SUPPLEMENTARY MATERIAL

for "Improved land mask for satellite remote sensing of oceans and inland waters"

Karlis Mikelsons and Menghua Wang

S1. Endorheic lakes

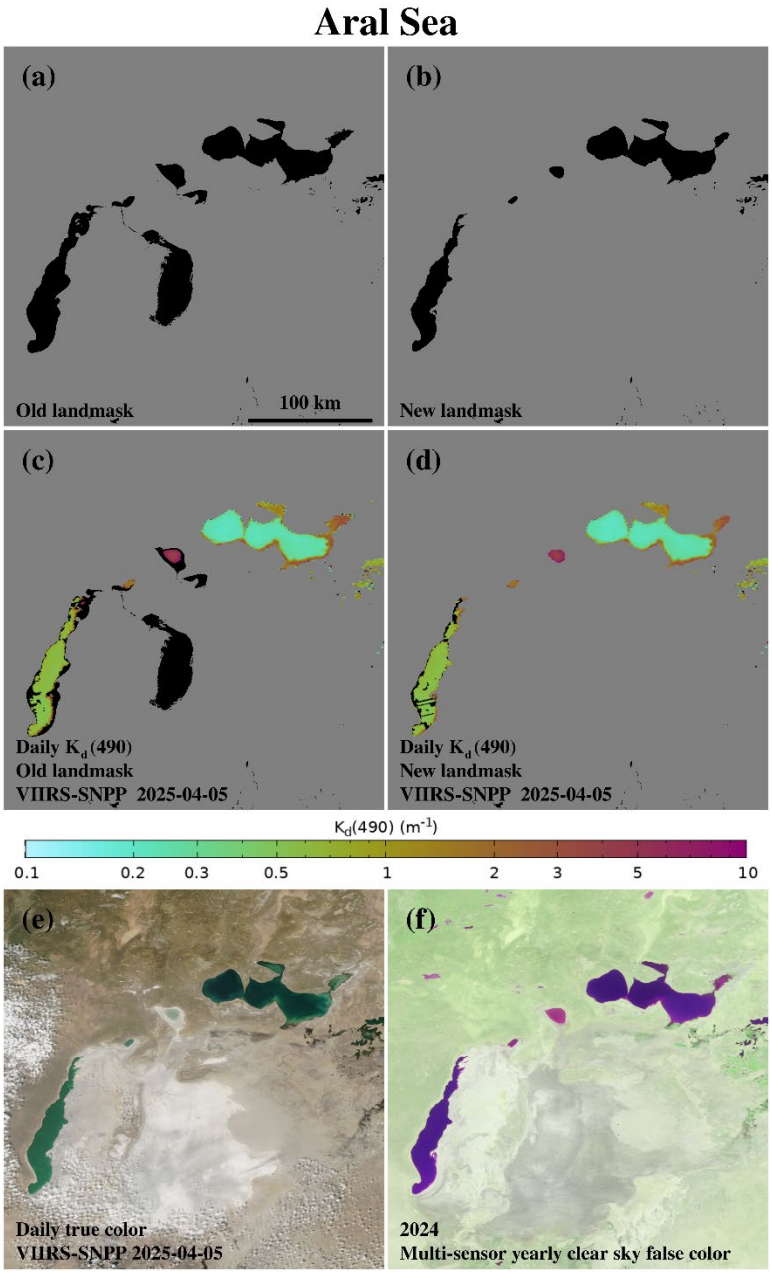

Figure S1: The extent of the lakes left over from the Aral Sea, in the old land mask (a) and the updated land mask (b), along with the corresponding daily Chl-a retrievals [(c) and (d)] from VIIRS-SNPP on April 5, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

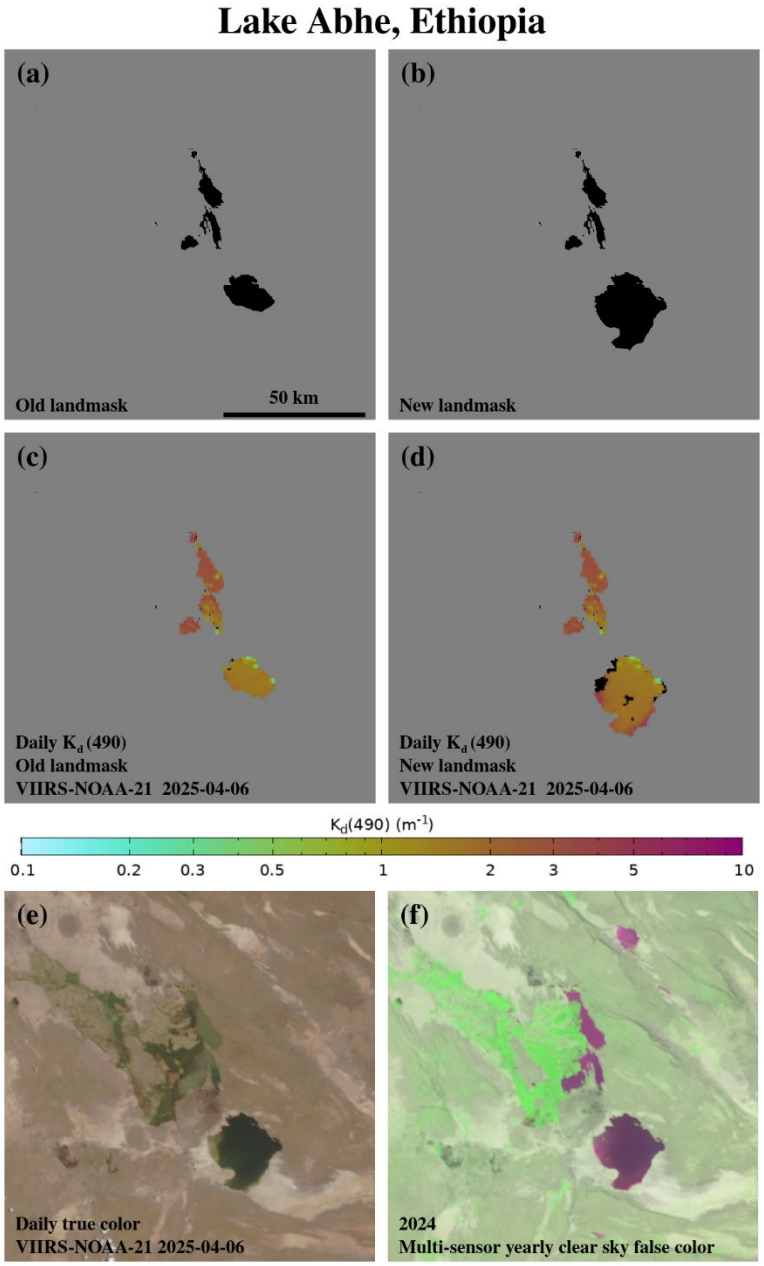

Figure S2: Changes in the extent of the Lake Abhe (lower right), on the border of Ethiopia and Djibouti in the old land mask (a) and the updated land mask (b), along with the corresponding daily $K_d(490)$ retrievals [(c) and (d)] from VIIRS-NOAA-21 on April 6, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

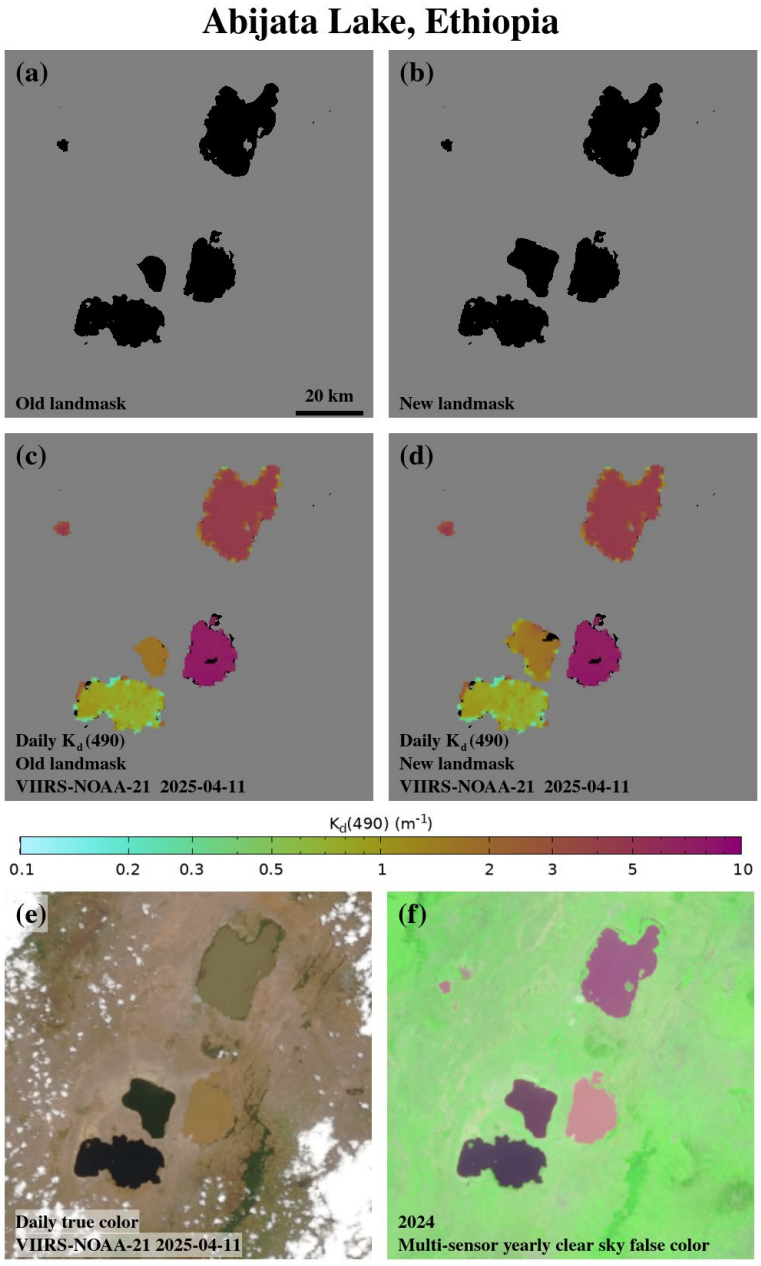

Figure S3: Changes in the extent of the Lake Abijatta (center left), Ethiopia in the old land mask (a) and the updated land mask (b), along with the corresponding daily $K_d(490)$ retrievals [(c) and (d)] from VIIRS-NOAA-21 on April 11, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

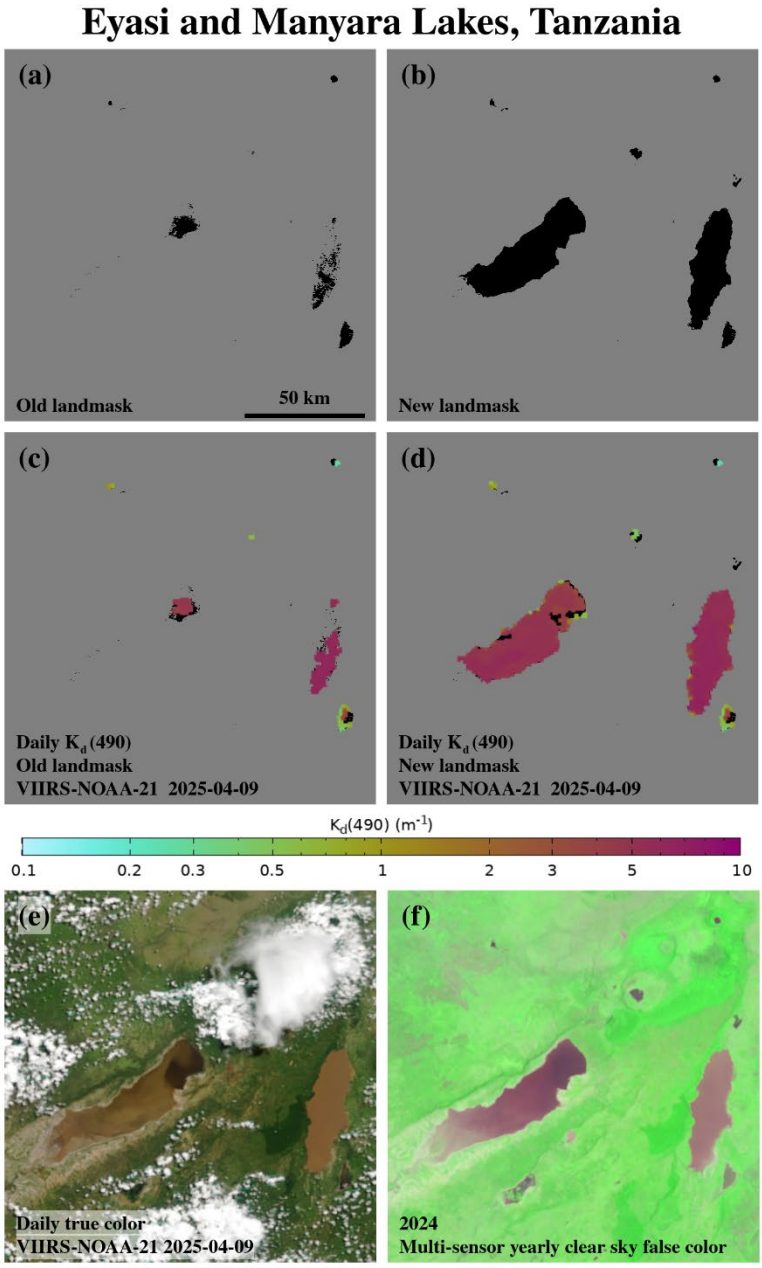

Figure S4: The extent of the Lakes Eyasi (center left) and Manyara (right), Tanzania, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-NOAA-21 on April 9, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

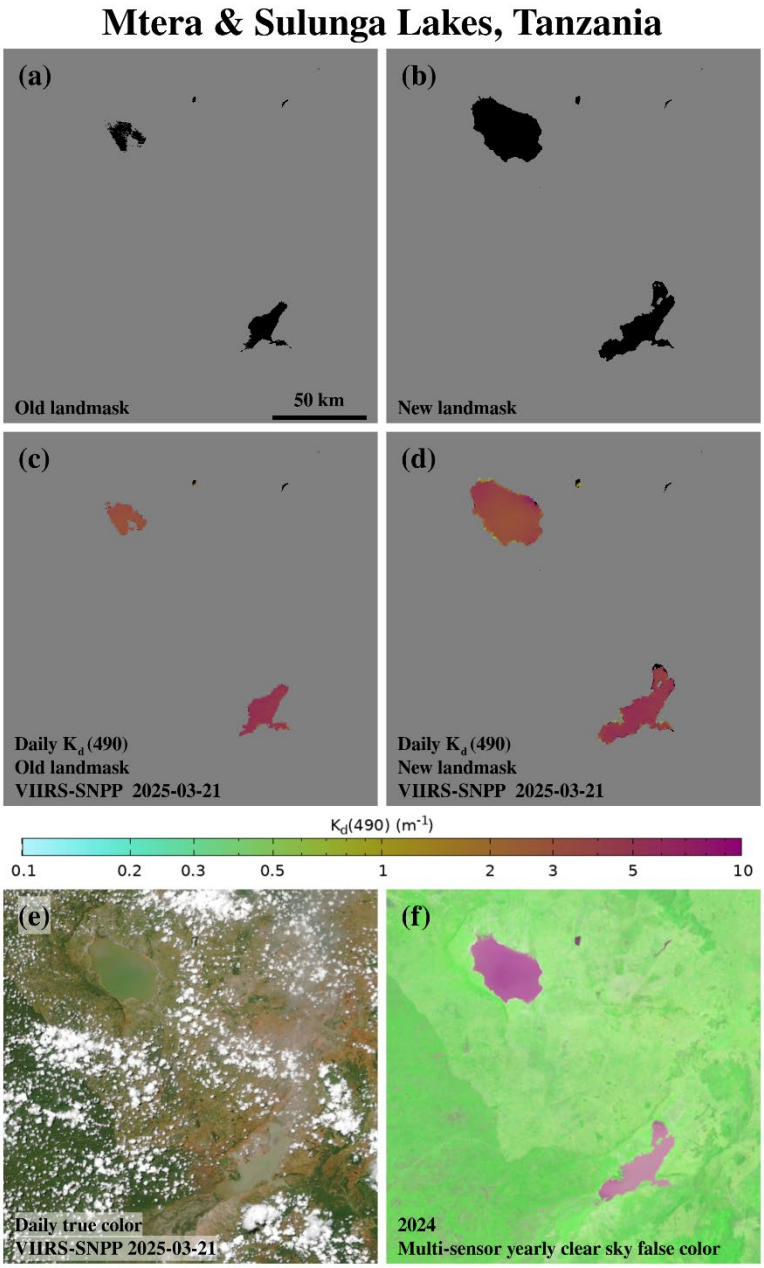

Figure S5: The extent of the Lake Sulunga (upper left) and Lake Mtera (lower right, not endorheic), Tanzania, in the old land mask (a) and the updated land mask (b), along with the corresponding daily $K_d(490)$ retrievals [(c) and (d)] from VIIRS-NOAA-21 on April 9, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

