

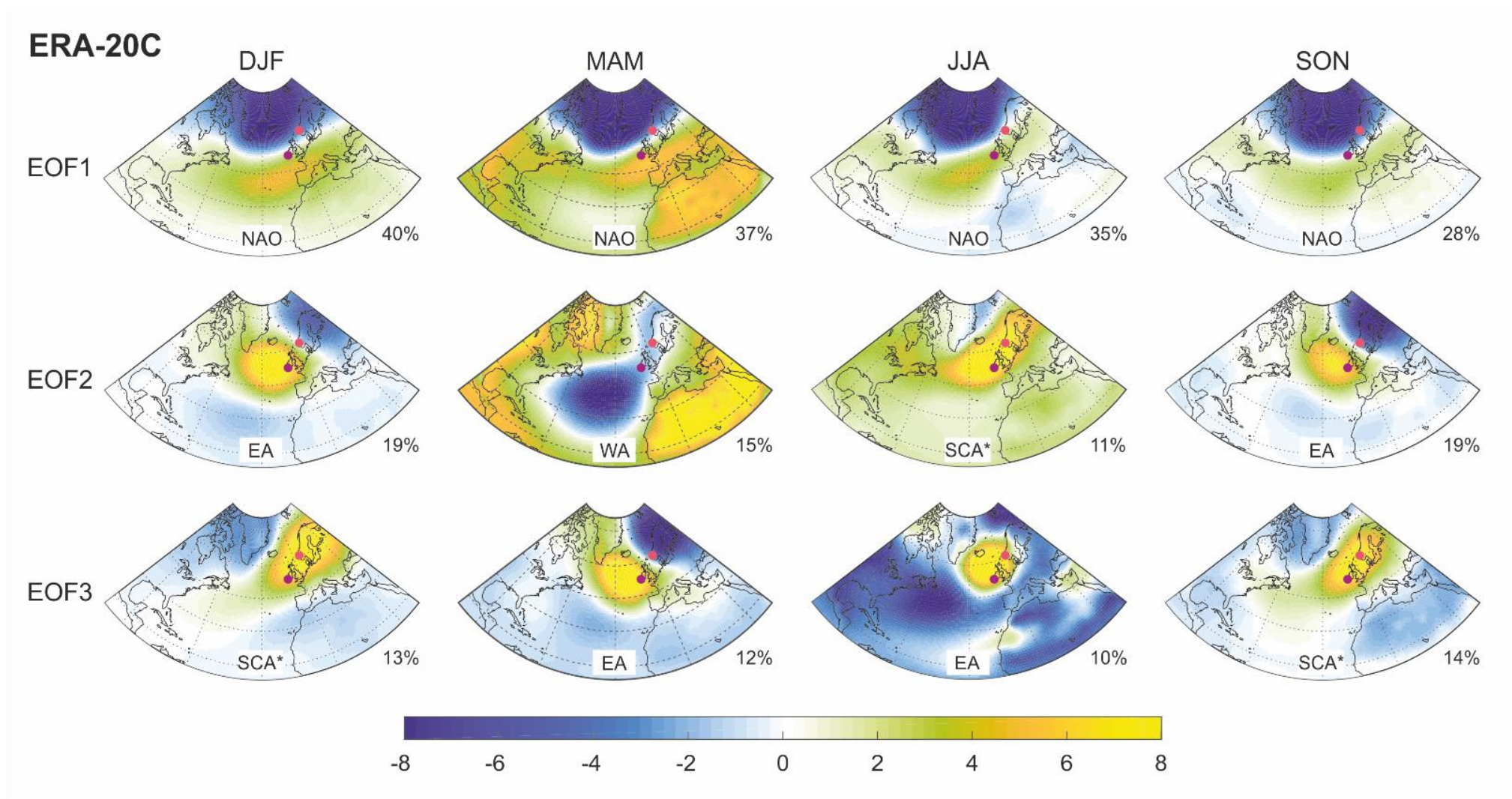
**Supplementary Information of** “Reconciling North Atlantic climate modes: Revised monthly indices for the East Atlantic and the Scandinavian patterns beyond the 20<sup>th</sup> century” L. Comas-Bru and A. Hernández (ms essd-2018-86)

