

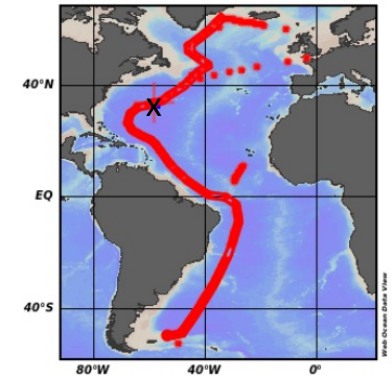
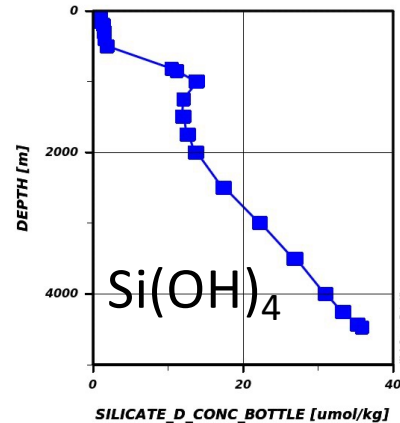
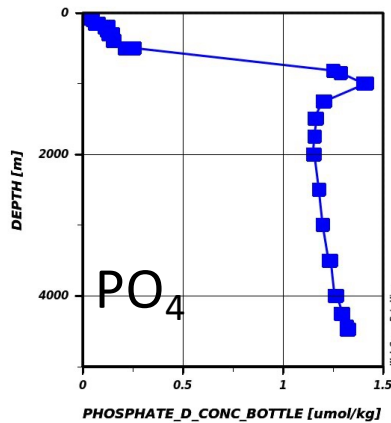
GEOTRACES Intermediate Data Product 2025

Incorporating the GEOTRACES IDP in teaching Chemical Oceanography

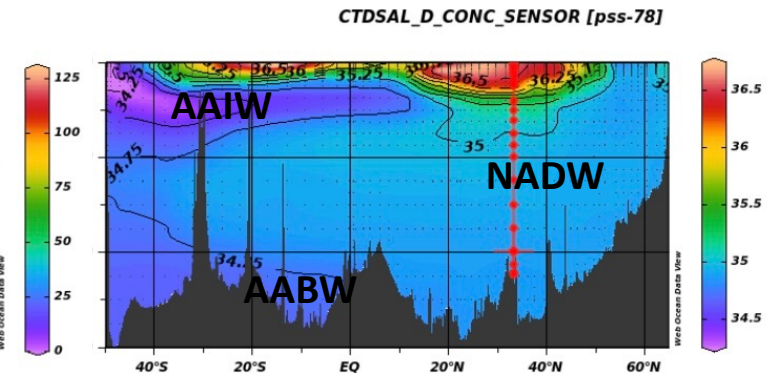
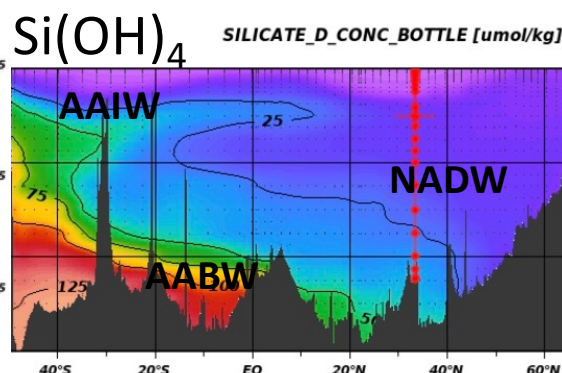
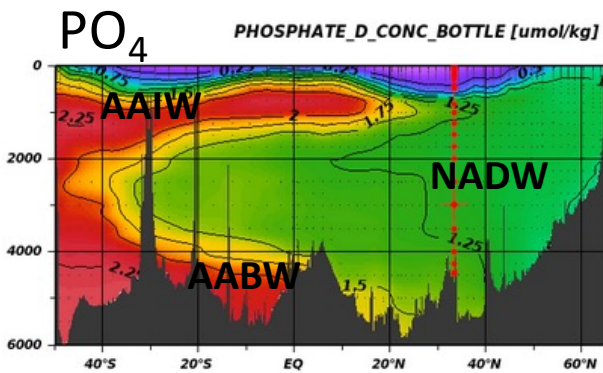
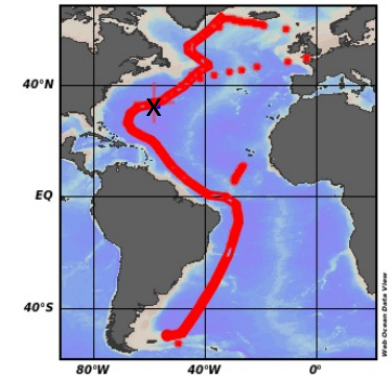
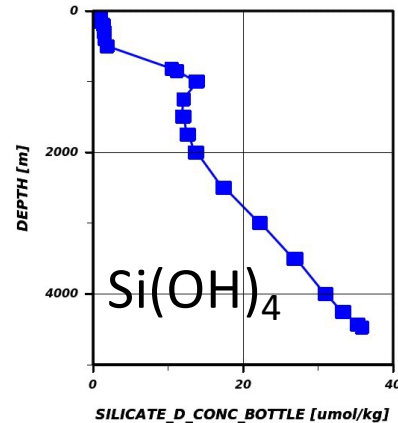
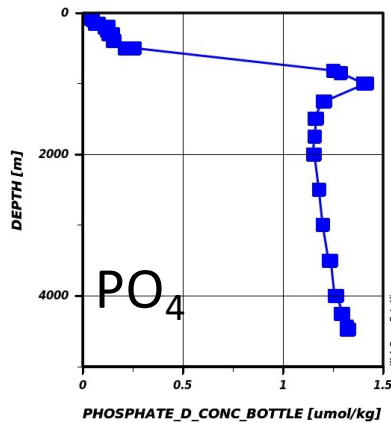
Phoebe J. Lam
University of California, Santa Cruz