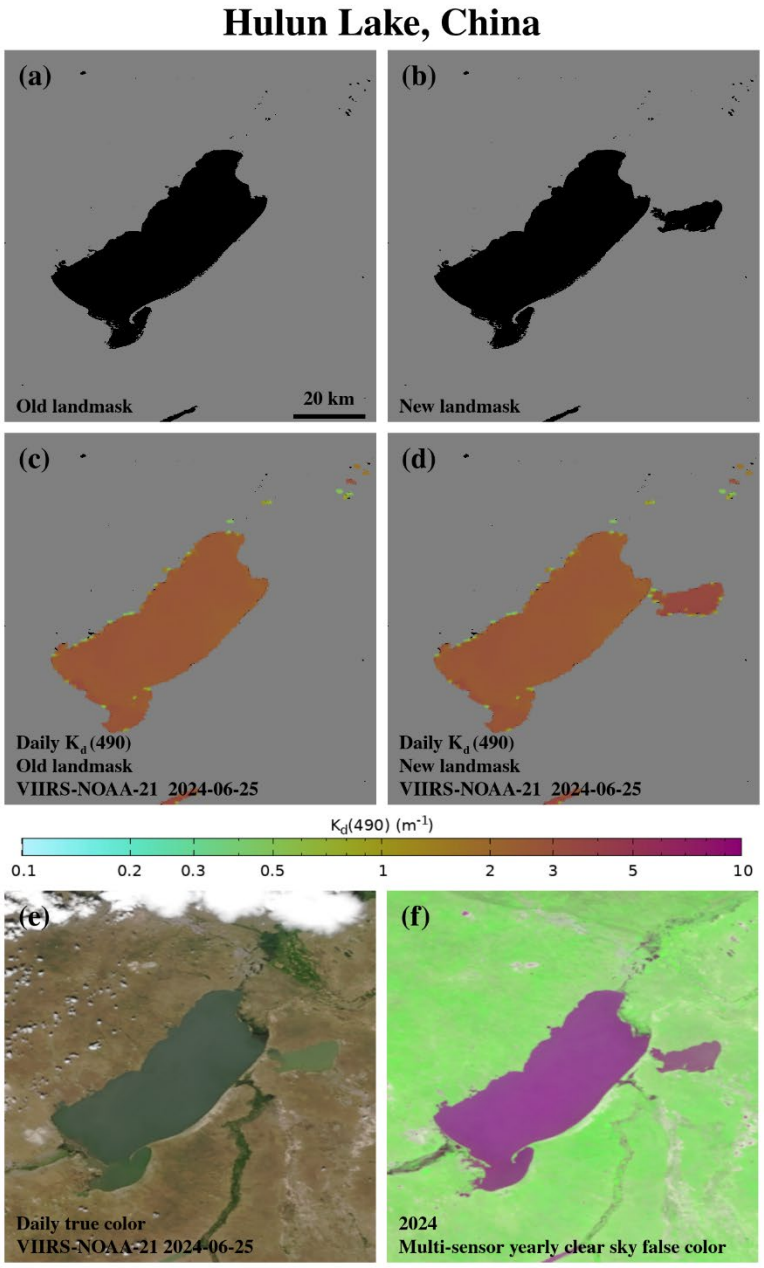

Figure S6: The extent of the Hulun Lake in China, in the old land mask (a) and the updated land mask (b), along with the corresponding daily $K_d(490)$ retrievals [(c) and (d)] from VIIRS-NOAA-21 on June 25, 2024, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

S2. River dam reservoirs in Africa and South America

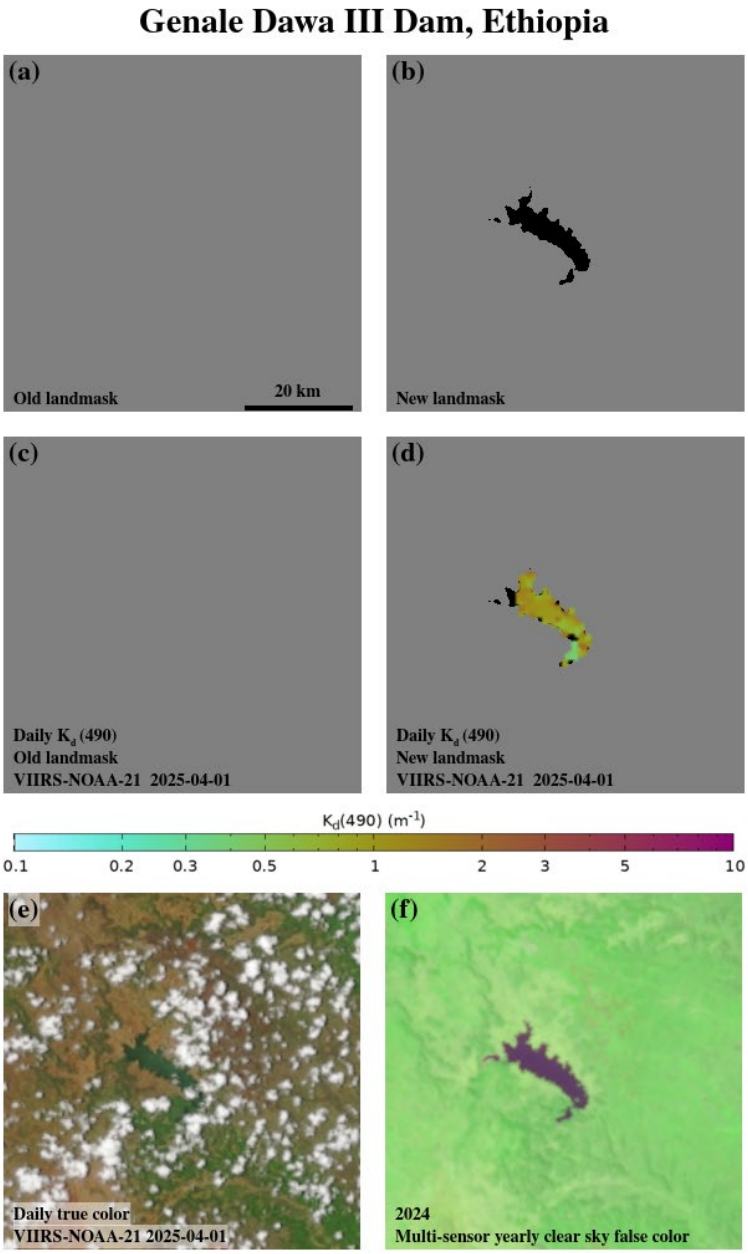

Figure S7: The extent of the Genale Dawa III Dam reservoir, Ethiopia, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-NOAA-21 on April 1, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

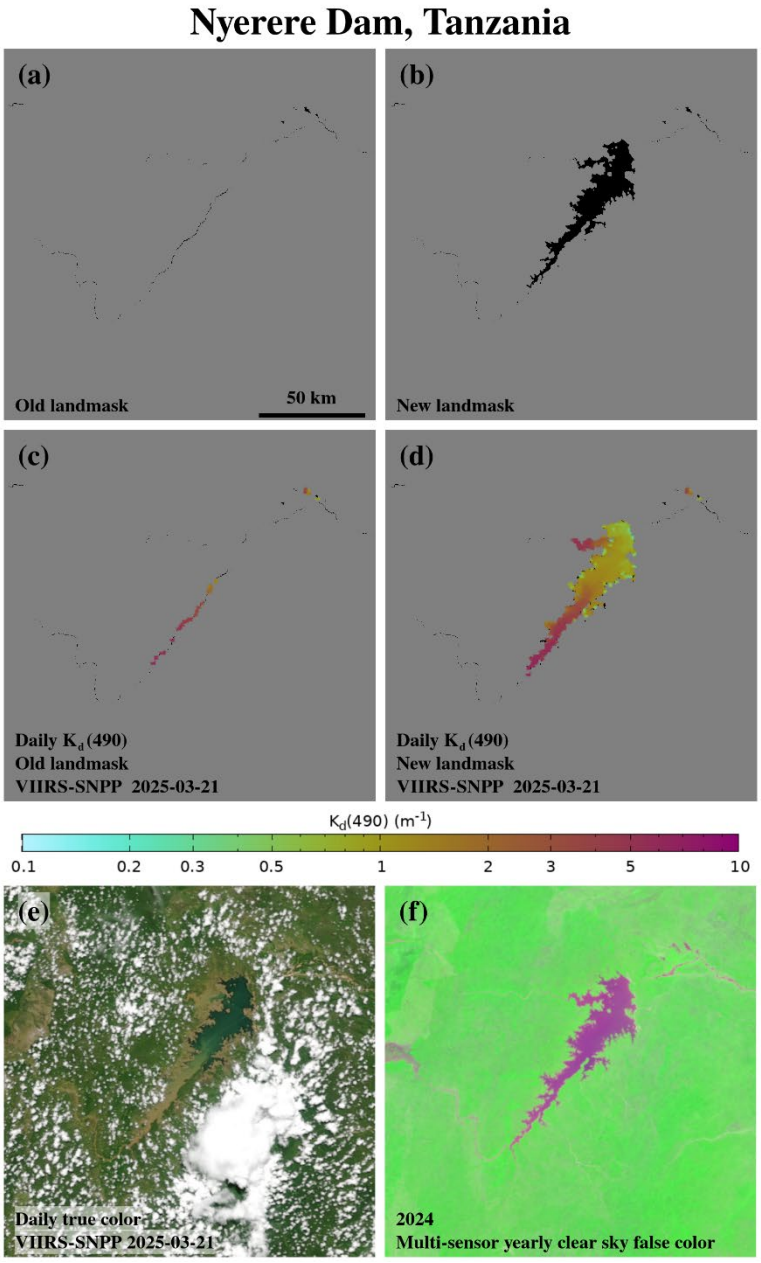

Figure S8: The extent of the Julius Nyerere hydropower station reservoir, Tanzania, in the old land mask (a) and the updated land mask (b), along with the corresponding daily Chlorophyll-a retrievals [(c) and (d)] from VIIRS-SNPP on March 21, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

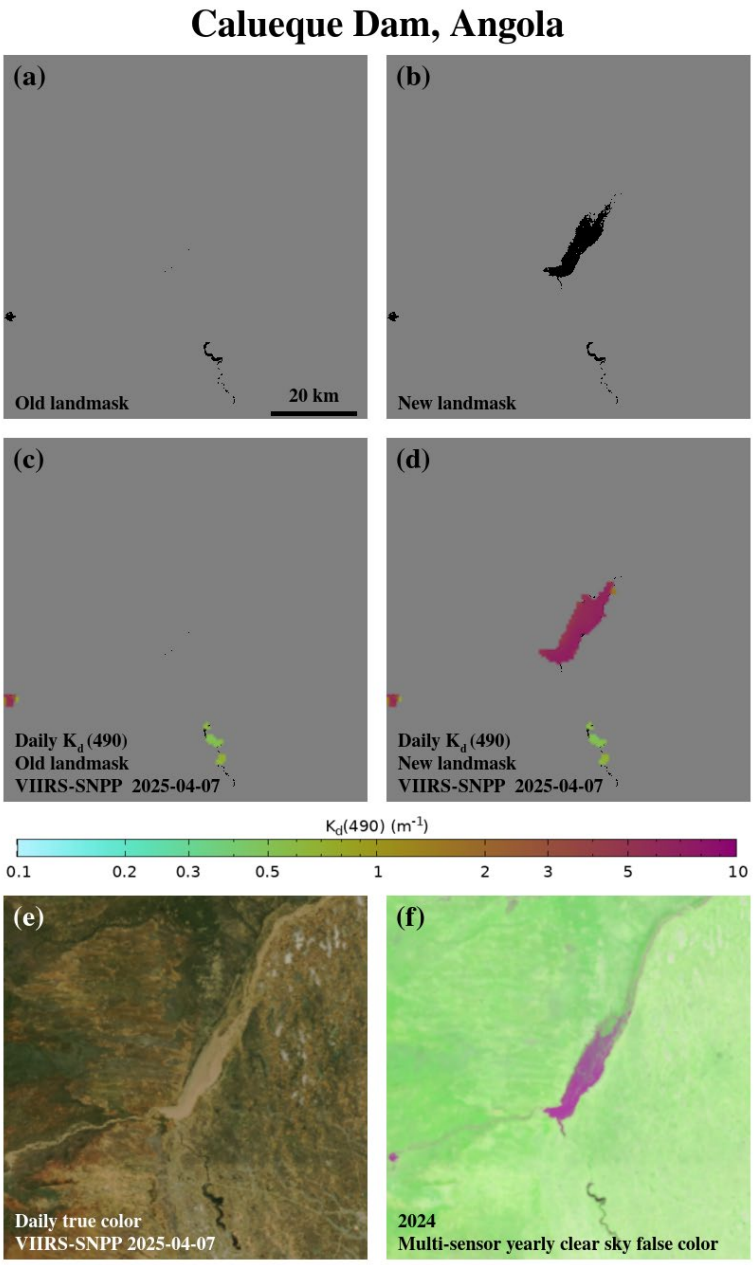

Figure S9: The extent of the Calueque Dam reservoir, Angola, in the old land mask (a) and the updated land mask (b), along with the corresponding daily $K_d(490)$ retrievals [(c) and (d)] from VIIRS-SNPP on April 7, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

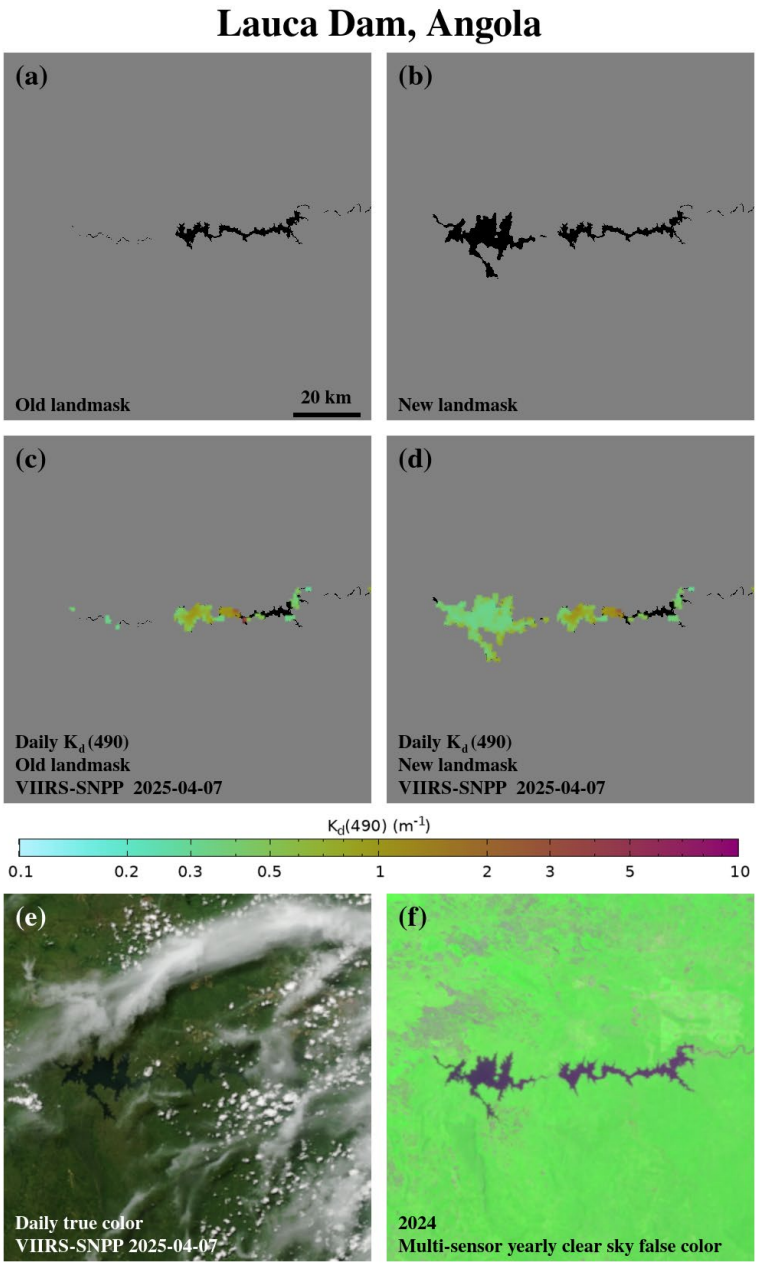

Figure S10: The extent of the Lauca Dam reservoir (left), Angola, in the old land mask (a) and the updated land mask (b), along with the corresponding daily $K_d(490)$ retrievals [(c) and (d)] from VIIRS-SNPP on April 7, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

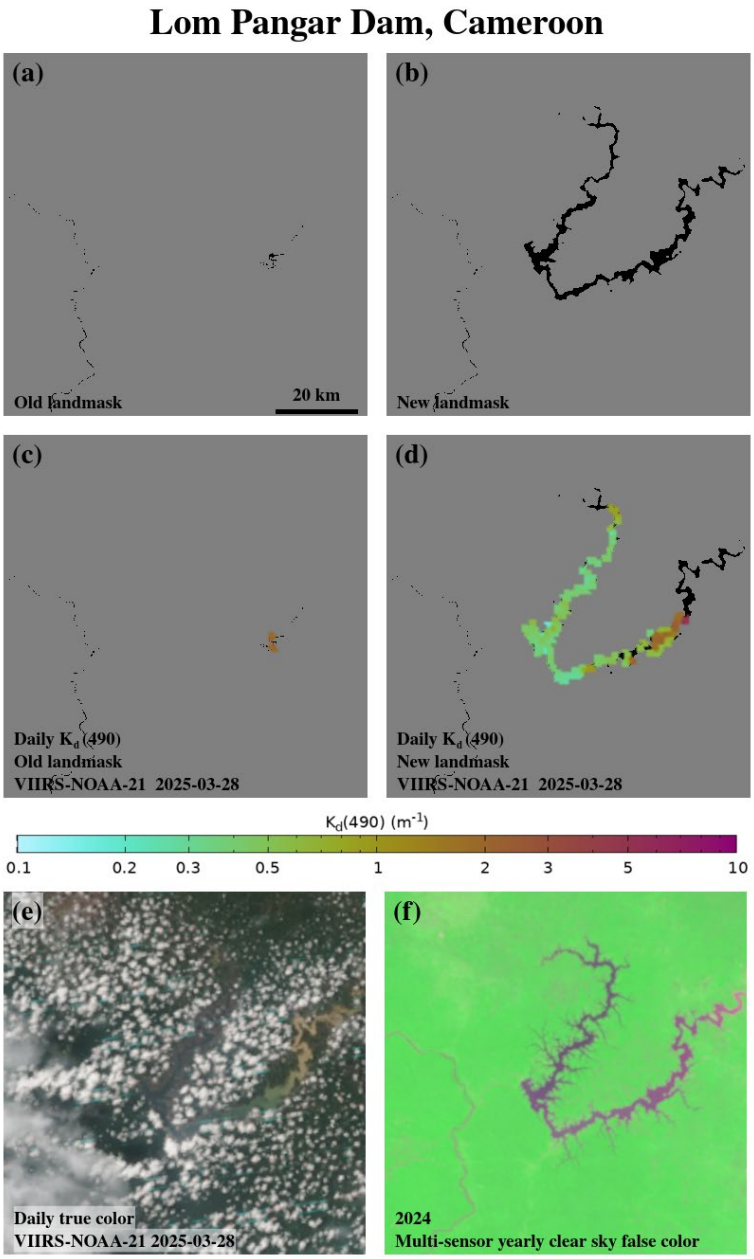

Figure S11: The extent of the Lom Pangar Dam reservoir, Cameroon, in the old land mask (a) and the updated land mask (b), along with the corresponding daily $K_d(490)$ retrievals [(c) and (d)] from VIIRS-NOAA-21 on March 28, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

