

**Colin A. Stedmon^{1*}; Rainer M.W. Amon^{2,3}, Dorothea Bauch^{4,5} Astrid Bracher^{6,7},
Rafael Gonçalves-Araujo¹; Mario Hoppmann⁶; Richard Krishfield⁸; Samuel
Laney⁸; Benjamin Rabe⁶; Heather Reader⁹; Mats A. Granskog¹⁰**

¹ National Institute for Aquatic Resources, Technical University of Denmark, Lyngby,
Denmark.

² Texas A&M University, Department of Marine and Coastal Environmental Science,
Galveston, USA

³ Texas A&M University, Department of Oceanography, College Station, USA

⁴ Leibniz Laboratory, University of Kiel, Kiel, Germany

⁵ GEOMAR Helmholtz Centre for Ocean Research Kiel, Kiel, Germany

⁶ Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung,
Bremerhaven, Germany

⁷ Institute of Environmental Physics, Faculty of Physics and Electrical Engineering,
University Bremen, Bremen, Germany

⁸ Woods Hole Oceanographic Institution, Woods Hole, Massachusetts, USA.

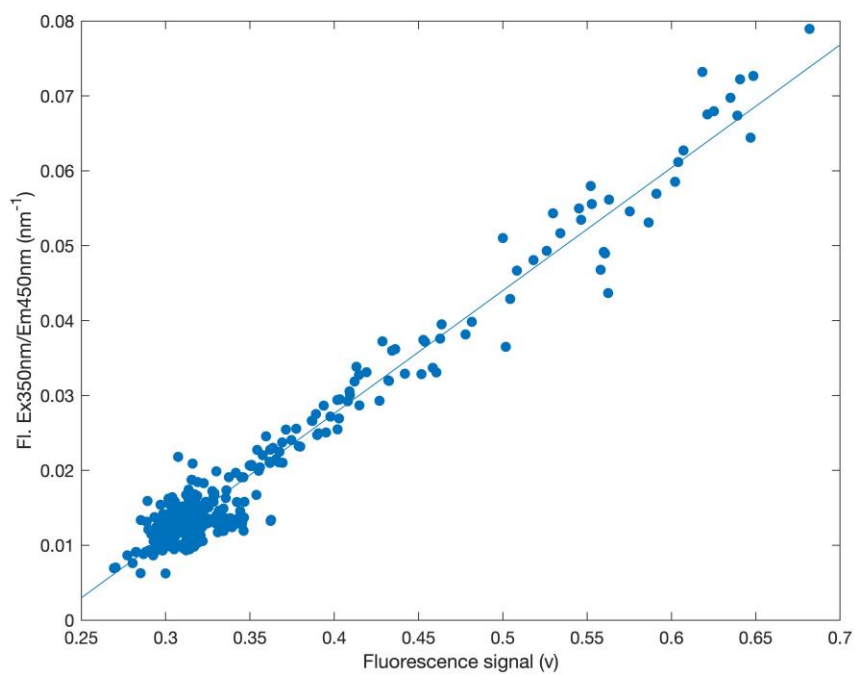
⁹ Department of Chemistry, Memorial University of Newfoundland, St John's, Canada.

¹⁰ Norwegian Polar Institute, Fram Centre, Tromsø, Norway.

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36 **Figure S1.** Calibration of the CTD mounted fluorometer on PS94 to water samples taken and
37 measured onboard. $Fl. = V * 0.1641 - 0.0380$; $R^2 = 0.96$.