**Table S1:-** Correlation coefficients between seasonal (3m) EOFs from all the employed reanalysis datasets. Note: all correlations with  $p\text{-val} \leq 0.01$  except <sup>(a)</sup>  $0.01 < p\text{-val} \leq 0.05$ ; <sup>(b)</sup>  $0.05 < p\text{-val} \leq 0.1$ ; and <sup>(c)</sup>  $p\text{-val} > 0.1$ . \*EOF2 and EOF3 for JJA have different geographical representation (see main text for further details). \*\* ERA-interim's EOF2 and EOF3 for JJA have been swapped in order to compare EOFs with the same meaning based on their geographical representation.

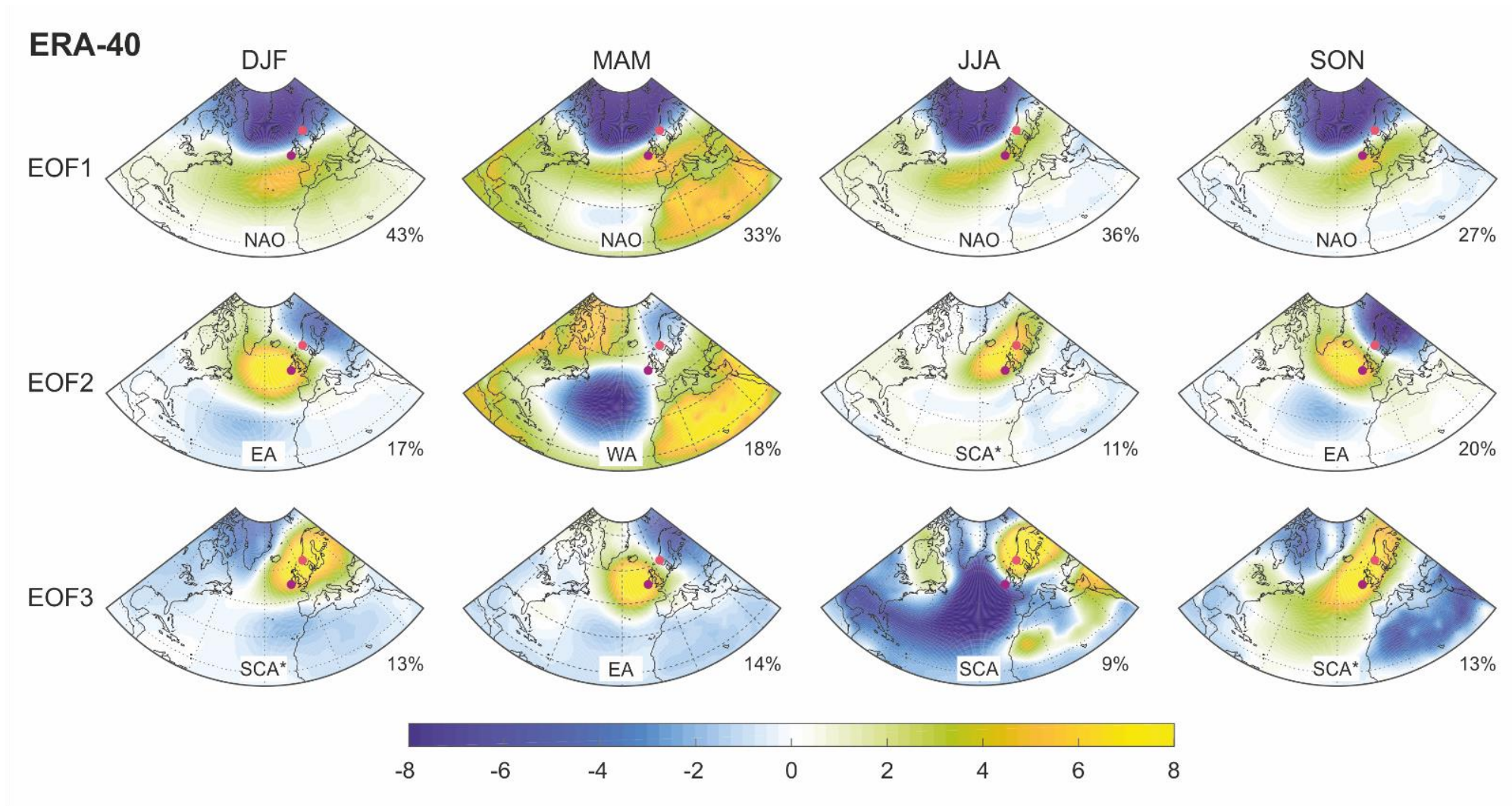
EOF1 (DJF)	20CRv2c	ERA-20C	ERA-40	ERA-interim	NCEP/NCAR
20CRv2c	1	0.99	0.99	0.99	0.99
ERA-20C		1	1	0.99	1
ERA-40			1	0.98	0.99
ERA-interim				1	0.99
NCEP/NCAR					1
EOF2 (DJF)	20CRv2c	ERA-20C	ERA-40	ERA-interim	NCEP/NCAR
20CRv2c	1	0.99	0.98	0.96	0.99
ERA-20C		1	0.99	0.97	0.99
ERA-40			1	0.96	0.99
ERA-interim				1	0.95
NCEP/NCAR					1
EOF3 (DJF)	20CRv2c	ERA-20C	ERA-40	ERA-interim	NCEP/NCAR
20CRv2c	1	0.98	0.98	0.90	0.99
ERA-20C		1	0.98	0.93	0.98
ERA-40			1	0.94	0.99
ERA-interim				1	0.91
NCEP/NCAR					1
EOF1 (MAM)	20CRv2c	ERA-20C	ERA-40	ERA-interim	NCEP/NCAR
20CRv2c	1	0.96	0.98	0.99	0.97
ERA-20C		1	0.99	0.99	0.96
ERA-40			1	1	0.97
ERA-interim				1	0.99
NCEP/NCAR					1
EOF2 (MAM)	20CRv2c	ERA-20C	ERA-40	ERA-interim	NCEP/NCAR
