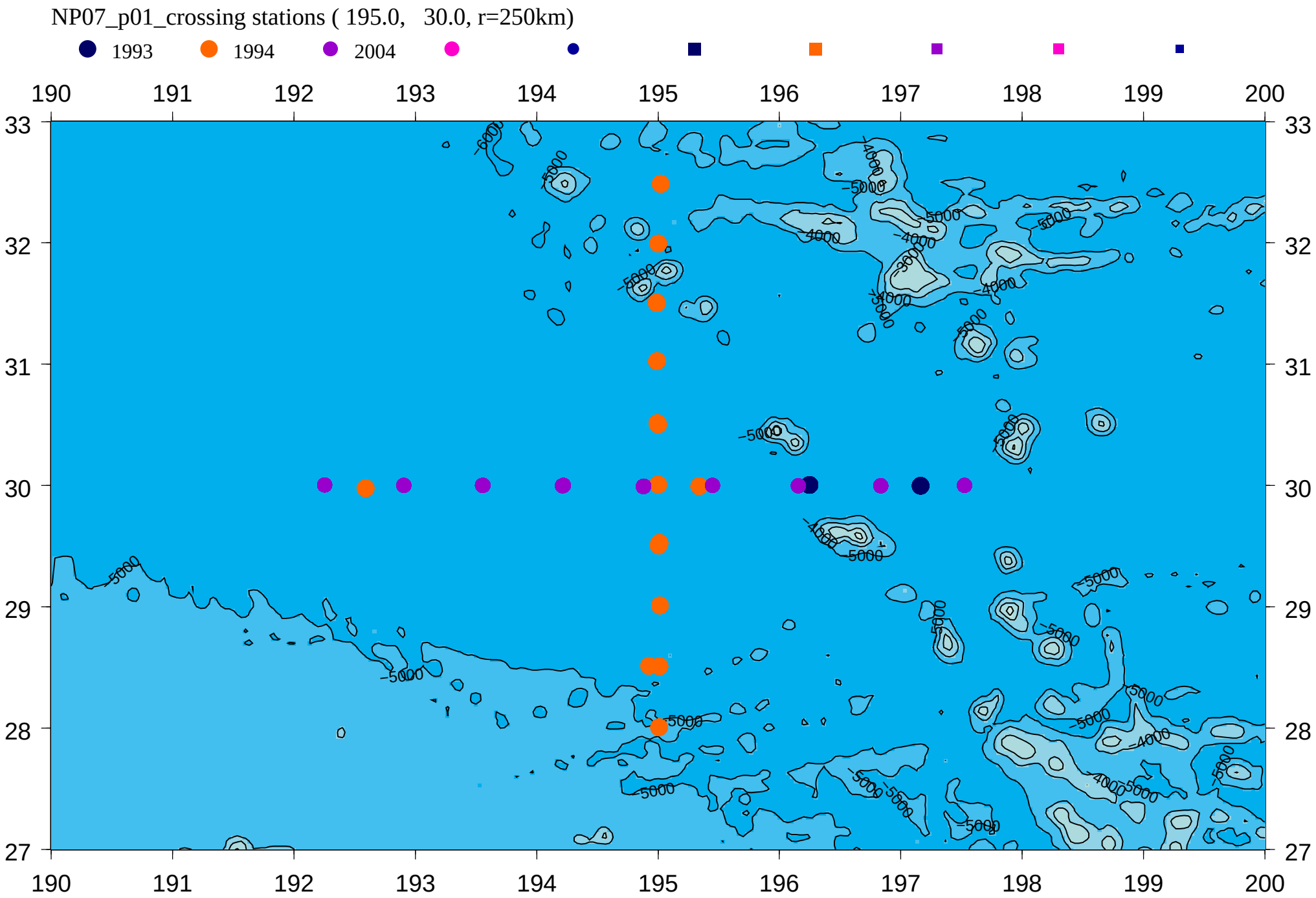

NP04_p01_crossing stations (149.3, 30.0, r=250km)
1993
1994
1995
1999
2000
2001
2002
2003
2004
2005
144
145
146
147
148
149
150
151
152
153
154
33
32
31
30
29
28
27

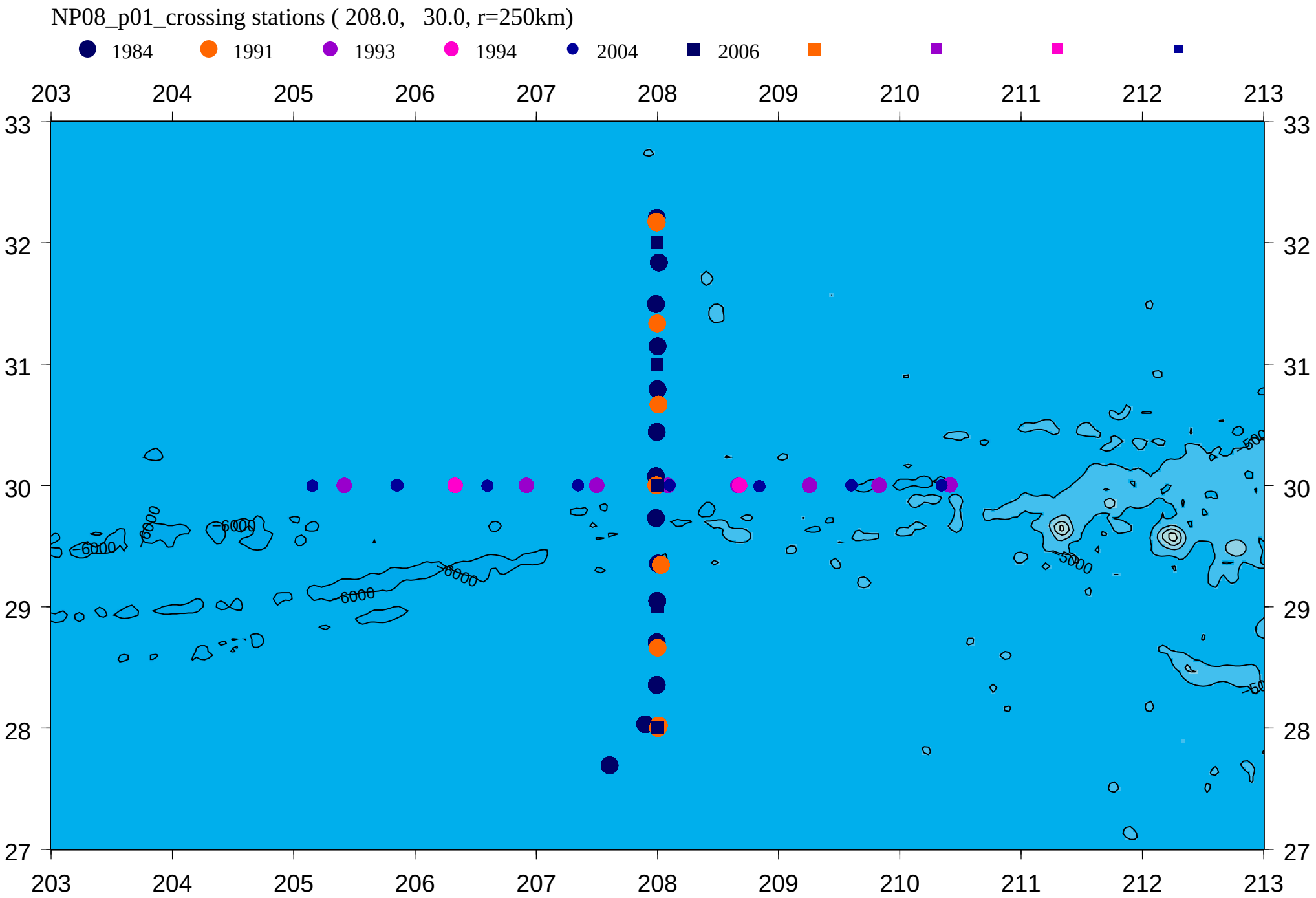

NP04_p02_crossing stations (149.3, 30.0, r=250km)
2004
2005
2006
2007
2008
144
145
146
147
148
149
150
151
152
153
154
33
32
31
30
29
28
27

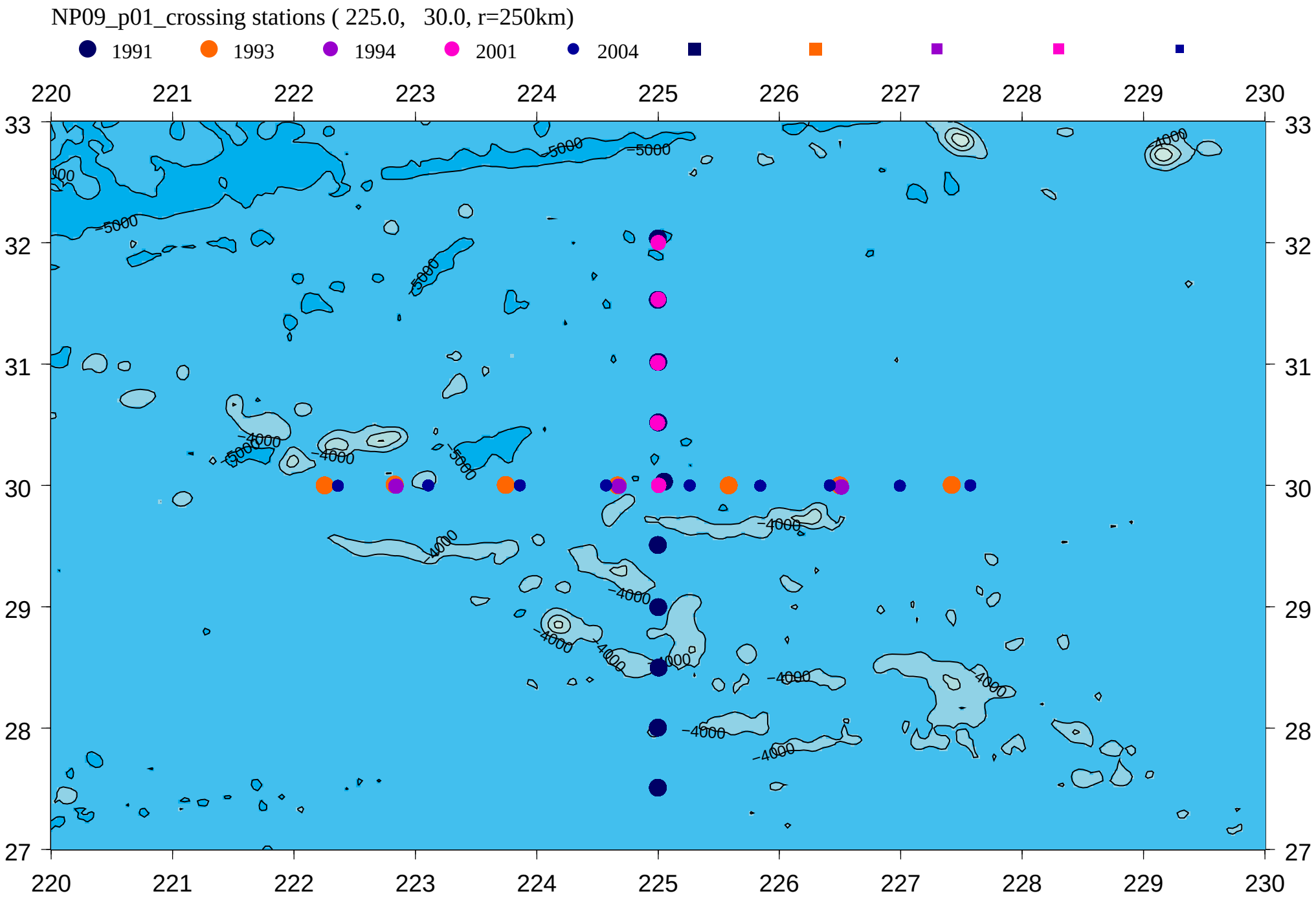

NP05_p01_crossing stations (165.0, 30.0, r=250km)
1991
1992
1993
1994
1997
1998
1999
2000
2001
2002
160
161
162
163
164
165
166
167
168
169
170
33
32
31
30
29
28
27
-6000
-5000

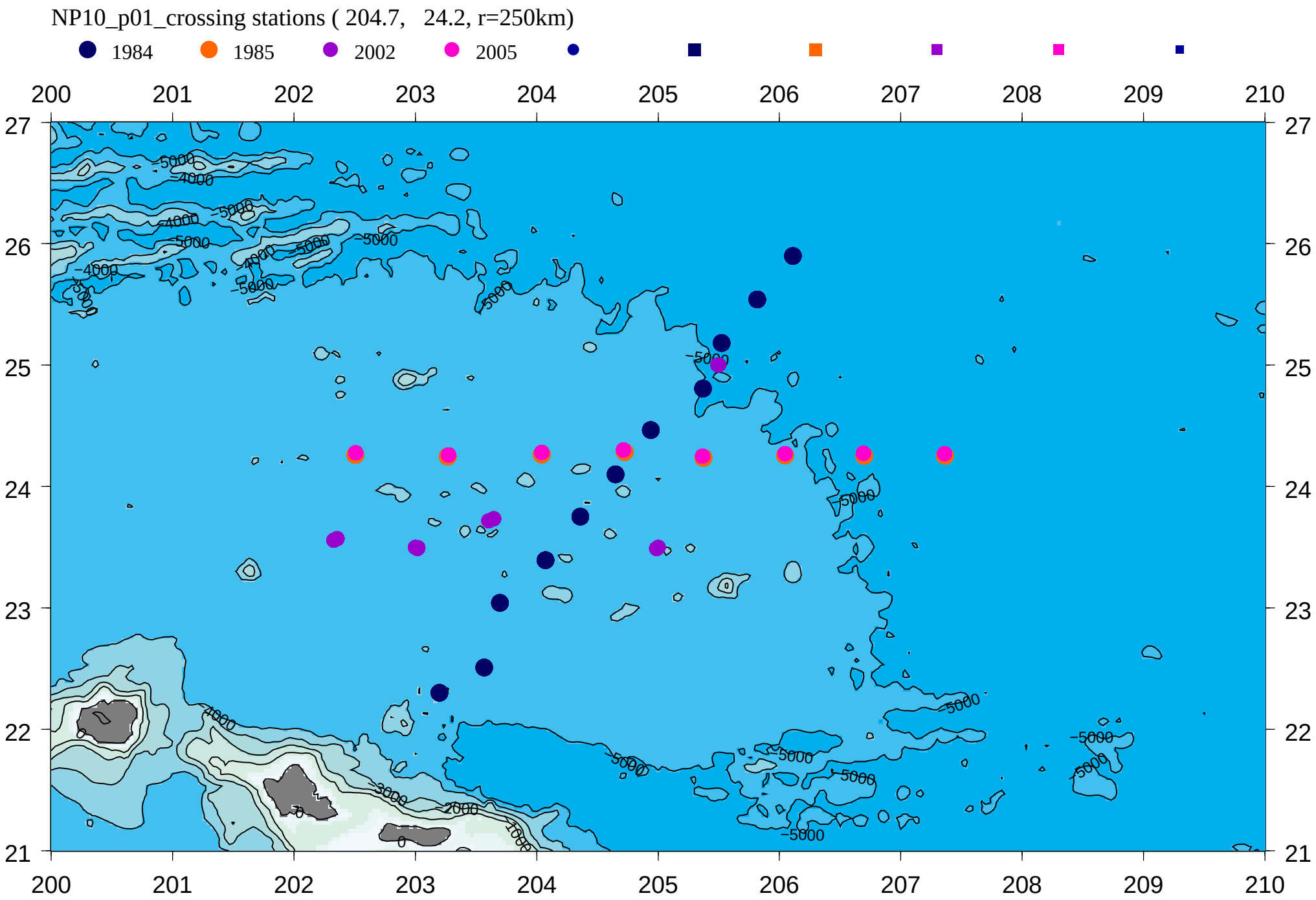

NP05_p02_crossing stations (165.0, 30.0, r=250km)
1995
2003
2004
2005
2006
2007
2008
160
161
162
163
164
165
166
167
168
169
170
33
32
31
30
29
28
27
-6000
-5000

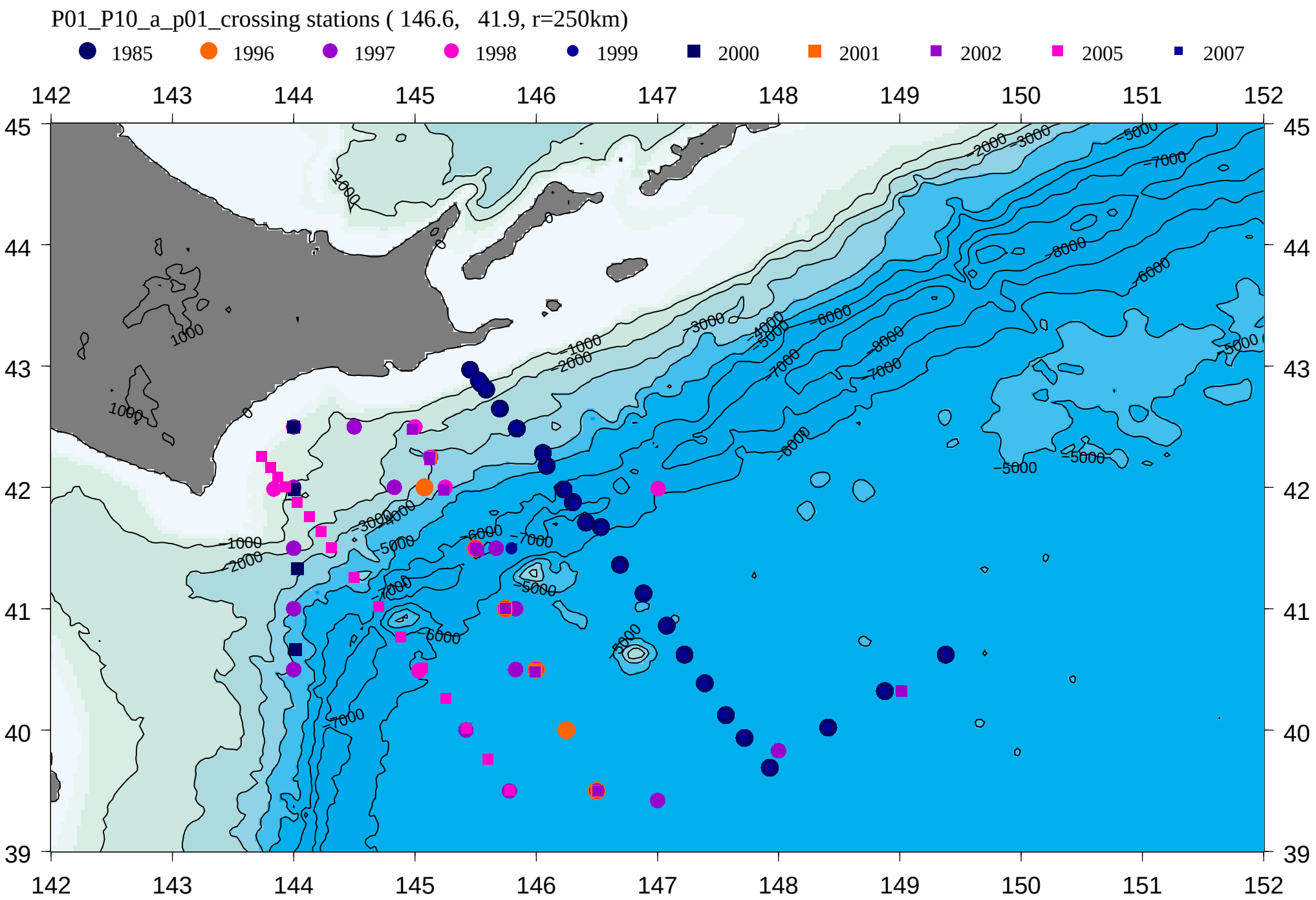

NP06_p01_crossing stations (179.0, 30.0, r=250km)
1993
1994
2004
2007
174
175
176
177
178
179
180
181
182
183
184
33
32
31
30
29
28
27

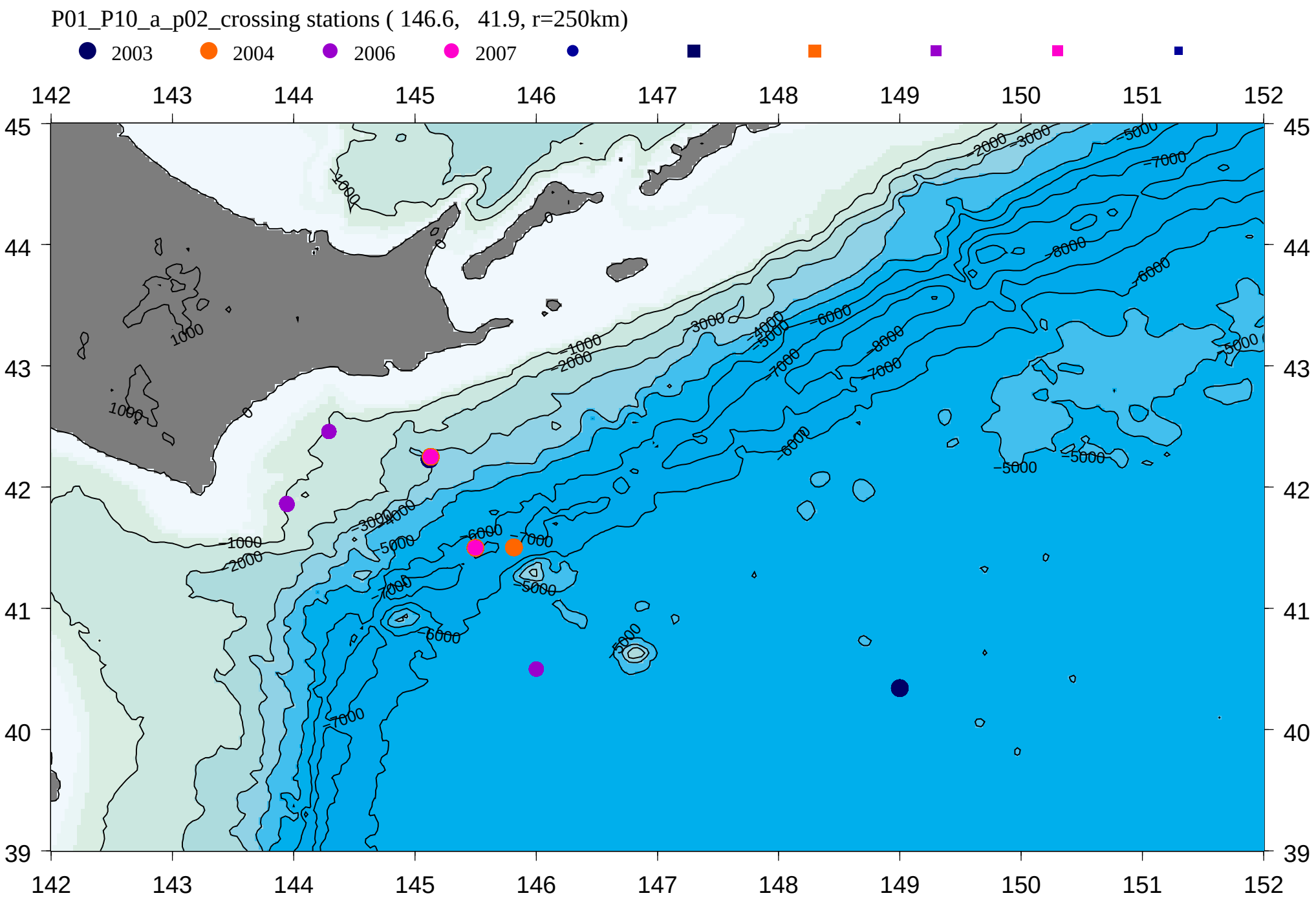

NP07_p01_crossing stations (195.0, 30.0, r=250km)
1993
1994
2004
190
191
192
193
194
195
196
197
198
199
200
33
32
31
30
29
28
27
-6000
-5000
-4000

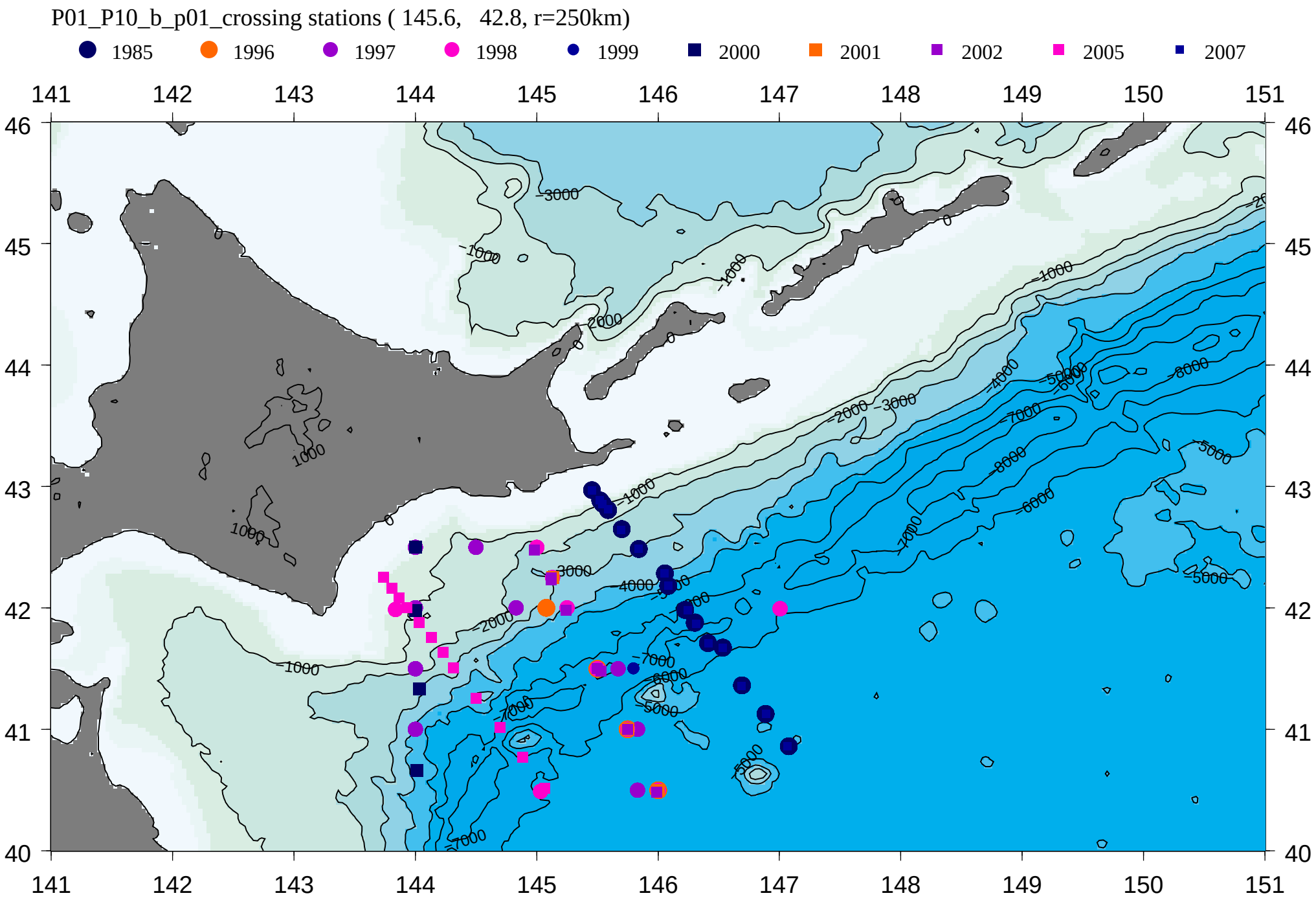

NP08_p01_crossing stations (208.0, 30.0, r=250km)
1984
1991
1993
1994
2004
2006
203
204
205
206
207
208
209
210
211
212
213
33
32
31
30
29
28
27
-6000
-5000
-500

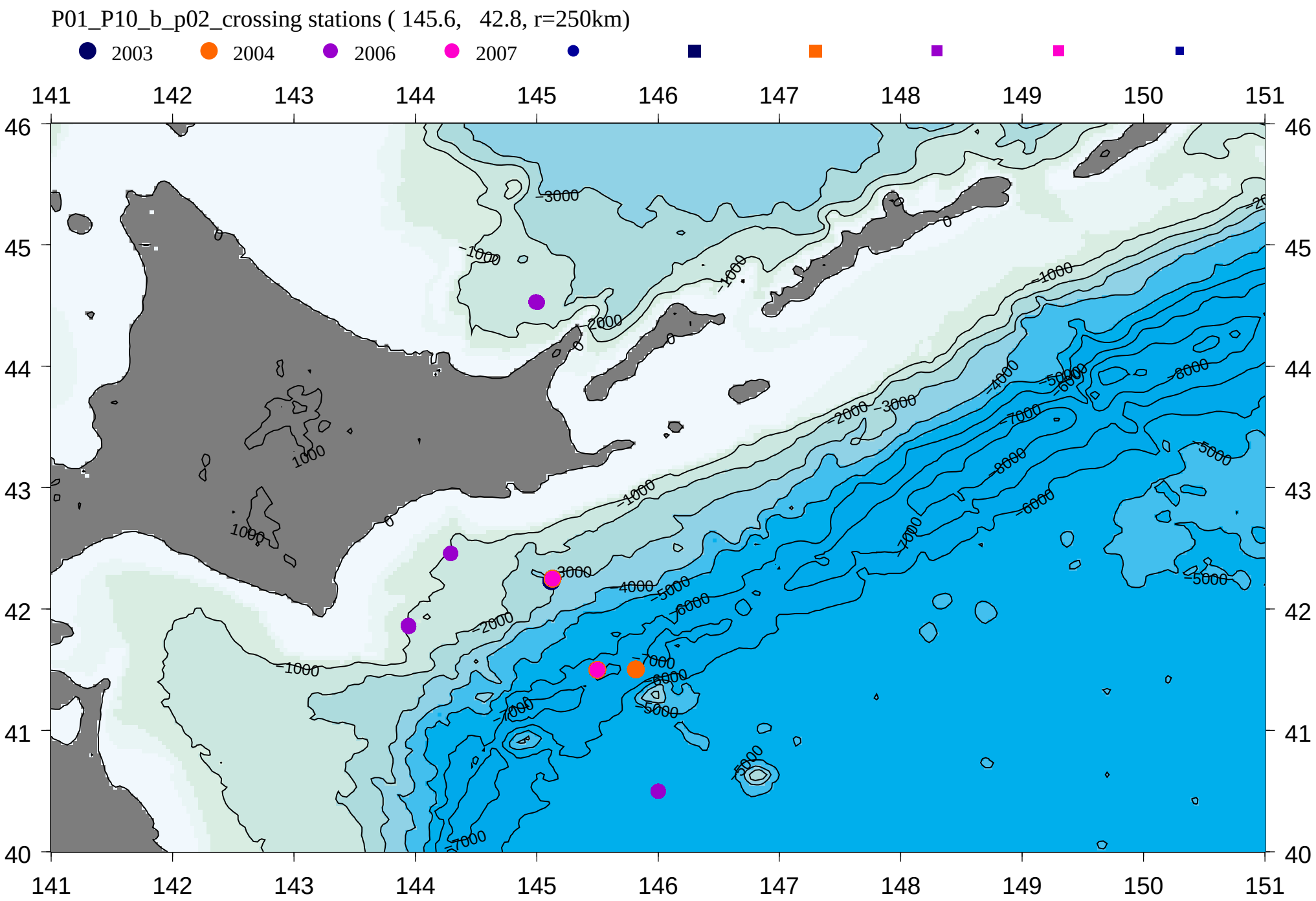

NP09_p01_crossing stations (225.0, 30.0, r=250km)
1991
1993
1994
2001
2004
220
221
222
223
224
225
226
227
228
229
230
33
32
31
30
29
28
27
-5000
-4000

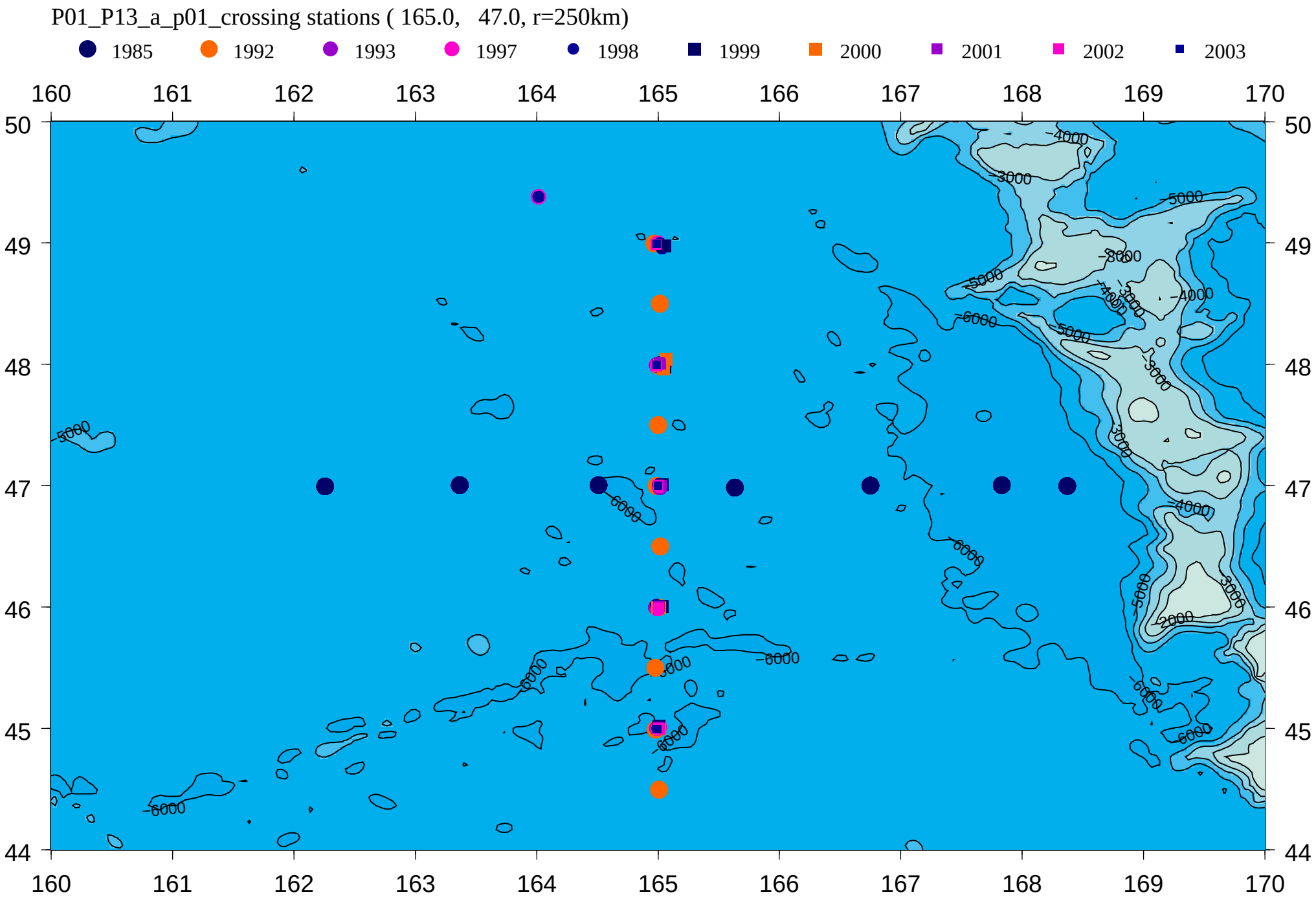

NP10_p01_crossing stations (204.7, 24.2, r=250km)
1984
1985
2002
2005
200
201
202
203
204
205
206
207
208
209
210
27
26
25
24
23
22
21
-5000
-4000
-3000
-2000
-1000
0

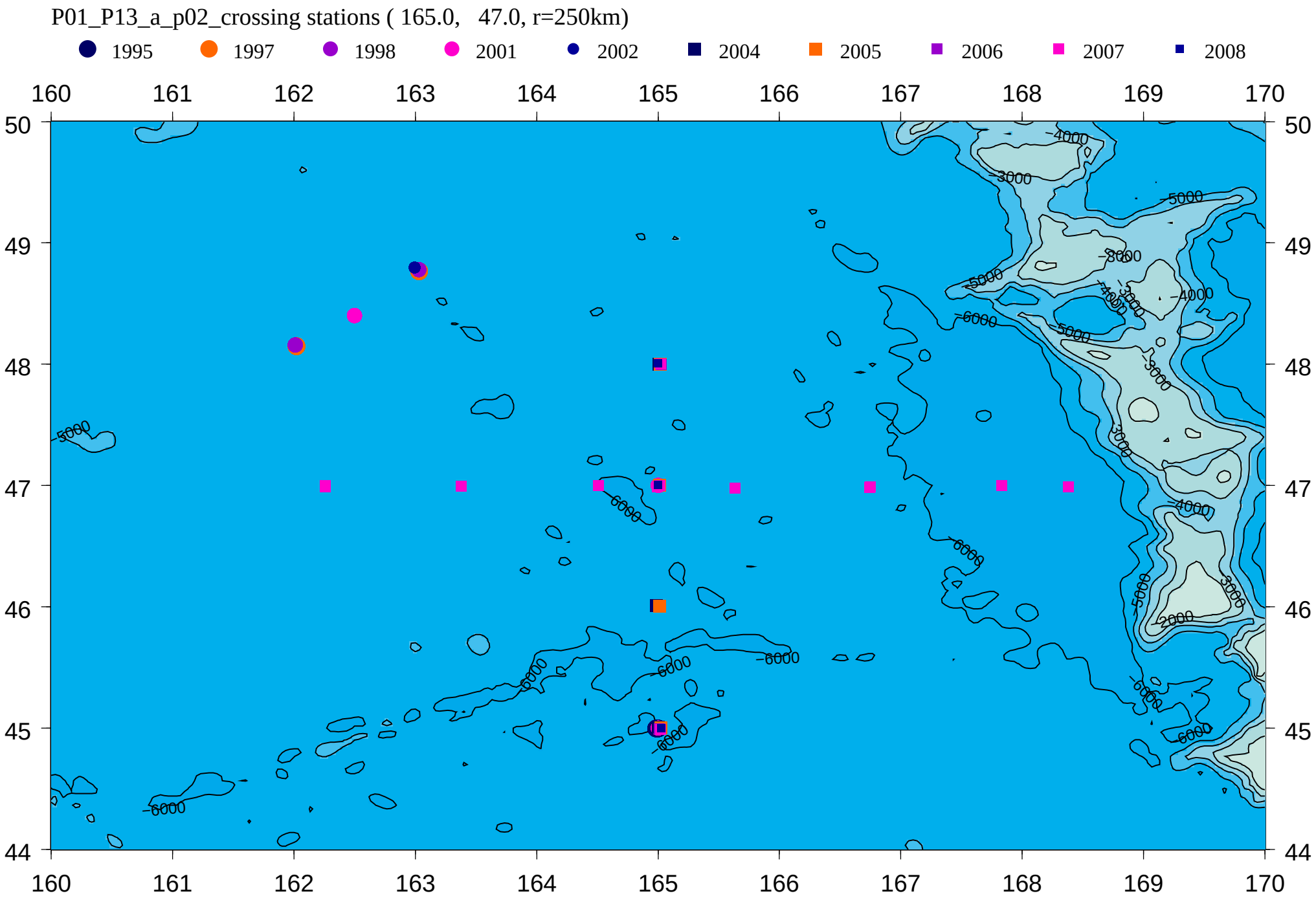

P01_P10_a_p01_crossing stations (146.6, 41.9, r=250km)
1985
1996
1997
1998
1999
2000
2001
2002
2005
2007
142
143
144
145
146
147
148
149
150
151
152
45
44
43
42
41
40
39

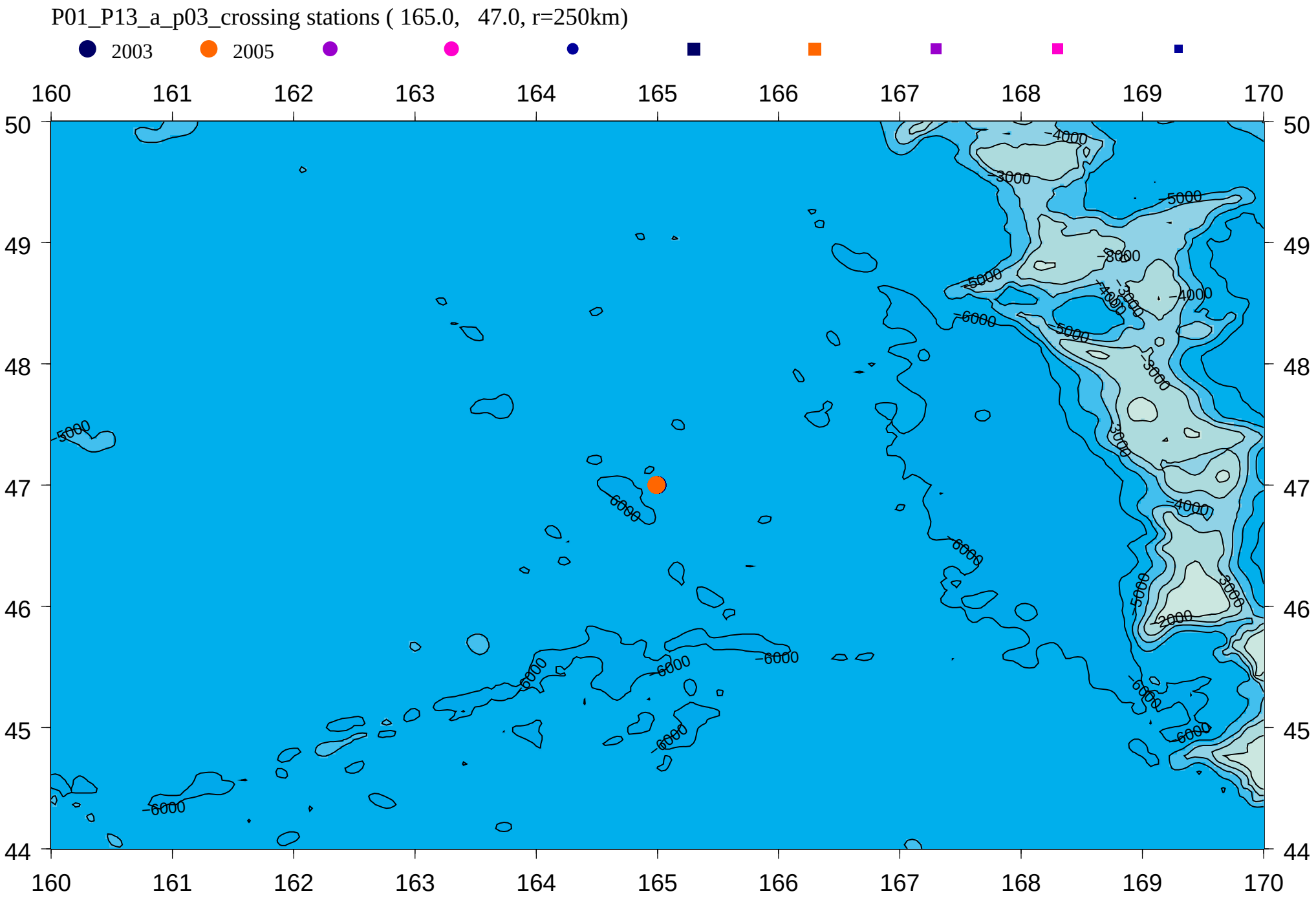

P01_P10_a_p02_crossing stations (146.6, 41.9, r=250km)
2003
2004
2006
2007
142
143
144
145
146
147
148
149
150
151
152
45
44
43
42
41
40
39
1000
2000
3000
4000
5000
6000
7000
8000
0

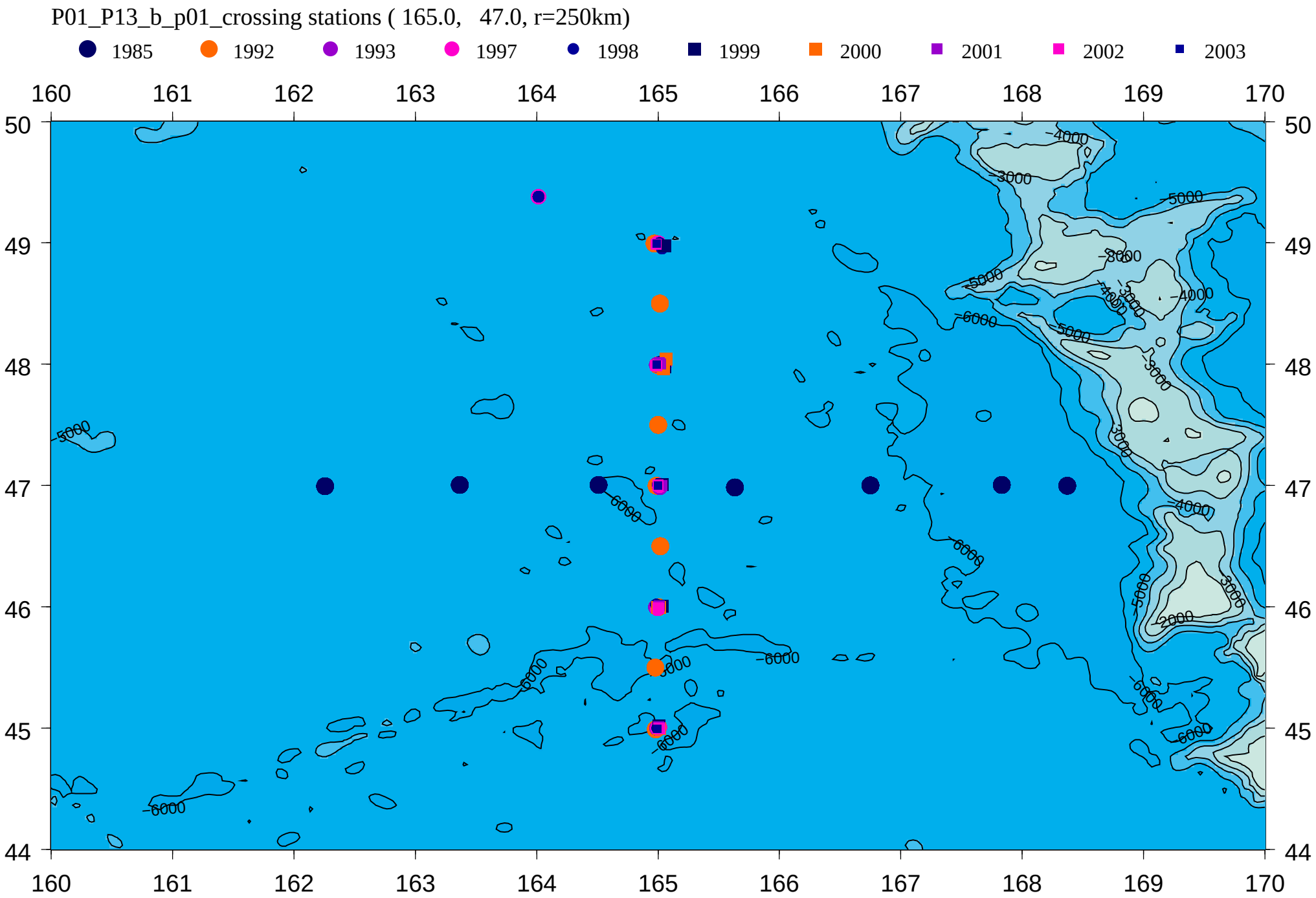

P01_P10_b_p01_crossing stations (145.6, 42.8, r=250km)
1985
1996
1997
1998
1999
2000
2001
2002
2005
2007
141
142
143
144
145
146
147
148
149
150
151
46
45
44
43
42
41
40
0
1000
2000
3000
4000
5000
6000
7000
8000

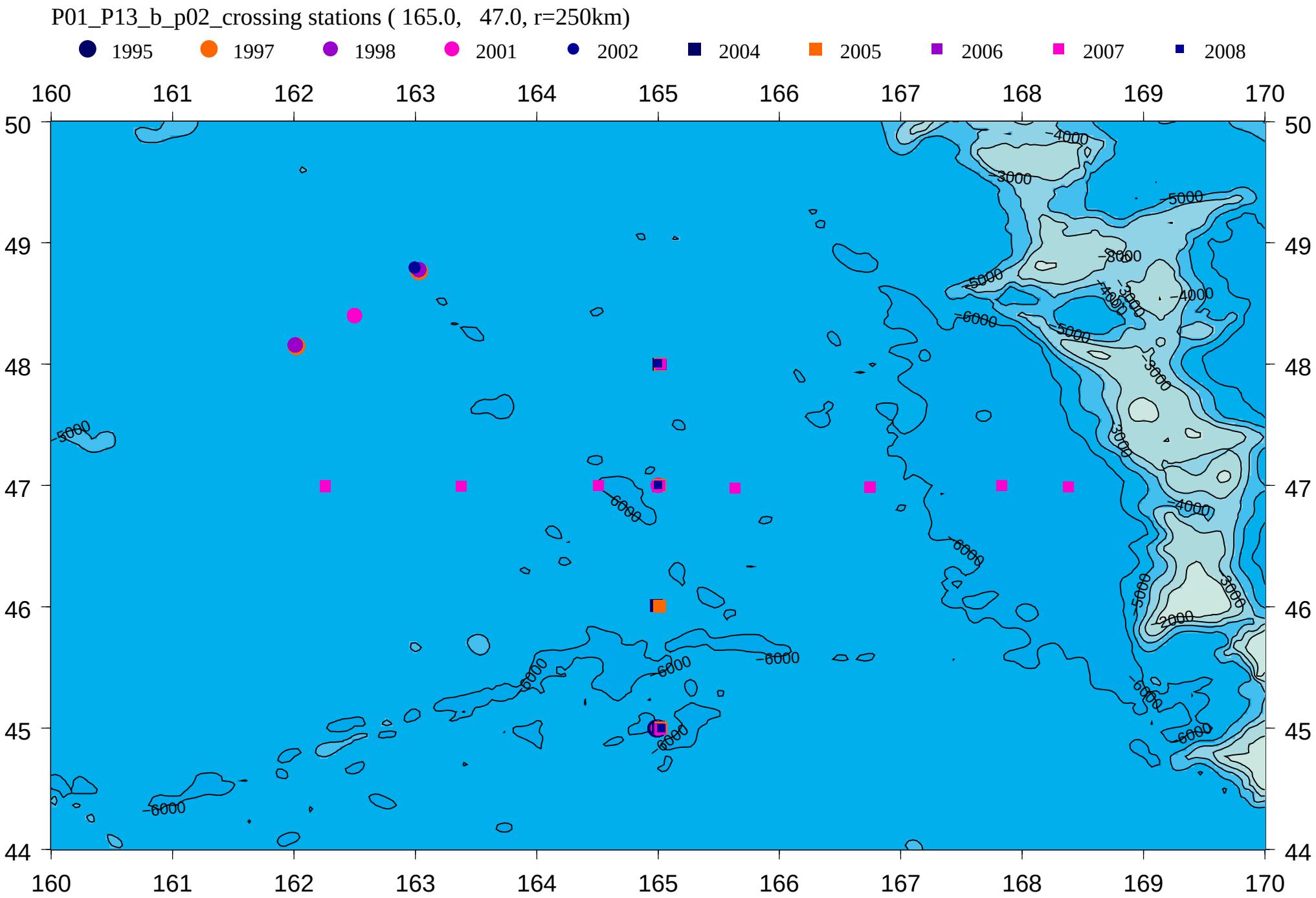

P01_P10_b_p02_crossing stations (145.6, 42.8, r=250km)
2003
2004
2006
2007
141
142
143
144
145
146
147
148
149
150
151
46
45
44
43
42
41
40
0
1000
2000
3000
4000
5000
6000
7000
8000

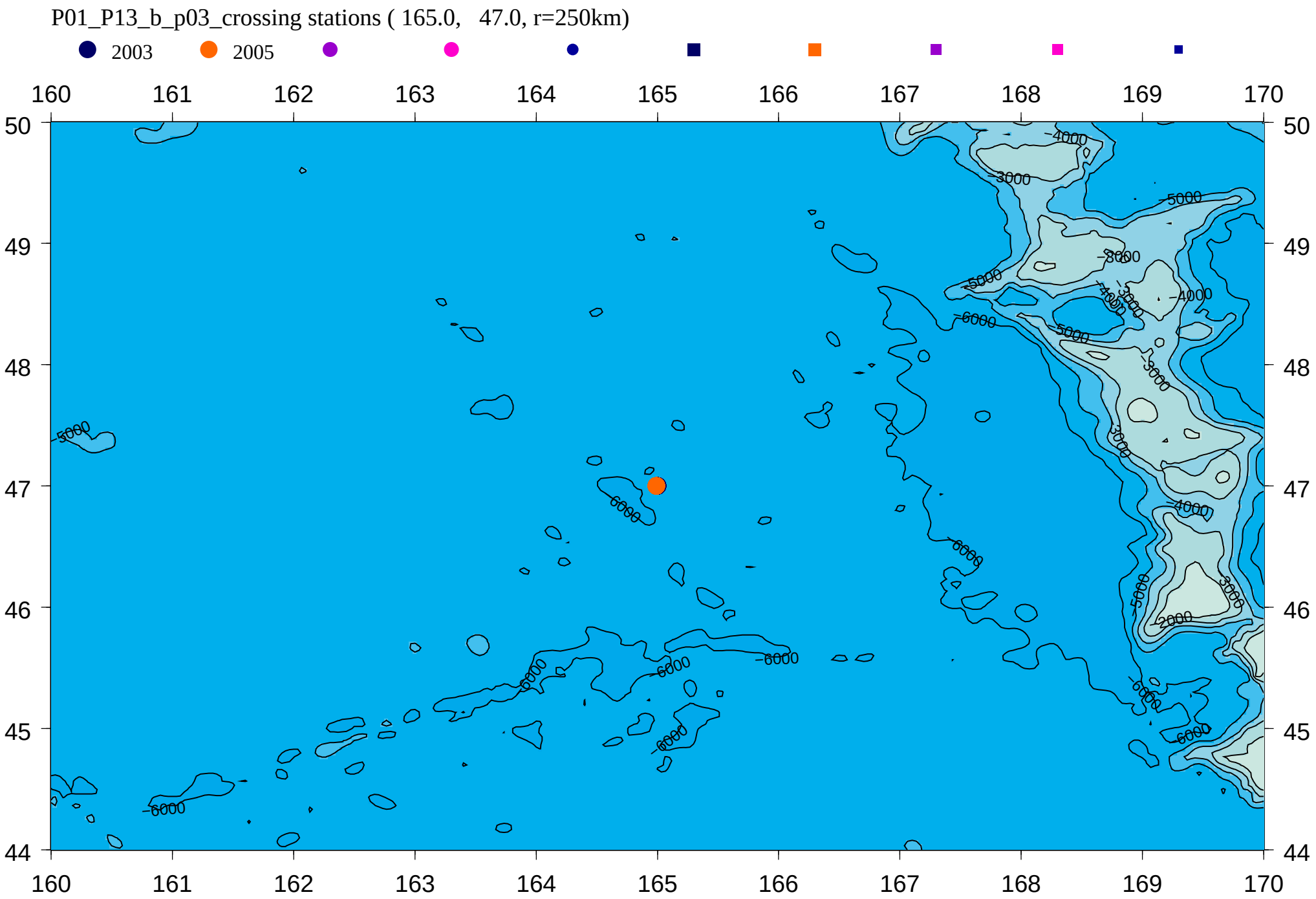

P01_P13_a_p01_crossing stations (165.0, 47.0, r=250km)
1985
1992
1993
1997
1998
1999
2000
2001
2002
2003
160
161
162
163
164
165
166
167
168
169
170
50
49
48
47
46
45
44
-6000
-5000
-4000
-3000
-2000

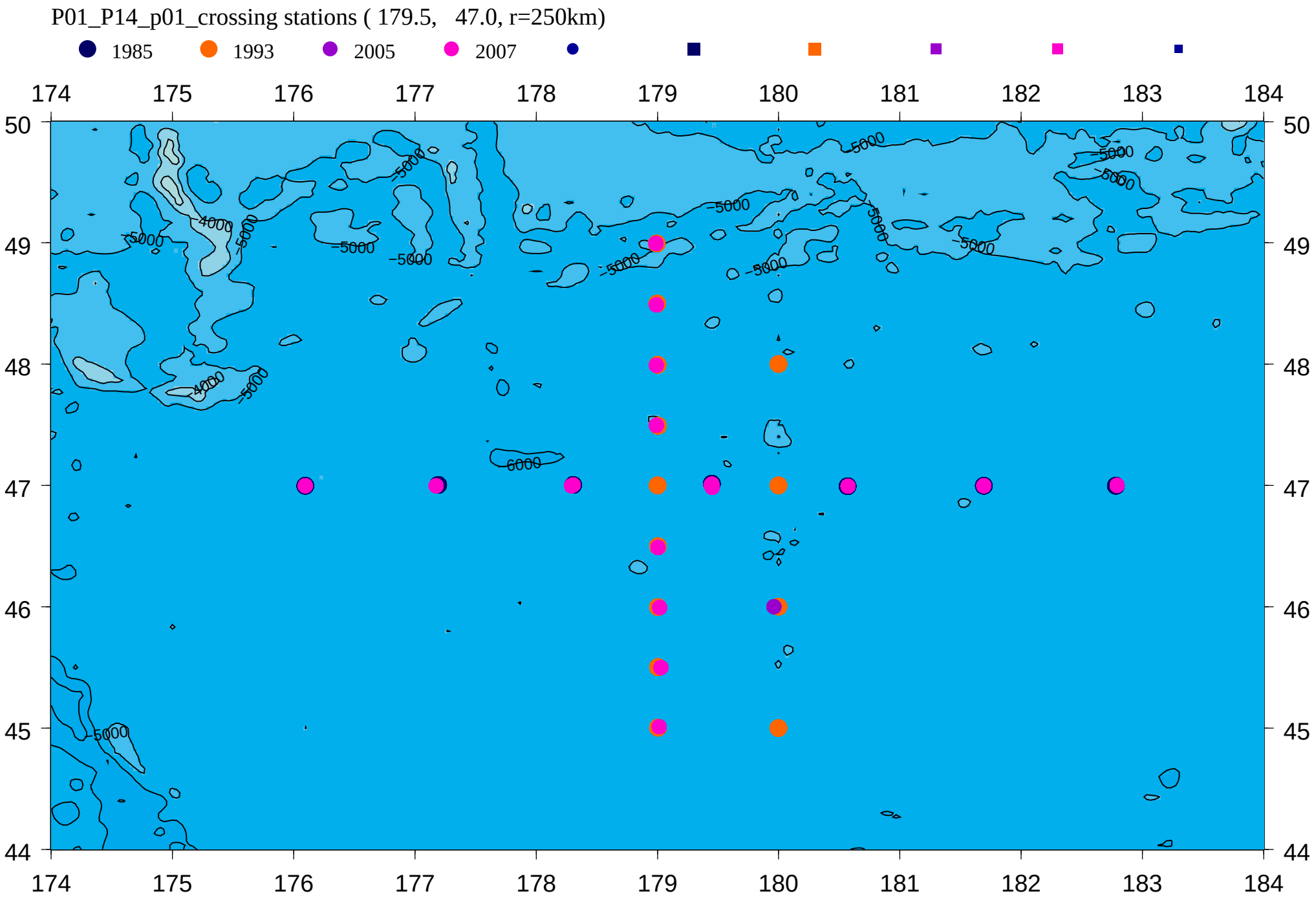

P01_P13_a_p02_crossing stations (165.0, 47.0, r=250km)
1995
1997
1998
2001
2002
2004
2005
2006
2007
2008
160
161
162
163
164
165
166
167
168
169
170
50
49
48
47
46
45
44
-6000
-5000
-4000
-3000
-2000

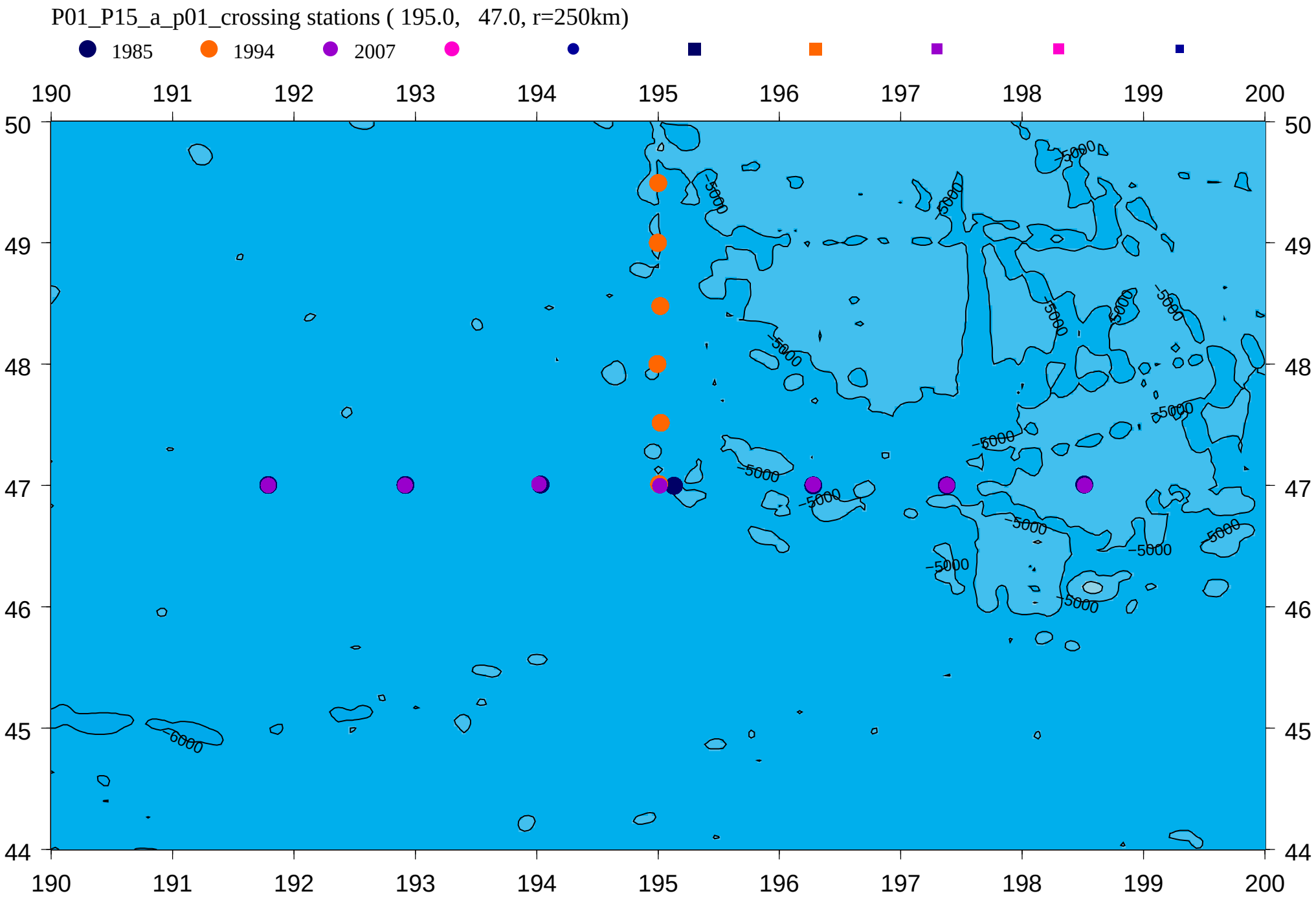

P01_P13_a_p03_crossing stations (165.0, 47.0, r=250km)
2003
2005
160
161
162
163
164
165
166
167
168
169
170
50
49
48
47
46
45
44
-2000
-3000
-4000
-5000
-6000

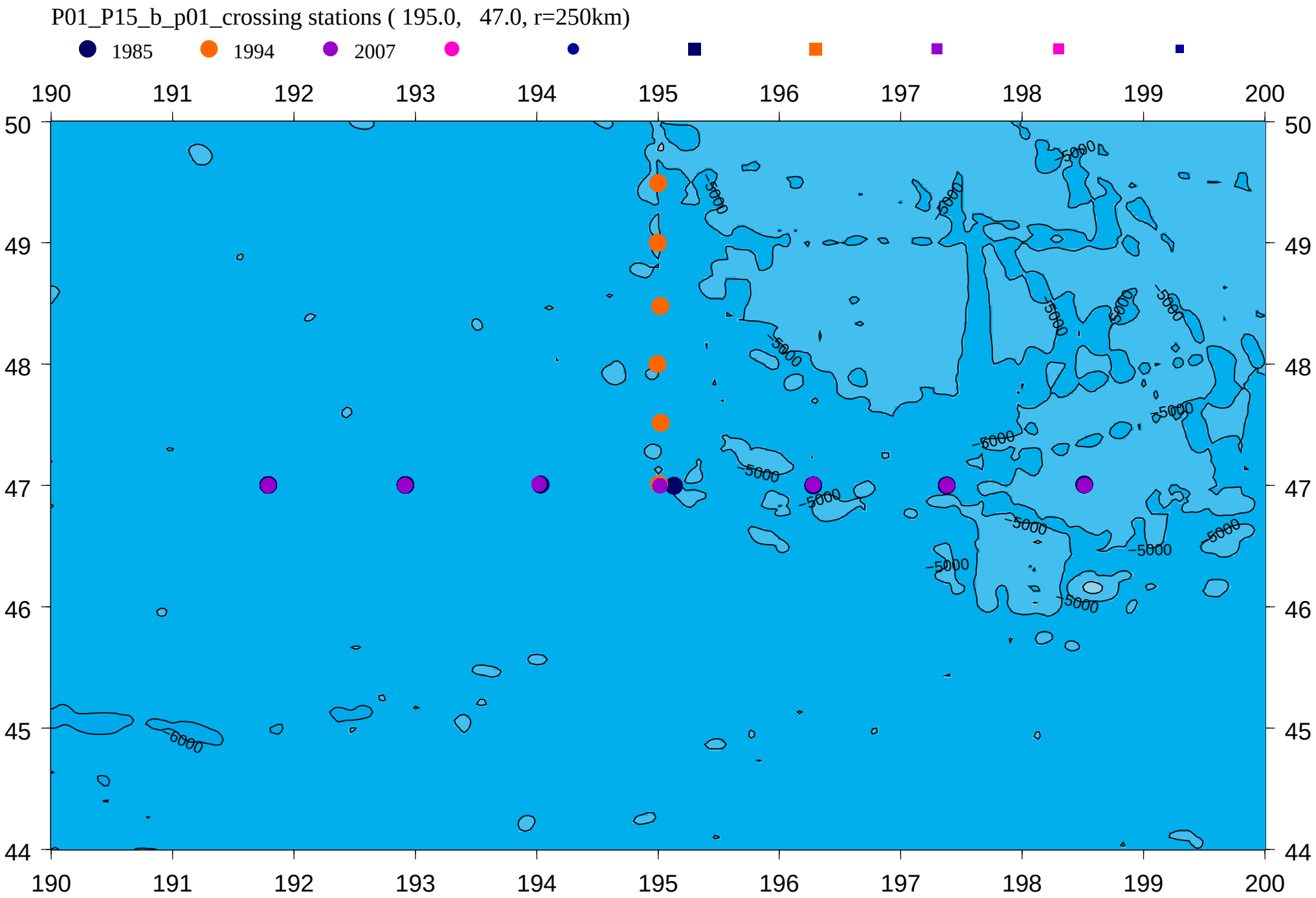

P01_P13_b_p01_crossing stations (165.0, 47.0, r=250km)
1985
1992
1993
1997
1998
1999
2000
2001
2002
2003
160
161
162
163
164
165
166
167
168
169
170
50
49
48
47
46
45
44
-6000
-5000
-4000
-3000
-2000

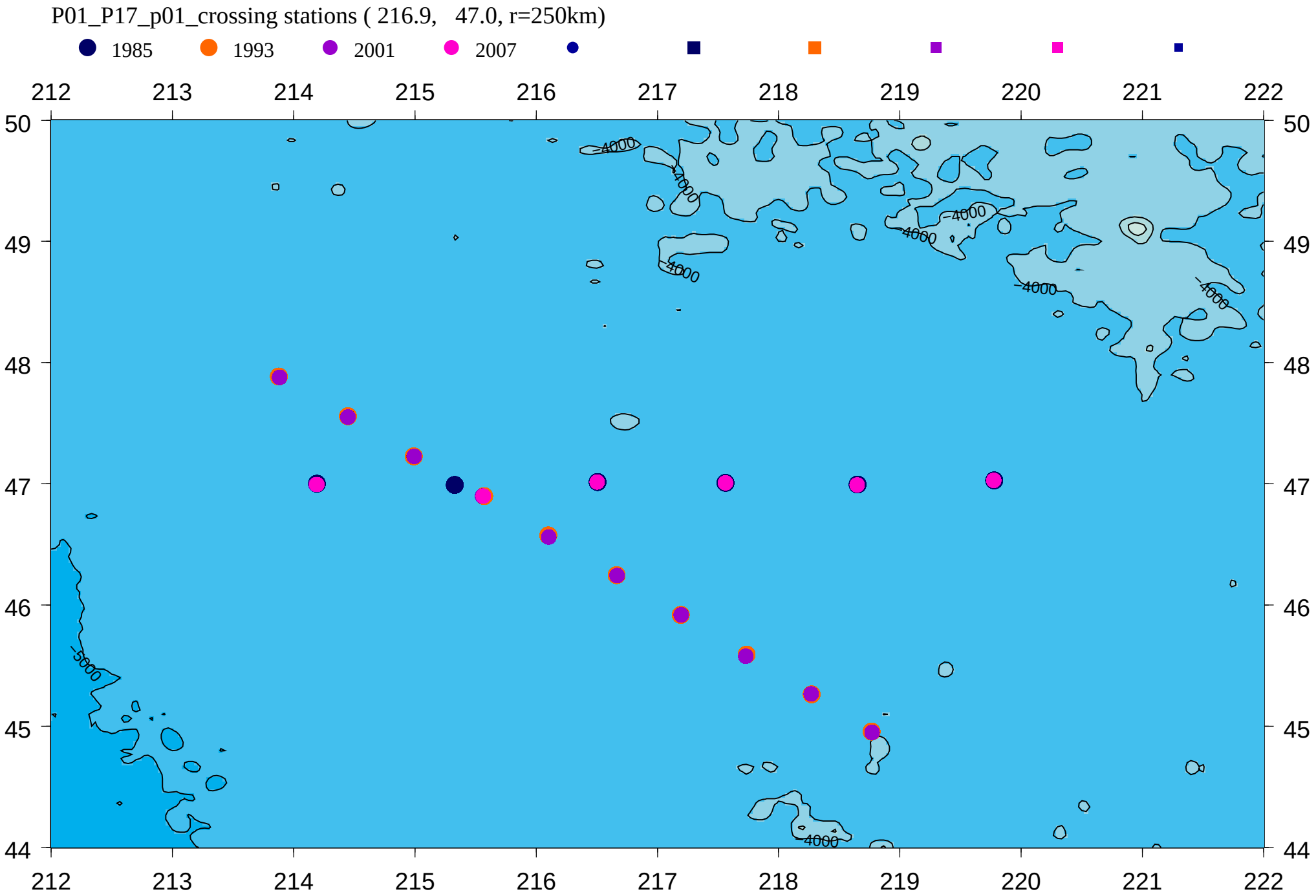

P01_P13_b_p02_crossing stations (165.0, 47.0, r=250km)
1995
1997
1998
2001
2002
2004
2005
2006
2007
2008
160
161
162
163
164
165
166
167
168
169
170
50
49
48
47
46
45
44
-6000
-5000
-4000
-3000
-2000

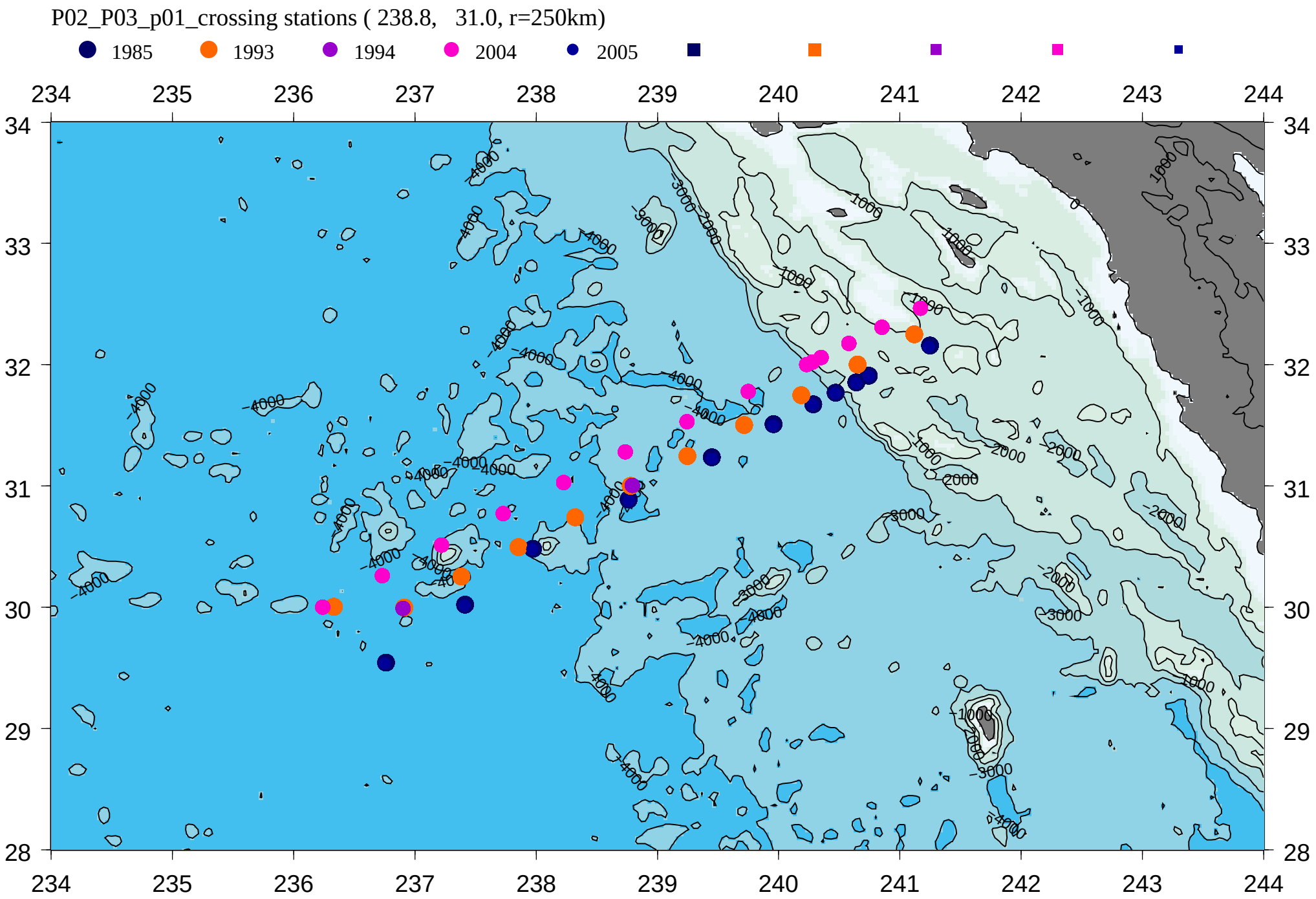

P01_P13_b_p03_crossing stations (165.0, 47.0, r=250km)
2003
2005
160
161
162
163
164
165
166
167
168
169
170
50
49
48
47
46
45
44
-6000
-5000
-4000
-3000
-2000

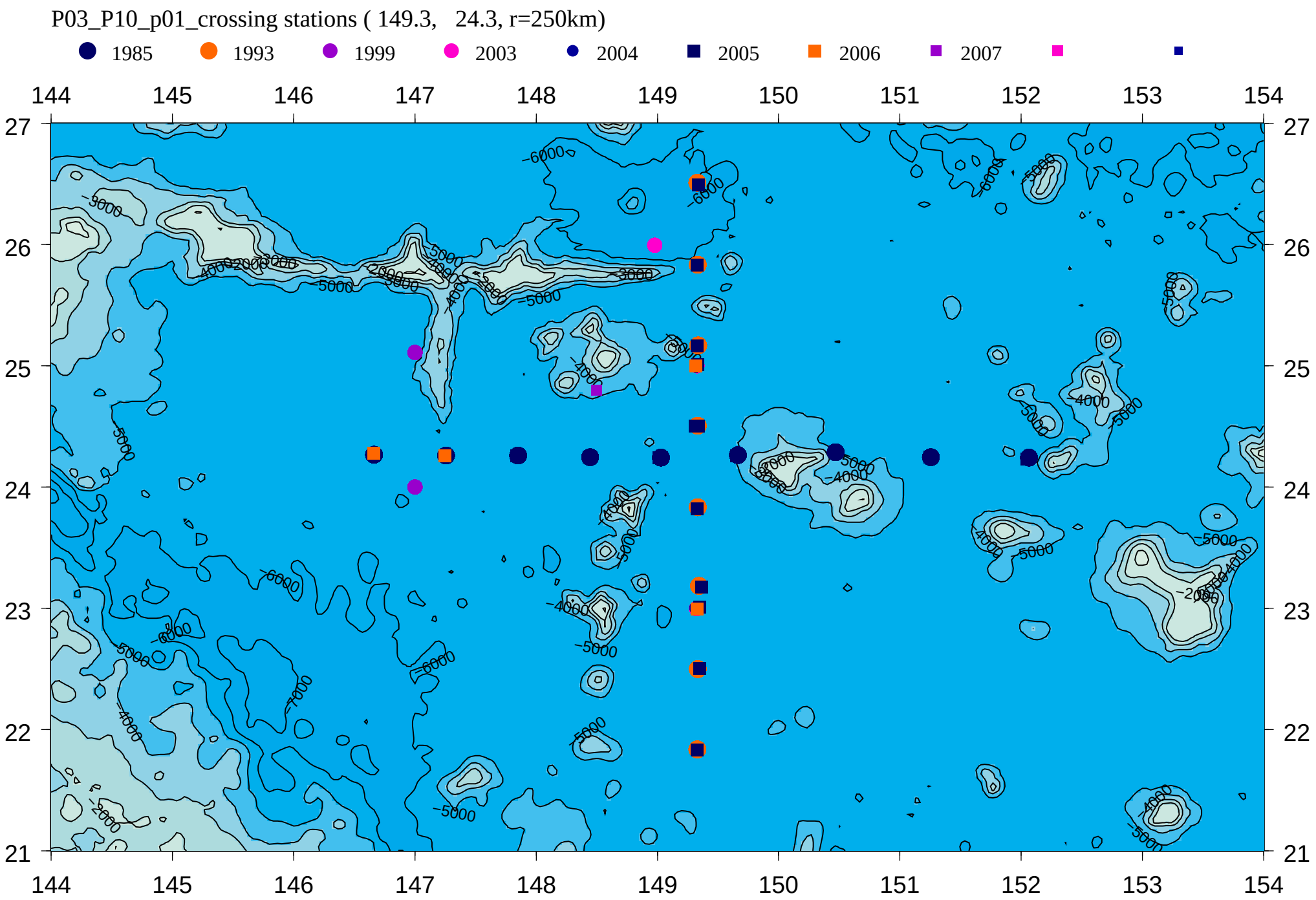

P01_P14_p01_crossing stations (179.5, 47.0, r=250km)
1985
1993
2005
2007
174
175
176
177
178
179
180
181
182
183
184
50
49
48
47
46
45
44
-5000
-4000
-6000

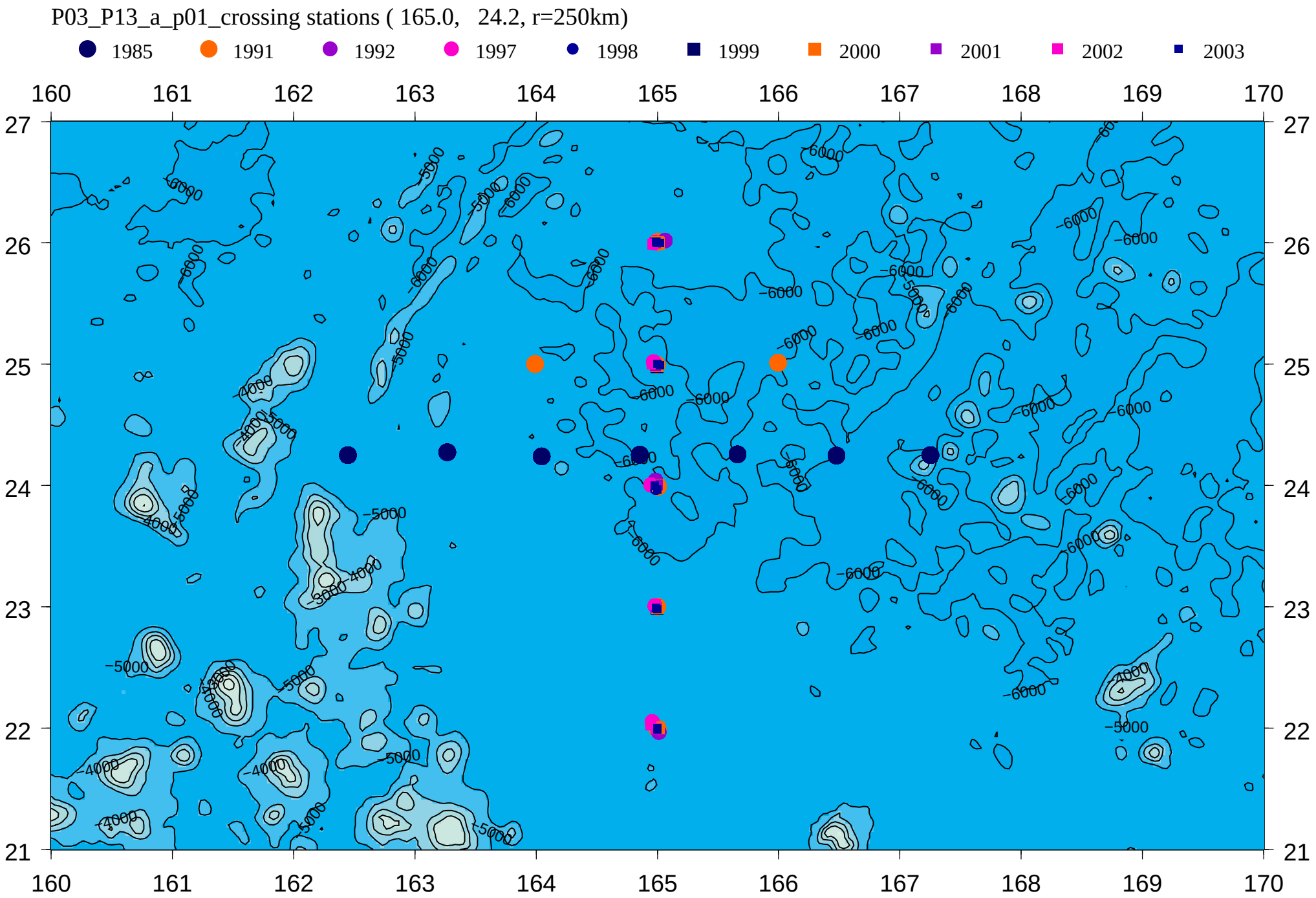

P01_P15_a_p01_crossing stations (195.0, 47.0, r=250km)
1985
1994
2007
190
191
192
193
194
195
196
197
198
199
200
50
49
48
47
46
45
44
-5000
-6000