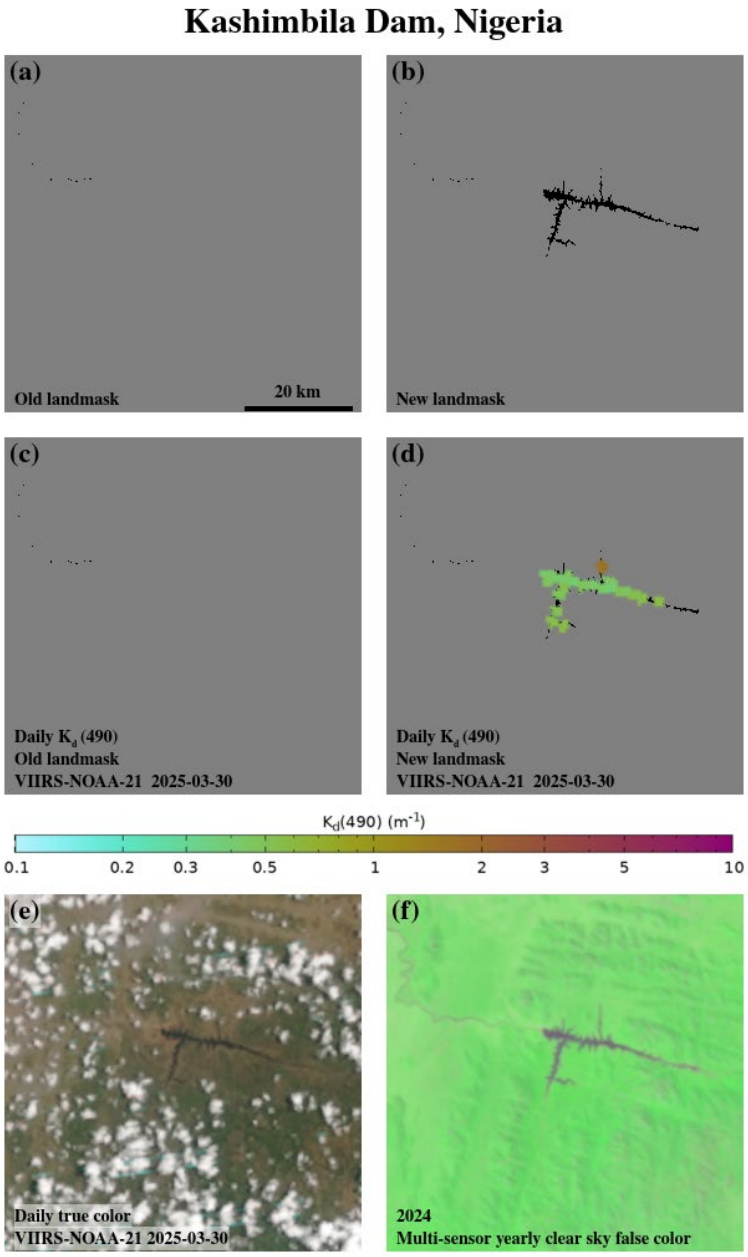

Figure S12: The extent of the Kashimbila Dam reservoir, Nigeria, in the old land mask (a) and the updated land mask (b), along with the corresponding daily $K_d(490)$ retrievals [(c) and (d)] from VIIRS-NOAA-21 on March 30, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

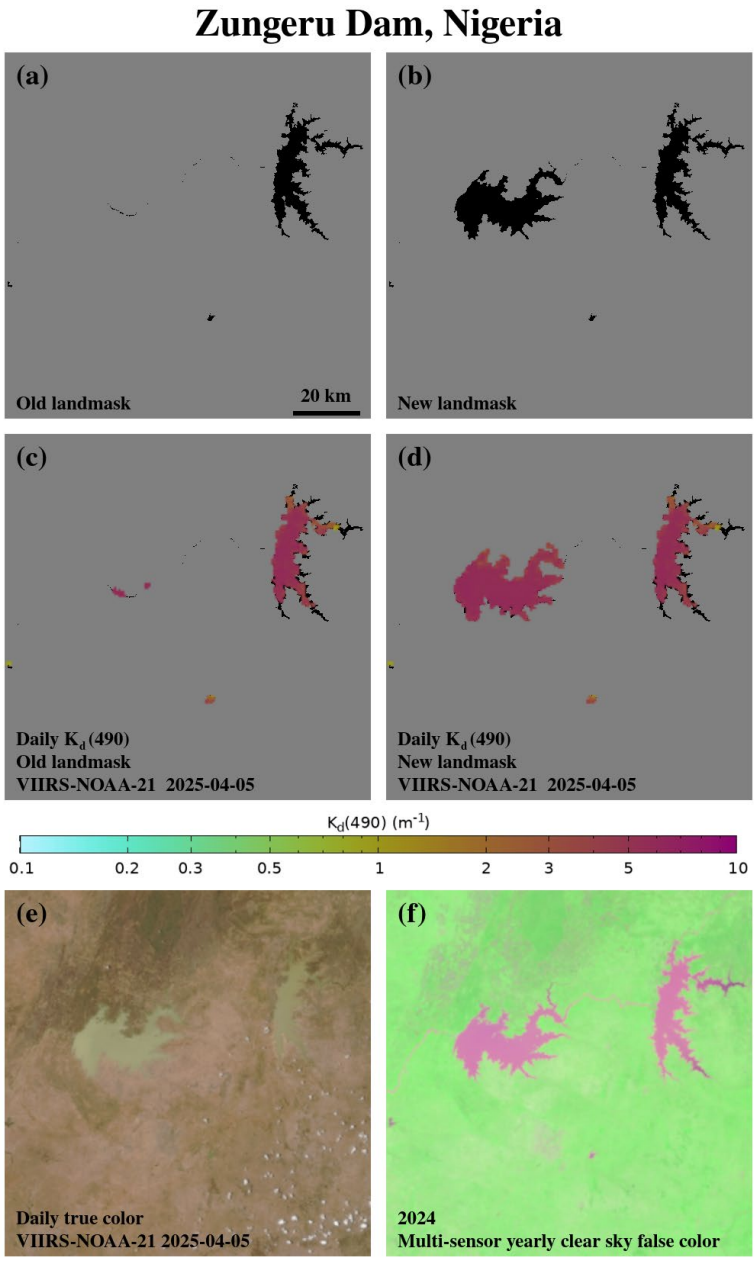

Figure S13: The extent of the Zungeru Dam reservoir (center left), Nigeria, in the old land mask (a) and the updated land mask (b), along with the corresponding daily $K_d(490)$ retrievals [(c) and (d)] from VIIRS-NOAA-21 on April 5, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

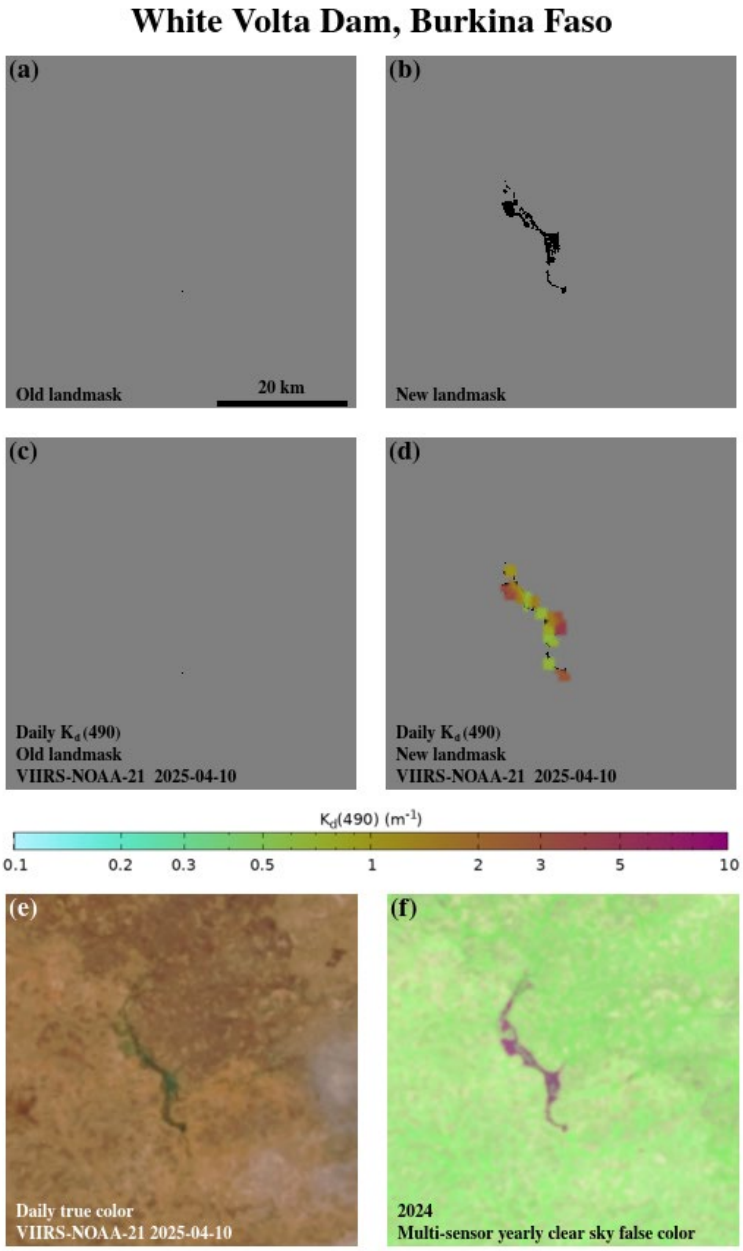

Figure S14: The extent of a dam on White Volta River in Burkina Faso, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-NOAA-21 on April 10, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

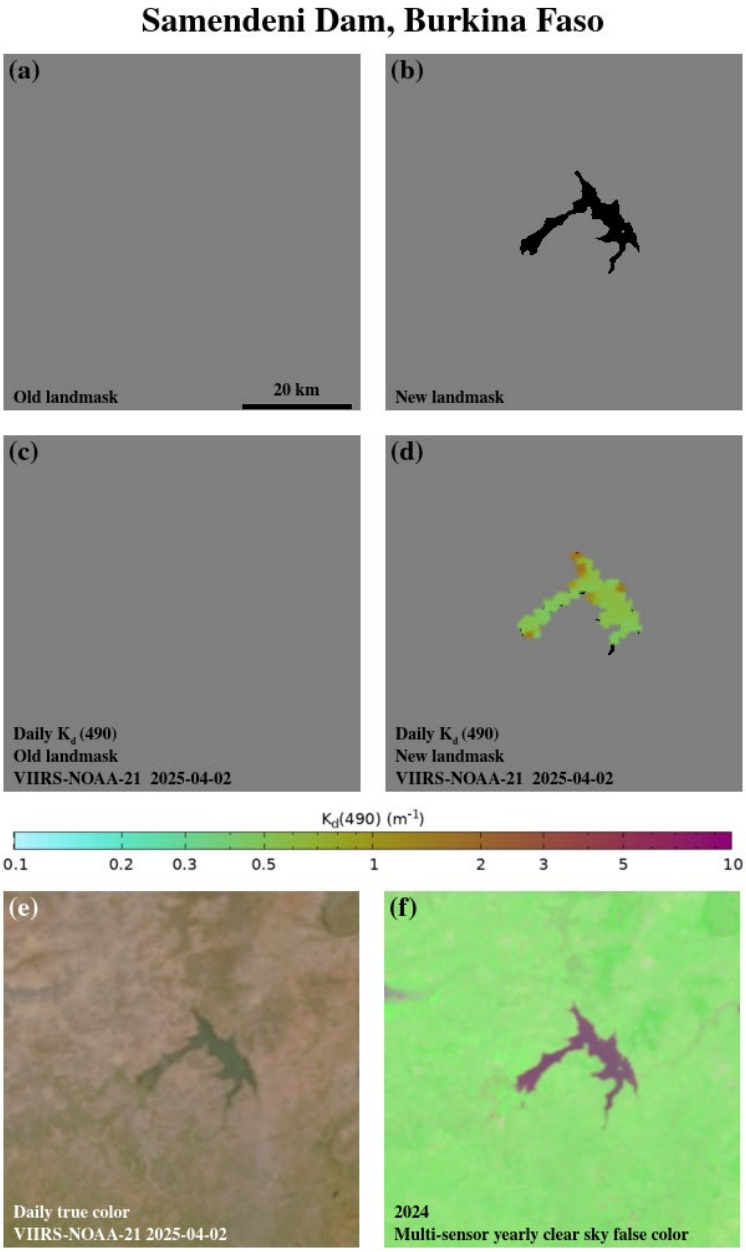

Figure S15: The extent of the Samendeni Dam reservoir Burkina Faso, in the old land mask (a) and the updated land mask (b), along with the corresponding daily $K_d(490)$ retrievals [(c) and (d)] from VIIRS-NOAA-21 on April 2, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

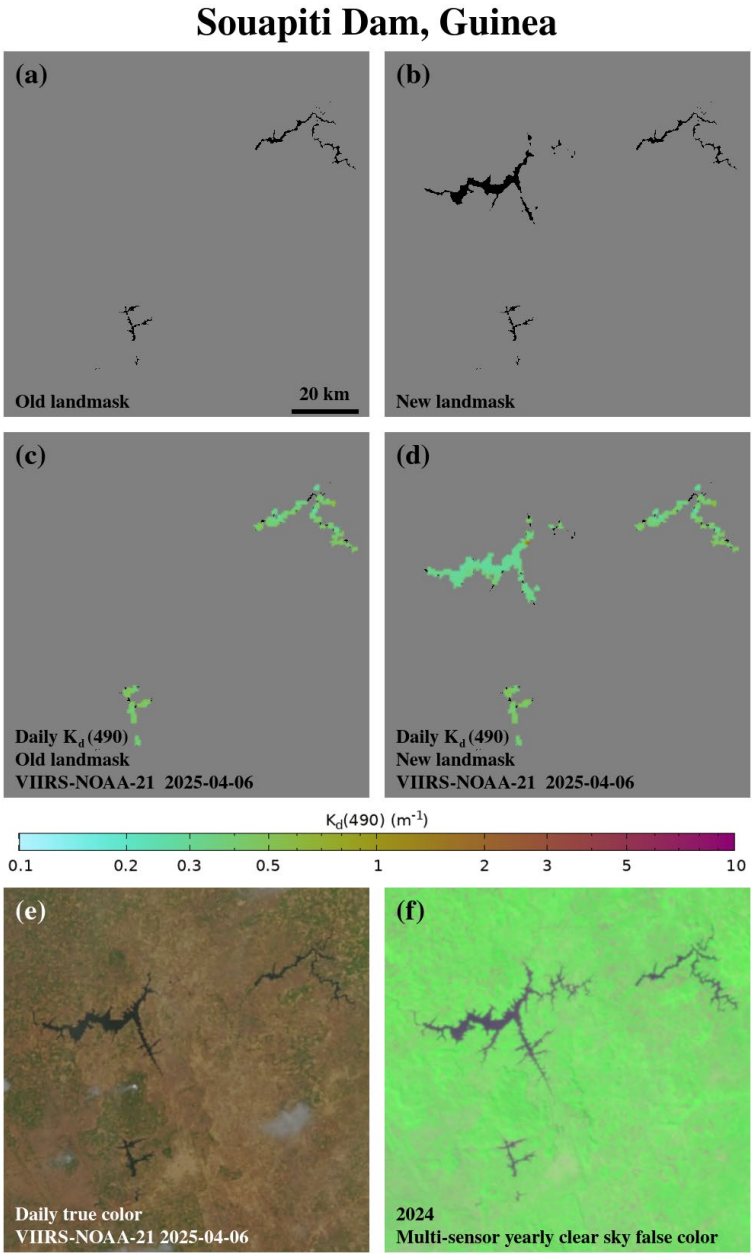

Figure S16: The extent of the Souapiti Dam reservoir (upper left), Guinea, in the old land mask (a) and the updated land mask (b), along with the corresponding daily $K_d(490)$ retrievals [(c) and (d)] from VIIRS-NOAA-21 on April 6, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