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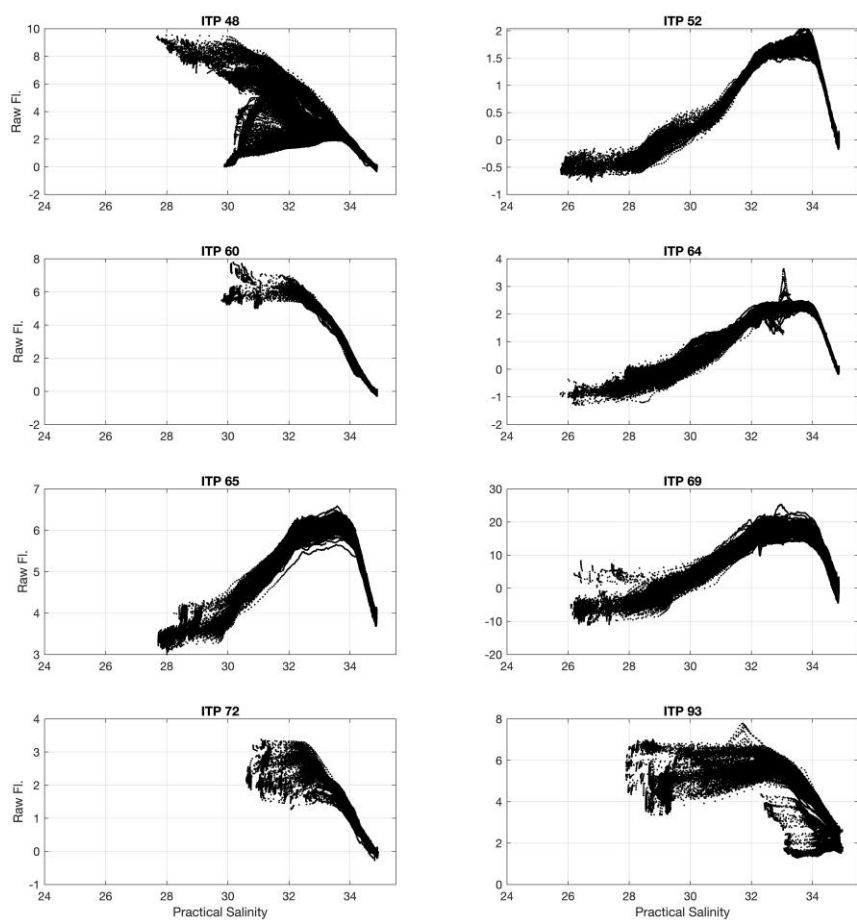


Figure S2. Raw fluorescence signal from the ITPs.

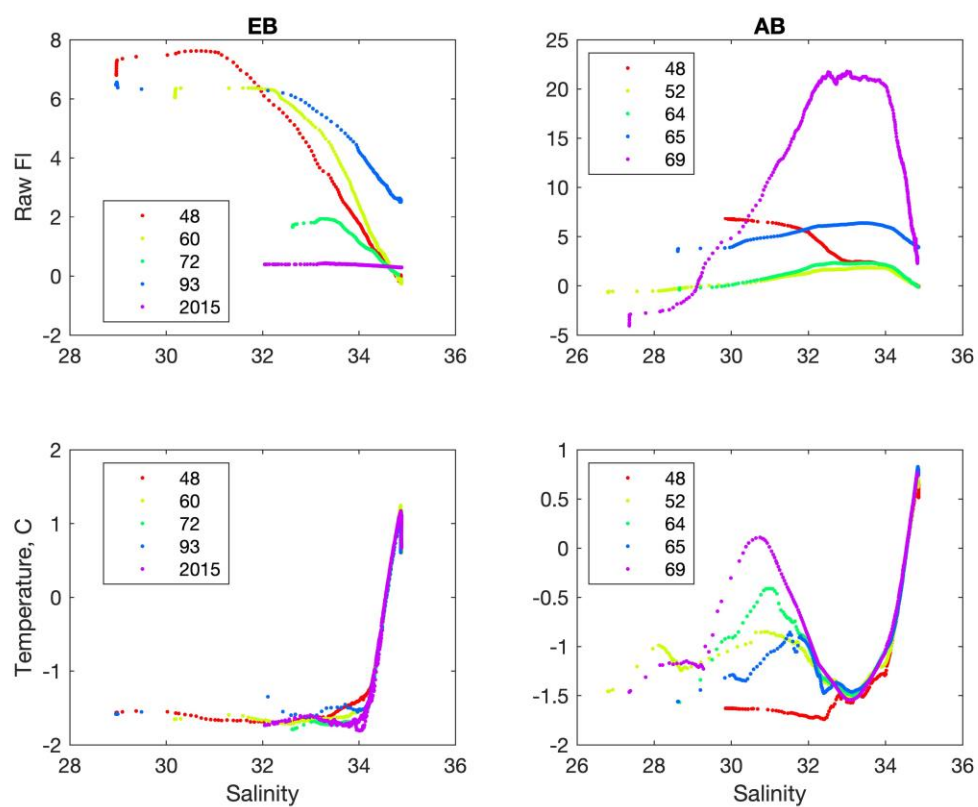


Figure S3. Data from selected profiles for Eurasian (EB) and Amerasian Basins (AB), where waters with common q-S were sampled and could be used to intercalibrate DOM fluorescence signal.