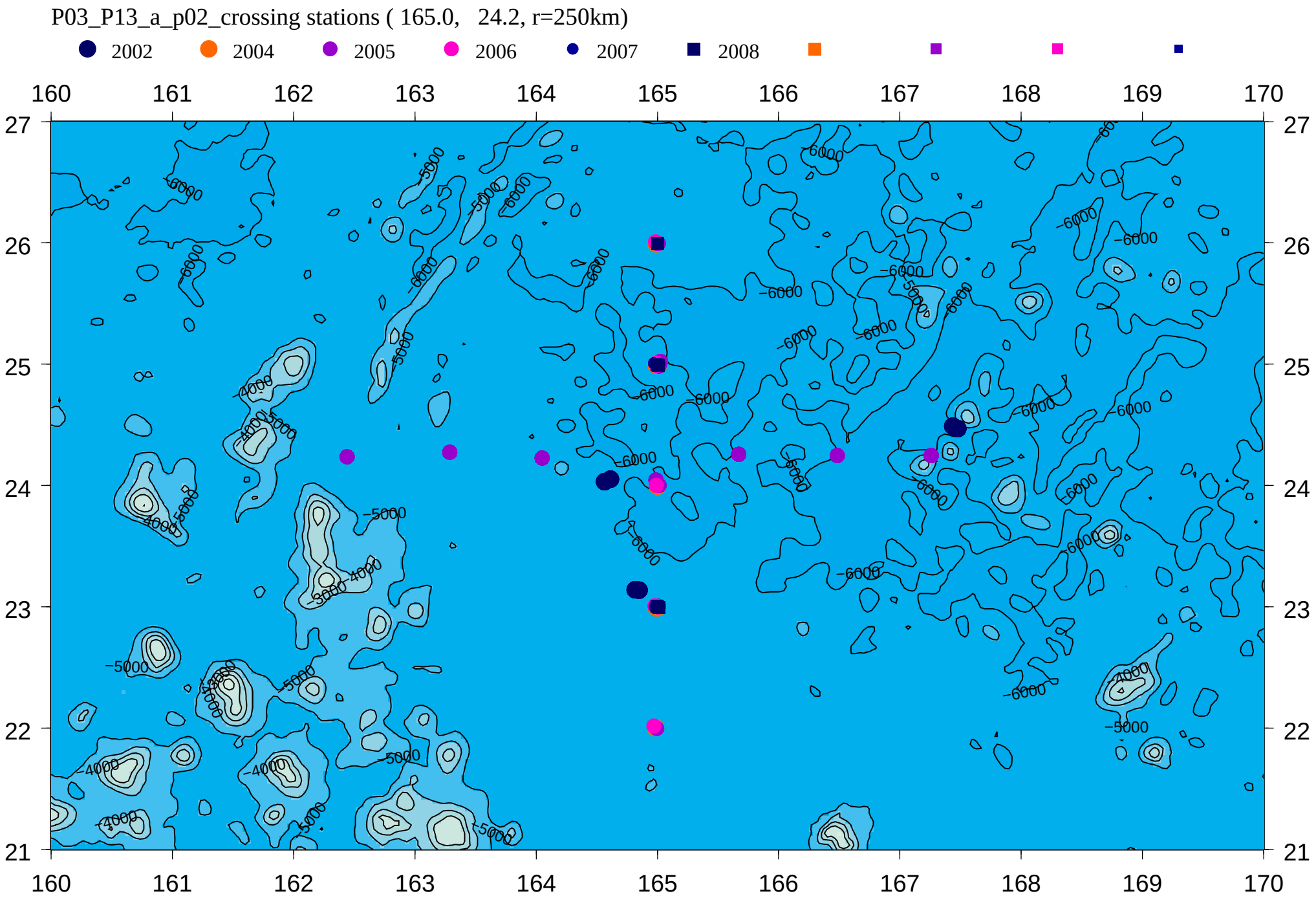

P01_P15_b_p01_crossing stations (195.0, 47.0, r=250km)
1985
1994
2007
190
191
192
193
194
195
196
197
198
199
200
50
49
48
47
46
45
44
-5000
-6000

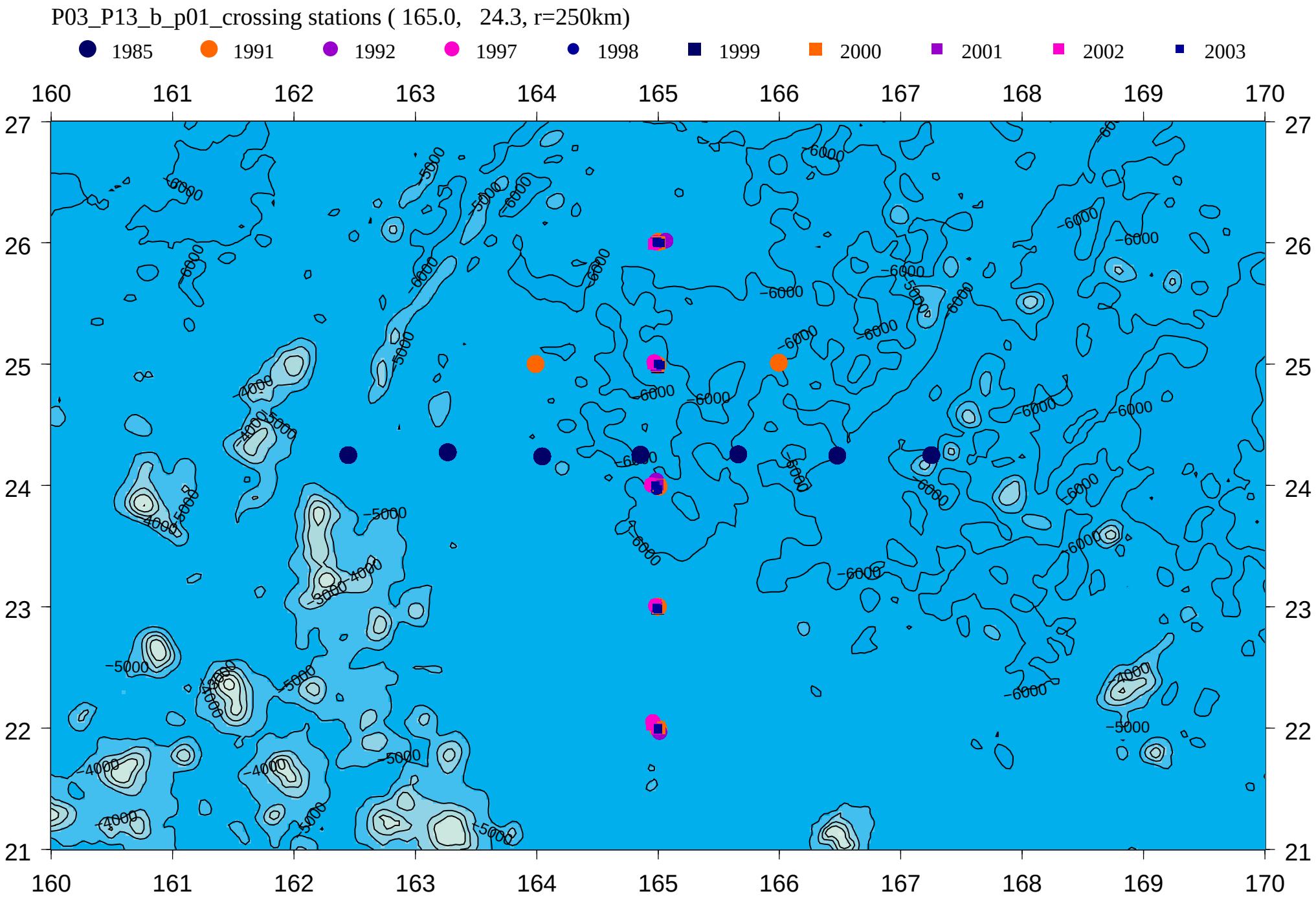

P01_P17_p01_crossing stations (216.9, 47.0, r=250km)
1985
1993
2001
2007
212
213
214
215
216
217
218
219
220
221
222
50
49
48
47
46
45
44
-4000
-5000

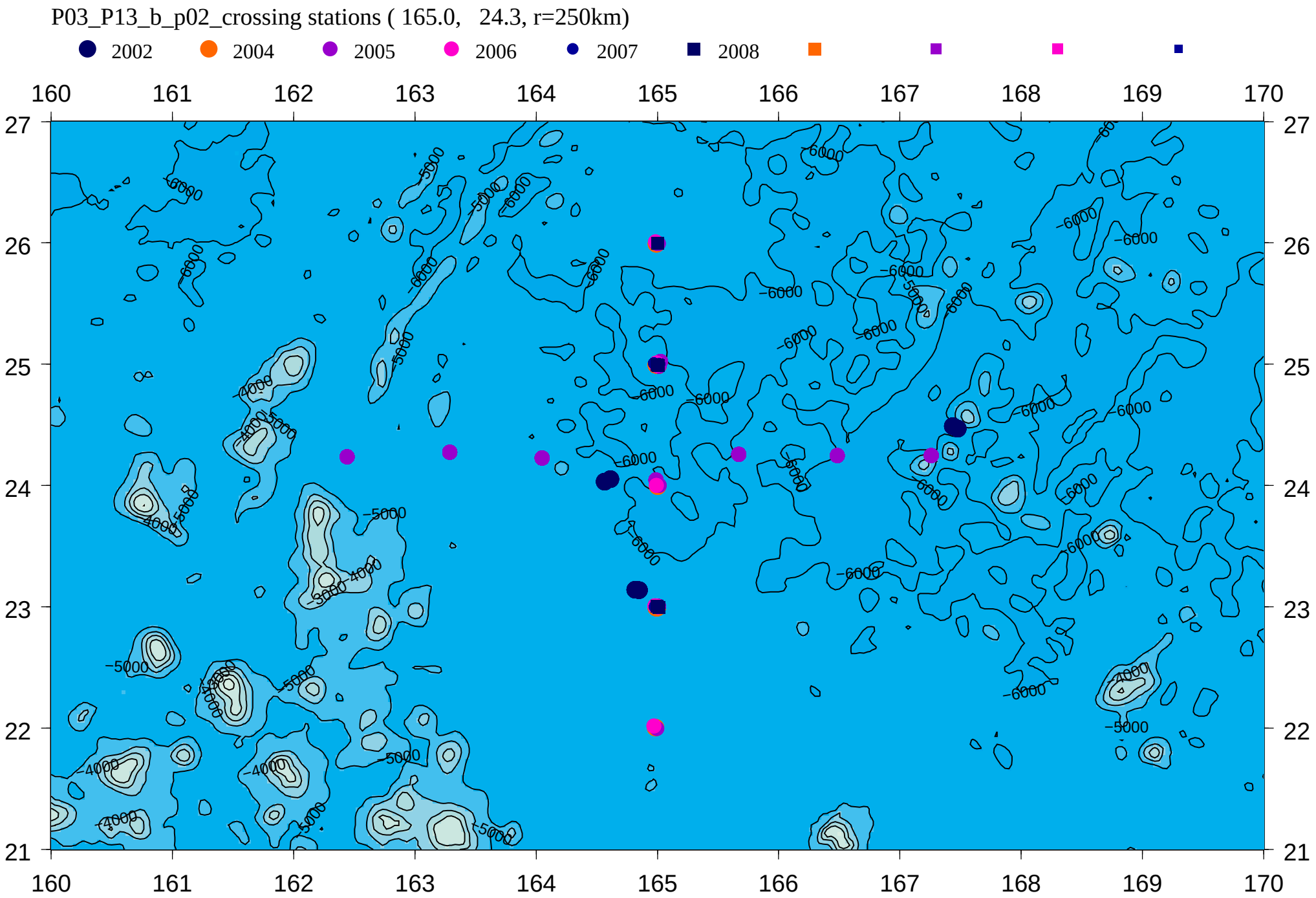

P02_P03_p01_crossing stations (238.8, 31.0, r=250km)
1985
1993
1994
2004
2005
234
235
236
237
238
239
240
241
242
243
244
34
33
32
31
30
29
28

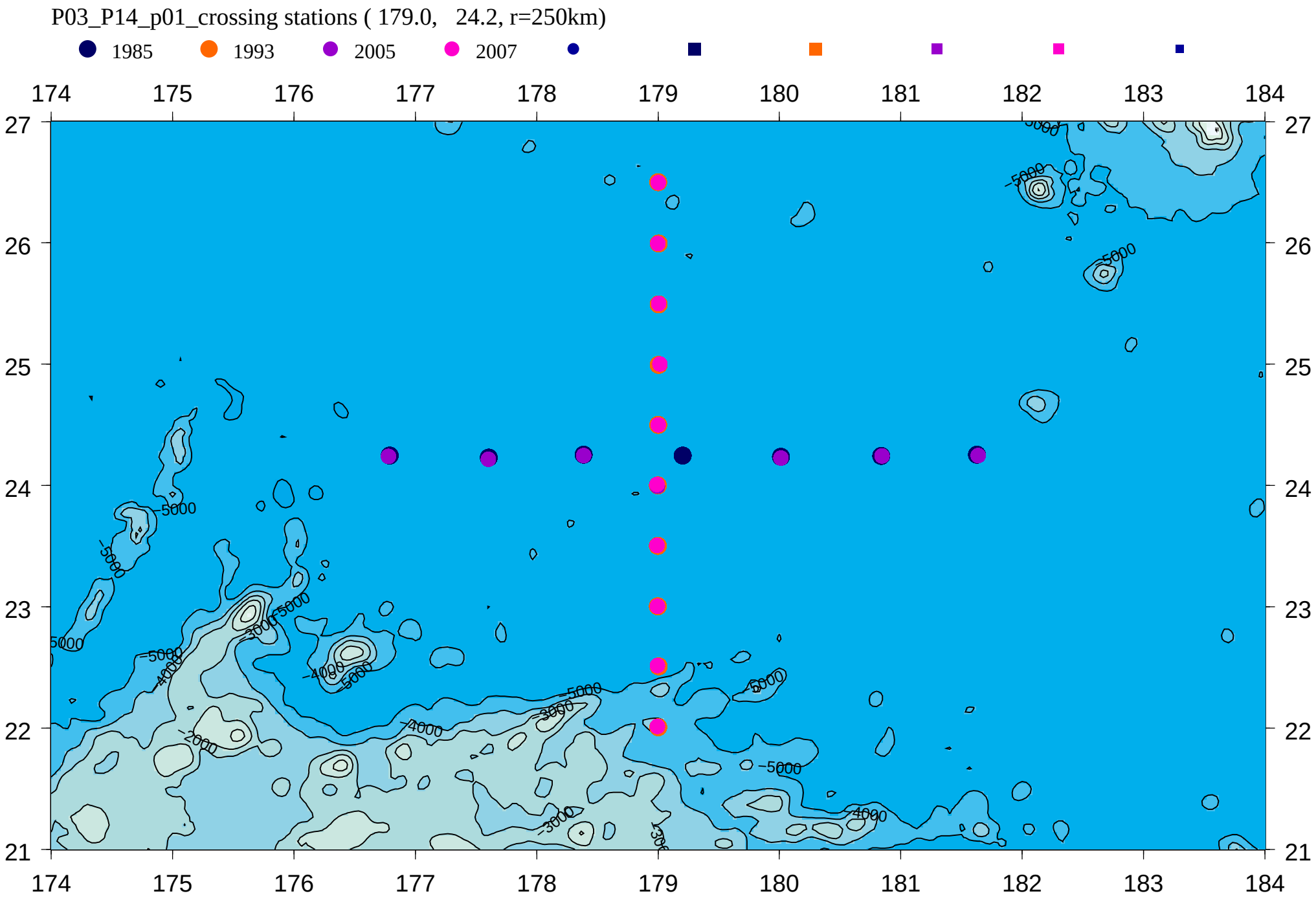

P03_P10_p01_crossing stations (149.3, 24.3, r=250km)
1985
1993
1999
2003
2004
2005
2006
2007
144
145
146
147
148
149
150
151
152
153
154
27
26
25
24
23
22
21

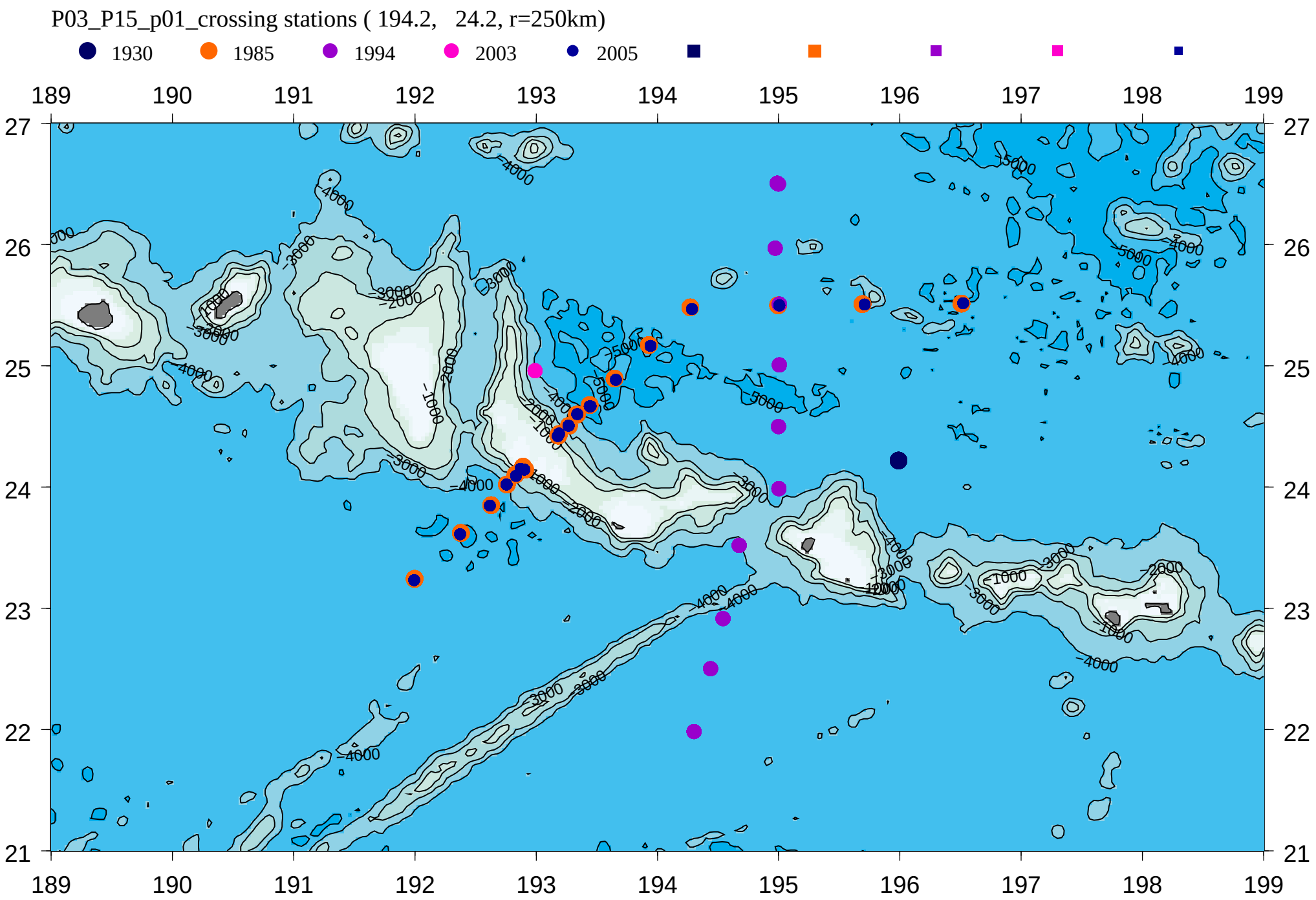

P03_P13_a_p01_crossing stations (165.0, 24.2, r=250km)
1985
1991
1992
1997
1998
1999
2000
2001
2002
2003
160
161
162
163
164
165
166
167
168
169
170
27
26
25
24
23
22
21
-6000
-5000
-4000

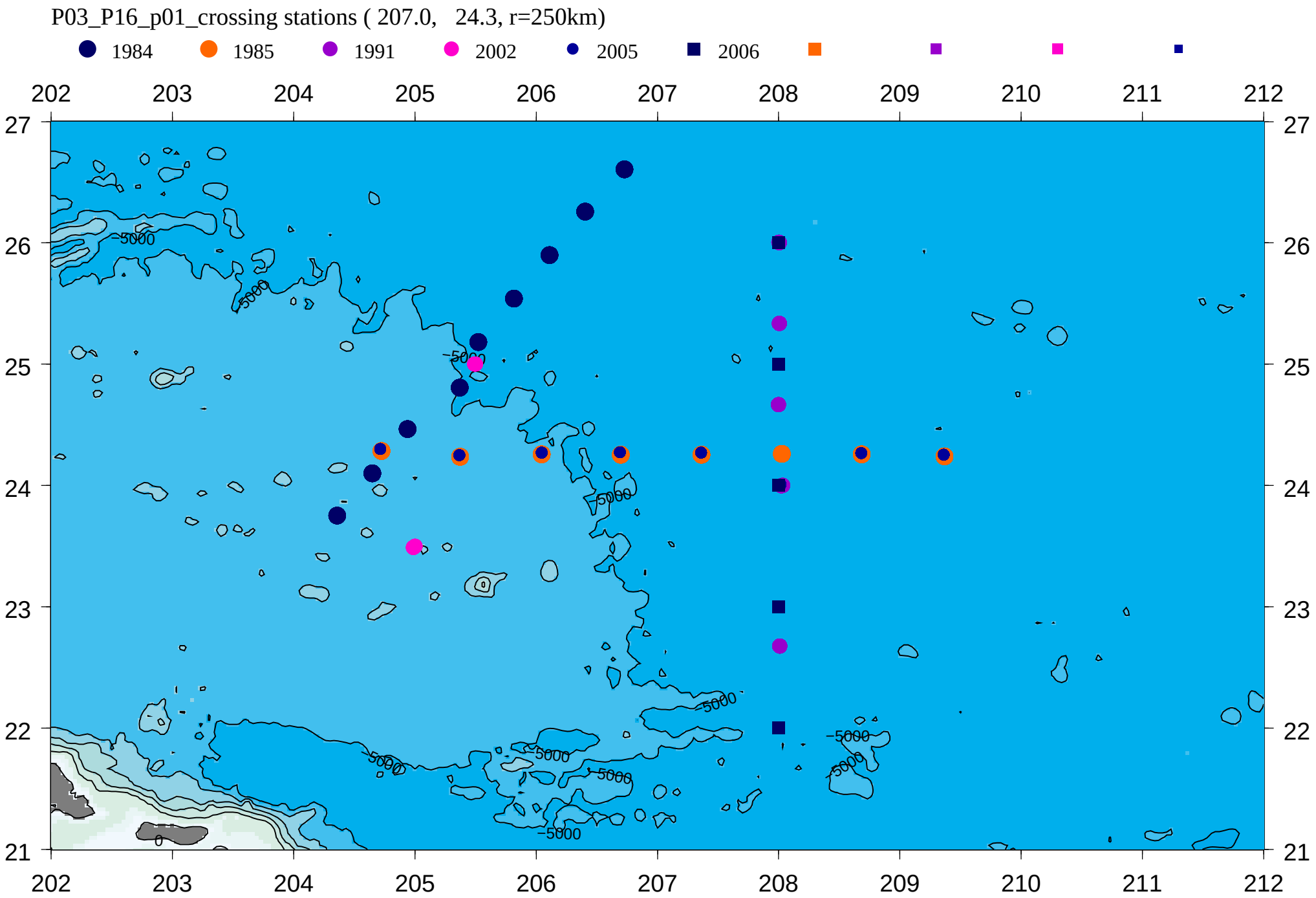

P03_P13_a_p02_crossing stations (165.0, 24.2, r=250km)
2002
2004
2005
2006
2007
2008
160
161
162
163
164
165
166
167
168
169
170
27
26
25
24
23
22
21
-6000
-5000
-4000

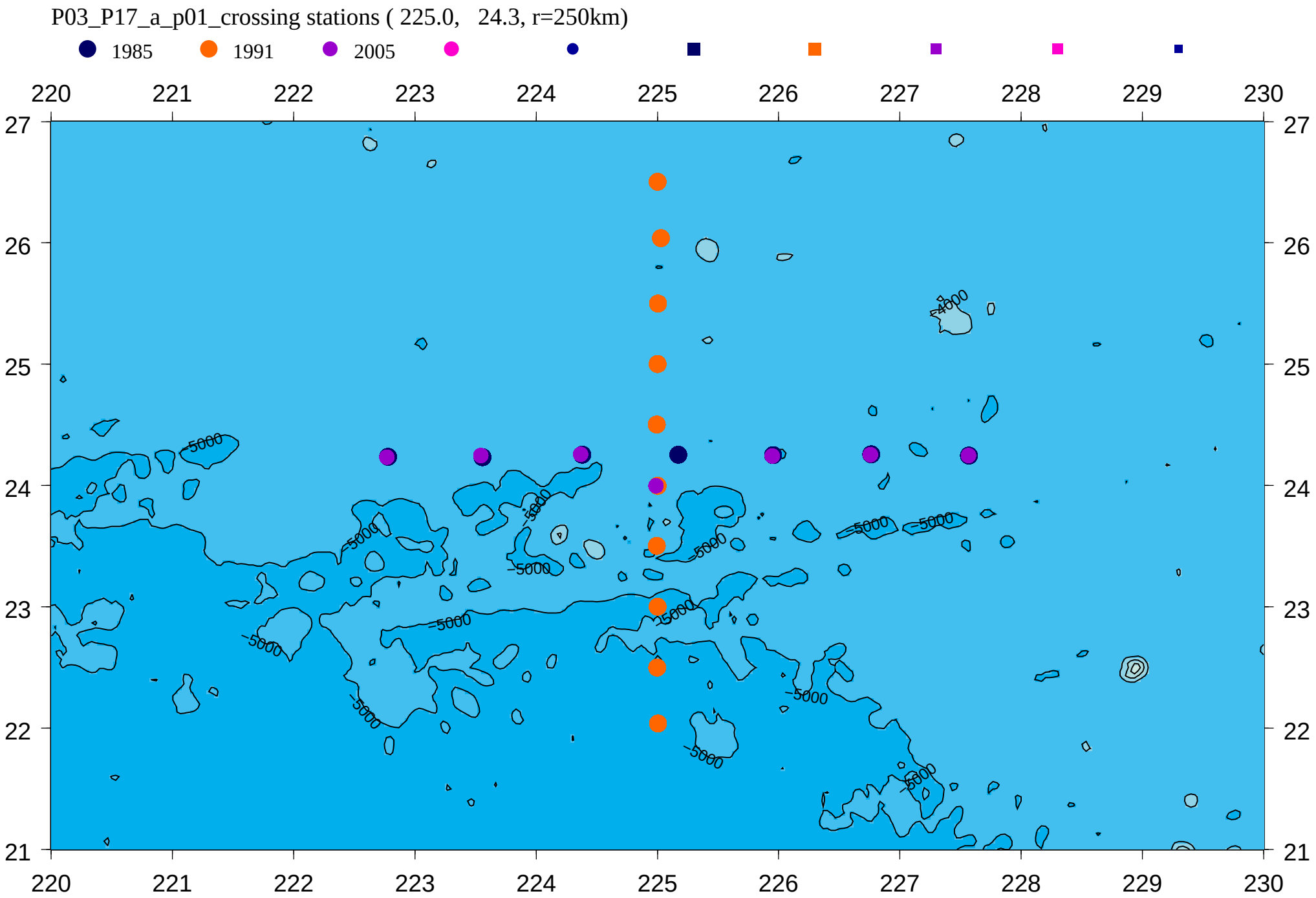

P03_P13_b_p01_crossing stations (165.0, 24.3, r=250km)
1985
1991
1992
1997
1998
1999
2000
2001
2002
2003
160
161
162
163
164
165
166
167
168
169
170
27
26
25
24
23
22
21
-6000
-5000
-4000

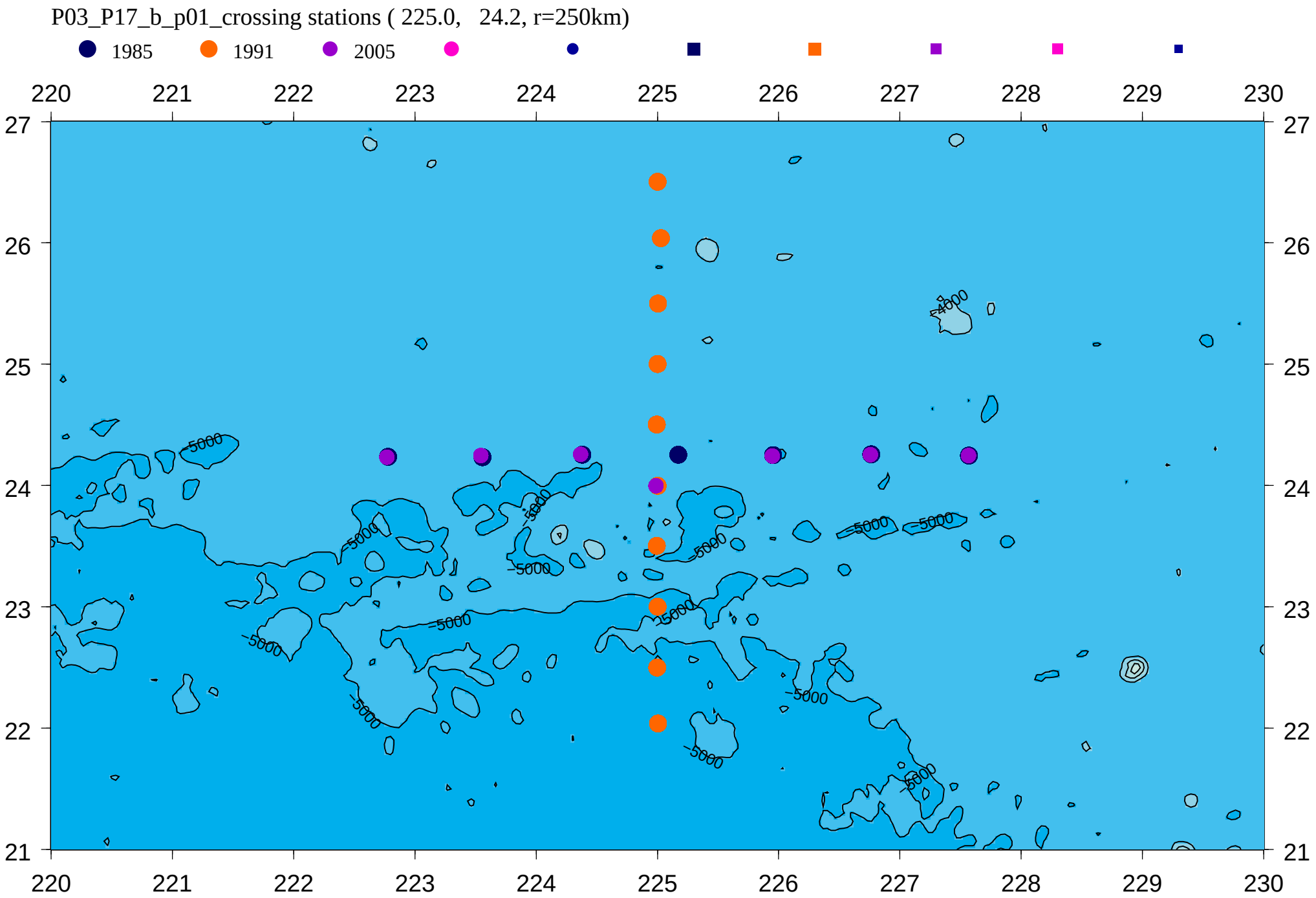

P03_P13_b_p02_crossing stations (165.0, 24.3, r=250km)
2002
2004
2005
2006
2007
2008
160
161
162
163
164
165
166
167
168
169
170
27
26
25
24
23
22
21
-6000
-5000
-4000

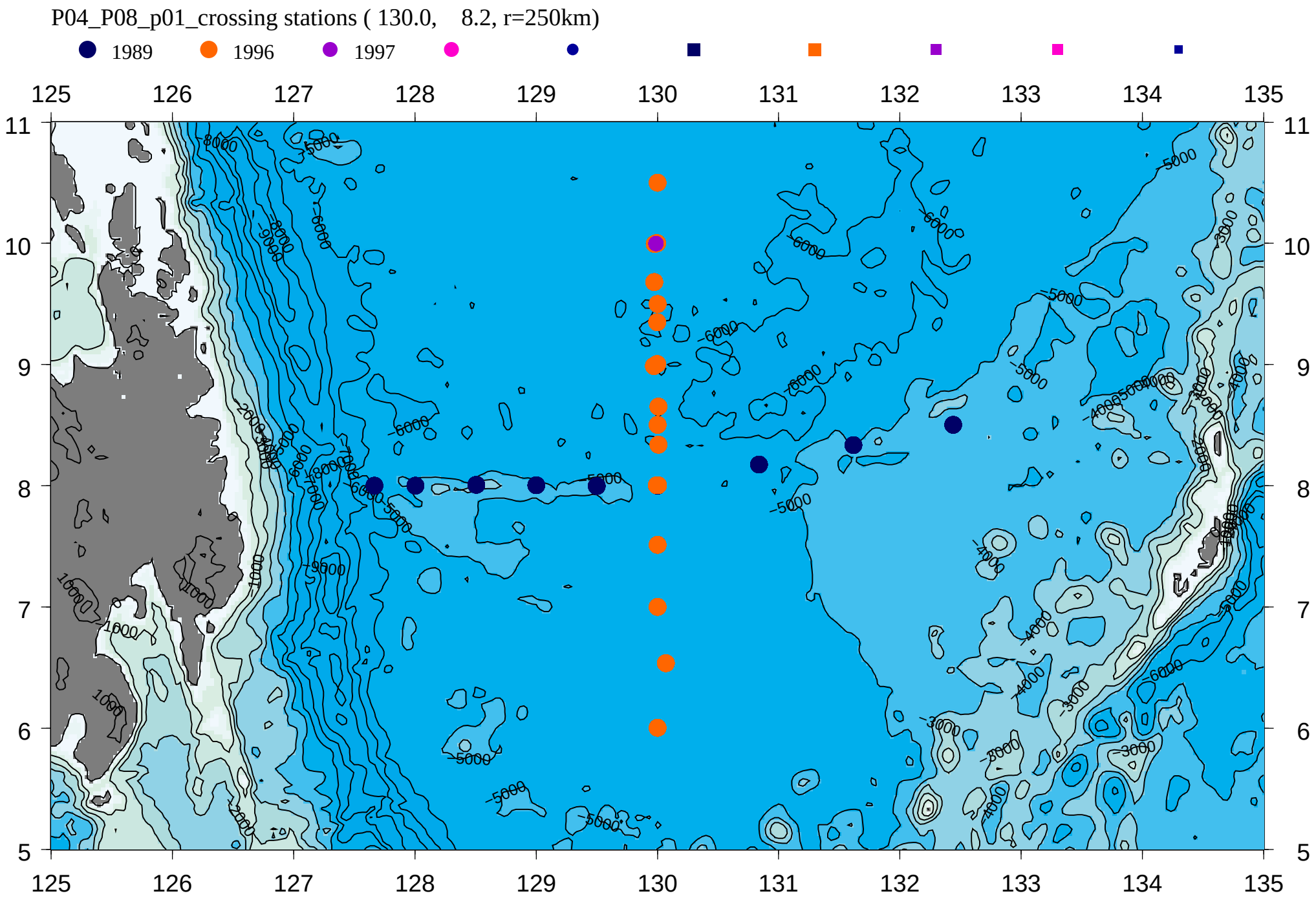

P03_P14_p01_crossing stations (179.0, 24.2, r=250km)
1985
1993
2005
2007
174
175
176
177
178
179
180
181
182
183
184
27
26
25
24
23
22
21
-5000
-4000
-3000
-2000

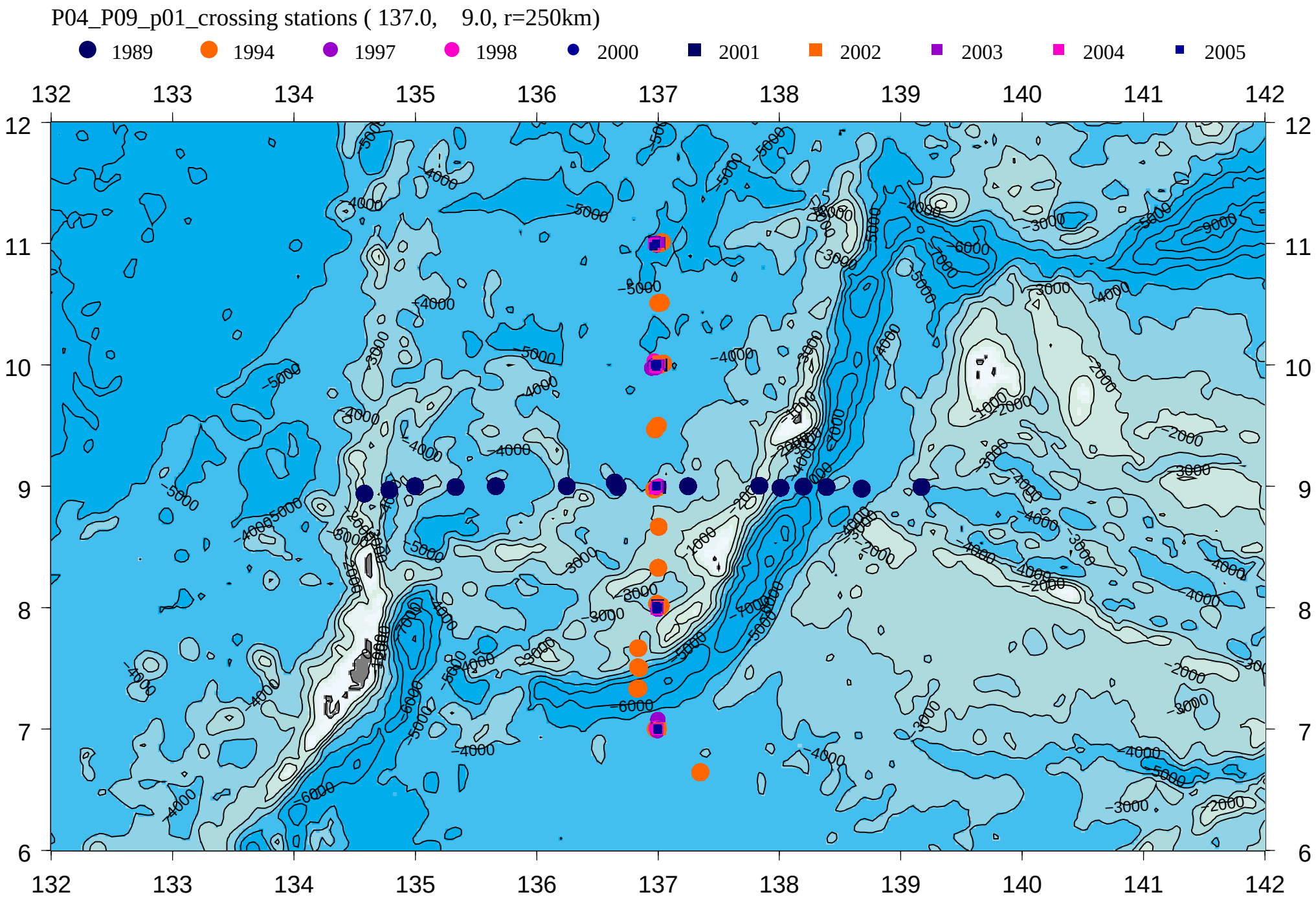

P03_P15_p01_crossing stations (194.2, 24.2, r=250km)
1930
1985
1994
2003
2005
189
190
191
192
193
194
195
196
197
198
199
27
26
25
24
23
22
21

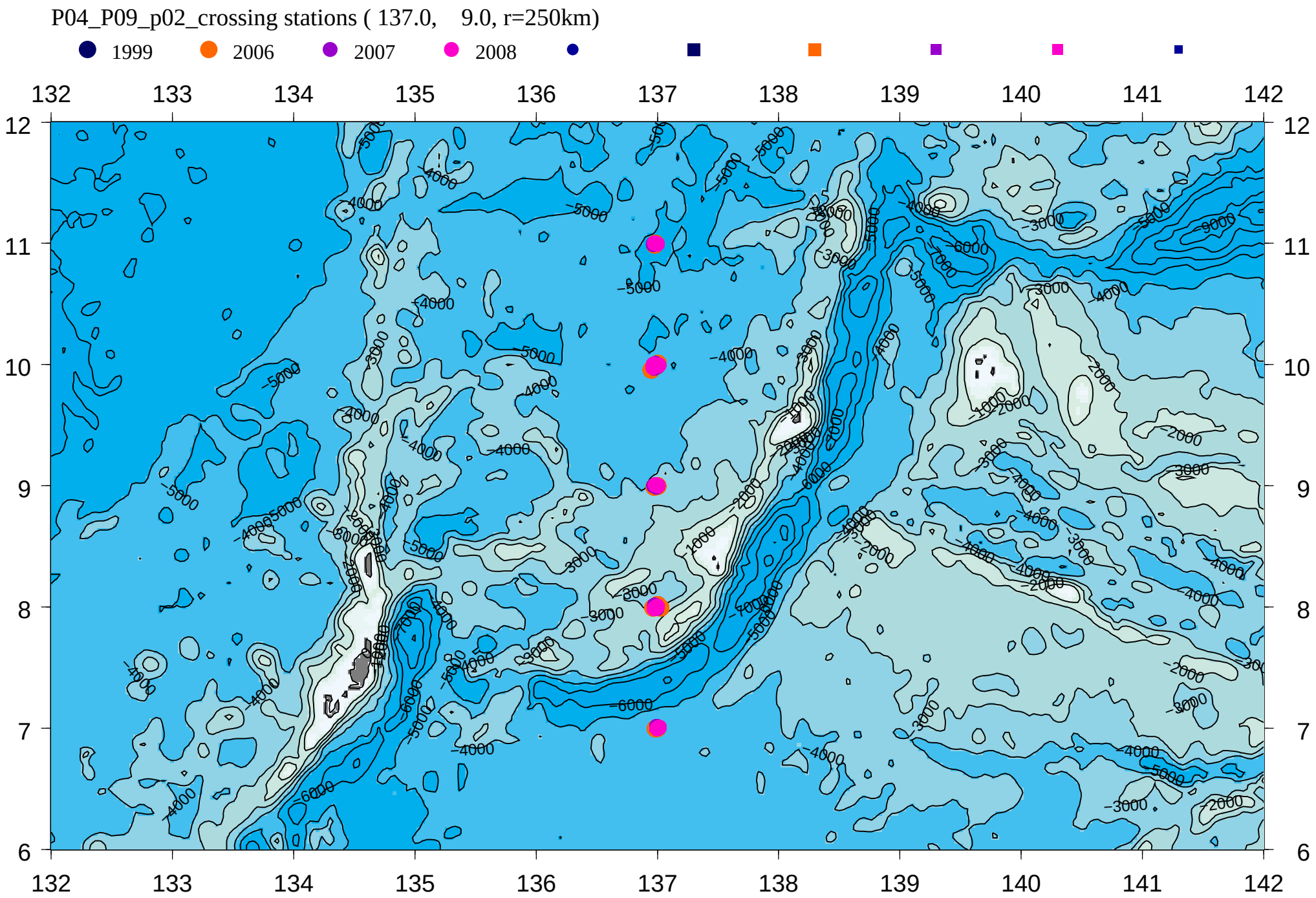

P03_P16_p01_crossing stations (207.0, 24.3, r=250km)
1984
1985
1991
2002
2005
2006
202
203
204
205
206
207
208
209
210
211
212
27
26
25
24
23
22
21
-5000
0

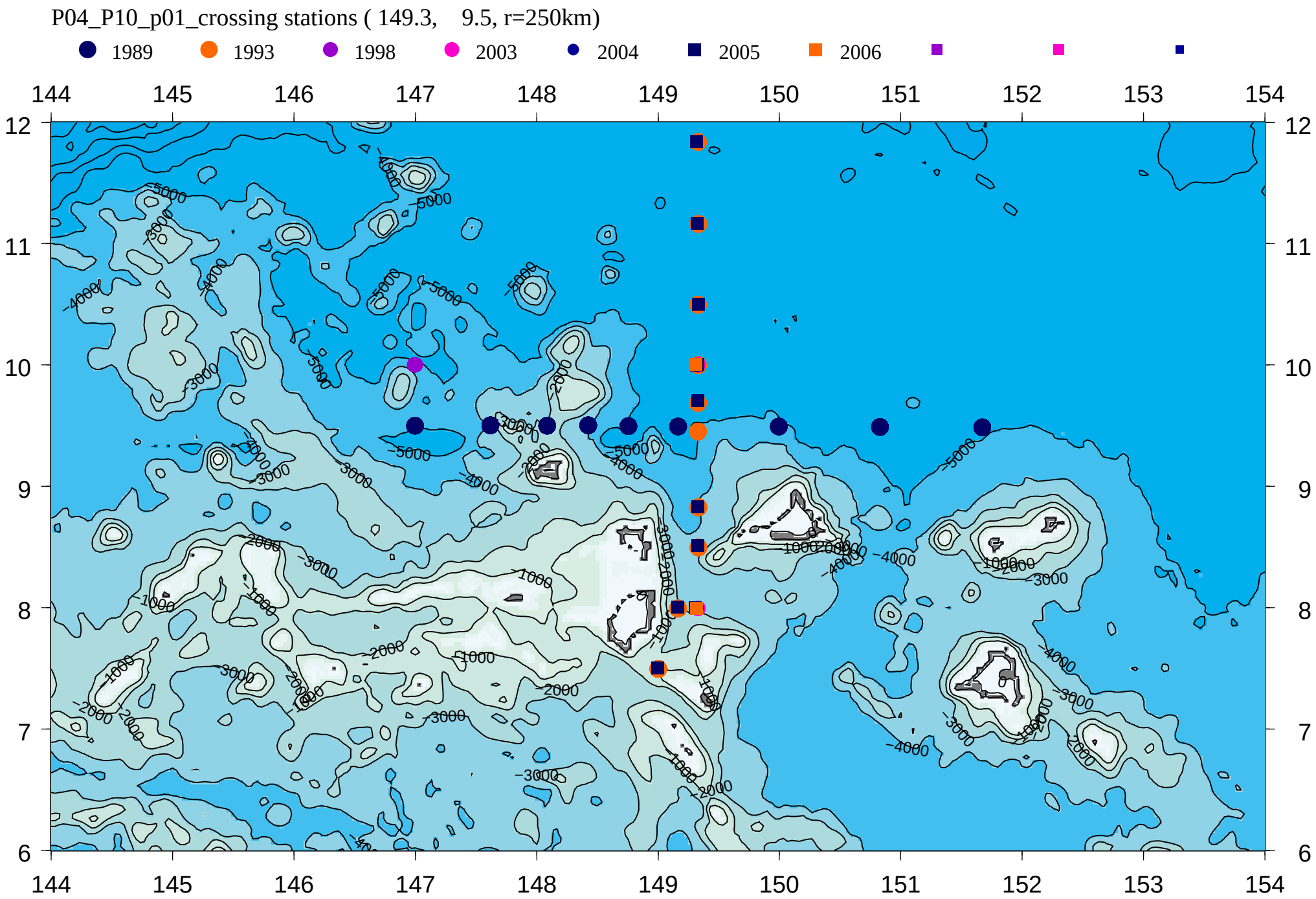

P03_P17_a_p01_crossing stations (225.0, 24.3, r=250km)
1985
1991
2005
220
221
222
223
224
225
226
227
228
229
230
27
26
25
24
23
22
21
-4000
-5000

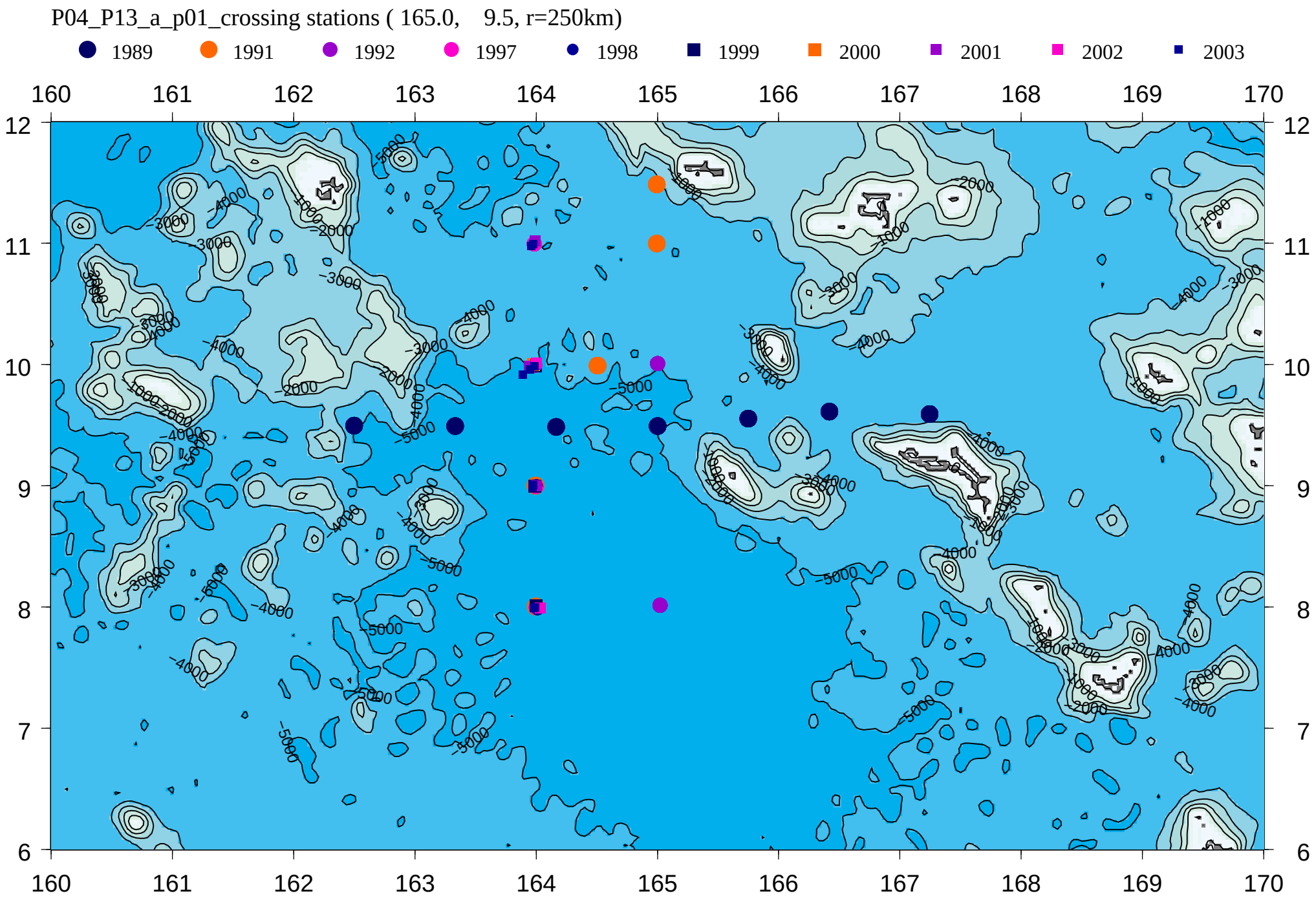

P03_P17_b_p01_crossing stations (225.0, 24.2, r=250km)
1985
1991
2005
220
221
222
223
224
225
226
227
228
229
230
27
26
25
24
23
22
21
-4000
-5000

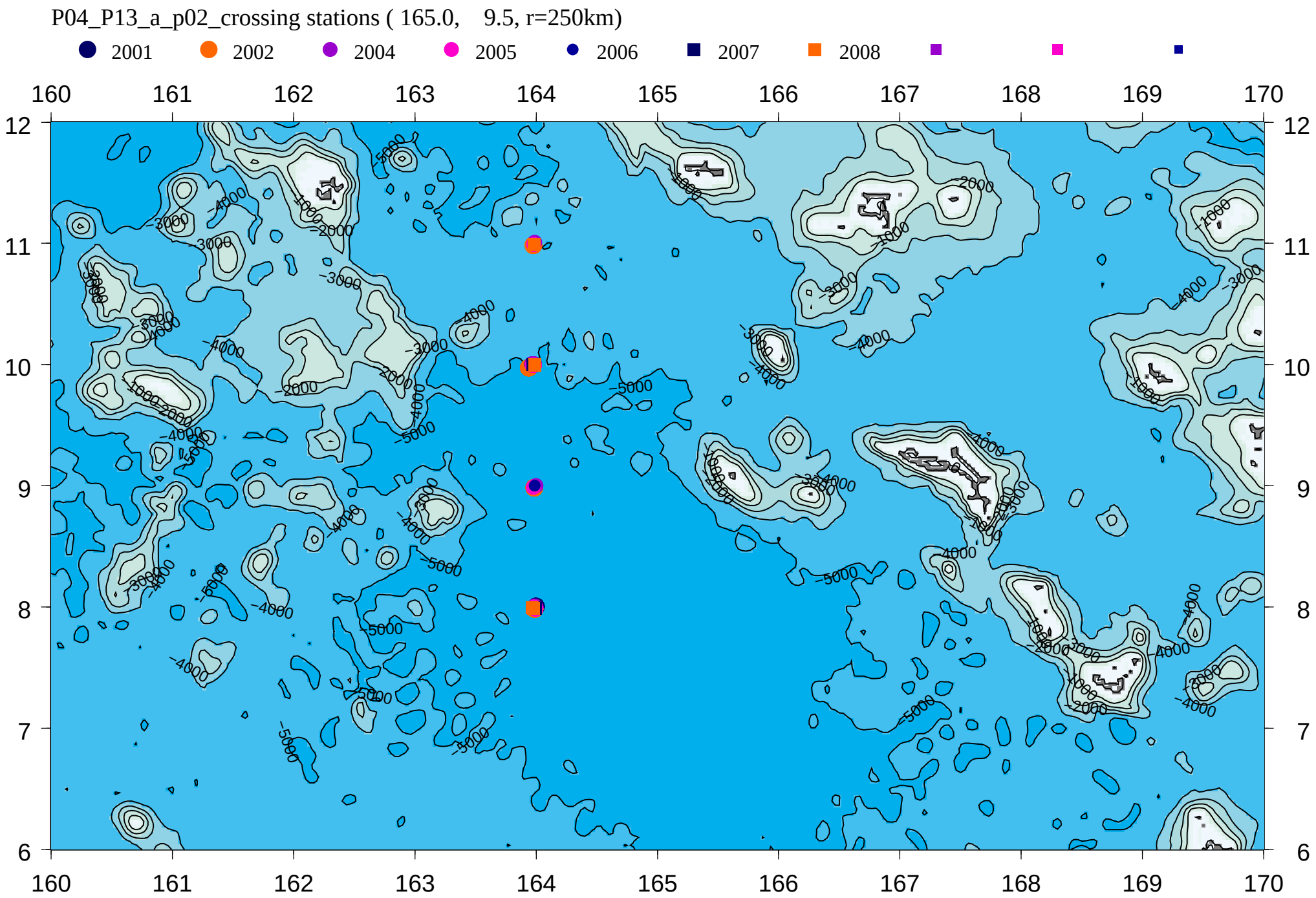

P04_P08_p01_crossing stations (130.0, 8.2, r=250km)
1989
1996
1997
125
126
127
128
129
130
131
132
133
134
135
11
10
9
8
7
6
5

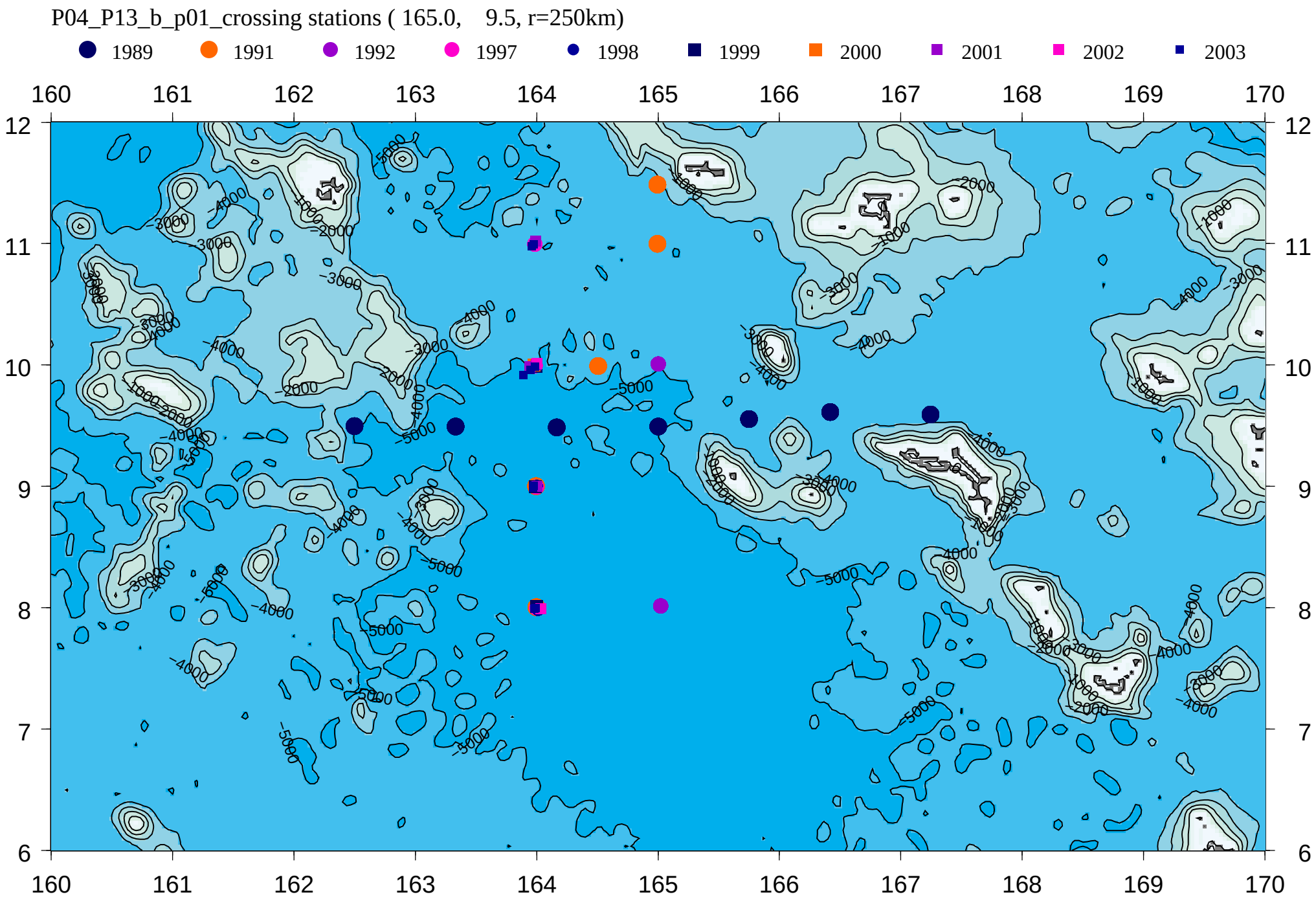

P04_P09_p01_crossing stations (137.0, 9.0, r=250km)
1989
1994
1997
1998
2000
2001
2002
2003
2004
2005
132
133
134
135
136
137
138
139
140
141
142
12
11
10
9
8
7
6

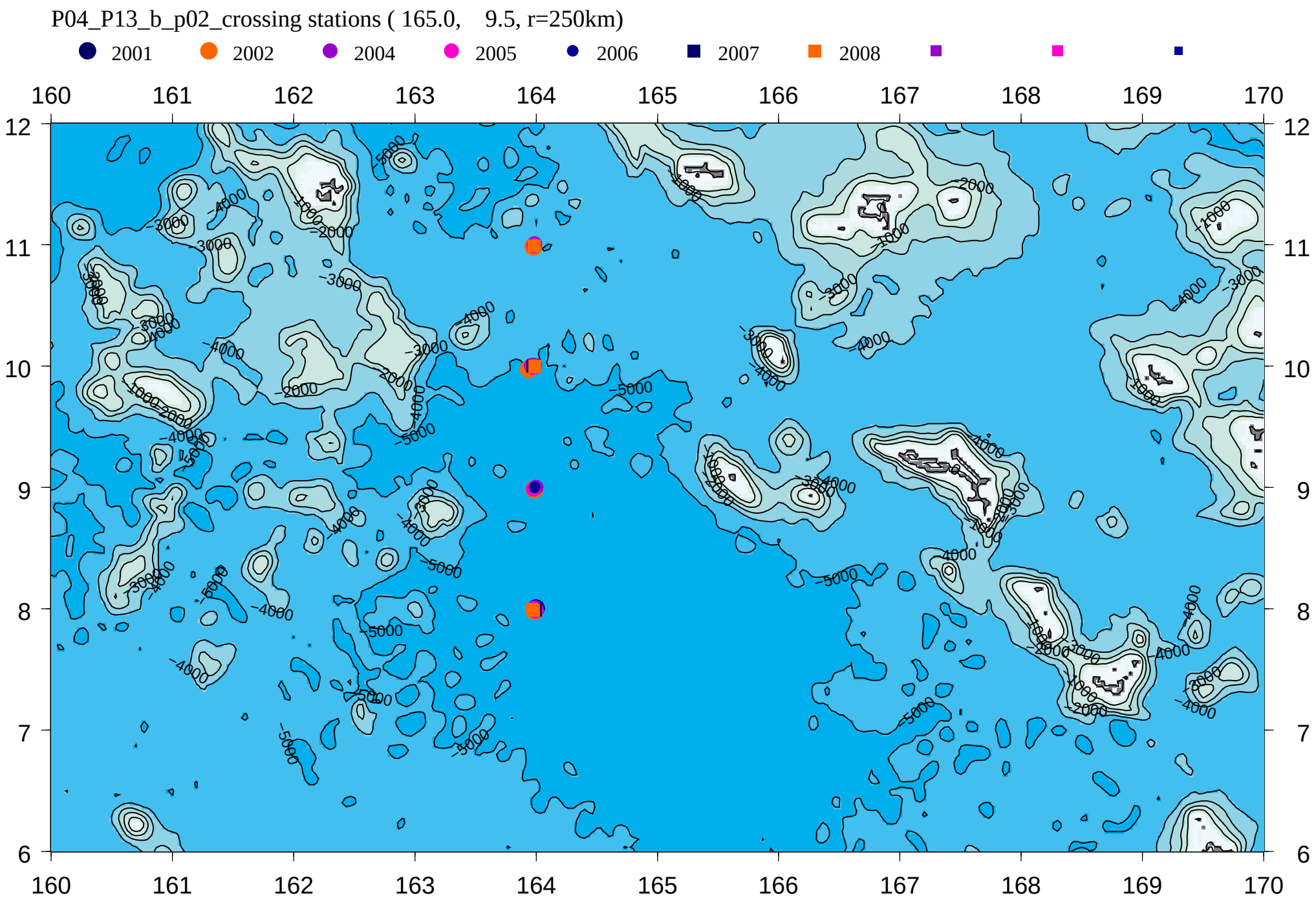

P04_P09_p02_crossing stations (137.0, 9.0, r=250km)
1999
2006
2007
2008
132
133
134
135
136
137
138
139
140
141
142
12
11
10
9
8
7
6

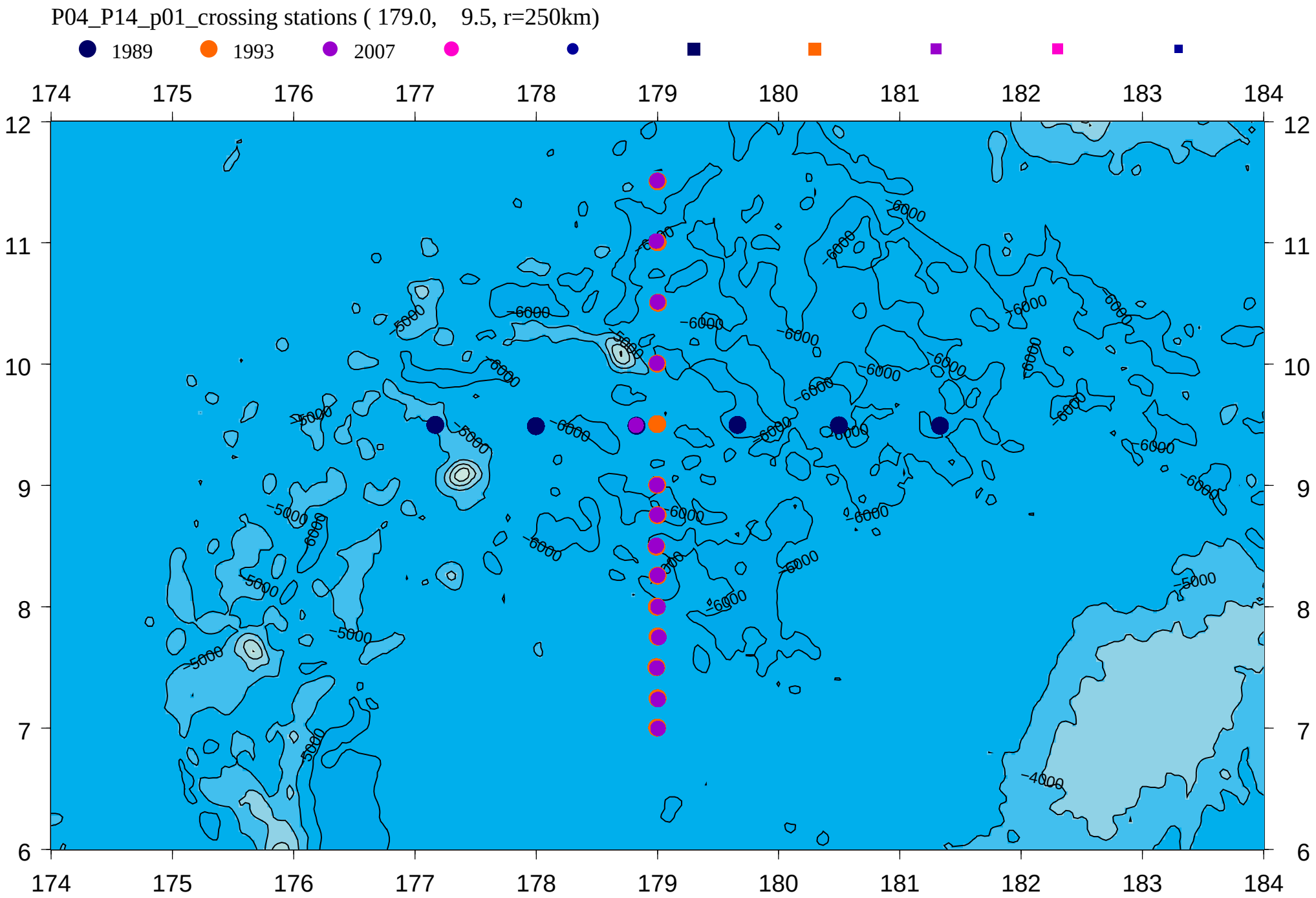

P04_P10_p01_crossing stations (149.3, 9.5, r=250km)
1989
1993
1998
2003
2004
2005
2006
144
145
146
147
148
149
150
151
152
153
154
12
11
10
9
8
7
6

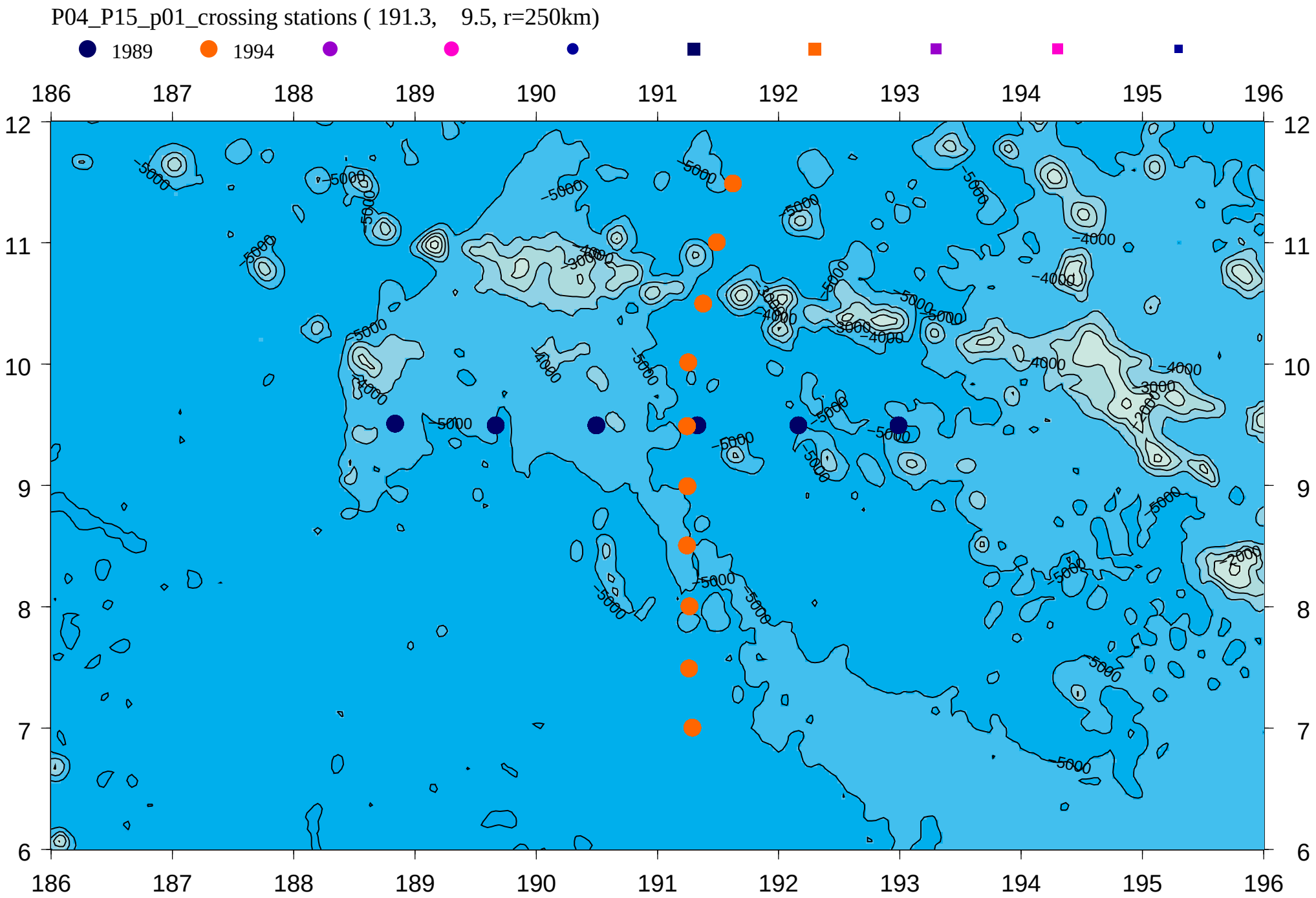

P04_P13_a_p01_crossing stations (165.0, 9.5, r=250km)
1989
1991
1992
1997
1998
1999
2000
2001
2002
2003
160
161
162
163
164
165
166
167
168
169
170
12
11
10
9
8
7
6

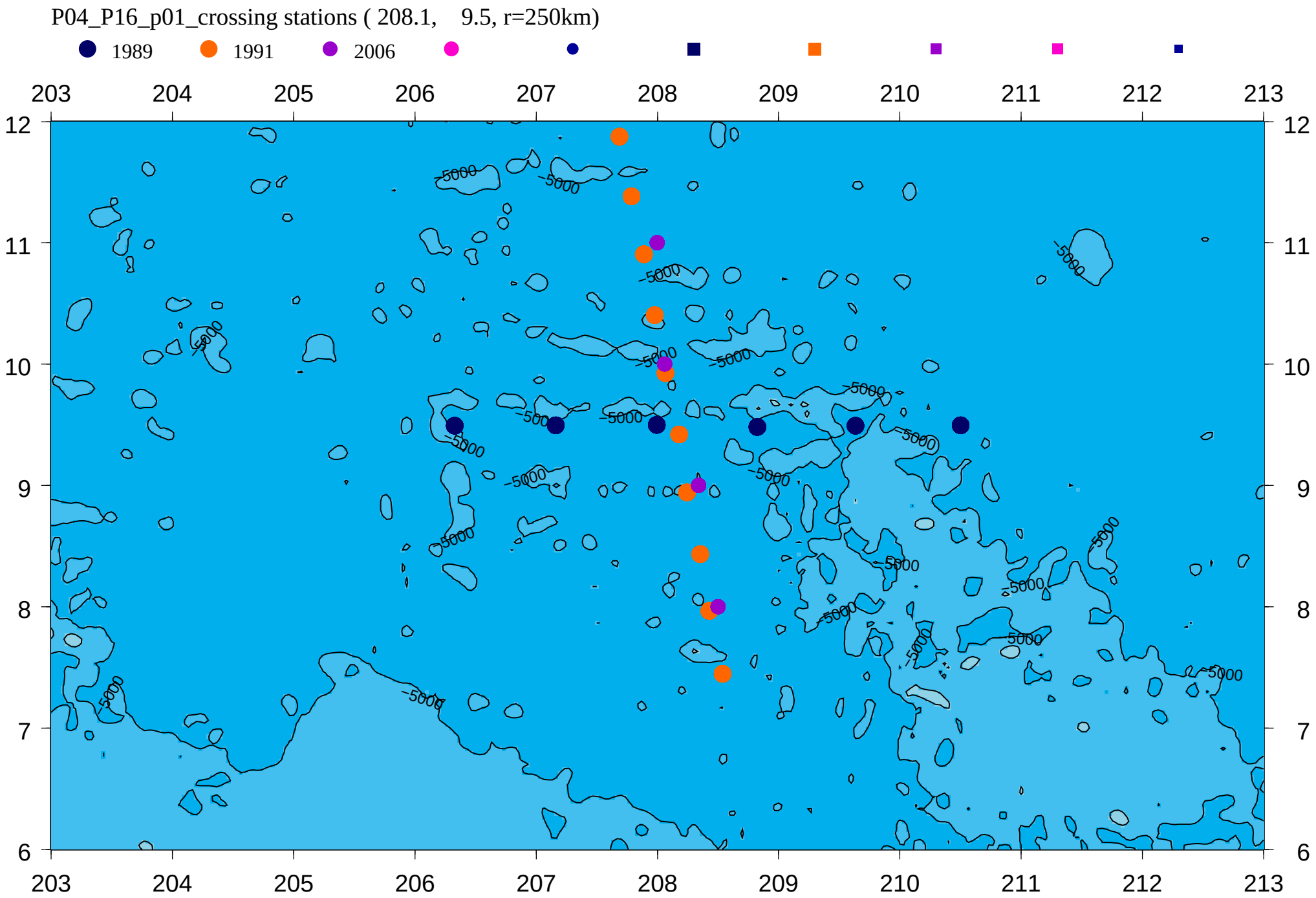

P04_P13_a_p02_crossing stations (165.0, 9.5, r=250km)
2001
2002
2004
2005
2006
2007
2008
160
161
162
163
164
165
166
167
168
169
170
12
11
10
9
8
7
6

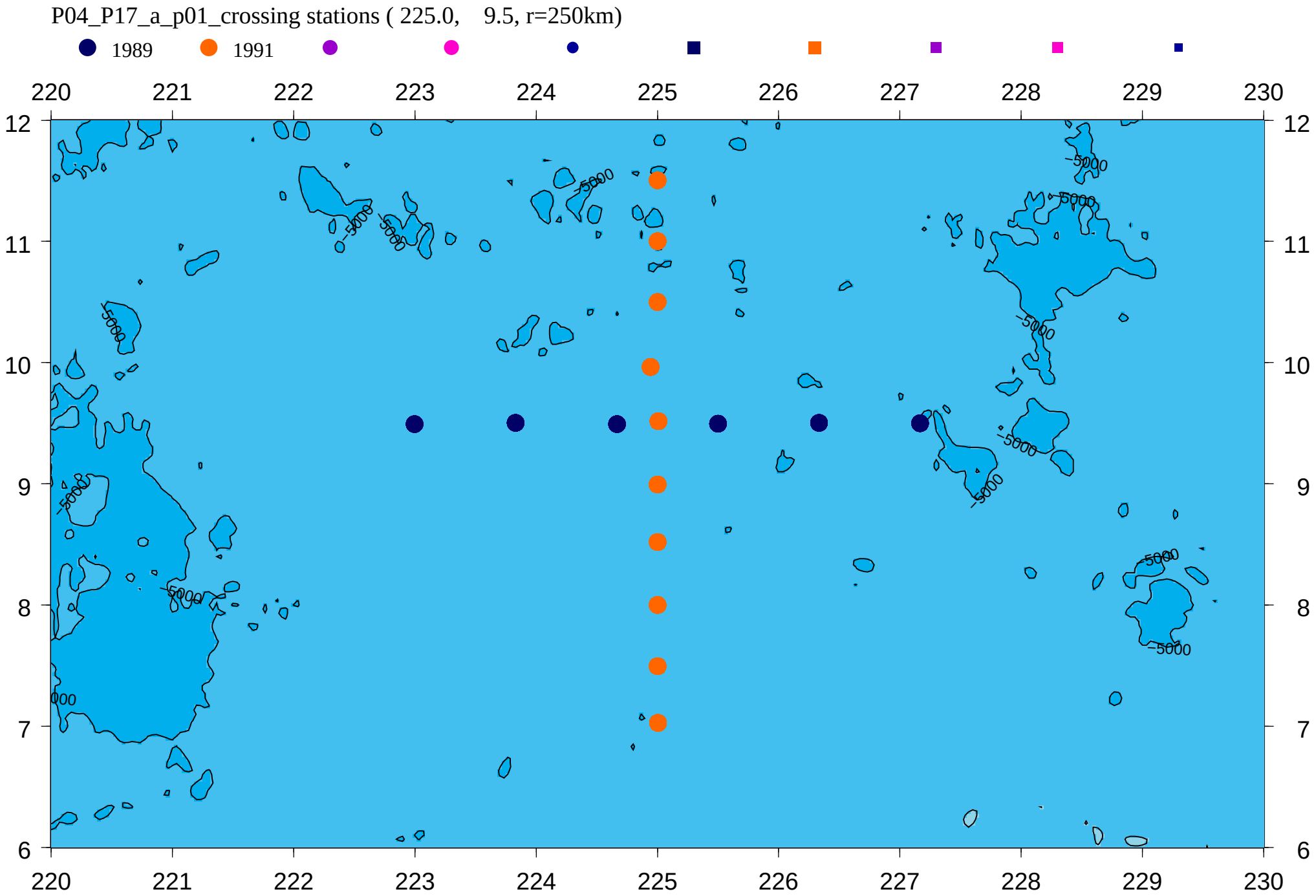

P04_P13_b_p01_crossing stations (165.0, 9.5, r=250km)
1989
1991
1992
1997
1998
1999
2000
2001
2002
2003
160
161
162
163
164
165
166
167
168
169
170
12
11
10
9
8
7
6

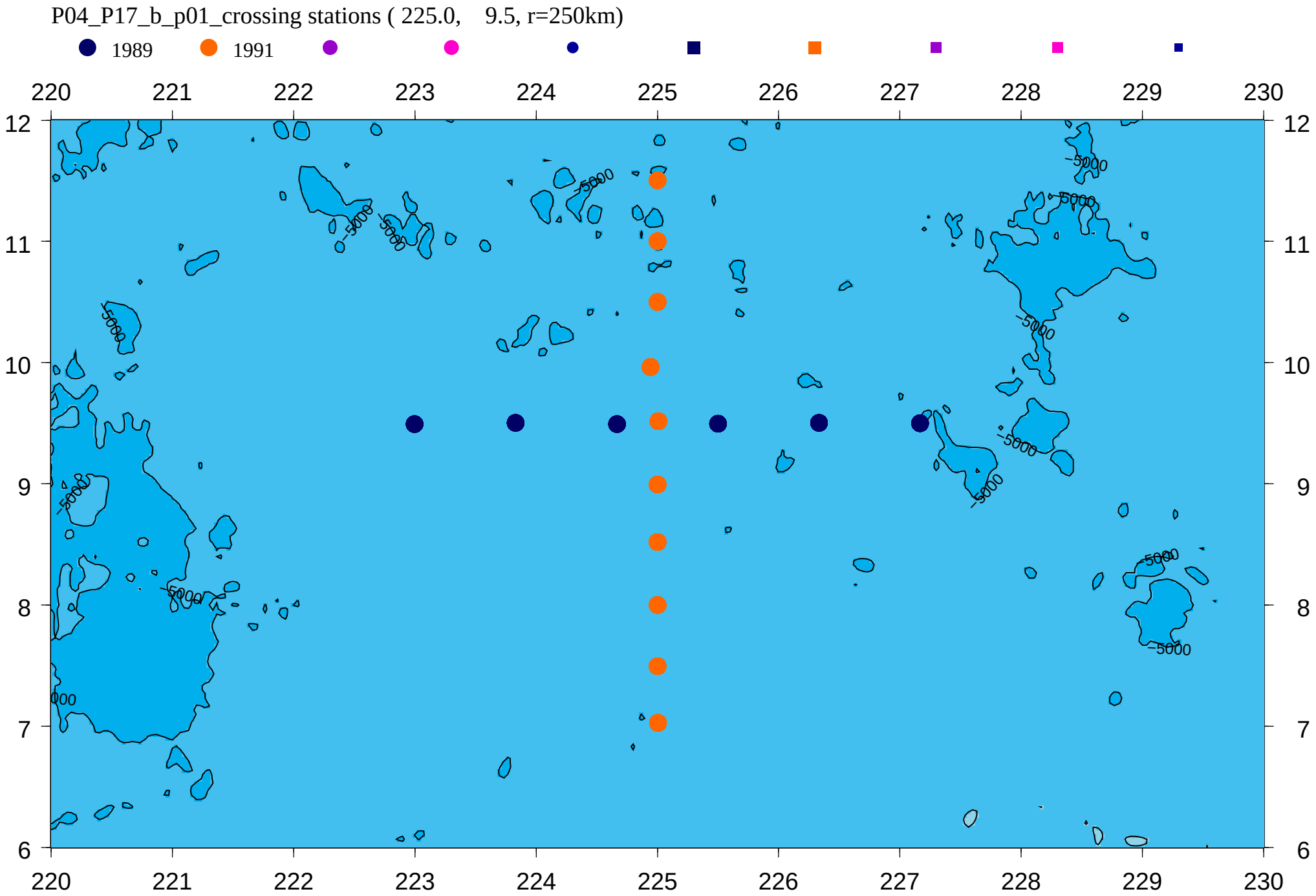

P04_P13_b_p02_crossing stations (165.0, 9.5, r=250km)
2001
2002
2004
2005
2006
2007
2008
160
161
162
163
164
165
166
167
168
169
170
12
11
10
9
8
7
6