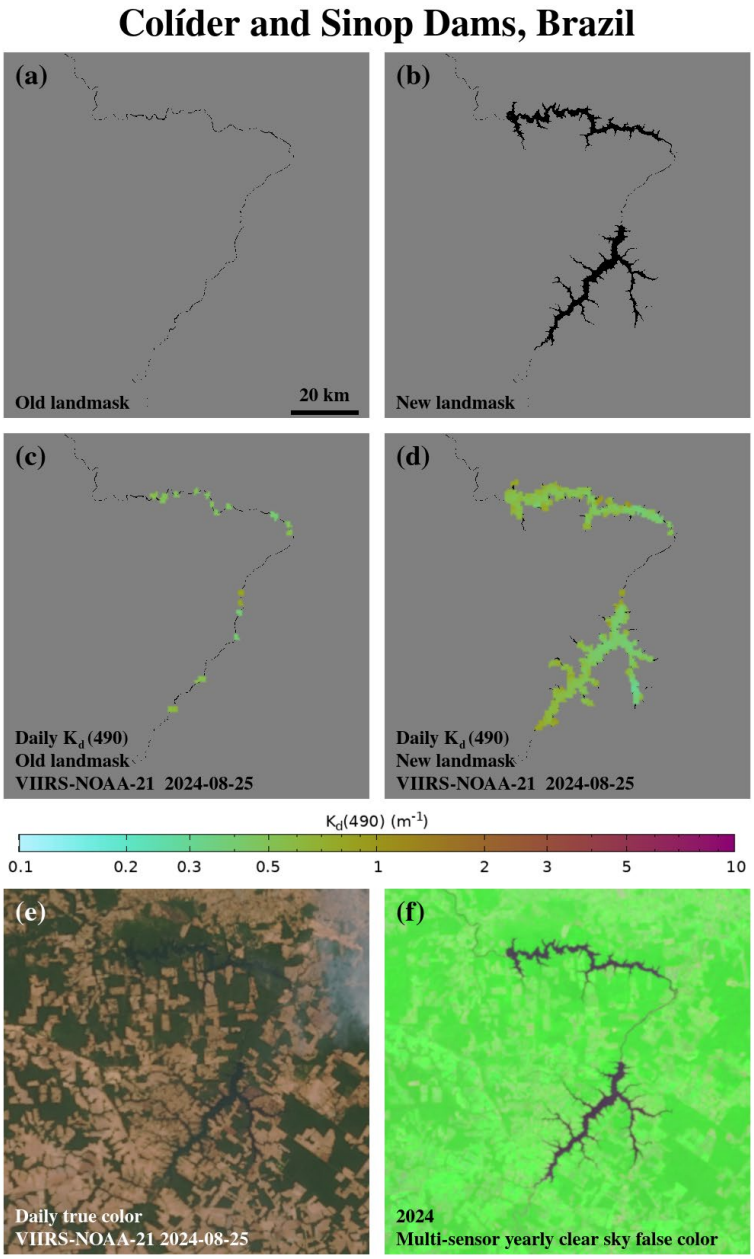

Figure S17: The extent of the Colider Dam reservoir (upper) and Sinop Dam reservoir (lower), Brazil, in the old land mask (a) and the updated land mask (b), along with the corresponding daily $K_d(490)$ retrievals [(c) and (d)] from VIIRS-NOAA-21 on August 25, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

S3. River Dams reservoirs, Asia and East Europe

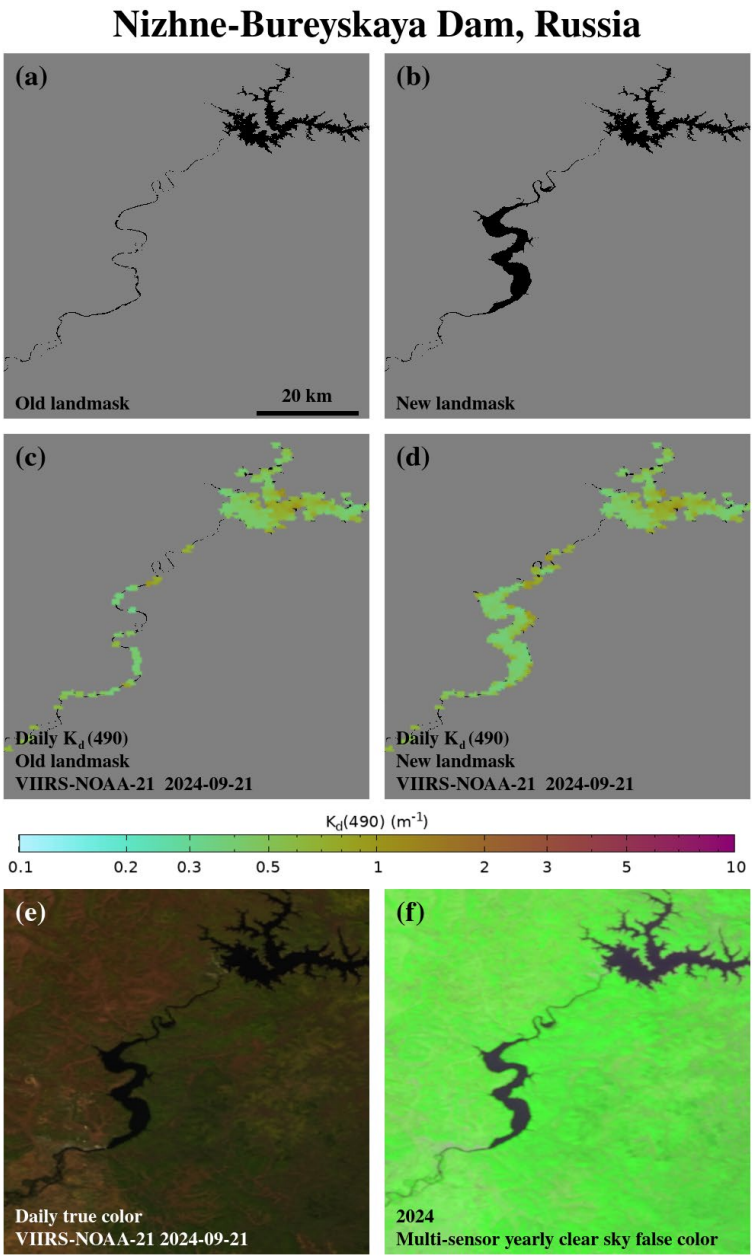

Figure S18: The extent of the Nizhne-Bureyskaya Dam reservoir (center left), Russia, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-NOAA-21 on September 21, 2024, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

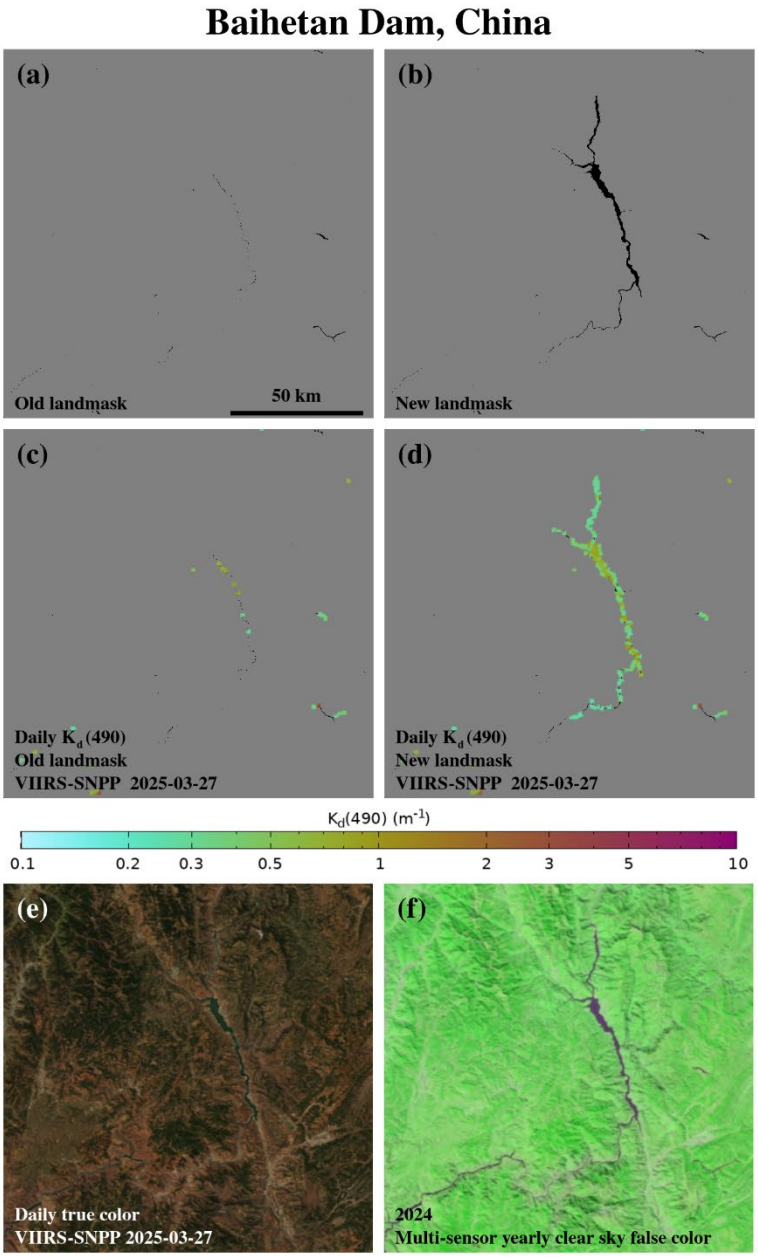

Figure S19: The extent of the Baihetan Dam reservoir, China, in the old land mask (a) and the updated land mask (b), along with the corresponding daily $K_d(490)$ retrievals [(c) and (d)] from VIIRS-SNPP on March 27, 2024, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

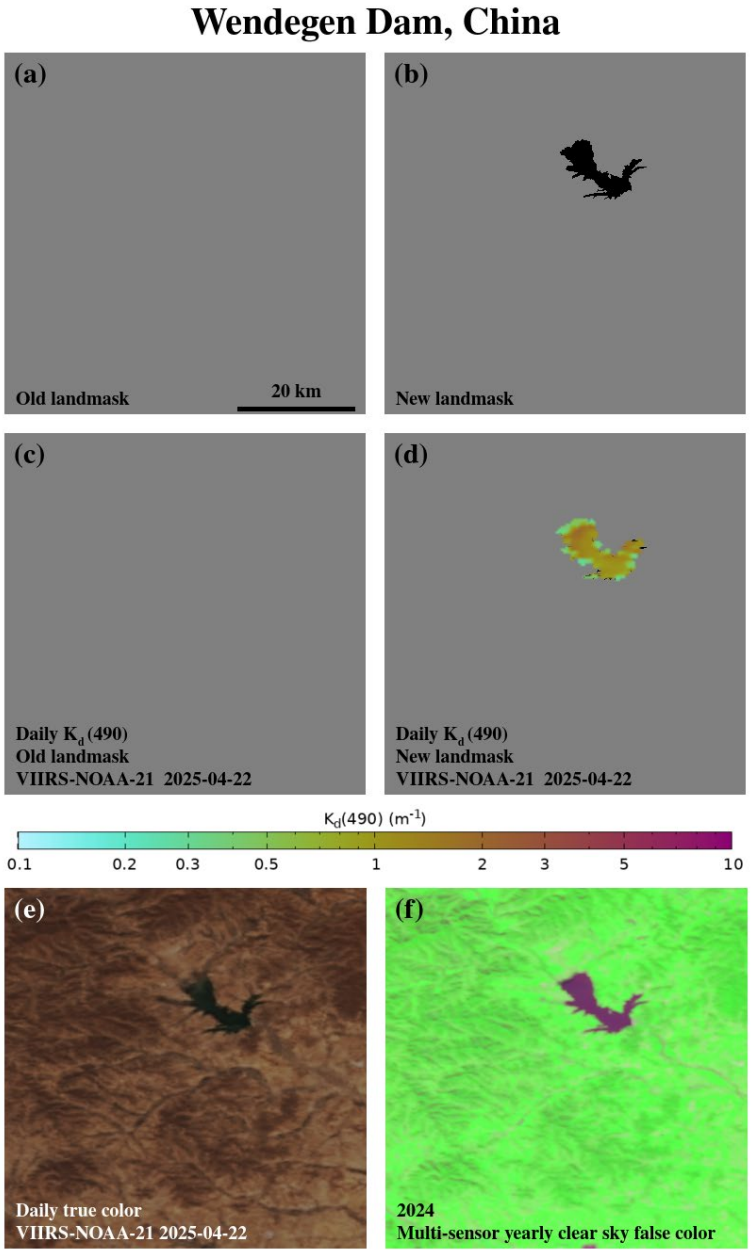

Figure S20: The extent of the Wendegen Dam reservoir, China, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-NOAA-21 on April 22, 2024, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

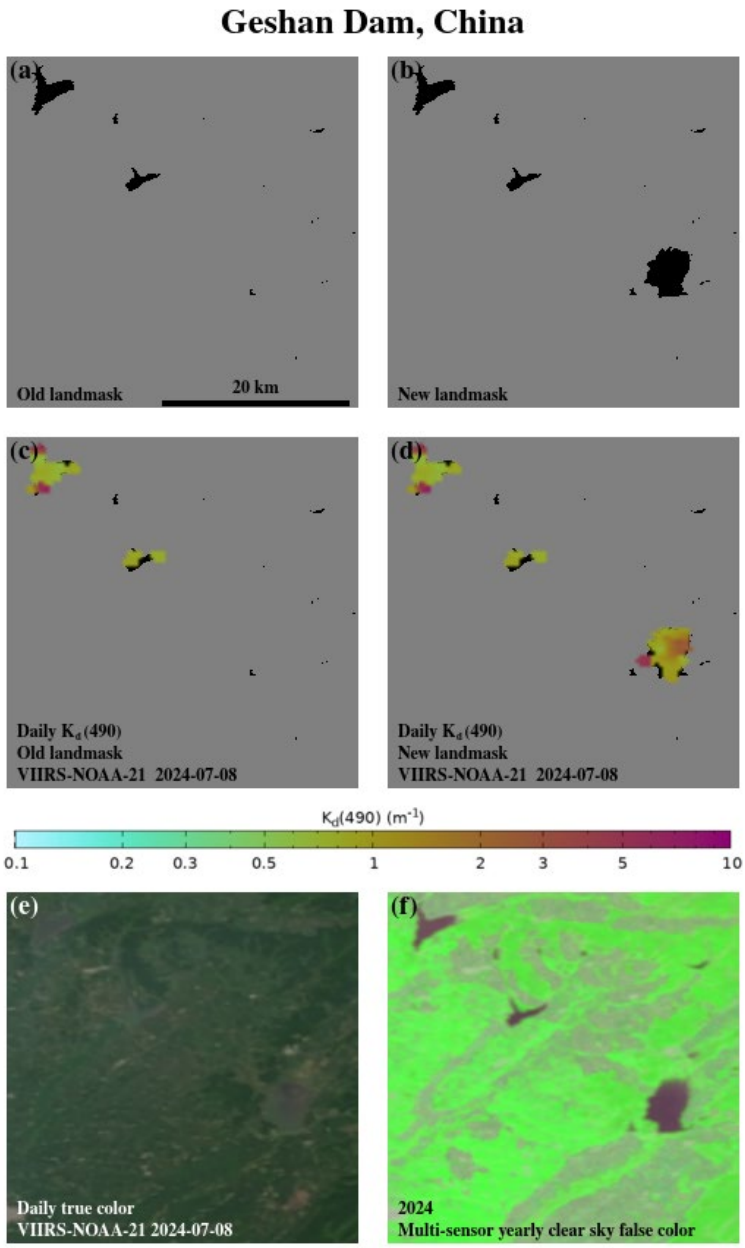

Figure S21: The extent of the Geshan Dam reservoir (lower right), China, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-NOAA-21 on July 8, 2024, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

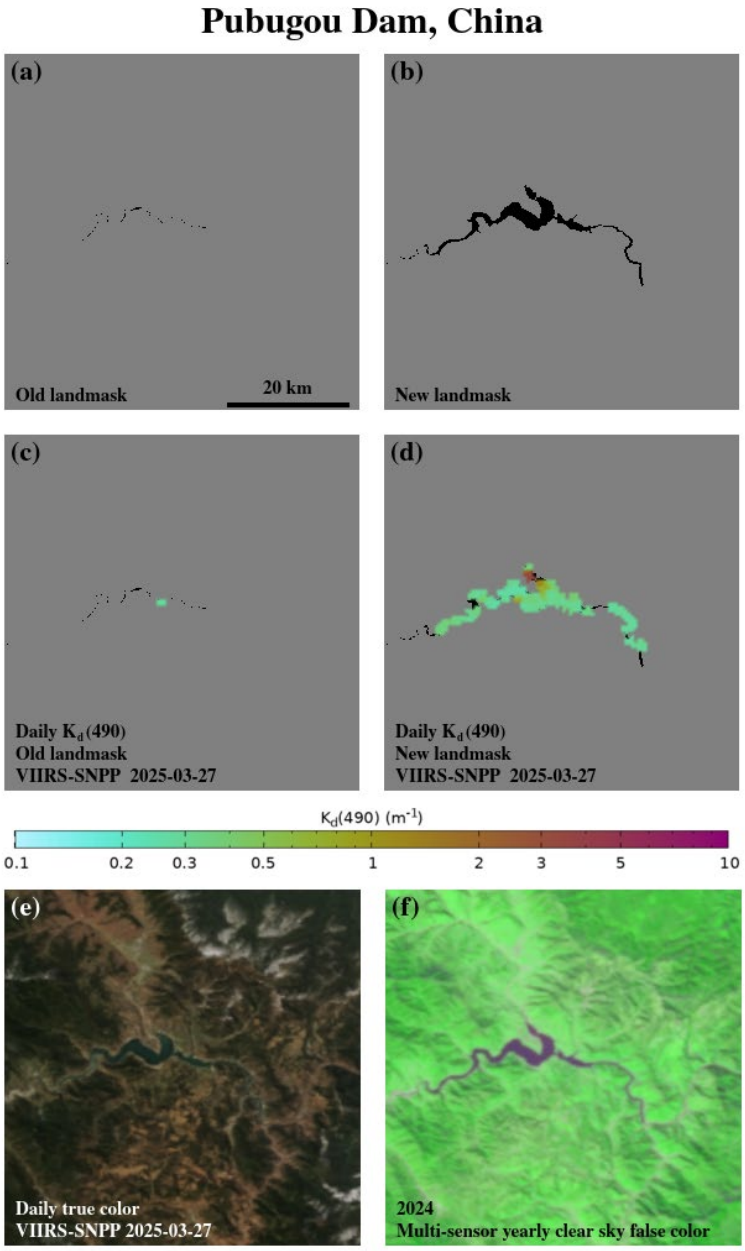

Figure S22: The extent of the Pubugou Dam reservoir, China, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-SNPP on March 27, 2024, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