20CRv2c	1	0.89	0.96	0.94	0.96
ERA-20C		1	0.98	0.99	0.93
ERA-40			1	0.98	0.95
ERA-interim				1	0.95
NCEP/NCAR					1
EOF3 (MAM)	20CRv2c	ERA-20C	ERA-40	ERA-interim	NCEP/NCAR
20CRv2c	1	0.92	0.96	0.83	0.97
ERA-20C		1	0.96	0.88	0.96
ERA-40			1	0.95	0.99
ERA-interim				1	0.89
NCEP/NCAR					1
EOF1 (JJA)	20CRv2c	ERA-20C	ERA-40	ERA-interim	NCEP/NCAR
20CRv2c	1	0.91	0.97	0.98	0.97
ERA-20C		1	0.97	0.97	0.96
ERA-40			1	0.99	0.99
ERA-interim				1	0.98
NCEP/NCAR					1
*EOF2 (JJA)	20CRv2c	ERA-20C	ERA-40	**ERA-interim	NCEP/NCAR
20CRv2c	1	0.85	0.90	0.87	0.92
ERA-20C		1	0.89	0.84	0.87
ERA-40			1	0.89	0.92
**ERA-interim				1	0.94
NCEP/NCAR					1
*EOF3 (JJA)	20CRv2c	ERA-20C	ERA-40	**ERA-interim	NCEP/NCAR
20CRv2c	1	0.60	0.76	0.69	0.45
ERA-20C		1	0.18a	0.94	0.87
ERA-40			1	0.25a	0.05b
**ERA-interim				1	0.94
NCEP/NCAR					1
EOF1 (SON)	20CRv2c	ERA-20C	ERA-40	ERA-interim	NCEP/NCAR
20CRv2c	1	0.91	0.96	0.93	0.92
ERA-20C		1	0.97	0.95	0.93
ERA-40			1	0.99	0.99
ERA-interim				1	0.99
NCEP/NCAR					1
EOF2 (SON)	20CRv2c	ERA-20C	ERA-40	ERA-interim	NCEP/NCAR
20CRv2c	1	0.98	0.95	0.92	0.89
ERA-20C		1	0.98	0.96	0.94
ERA-40			1	0.97	0.98
ERA-interim				1	0.97
NCEP/NCAR					1
EOF3 (SON)	20CRv2c	ERA-20C	ERA-40	ERA-interim	NCEP/NCAR
20CRv2c	1	0.96	0.98	0.94	0.97
ERA-20C		1	0.93	0.89	0.91
ERA-40			1	0.93	0.98
ERA-interim				1	0.95
NCEP/NCAR					1