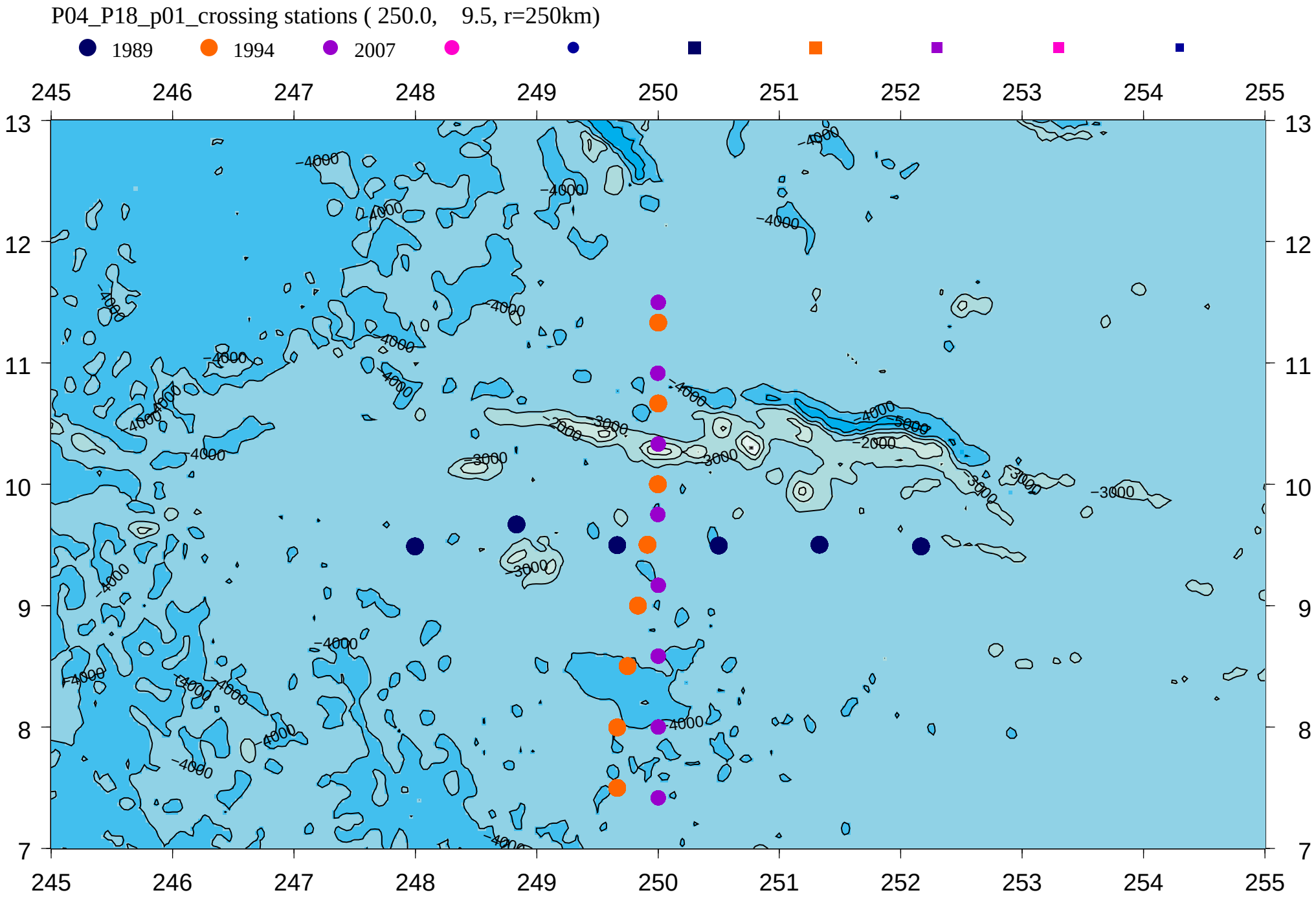

P04_P14_p01_crossing stations (179.0, 9.5, r=250km)
1989
1993
2007
174
175
176
177
178
179
180
181
182
183
184
12
11
10
9
8
7
6
-6000
-5000
-4000

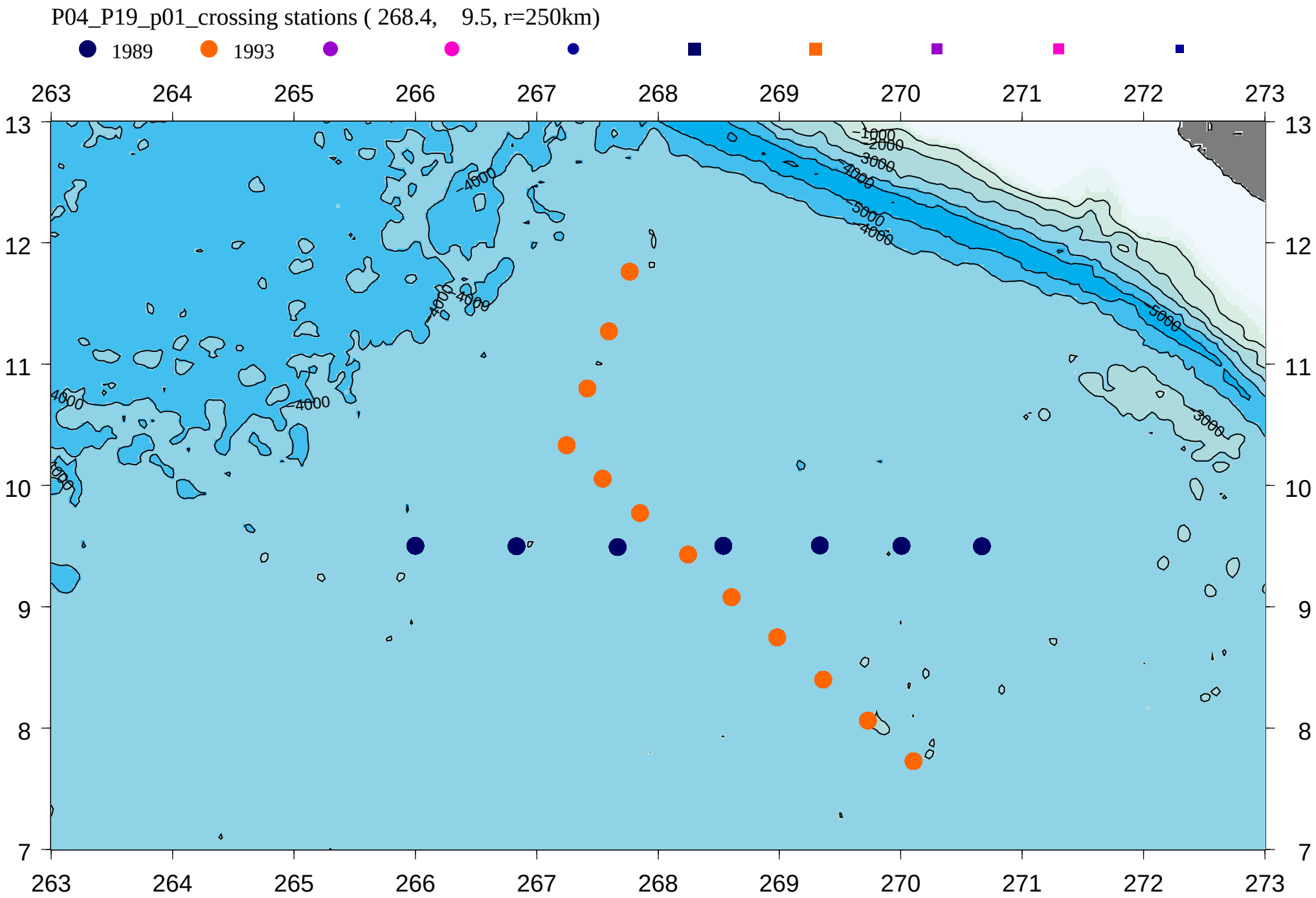

P04_P15_p01_crossing stations (191.3, 9.5, r=250km)
1989
1994
186
187
188
189
190
191
192
193
194
195
196
12
11
10
9
8
7
6
-5000
-4000
-3000
-2000

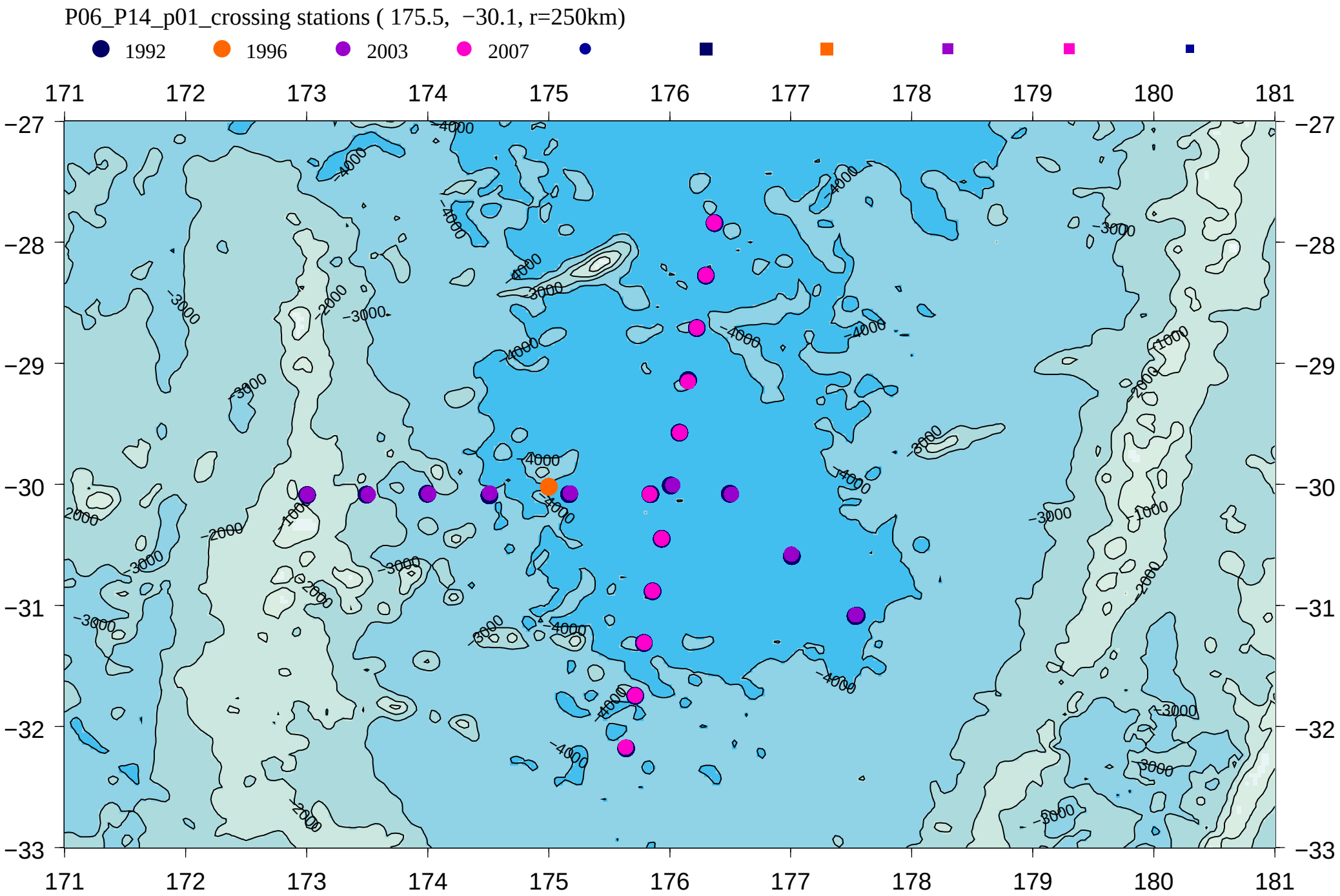

P04_P16_p01_crossing stations (208.1, 9.5, r=250km)
1989
1991
2006
203
204
205
206
207
208
209
210
211
212
213
12
11
10
9
8
7
6
-5000
5000

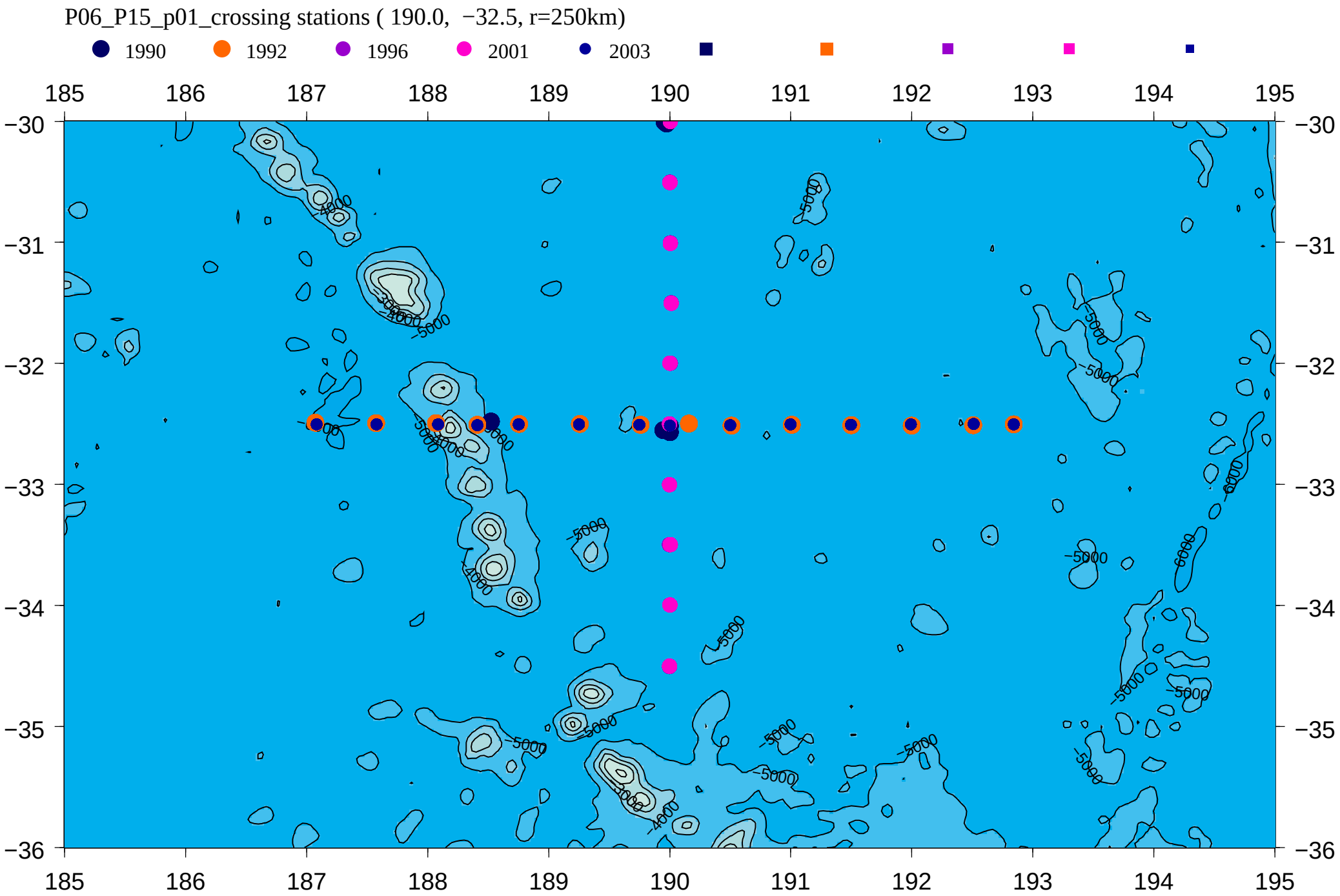

P04_P17_a_p01_crossing stations (225.0, 9.5, r=250km)
1989
1991
220
221
222
223
224
225
226
227
228
229
230
12
11
10
9
8
7
6
-5000

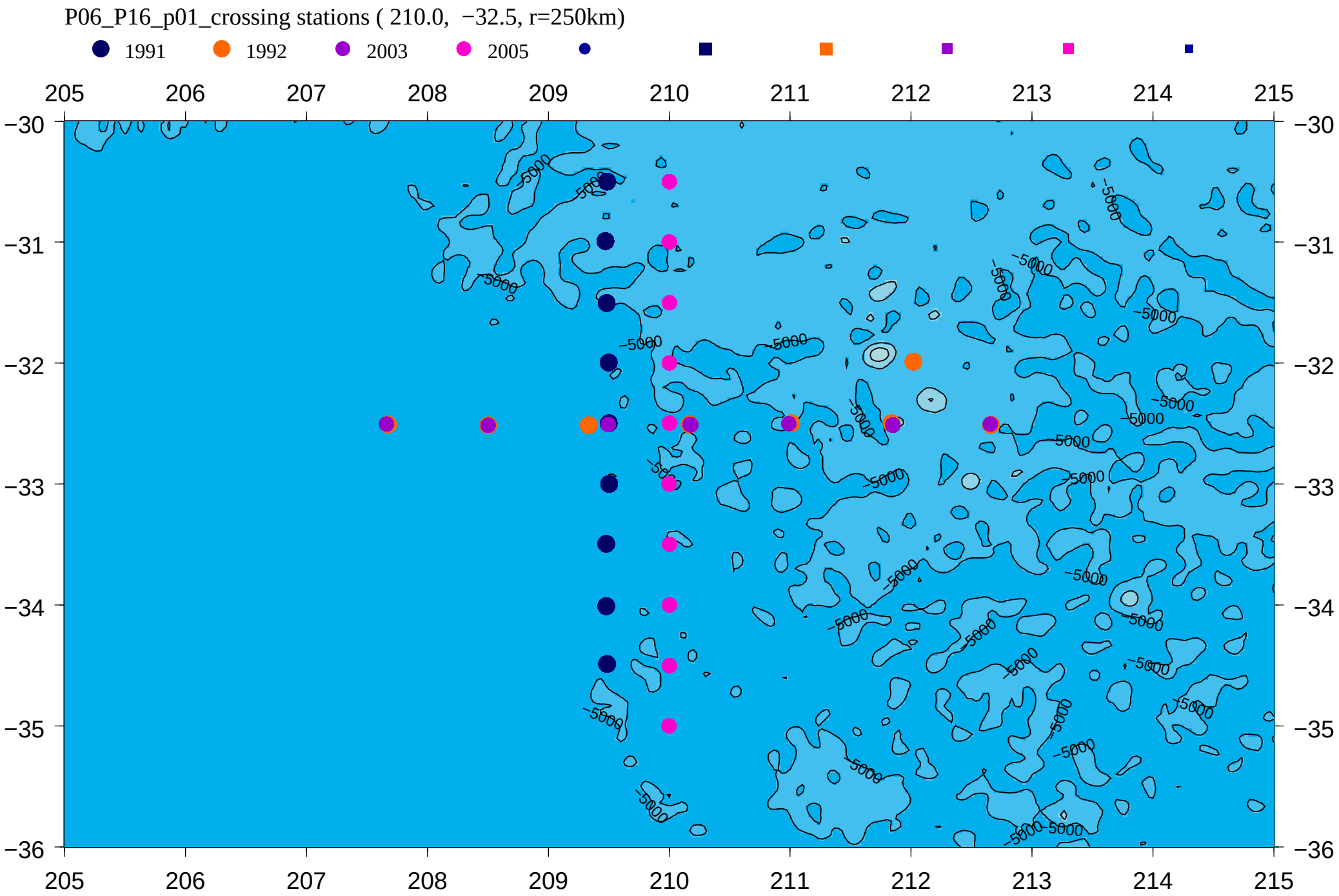

P04_P17_b_p01_crossing stations (225.0, 9.5, r=250km)
1989
1991
220
221
222
223
224
225
226
227
228
229
230
12
11
10
9
8
7
6
-5000

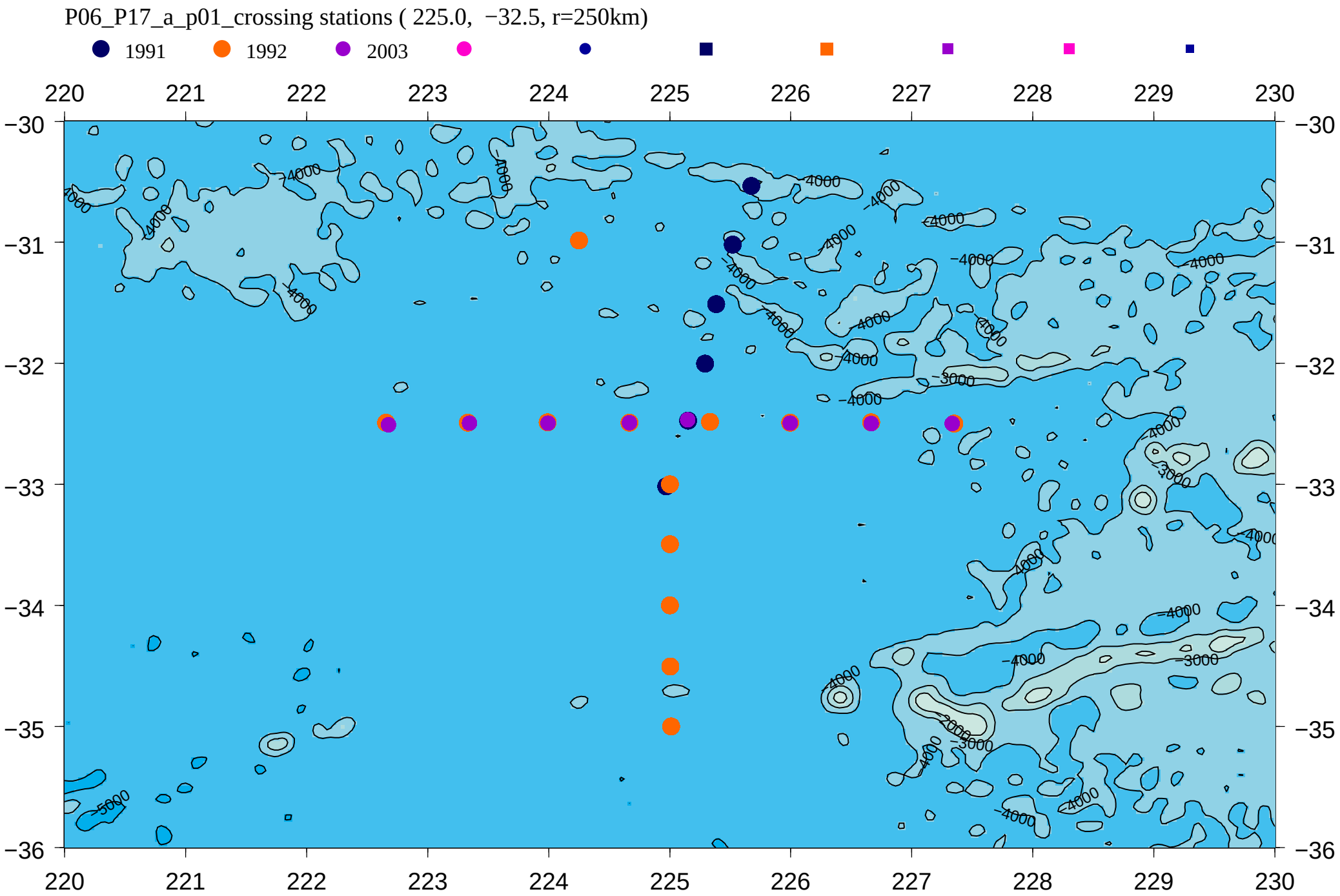

P04_P18_p01_crossing stations (250.0, 9.5, r=250km)
1989
1994
2007
245
246
247
248
249
250
251
252
253
254
255
13
12
11
10
9
8
7
-4000
-3000
-2000
-5000

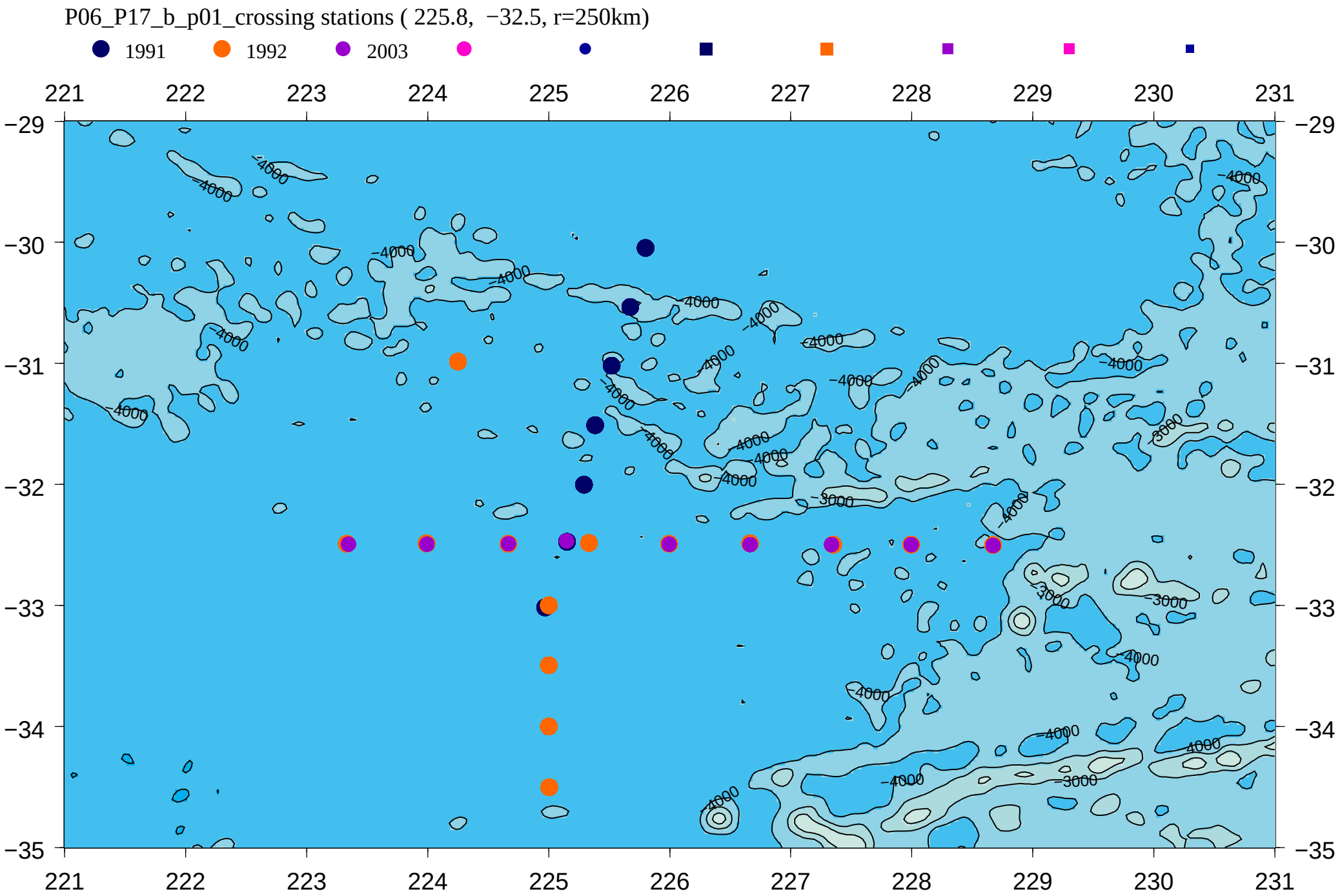

P04_P19_p01_crossing stations (268.4, 9.5, r=250km)
1989
1993
263
264
265
266
267
268
269
270
271
272
273
13
12
11
10
9
8
7
1000
2000
3000
4000
5000
6000

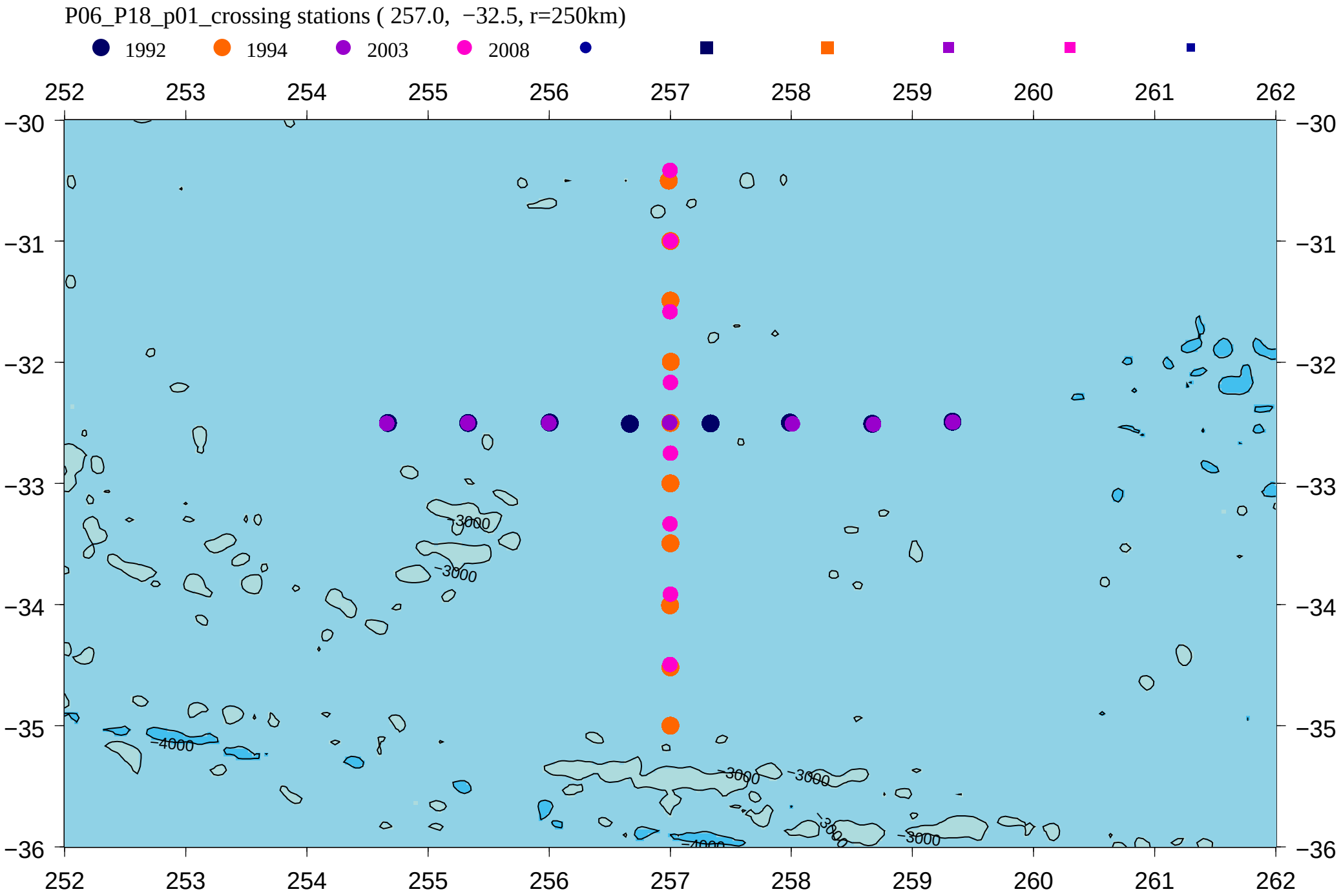

P06_P14_p01_crossing stations (175.5, −30.1, r=250km)
1992
1996
2003
2007
171
172
173
174
175
176
177
178
179
180
181
−27
−28
−29
−30
−31
−32
−33

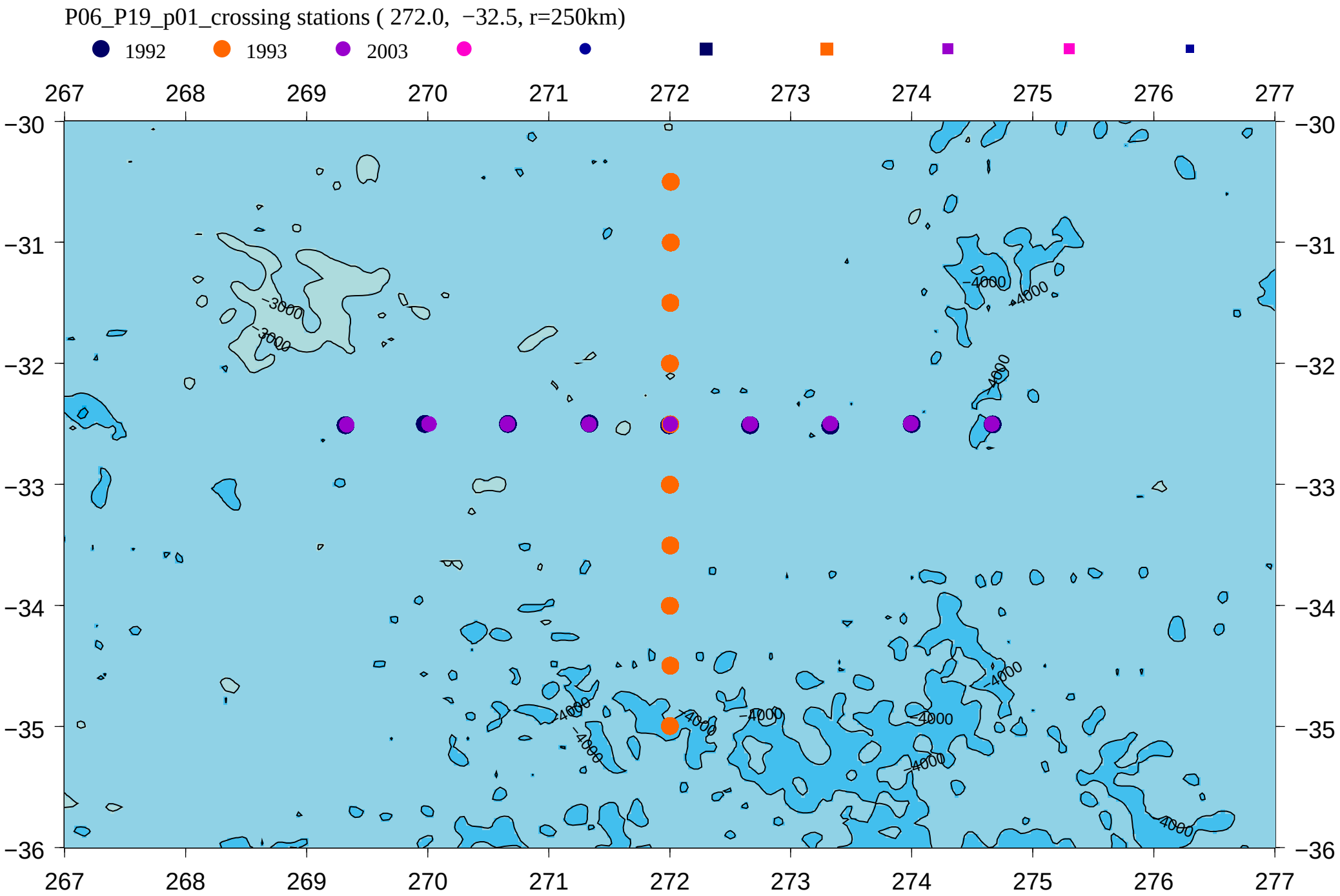

P06_P15_p01_crossing stations (190.0, −32.5, r=250km)
1990
1992
1996
2001
2003
185
186
187
188
189
190
191
192
193
194
195
−30
−31
−32
−33
−34
−35
−36
−4000
−5000
−6000

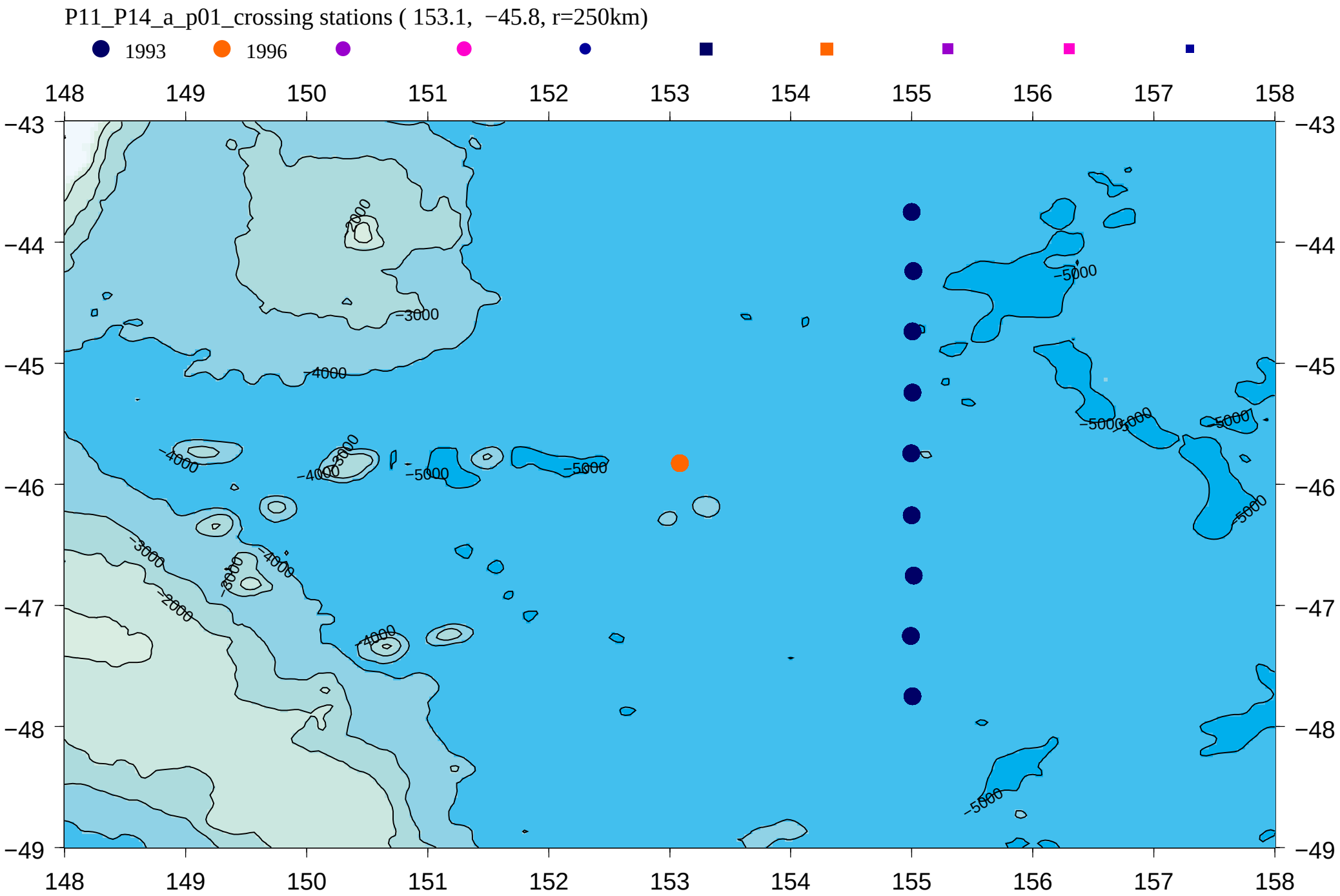

P06_P16_p01_crossing stations (210.0, −32.5, r=250km)
1991
1992
2003
2005
205
206
207
208
209
210
211
212
213
214
215
−30
−31
−32
−33
−34
−35
−36
-5000

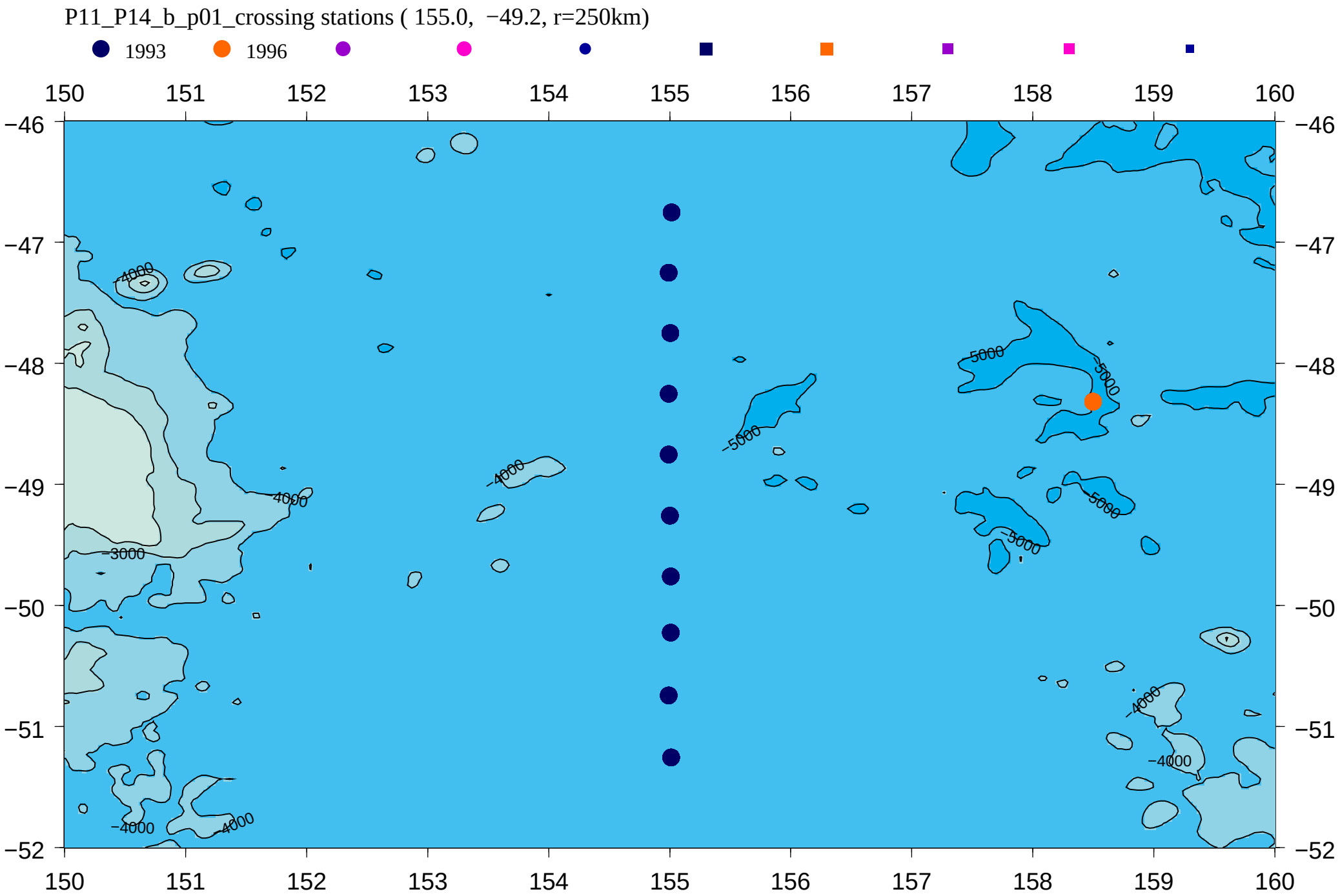

P06_P17_a_p01_crossing stations (225.0, −32.5, r=250km)
1991
1992
2003
220
221
222
223
224
225
226
227
228
229
230
−30
−31
−32
−33
−34
−35
−36
−4000
−3000
−5000

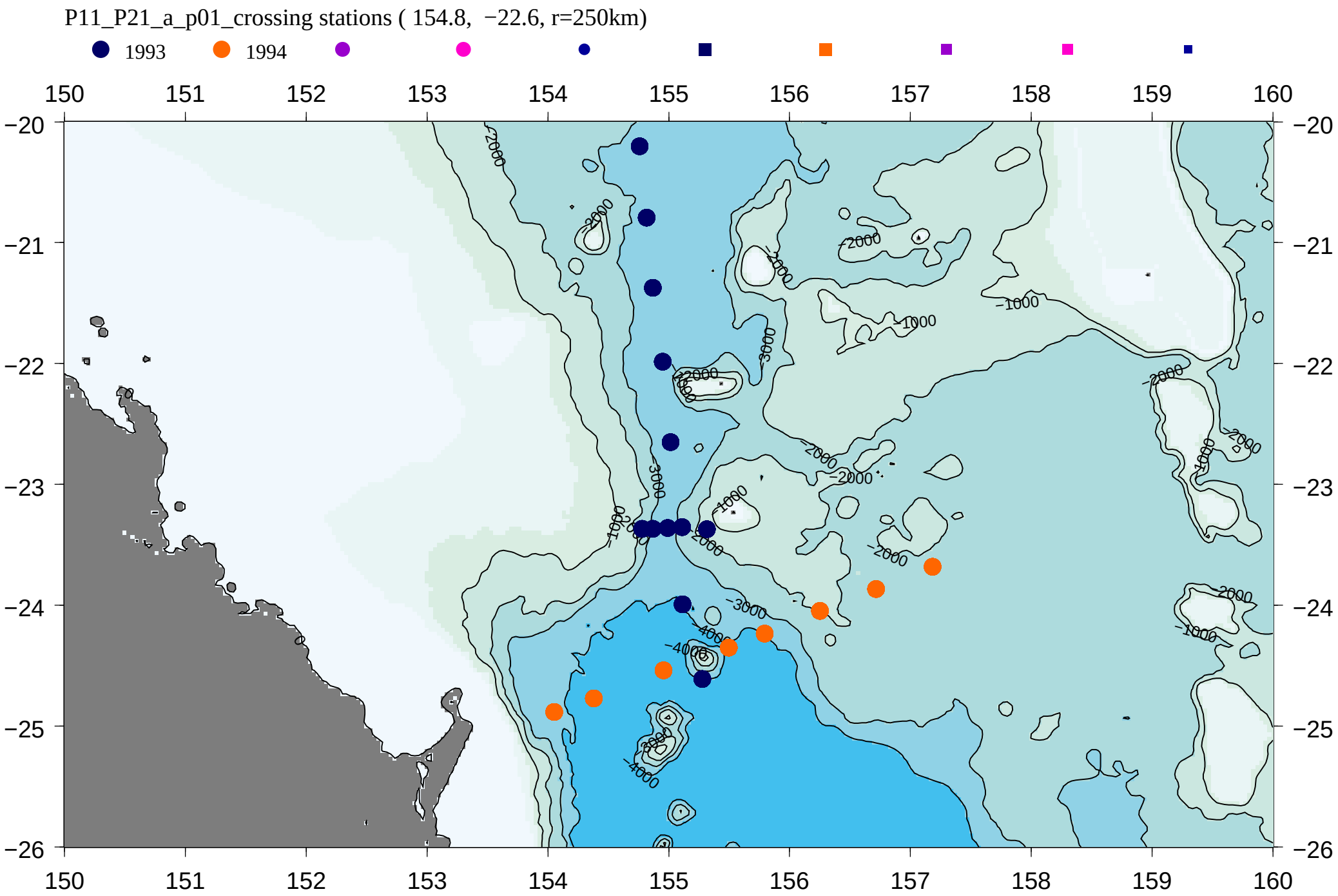

P06_P17_b_p01_crossing stations (225.8, −32.5, r=250km)
1991
1992
2003
221
222
223
224
225
226
227
228
229
230
231
−29
−30
−31
−32
−33
−34
−35
−4000
−3000

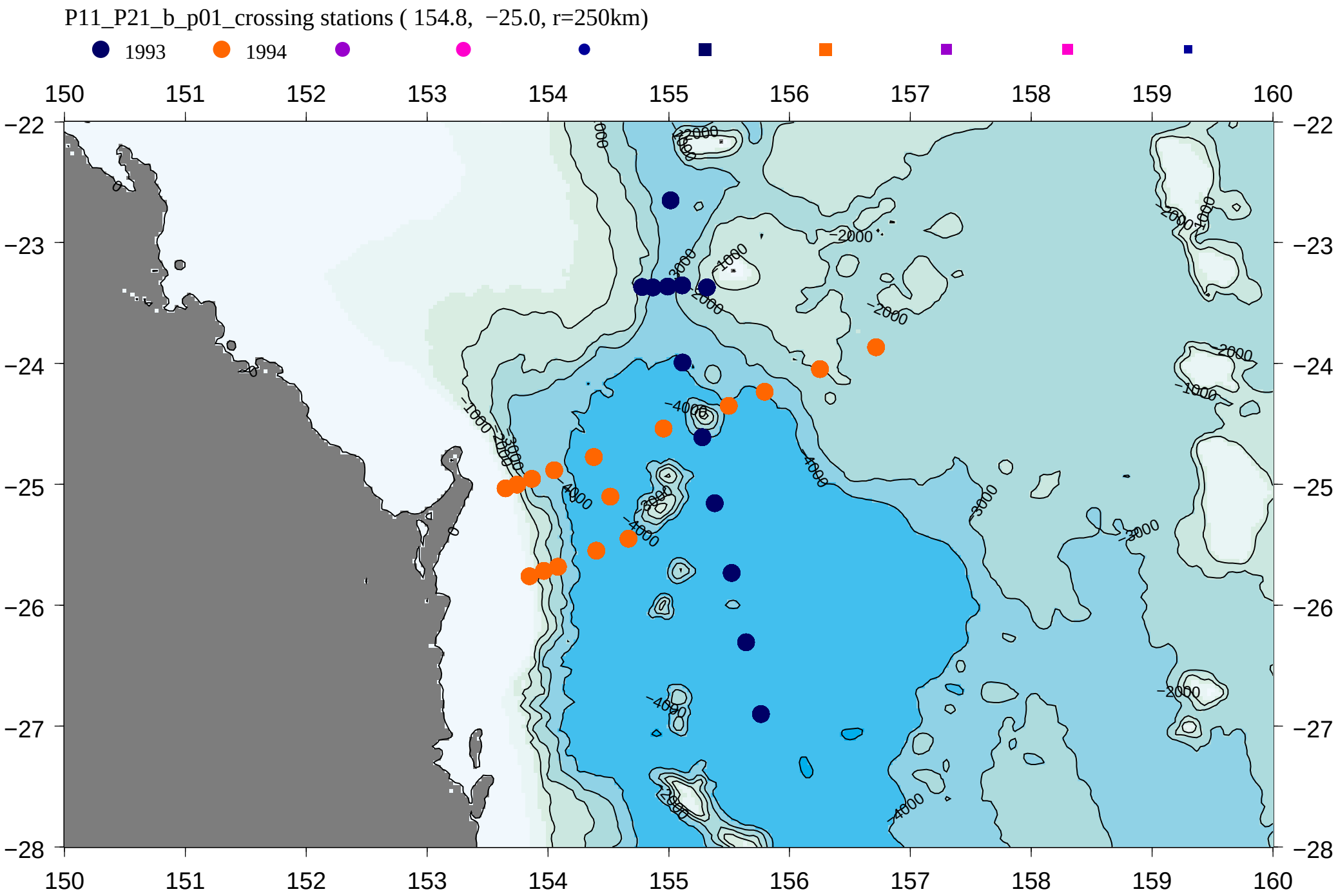

P06_P18_p01_crossing stations (257.0, −32.5, r=250km)
1992
1994
2003
2008
252
253
254
255
256
257
258
259
260
261
262
−30
−31
−32
−33
−34
−35
−36
−3000
−4000

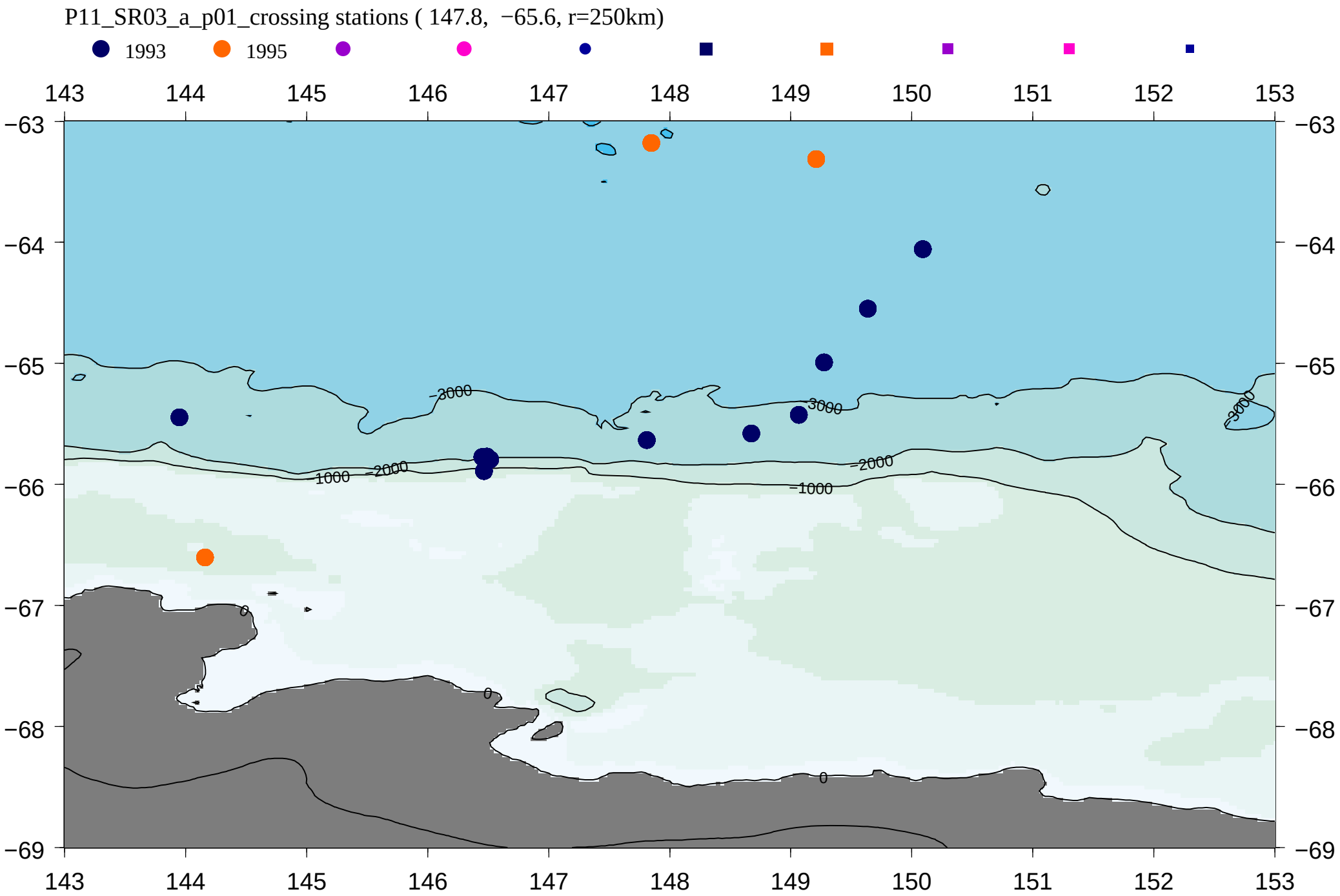

P06_P19_p01_crossing stations (272.0, −32.5, r=250km)
1992
1993
2003
267
268
269
270
271
272
273
274
275
276
277
−30
−31
−32
−33
−34
−35
−36
−3000
−4000
−4500

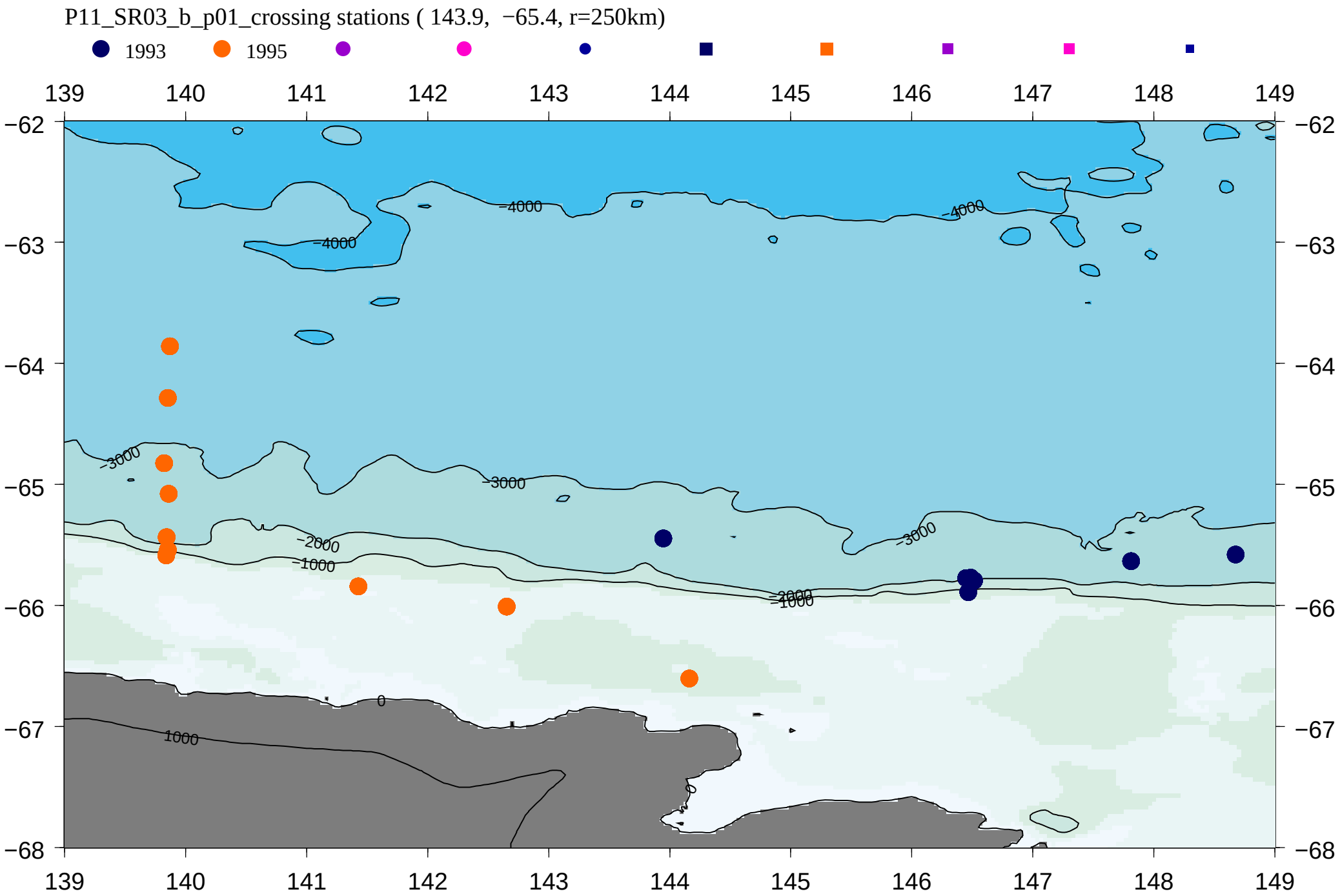

P11_P14_a_p01_crossing stations (153.1, −45.8, r=250km)
1993
1996
148
149
150
151
152
153
154
155
156
157
158
−43
−44
−45
−46
−47
−48
−49
−2000
−3000
−4000
−5000

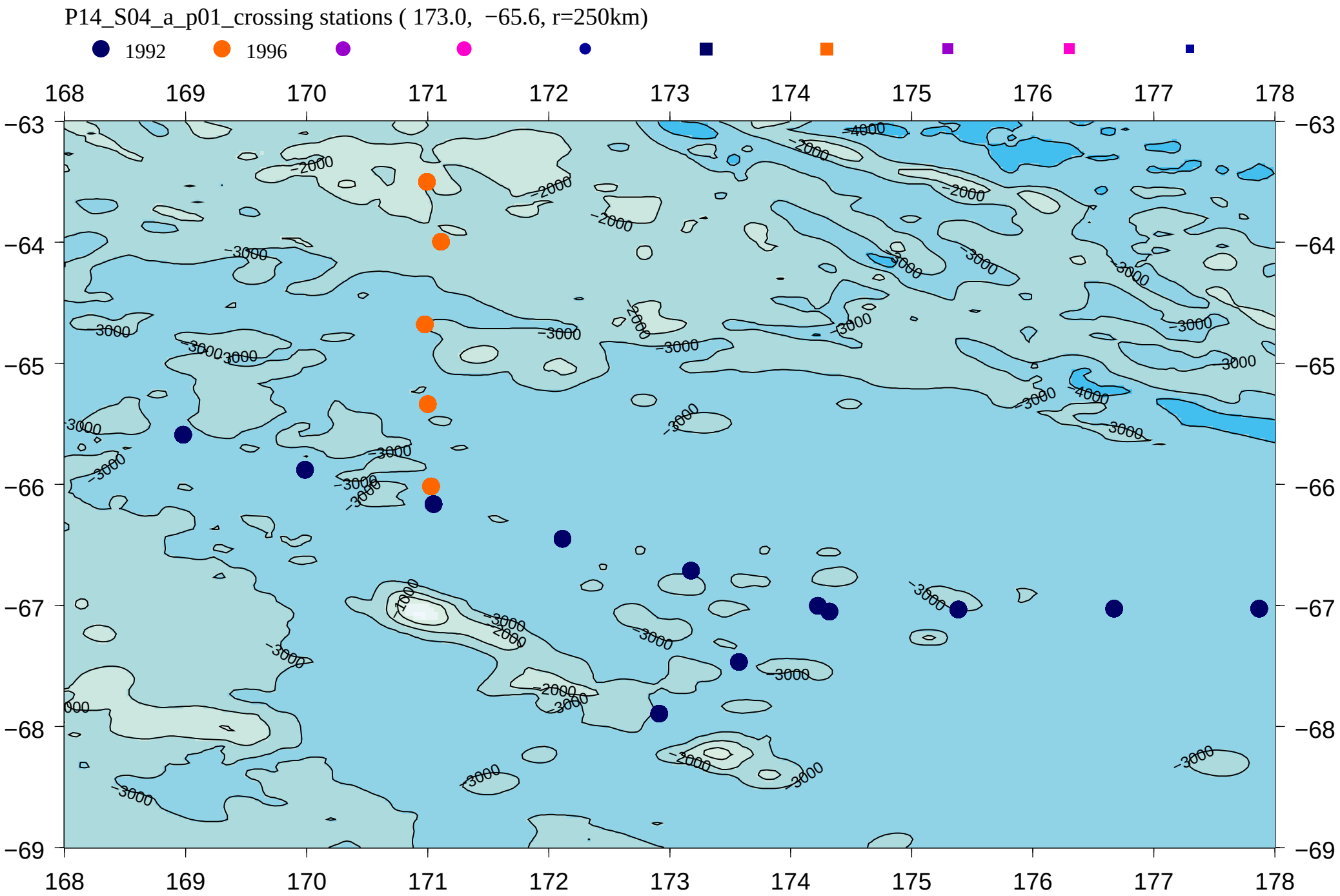

P11_P14_b_p01_crossing stations (155.0, −49.2, r=250km)
1993
1996
150
151
152
153
154
155
156
157
158
159
160
−46
−47
−48
−49
−50
−51
−52
−4000
−3000
−5000

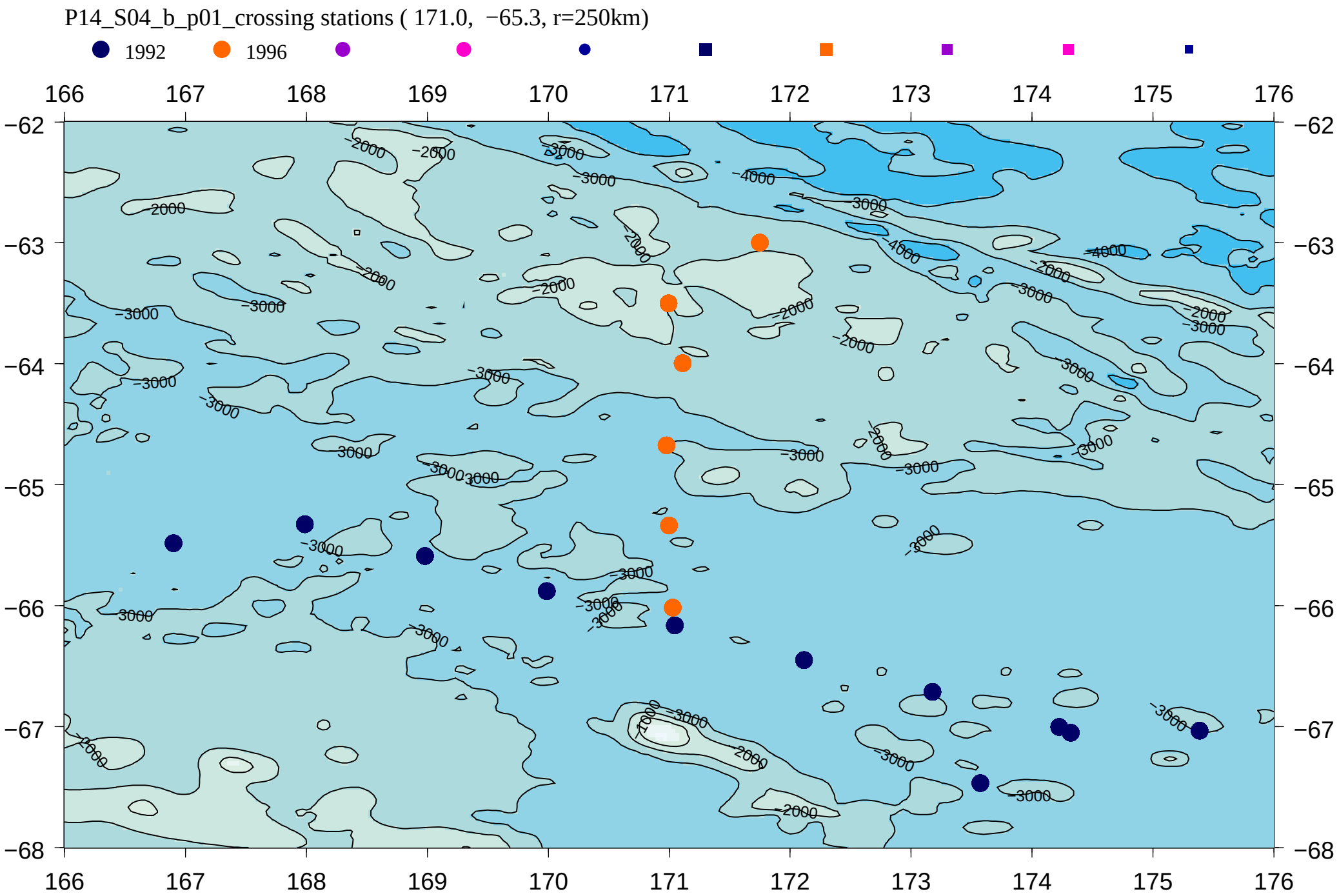

P11_P21_a_p01_crossing stations (154.8, −22.6, r=250km)
1993
1994
150
151
152
153
154
155
156
157
158
159
160
−20
−21
−22
−23
−24
−25
−26

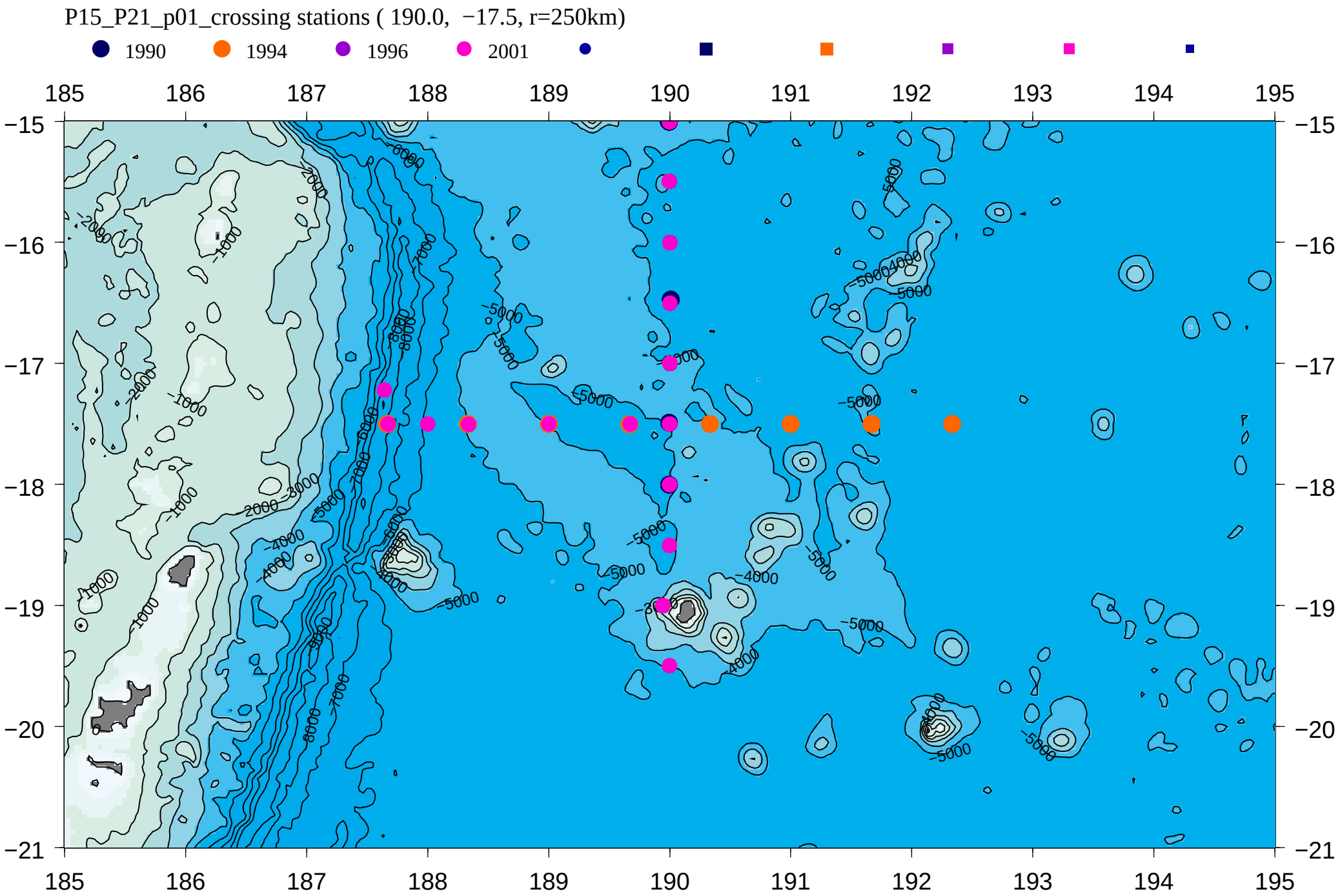

P11_P21_b_p01_crossing stations (154.8, −25.0, r=250km)
1993
1994
150
151
152
153
154
155
156
157
158
159
160
−22
−23
−24
−25
−26
−27
−28

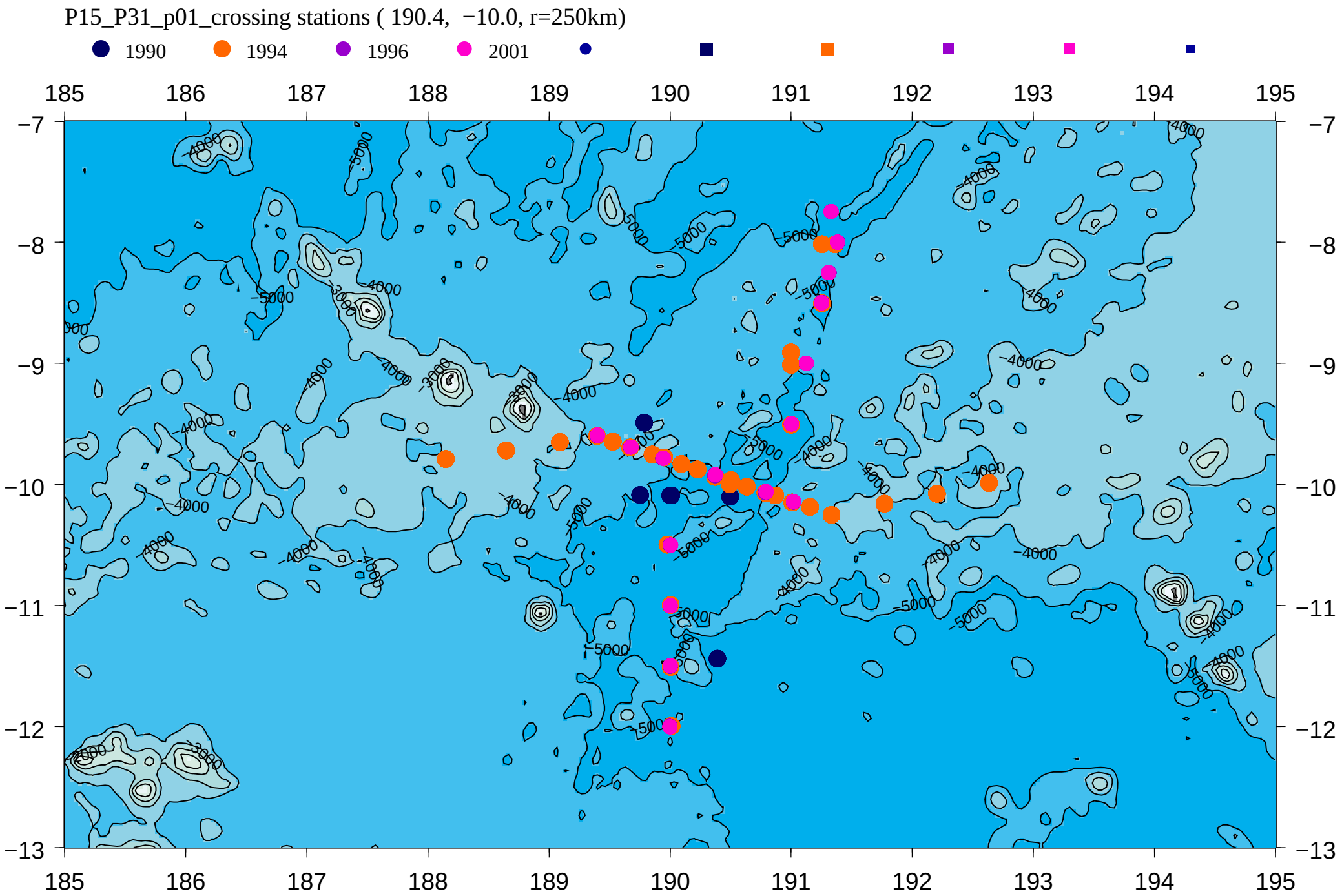

P11_SR03_a_p01_crossing stations (147.8, −65.6, r=250km)
1993
1995
143
144
145
146
147
148
149
150
151
152
153
−63
−64
−65
−66
−67
−68
−69
−3000
−2000
−1000
0

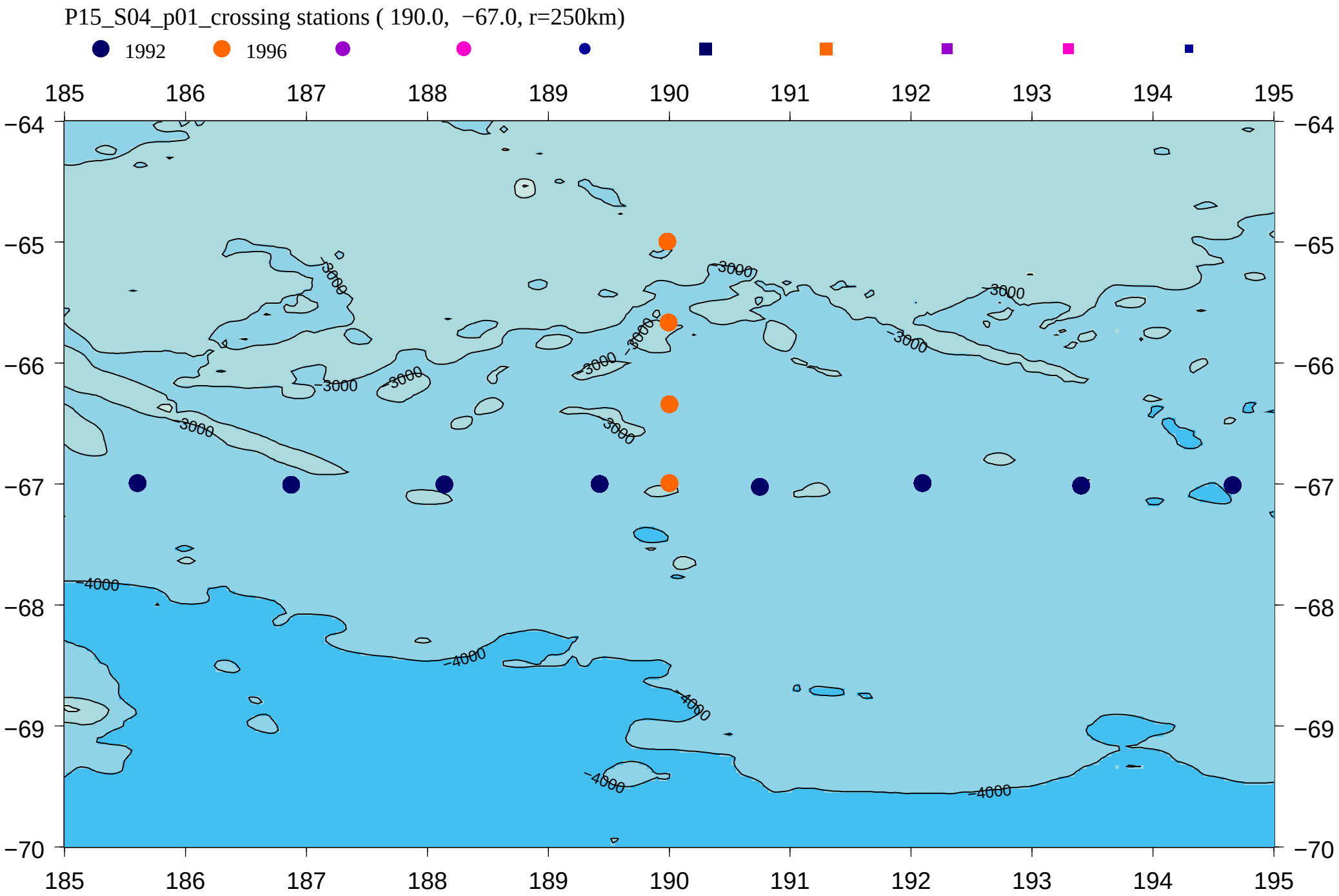

P11_SR03_b_p01_crossing stations (143.9, −65.4, r=250km)
1993
1995
139
140
141
142
143
144
145
146
147
148
149
−62
−63
−64
−65
−66
−67
−68
−4000
−3000
−2000
−1000
0
1000

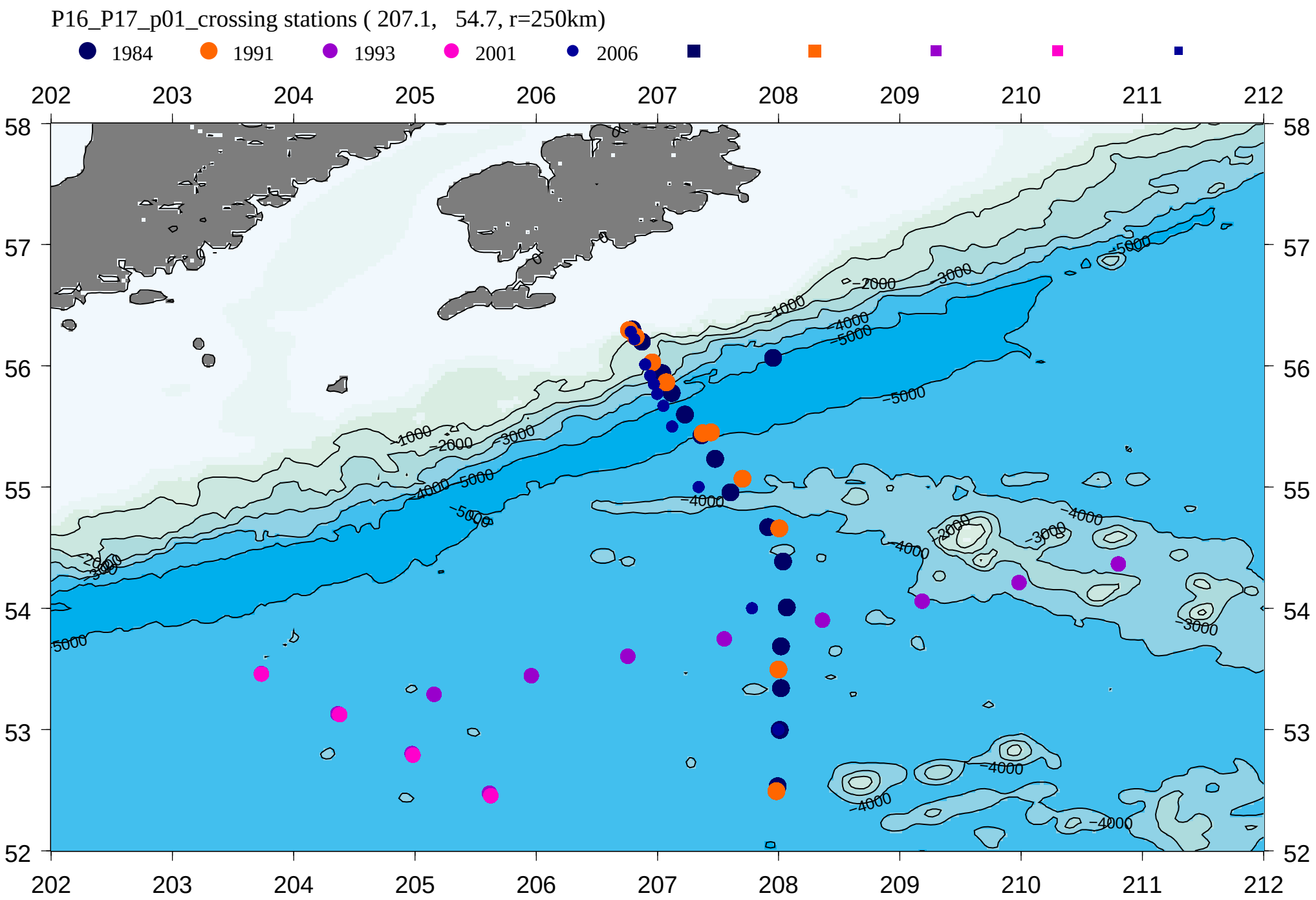

P14_S04_a_p01_crossing stations (173.0, −65.6, r=250km)
1992
1996
168
169
170
171
172
173
174
175
176
177
178
−63
−64
−65
−66
−67
−68
−69