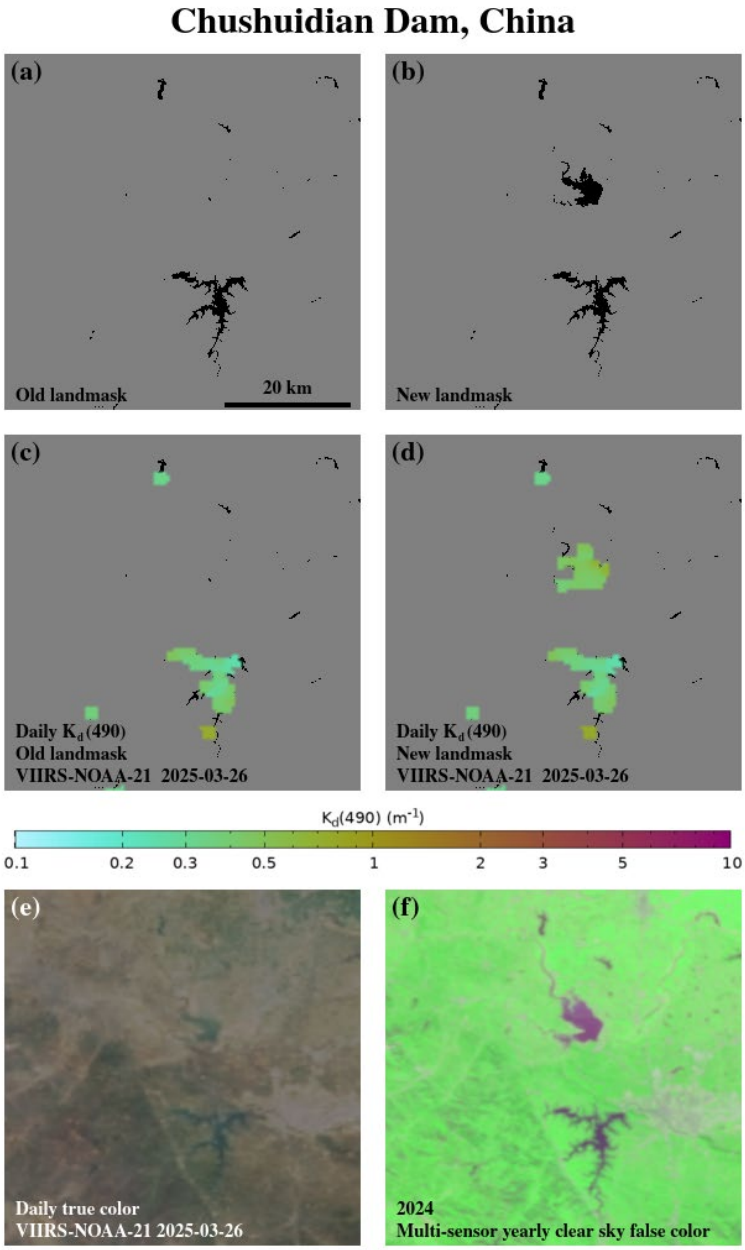

Figure S23: The extent of the Chushuidian Dam reservoir (center up), China, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-NOAA-21 on March 26, 2024, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

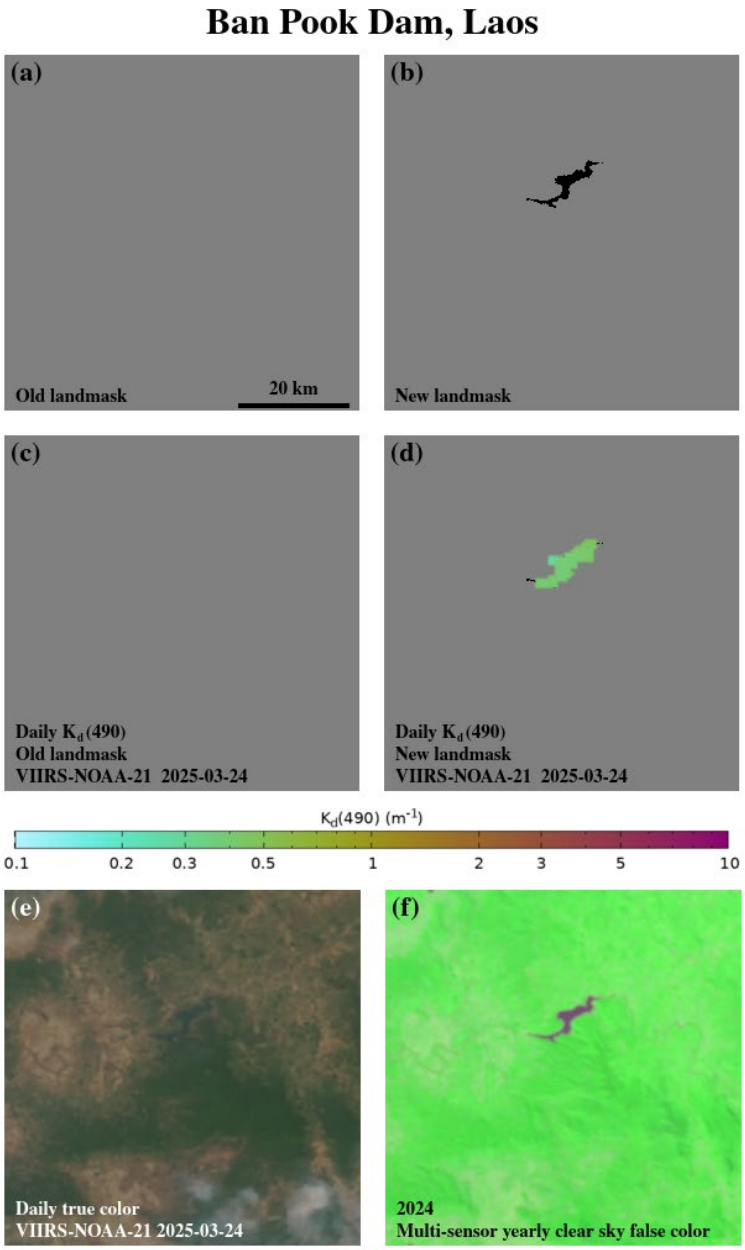

Figure S24: The extent of the Ban Pook Dam reservoir, Laos, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-NOAA-21 on March 24, 2024, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

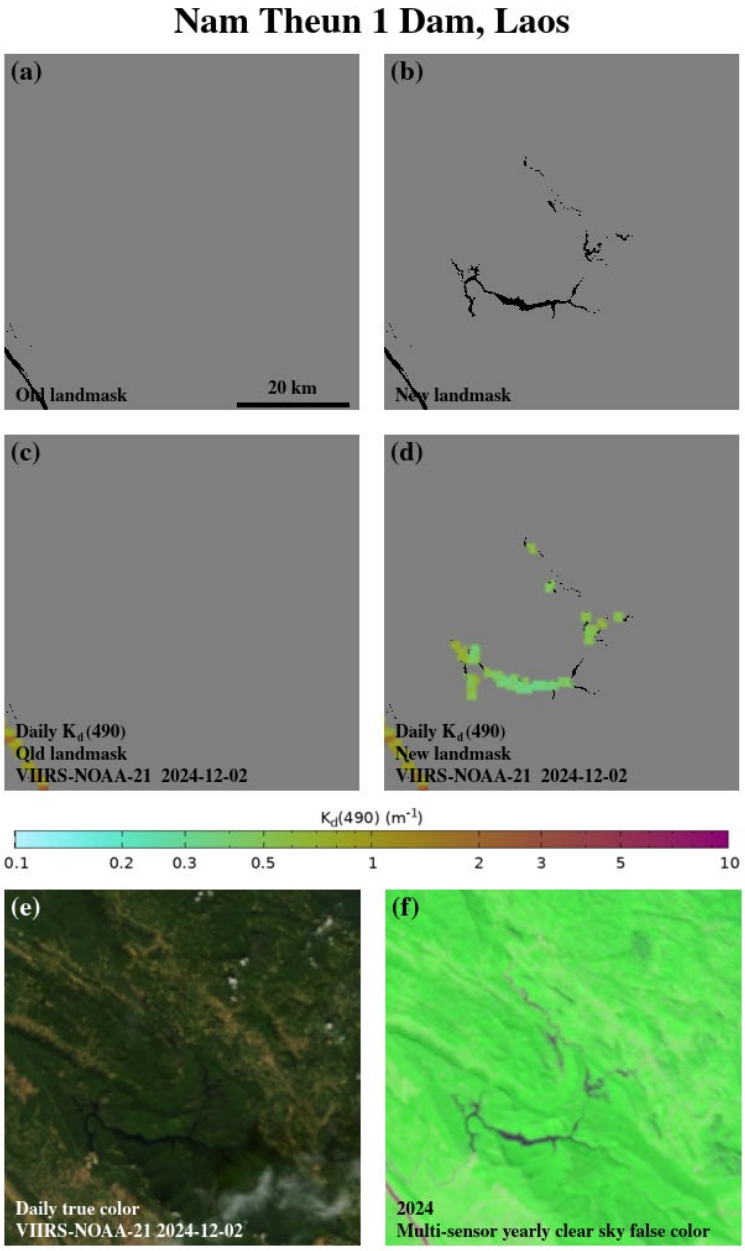

Figure S25: The extent of the Nam Theun 1 hydropower station dam reservoir, Laos, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-NOAA-21 on December 2, 2024, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

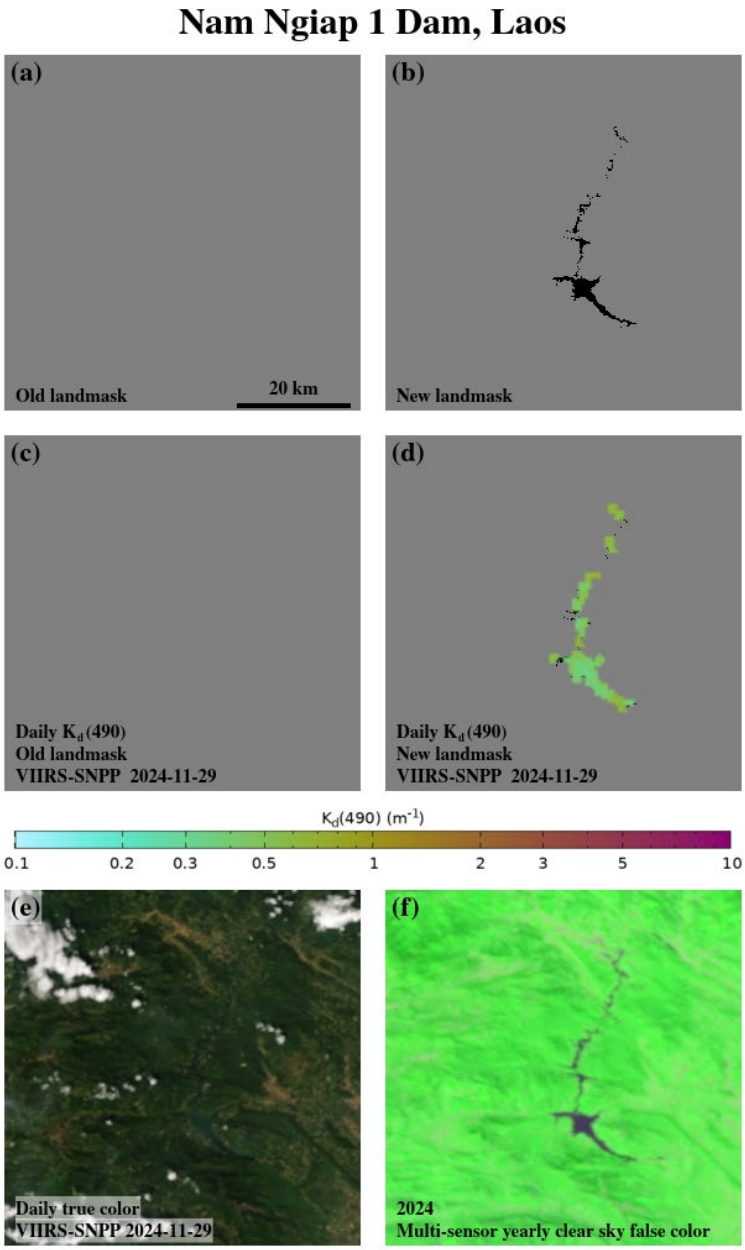

Figure S26: The extent of the Nam Ngiap 1 dam reservoir, Laos, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-SNPP on November 29, 2024, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

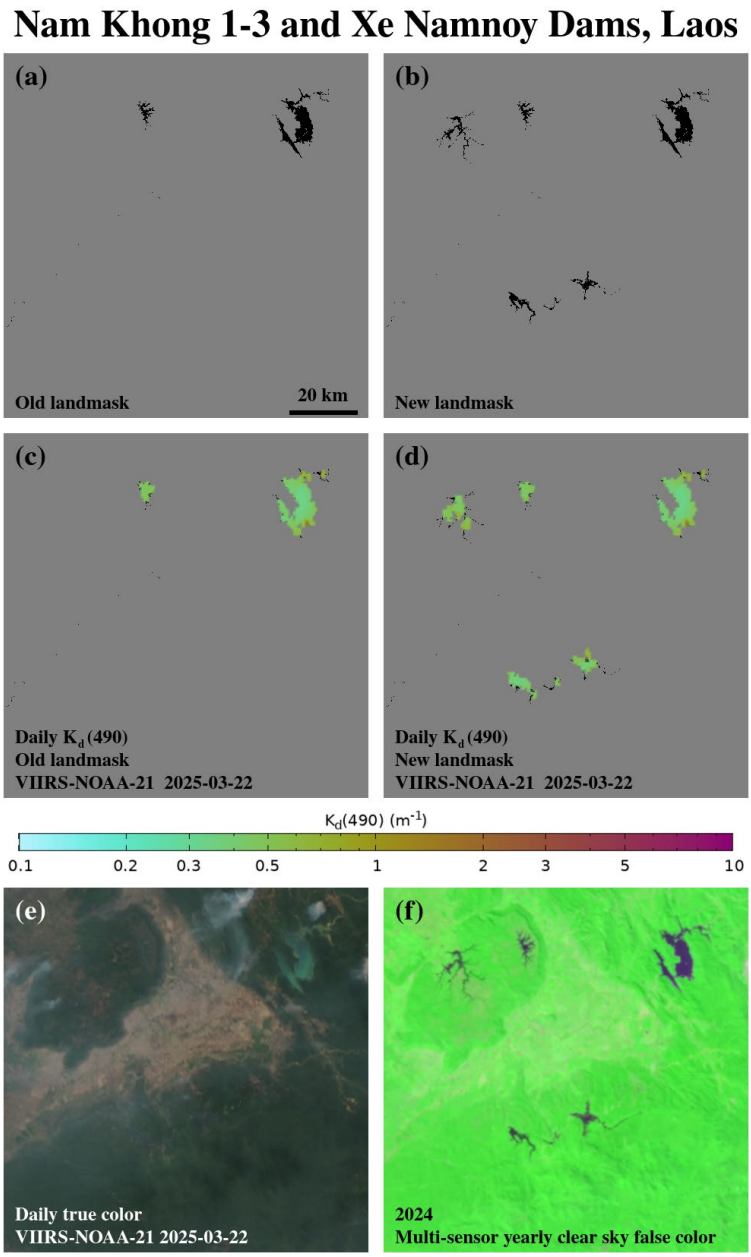

Figure S27: The extent of the Nam Kong 1–3 dams reservoirs (lower center), Xe Namnoy (upper left) and Xekaman 1 Dam reservoir (upper right), Laos, in the old land mask (a) and the updated land mask (b), along with the corresponding daily $K_d(490)$ retrievals [(c) and (d)] from VIIRS-SNPP on March 22, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

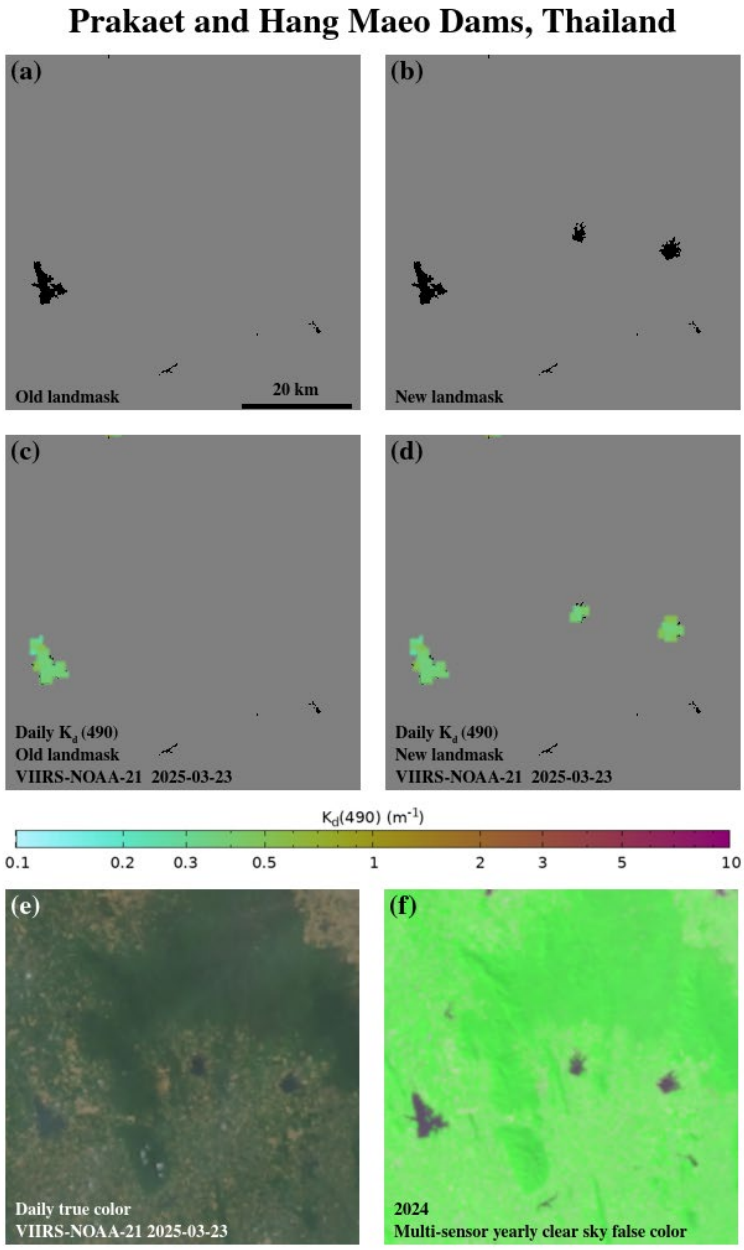

Figure S28: The extent of the Prasae (left), Prakaet (center), and Hang Maeo Dam (right) reservoirs, Thailand, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-NOAA-21 on March 23, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