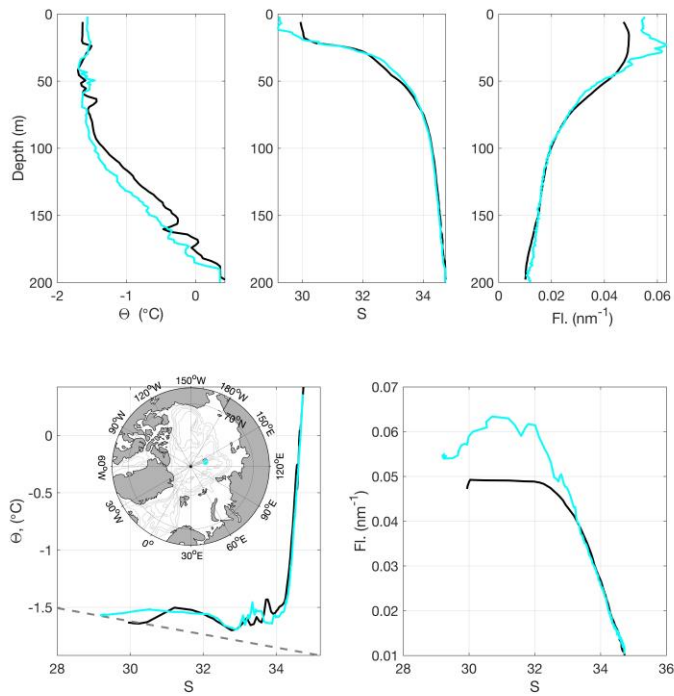


Figure S4. Comparison of PS94 (blue) with ITP93 calibrated using the q-S space approach for a station where ITP93 was deployed and a ship CTD cast was also performed.

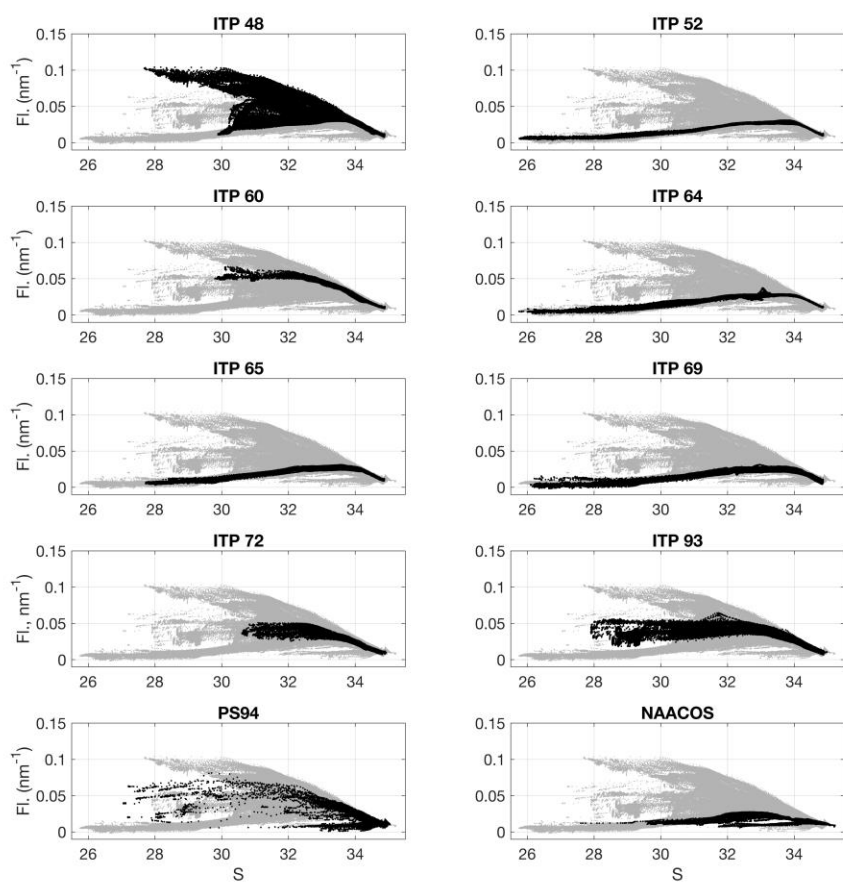


Figure S5. Calibrated organic matter fluorescence against practical salinity. Black data are for each specific ITP or cruise. Grey data points in the background are all data combined.