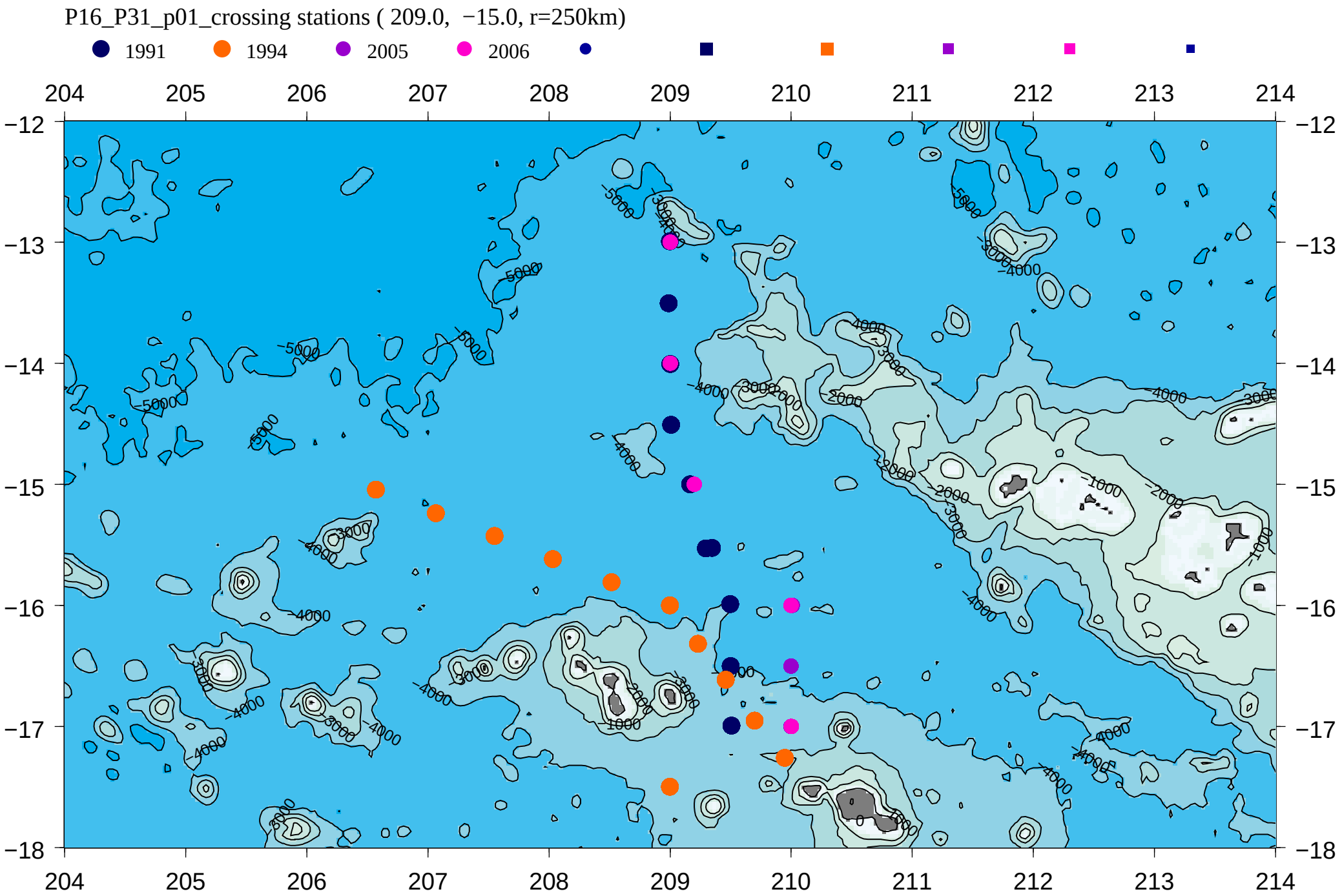

P14_S04_b_p01_crossing stations (171.0, −65.3, r=250km)
1992
1996
166
167
168
169
170
171
172
173
174
175
176
−62
−63
−64
−65
−66
−67
−68

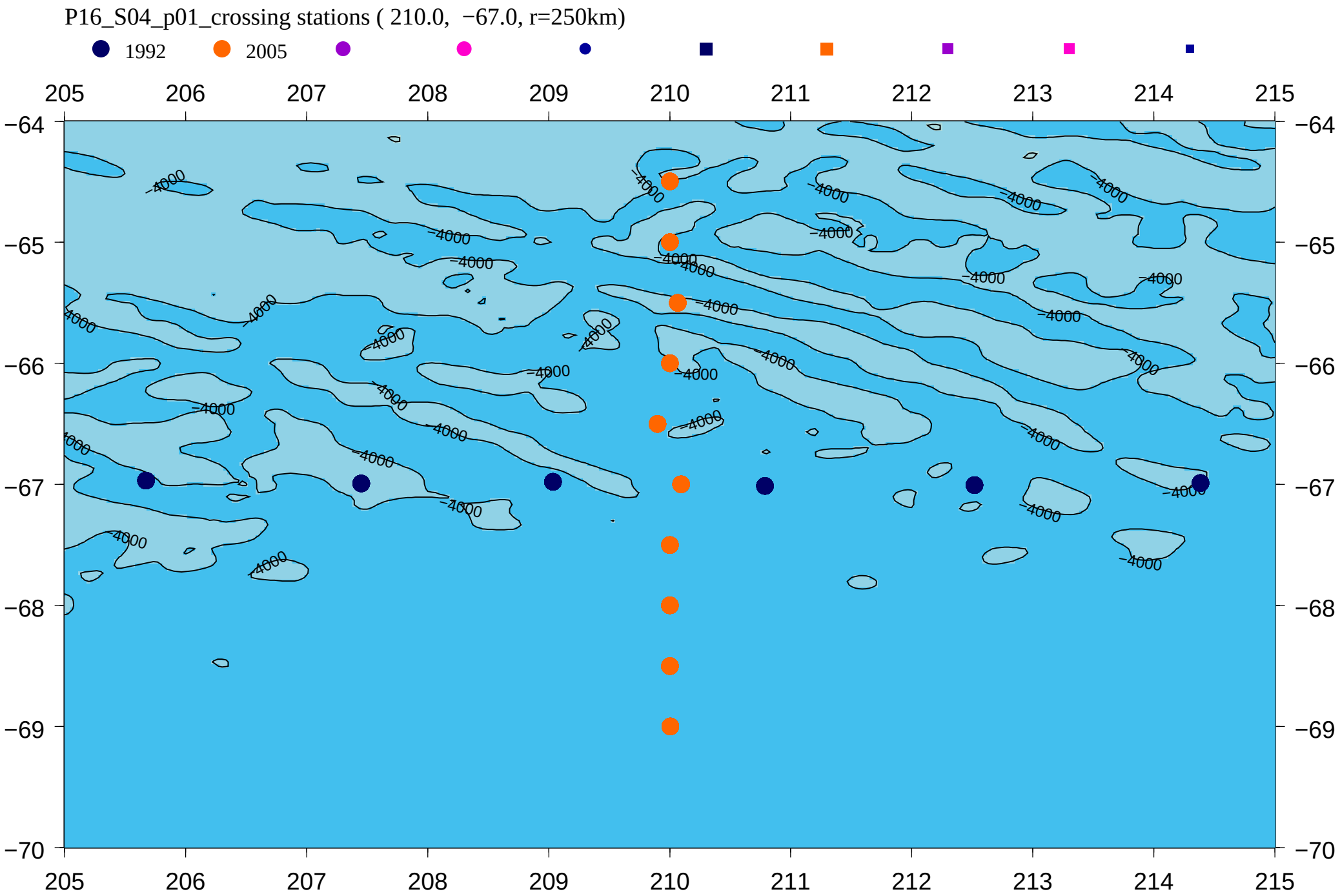

P15_P21_p01_crossing stations (190.0, −17.5, r=250km)
1990
1994
1996
2001
185
186
187
188
189
190
191
192
193
194
195
−15
−16
−17
−18
−19
−20
−21

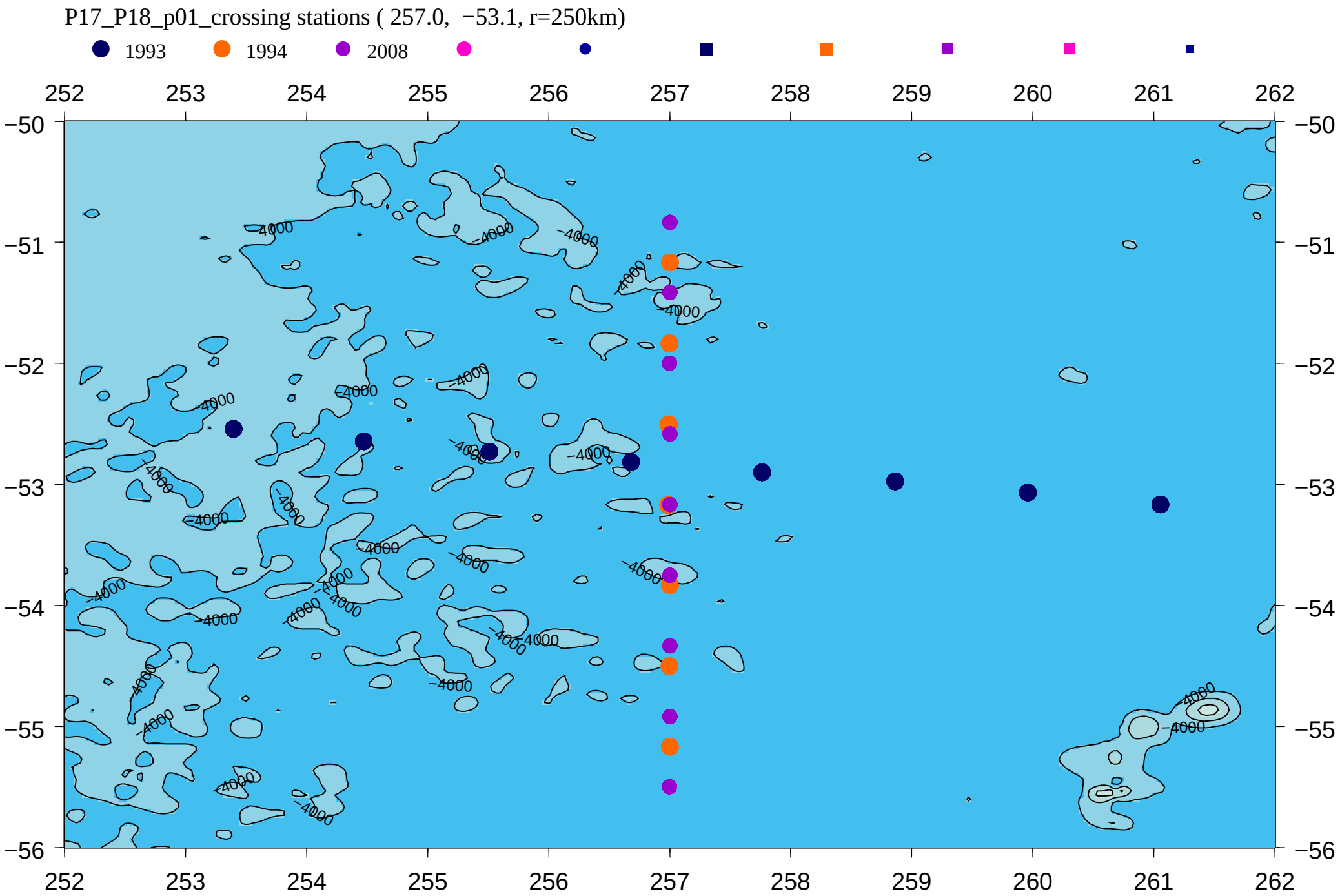

P15_P31_p01_crossing stations (190.4, −10.0, r=250km)
1990
1994
1996
2001
185
186
187
188
189
190
191
192
193
194
195
−7
−8
−9
−10
−11
−12
−13

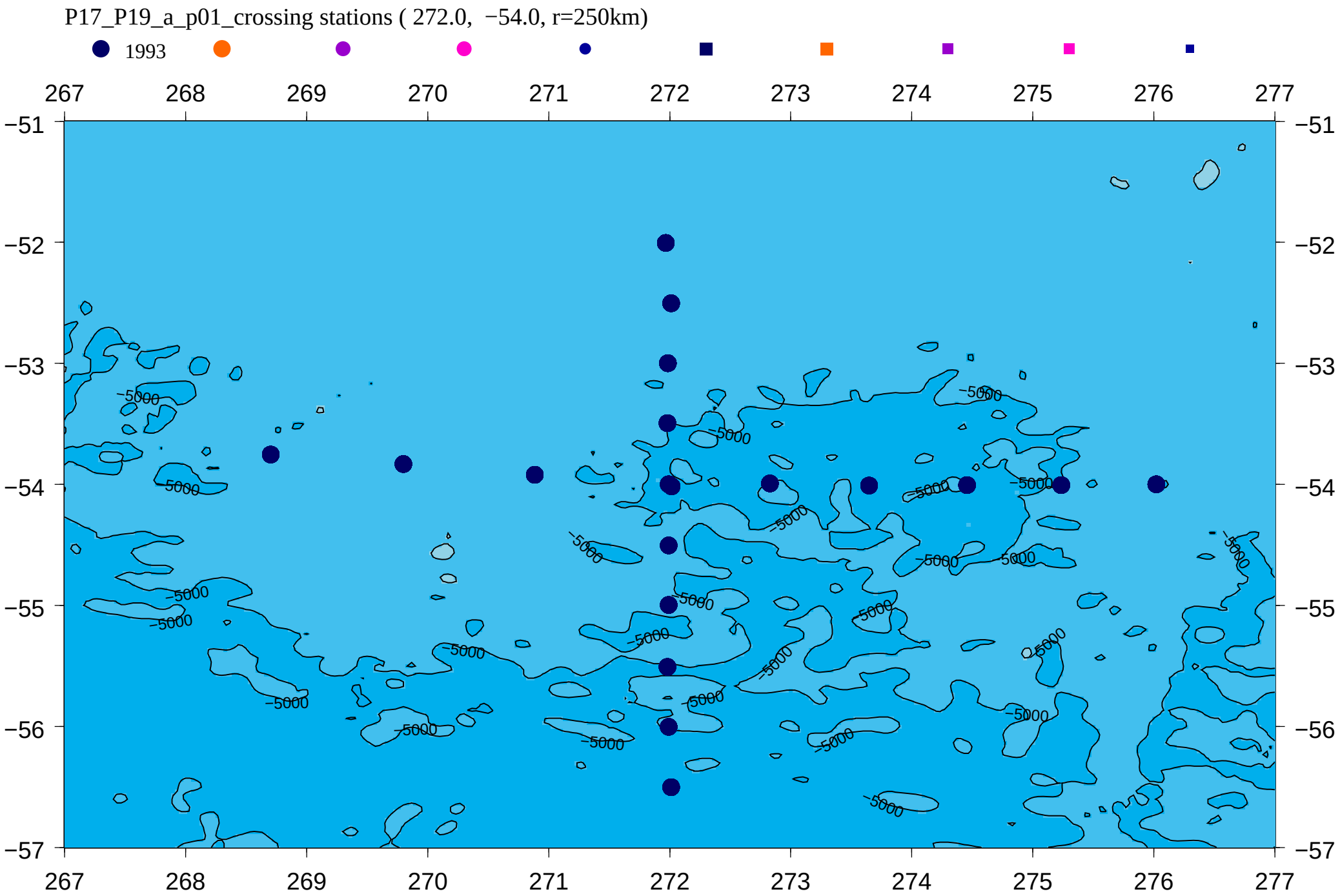

P15_S04_p01_crossing stations (190.0, −67.0, r=250km)
1992
1996
185
186
187
188
189
190
191
192
193
194
195
−64
−65
−66
−67
−68
−69
−70
−3000
−4000

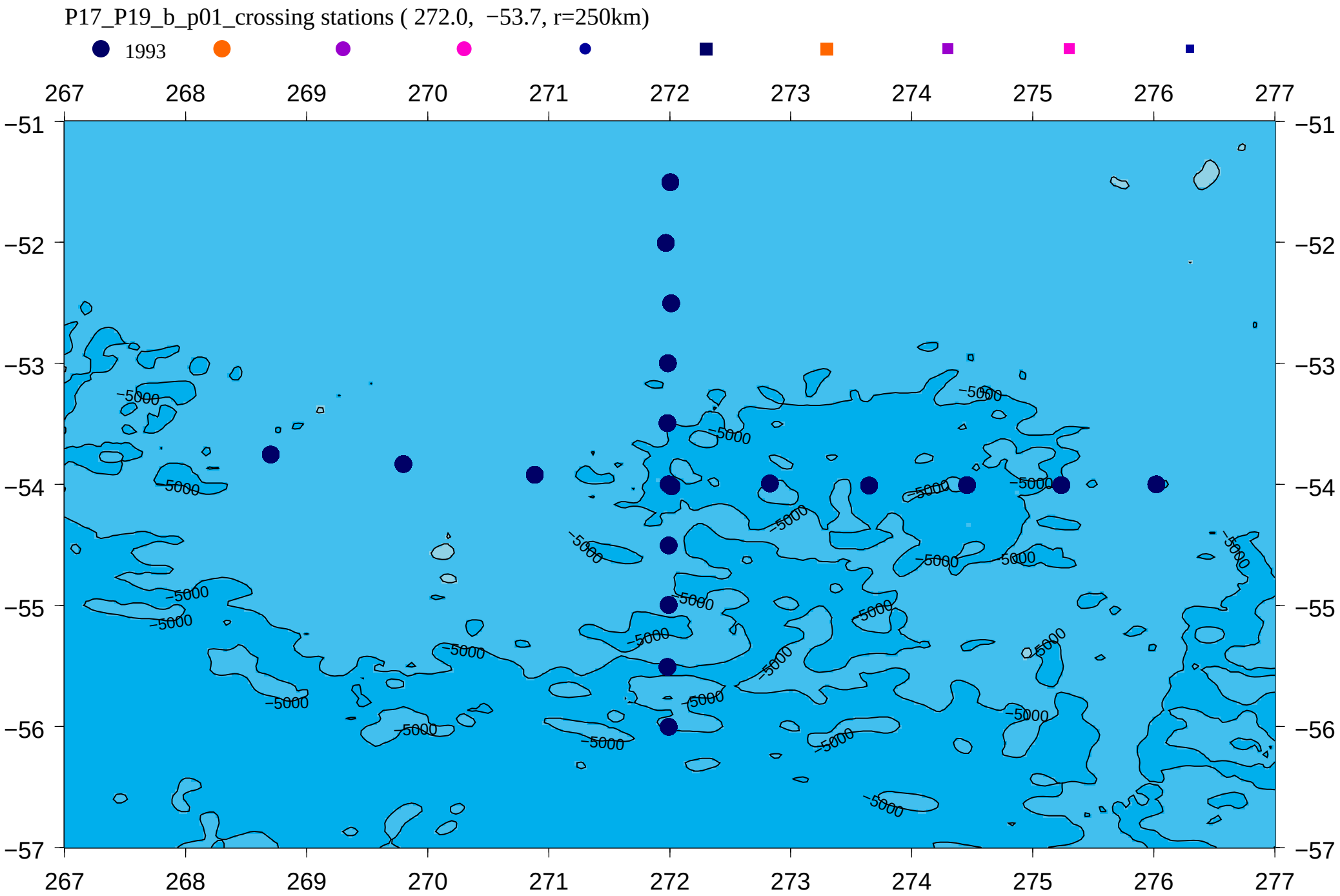

P16_P17_p01_crossing stations (207.1, 54.7, r=250km)
1984
1991
1993
2001
2006
202
203
204
205
206
207
208
209
210
211
212
58
57
56
55
54
53
52
0
-1000
-2000
-3000
-4000
-5000

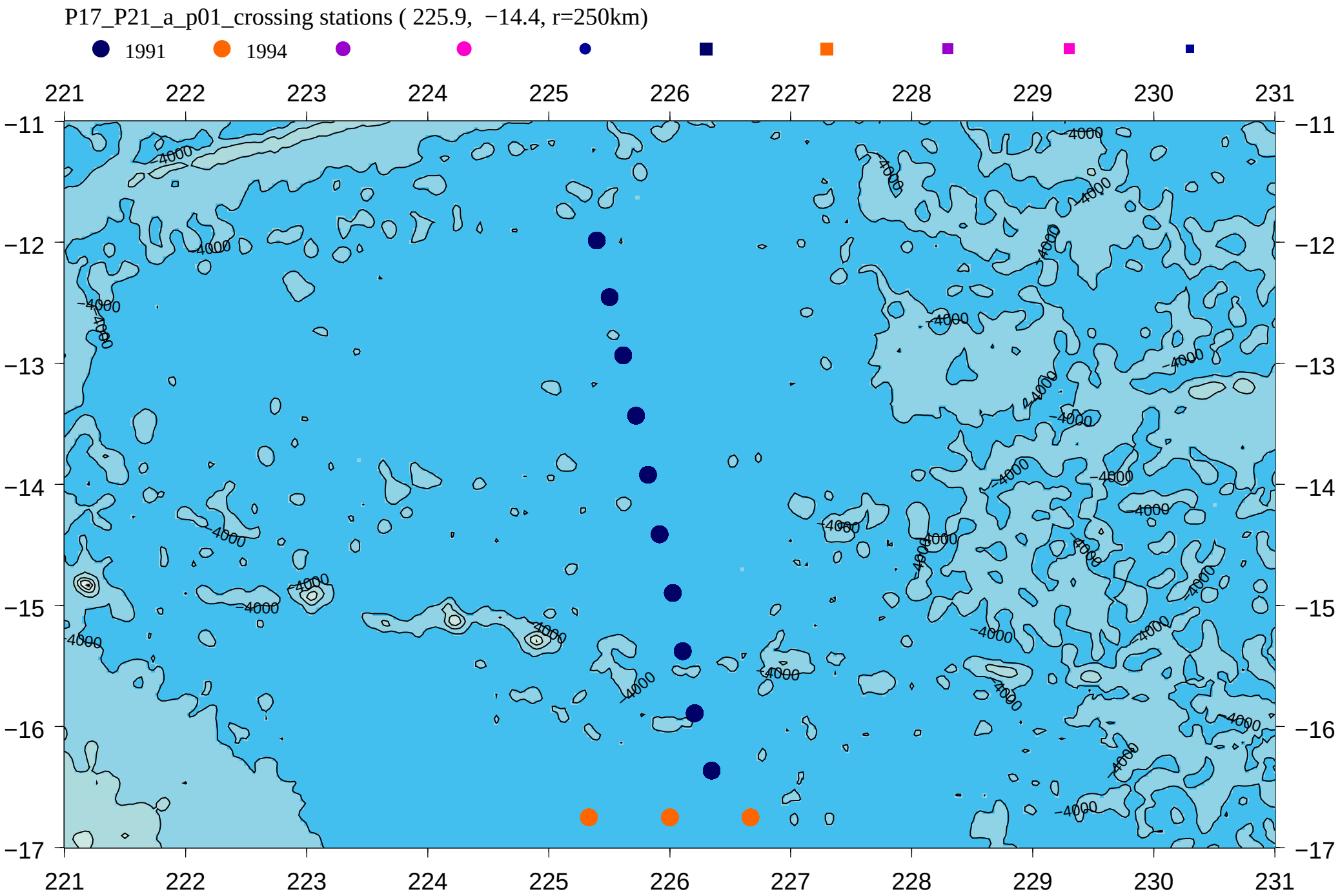

P16_P31_p01_crossing stations (209.0, −15.0, r=250km)
1991
1994
2005
2006
204
205
206
207
208
209
210
211
212
213
214
−12
−13
−14
−15
−16
−17
−18

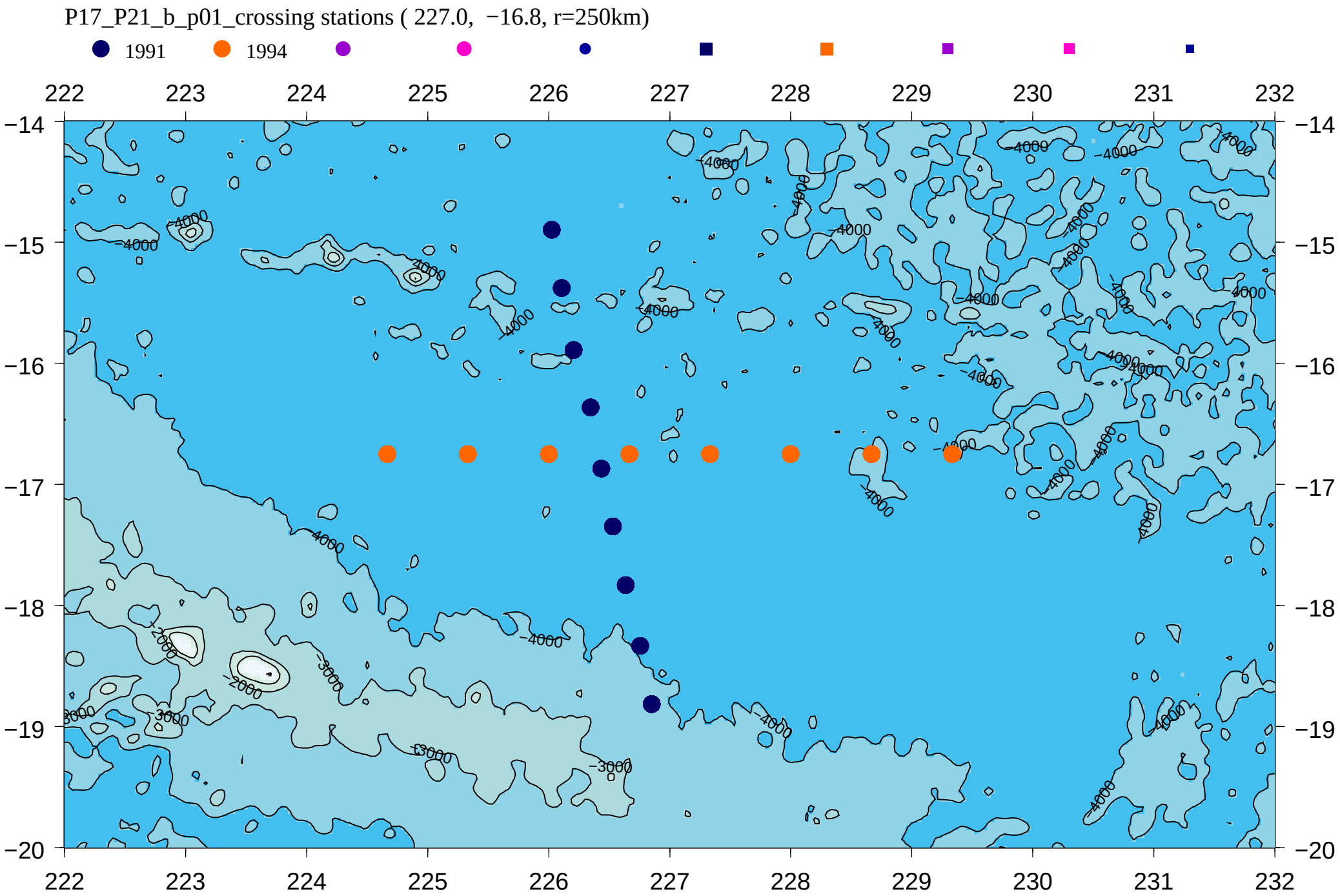

P16_S04_p01_crossing stations (210.0, −67.0, r=250km)
1992
2005
205
206
207
208
209
210
211
212
213
214
215
−64
−65
−66
−67
−68
−69
−70
−4000

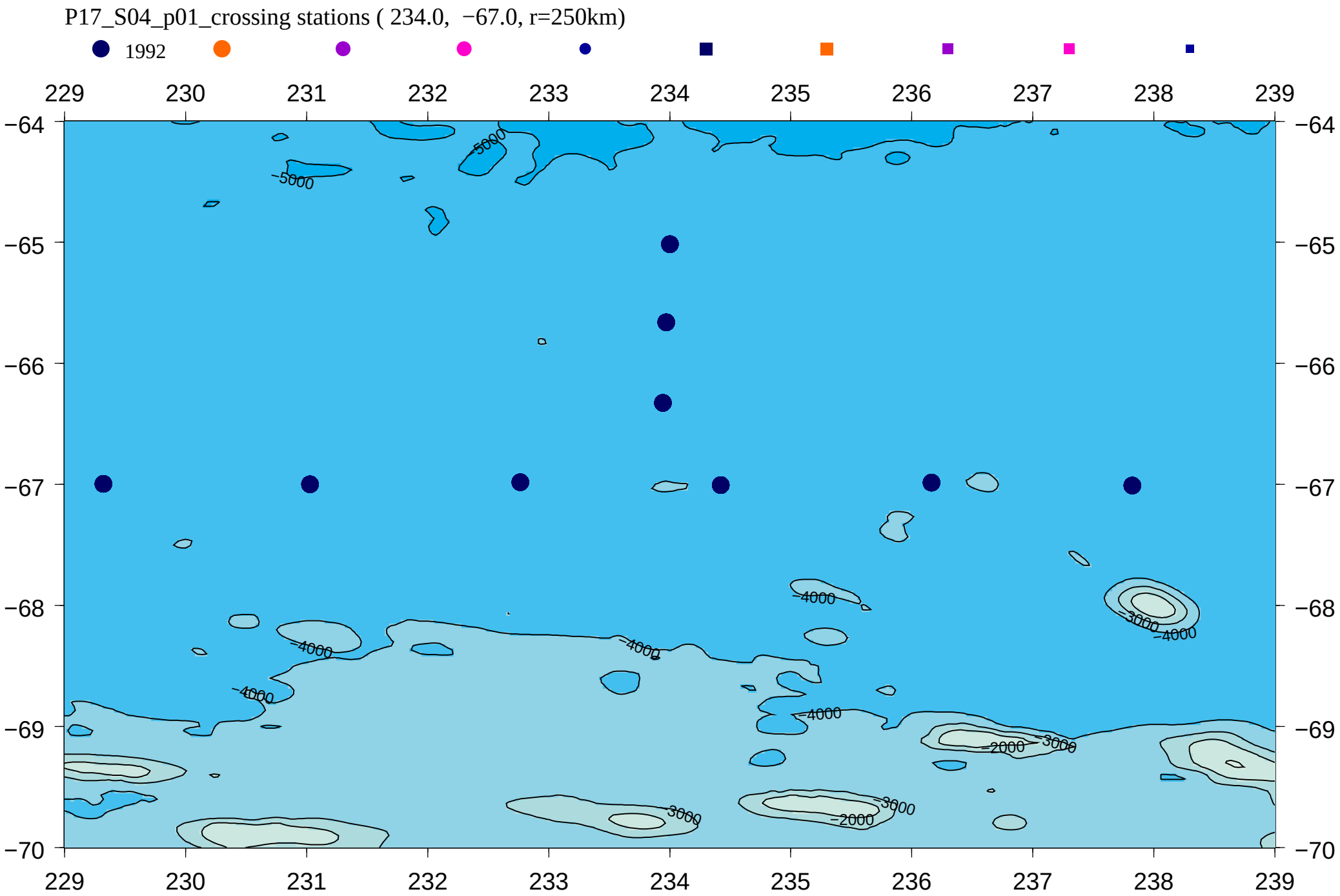

P17_P18_p01_crossing stations (257.0, −53.1, r=250km)
1993
1994
2008
252
253
254
255
256
257
258
259
260
261
262
−50
−51
−52
−53
−54
−55
−56
−4000

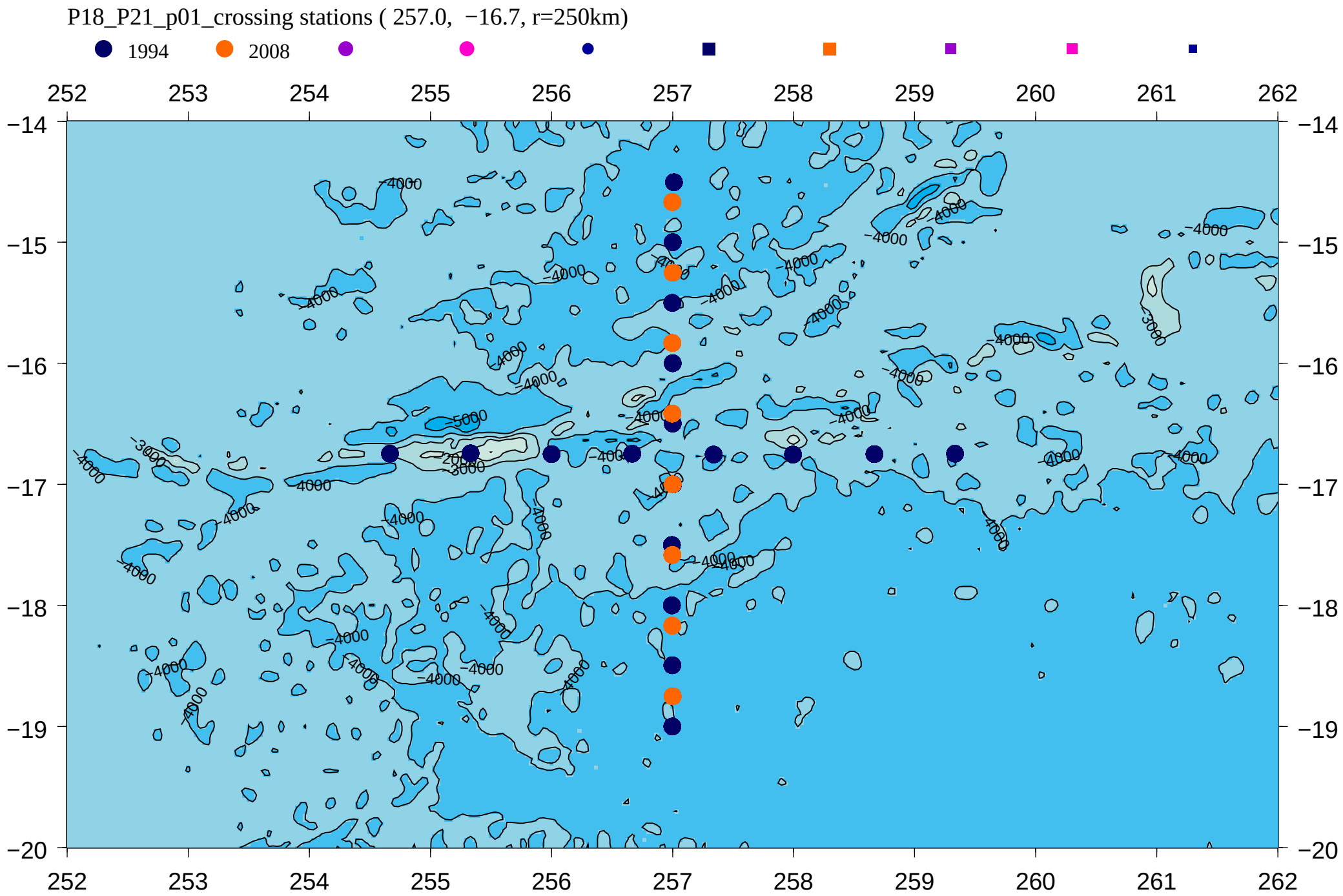

P17_P19_a_p01_crossing stations (272.0, −54.0, r=250km)
1993
267
268
269
270
271
272
273
274
275
276
277
−51
−52
−53
−54
−55
−56
−57
−5000

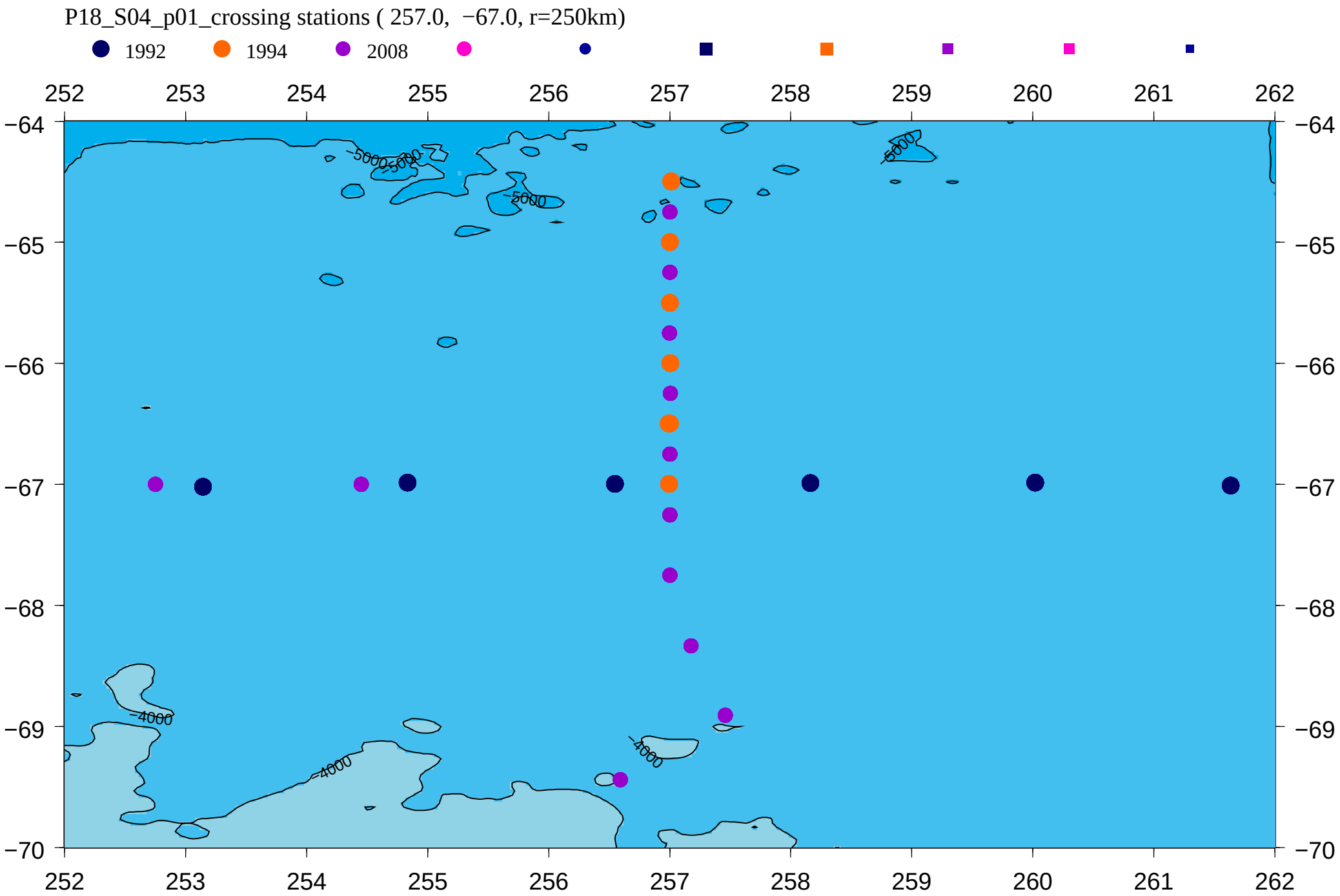

P17_P19_b_p01_crossing stations (272.0, −53.7, r=250km)
1993
267
268
269
270
271
272
273
274
275
276
277
−51
−52
−53
−54
−55
−56
−57
−5000

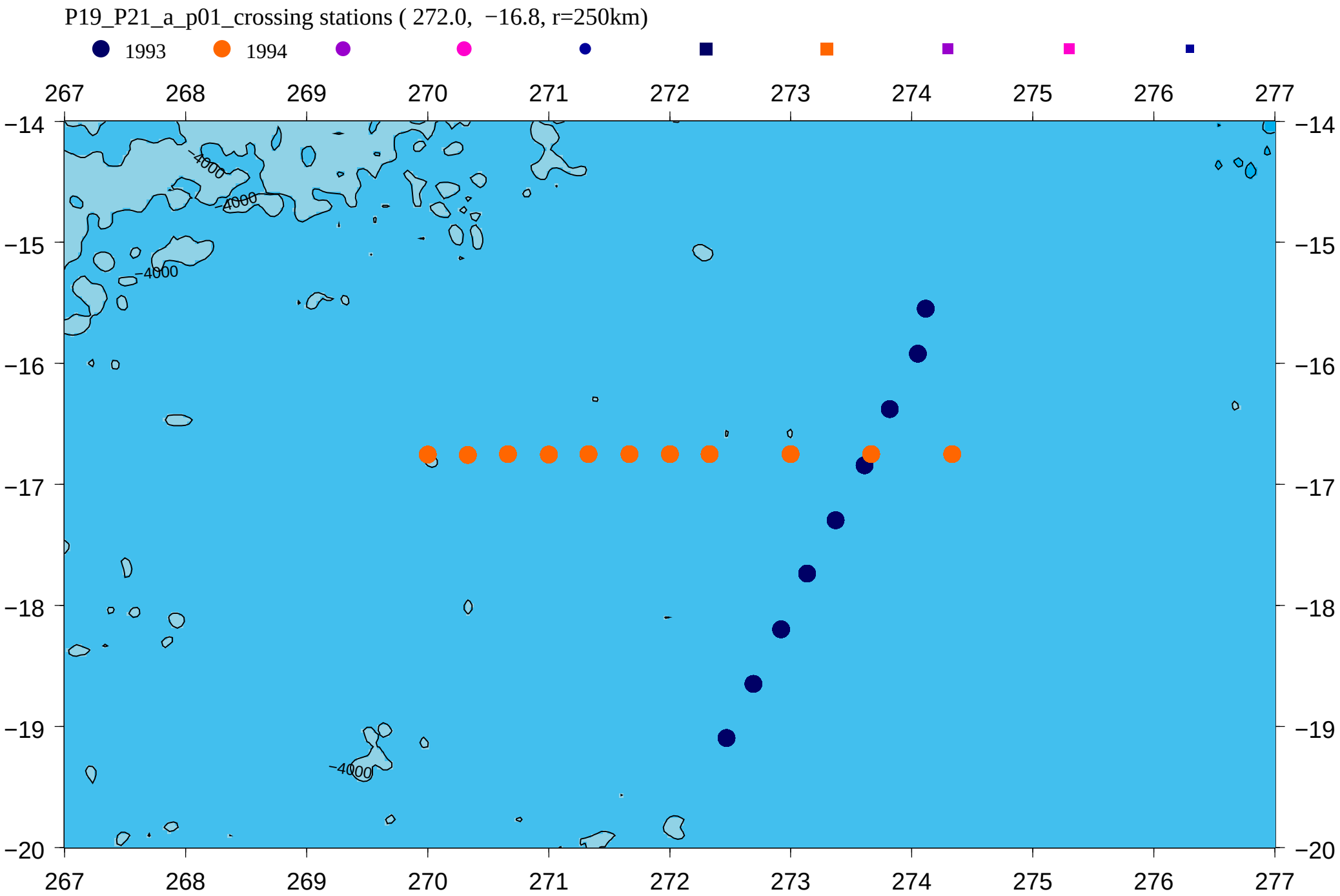

P17_P21_a_p01_crossing stations (225.9, −14.4, r=250km)
1991
1994
221
222
223
224
225
226
227
228
229
230
231
−11
−12
−13
−14
−15
−16
−17
−4000

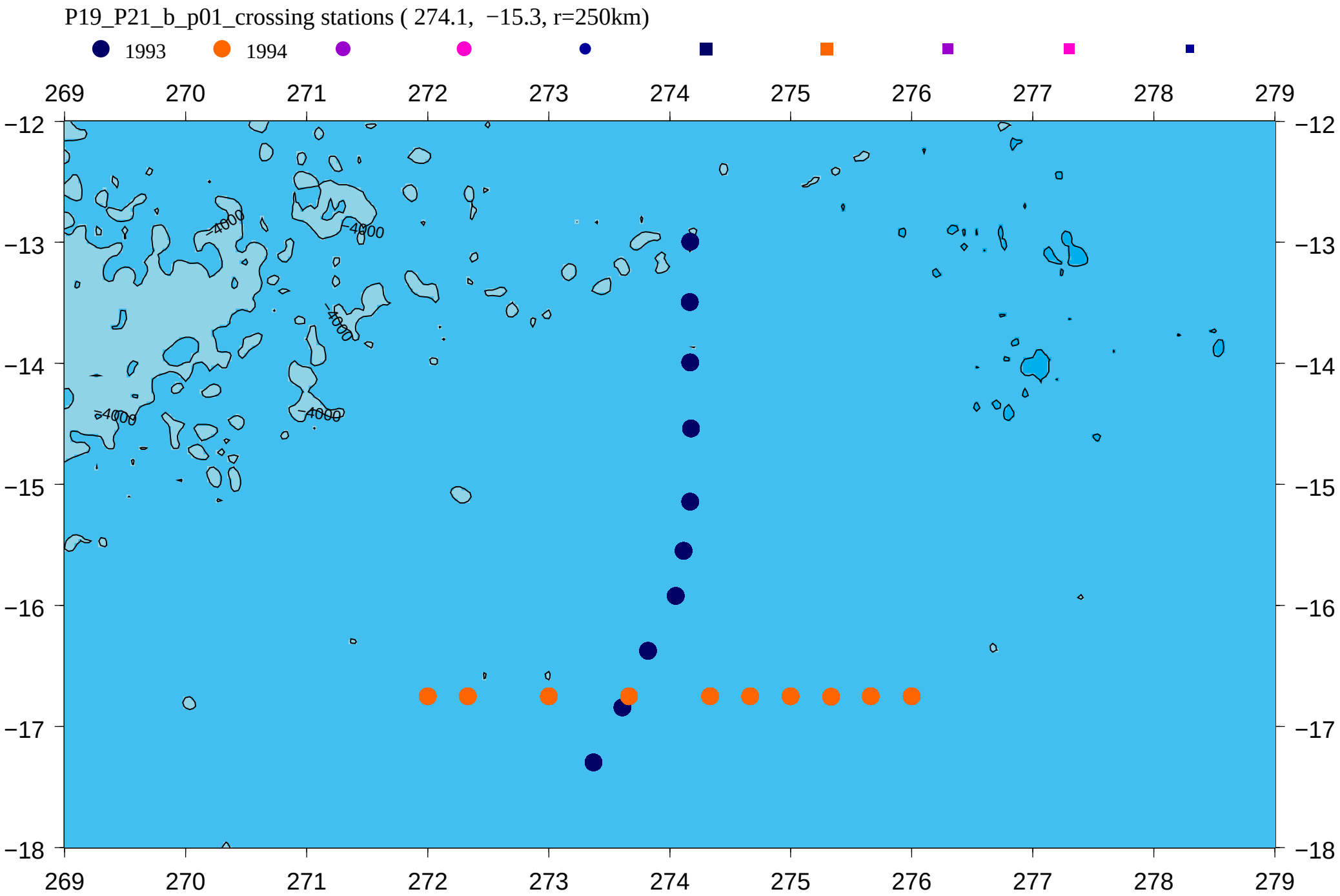

P17_P21_b_p01_crossing stations (227.0, −16.8, r=250km)
1991
1994
222
223
224
225
226
227
228
229
230
231
232
−14
−15
−16
−17
−18
−19
−20
−4000
−3000
−2000

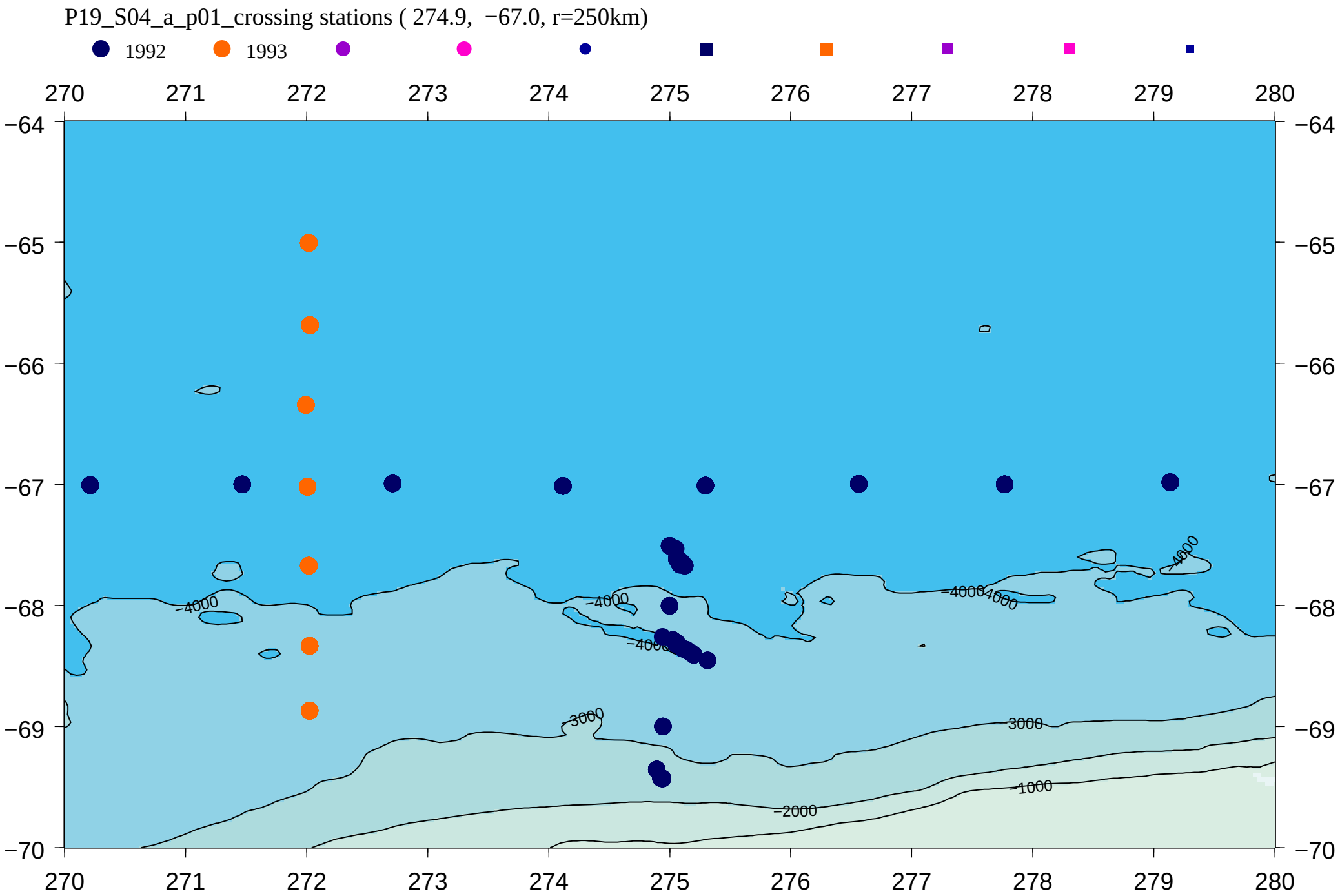

P17_S04_p01_crossing stations (234.0, −67.0, r=250km)
1992
229
230
231
232
233
234
235
236
237
238
239
−64
−65
−66
−67
−68
−69
−70
−5000
−4000
−3000
−2000

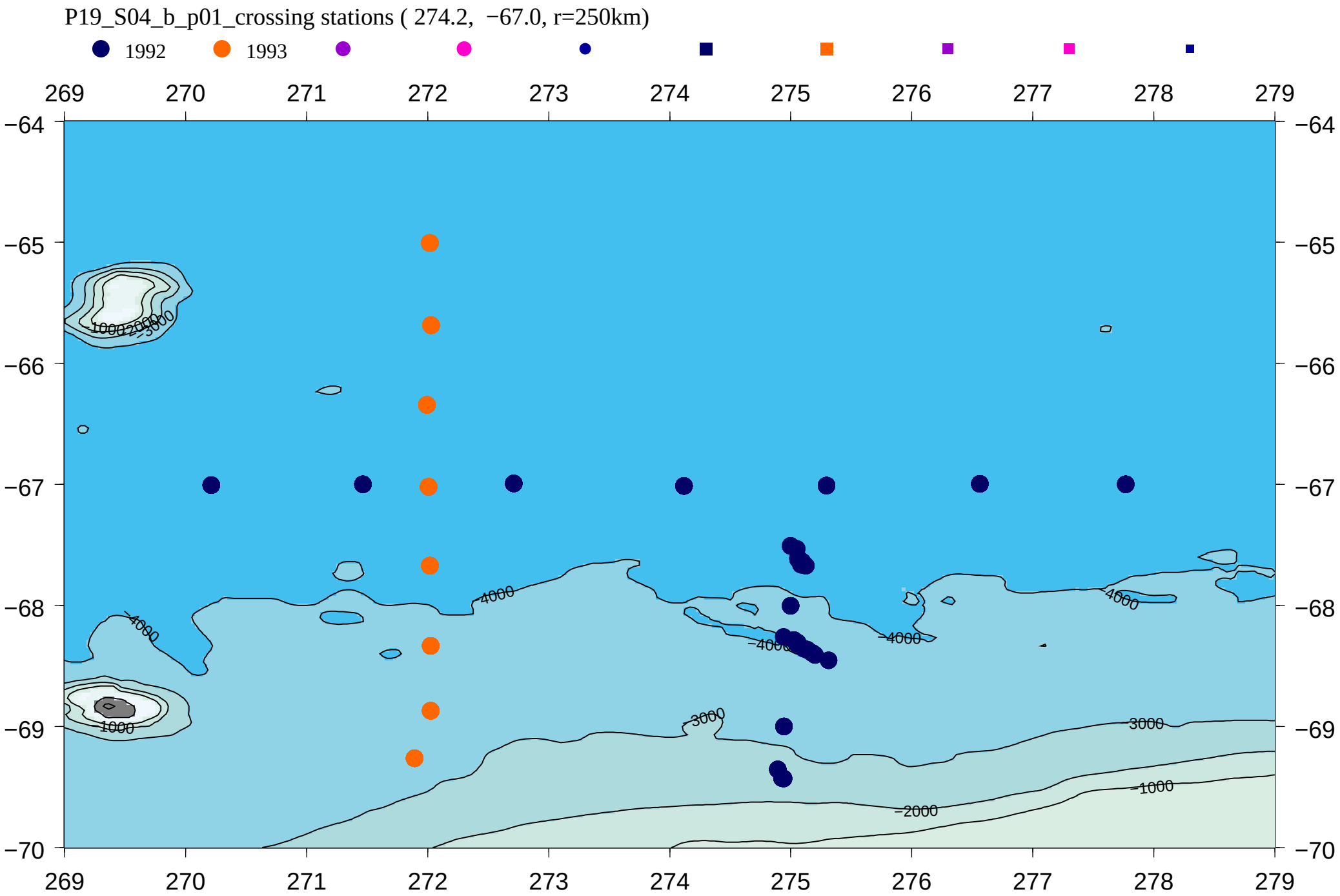

P18_P21_p01_crossing stations (257.0, −16.7, r=250km)
1994
2008
252
253
254
255
256
257
258
259
260
261
262
−14
−15
−16
−17
−18
−19
−20
−4000
−5000
−3000

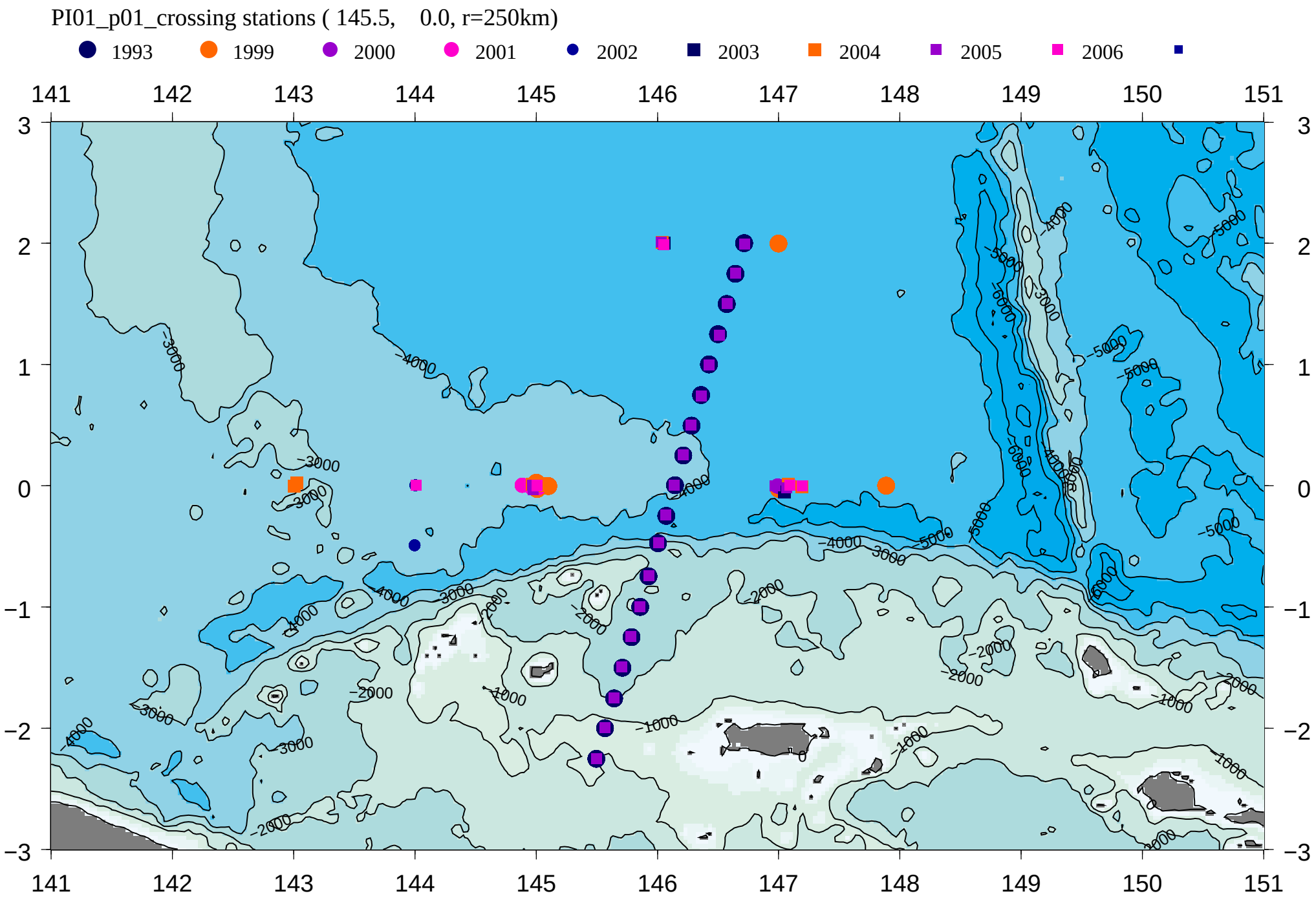

P18_S04_p01_crossing stations (257.0, −67.0, r=250km)
1992
1994
2008
252
253
254
255
256
257
258
259
260
261
262
−64
−65
−66
−67
−68
−69
−70
−5000
−4000

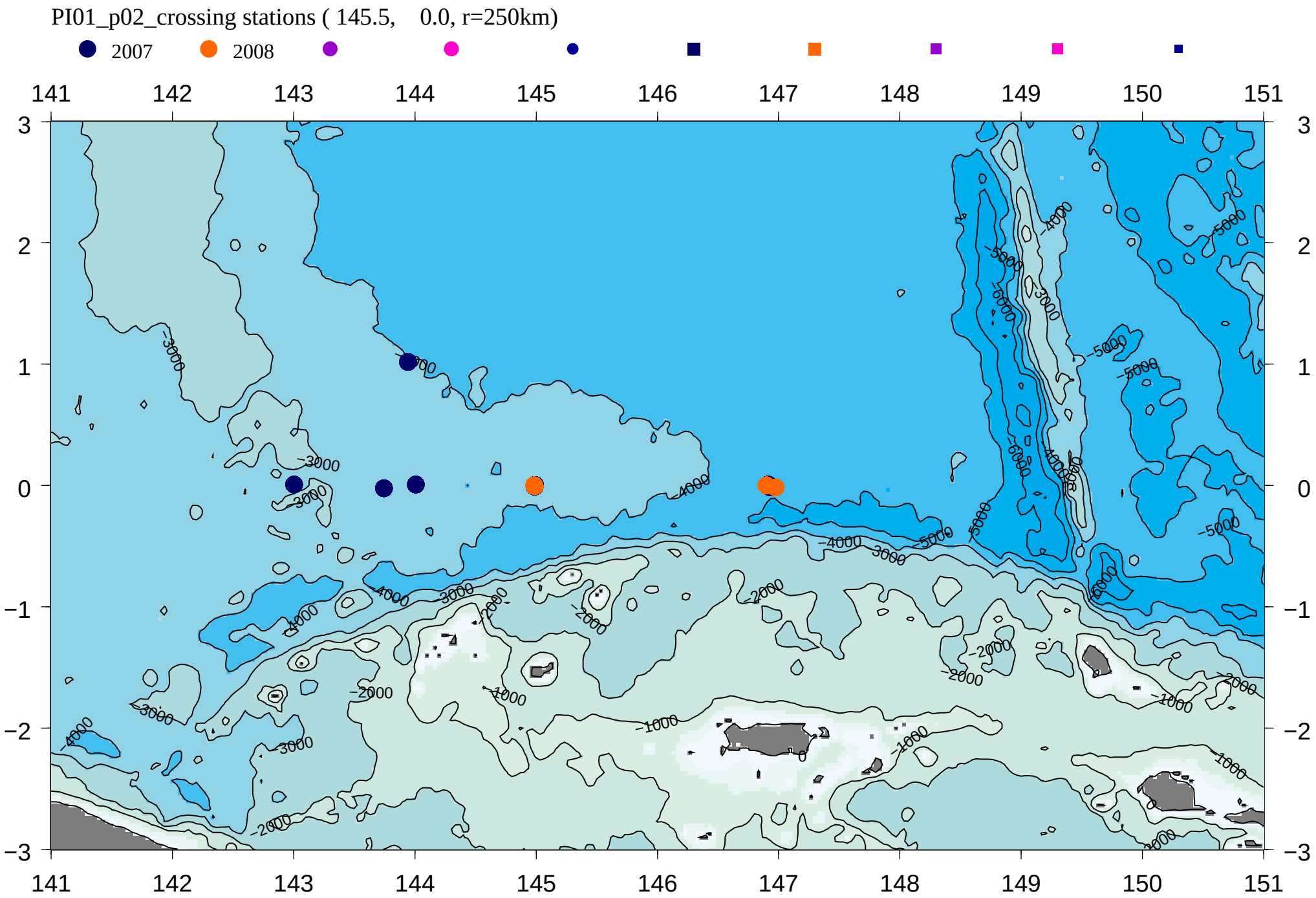

P19_P21_a_p01_crossing stations (272.0, −16.8, r=250km)
1993
1994
267
268
269
270
271
272
273
274
275
276
277
−14
−15
−16
−17
−18
−19
−20
−4000
−4000
−4000
−4000

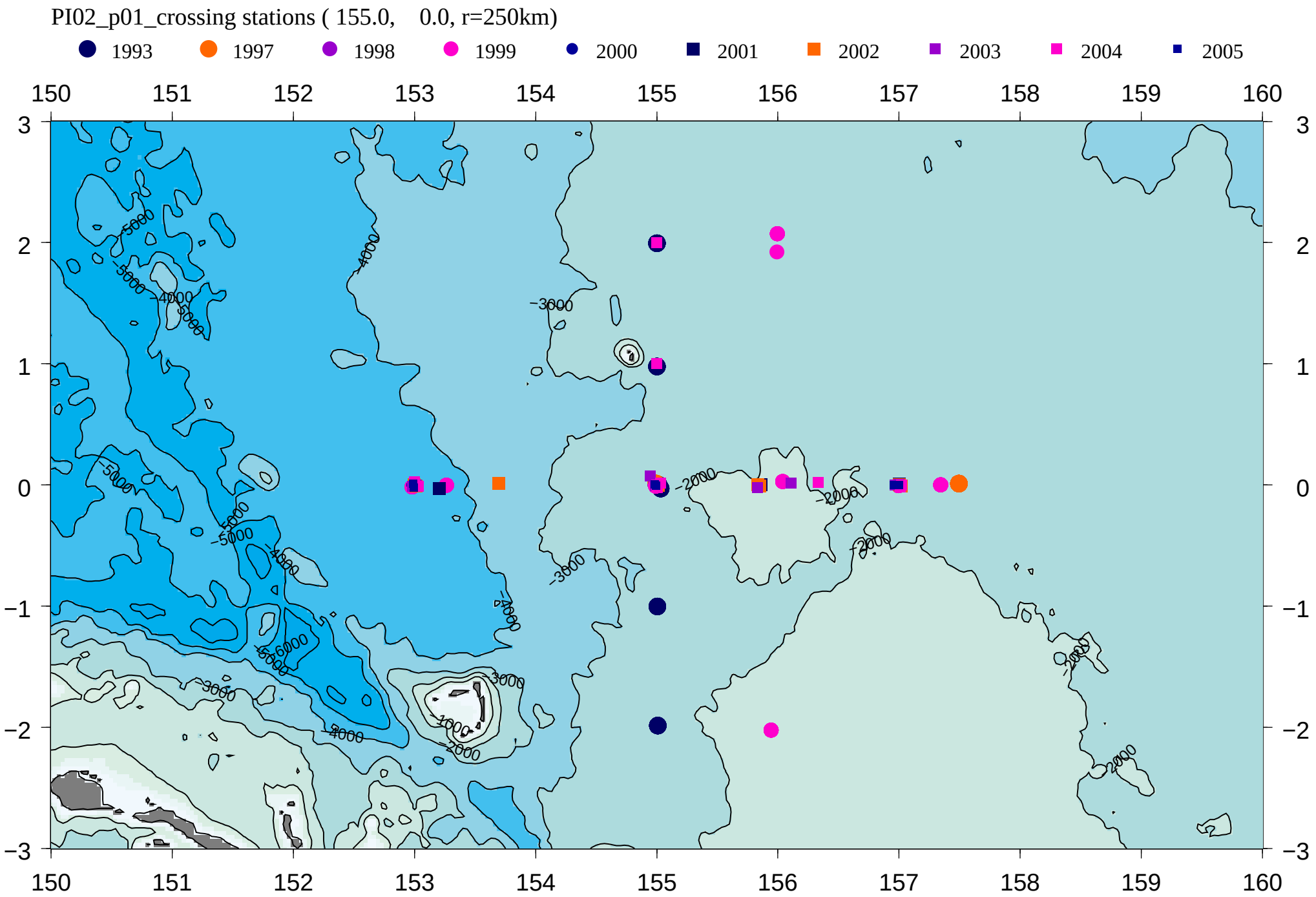

P19_P21_b_p01_crossing stations (274.1, −15.3, r=250km)
1993
1994
269
270
271
272
273
274
275
276
277
278
279
−12
−13
−14
−15
−16
−17
−18
−4000
−4000
−4000
−4000
−4000

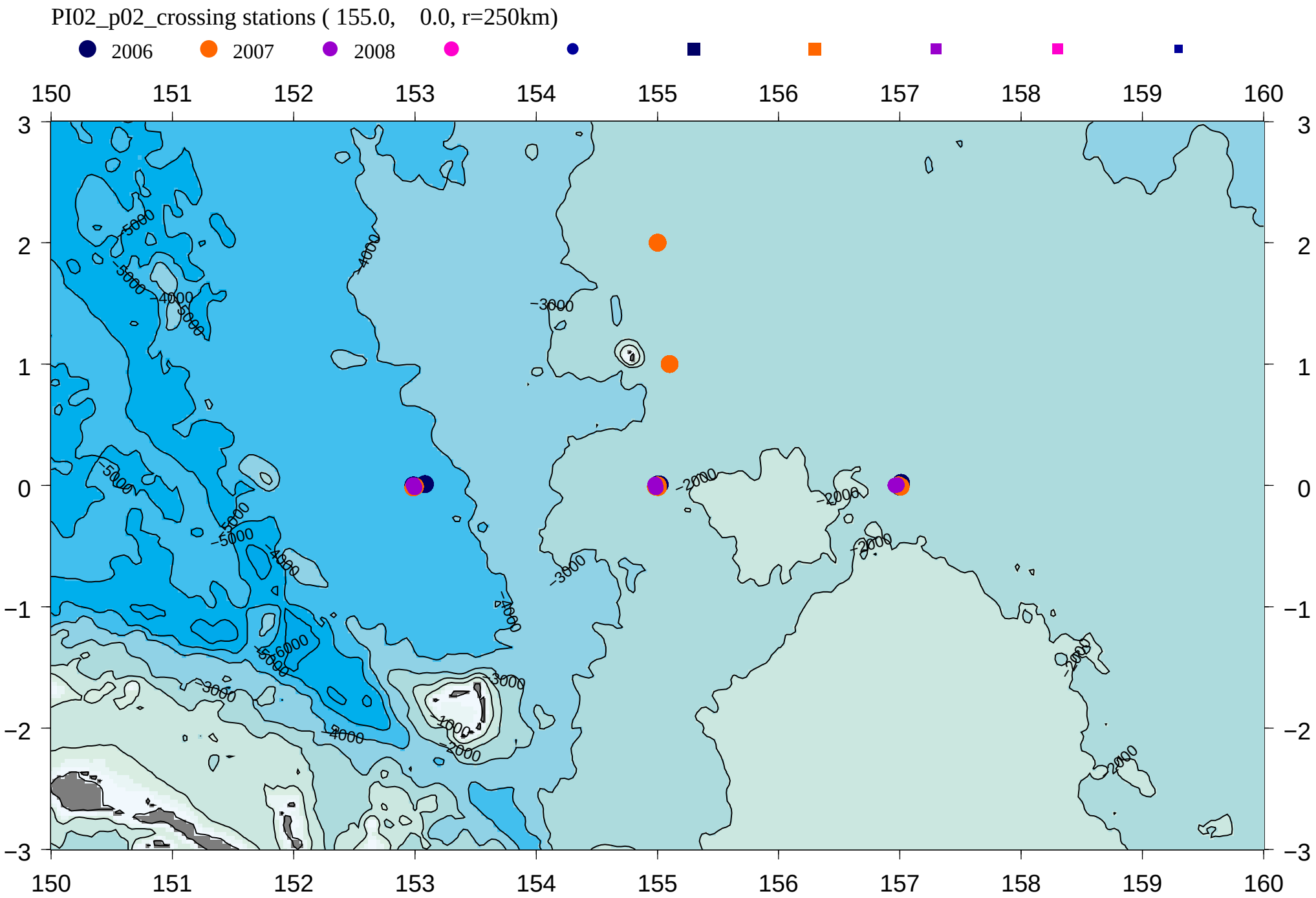

P19_S04_a_p01_crossing stations (274.9, −67.0, r=250km)
1992
1993
270
271
272
273
274
275
276
277
278
279
280
−64
−65
−66
−67
−68
−69
−70
−4000
−4000
−4000
−4000
−4000
3000
3000
−2000
−1000

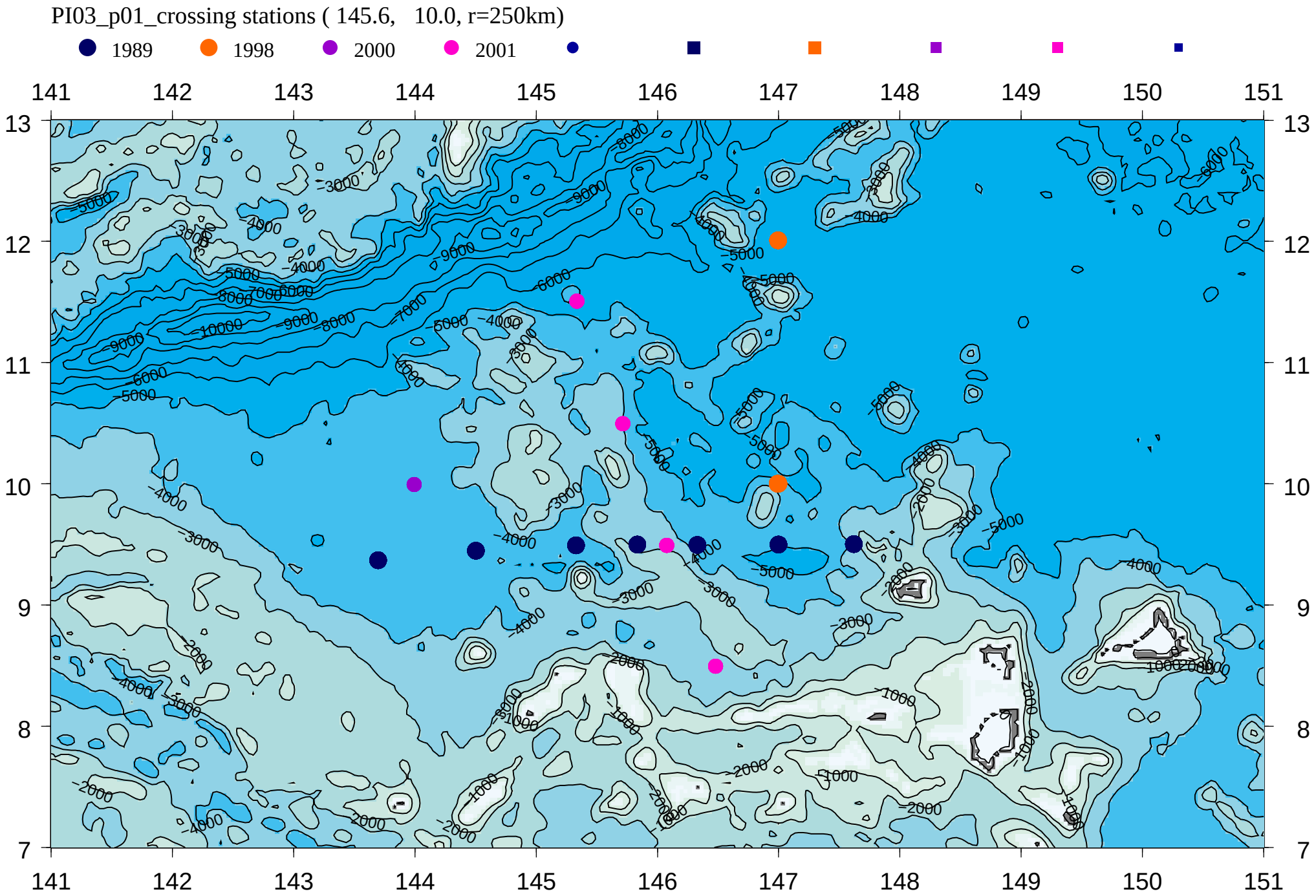

P19_S04_b_p01_crossing stations (274.2, −67.0, r=250km)
1992
1993
269
270
271
272
273
274
275
276
277
278
279
−64
−65
−66
−67
−68
−69
−70
−1000
−2000
−3000
−4000

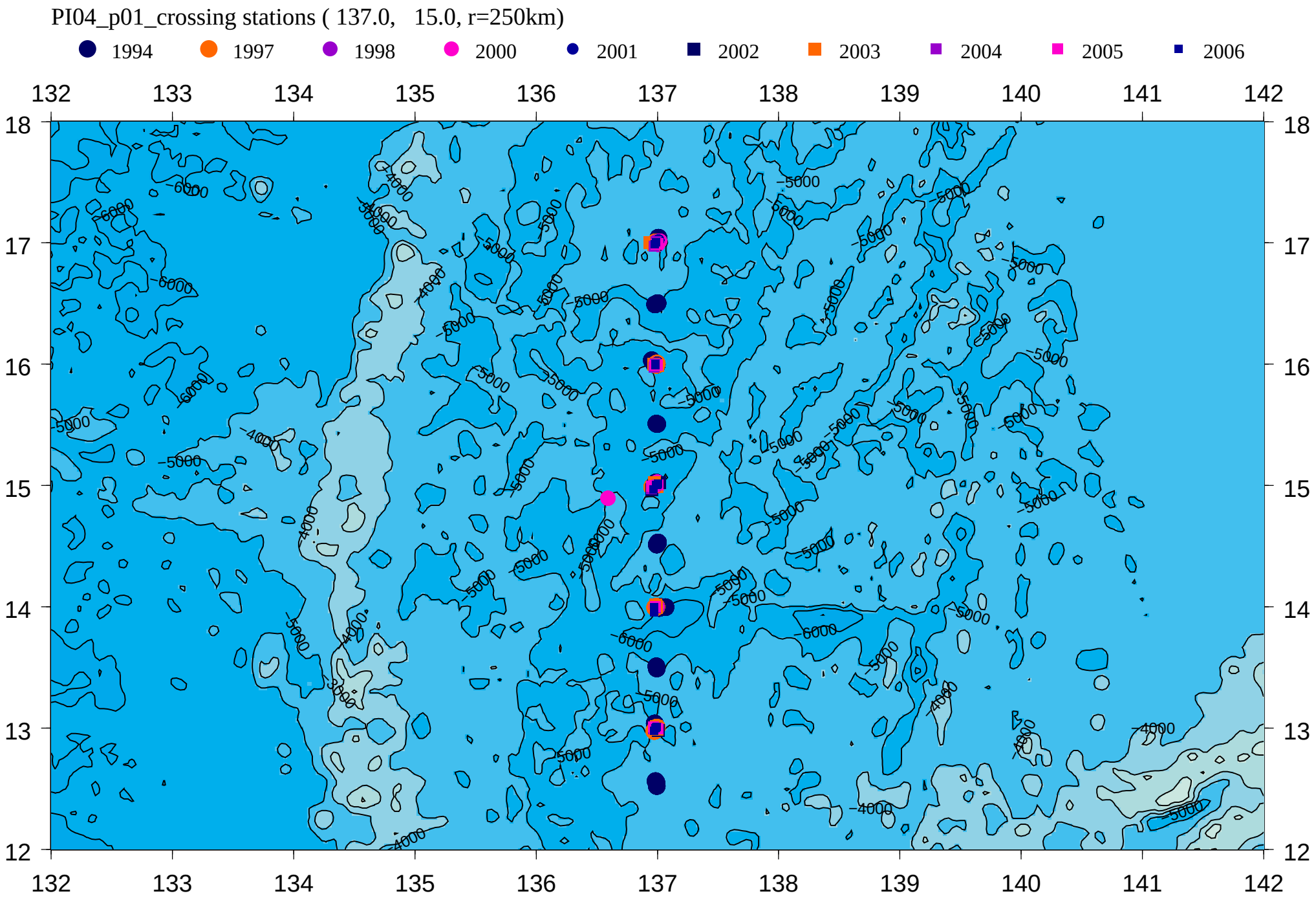

PI01_p01_crossing stations (145.5, 0.0, r=250km)
1993
1999
2000
2001
2002
2003
2004
2005
2006
141
142
143
144
145
146
147
148
149
150
151
3
2
1
0
−1
−2
−3

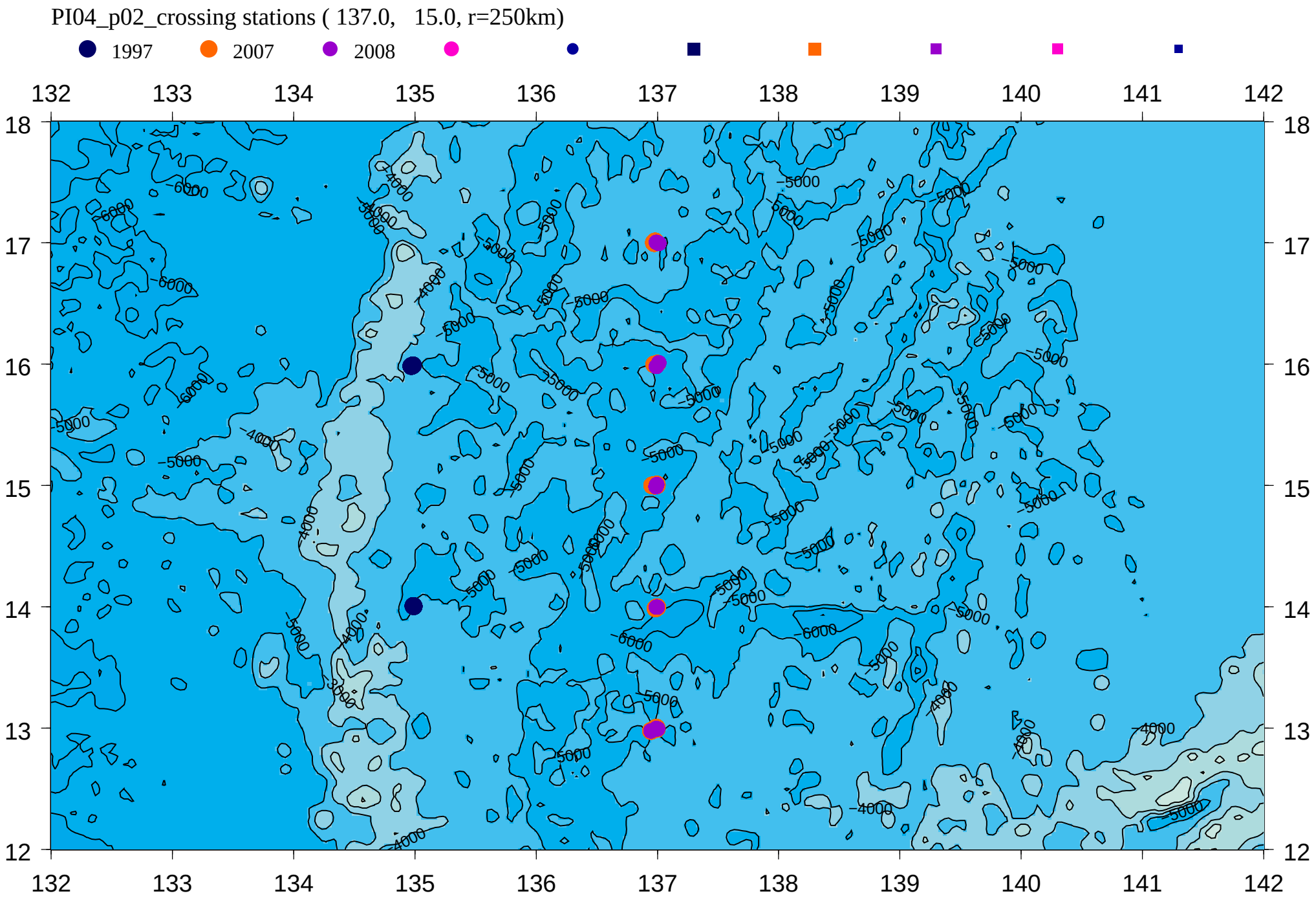

PI01_p02_crossing stations (145.5, 0.0, r=250km)
2007
2008
141
142
143
144
145
146
147
148
149
150
151
3
2
1
0
−1
−2
−3

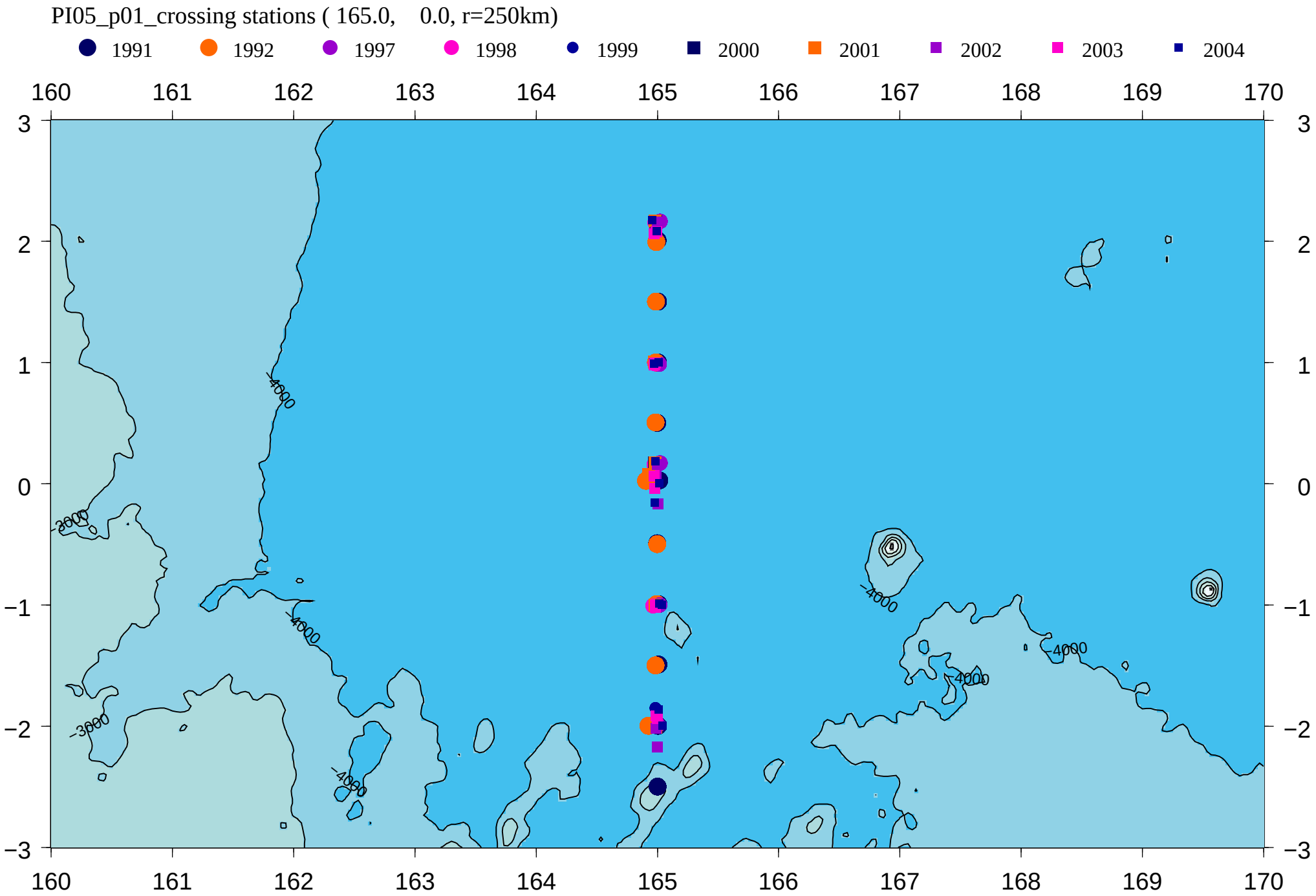

PI02_p01_crossing stations (155.0, 0.0, r=250km)
1993
1997
1998
1999
2000
2001
2002
2003
2004
2005
150
151
152
153
154
155
156
157
158
159
160
3
2
1
0
−1
−2
−3