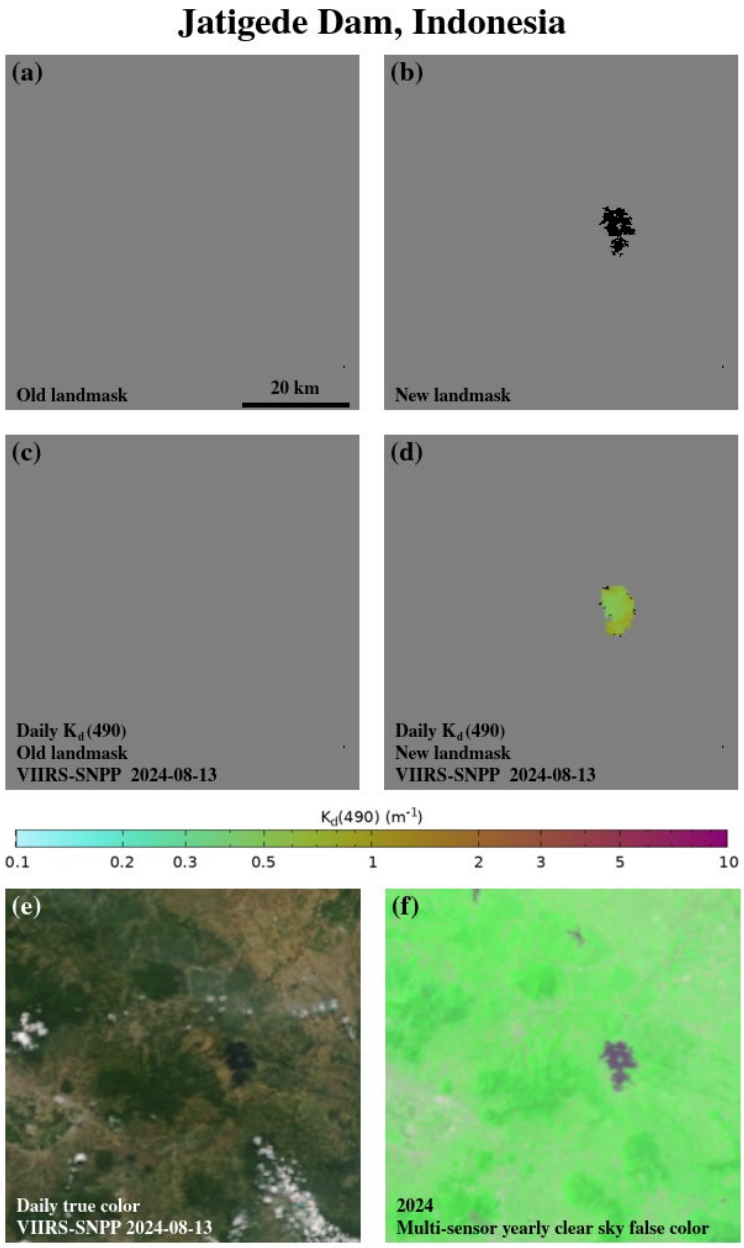

Figure S29: The extent of the Jatigede Dam reservoir, Indonesia, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-SNPP on August 13, 2024, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

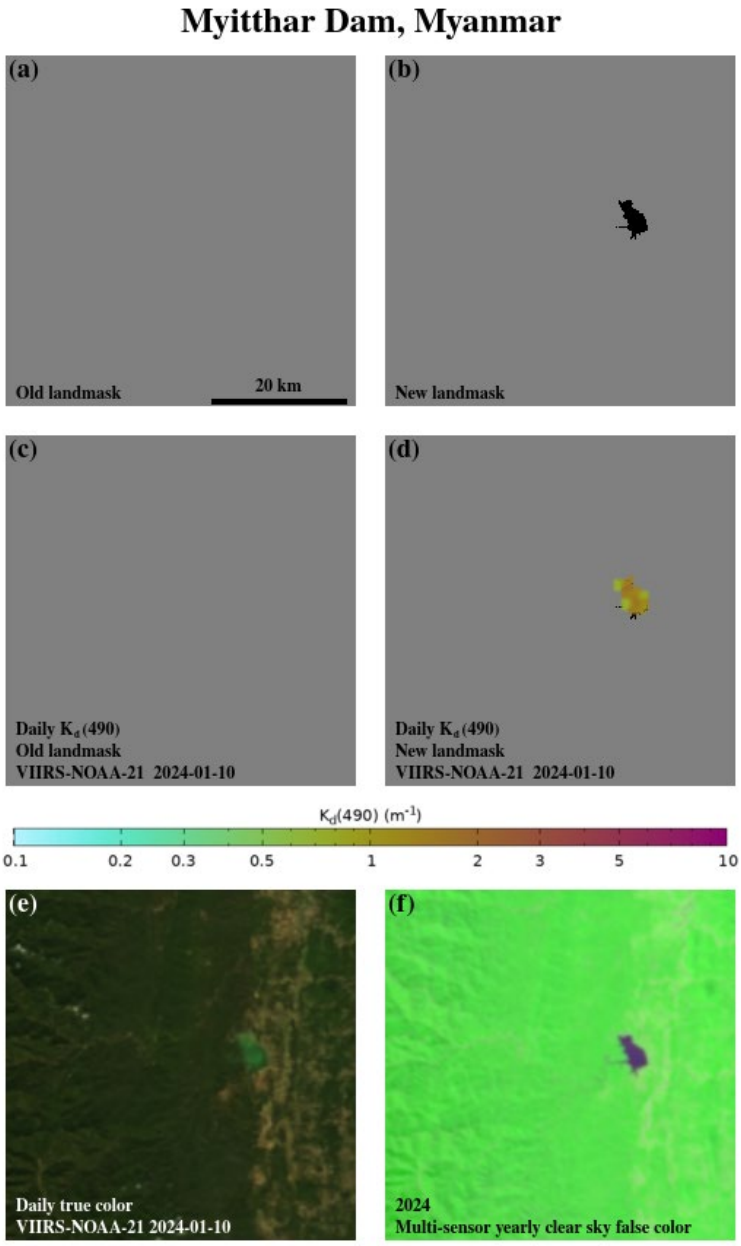

Figure S30: The extent of the Myittha Dam reservoir, Myanmar, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-SNPP on January 10, 2024, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

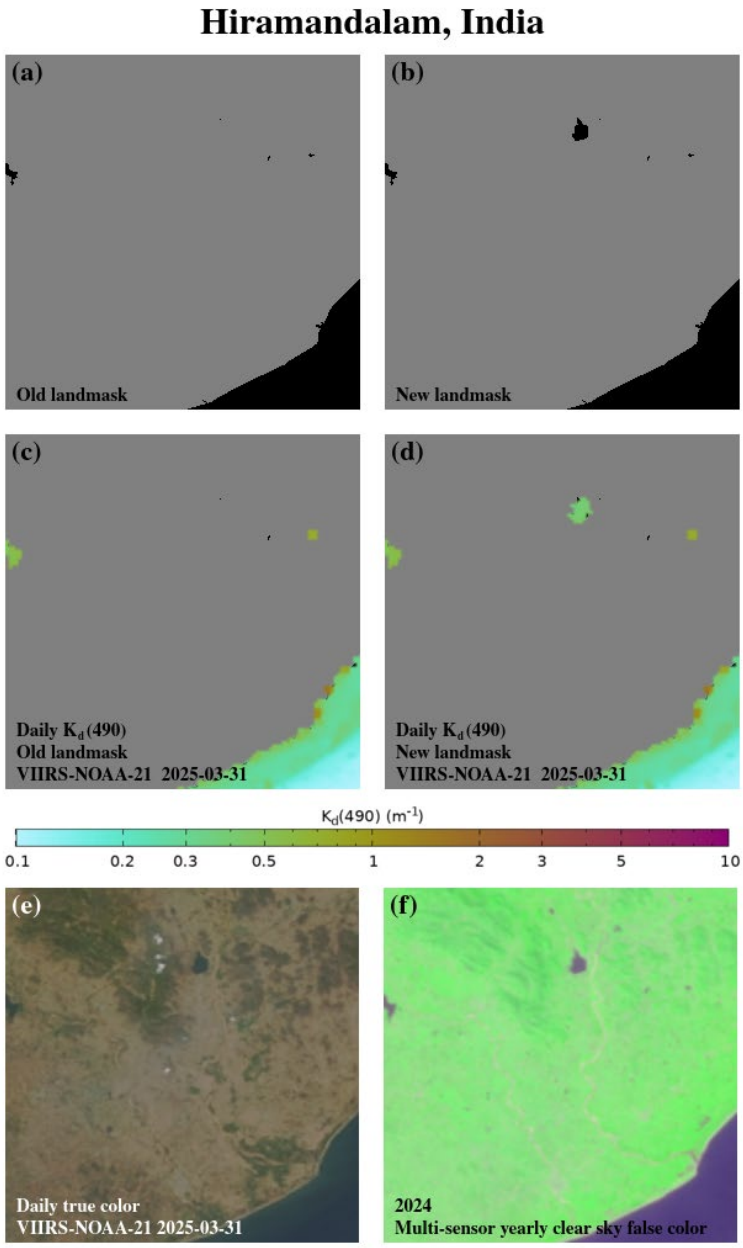

Figure S31: The extent of the Hiramandalam Dam reservoir (top center), India, in the old land mask (a) and the updated land mask (b), along with the corresponding daily $K_d(490)$ retrievals [(c) and (d)] from VIIRS-NOAA-21 on March 31, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

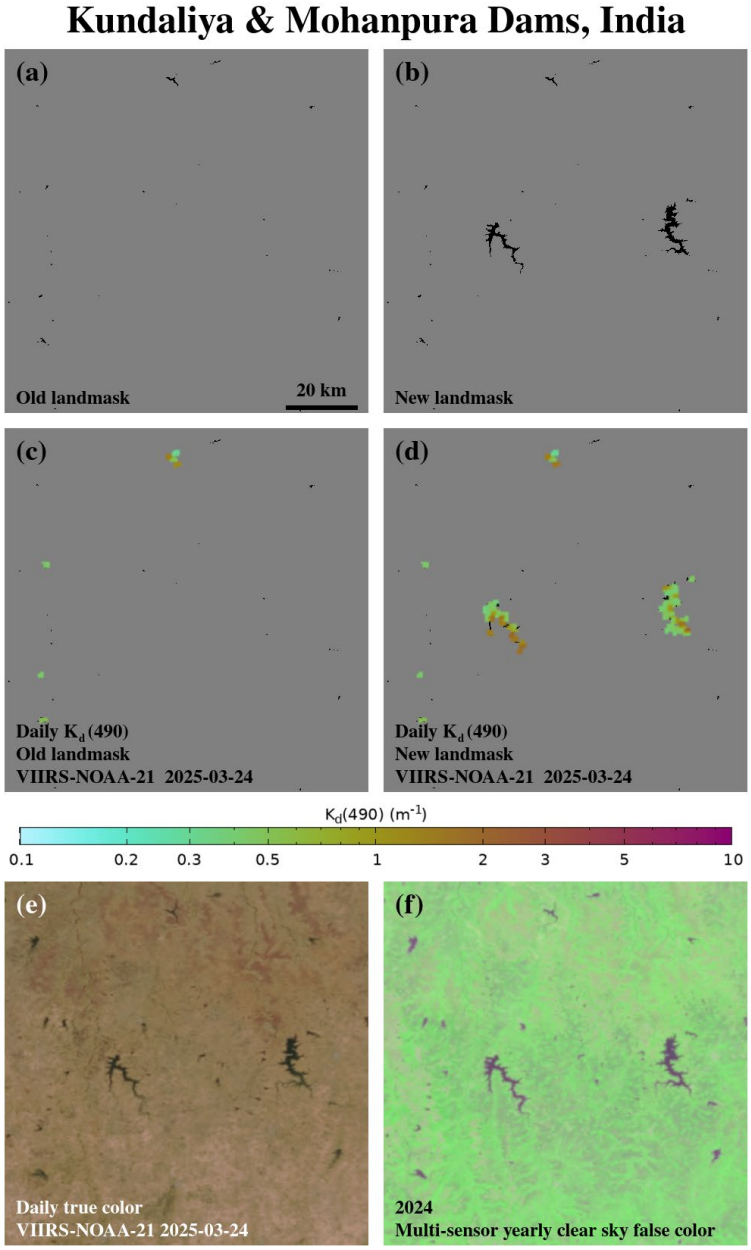

Figure S32: The extent of the Kundaliya (center left) and Mohanpura (center right) dam reservoirs, India, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-NOAA-21 on March 24, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

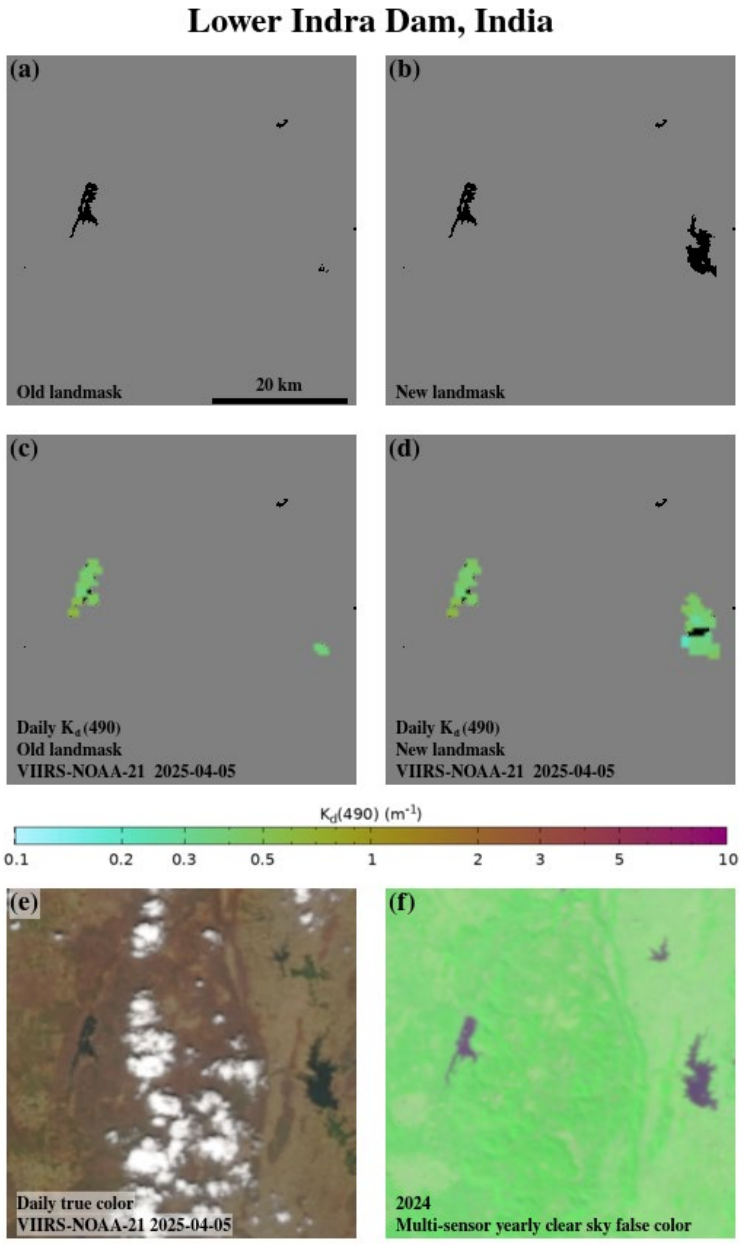

Figure S33: The extent of the Sikaser Dam (left) and Lower Indra Dam (right) reservoirs, India, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-NOAA-21 on April 5, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