**Table S2:** Percentage of SLP variability explained by the corresponding EOF during the given season and for each reanalysis dataset. The “total” column is the variability explained by adding the three main EOFs. EOF1 corresponds always to the NAO. EOF2 and EOF3 correspond to the EA and the SCA, respectively, except in MAM when the EOF3 presents the EA pattern and SCA is not reflected by the three first EOFs (see also Fig. 1 and S1-S4).

	20CRv2c				ERA-20C				ERA-40				ERA-interim				NCEP/NCAR			
	EOF	EOF	EOF	Tota	EOF	EOF	EOF	Tota	EOF	EOF	EOF	Tota	EOF 1	EOF 2	EOF 3	Tota	EOF	EOF	EOF	Tota
<b>DJF</b>	39	19	13	<b>71</b>	40	19	13	<b>72</b>	43	17	13	<b>73</b>	46	16	13	<b>75</b>	41	17	13	<b>71</b>
<b>MAM</b>	33	13	10	<b>56</b>	37	15	12	<b>64</b>	33	18	14	<b>65</b>	40	16	10	<b>66</b>	34	18	11	<b>63</b>
<b>JJA</b>	30	17	14	<b>61</b>	35	11	10	<b>56</b>	36	11	09	<b>56</b>	39	12	10	<b>61</b>	35	10	09	<b>54</b>
<b>SON</b>	30	17	14	<b>61</b>	28	19	14	<b>61</b>	27	20	13	<b>60</b>	28	21	14	<b>63</b>	26	19	14	<b>59</b>