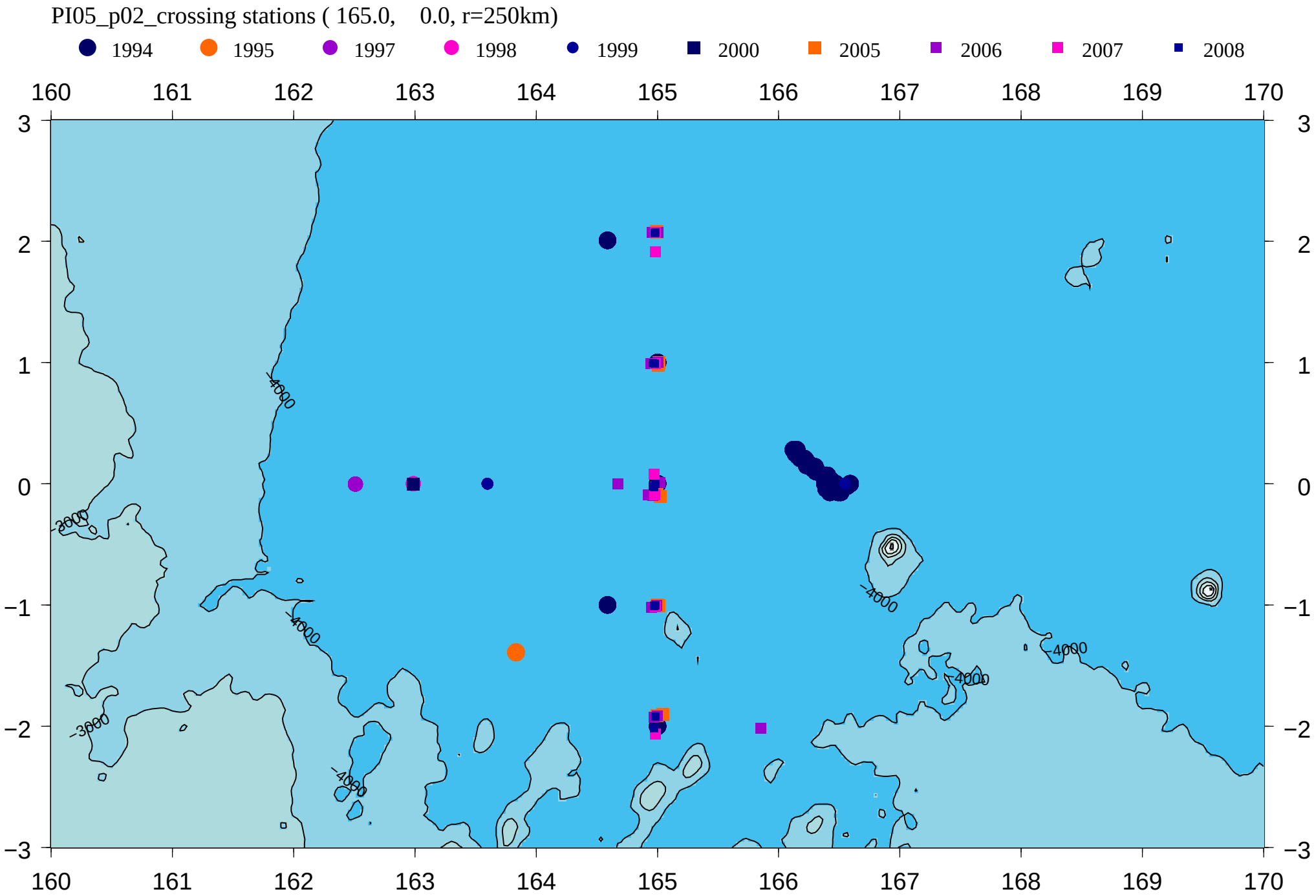

PI02_p02_crossing stations (155.0, 0.0, r=250km)
2006
2007
2008
150
151
152
153
154
155
156
157
158
159
160
3
2
1
0
−1
−2
−3

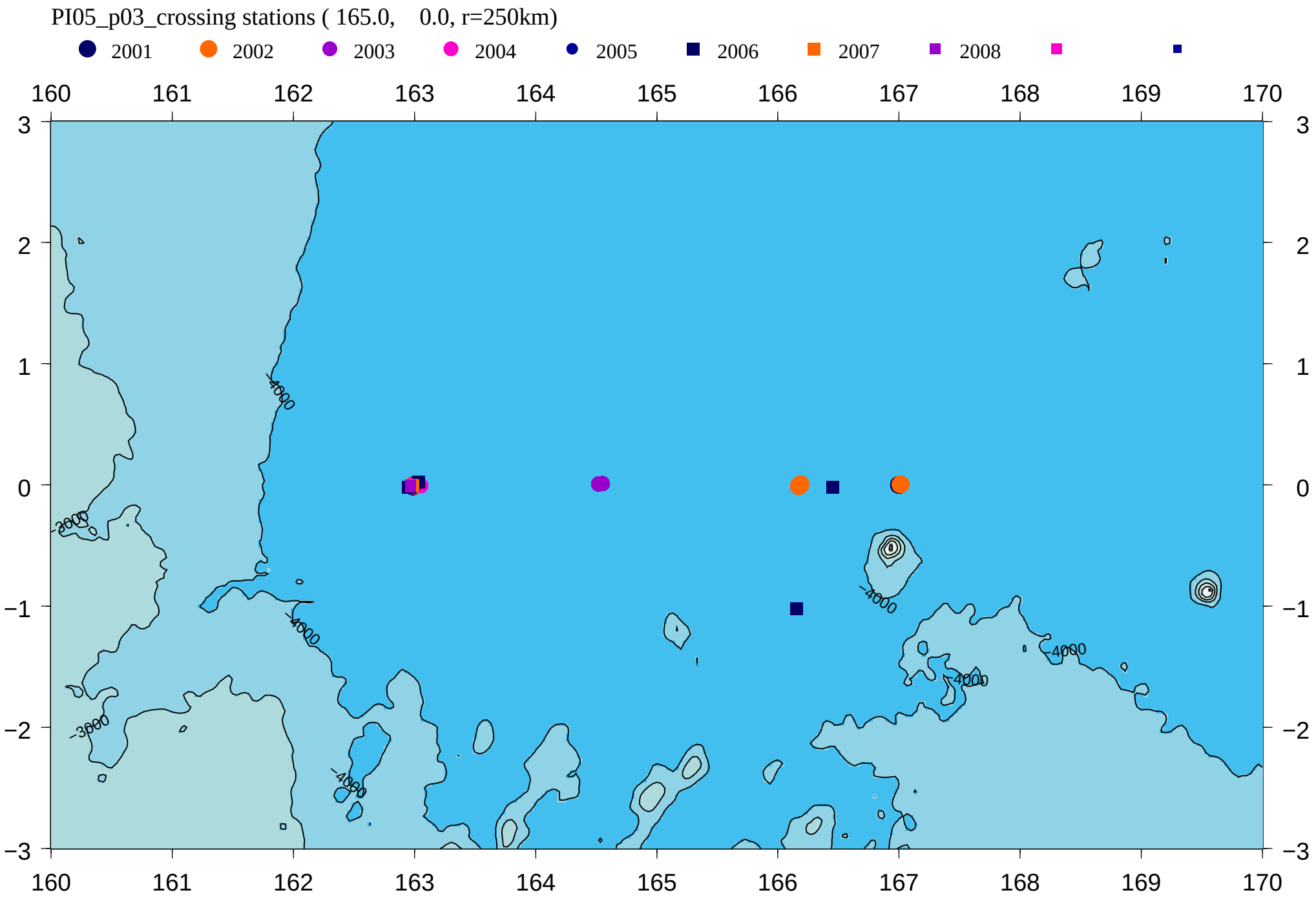

PI03_p01_crossing stations (145.6, 10.0, r=250km)
1989
1998
2000
2001
141
142
143
144
145
146
147
148
149
150
151
13
12
11
10
9
8
7

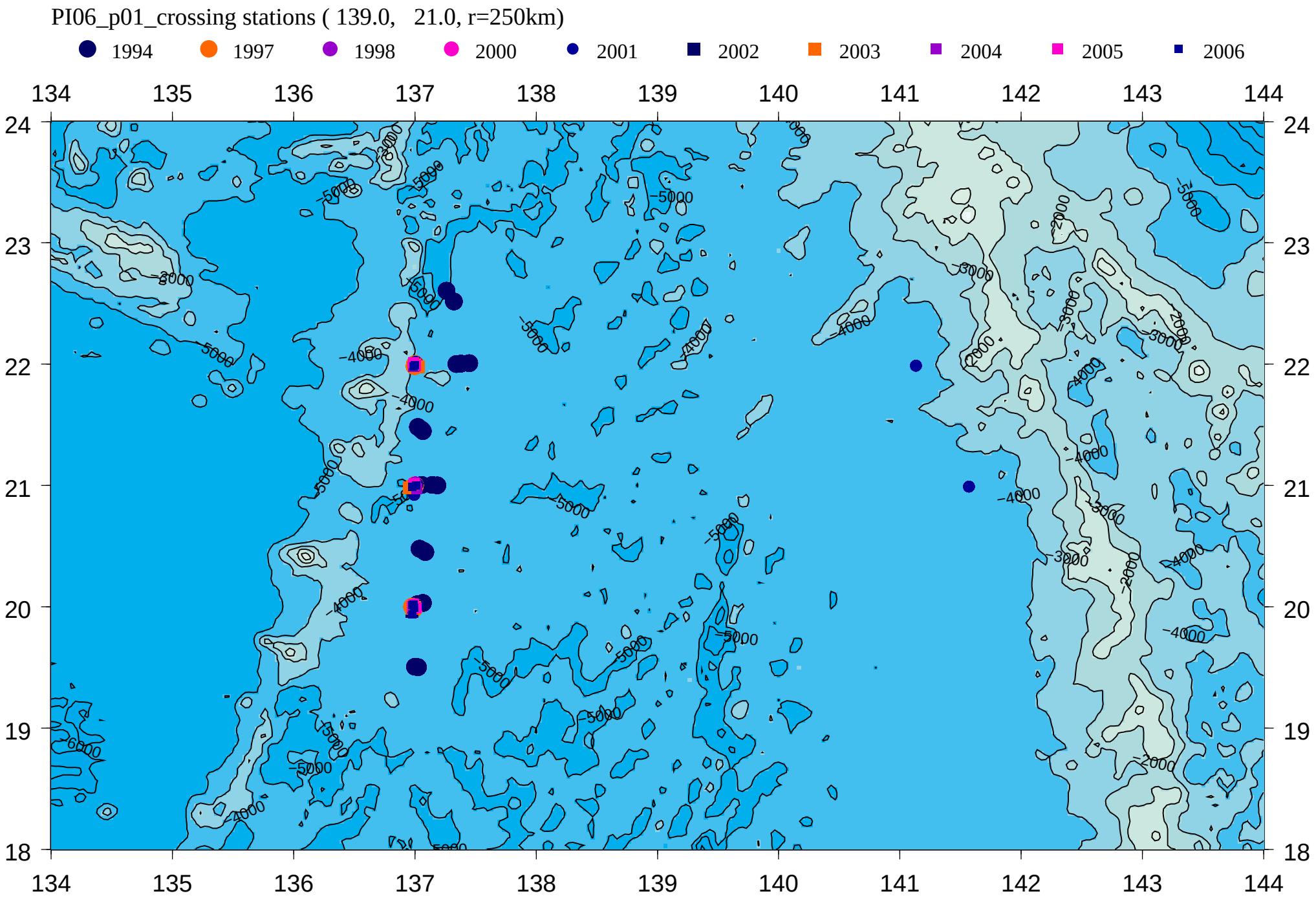

PI04_p01_crossing stations (137.0, 15.0, r=250km)
1994
1997
1998
2000
2001
2002
2003
2004
2005
2006
132
133
134
135
136
137
138
139
140
141
142
18
17
16
15
14
13
12

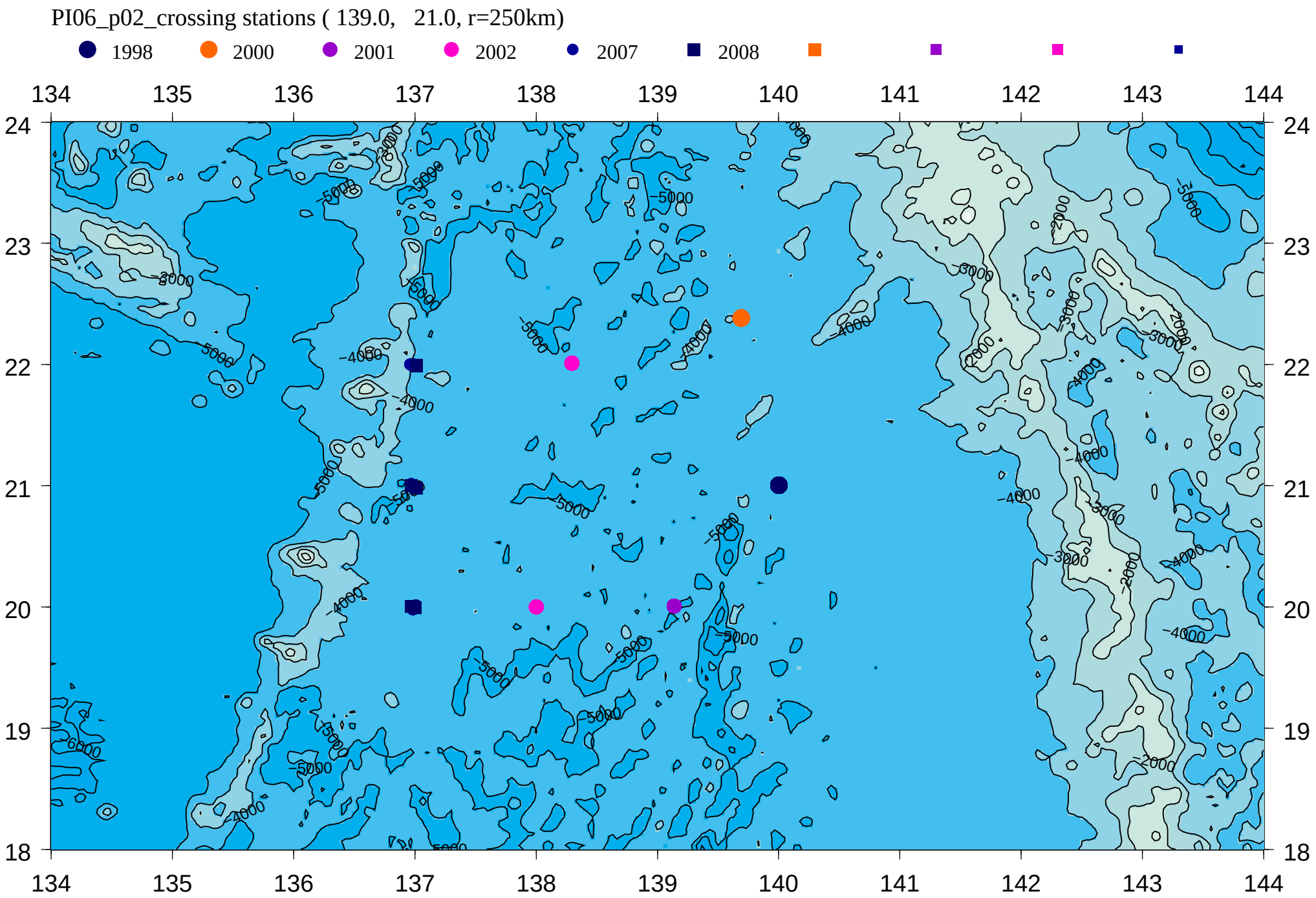

PI04_p02_crossing stations (137.0, 15.0, r=250km)
1997
2007
2008
132
133
134
135
136
137
138
139
140
141
142
18
17
16
15
14
13
12

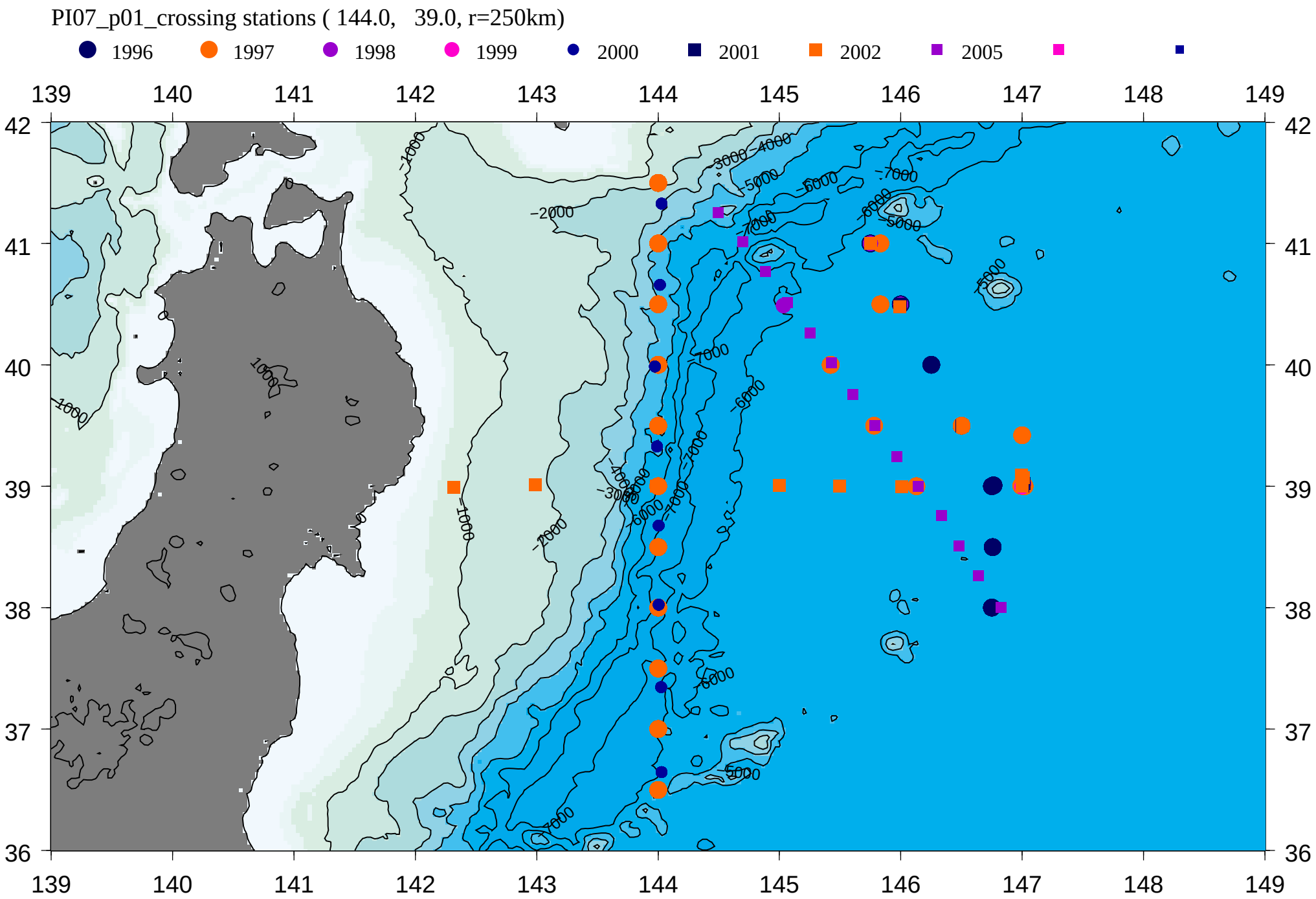

PI05_p01_crossing stations (165.0, 0.0, r=250km)
1991
1992
1997
1998
1999
2000
2001
2002
2003
2004
160
161
162
163
164
165
166
167
168
169
170
3
2
1
0
−1
−2
−3
-4000
-3000

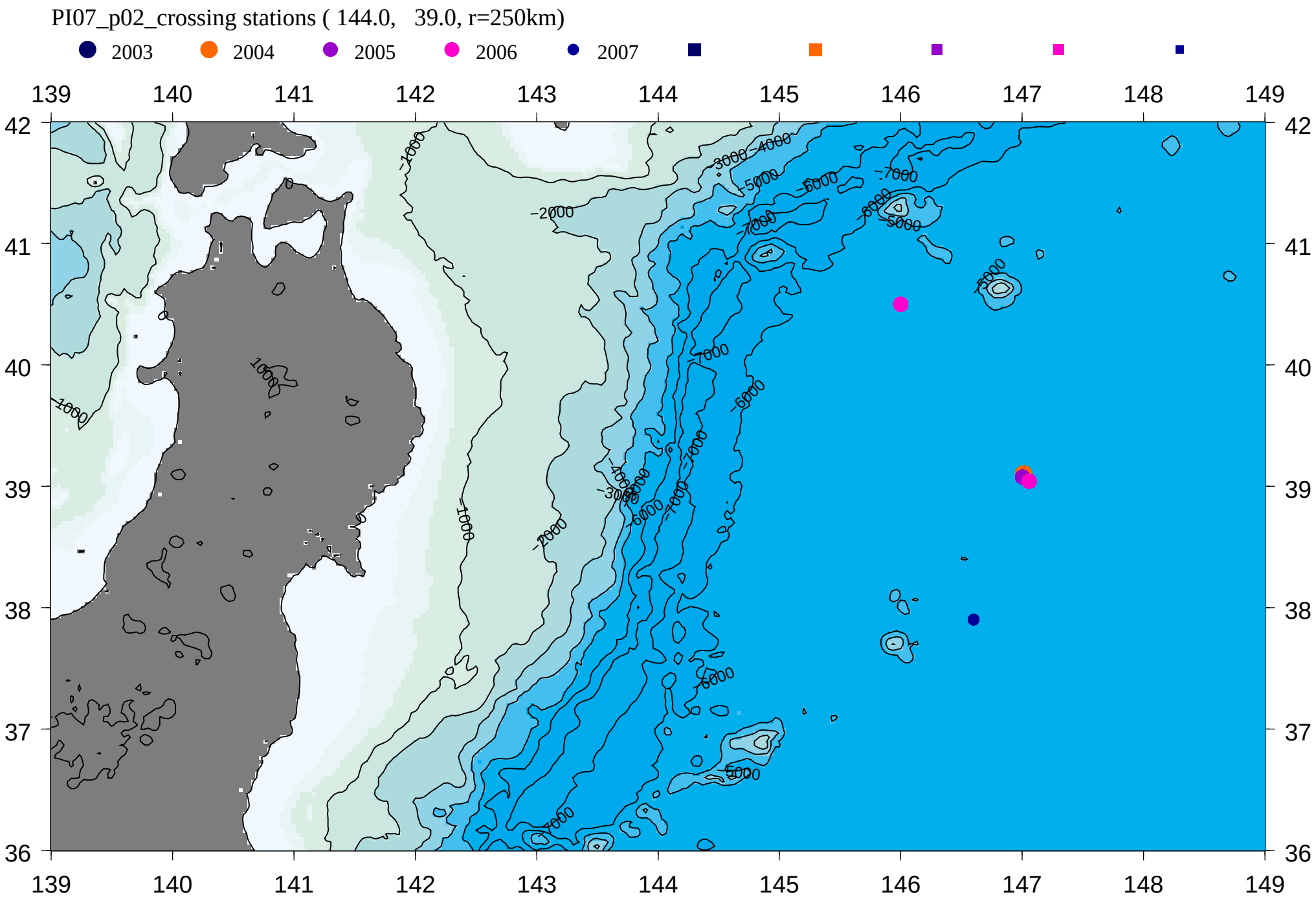

PI05_p02_crossing stations (165.0, 0.0, r=250km)
1994
1995
1997
1998
1999
2000
2005
2006
2007
2008
160
161
162
163
164
165
166
167
168
169
170
3
2
1
0
−1
−2
−3
-4000
-3000

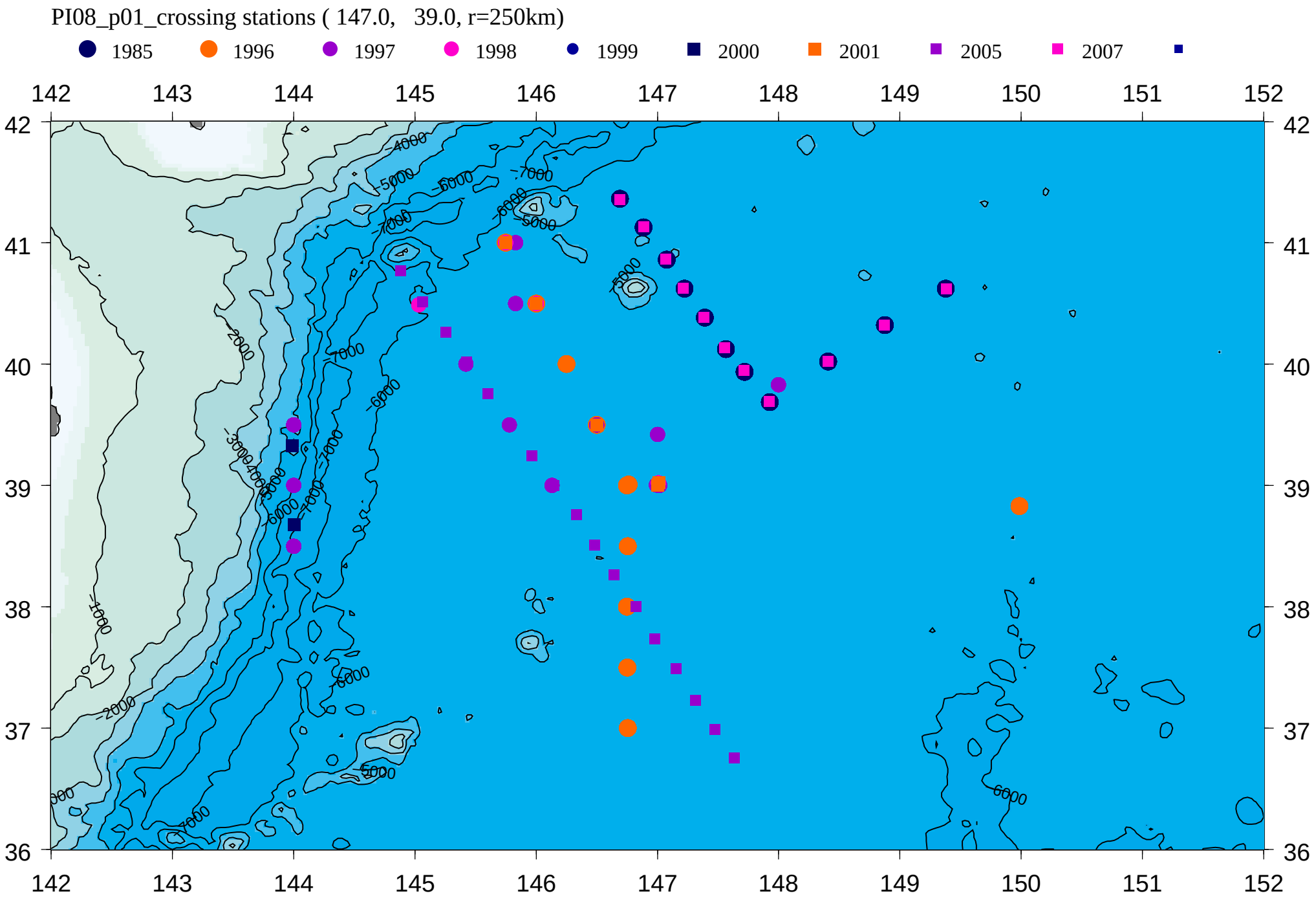

PI05_p03_crossing stations (165.0, 0.0, r=250km)
2001
2002
2003
2004
2005
2006
2007
2008
160
161
162
163
164
165
166
167
168
169
170
3
2
1
0
−1
−2
−3
-4000
-3000

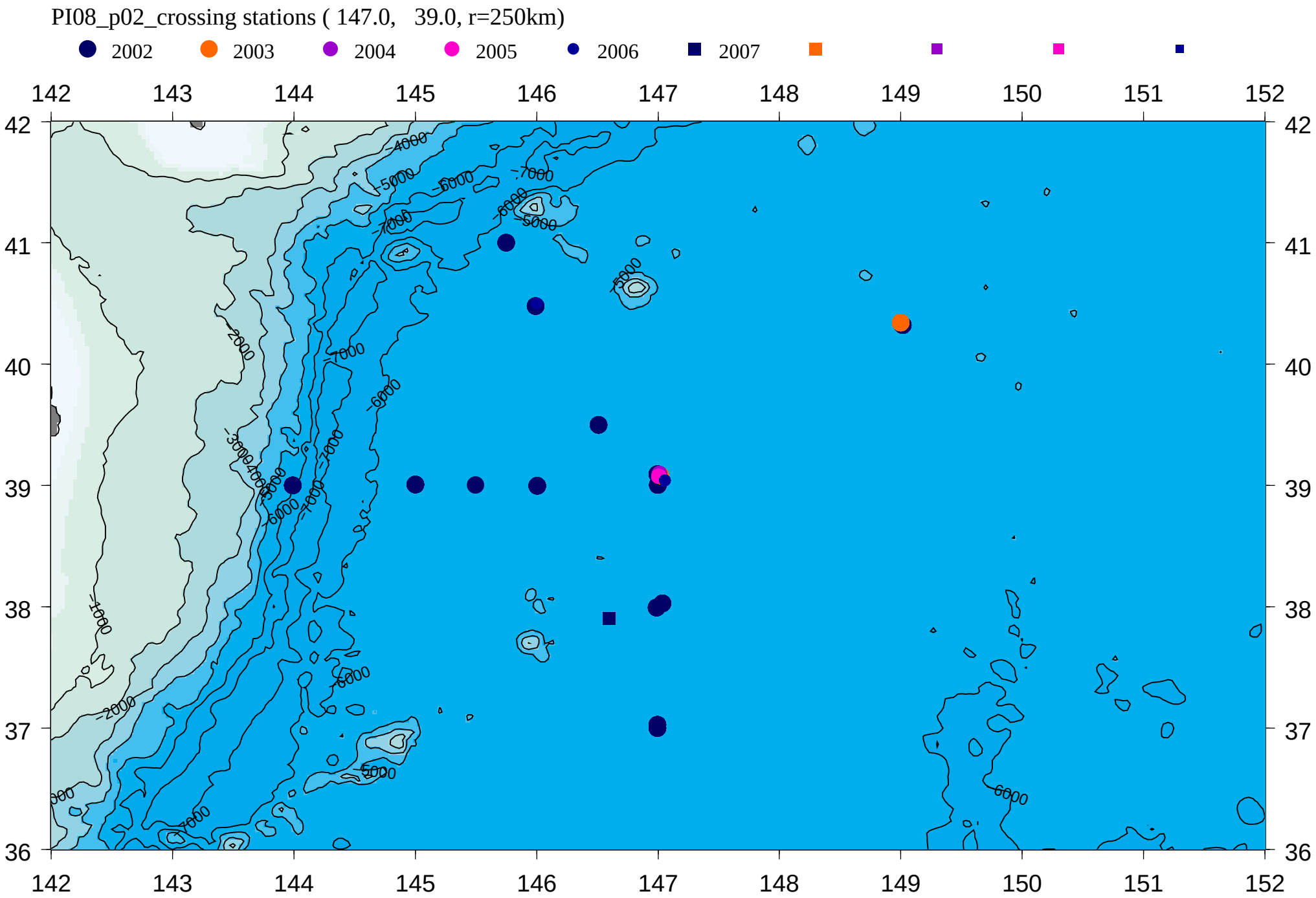

PI06_p01_crossing stations (139.0, 21.0, r=250km)
1994
1997
1998
2000
2001
2002
2003
2004
2005
2006
134
135
136
137
138
139
140
141
142
143
144
24
23
22
21
20
19
18

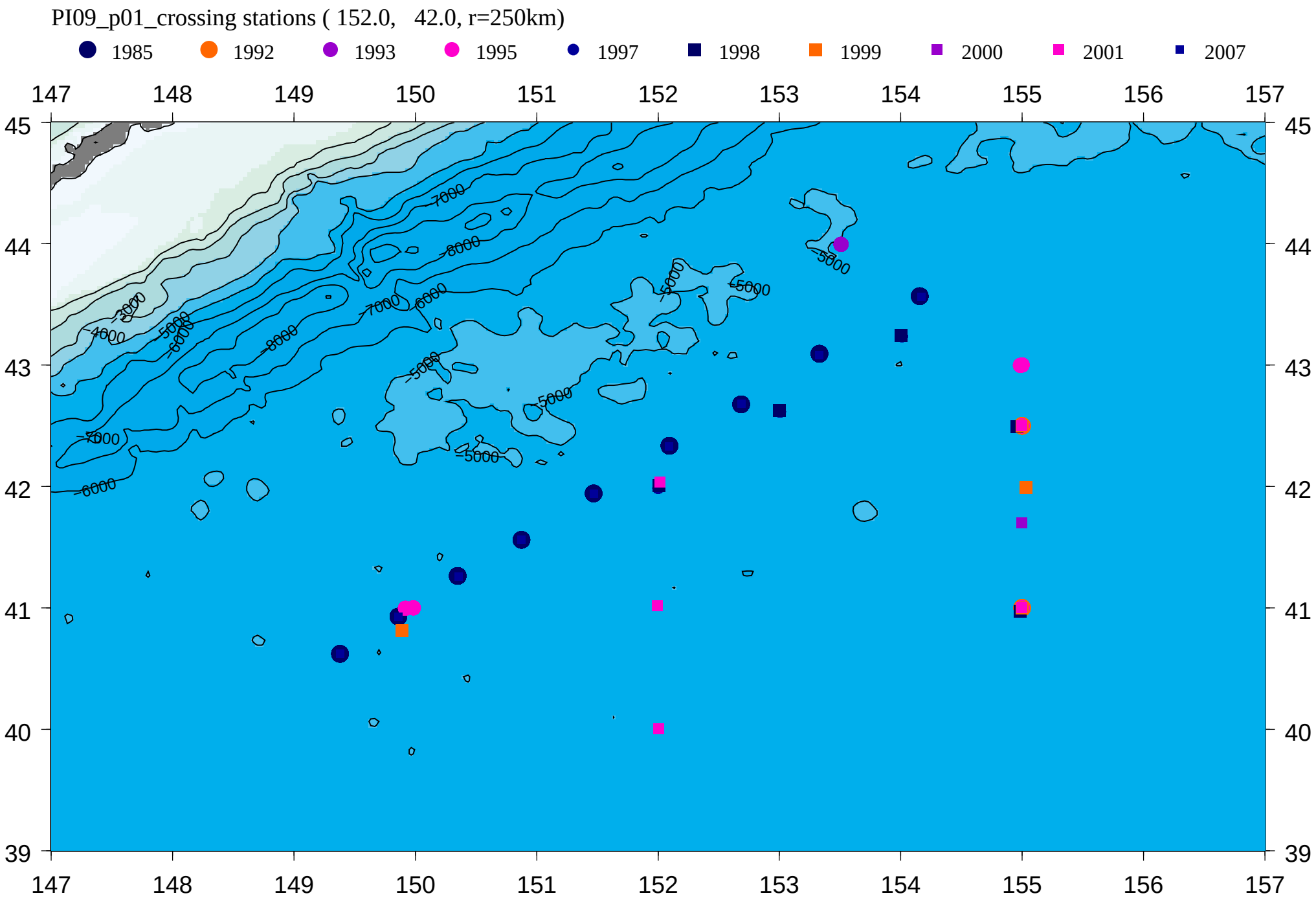

PI06_p02_crossing stations (139.0, 21.0, r=250km)
1998
2000
2001
2002
2007
2008
134
135
136
137
138
139
140
141
142
143
144
24
23
22
21
20
19
18

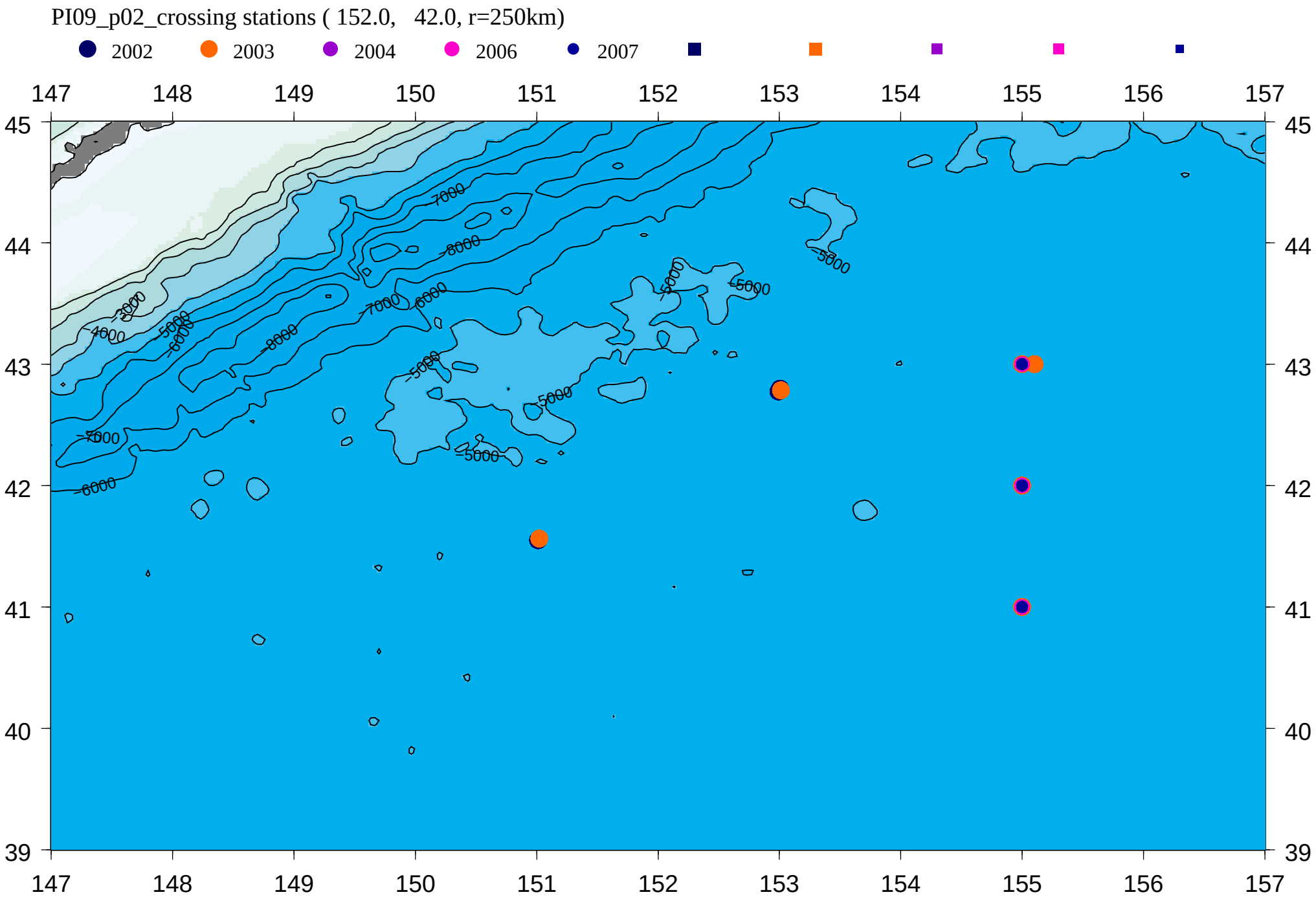

PI07_p01_crossing stations (144.0, 39.0, r=250km)
1996
1997
1998
1999
2000
2001
2002
2005
139
140
141
142
143
144
145
146
147
148
149
42
41
40
39
38
37
36
-1000
-2000
-3000
-4000
-5000
-6000
-7000

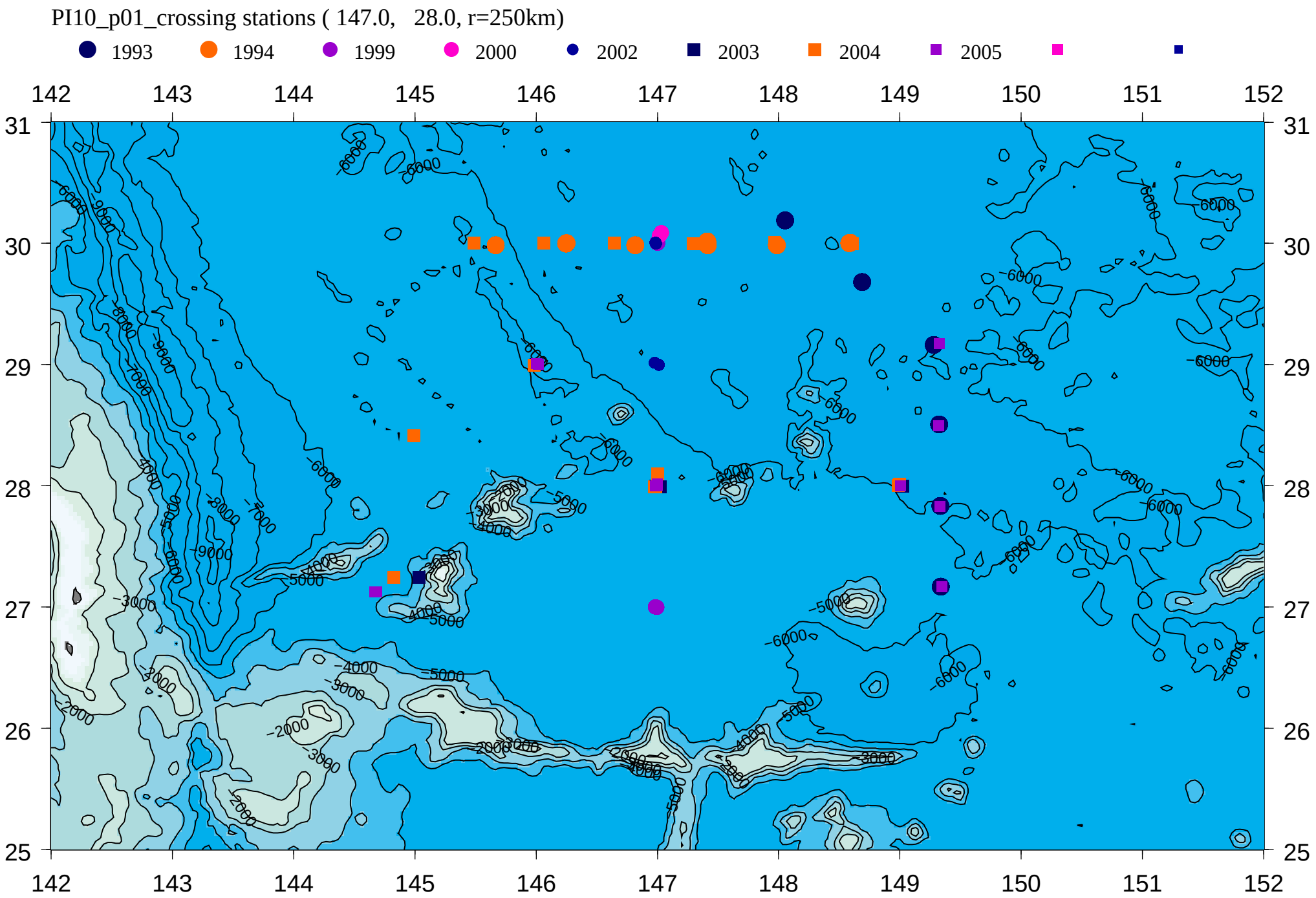

PI07_p02_crossing stations (144.0, 39.0, r=250km)
2003
2004
2005
2006
2007
139
140
141
142
143
144
145
146
147
148
149
42
41
40
39
38
37
36
-1000
-2000
-3000
-4000
-5000
-6000
-7000

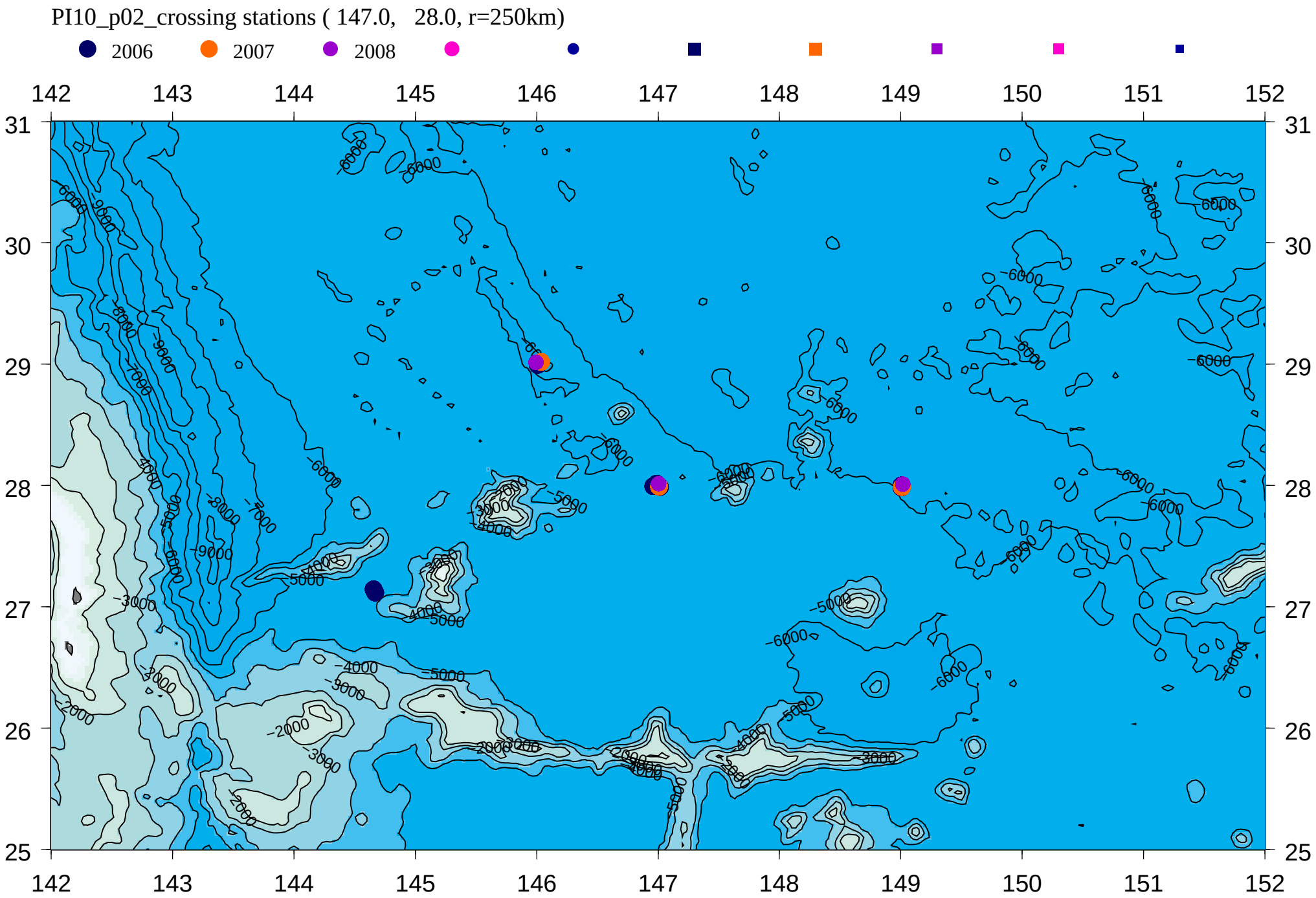

PI08_p01_crossing stations (147.0, 39.0, r=250km)
1985
1996
1997
1998
1999
2000
2001
2005
2007
142
143
144
145
146
147
148
149
150
151
152
42
41
40
39
38
37
36

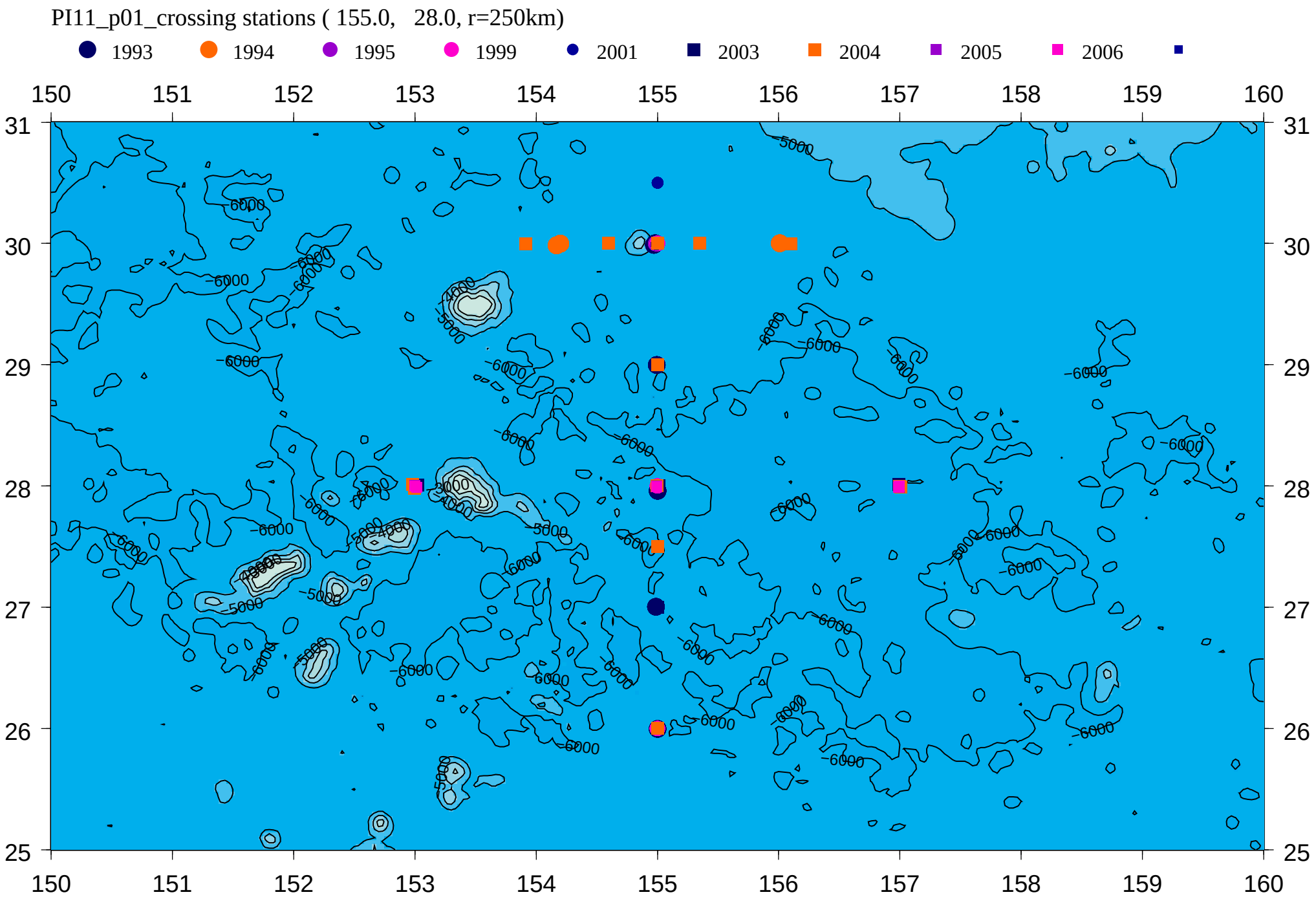

PI08_p02_crossing stations (147.0, 39.0, r=250km)
2002
2003
2004
2005
2006
2007
142
143
144
145
146
147
148
149
150
151
152
42
41
40
39
38
37
36

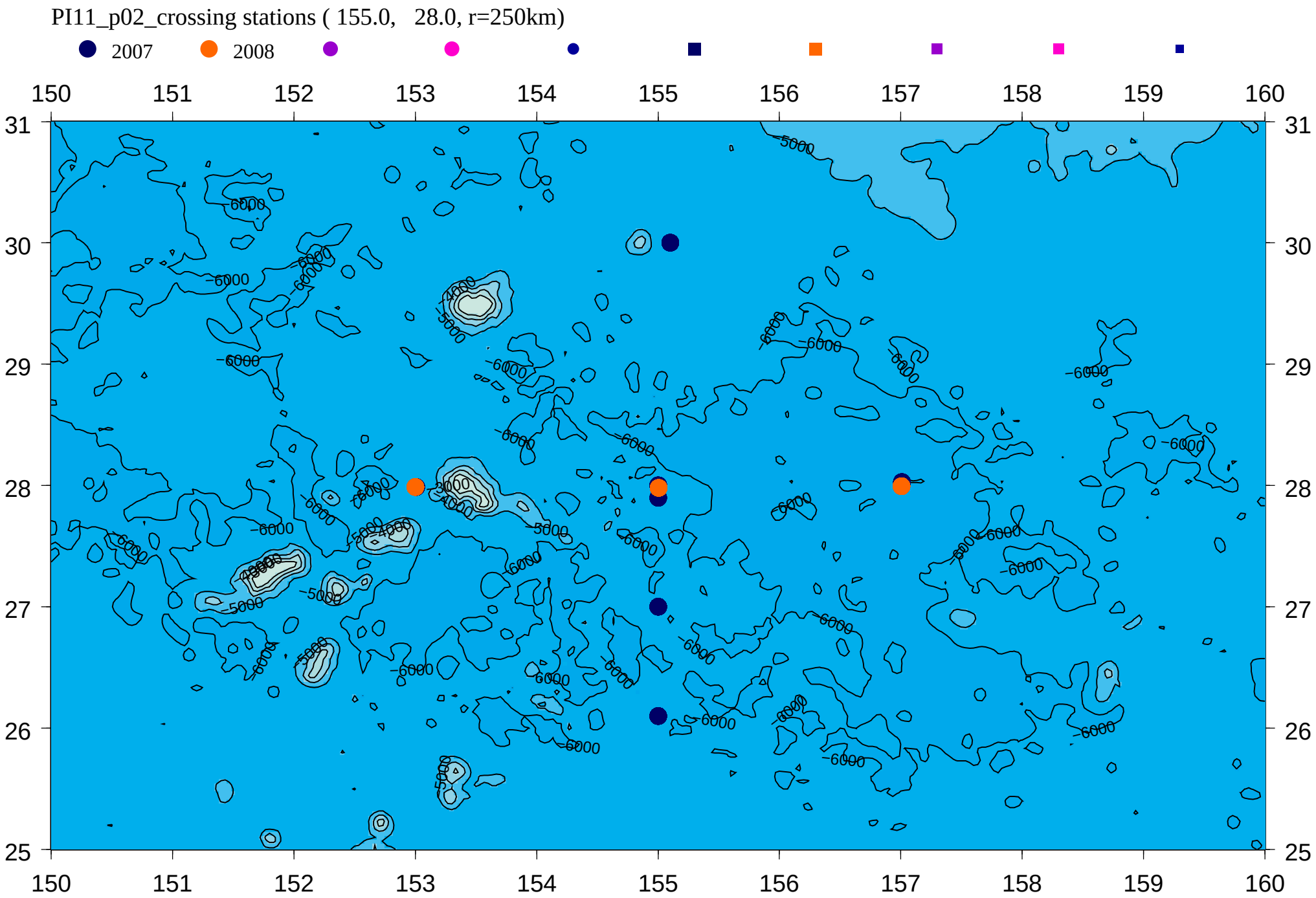

PI09_p01_crossing stations (152.0, 42.0, r=250km)
1985
1992
1993
1995
1997
1998
1999
2000
2001
2007
147
148
149
150
151
152
153
154
155
156
157
45
44
43
42
41
40
39
-3000
-4000
-5000
-6000
-7000
-8000

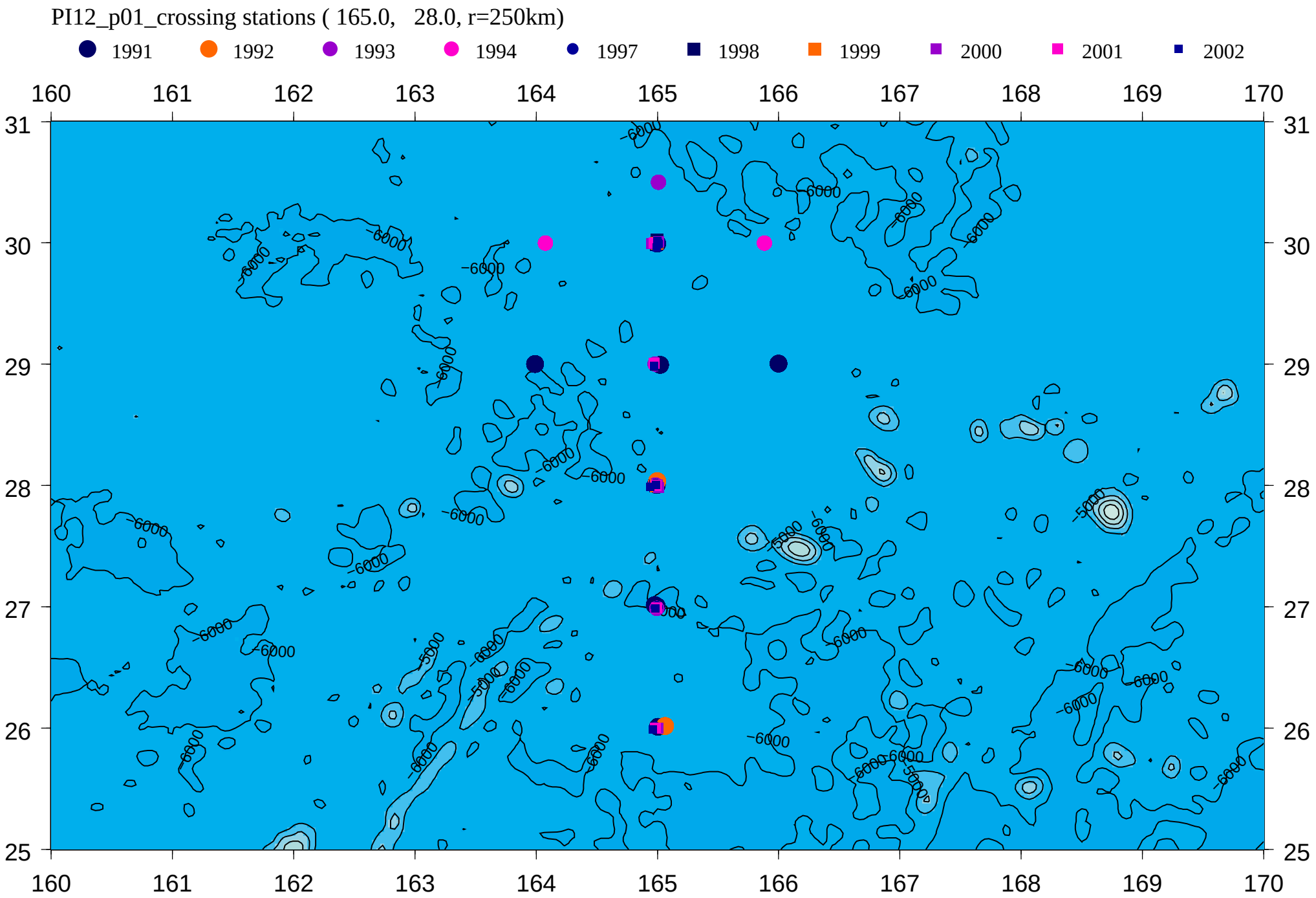

PI09_p02_crossing stations (152.0, 42.0, r=250km)
2002
2003
2004
2006
2007
147
148
149
150
151
152
153
154
155
156
157
45
44
43
42
41
40
39
-3000
-4000
-5000
-6000
-7000
-8000
-5000

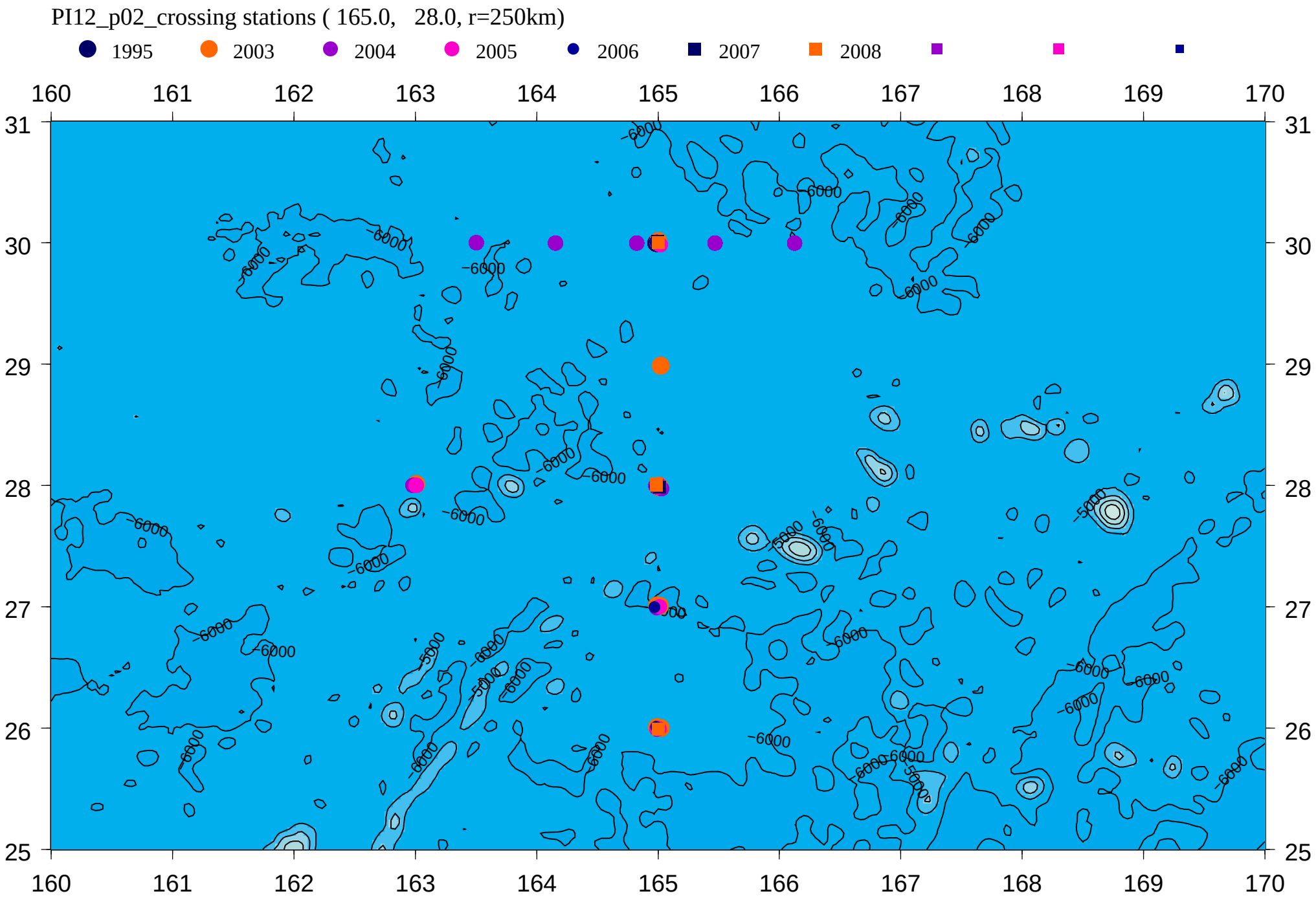

PI10_p01_crossing stations (147.0, 28.0, r=250km)
1993
1994
1999
2000
2002
2003
2004
2005
142
143
144
145
146
147
148
149
150
151
152
31
30
29
28
27
26
25

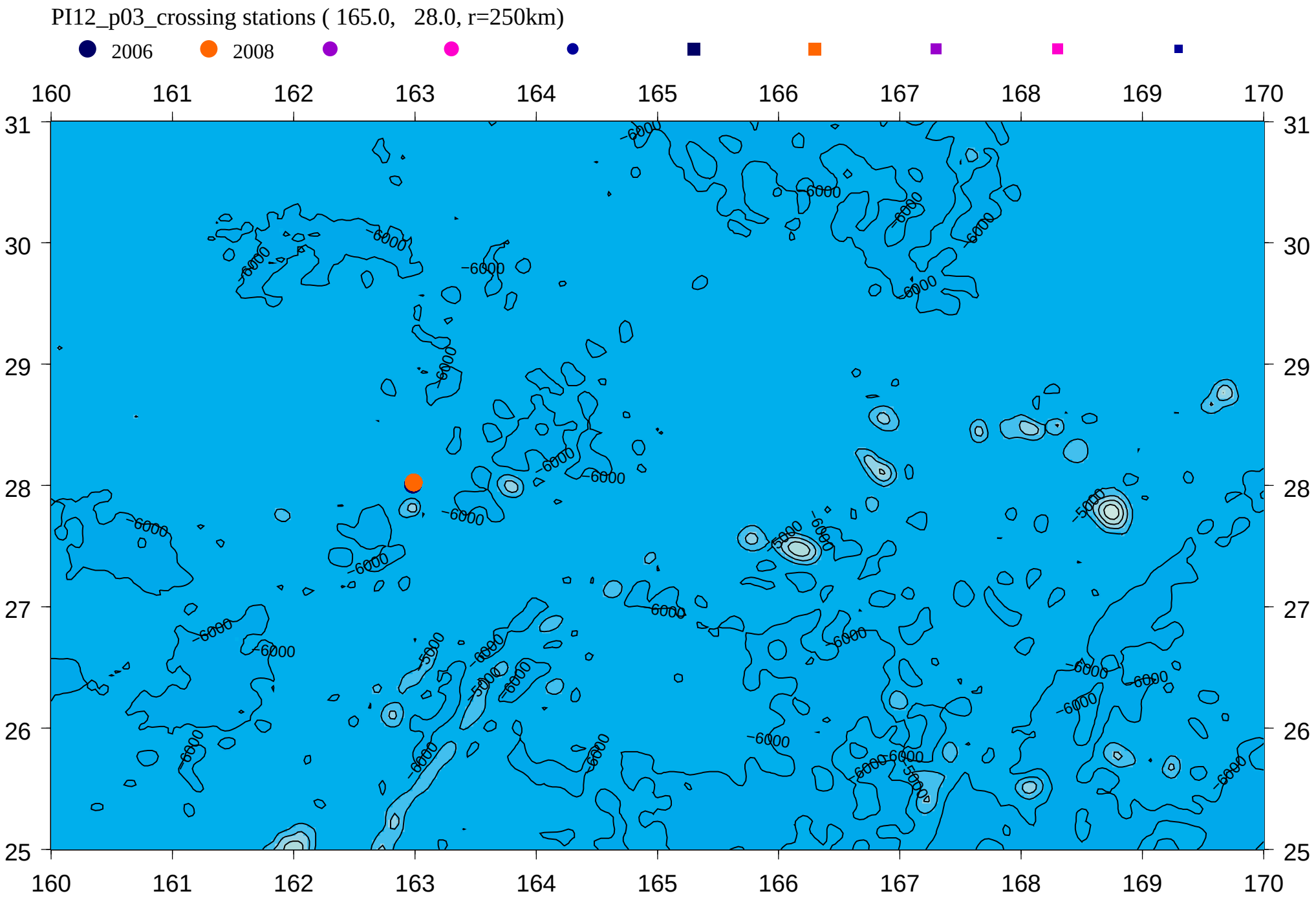

PI10_p02_crossing stations (147.0, 28.0, r=250km)
2006
2007
2008
142
143
144
145
146
147
148
149
150
151
152
31
30
29
28
27
26
25

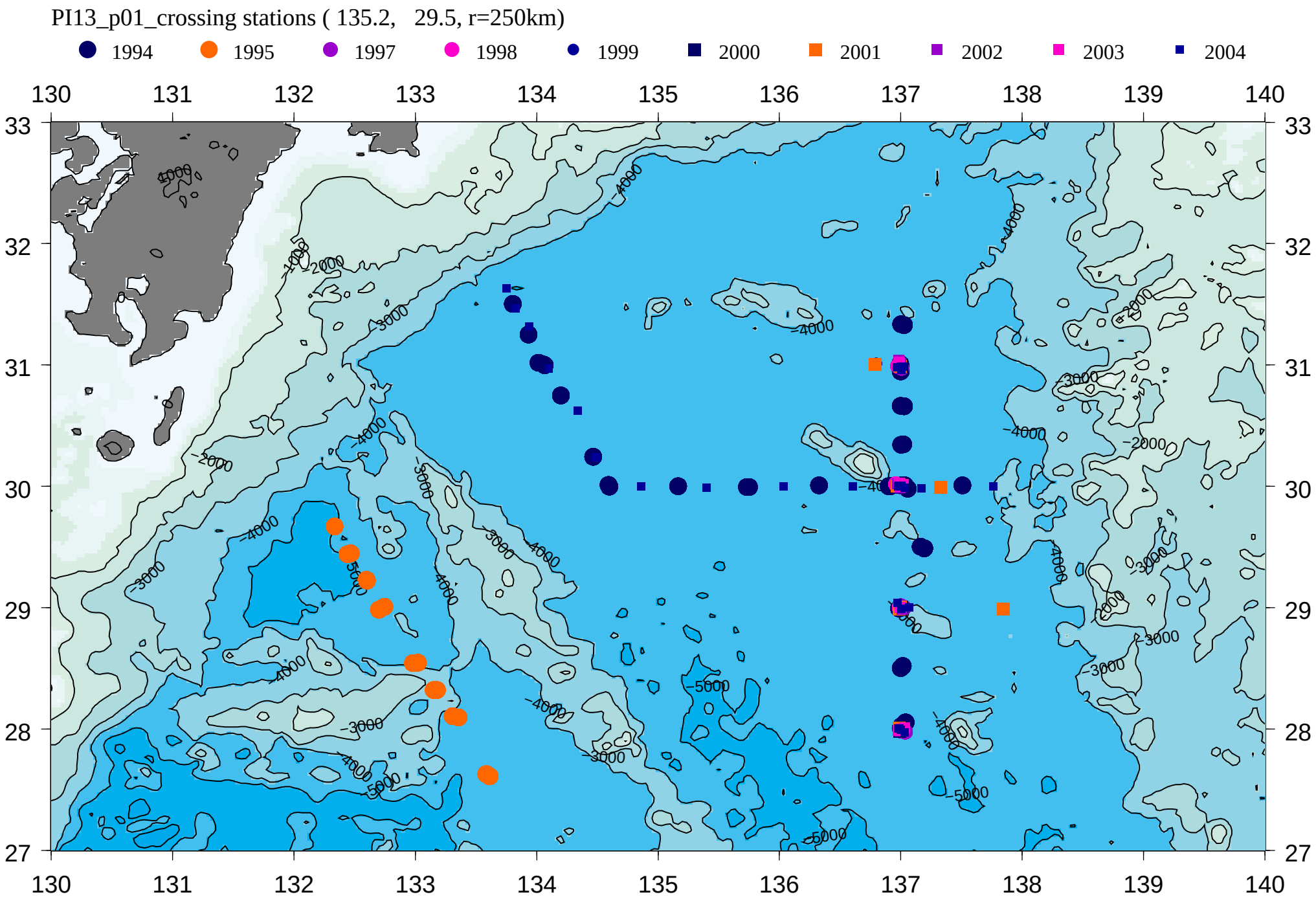

PI11_p01_crossing stations (155.0, 28.0, r=250km)
1993
1994
1995
1999
2001
2003
2004
2005
2006
150
151
152
153
154
155
156
157
158
159
160
31
30
29
28
27
26
25
-6000
-5000
-4000
-3000

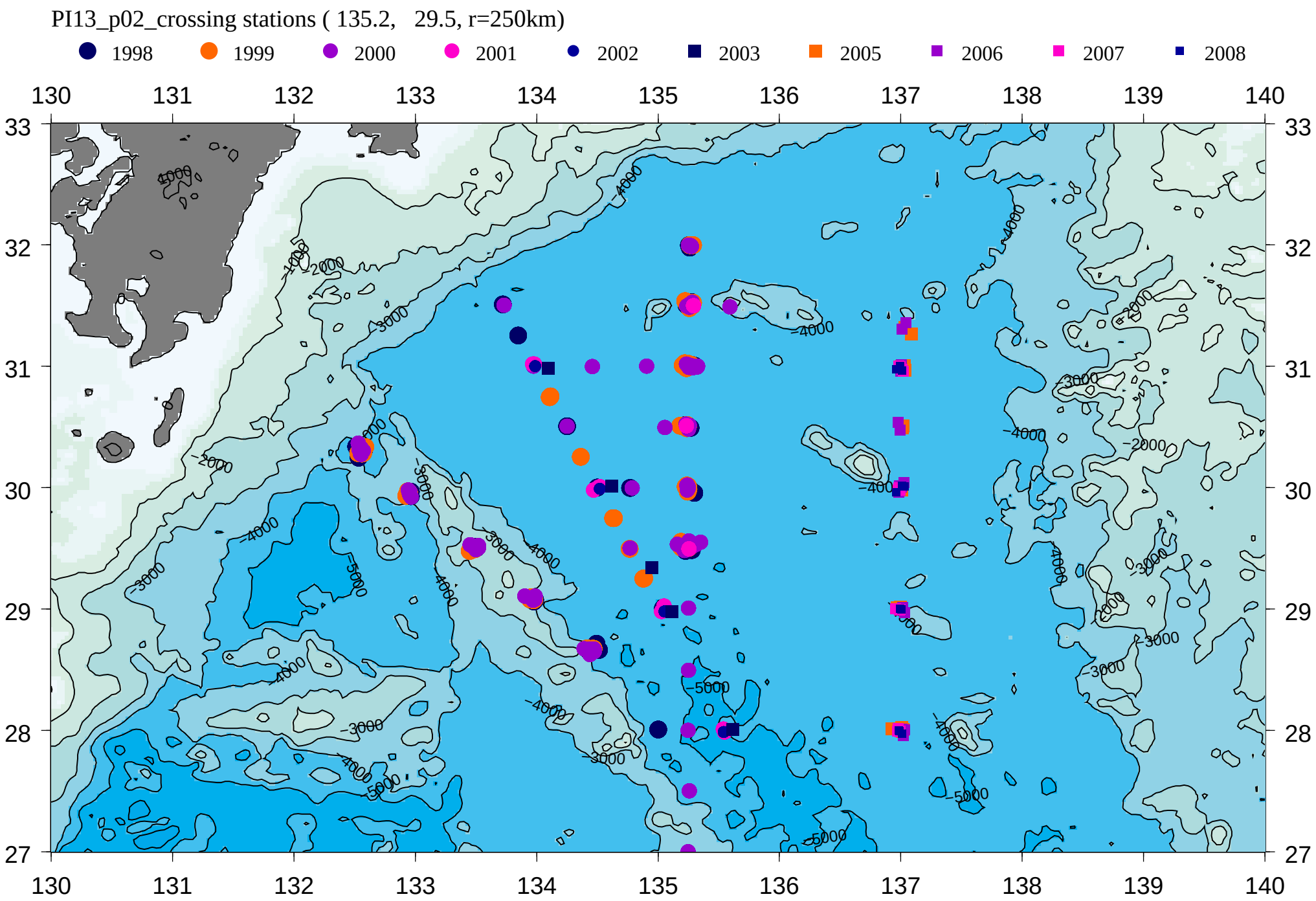

PI11_p02_crossing stations (155.0, 28.0, r=250km)
2007
2008
150
151
152
153
154
155
156
157
158
159
160
31
30
29
28
27
26
25

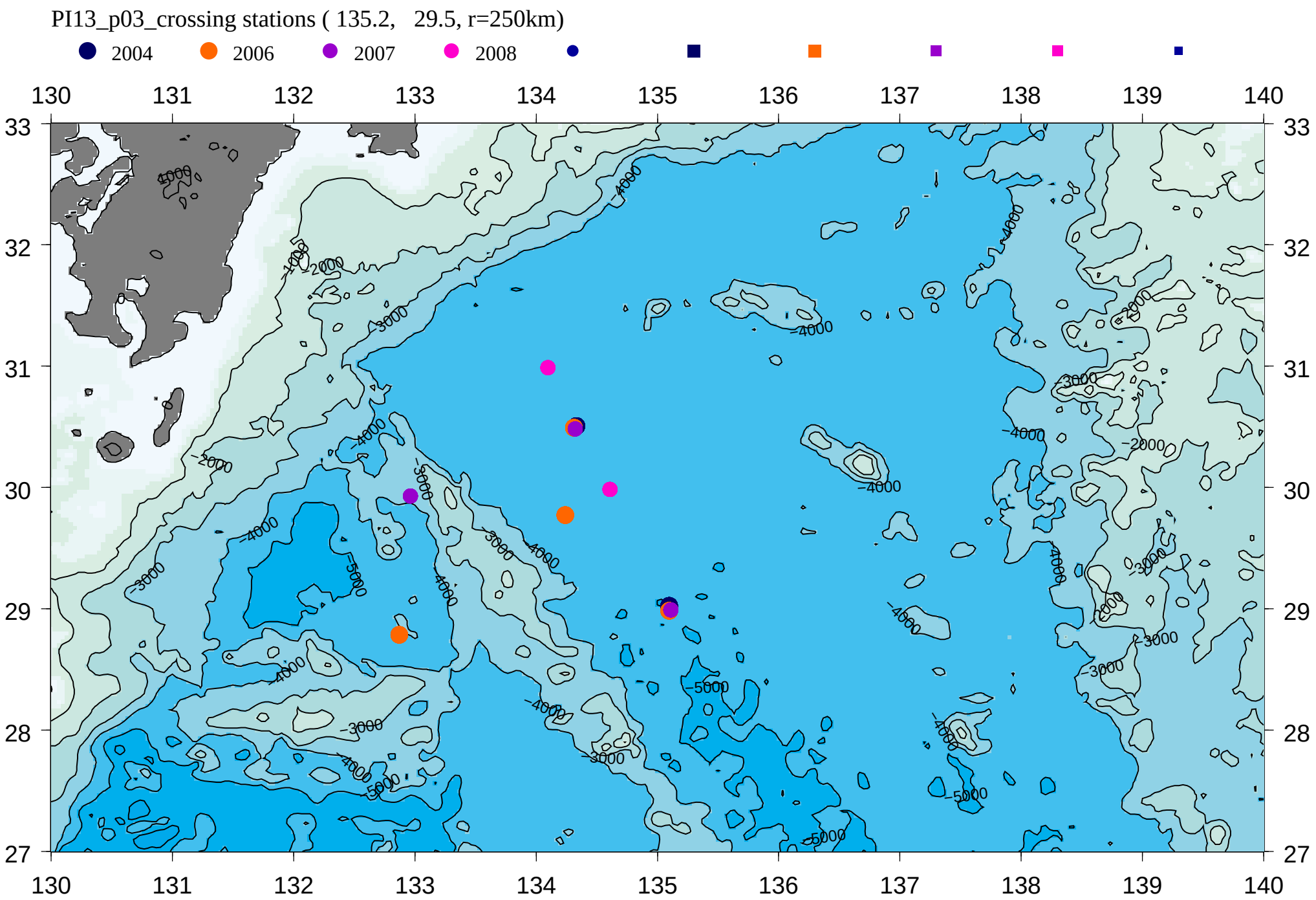

PI12_p01_crossing stations (165.0, 28.0, r=250km)
1991
1992
1993
1994
1997
1998
1999
2000
2001
2002
160
161
162
163
164
165
166
167
168
169
170
31
30
29
28
27
26
25
-6000
-5500
-5000

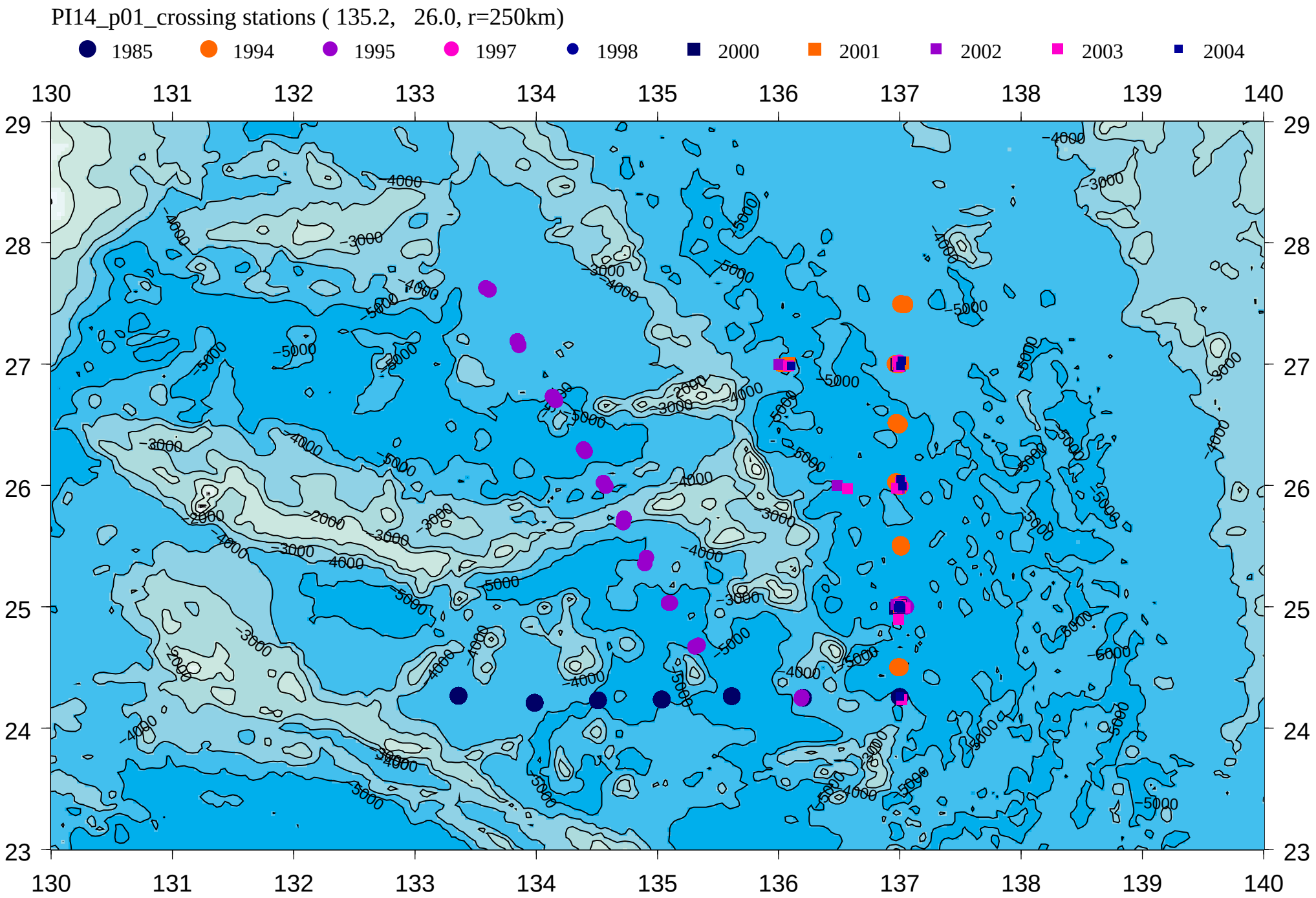

PI12_p02_crossing stations (165.0, 28.0, r=250km)
1995
2003
2004
2005
2006
2007
2008
160
161
162
163
164
165
166
167
168
169
170
31
30
29
28
27
26
25
-6000
-5500
-5000