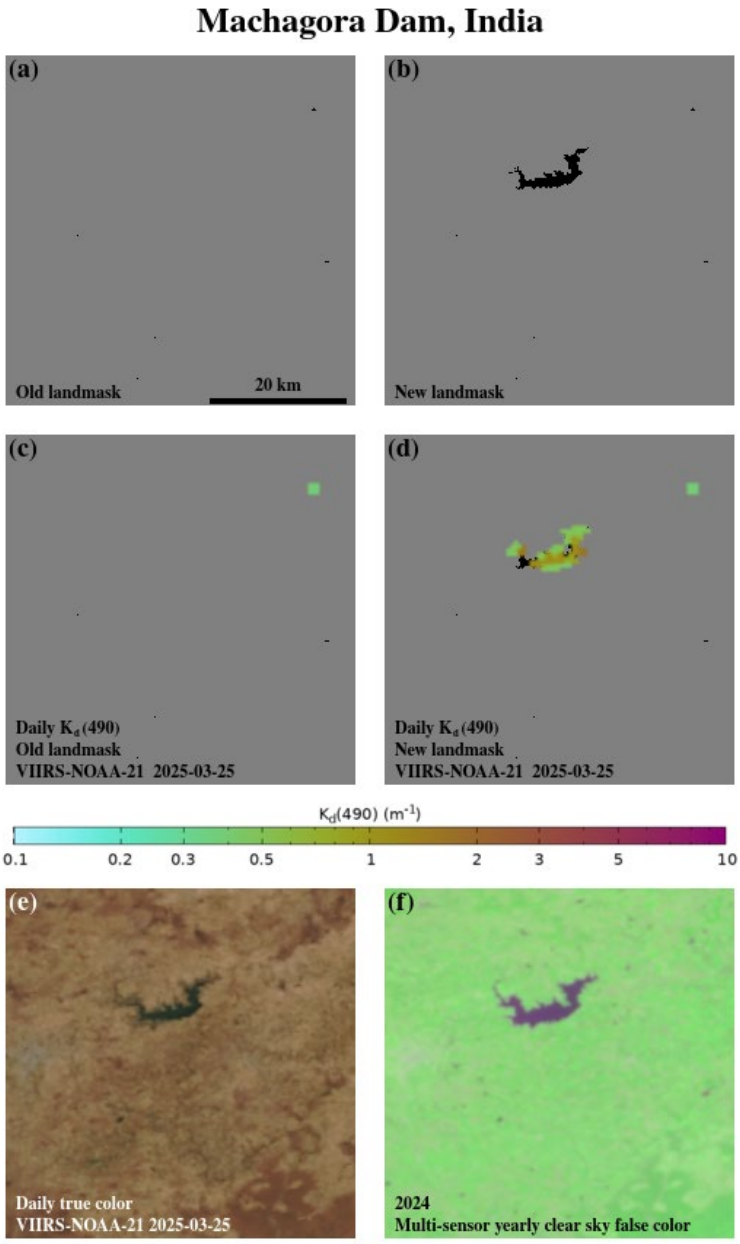

Figure S34: The extent of the Machagora Dam reservoir, India, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-NOAA-21 on March 25, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

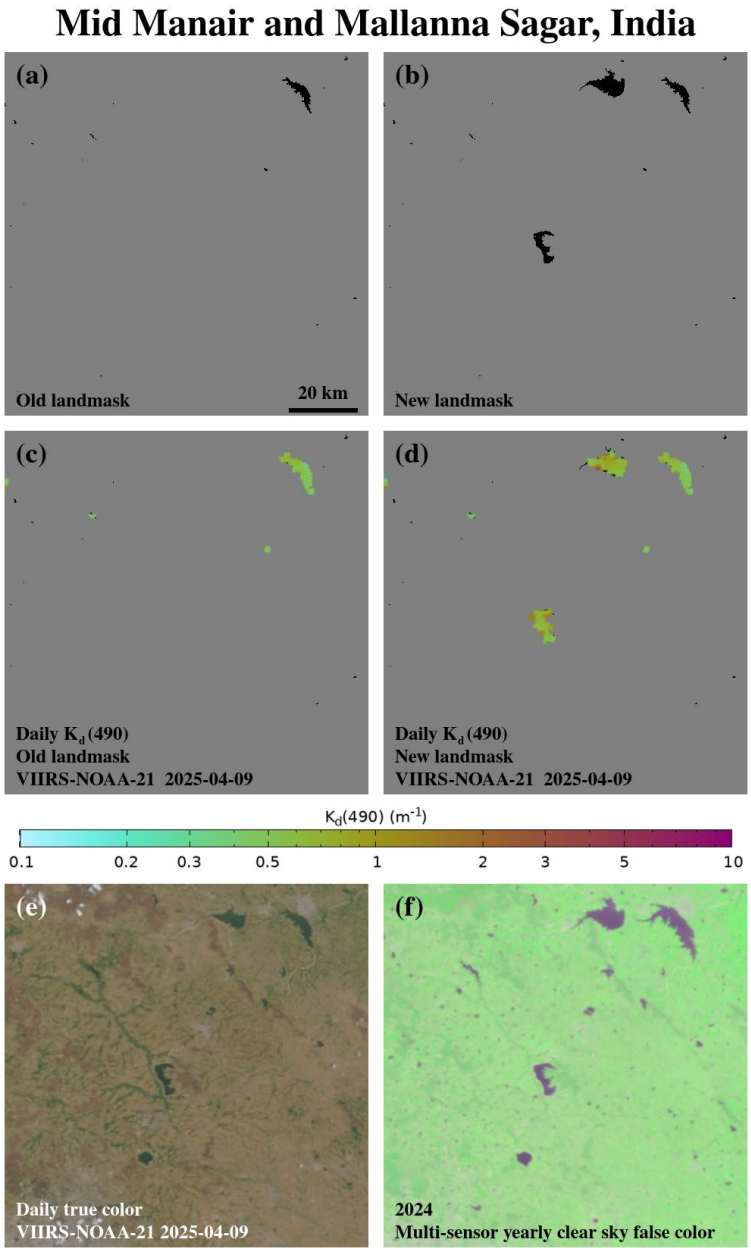

Figure S35: The extent of the Mid Manair and Lower Manair Dams (top) and Mallana Sagar reservoir, India, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-NOAA-21 on April 9, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

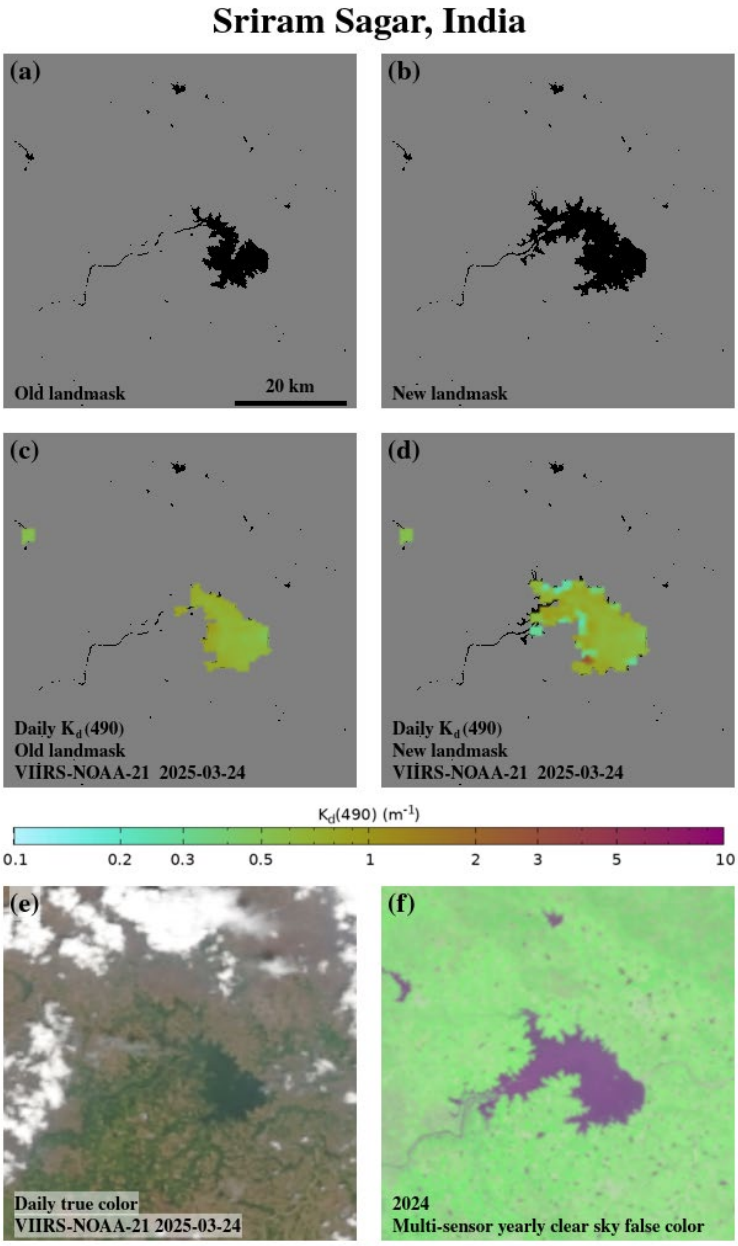

Figure S36: The extent of the Sriram Sagar Dam reservoir, India, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-NOAA-21 on March 24, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

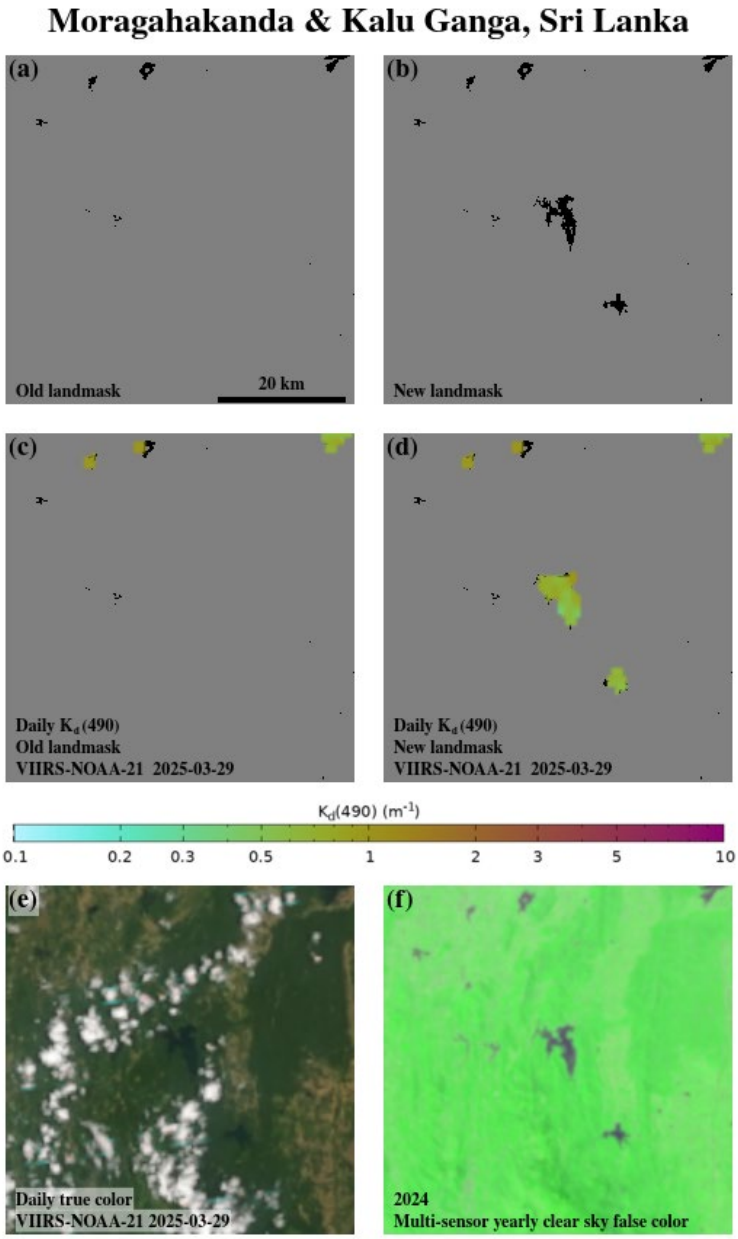

Figure S37: The extent of the Moragahakanda (center) and Kalu Ganga Dam reservoir (lower right), Sri Lanka, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-NOAA-21 on March 29, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

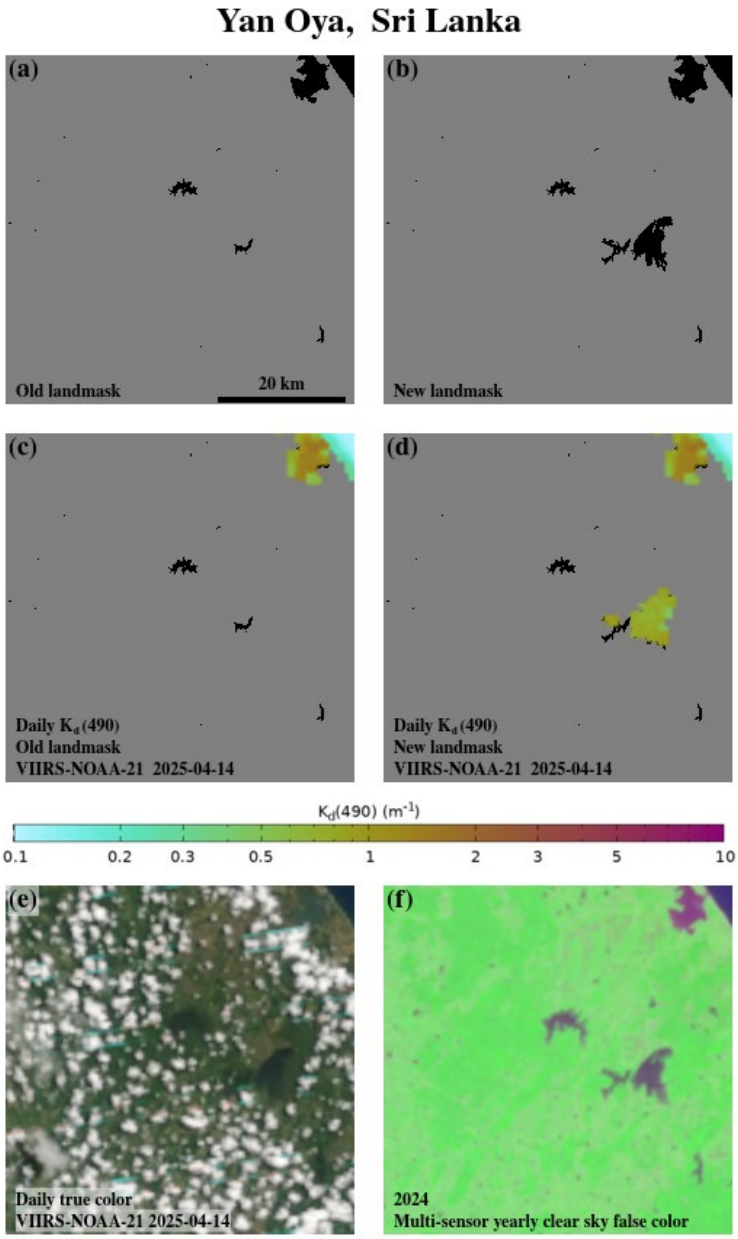

Figure S38: The extent of the Yan Oya Dam reservoir (center right), Sri Lanka, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-NOAA-21 on March 29, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

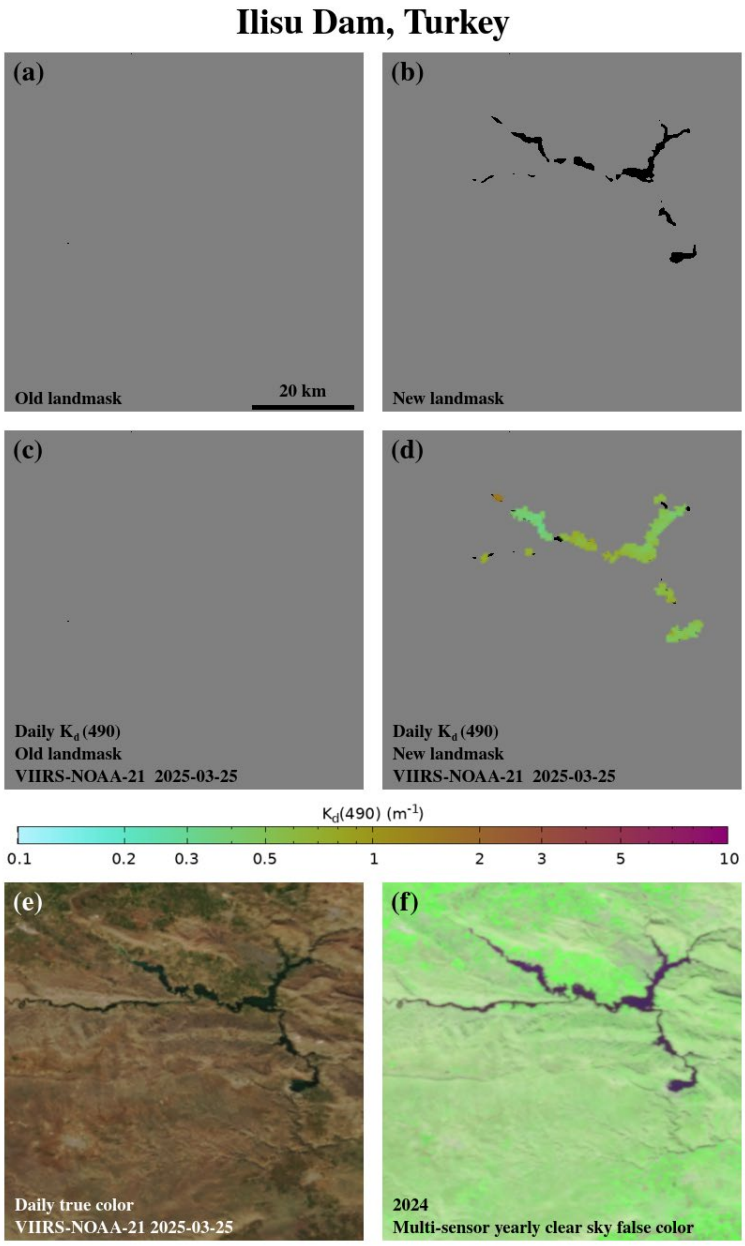

Figure S39: The extent of the Ilısu Dam reservoir, Turkey, in the old land mask (a) and the updated land mask (b), along with the corresponding daily $K_d(490)$ retrievals [(c) and (d)] from VIIRS-NOAA-21 on March 25, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