The depth profile is how most of us first encounter oceanographic data...



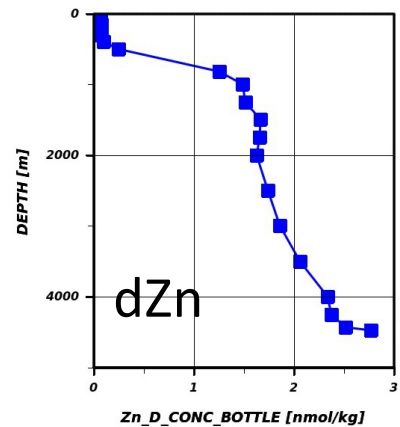
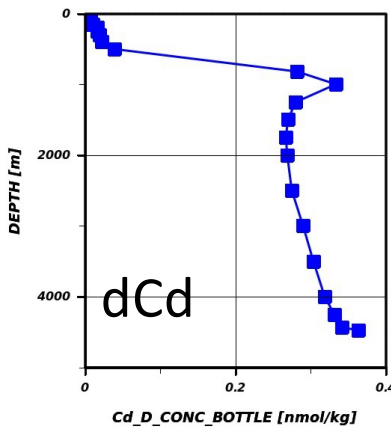
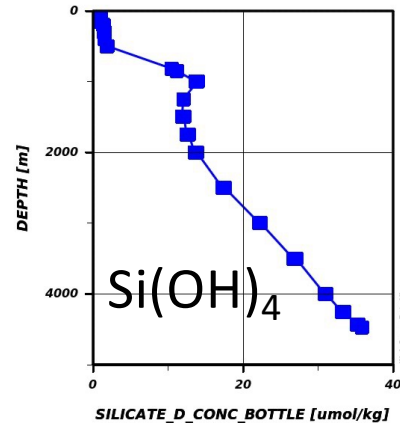
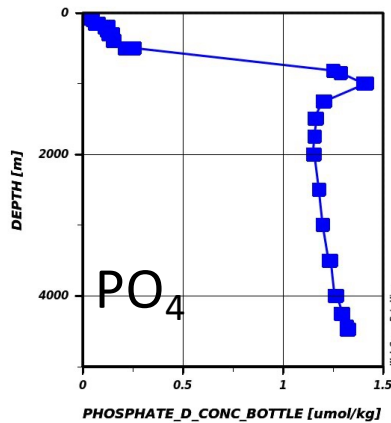
Seeing full sections tells so much more of the three-dimensional story of the ocean