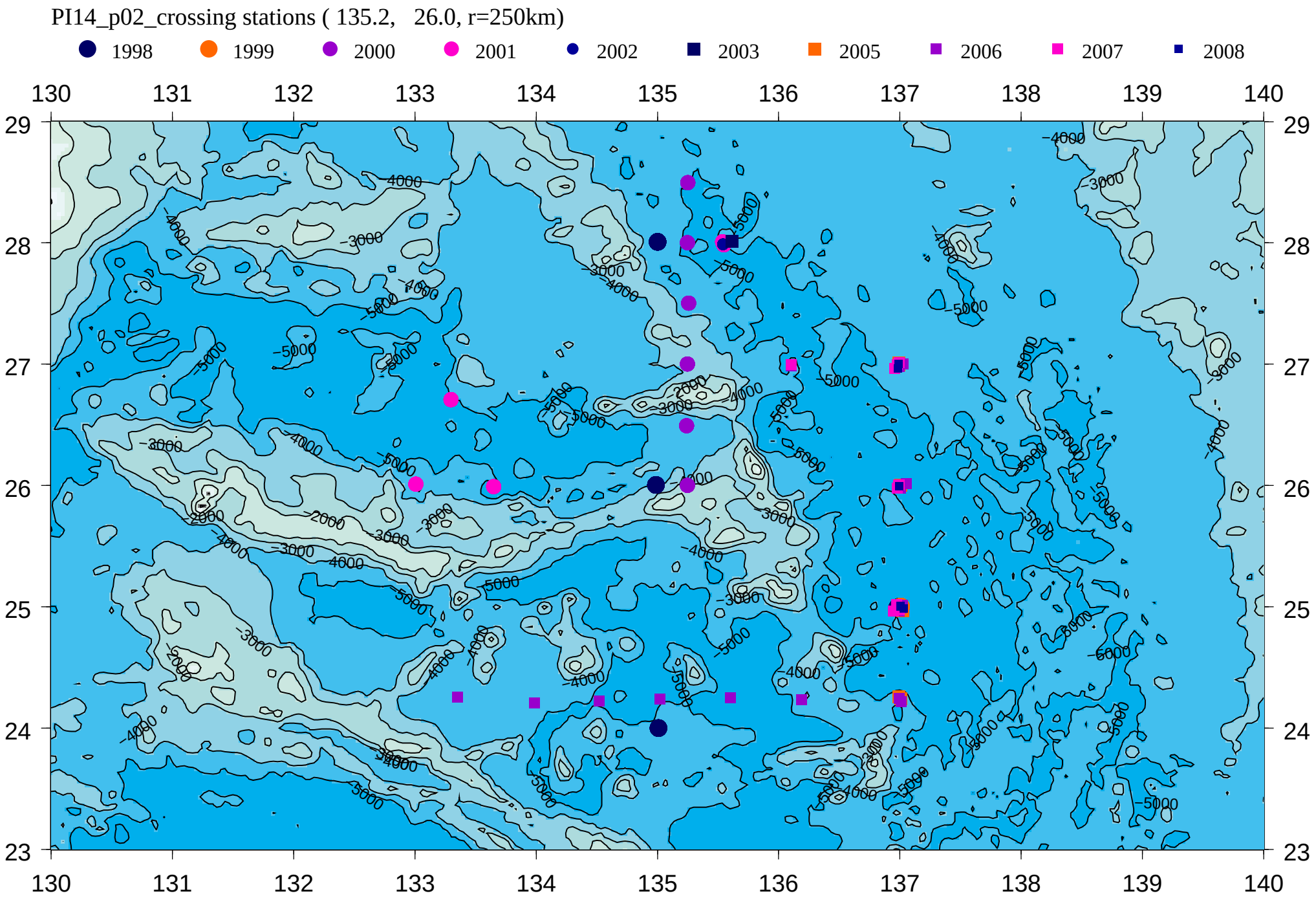

PI12_p03_crossing stations (165.0, 28.0, r=250km)
2006
2008
160
161
162
163
164
165
166
167
168
169
170
31
30
29
28
27
26
25
-6000
-5000

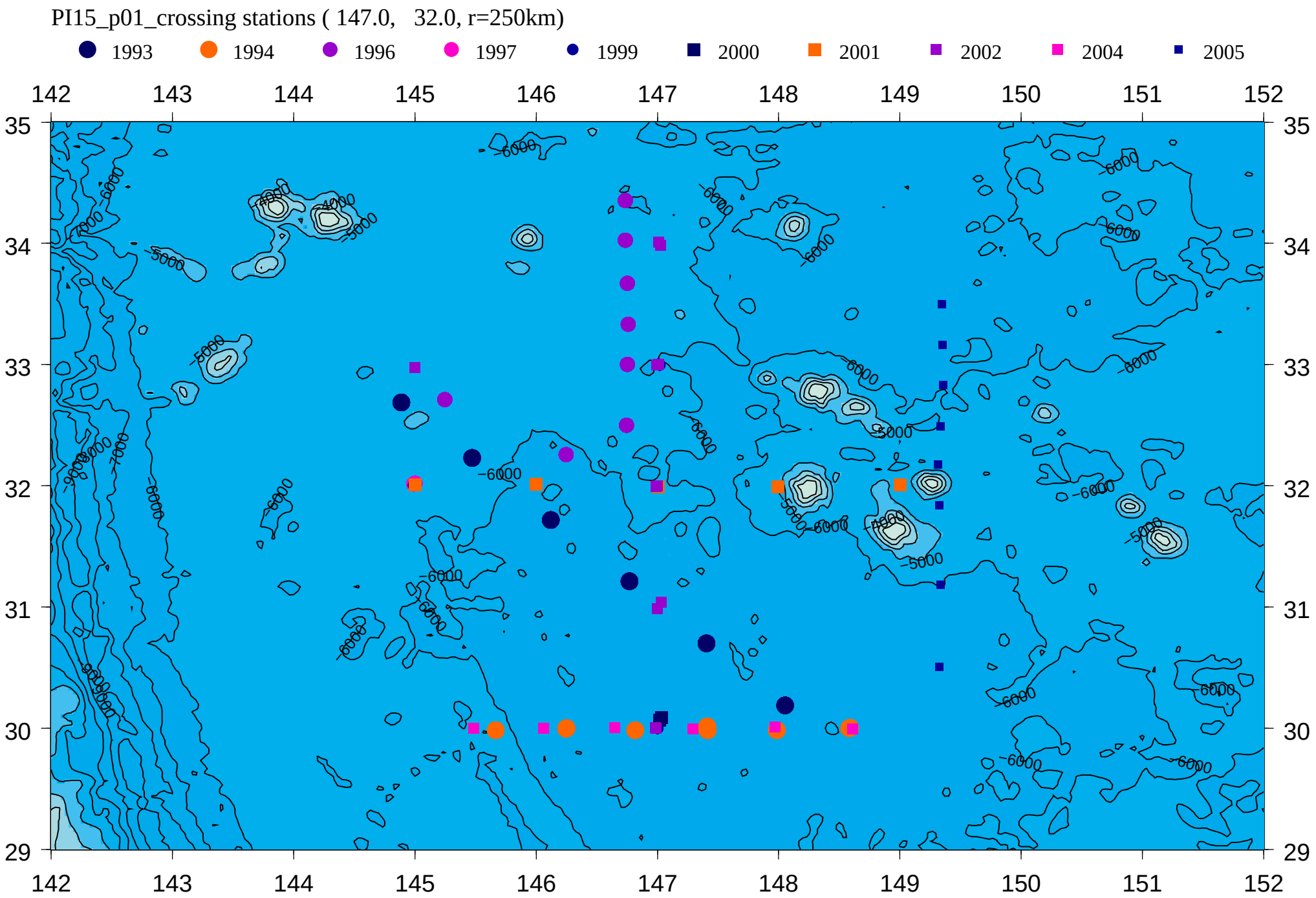

PI13_p01_crossing stations (135.2, 29.5, r=250km)
1994
1995
1997
1998
1999
2000
2001
2002
2003
2004
130
131
132
133
134
135
136
137
138
139
140
33
32
31
30
29
28
27

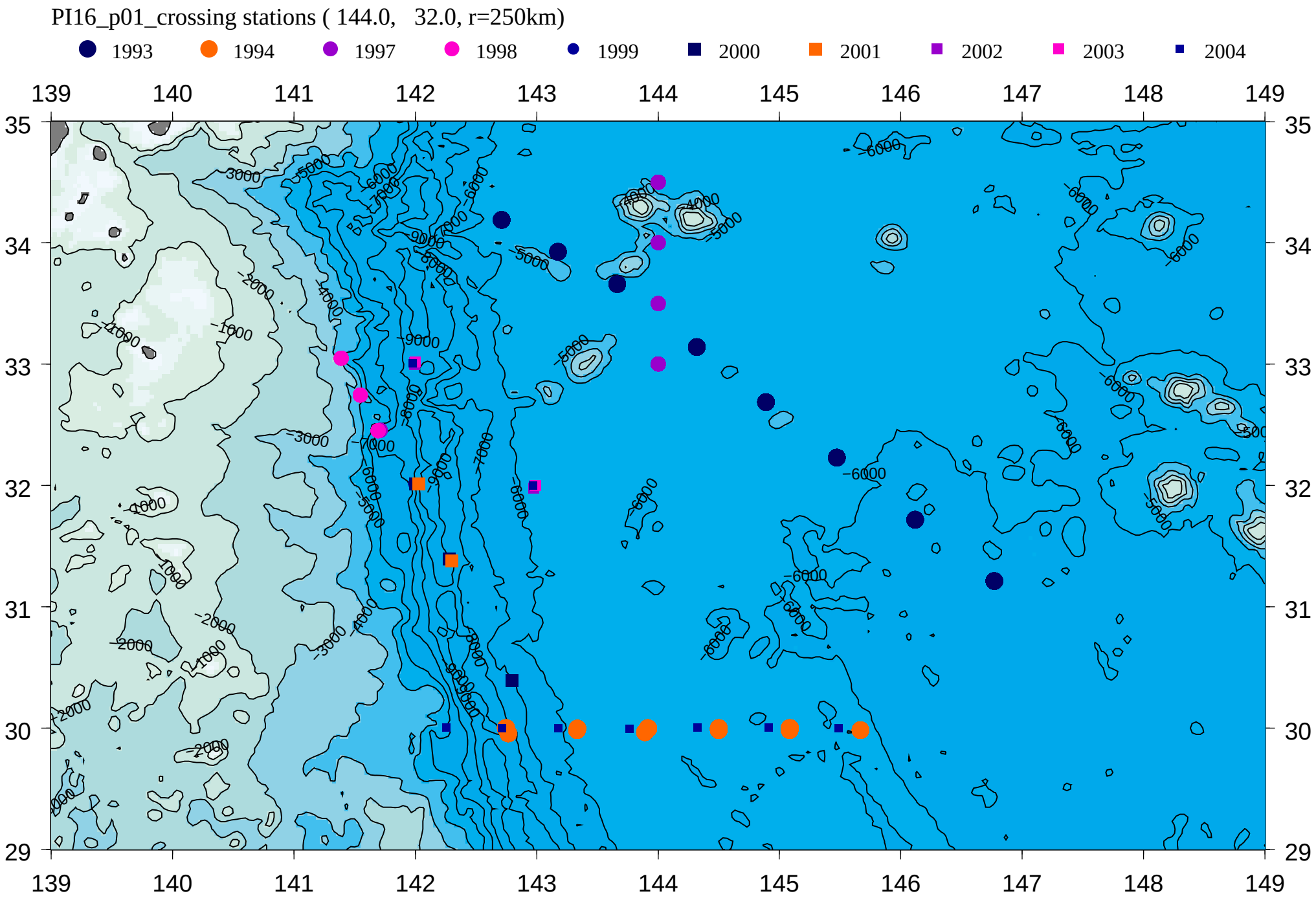

PI13_p02_crossing stations (135.2, 29.5, r=250km)
1998
1999
2000
2001
2002
2003
2005
2006
2007
2008
130
131
132
133
134
135
136
137
138
139
140
33
32
31
30
29
28
27

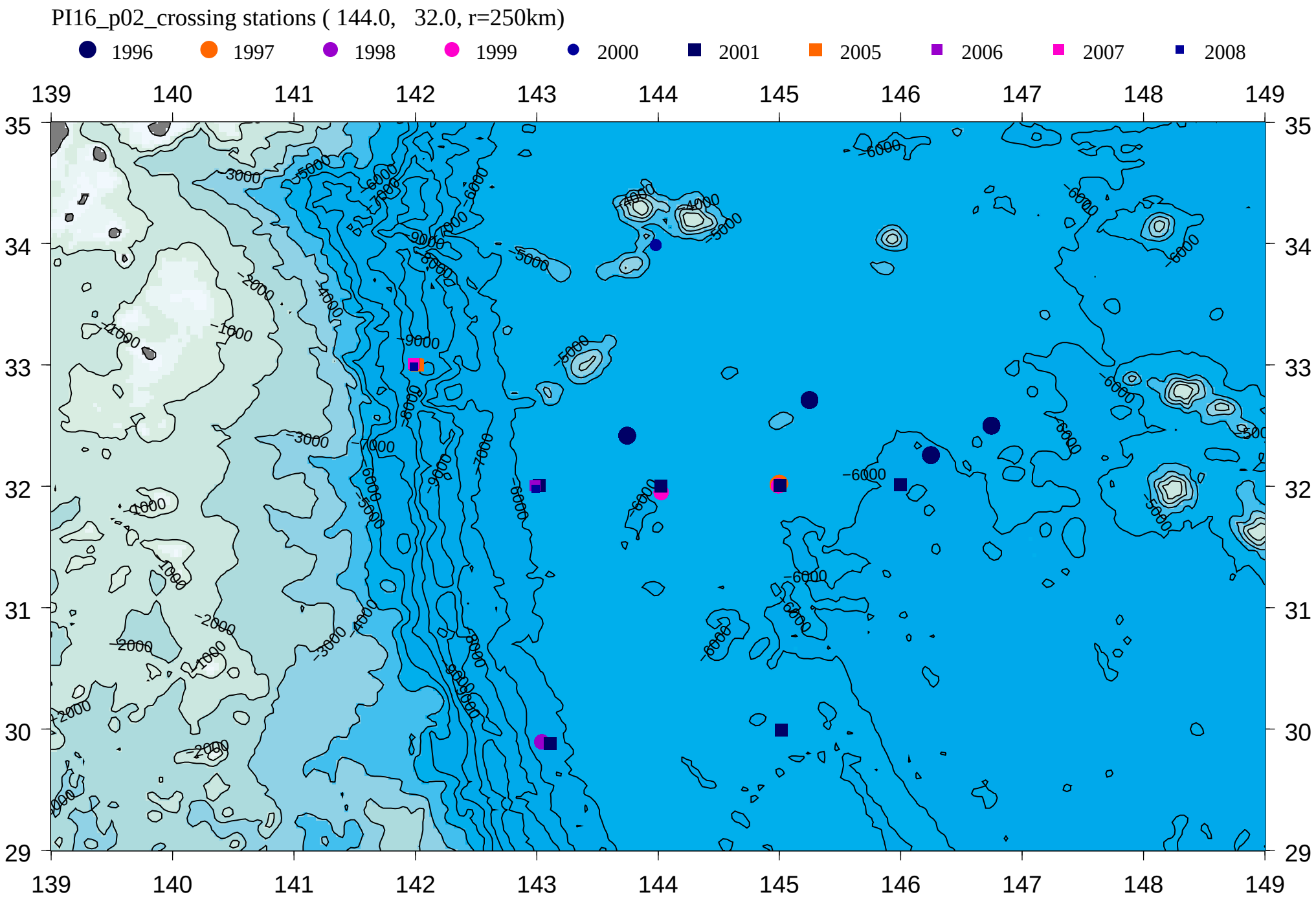

PI13_p03_crossing stations (135.2, 29.5, r=250km)
2004
2006
2007
2008
130
131
132
133
134
135
136
137
138
139
140
33
32
31
30
29
28
27
-1000
-2000
-3000
-4000
-5000

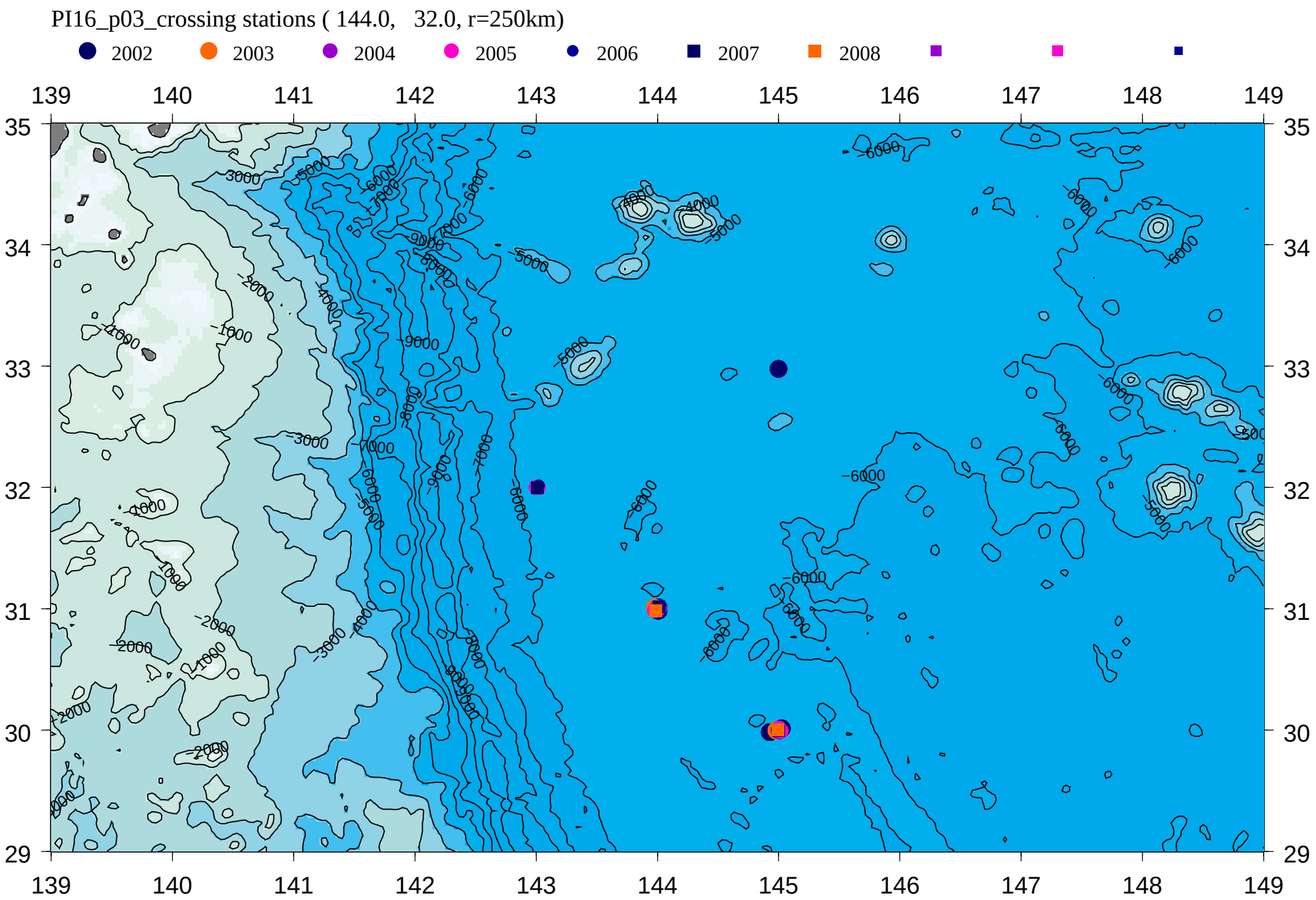

PI14_p01_crossing stations (135.2, 26.0, r=250km)
1985
1994
1995
1997
1998
2000
2001
2002
2003
2004
130
131
132
133
134
135
136
137
138
139
140
29
28
27
26
25
24
23

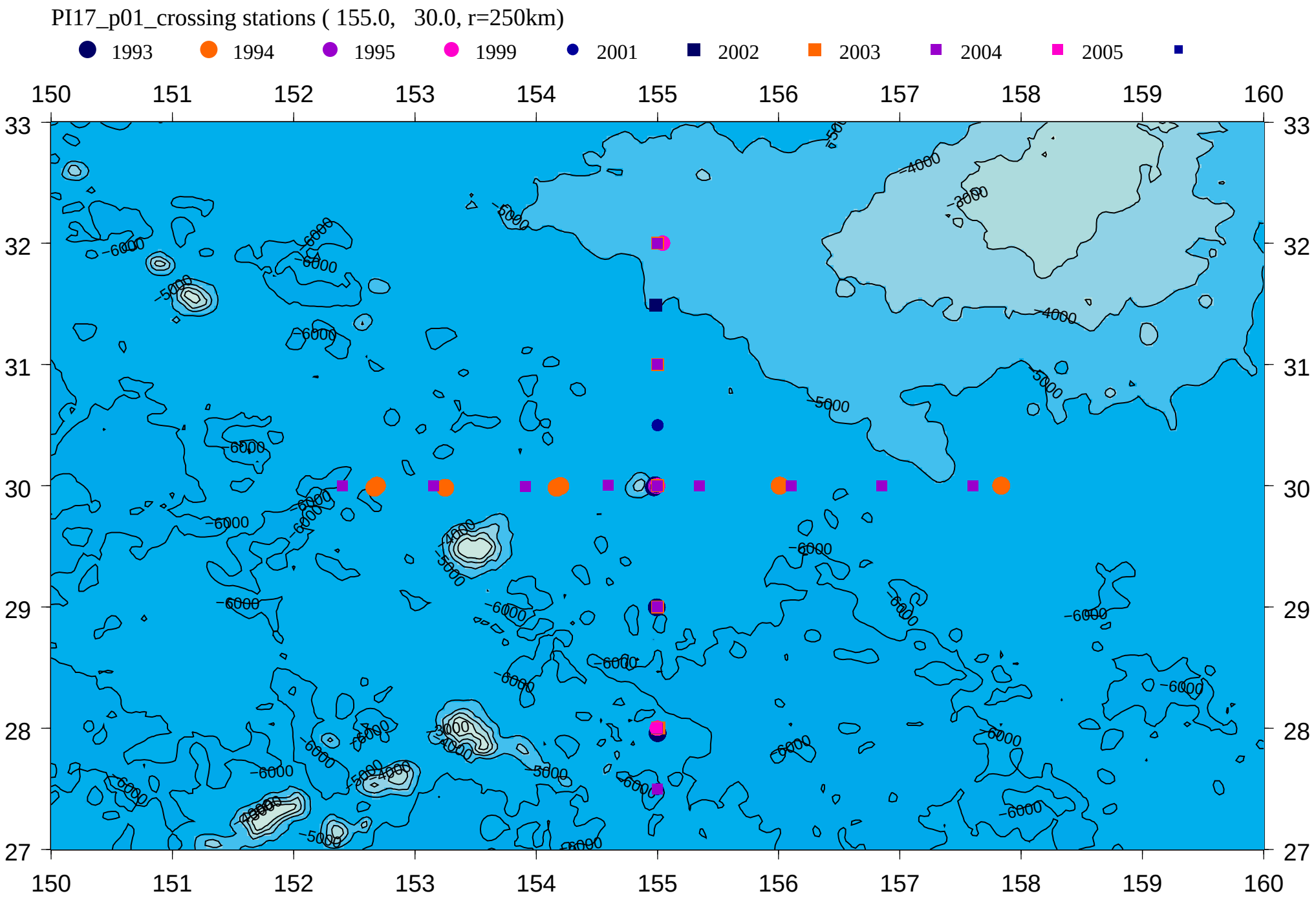

PI14_p02_crossing stations (135.2, 26.0, r=250km)
1998
1999
2000
2001
2002
2003
2005
2006
2007
2008
130
131
132
133
134
135
136
137
138
139
140
29
28
27
26
25
24
23

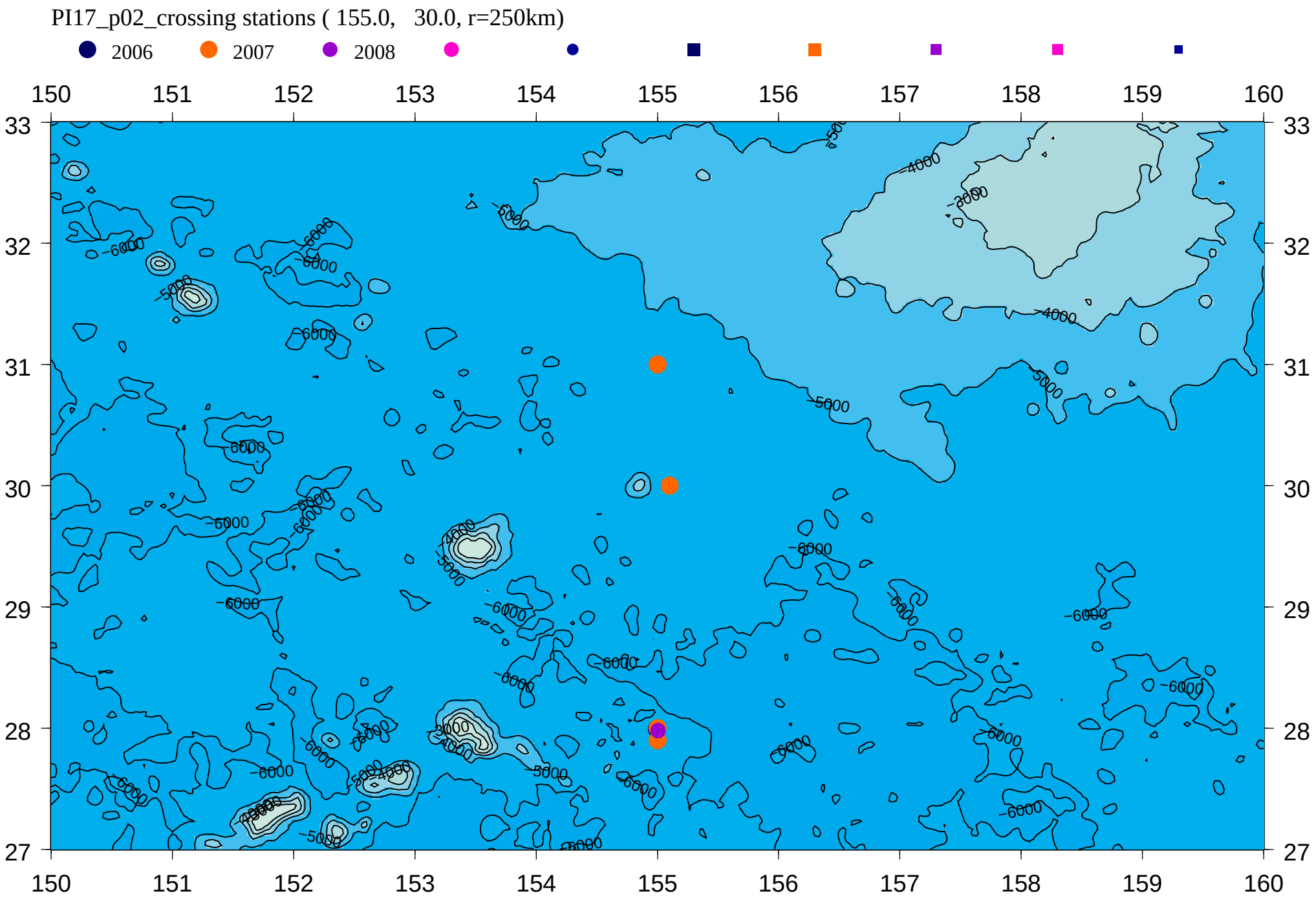

PI15_p01_crossing stations (147.0, 32.0, r=250km)
1993
1994
1996
1997
1999
2000
2001
2002
2004
2005
142
143
144
145
146
147
148
149
150
151
152
35
34
33
32
31
30
29
-6000
-5000
-7000
-4000

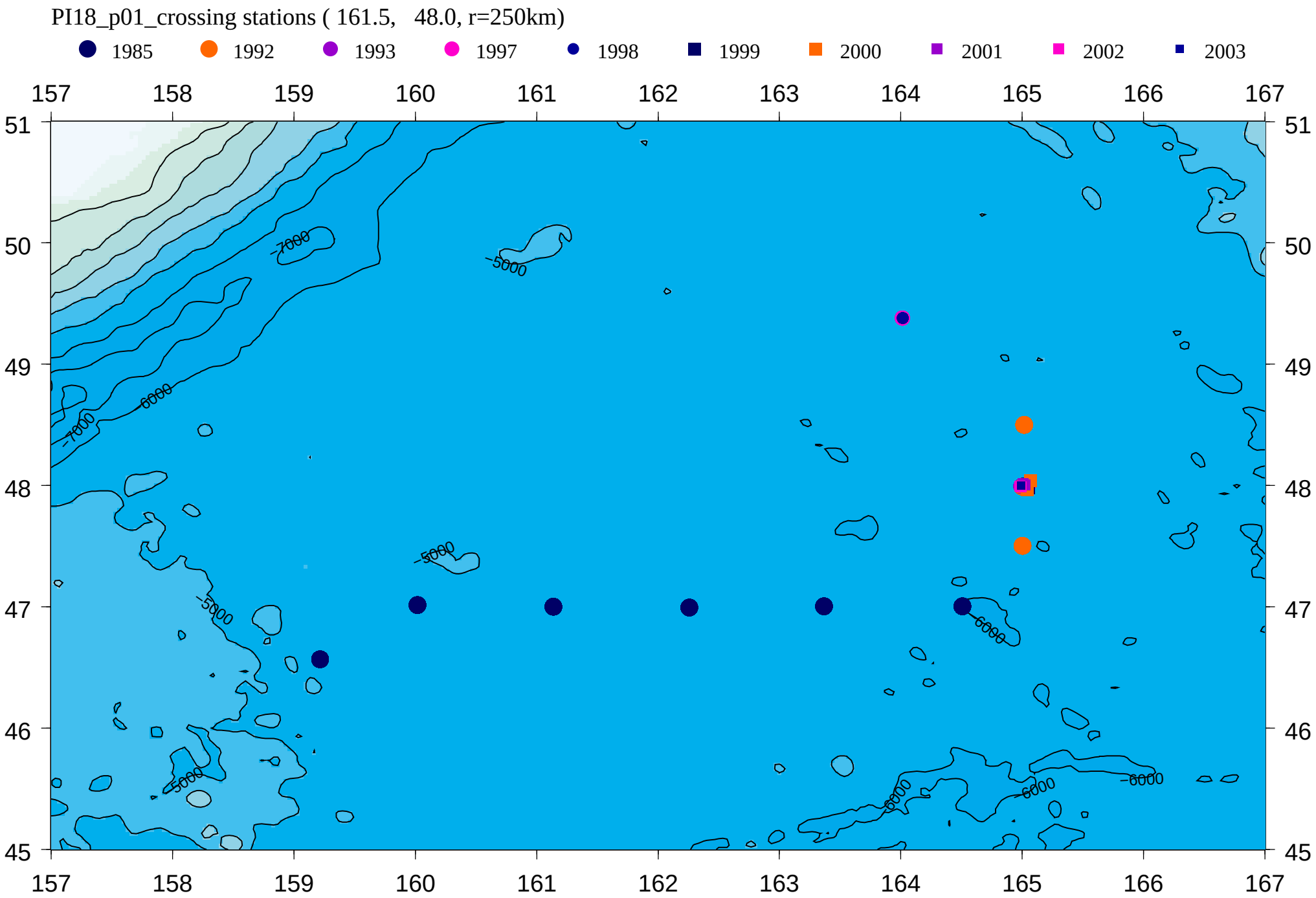

PI16_p01_crossing stations (144.0, 32.0, r=250km)
1993
1994
1997
1998
1999
2000
2001
2002
2003
2004
139
140
141
142
143
144
145
146
147
148
149
35
34
33
32
31
30
29

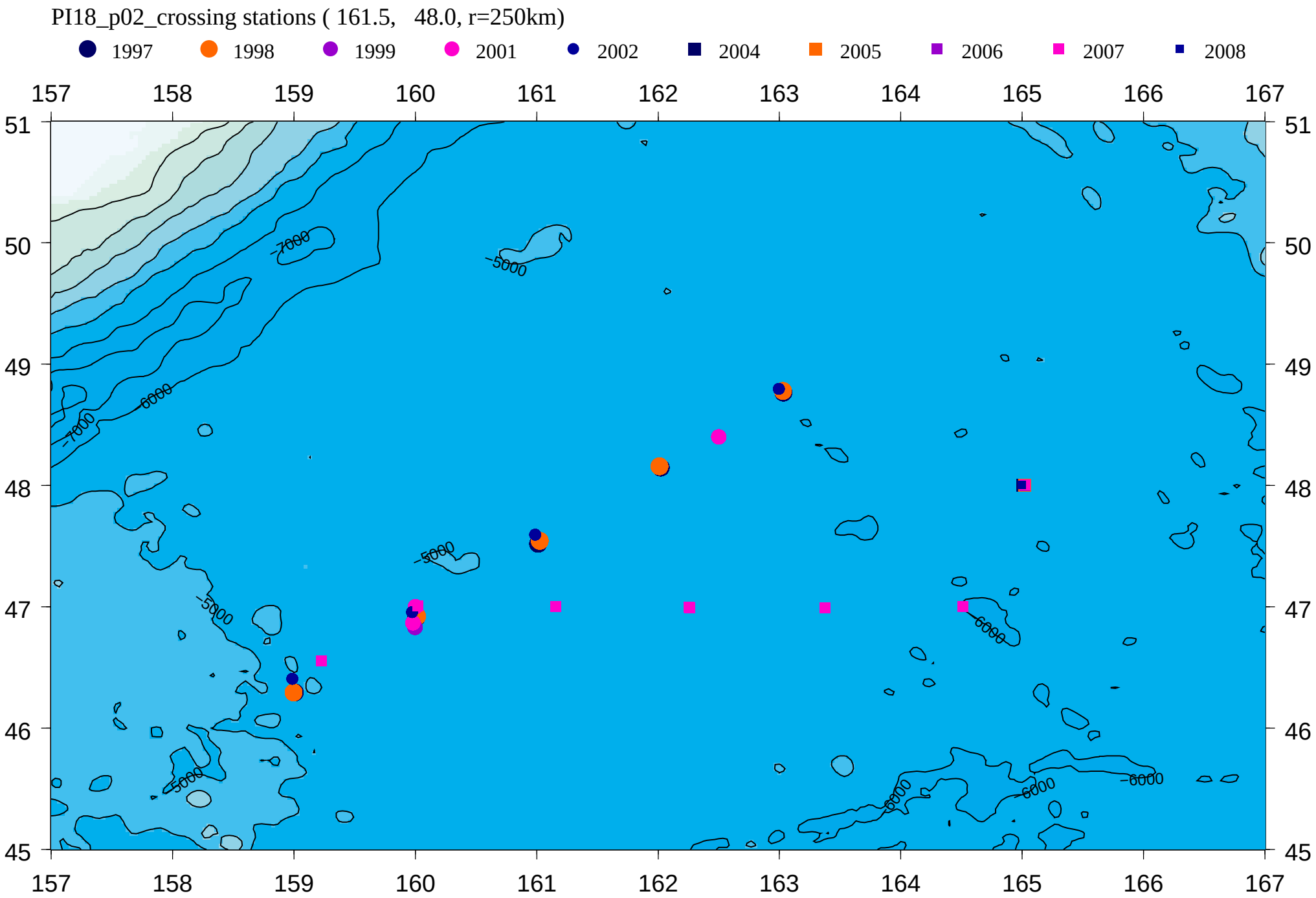

PI16_p02_crossing stations (144.0, 32.0, r=250km)
1996
1997
1998
1999
2000
2001
2005
2006
2007
2008
139
140
141
142
143
144
145
146
147
148
149
35
34
33
32
31
30
29

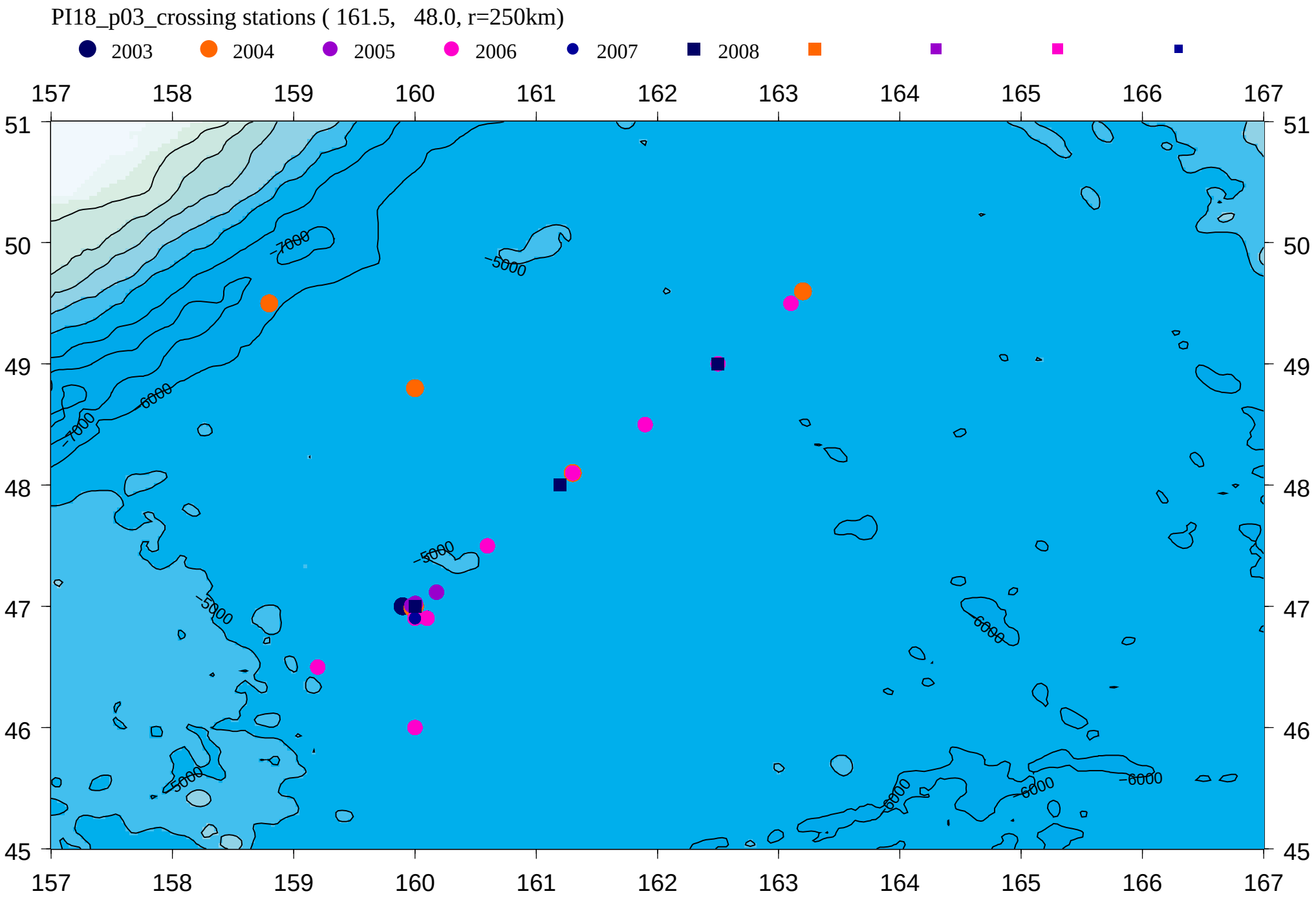

PI16_p03_crossing stations (144.0, 32.0, r=250km)
2002
2003
2004
2005
2006
2007
2008
139
140
141
142
143
144
145
146
147
148
149
35
34
33
32
31
30
29

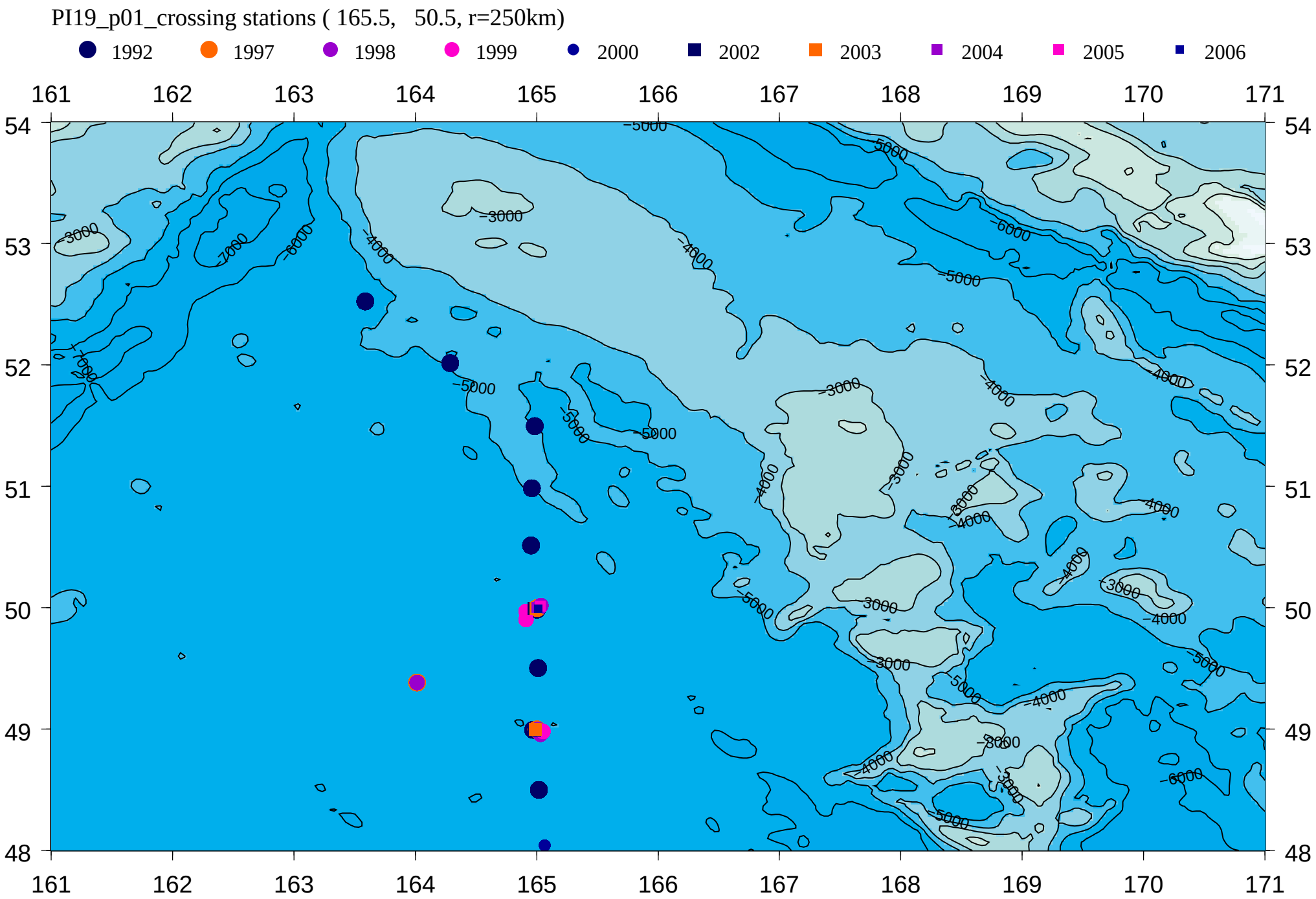

PI17_p01_crossing stations (155.0, 30.0, r=250km)
1993
1994
1995
1999
2001
2002
2003
2004
2005
150
151
152
153
154
155
156
157
158
159
160
33
32
31
30
29
28
27
-6000
-5000
-4000
-3000

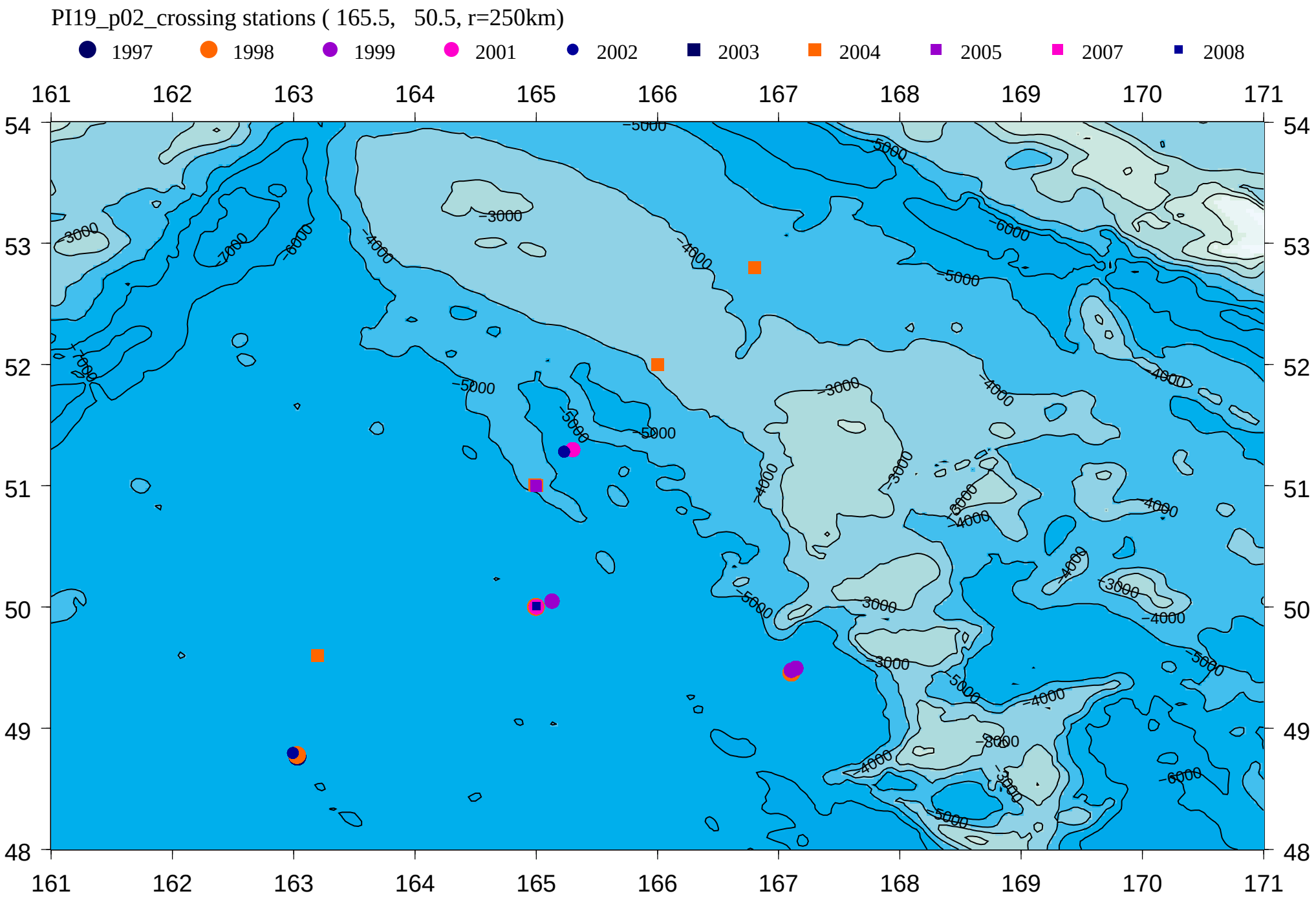

PI17_p02_crossing stations (155.0, 30.0, r=250km)
2006
2007
2008
150
151
152
153
154
155
156
157
158
159
160
33
32
31
30
29
28
27

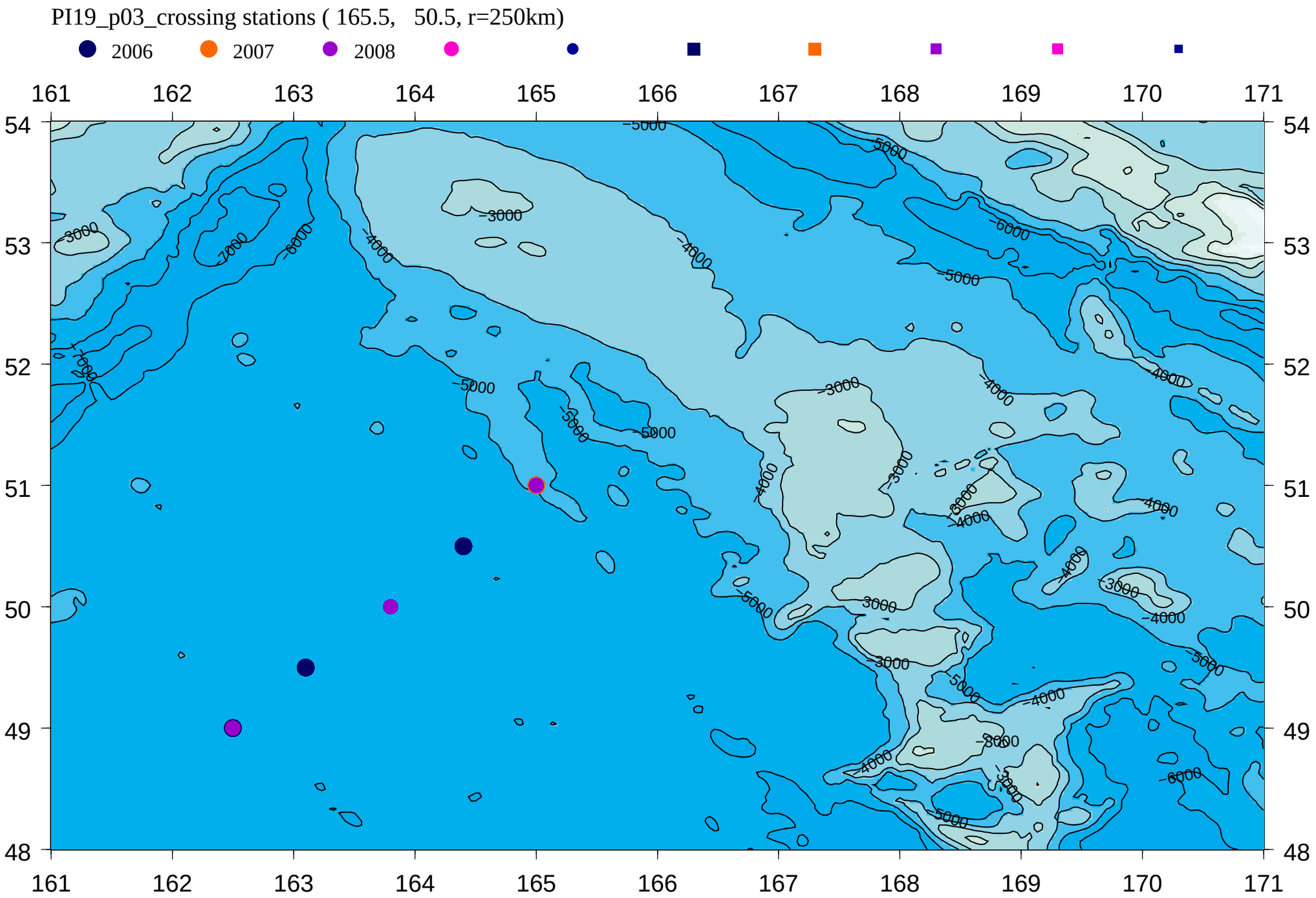

PI18_p01_crossing stations (161.5, 48.0, r=250km)
1985
1992
1993
1997
1998
1999
2000
2001
2002
2003
157
158
159
160
161
162
163
164
165
166
167
51
50
49
48
47
46
45
-7000
-5000
-6000

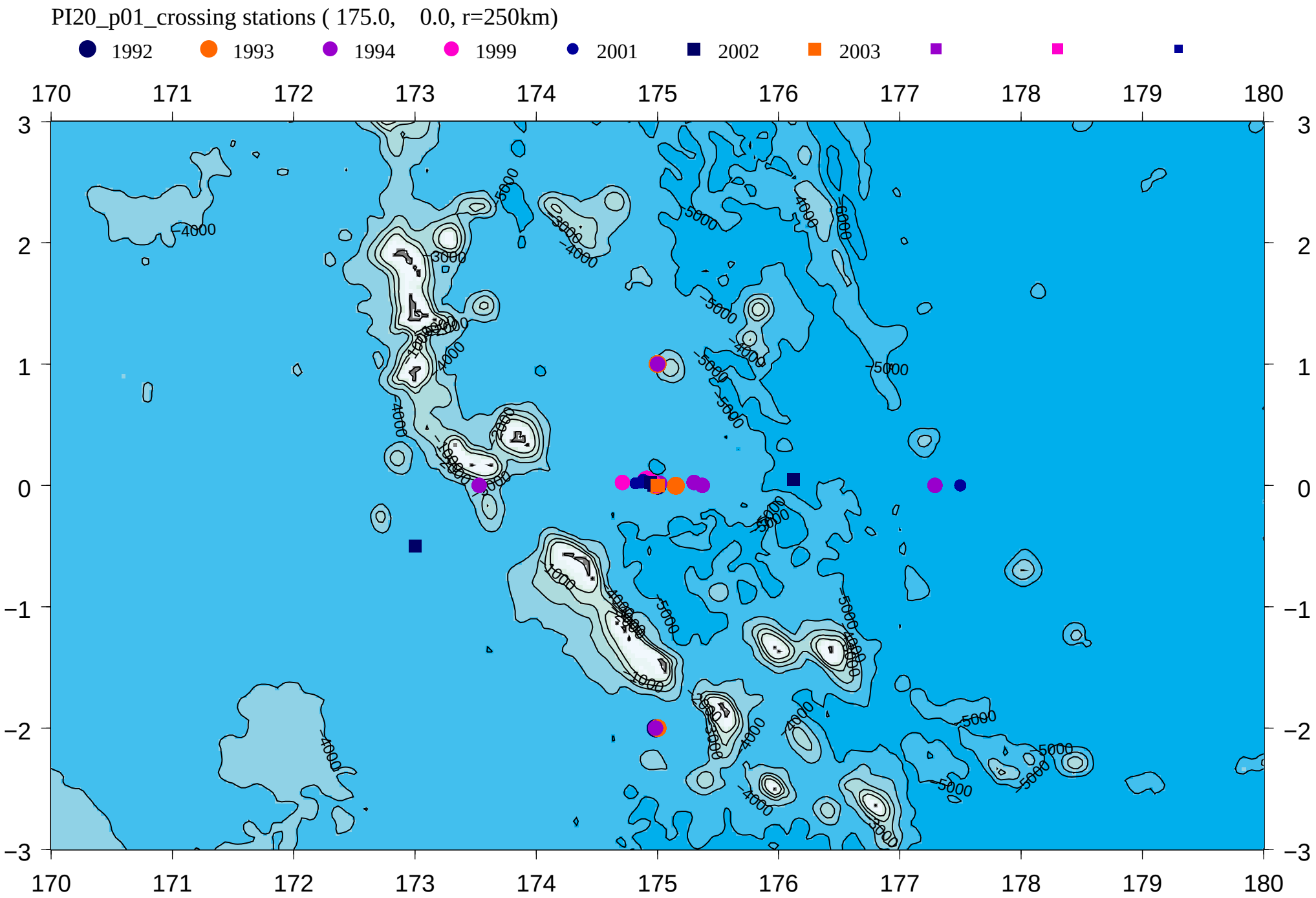

PI18_p02_crossing stations (161.5, 48.0, r=250km)
1997
1998
1999
2001
2002
2004
2005
2006
2007
2008
157
158
159
160
161
162
163
164
165
166
167
51
50
49
48
47
46
45
-7000
-6000
-5000

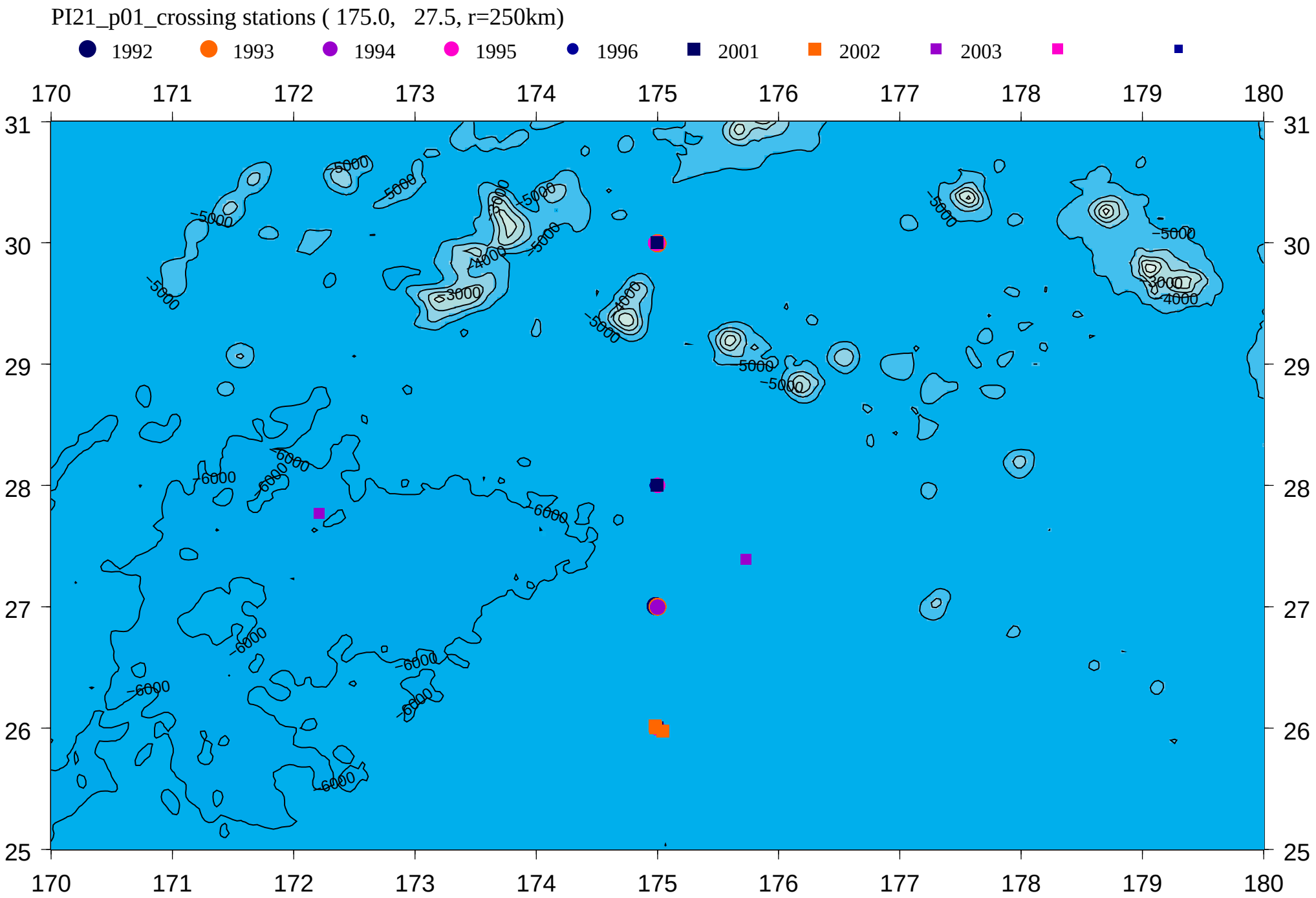

PI18_p03_crossing stations (161.5, 48.0, r=250km)
2003
2004
2005
2006
2007
2008
157
158
159
160
161
162
163
164
165
166
167
51
50
49
48
47
46
45
-7000
-5000
-6000

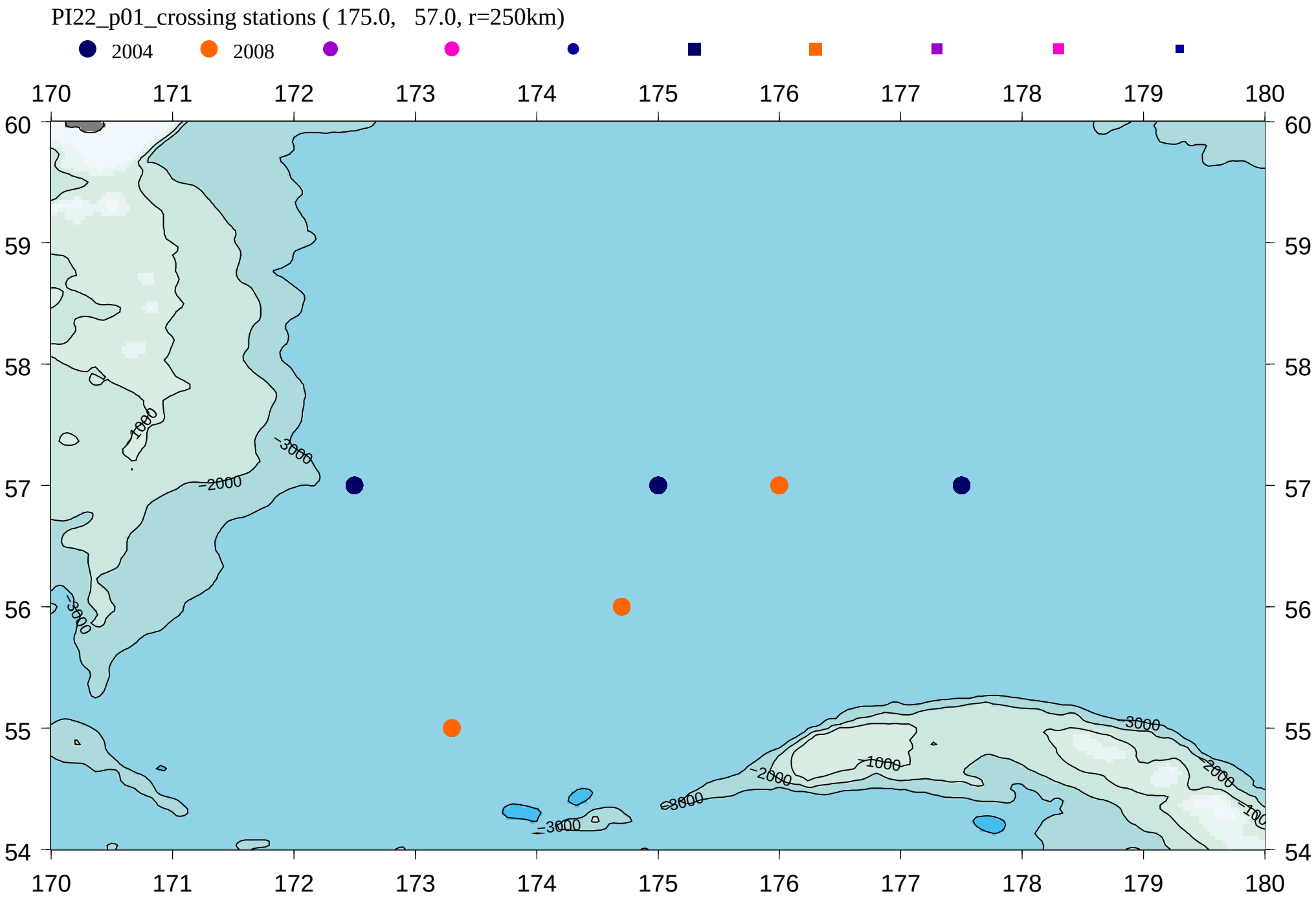

PI19_p01_crossing stations (165.5, 50.5, r=250km)
1992
1997
1998
1999
2000
2002
2003
2004
2005
2006
161
162
163
164
165
166
167
168
169
170
171
54
53
52
51
50
49
48

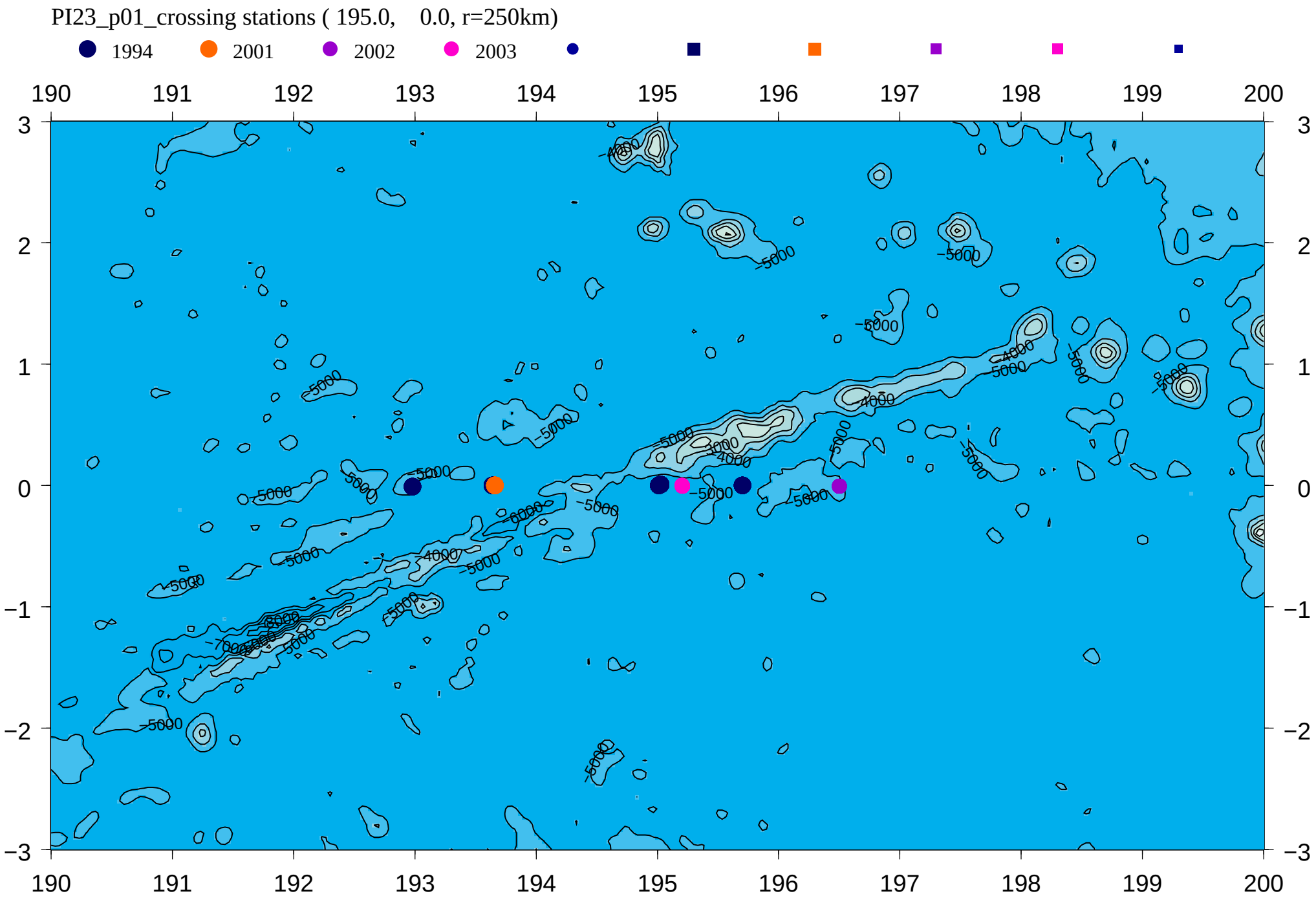

PI19_p02_crossing stations (165.5, 50.5, r=250km)
1997
1998
1999
2001
2002
2003
2004
2005
2007
2008
161
162
163
164
165
166
167
168
169
170
171
54
53
52
51
50
49
48
-3000
-4000
-5000
-6000
5000

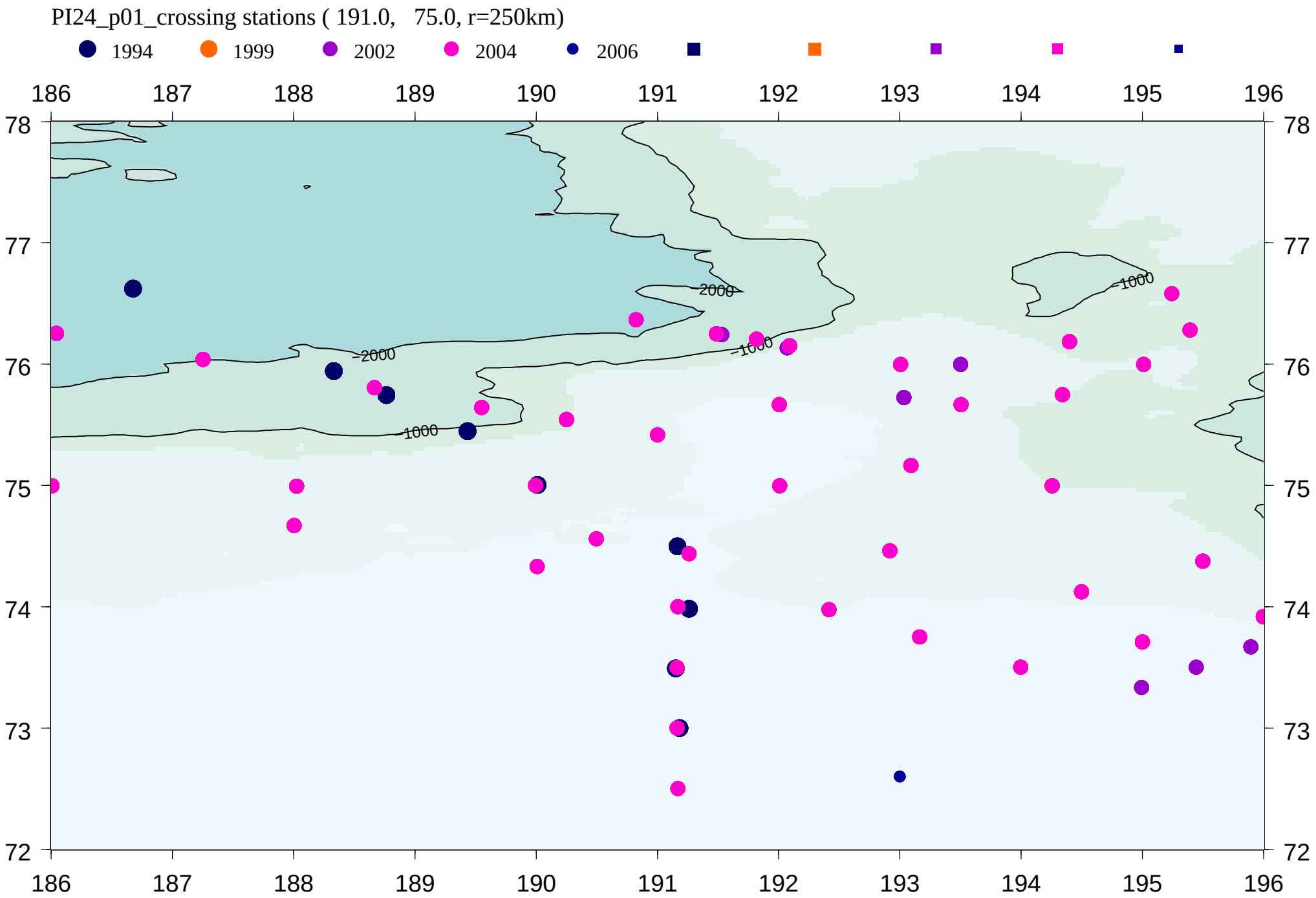

PI19_p03_crossing stations (165.5, 50.5, r=250km)
2006
2007
2008
161
162
163
164
165
166
167
168
169
170
171
54
53
52
51
50
49
48

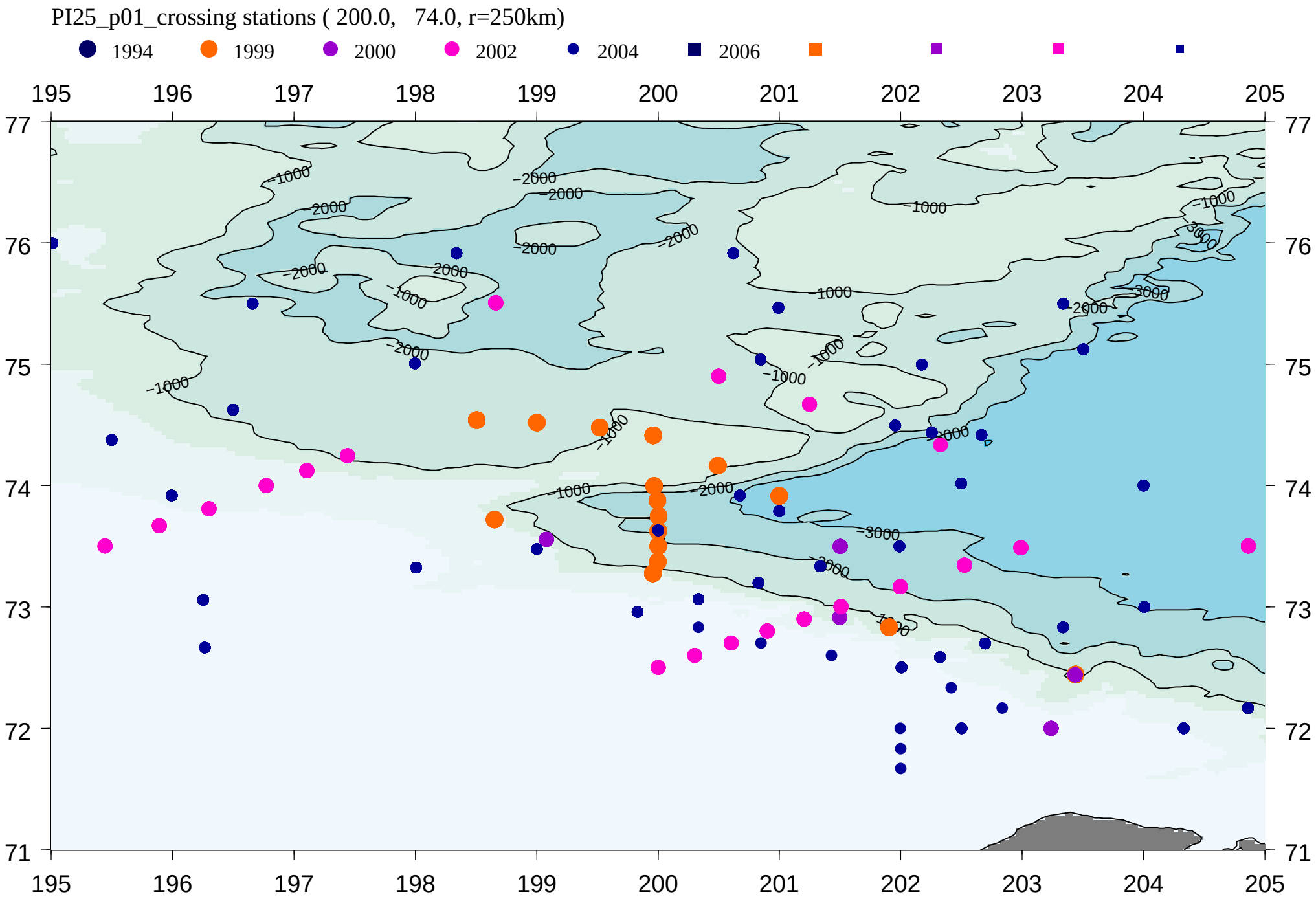

PI20_p01_crossing stations (175.0, 0.0, r=250km)
1992
1993
1994
1999
2001
2002
2003
170
171
172
173
174
175
176
177
178
179
180
3
2
1
0
−1
−2
−3

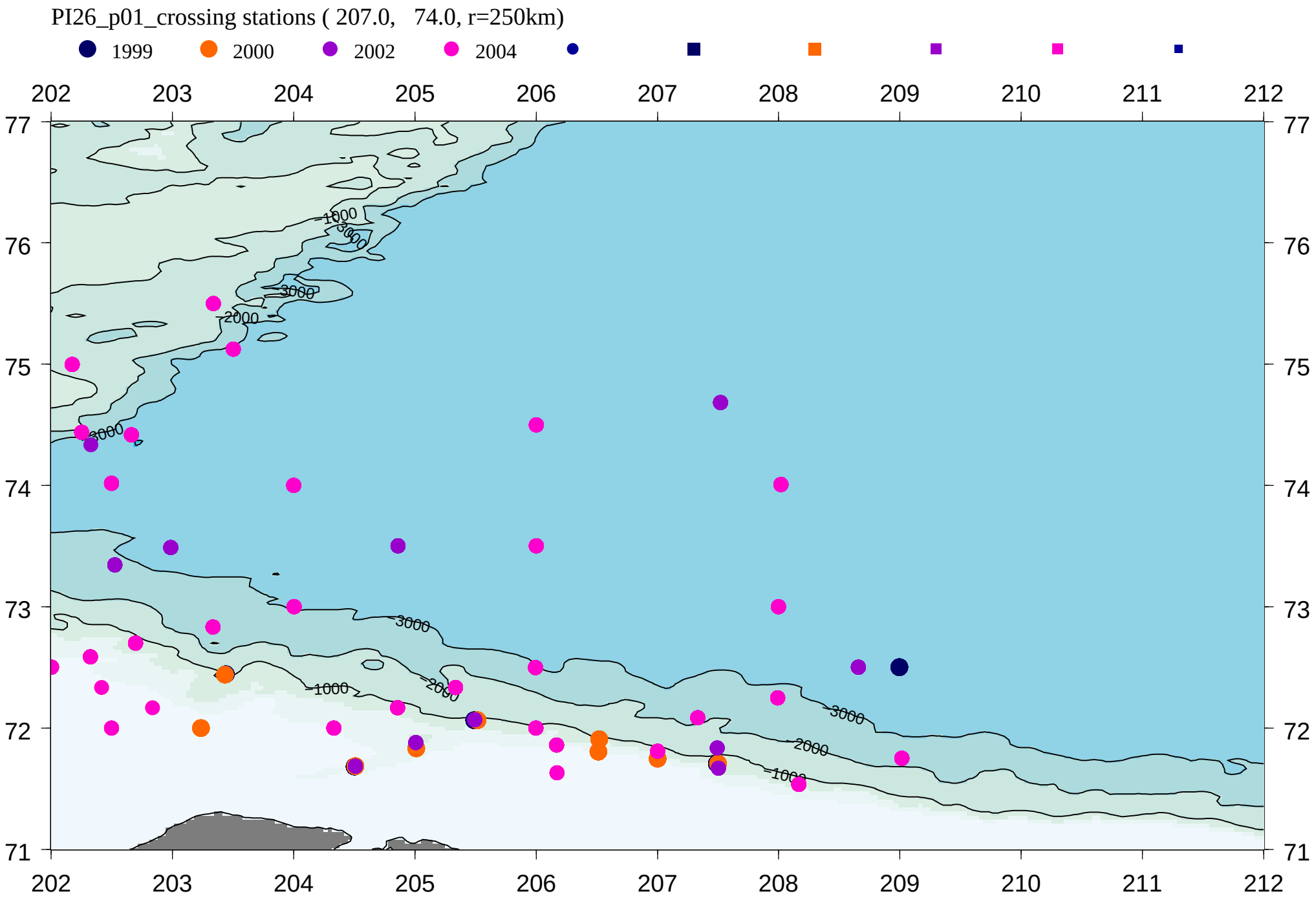

PI21_p01_crossing stations (175.0, 27.5, r=250km)
1992
1993
1994
1995
1996
2001
2002
2003
170
171
172
173
174
175
176
177
178
179
180
31
30
29
28
27
26
25
-5000
-4000
-3000
-6000
5000

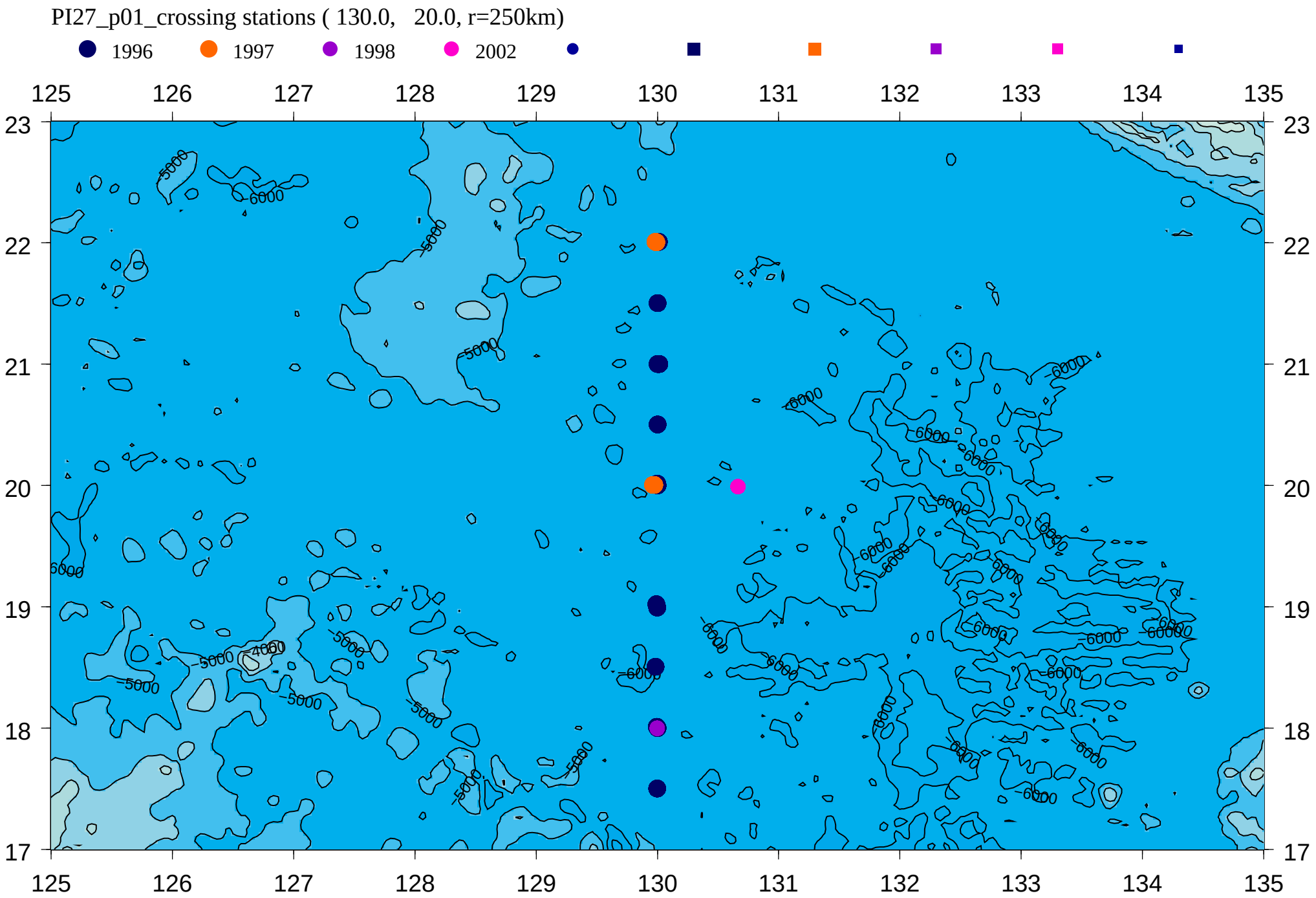

PI22_p01_crossing stations (175.0, 57.0, r=250km)
2004
2008
170
171
172
173
174
175
176
177
178
179
180
60
59
58
57
56
55
54
-1000
-2000
-3000
-3000
-3000
1000
2000
3000