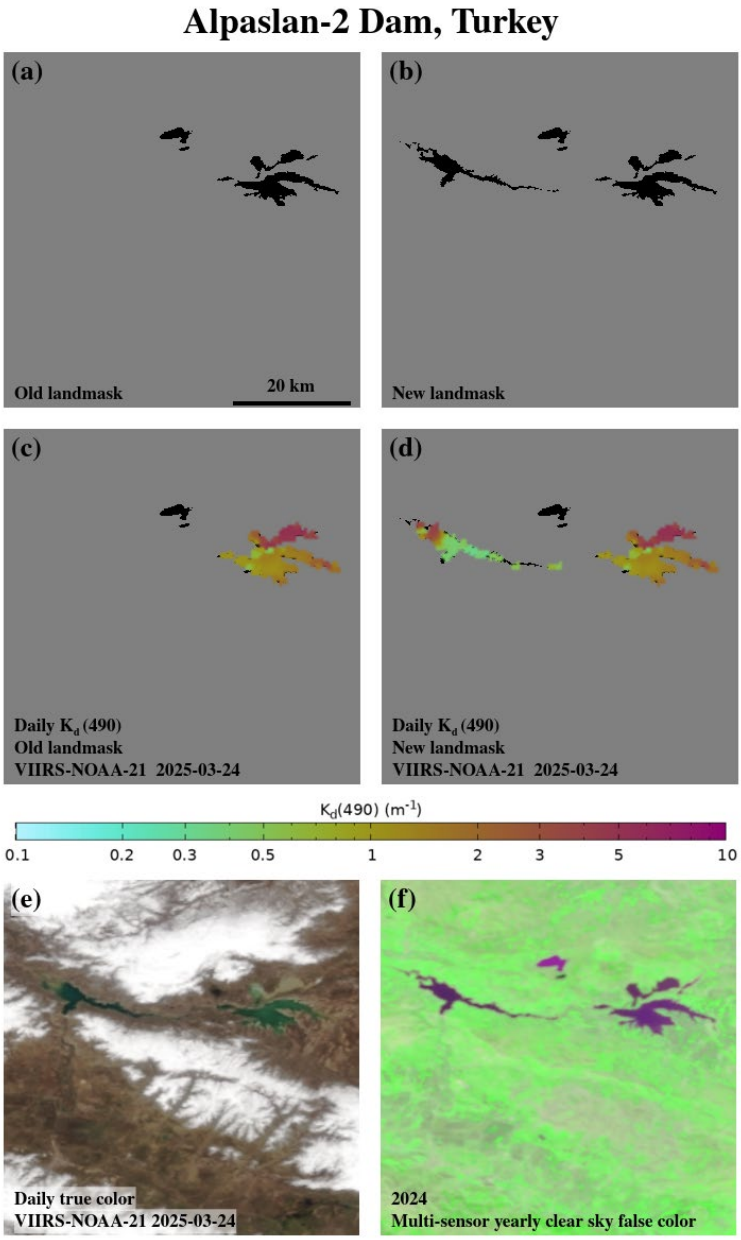

Figure S40: The extent of the Alpaslan-2 (left) and Alpaslan-1 (right) dam reservoirs, Turkey, in the old land mask (a) and the updated land mask (b), along with the corresponding daily K_d(490) retrievals [(c) and (d)] from VIIRS-NOAA-21 on March 24, 2025, and the corresponding true color imagery (e). The yearly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

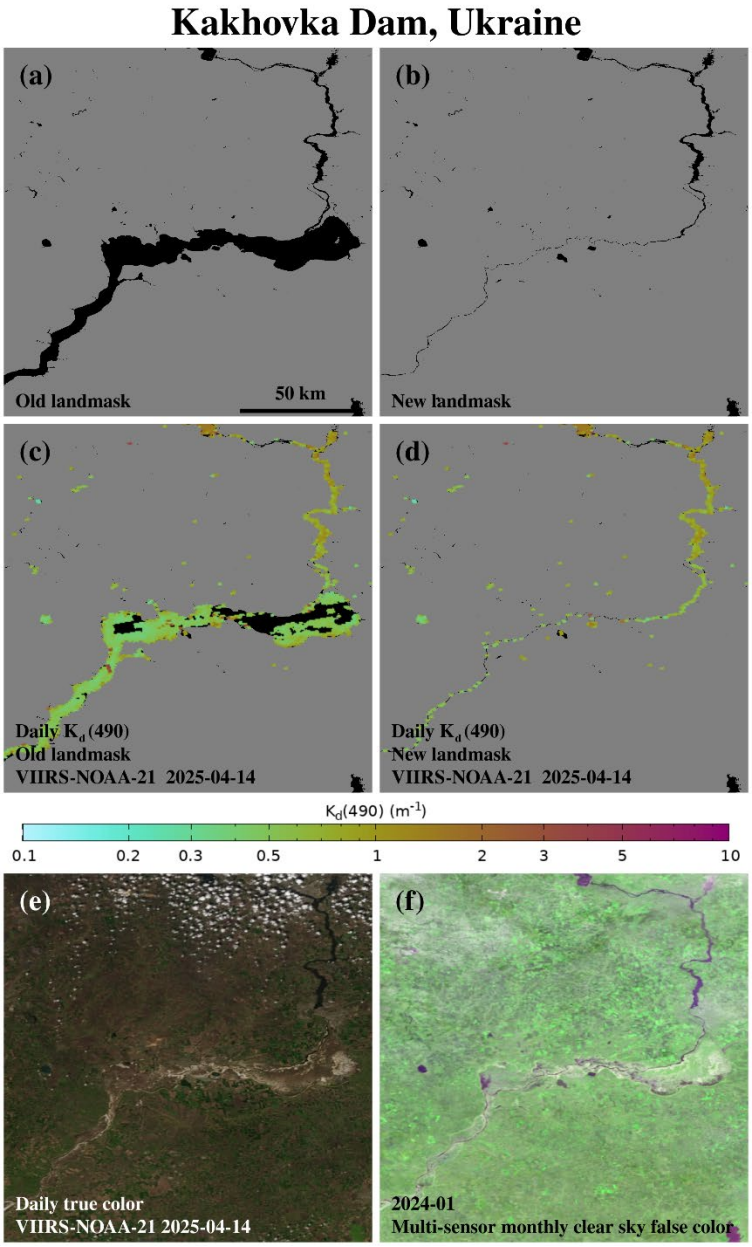

Figure S41: The extent of the Kakhovka Dam reservoir, Ukraine, in the old land mask (a) and the updated land mask (b), along with the corresponding daily $K_d(490)$ retrievals [(c) and (d)] from VIIRS-NOAA-21 on April 14, 2025, and the corresponding true color imagery (e). The monthly clear sky false color imagery (f) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in January 2024.

S4. Changes to coastal regions

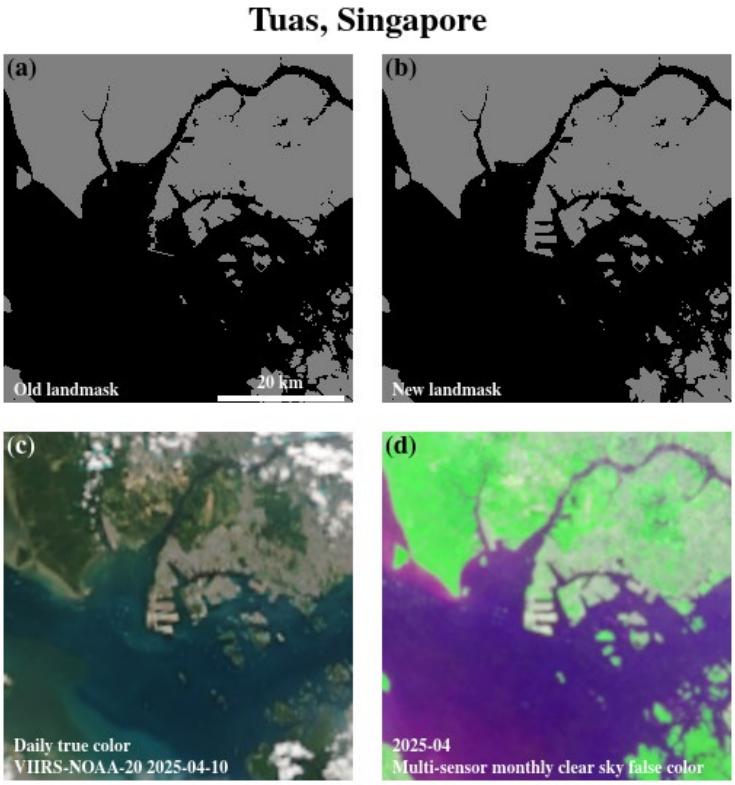

Figure S42: Changes due to land reclamation in Tuas, Singapore, between the old land mask (a) and the updated land mask (b), along with the corresponding VIIRS NOAA-20 daily true color imagery from April 10, 2025 (c), and the monthly clear sky false color imagery (d) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in April 2024.

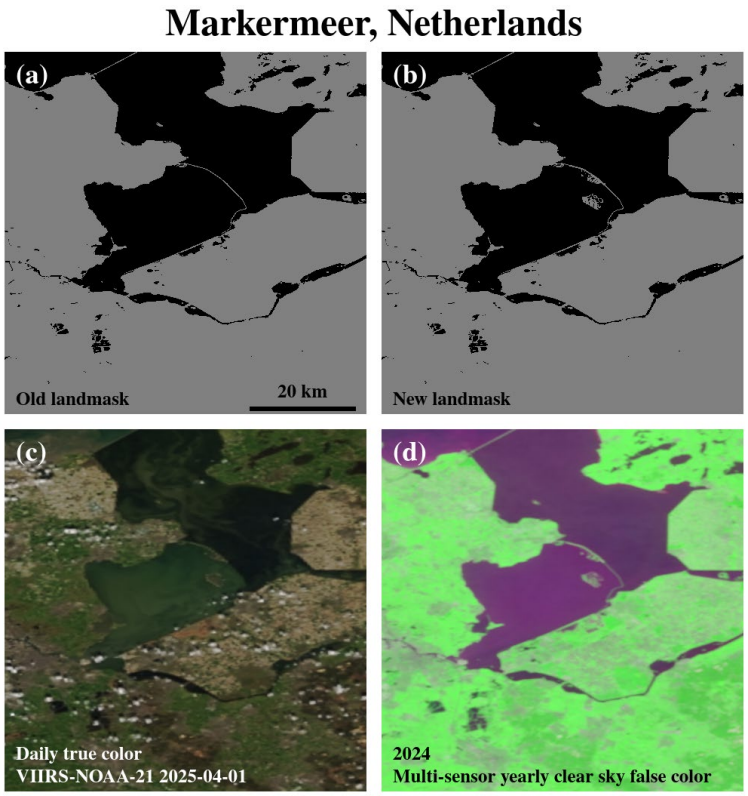

Figure S43: Changes due to land reclamation in Markermeer, Netherlands, between the old land mask (a) and the updated land mask (b), along with the corresponding VIIRS NOAA-21 daily true color imagery from April 1, 2025 (c), and the yearly clear sky false color imagery (d) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

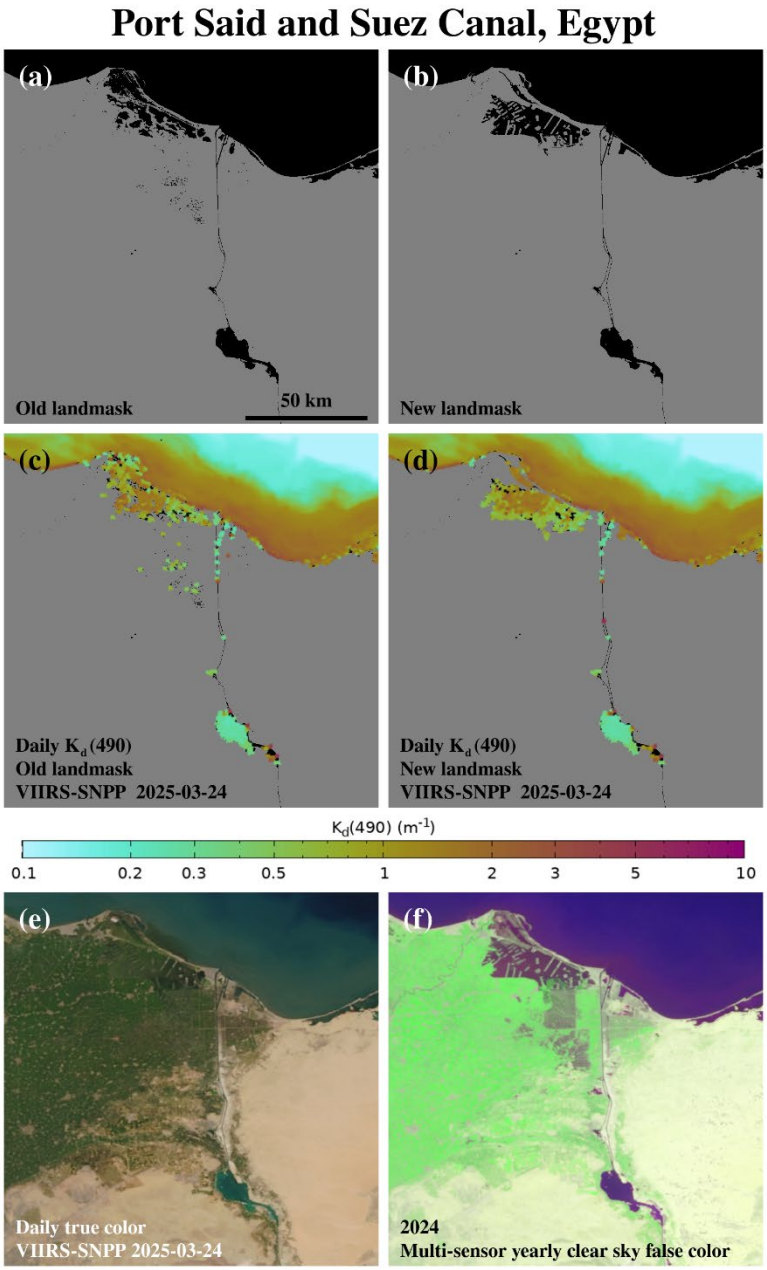

Figure S44: Changes due to land development near Port Said and expansion of Suez Canal, Egypt, between the old land mask (a) and the updated land mask (b), along with the corresponding VIIRS-SNPP daily true color imagery from March 24, 2025 (c), and the yearly clear sky false color imagery (d) obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.

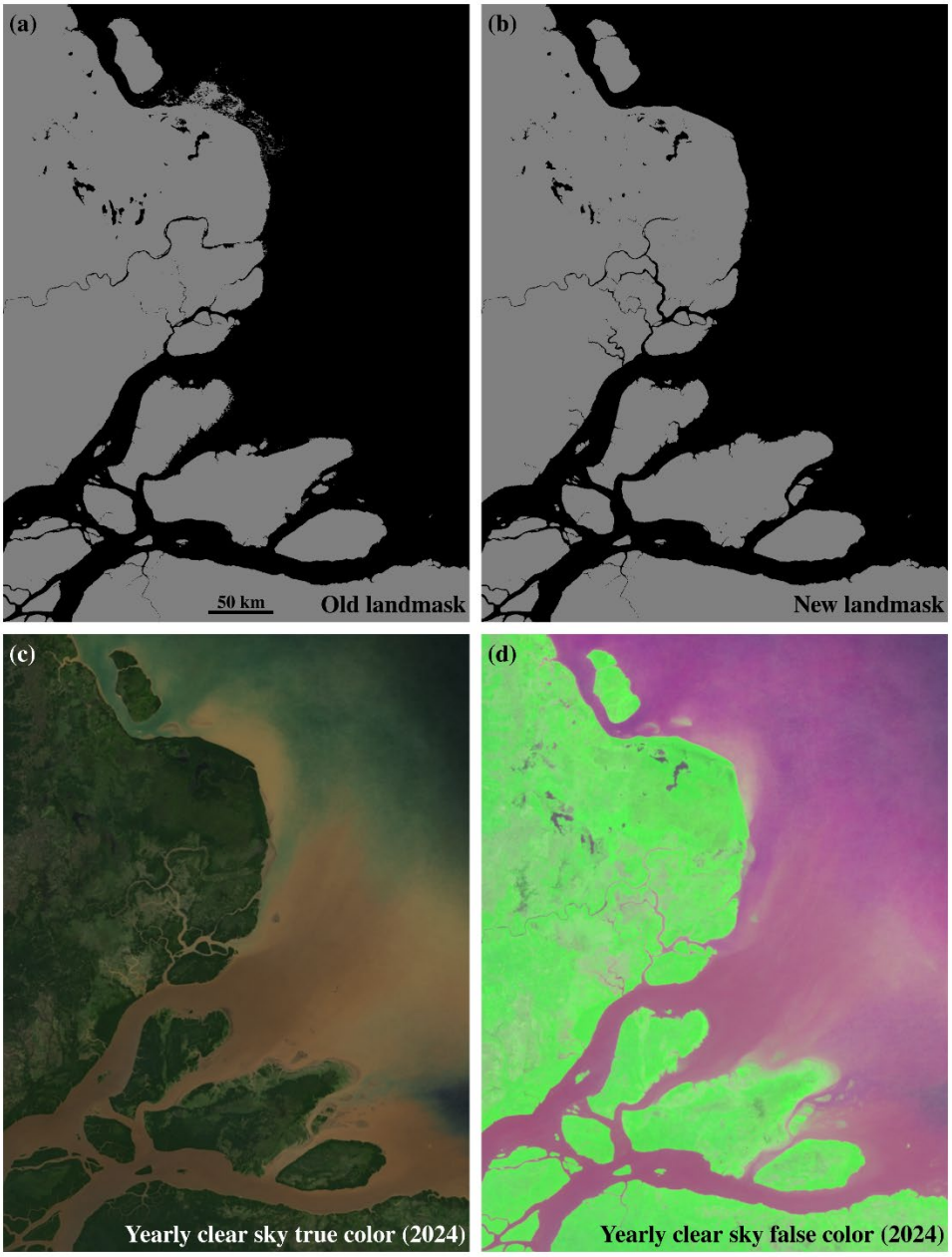

Figure S45: Changes in the Amazon River Delta region between the old land mask (a) and the updated land mask (b), including removal of artifacts, and updates to reflect recent changes to the river paths and island coastlines. The corresponding yearly clear sky true color imagery in panel (c) and yearly clear sky false color imagery in panel (d) are obtained from VIIRS-SNPP and VIIRS-NOAA-21 daily false color imageries in 2024.