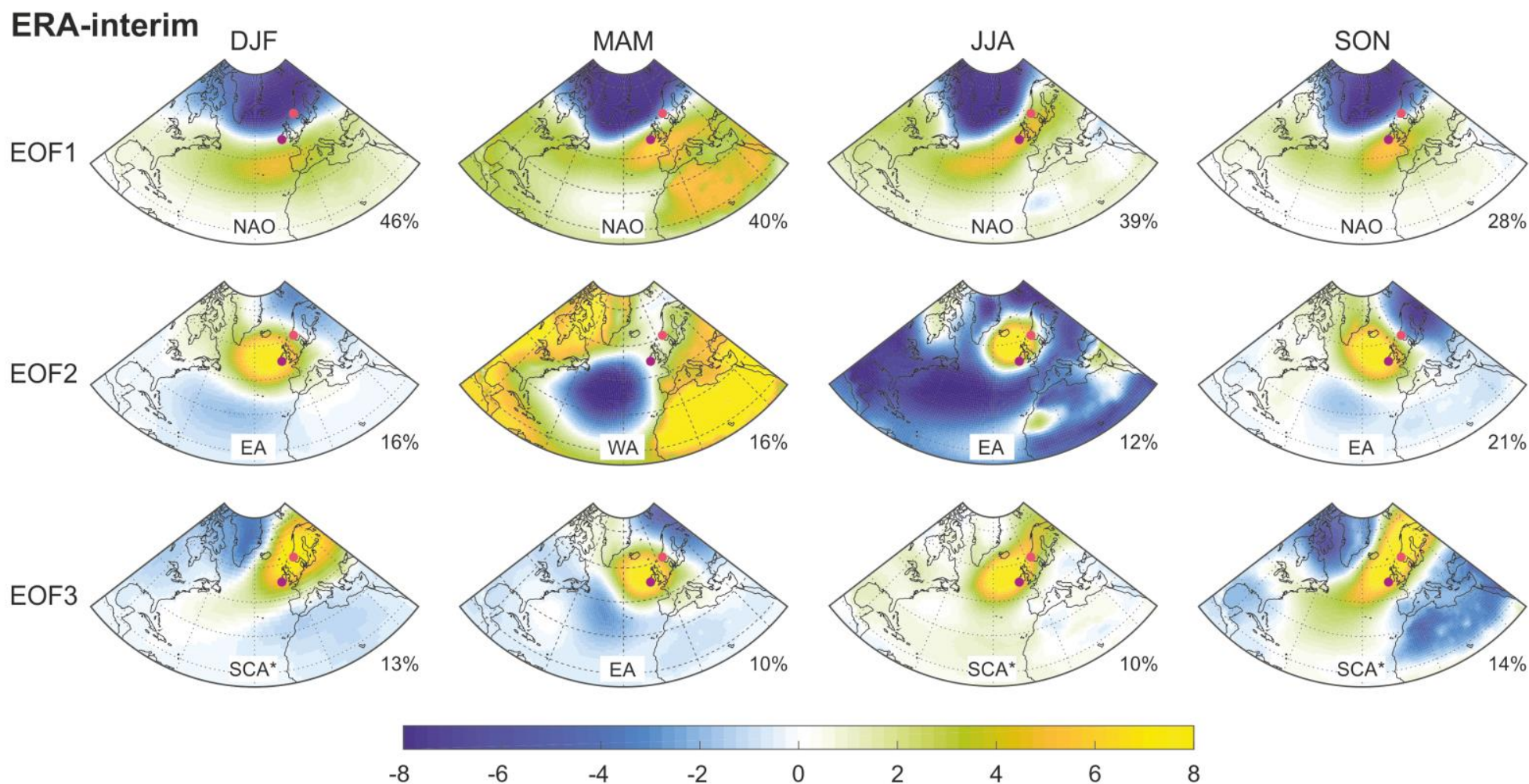


**Figure S1:** EOF loadings based on monthly SLP data (ERA-20C dataset; Poli et al., 2016). Each column represents a 3-month season. The percentages at the bottom right of each map are the variability explained by the corresponding EOF (rows) at any given season (columns) as shown in Table S2. The text at the bottom of each map identifies the observed pattern. Pink (purple) dots show the location of Bergen Florida (Valentia Observatory) stations as listed in Table 1. Figures S1-S4 show the same maps for the other four reanalysis products in Table 2.