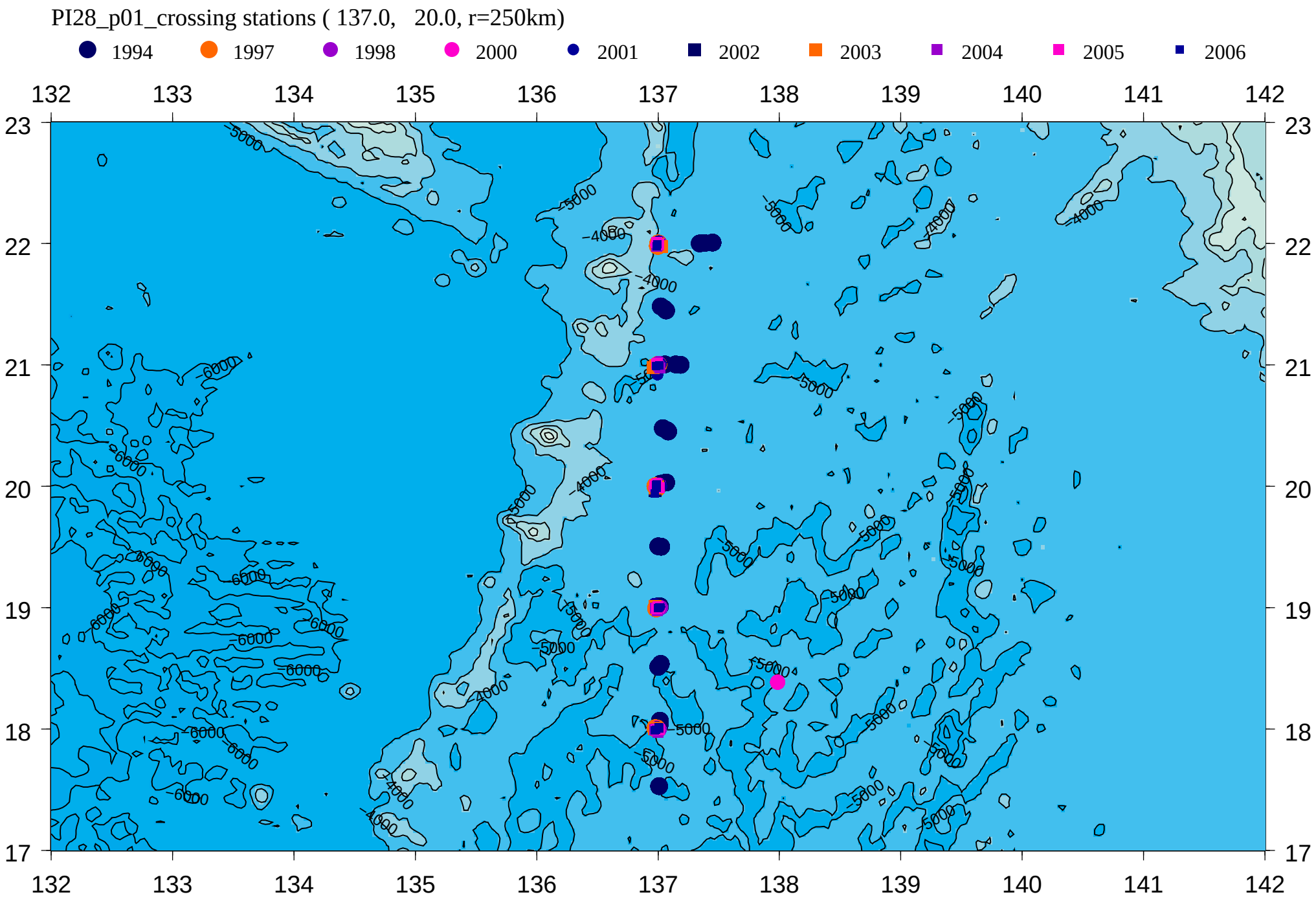

PI23_p01_crossing stations (195.0, 0.0, r=250km)
1994
2001
2002
2003
190
191
192
193
194
195
196
197
198
199
200
3
2
1
0
−1
−2
−3
−5000
−4000
−6000
−7000

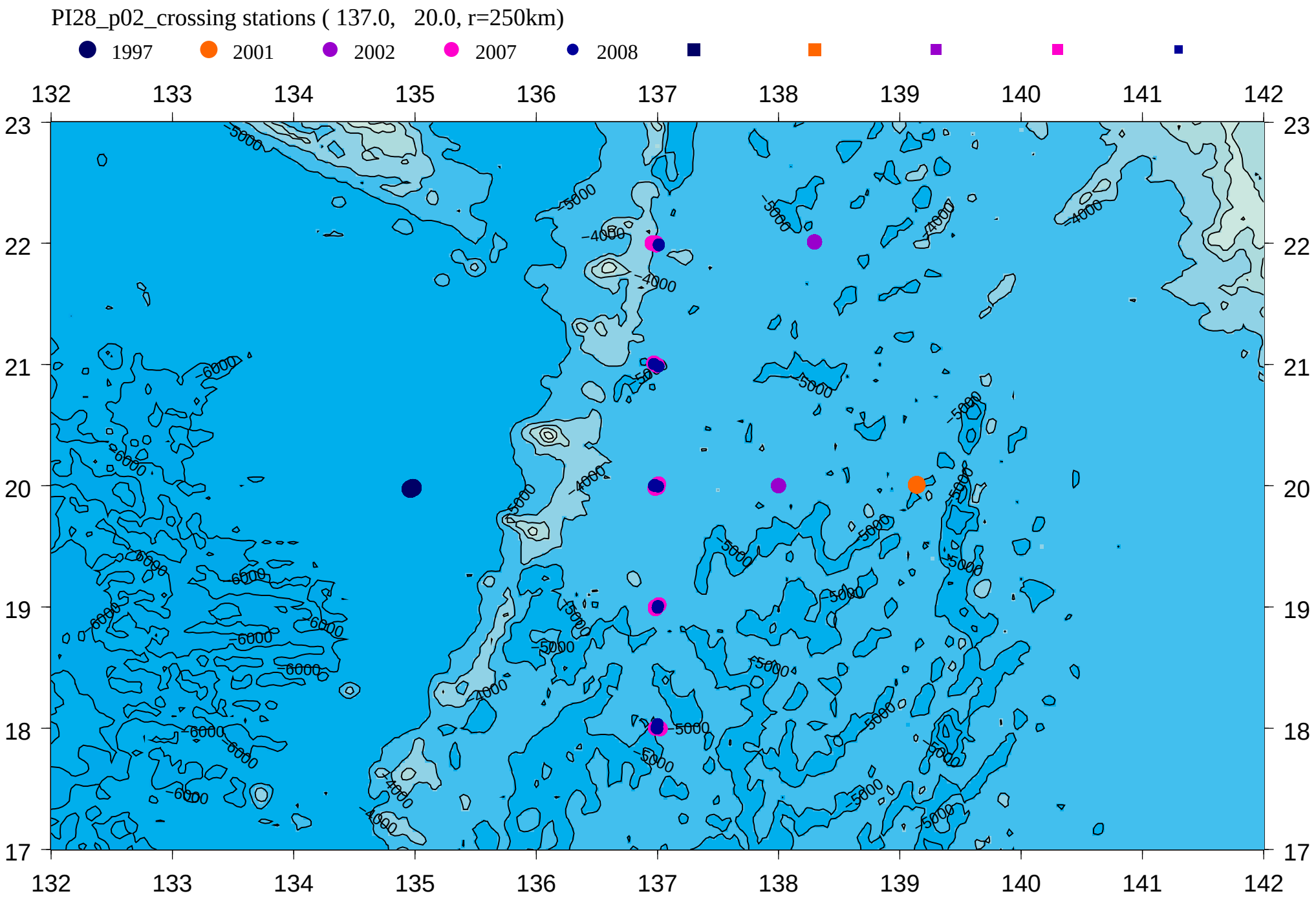

PI24_p01_crossing stations (191.0, 75.0, r=250km)
1994
1999
2002
2004
2006
186
187
188
189
190
191
192
193
194
195
196
78
77
76
75
74
73
72
2000
1000

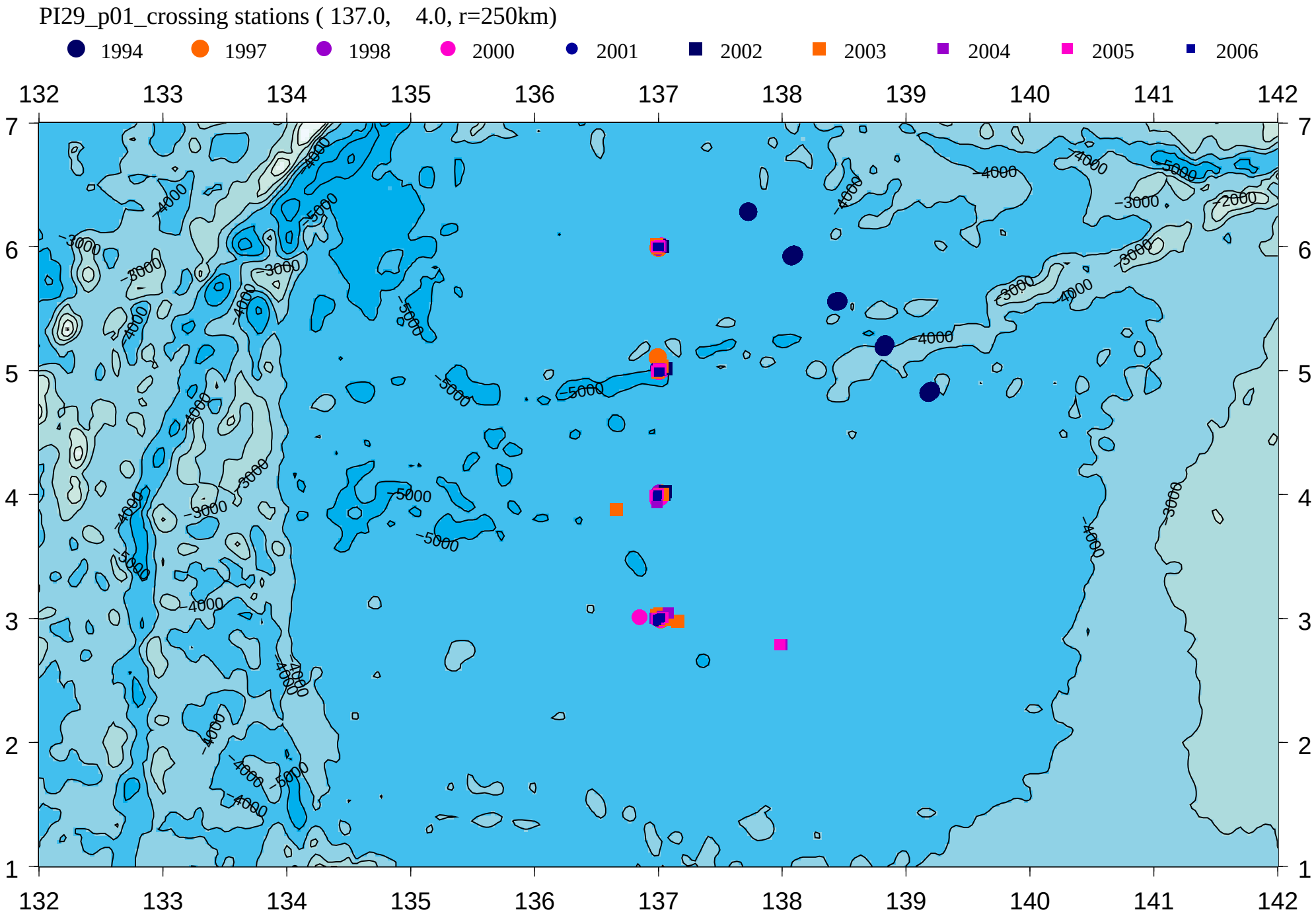

PI25_p01_crossing stations (200.0, 74.0, r=250km)
1994
1999
2000
2002
2004
2006
195
196
197
198
199
200
201
202
203
204
205
77
76
75
74
73
72
71
-1000
-2000
-3000

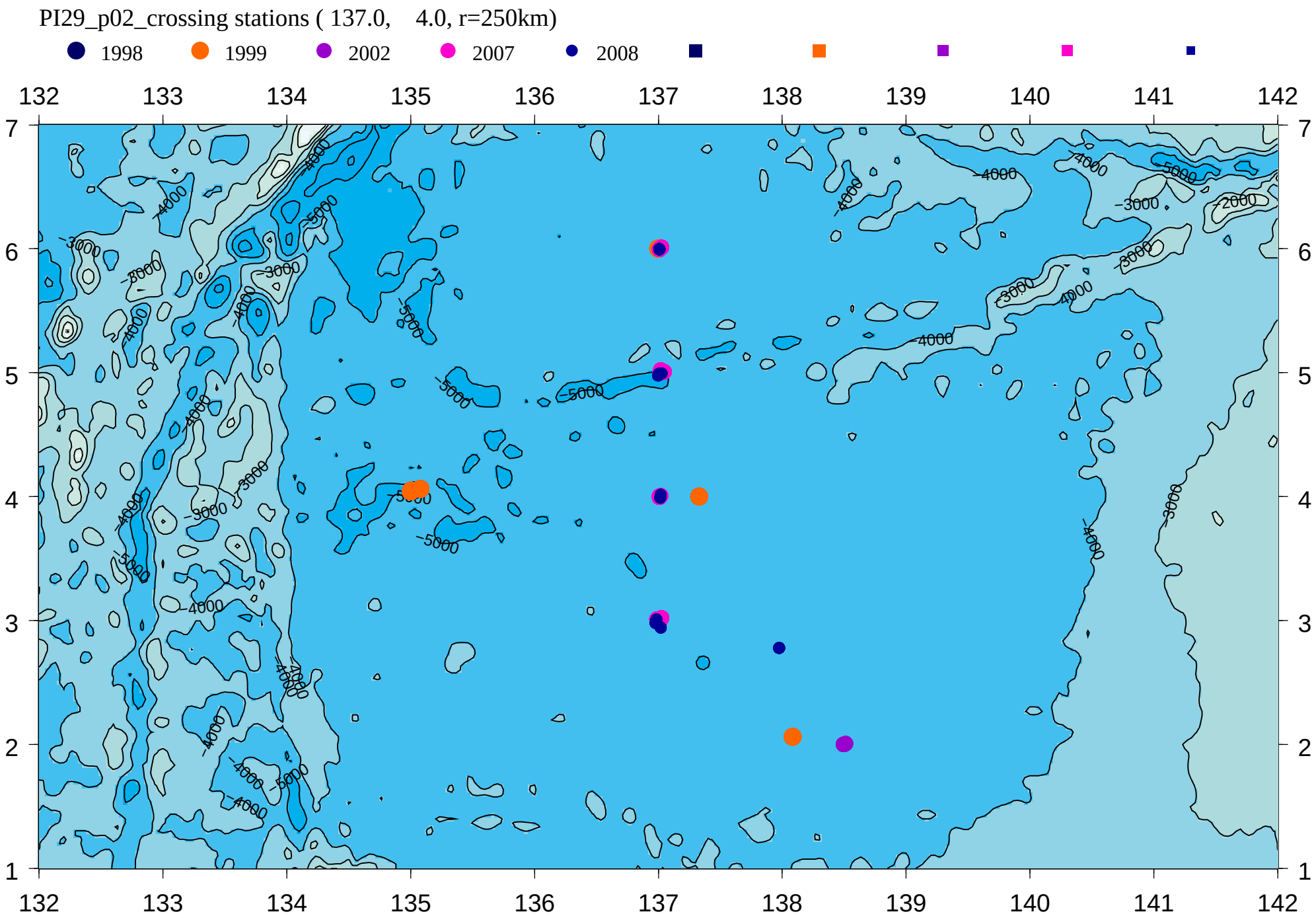

PI26_p01_crossing stations (207.0, 74.0, r=250km)
1999
2000
2002
2004
202
203
204
205
206
207
208
209
210
211
212
77
76
75
74
73
72
71
1000
2000
3000

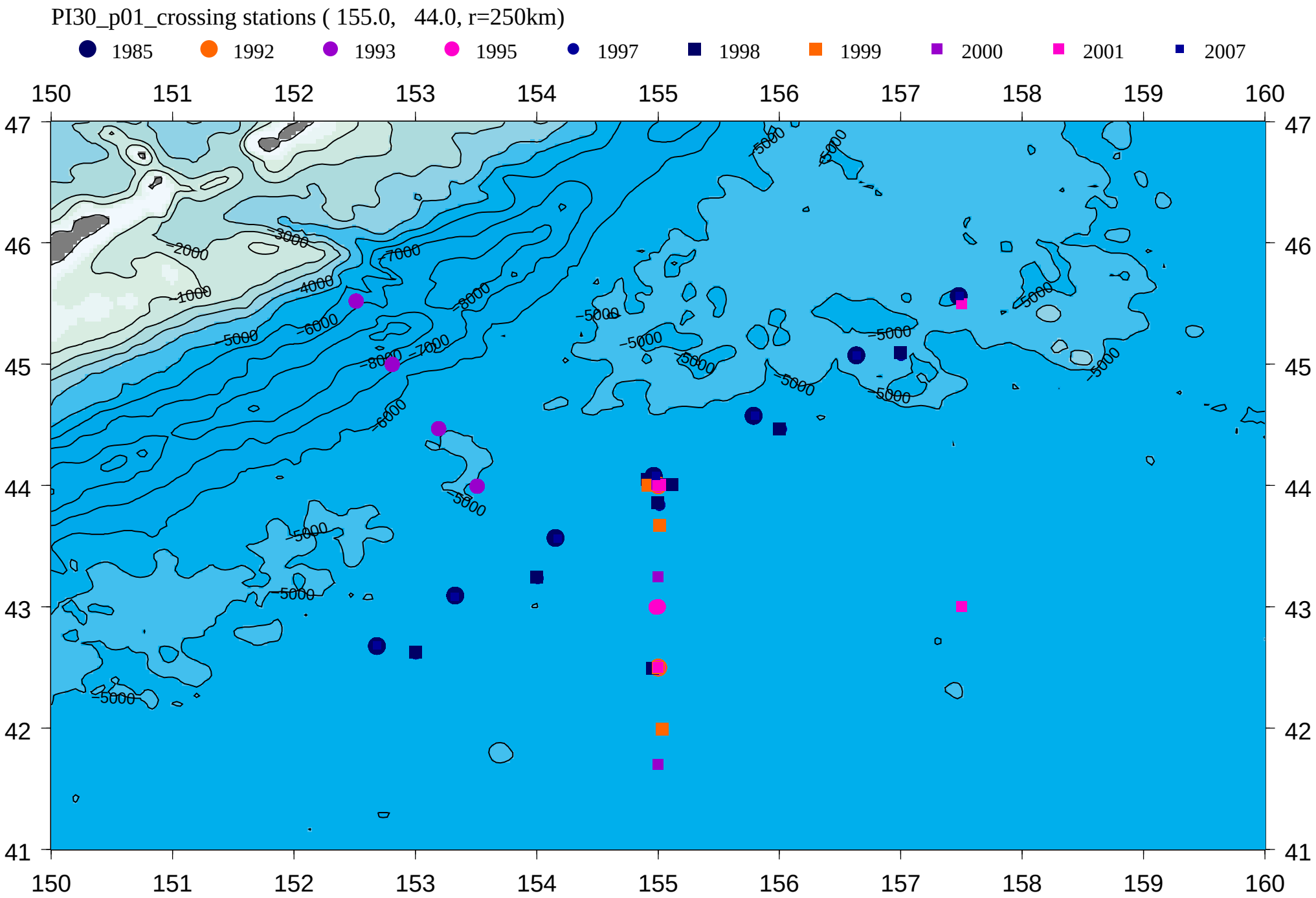

PI27_p01_crossing stations (130.0, 20.0, r=250km)
1996
1997
1998
2002
125
126
127
128
129
130
131
132
133
134
135
23
22
21
20
19
18
17
-5000
-6000
-4000

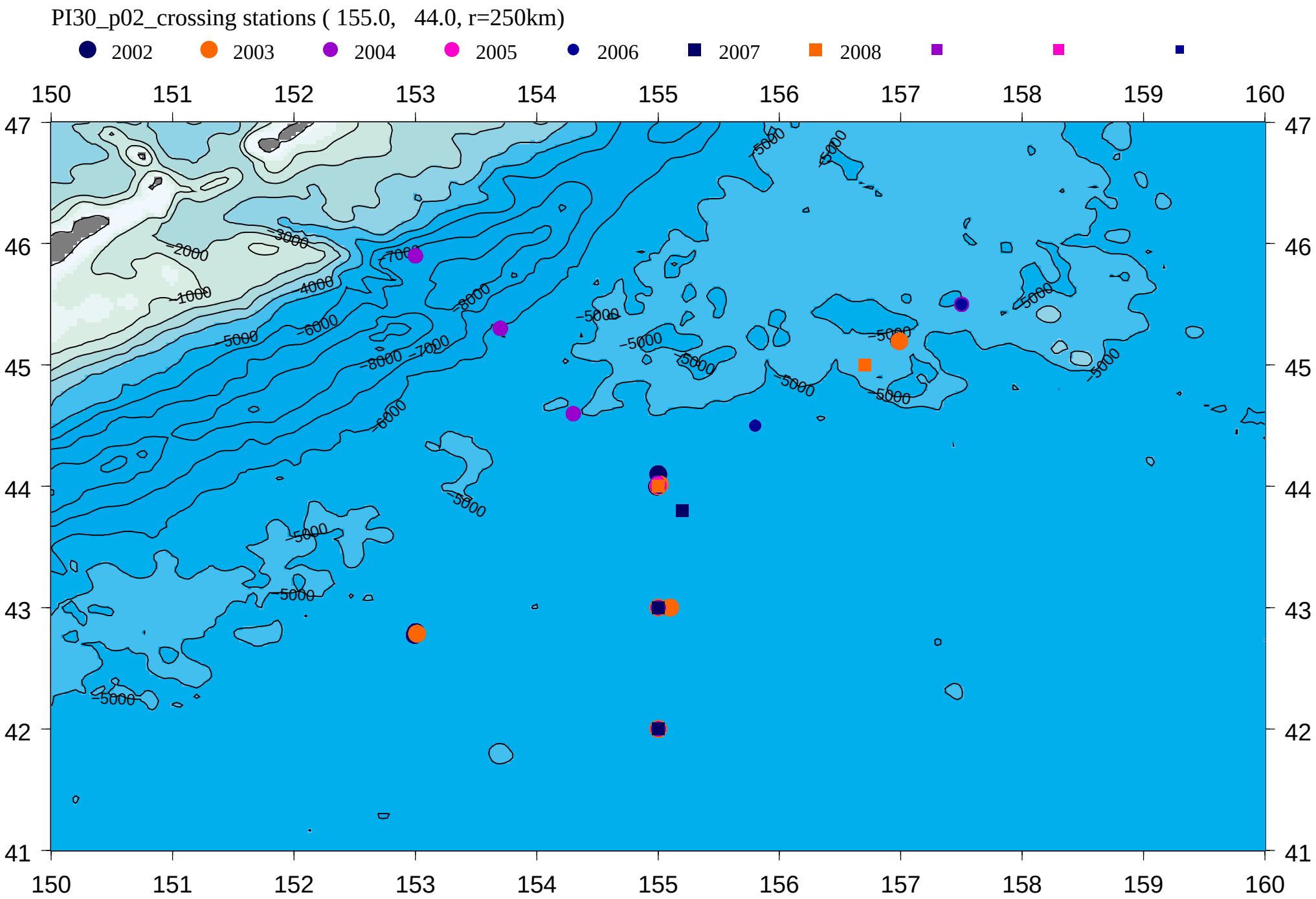

PI28_p01_crossing stations (137.0, 20.0, r=250km)
1994
1997
1998
2000
2001
2002
2003
2004
2005
2006
132
133
134
135
136
137
138
139
140
141
142
23
22
21
20
19
18
17
-5000
-4000
-6000

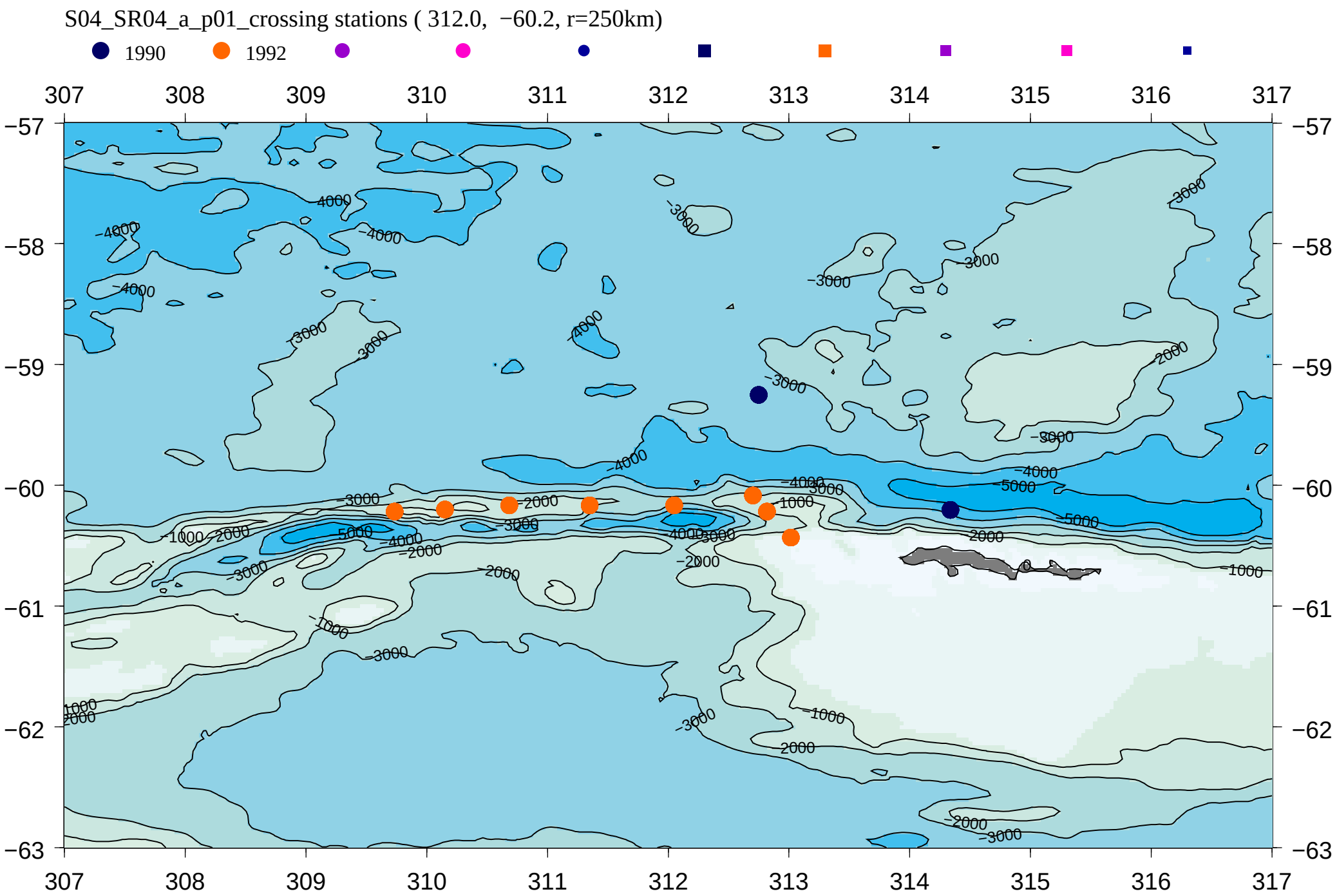

PI28_p02_crossing stations (137.0, 20.0, r=250km)
1997
2001
2002
2007
2008
132
133
134
135
136
137
138
139
140
141
142
23
22
21
20
19
18
17
-4000
-5000
-6000

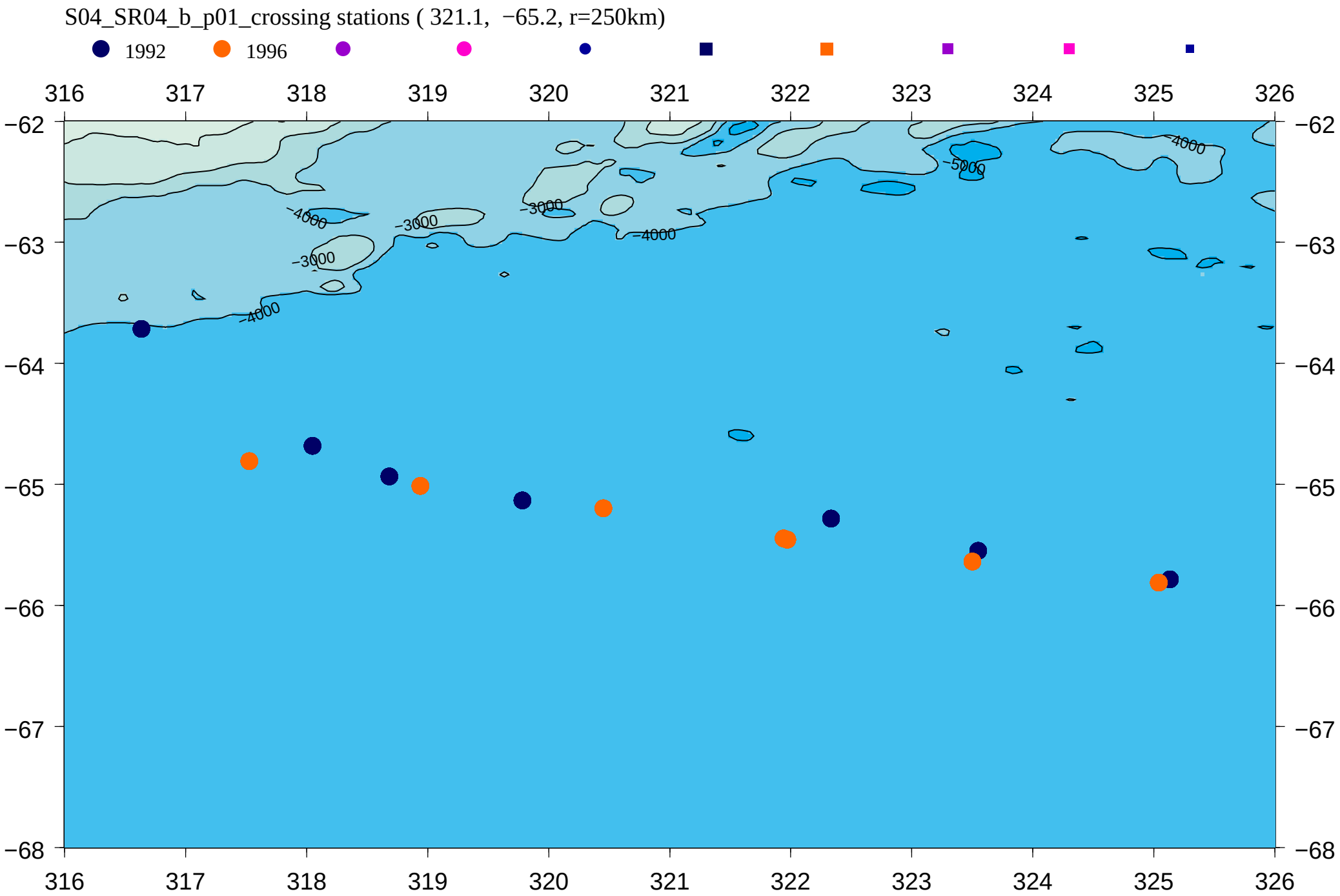

PI29_p01_crossing stations (137.0, 4.0, r=250km)
1994
1997
1998
2000
2001
2002
2003
2004
2005
2006
132
133
134
135
136
137
138
139
140
141
142
7
6
5
4
3
2
1
-2000
-3000
-4000
-5000

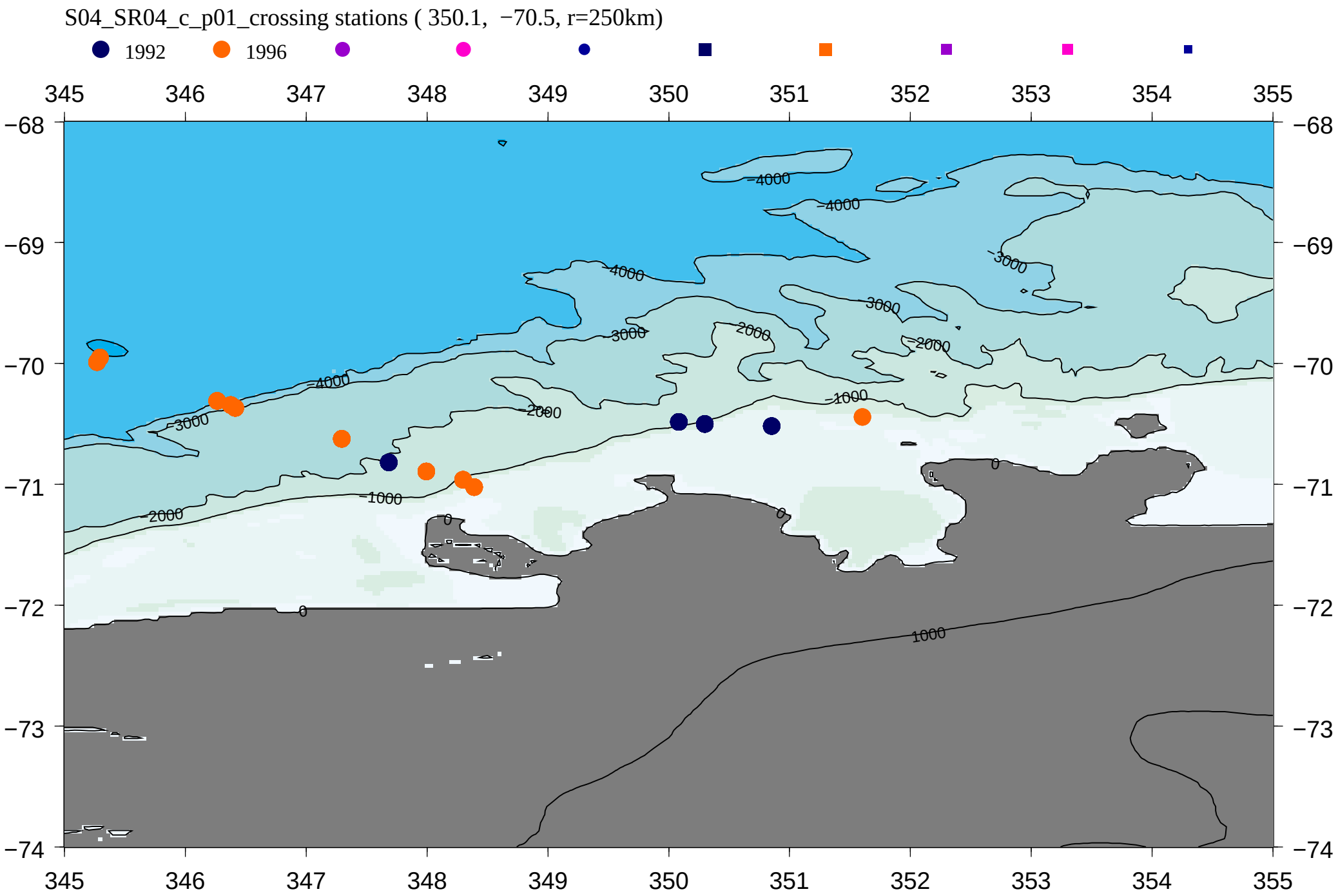

PI29_p02_crossing stations (137.0, 4.0, r=250km)
1998
1999
2002
2007
2008
132
133
134
135
136
137
138
139
140
141
142
7
6
5
4
3
2
1
-2000
-3000
-4000
-5000

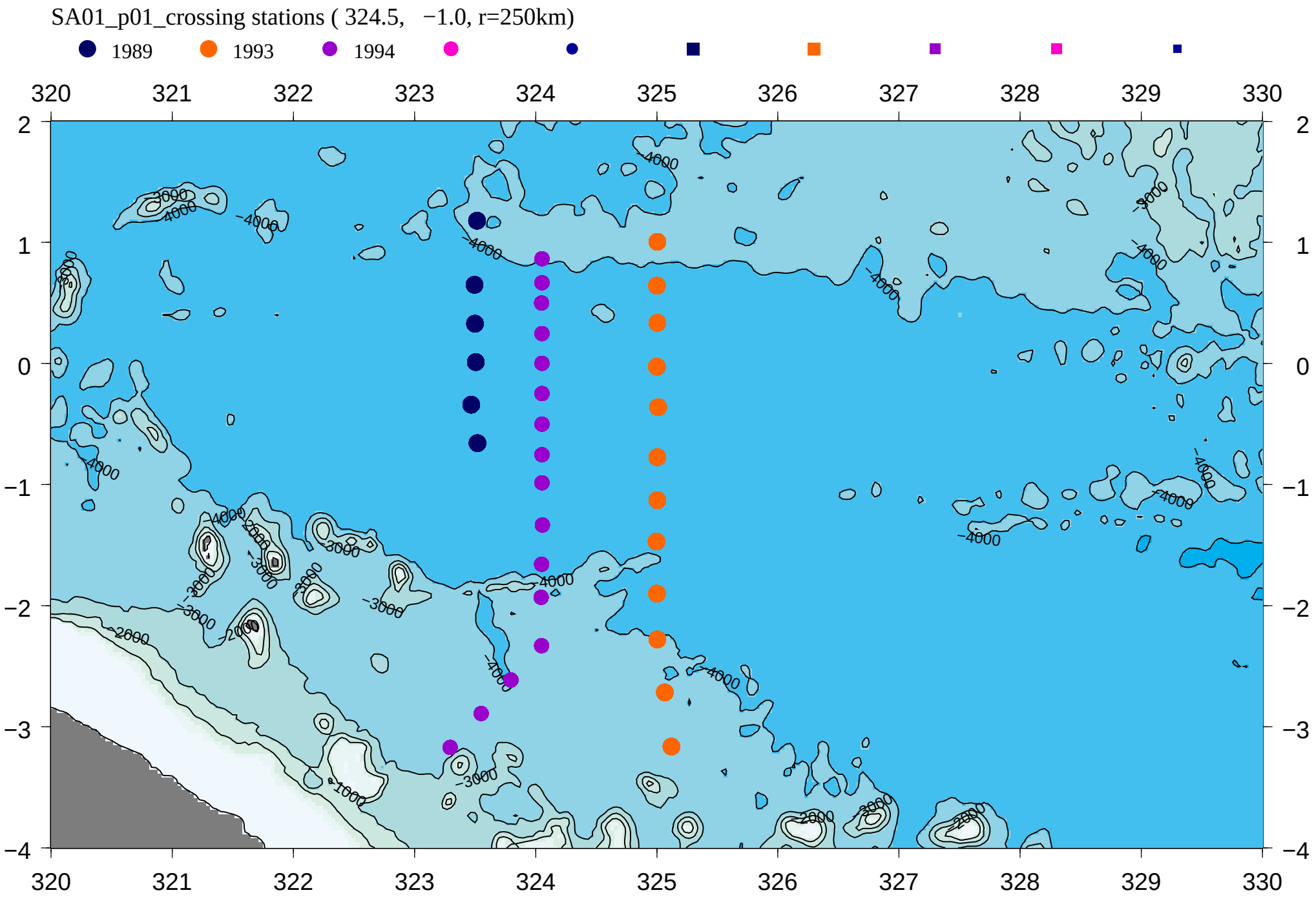

PI30_p01_crossing stations (155.0, 44.0, r=250km)
1985
1992
1993
1995
1997
1998
1999
2000
2001
2007
150
151
152
153
154
155
156
157
158
159
160
47
46
45
44
43
42
41
-1000
-2000
-3000
-4000
-5000
-6000
-7000

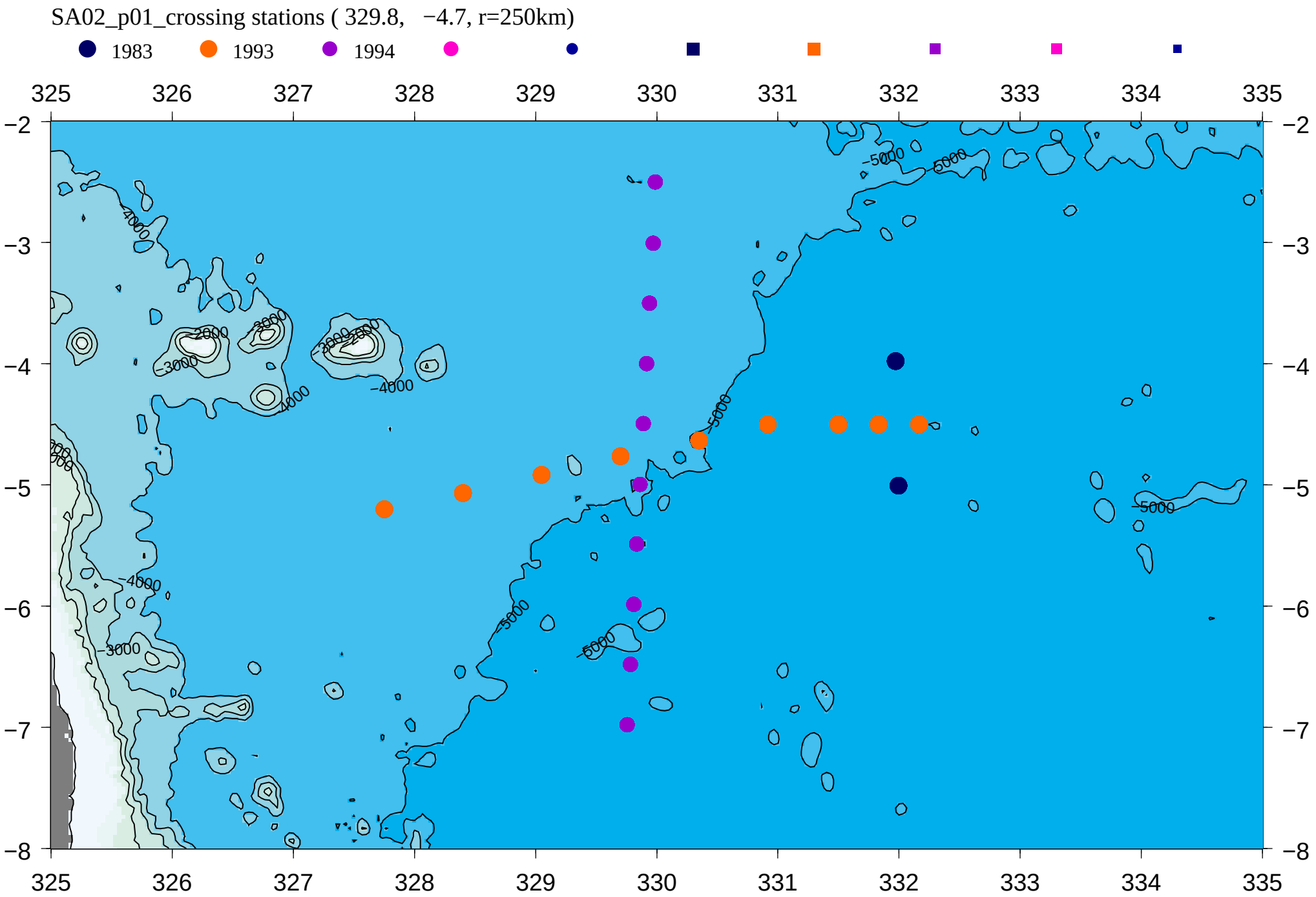

PI30_p02_crossing stations (155.0, 44.0, r=250km)
2002
2003
2004
2005
2006
2007
2008
150
151
152
153
154
155
156
157
158
159
160
47
46
45
44
43
42
41
-1000
-2000
-3000
-4000
-5000
-6000
-7000
-8000

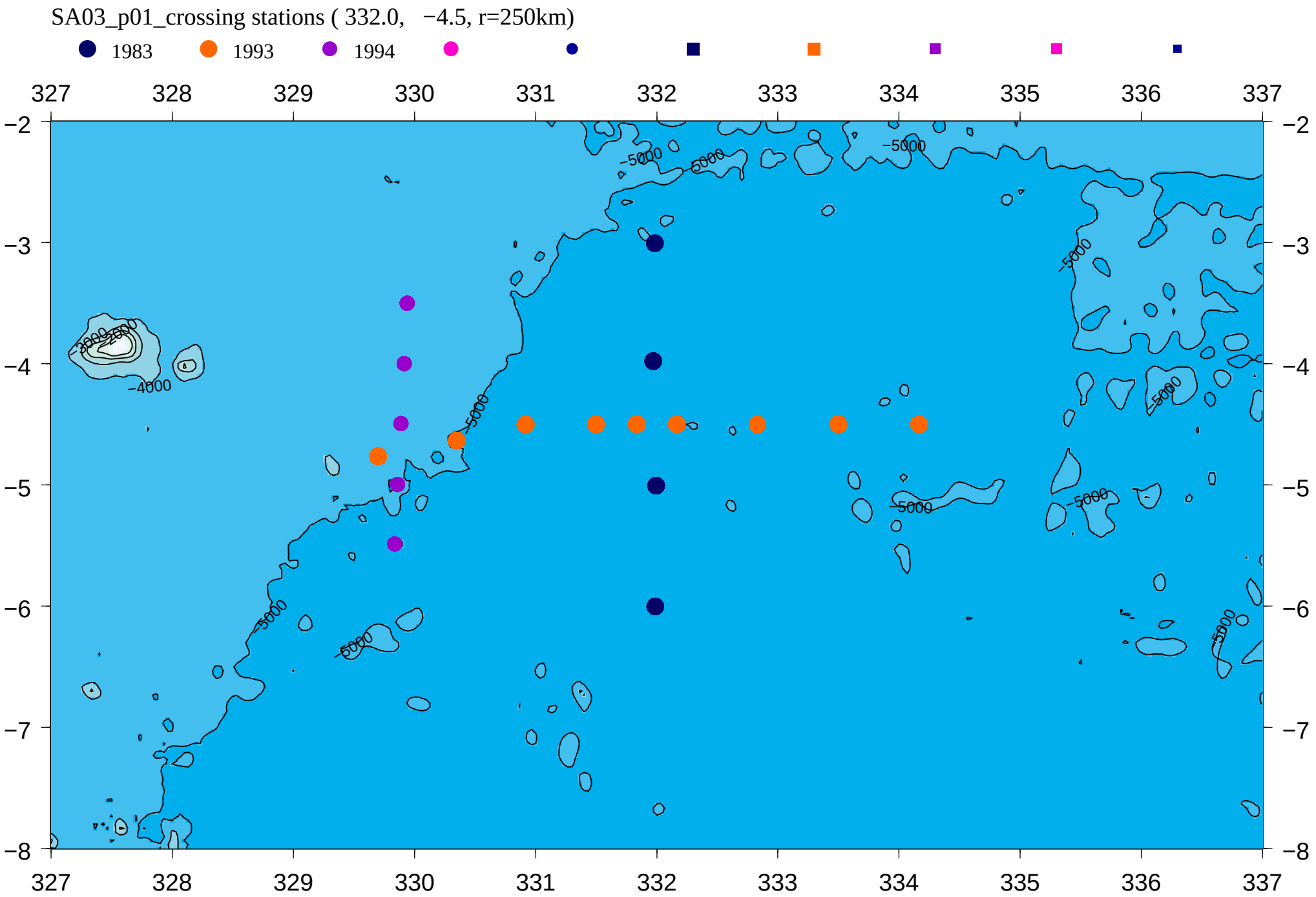

S04_SR04_a_p01_crossing stations (312.0, −60.2, r=250km)
1990
1992
307
308
309
310
311
312
313
314
315
316
317
−57
−58
−59
−60
−61
−62
−63

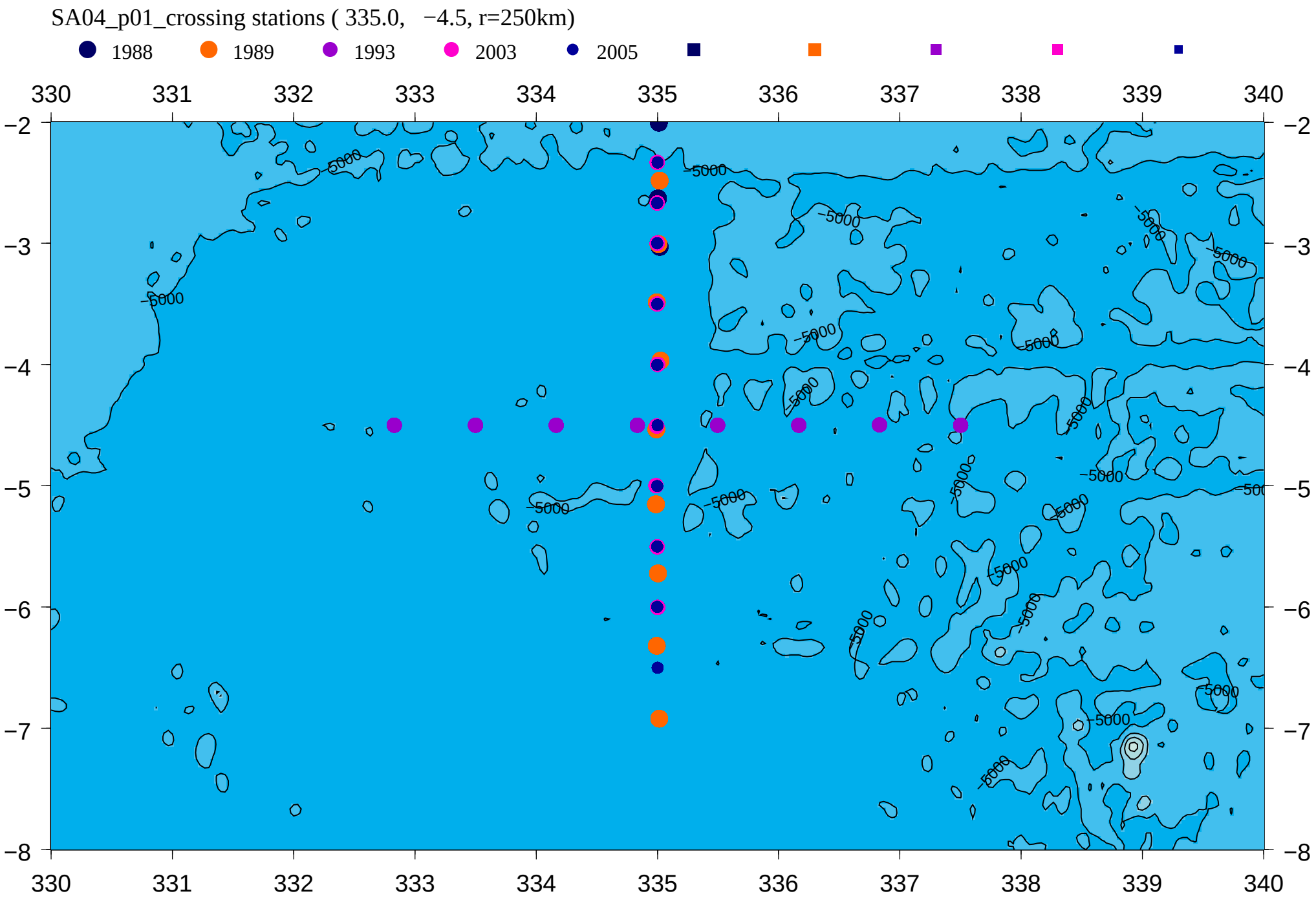

S04_SR04_b_p01_crossing stations (321.1, −65.2, r=250km)
1992
1996
316
317
318
319
320
321
322
323
324
325
326
−62
−63
−64
−65
−66
−67
−68
−4000
−3000
−5000

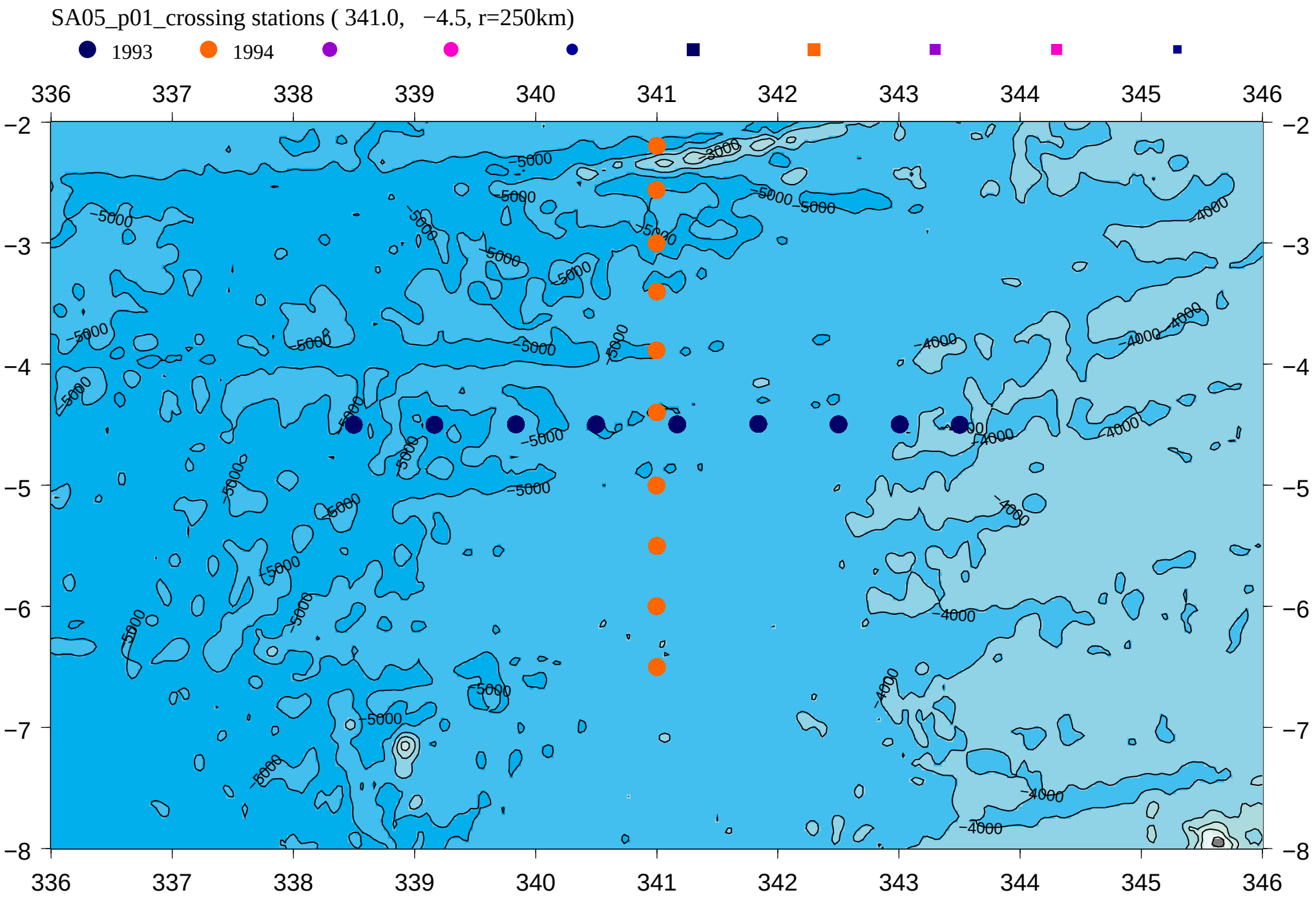

S04_SR04_c_p01_crossing stations (350.1, −70.5, r=250km)
1992
1996
345
346
347
348
349
350
351
352
353
354
355
−68
−69
−70
−71
−72
−73
−74
−4000
−3000
−2000
−1000
0
1000

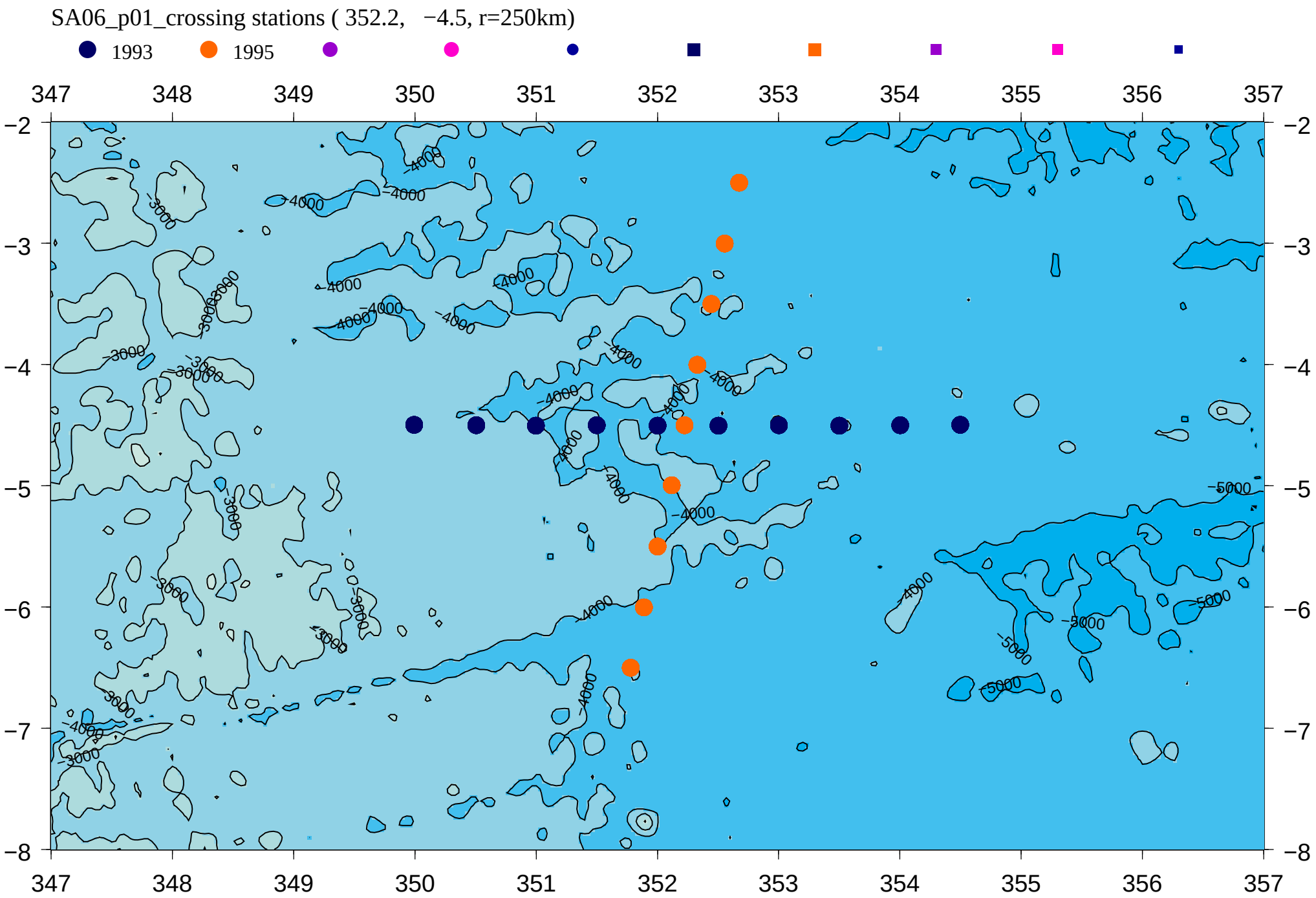

SA01_p01_crossing stations (324.5, −1.0, r=250km)
1989
1993
1994
320
321
322
323
324
325
326
327
328
329
330
2
1
0
−1
−2
−3
−4
−4000
−3000
−2000
−1000

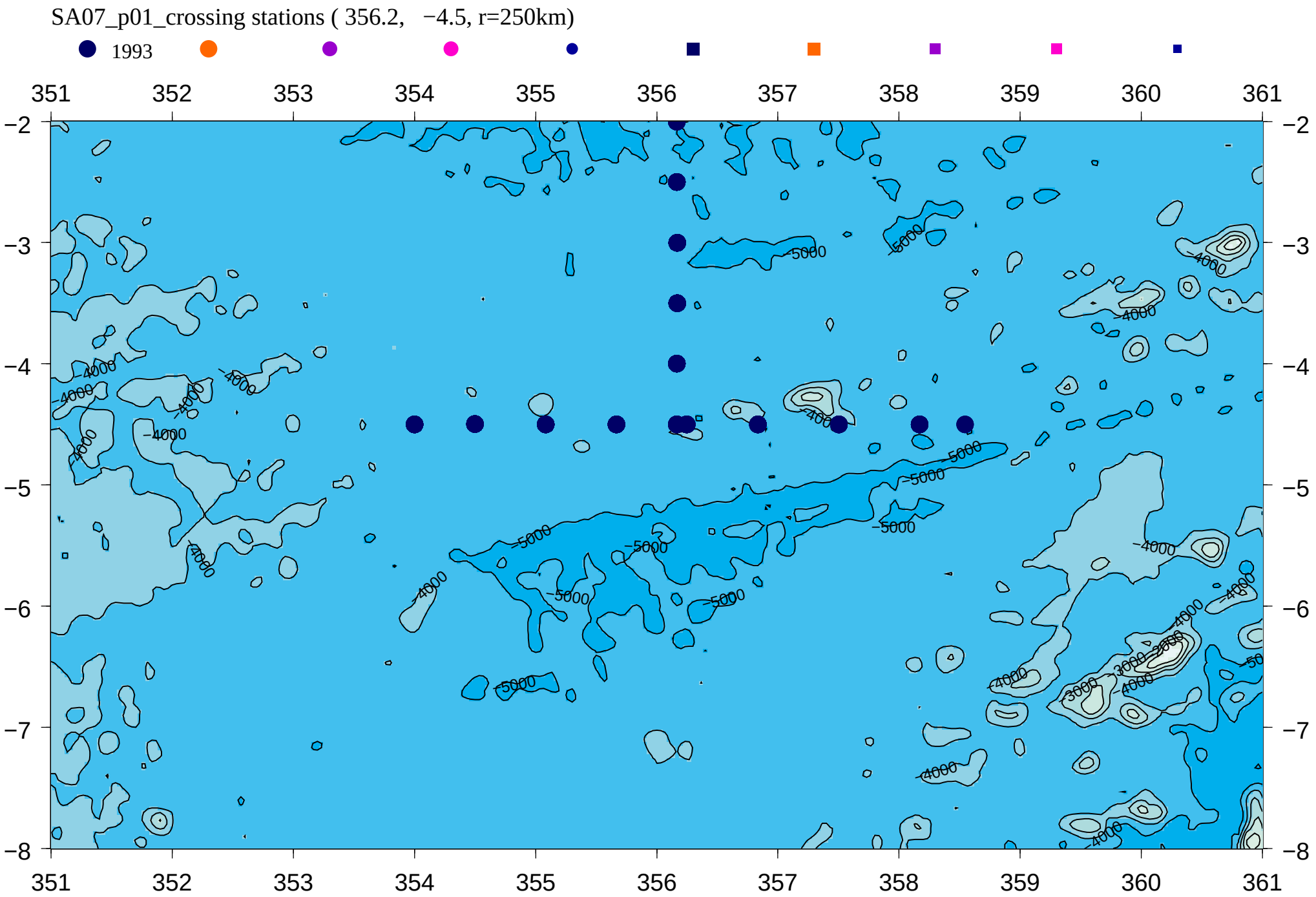

SA02_p01_crossing stations (329.8, −4.7, r=250km)
1983
1993
1994
325
326
327
328
329
330
331
332
333
334
335
−2
−3
−4
−5
−6
−7
−8
−5000
−4000
−3000
−2000

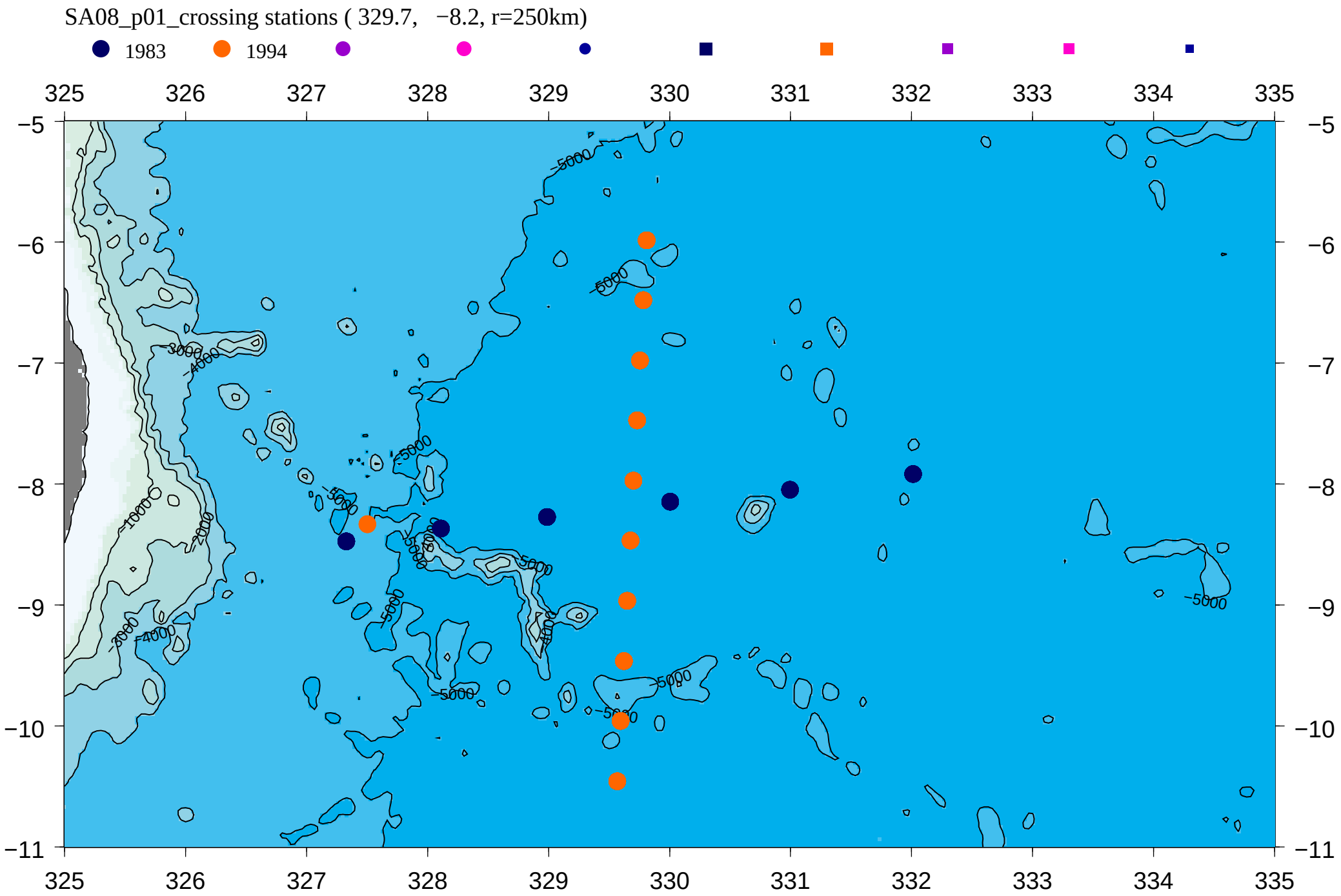

SA03_p01_crossing stations (332.0, −4.5, r=250km)
1983
1993
1994
327
328
329
330
331
332
333
334
335
336
337
−2
−3
−4
−5
−6
−7
−8
−5000
−4000
−3000
−2000

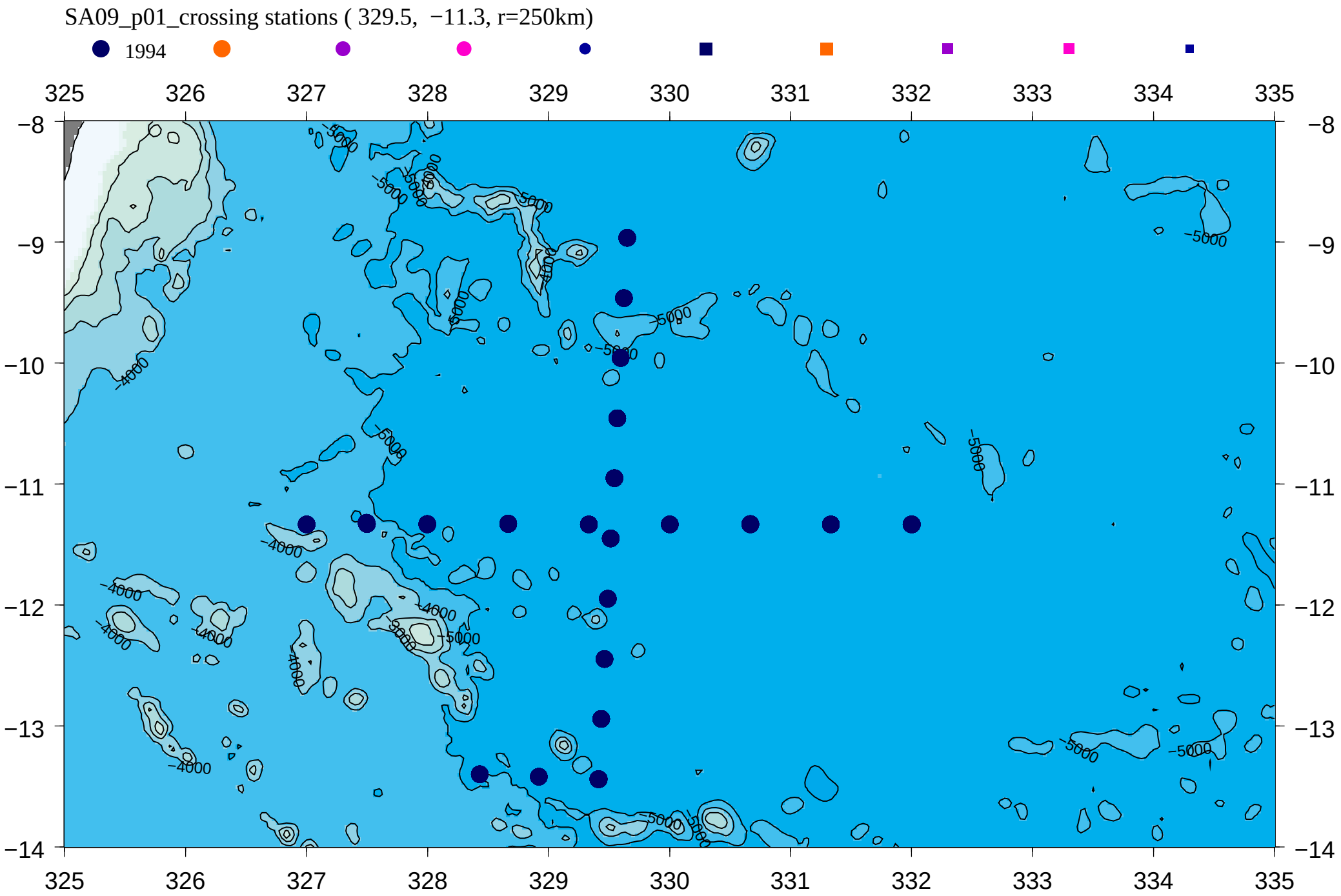

SA04_p01_crossing stations (335.0, −4.5, r=250km)
1988
1989
1993
2003
2005
330
331
332
333
334
335
336
337
338
339
340
−2
−3
−4
−5
−6
−7
−8
−5000

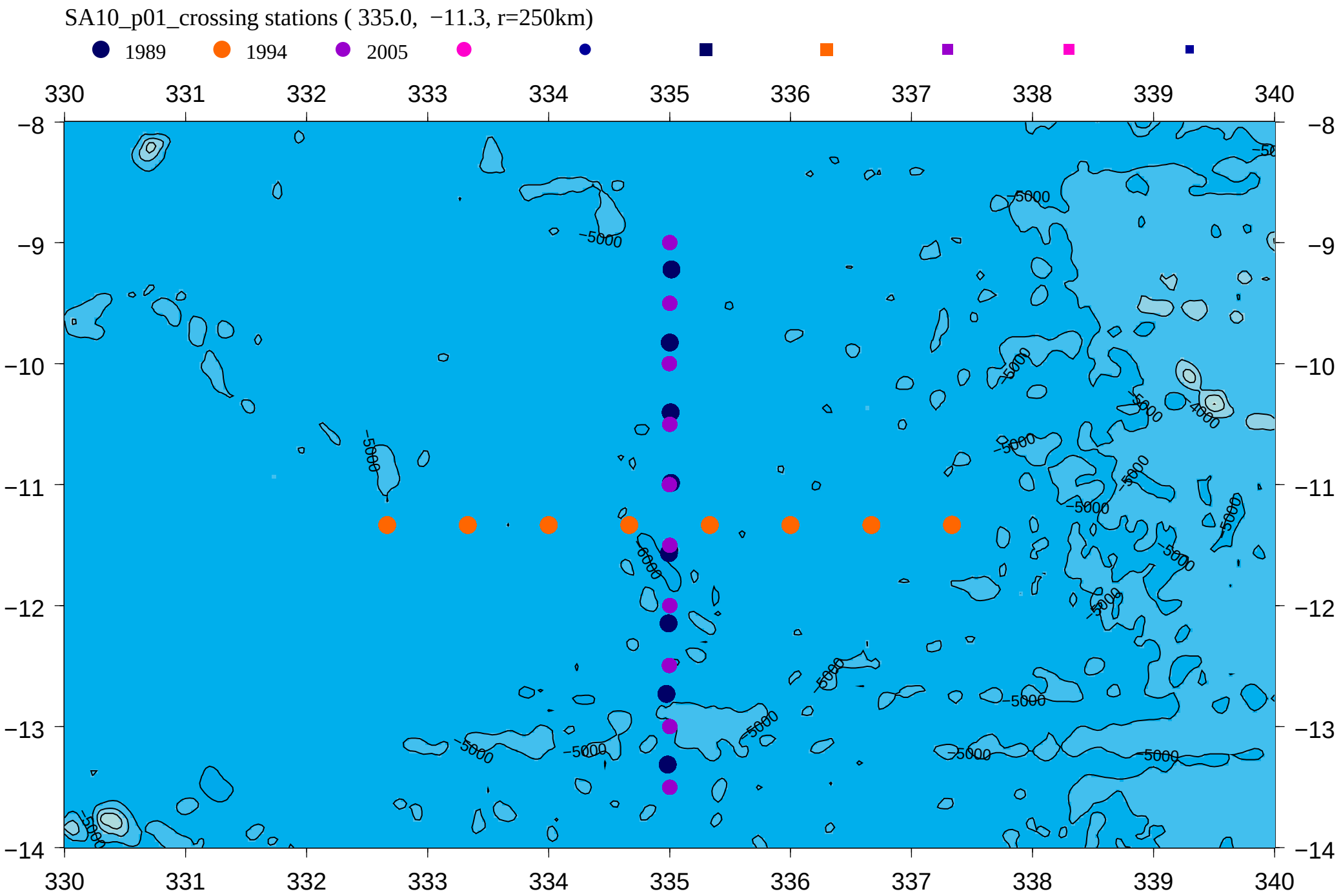

SA05_p01_crossing stations (341.0, −4.5, r=250km)
1993
1994
336
337
338
339
340
341
342
343
344
345
346
−2
−3
−4
−5
−6
−7
−8
−5000
−4000
−3000

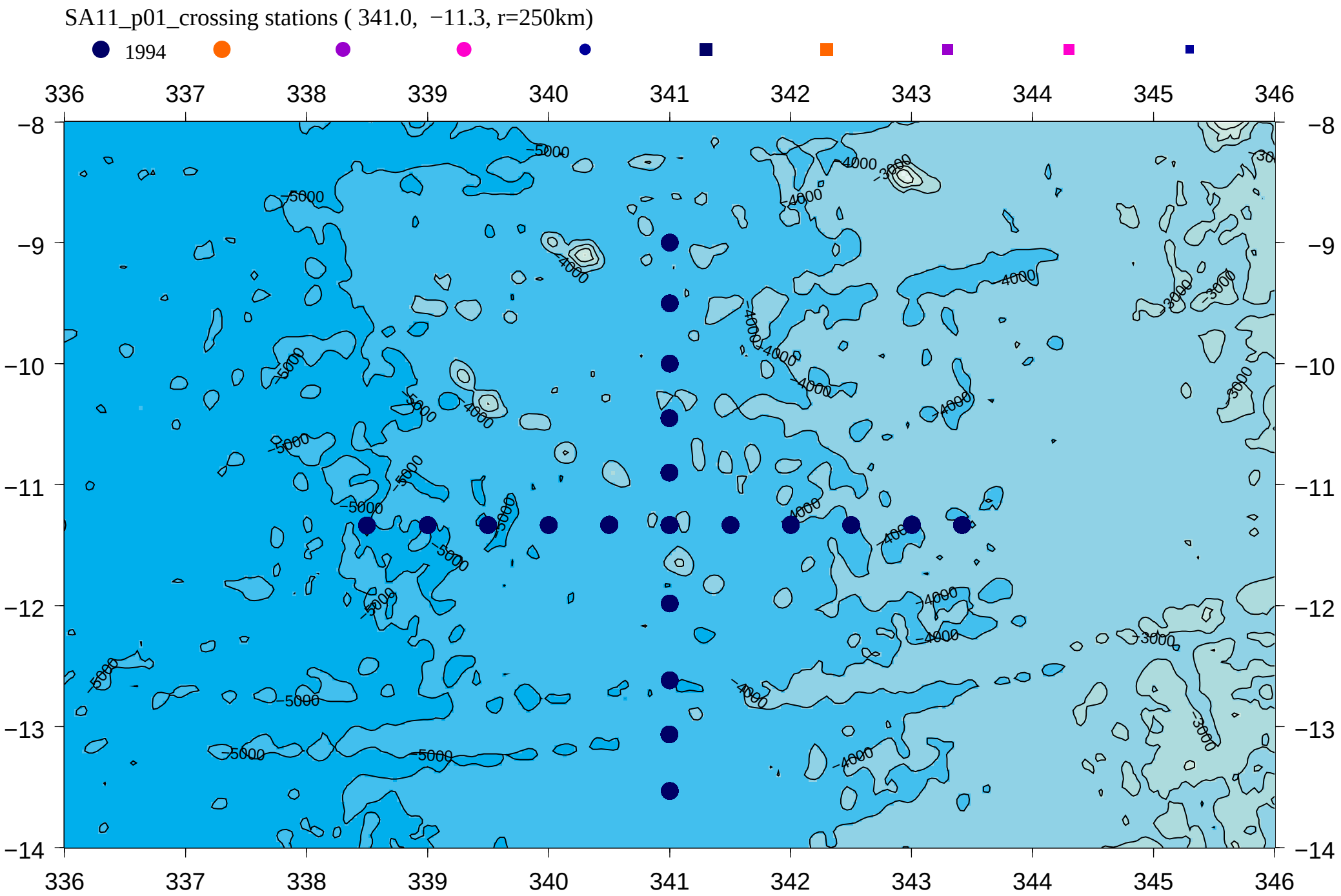

SA06_p01_crossing stations (352.2, −4.5, r=250km)
1993
1995
347
348
349
350
351
352
353
354
355
356
357
−2
−3
−4
−5
−6
−7
−8
−3000
−4000
−5000

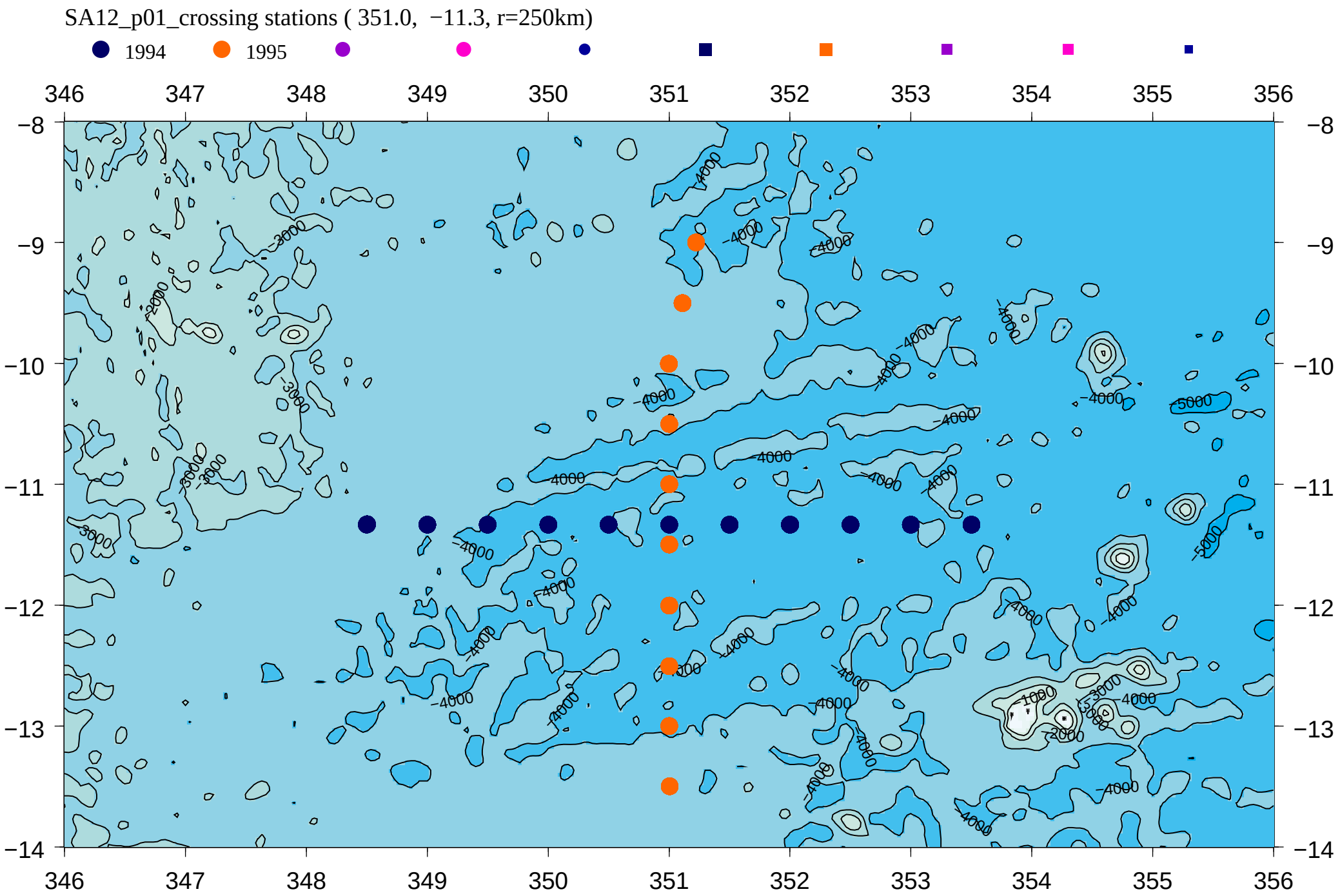

SA07_p01_crossing stations (356.2, −4.5, r=250km)
1993
351
352
353
354
355
356
357
358
359
360
361
−2
−3
−4
−5
−6
−7
−8
−4000
−5000
−3000