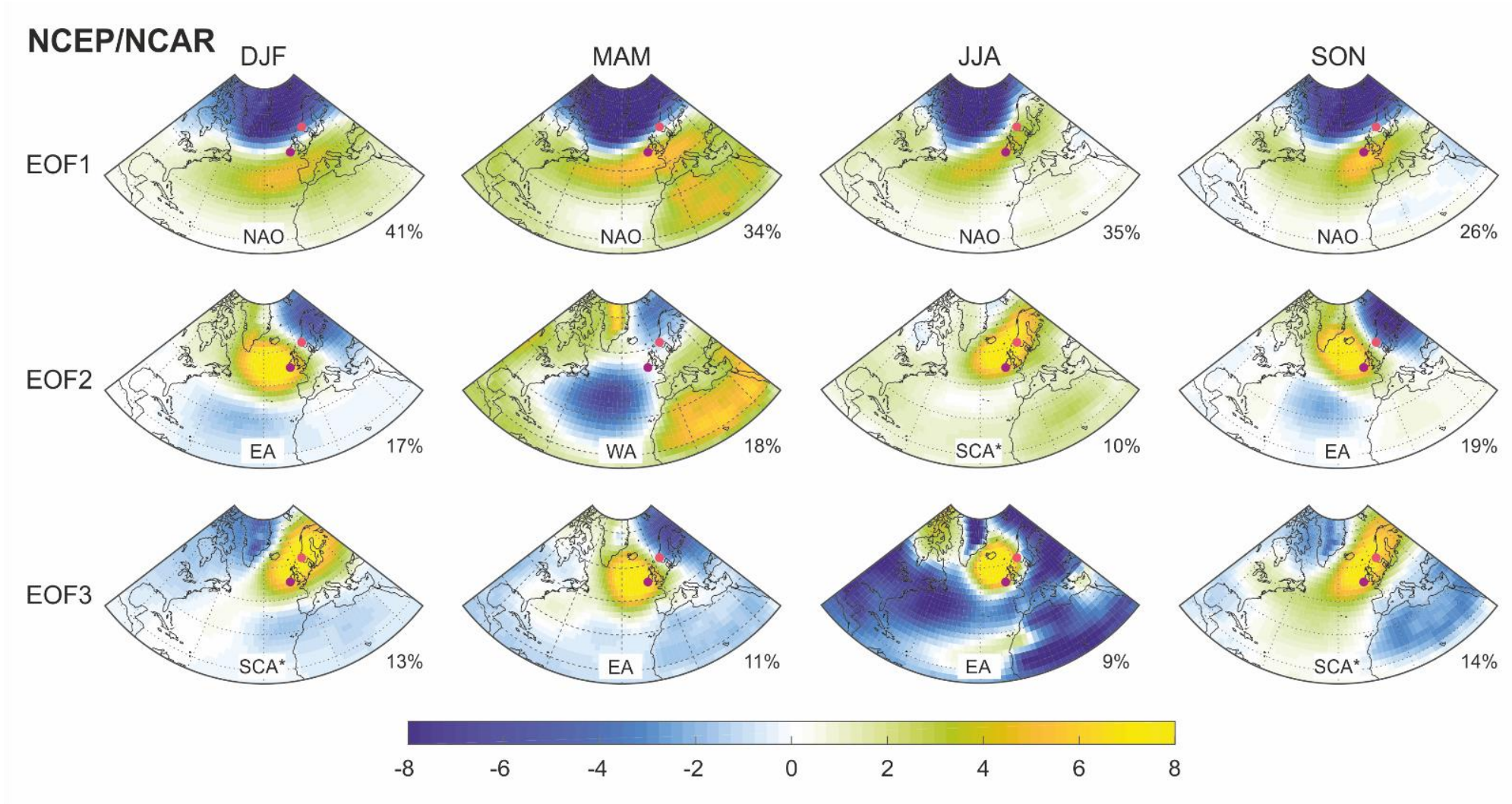


**Figure S2:** EOF loadings based on monthly SLP data (ERA-40 dataset; Uppala et al., 2005). Each column represents a 3-month season. The percentages at the bottom right of each map are the variability explained by the corresponding EOF (rows) at any given season (columns) as shown in Table S2. The text at the bottom of each map identifies the observed pattern. Pink (purple) dots show the location of Bergen Florida (Valentia Observatory) stations as listed in Table 1. Figures S1-S4 show the same maps for the other four reanalysis products in Table 2.





**Figure S3:** EOF loadings based on monthly SLP data (ERA-interim dataset; Dee et al., 2011). Each column represents a 3-month season. The percentages at the bottom right of each map are the variability explained by the corresponding EOF (rows) at any given season (columns) as shown in Table S2. The text at the bottom of each map identifies the observed pattern. Pink (purple) dots show the location of Bergen Florida (Valentia Observatory) stations as listed in Table 1. Figures S1-S4 show the same maps for the other four reanalysis products in Table 2.



**Figure S4:** EOF loadings based on monthly SLP data (NCEP/NCAR dataset; Kalnay et al., 1996). Each column represents a 3-month season. The percentages at the bottom right of each map are the variability explained by the corresponding EOF (rows) at any given season (columns) as shown in Table S2. The text at the bottom of each map identifies the observed pattern. Pink (purple) dots show the location of Bergen Florida (Valentia Observatory) stations as listed in Table 1. Figures S1-S4 show the same maps for the other four reanalysis products in Table 2.