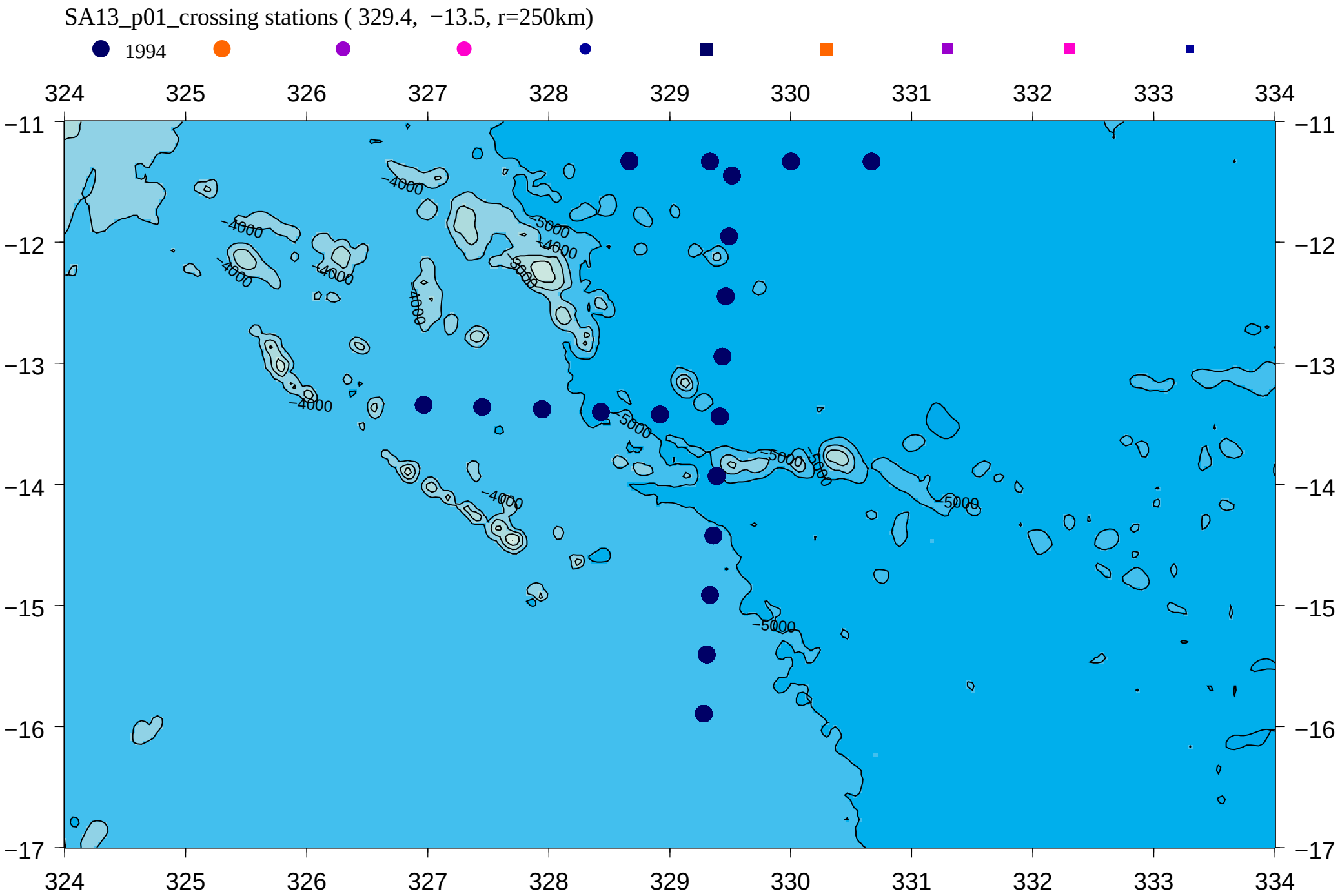

SA08_p01_crossing stations (329.7, −8.2, r=250km)
1983
1994
325
326
327
328
329
330
331
332
333
334
335
−5
−6
−7
−8
−9
−10
−11
−5000
−4000
−3000
−2000
−1000

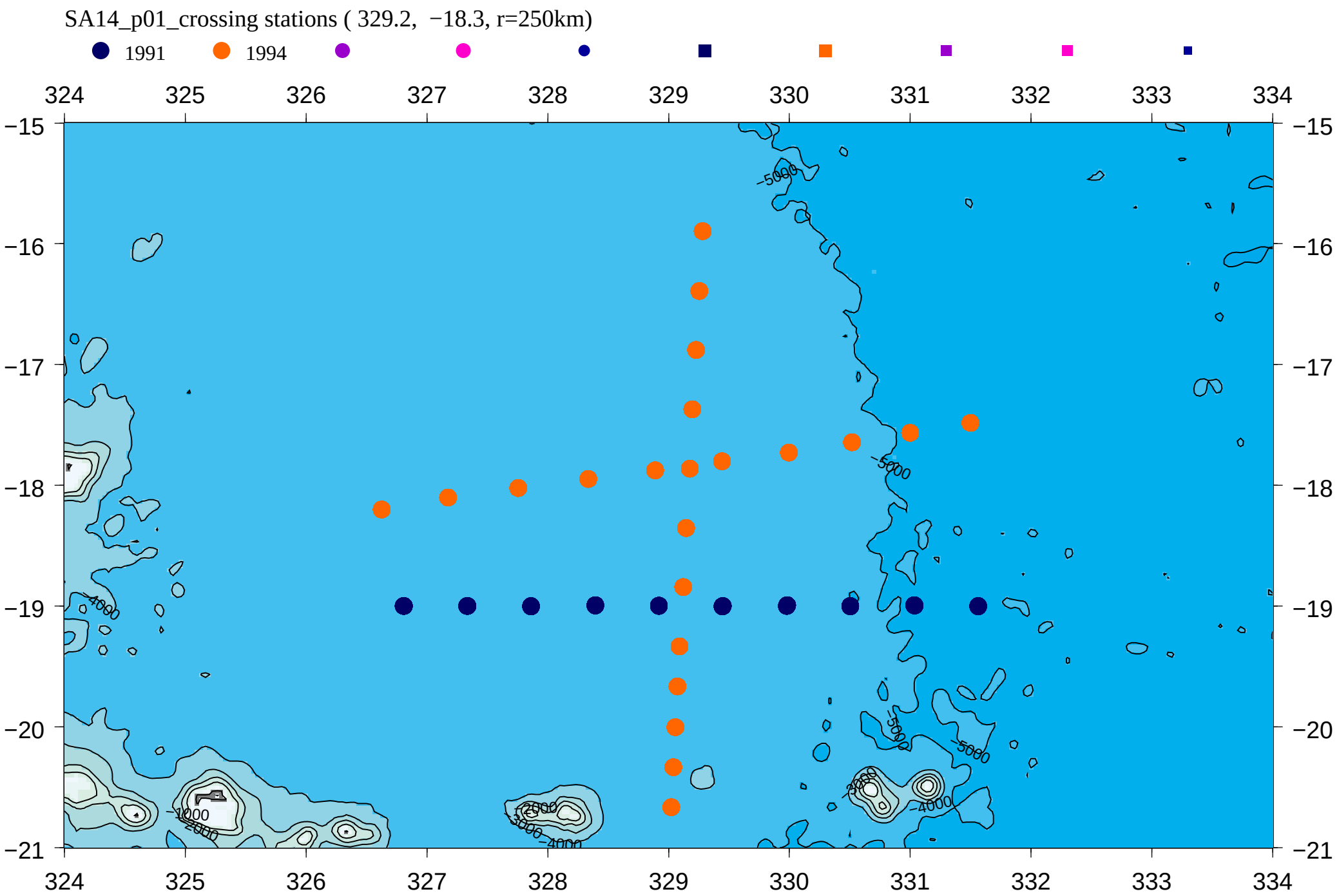

SA09_p01_crossing stations (329.5, −11.3, r=250km)
1994
325
326
327
328
329
330
331
332
333
334
335
−8
−9
−10
−11
−12
−13
−14
−5000
−4000

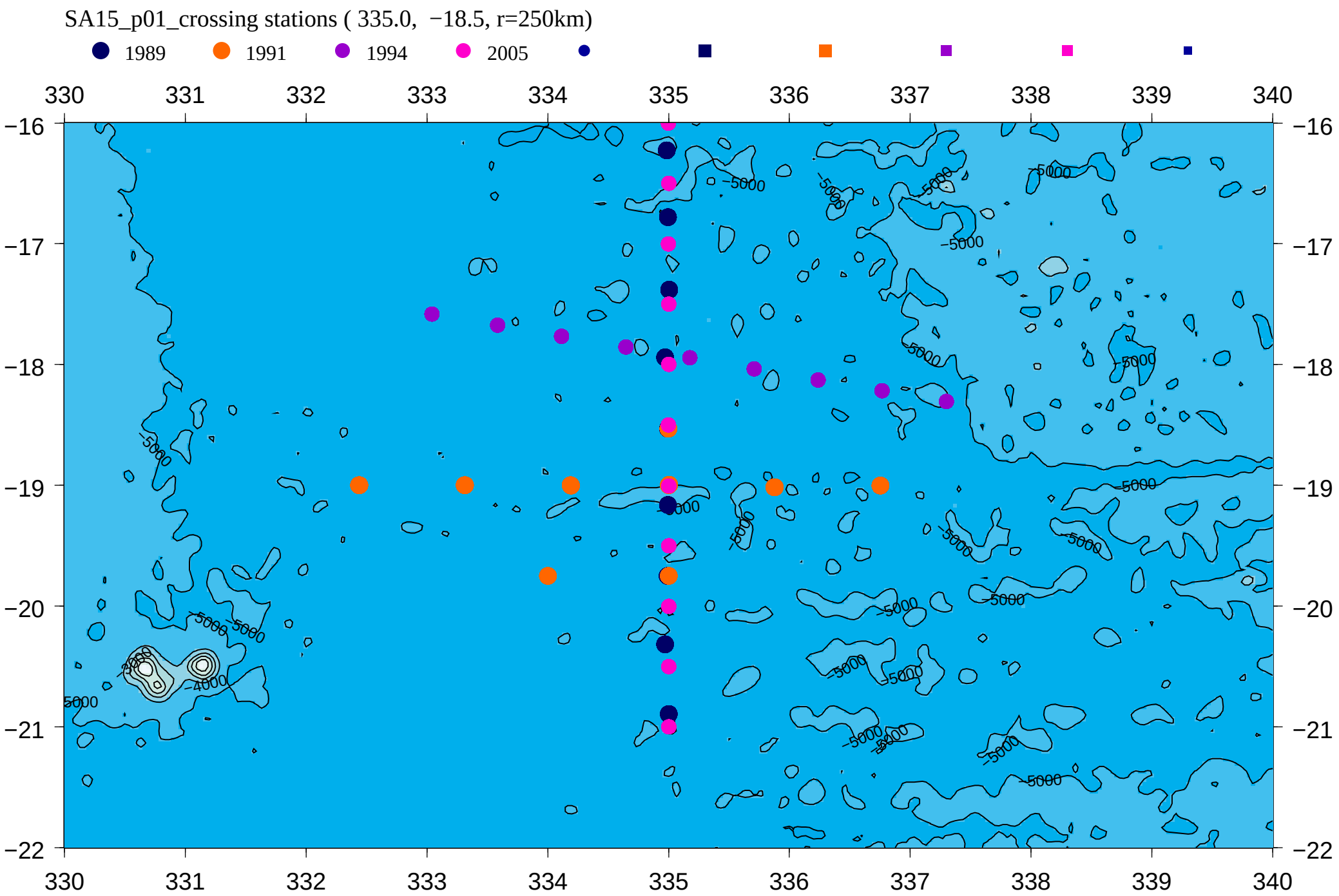

SA10_p01_crossing stations (335.0, −11.3, r=250km)
1989
1994
2005
330
331
332
333
334
335
336
337
338
339
340
−8
−9
−10
−11
−12
−13
−14
−5000
−4000

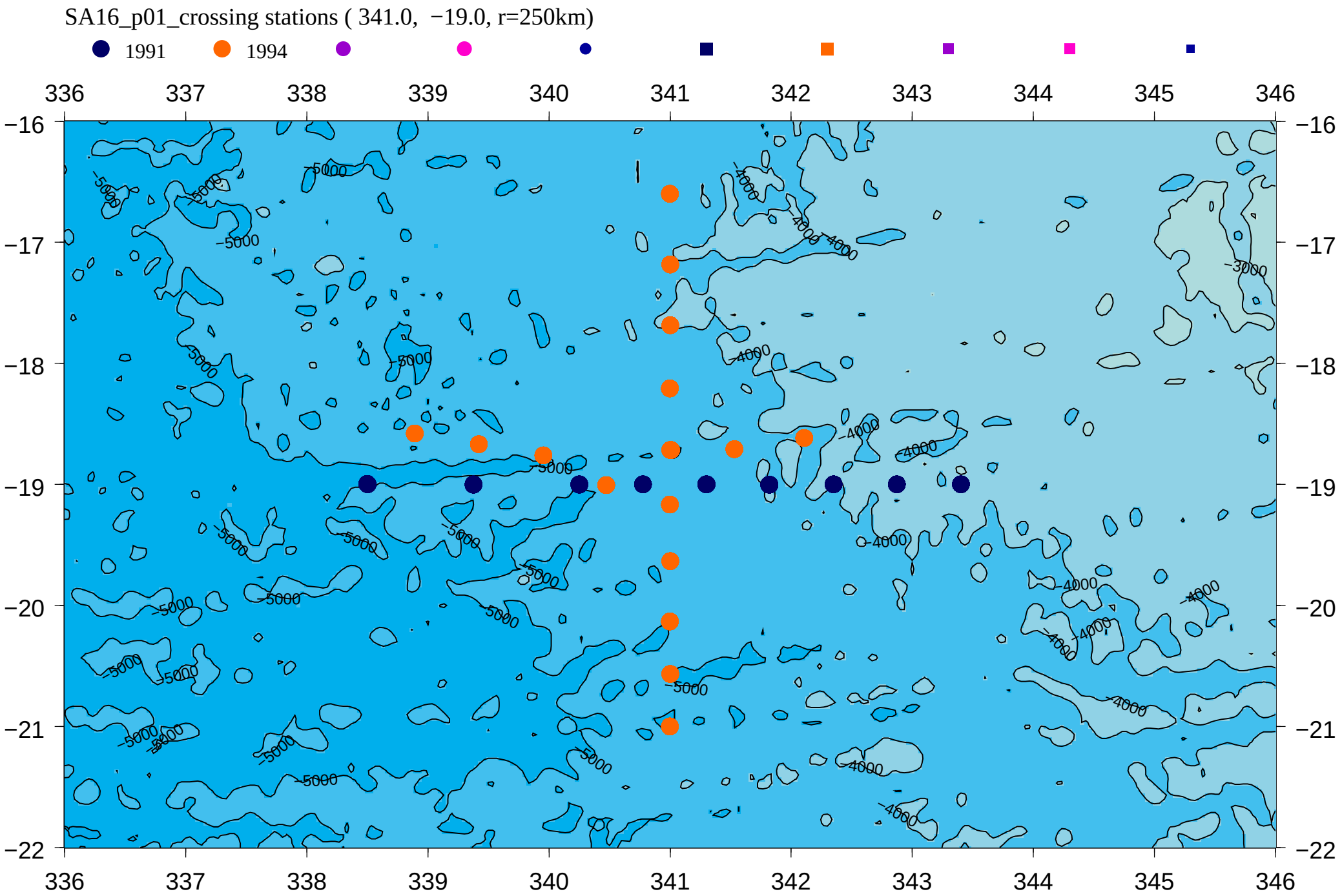

SA11_p01_crossing stations (341.0, −11.3, r=250km)
1994
336
337
338
339
340
341
342
343
344
345
346
−8
−9
−10
−11
−12
−13
−14
−5000
−4000
−3000

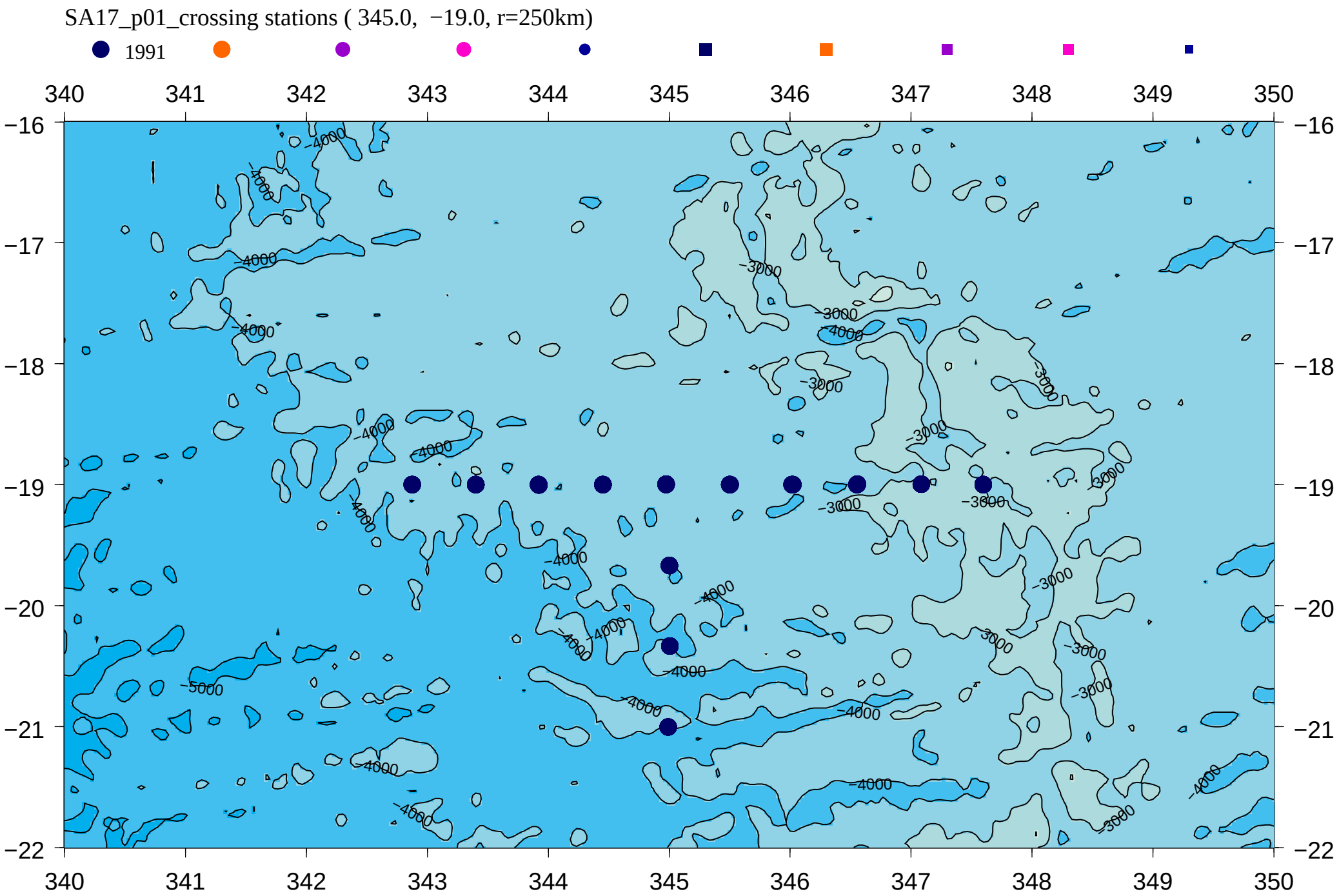

SA12_p01_crossing stations (351.0, −11.3, r=250km)
1994
1995
346
347
348
349
350
351
352
353
354
355
356
−8
−9
−10
−11
−12
−13
−14

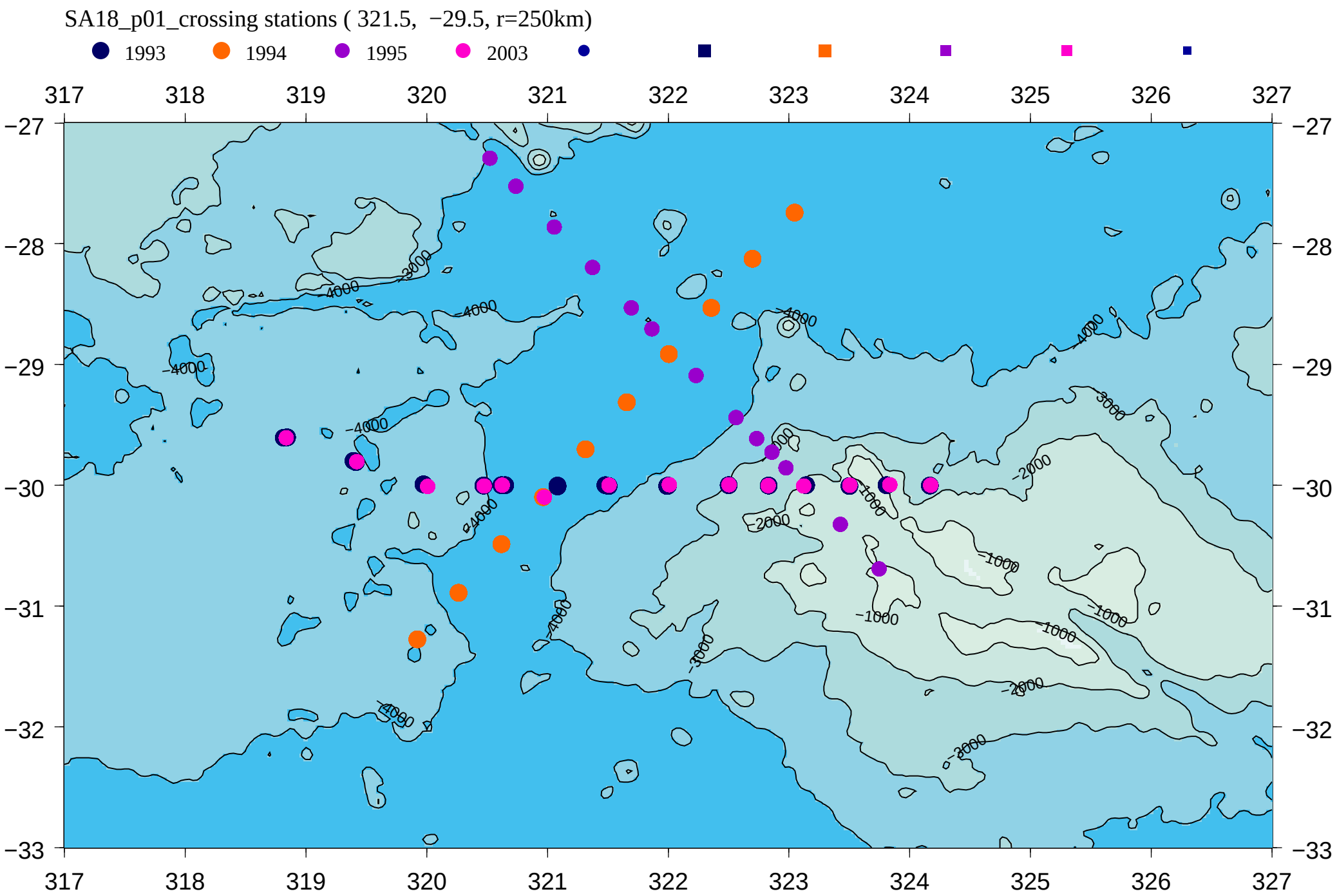

SA13_p01_crossing stations (329.4, −13.5, r=250km)
1994
324
325
326
327
328
329
330
331
332
333
334
−11
−12
−13
−14
−15
−16
−17
−4000
−5000

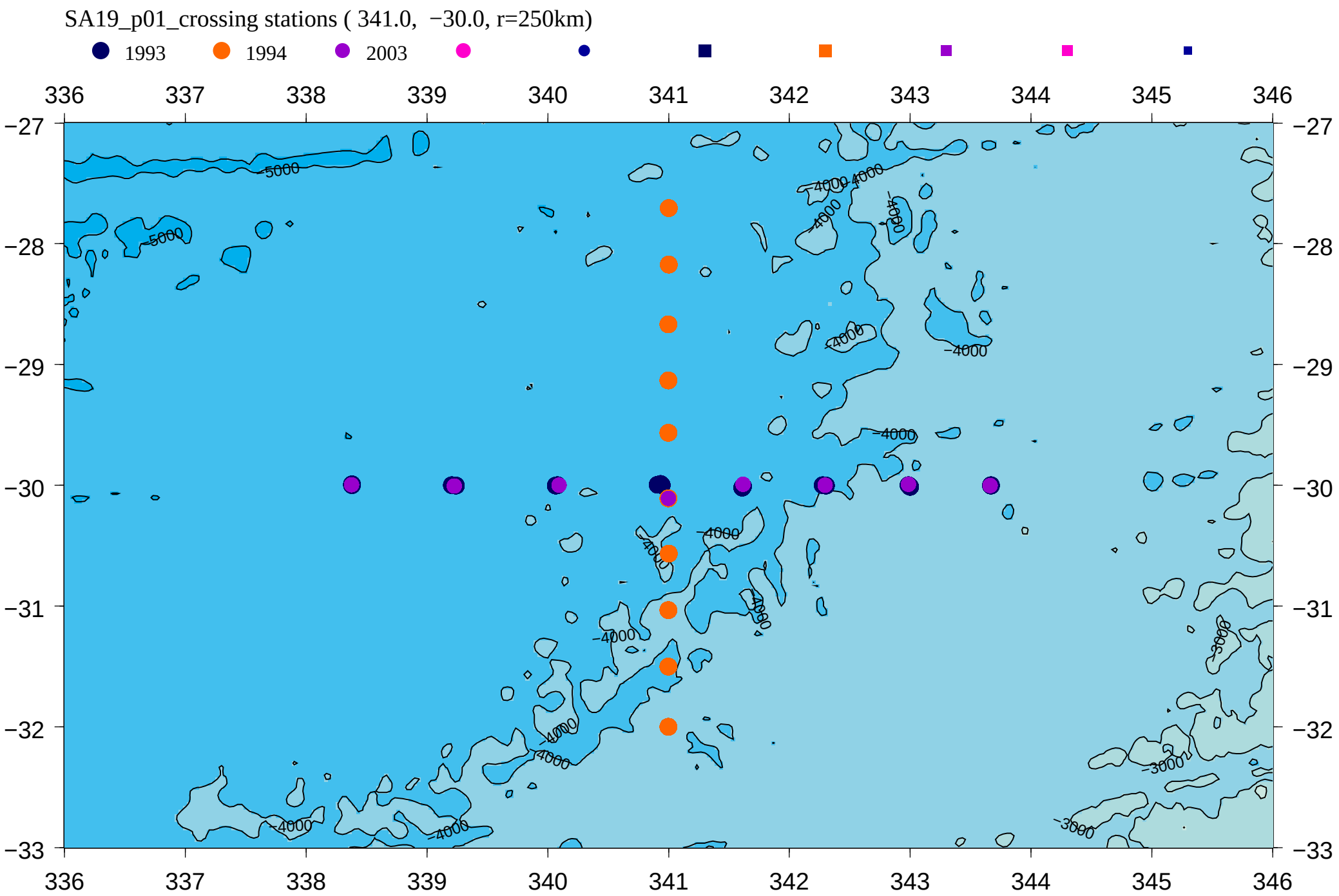

SA14_p01_crossing stations (329.2, −18.3, r=250km)
1991
1994
324
325
326
327
328
329
330
331
332
333
334
−15
−16
−17
−18
−19
−20
−21
-5000
-4000
-3000
-2000
-1000

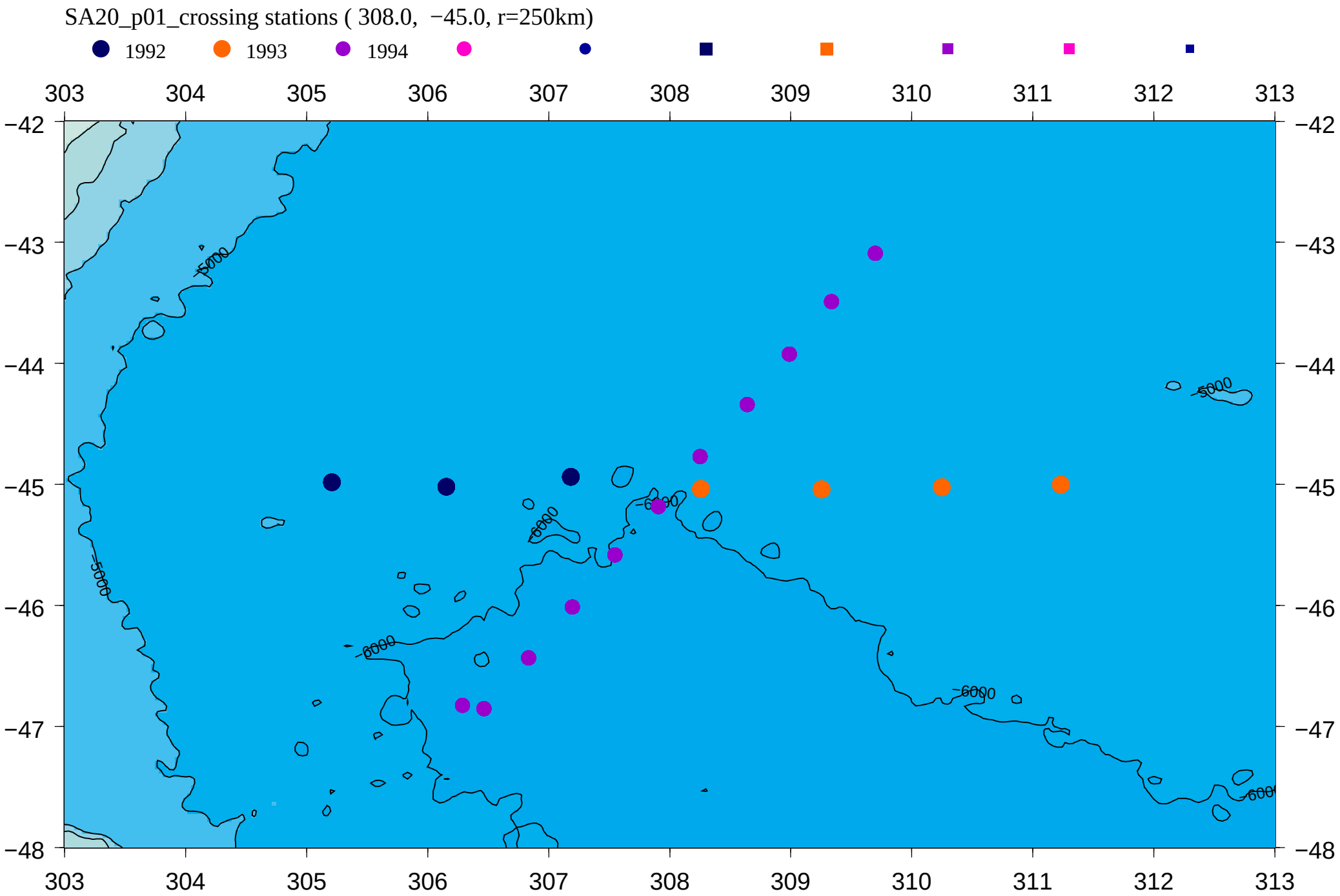

SA15_p01_crossing stations (335.0, −18.5, r=250km)
1989
1991
1994
2005
330
331
332
333
334
335
336
337
338
339
340
−16
−17
−18
−19
−20
−21
−22
−5000
−4000

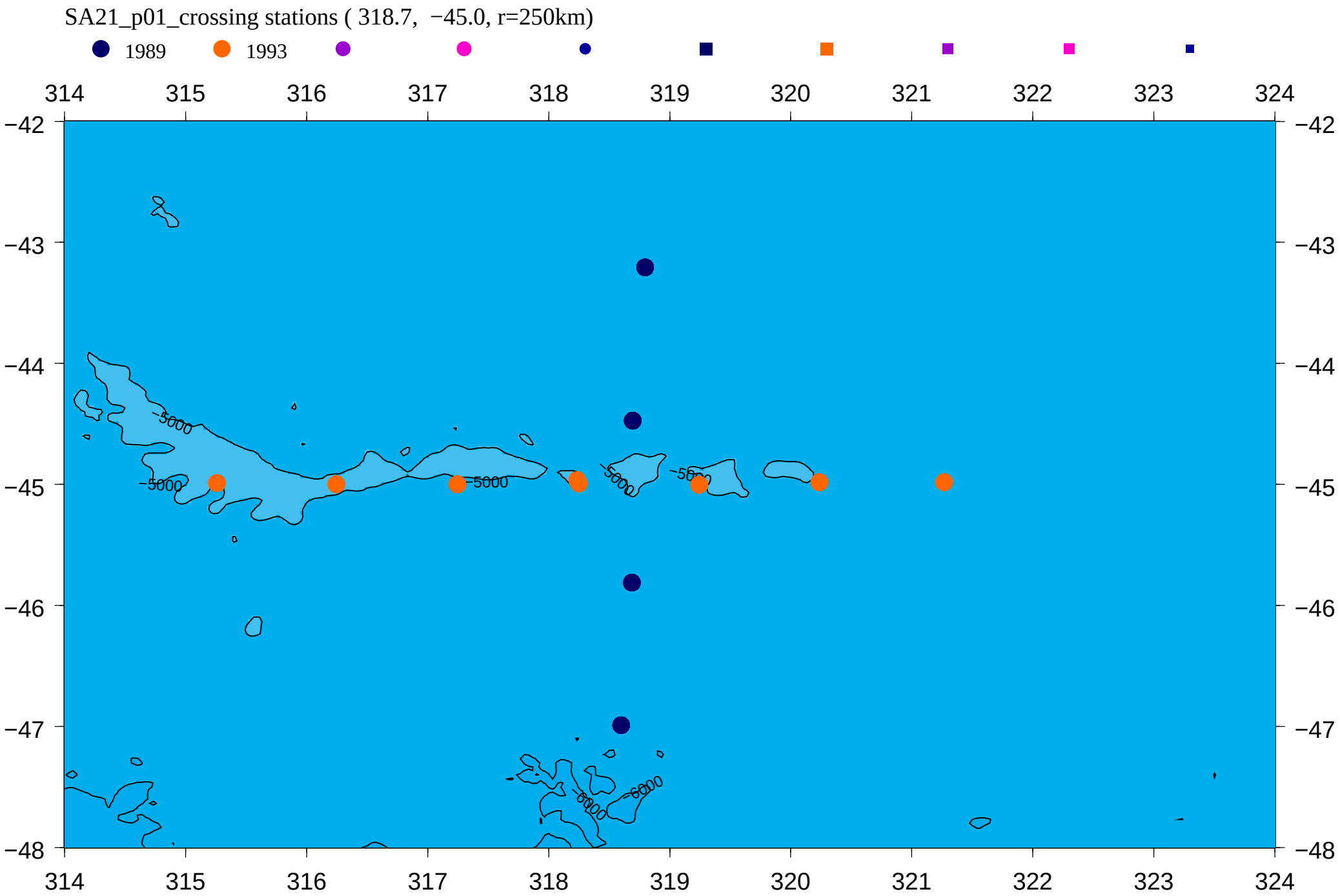

SA16_p01_crossing stations (341.0, −19.0, r=250km)
1991
1994
336
337
338
339
340
341
342
343
344
345
346
−16
−17
−18
−19
−20
−21
−22
−5000
−4000
−3000

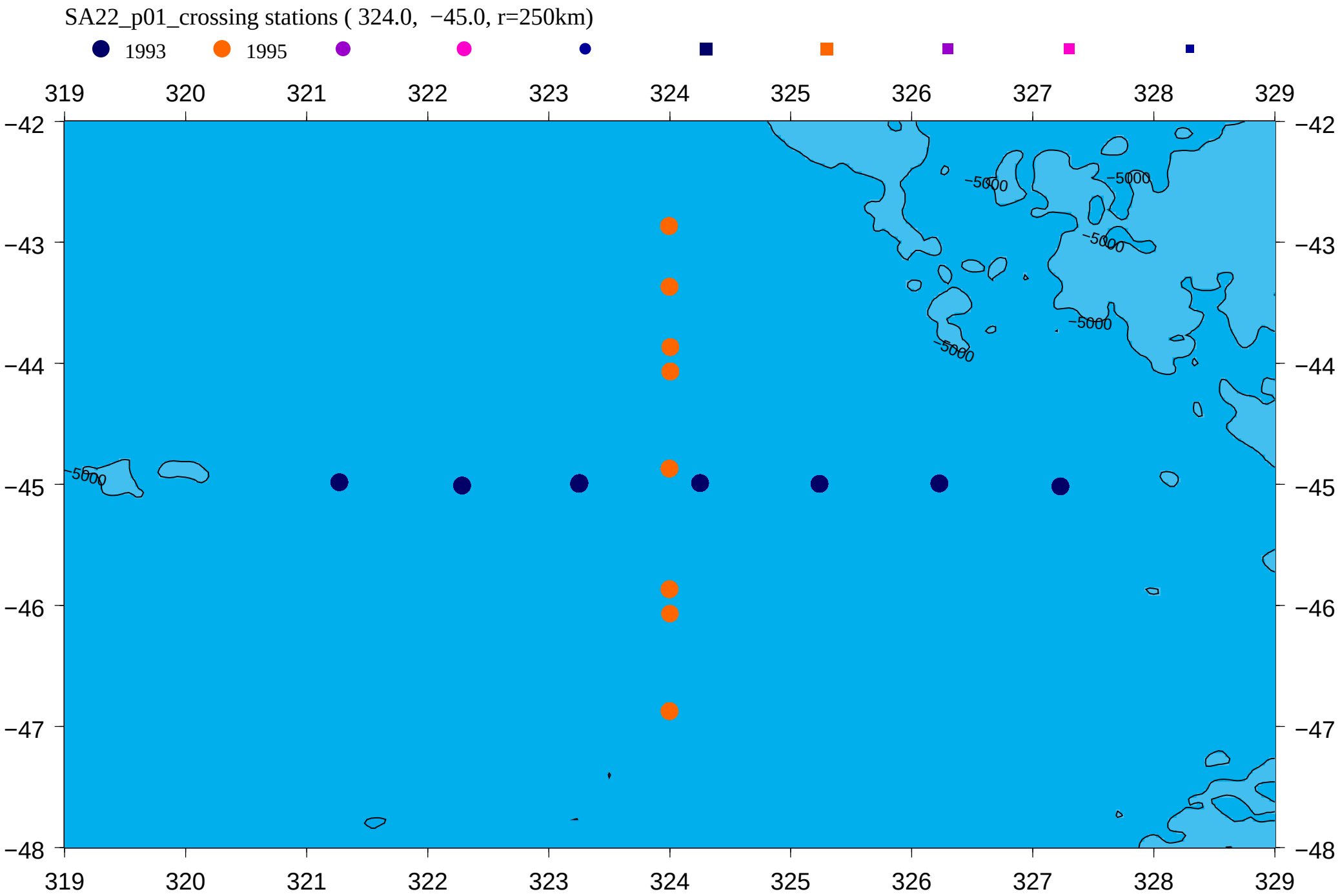

SA17_p01_crossing stations (345.0, −19.0, r=250km)
1991
340
341
342
343
344
345
346
347
348
349
350
−16
−17
−18
−19
−20
−21
−22
−4000
−3000
−5000

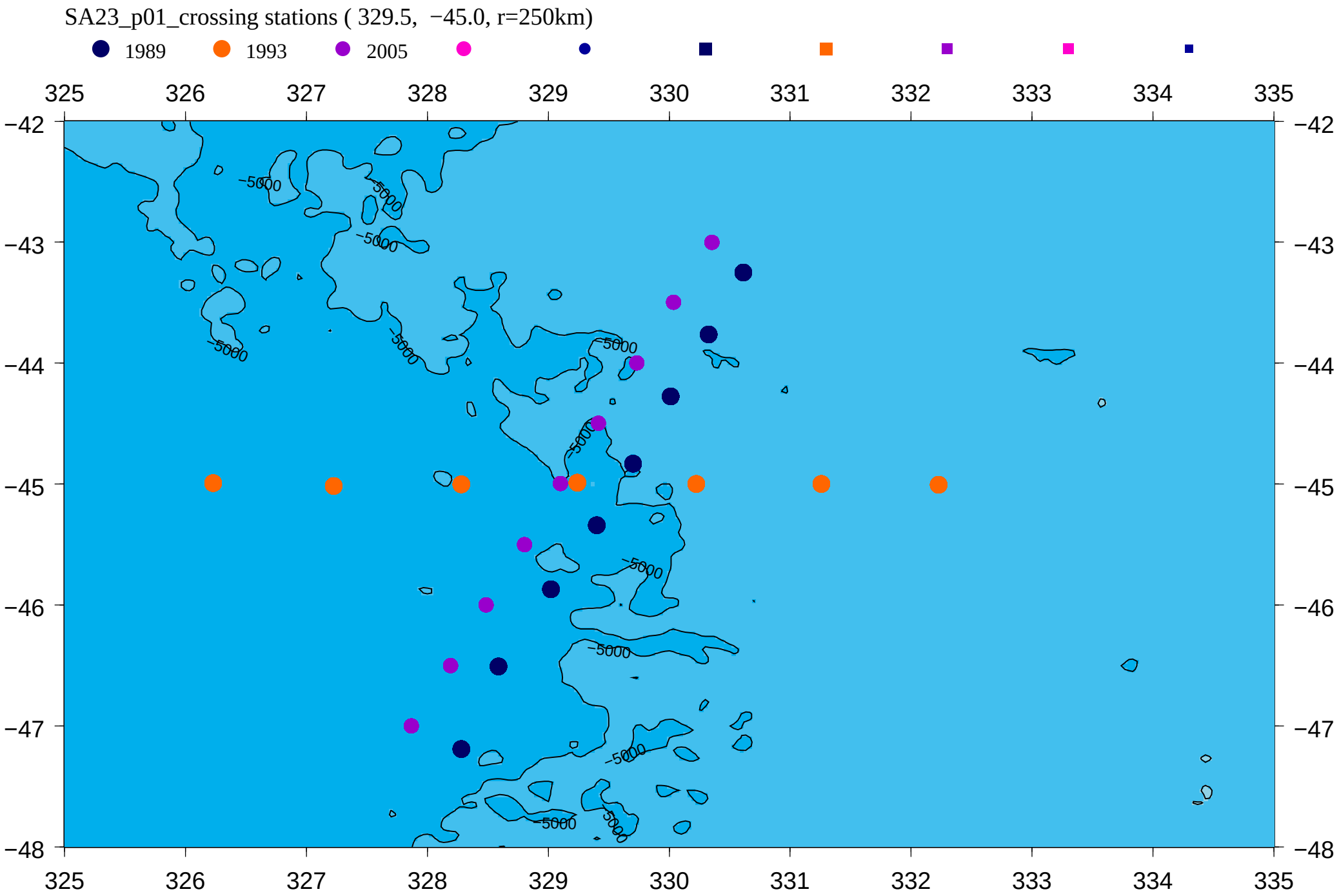

SA18_p01_crossing stations (321.5, −29.5, r=250km)
1993
1994
1995
2003
317
318
319
320
321
322
323
324
325
326
327
−27
−28
−29
−30
−31
−32
−33
−4000
−3000
−2000
−1000
−100

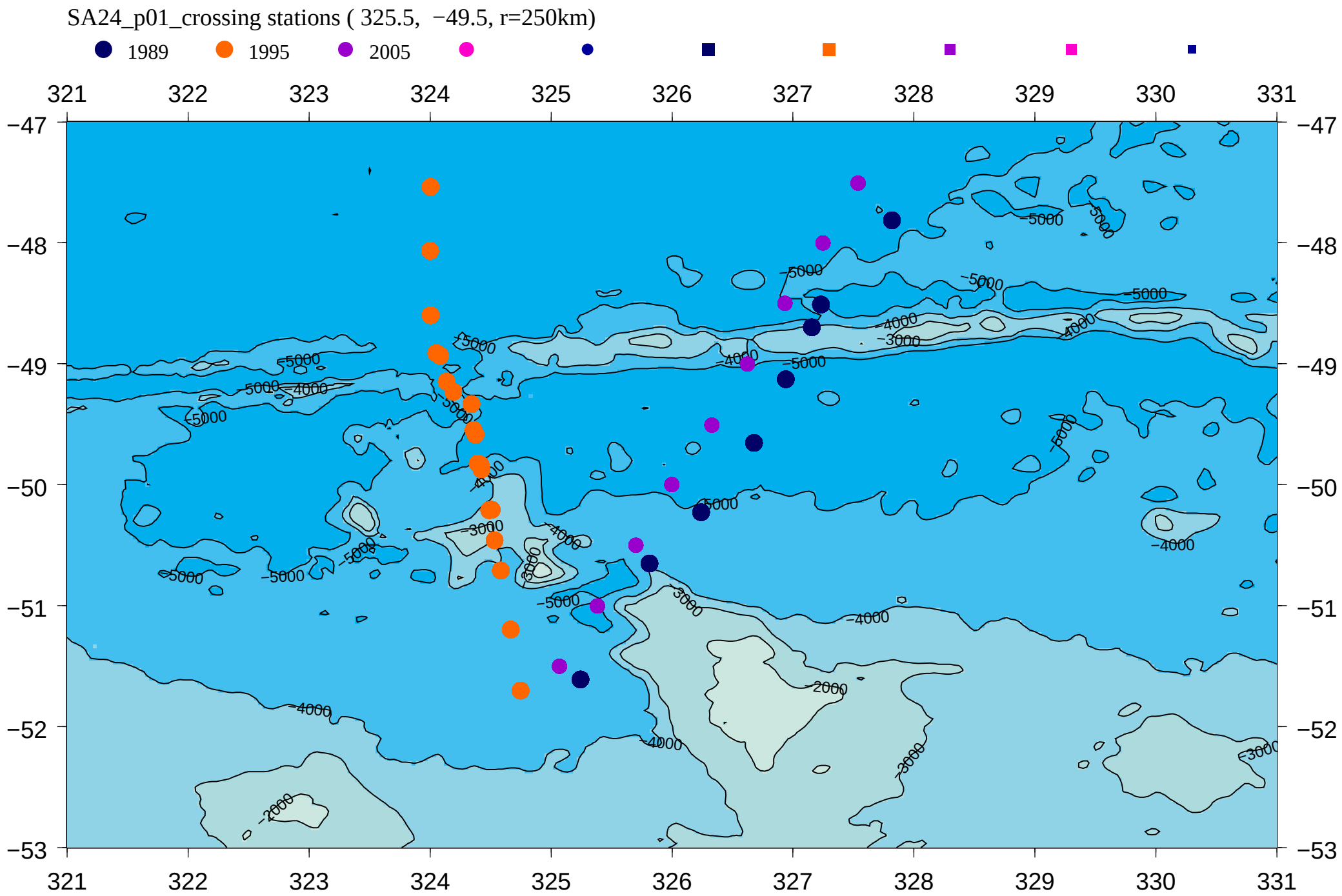

SA19_p01_crossing stations (341.0, −30.0, r=250km)
1993
1994
2003
336
337
338
339
340
341
342
343
344
345
346
−27
−28
−29
−30
−31
−32
−33
−5000
−4000
−3000

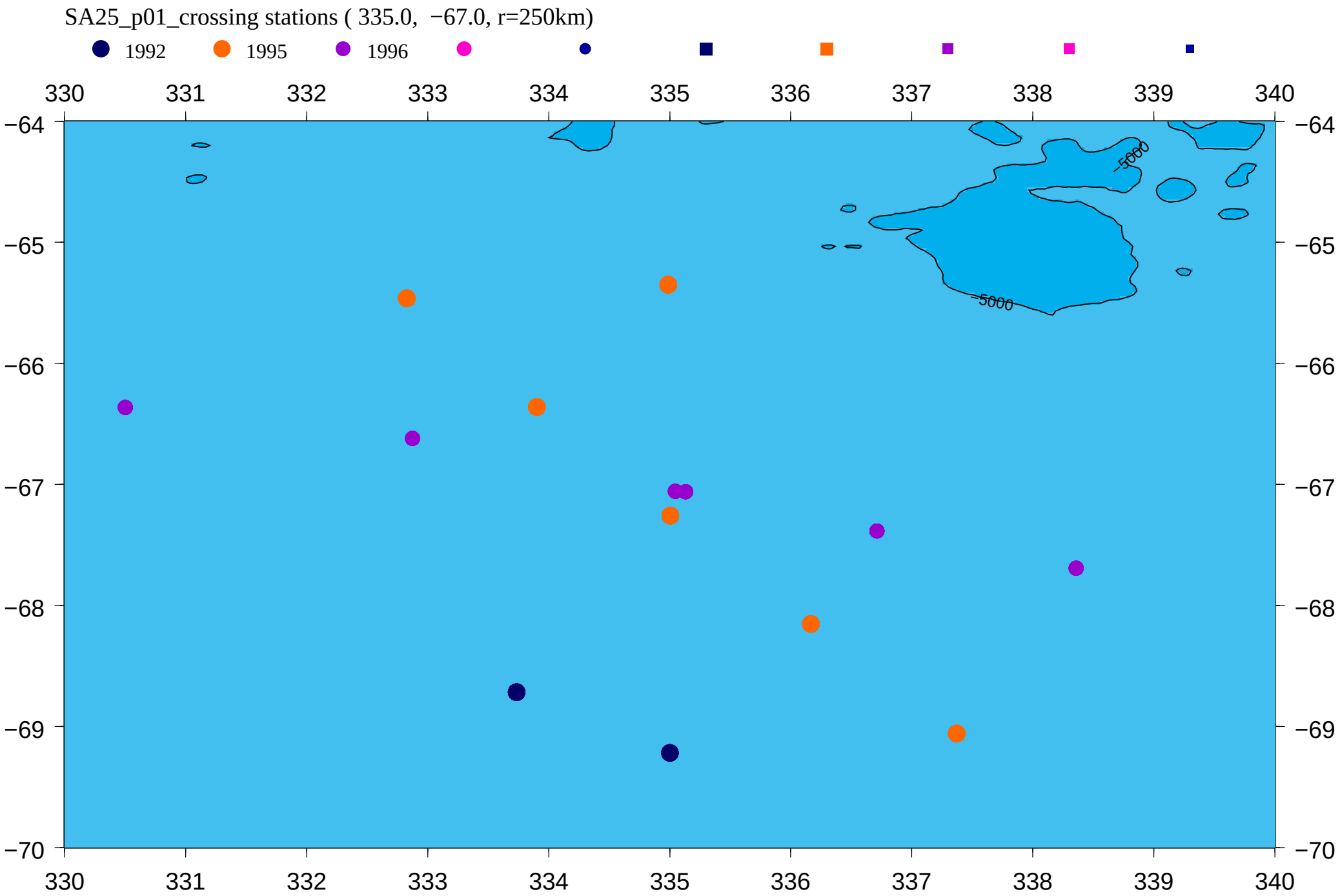

SA20_p01_crossing stations (308.0, −45.0, r=250km)
1992
1993
1994
303
304
305
306
307
308
309
310
311
312
313
−42
−43
−44
−45
−46
−47
−48
−5000
−6000

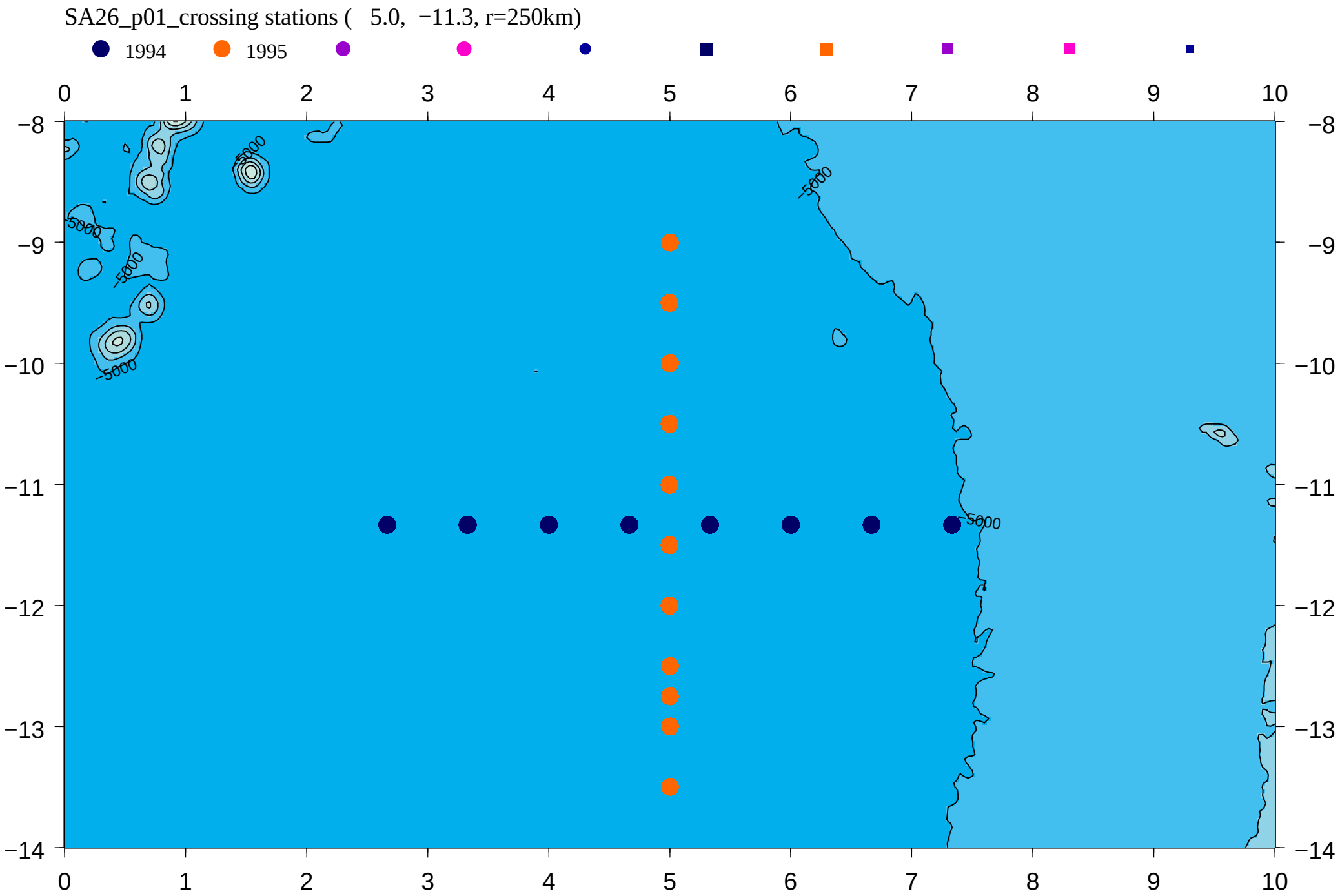

SA21_p01_crossing stations (318.7, −45.0, r=250km)
1989
1993
314
315
316
317
318
319
320
321
322
323
324
−42
−43
−44
−45
−46
−47
−48
−5000
−5000
−5000
−5000
−6000
−6000

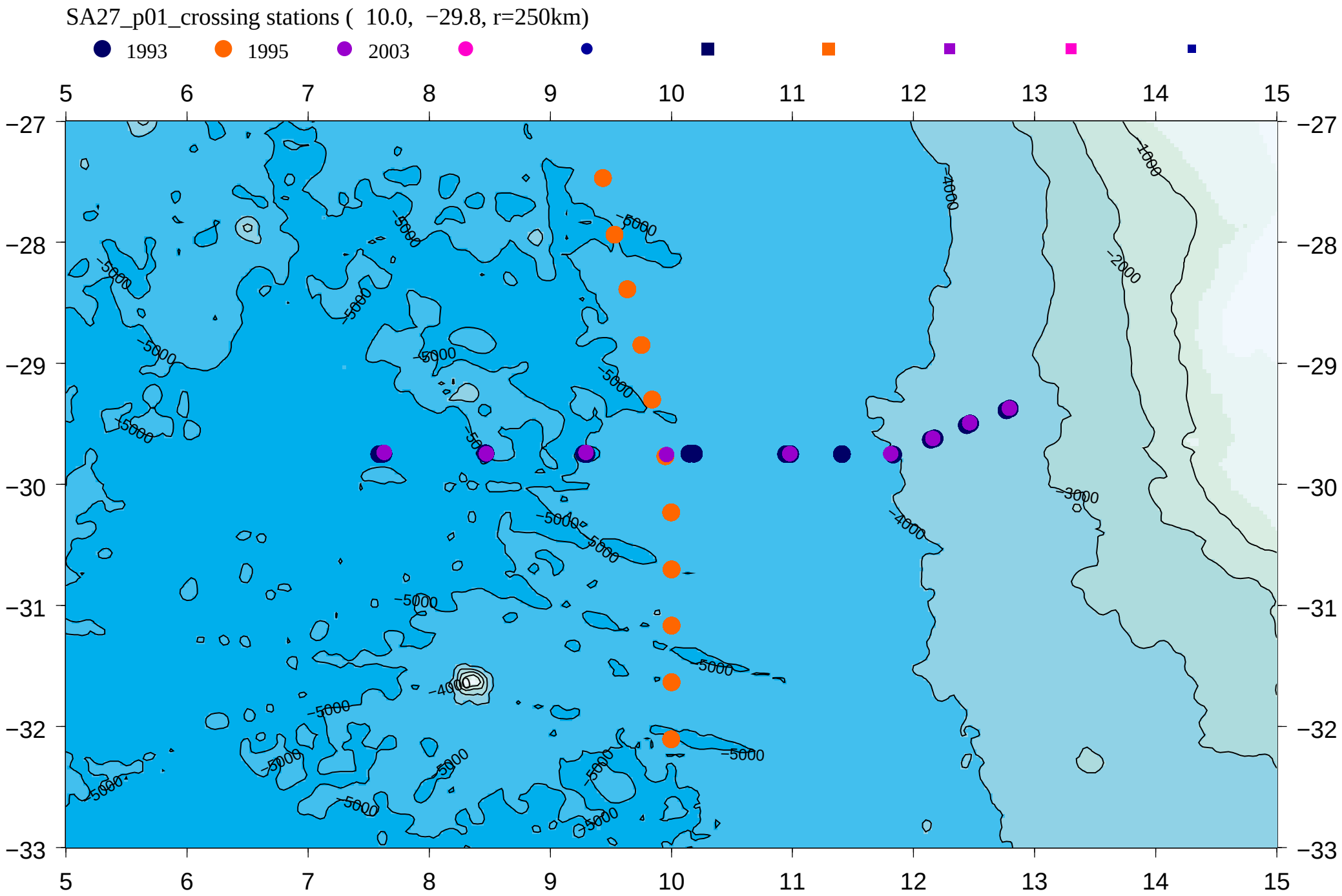

SA22_p01_crossing stations (324.0, −45.0, r=250km)
1993
1995
319
320
321
322
323
324
325
326
327
328
329
−42
−43
−44
−45
−46
−47
−48
−5000

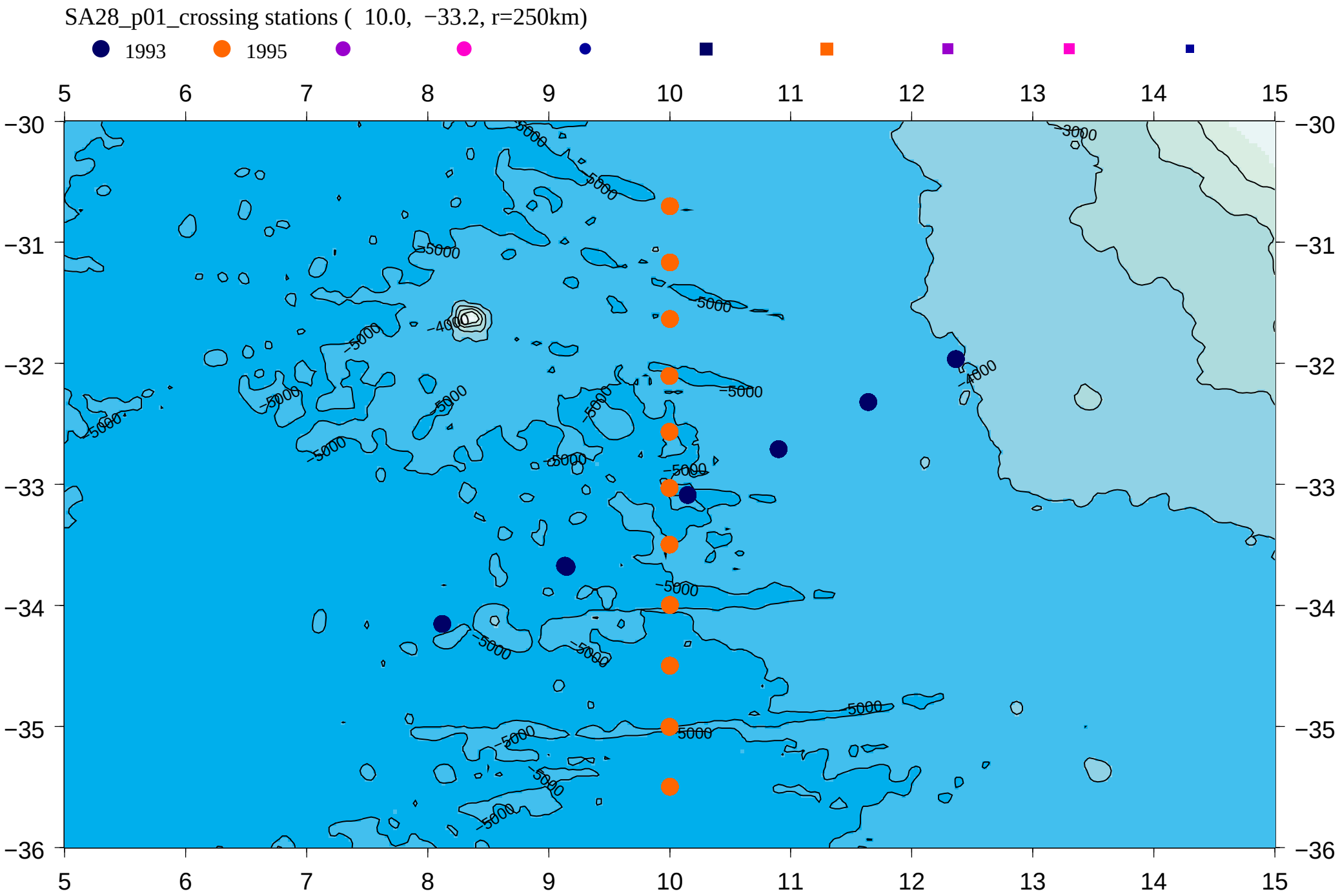

SA23_p01_crossing stations (329.5, −45.0, r=250km)
1989
1993
2005
325
326
327
328
329
330
331
332
333
334
335
−42
−43
−44
−45
−46
−47
−48
−5000

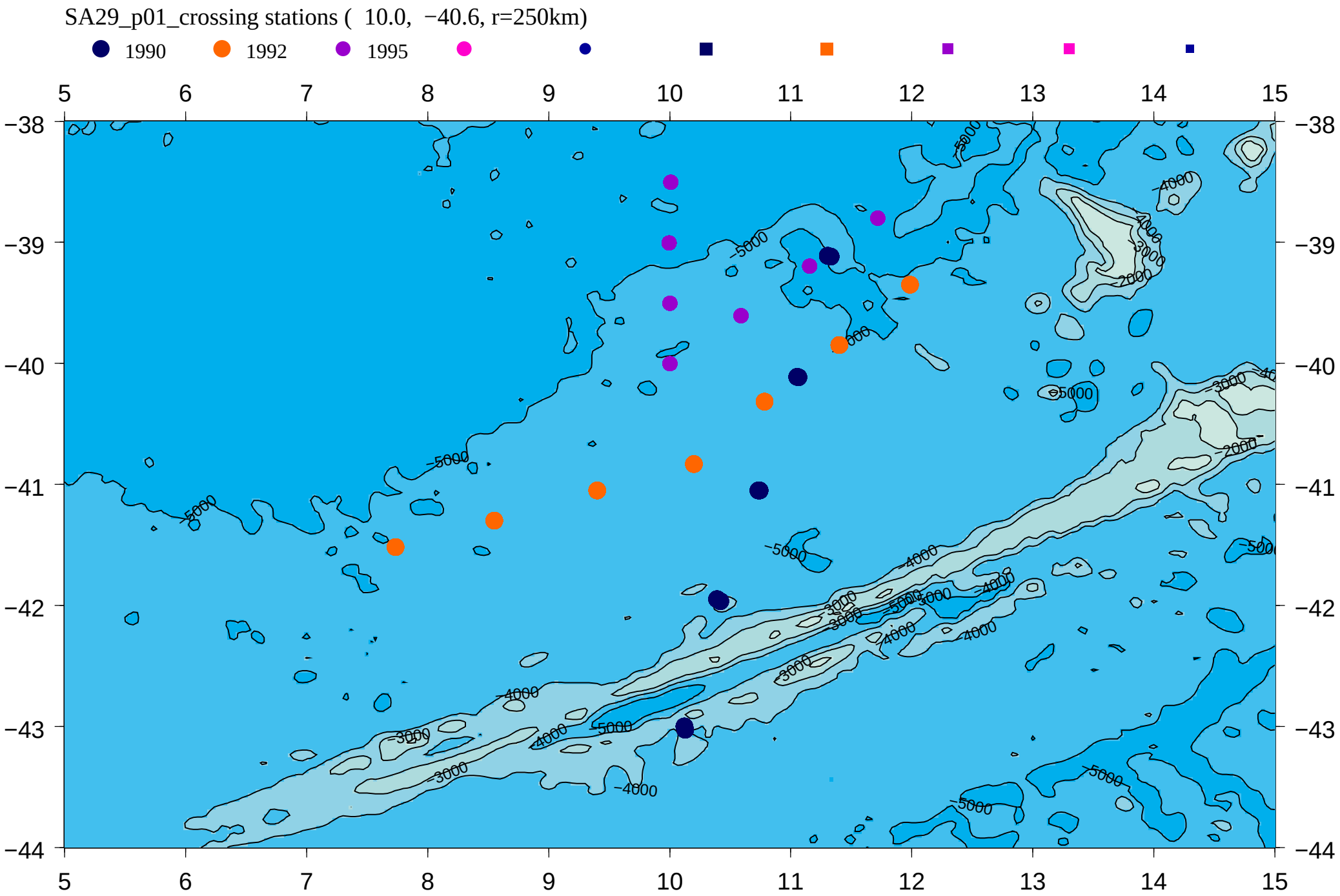

SA24_p01_crossing stations (325.5, −49.5, r=250km)
1989
1995
2005
321
322
323
324
325
326
327
328
329
330
331
−47
−48
−49
−50
−51
−52
−53
−5000
−4000
−3000
−2000

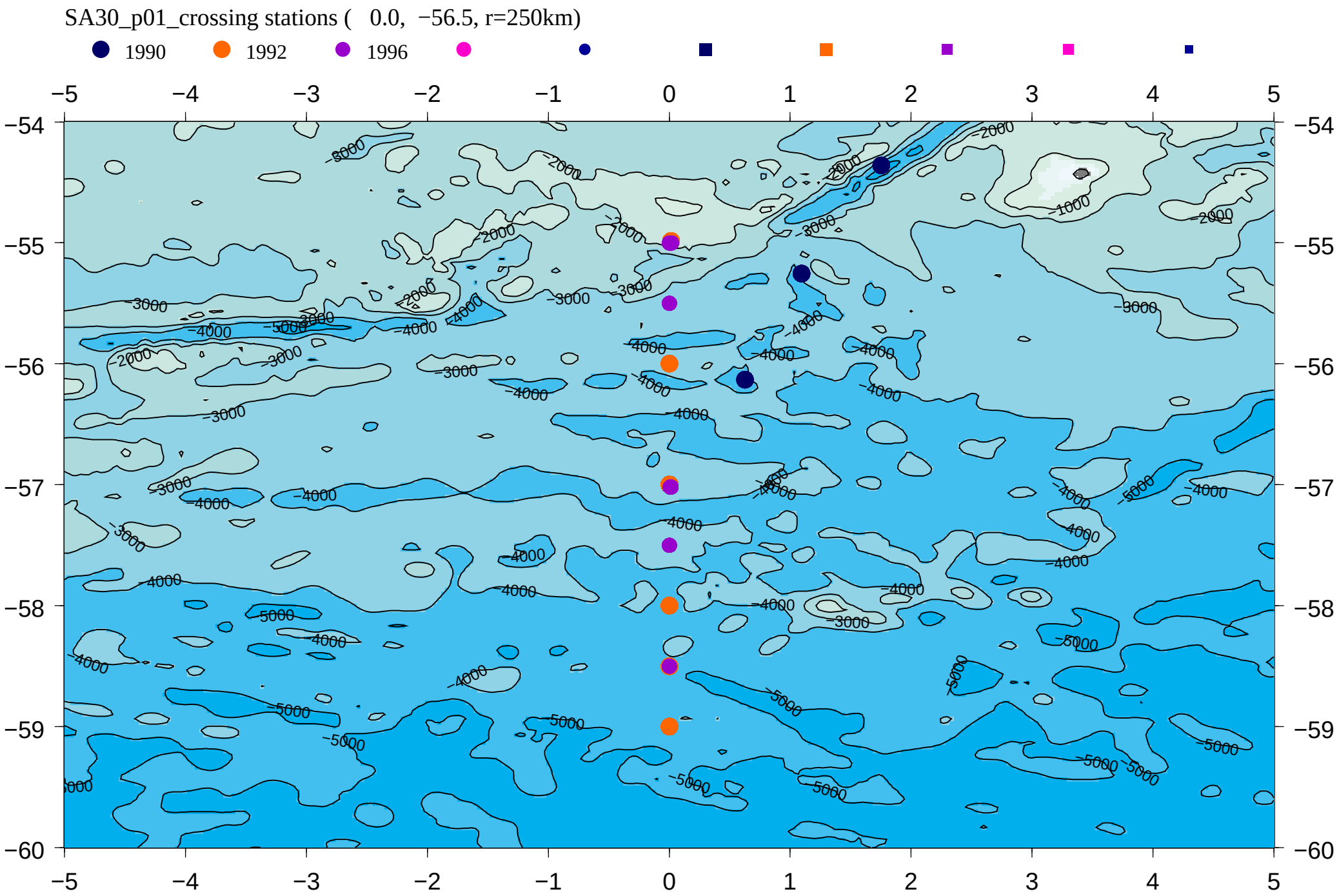

SA25_p01_crossing stations (335.0, −67.0, r=250km)
1992
1995
1996
330
331
332
333
334
335
336
337
338
339
340
−64
−65
−66
−67
−68
−69
−70
−5000
−5000

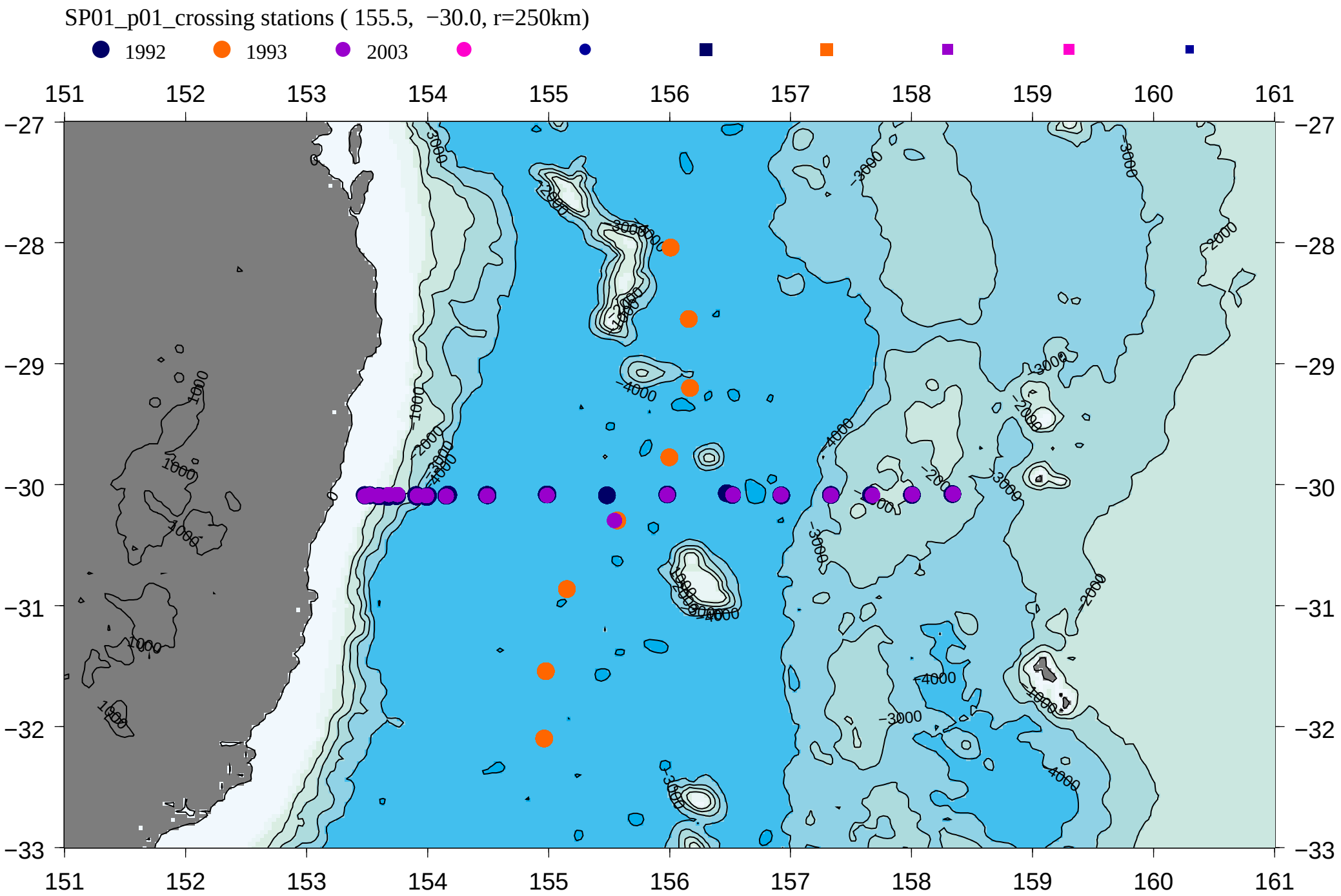

SA26_p01_crossing stations (5.0, −11.3, r=250km)
1994
1995
0
1
2
3
4
5
6
7
8
9
10
−8
−9
−10
−11
−12
−13
−14
-5000

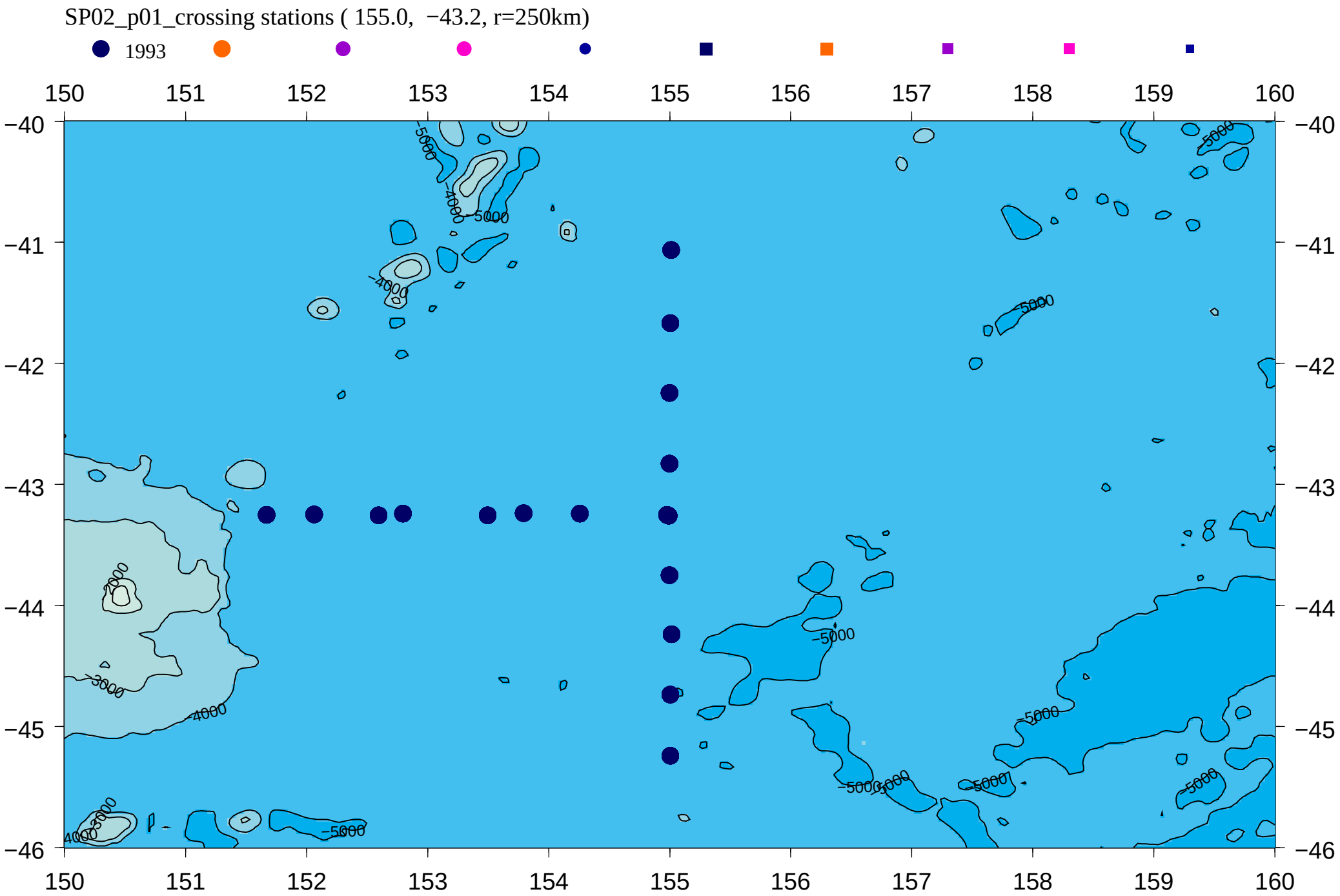

SA27_p01_crossing stations (10.0, −29.8, r=250km)
1993
1995
2003
5
6
7
8
9
10
11
12
13
14
15
−27
−28
−29
−30
−31
−32
−33
−5000
−4000
−3000
−2000
−1000

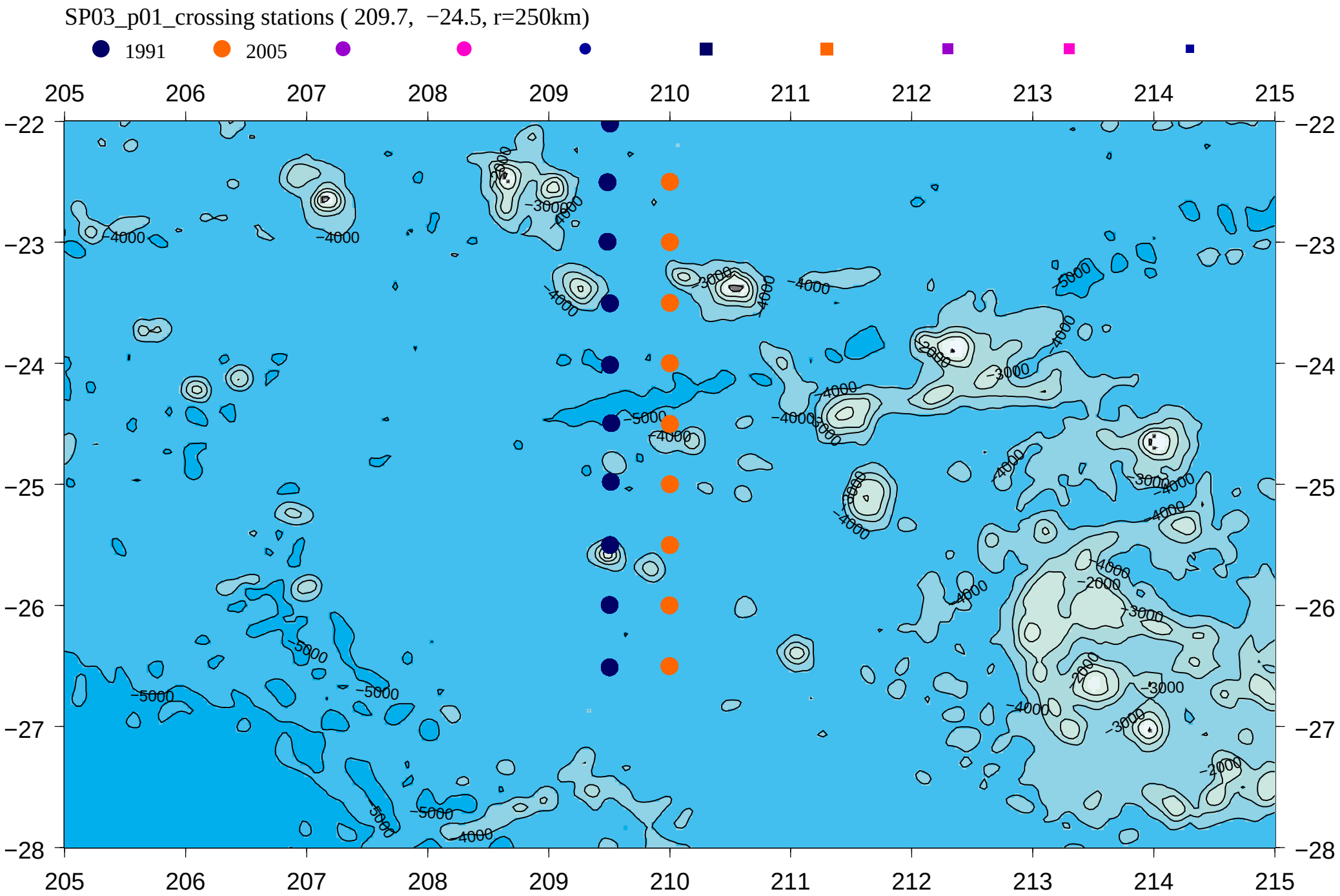

SA28_p01_crossing stations (10.0, −33.2, r=250km)
1993
1995
5
6
7
8
9
10
11
12
13
14
15
−30
−31
−32
−33
−34
−35
−36
−5000
−4000
−3000


SA29_p01_crossing stations (10.0, −40.6, r=250km)
1990
1992
1995
5
6
7
8
9
10
11
12
13
14
15
−38
−39
−40
−41
−42
−43
−44
−5000
−4000
−3000
−2000


SA30_p01_crossing stations (0.0, −56.5, r=250km)
1990
1992
1996
−5
−4
−3
−2
−1
0
1
2
3
4
5
−54
−55
−56
−57
−58
−59
−60


SP01_p01_crossing stations (155.5, −30.0, r=250km)
1992
1993
2003
151
152
153
154
155
156
157
158
159
160
161
−27
−28
−29
−30
−31
−32
−33


SP02_p01_crossing stations (155.0, −43.2, r=250km)
1993
150
151
152
153
154
155
156
157
158
159
160
−40
−41
−42
−43
−44
−45
−46
−5000
−4000
−3000
−2000


SP03_p01_crossing stations (209.7, −24.5, r=250km)
1991
2005
205
206
207
208
209
210
211
212
213
214
215
−22
−23
−24
−25
−26
−27
−28
−4000
−3000
−5000
−2000