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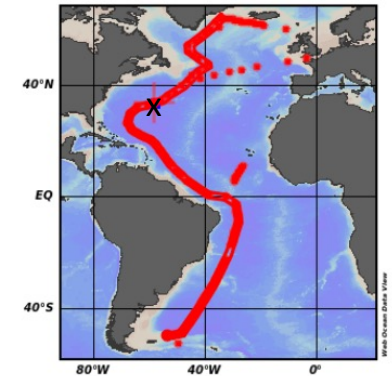
Trace metal data used to only be available as profiles...



rg

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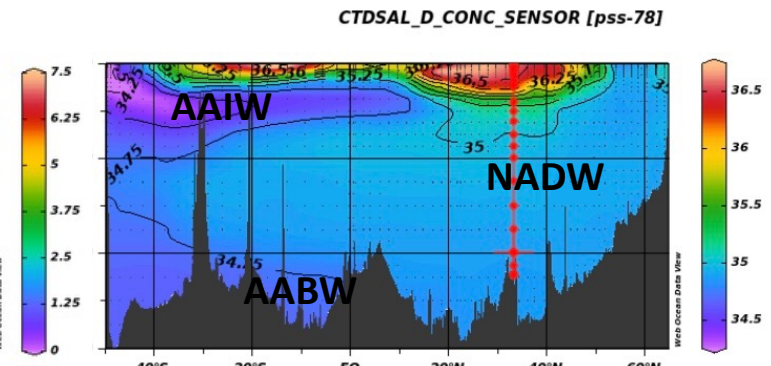
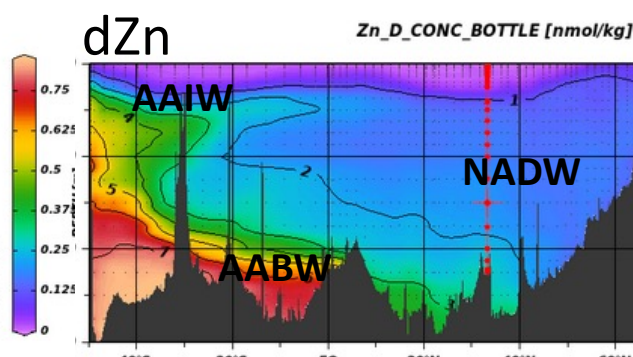
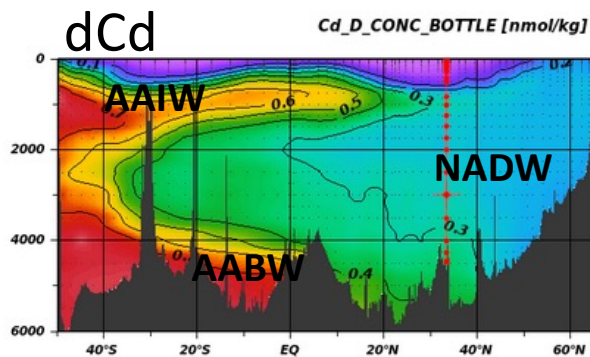
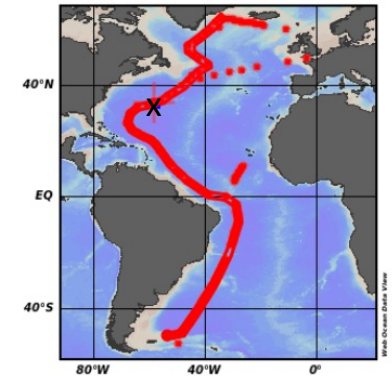
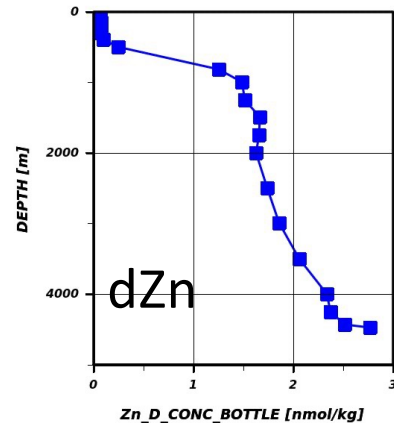
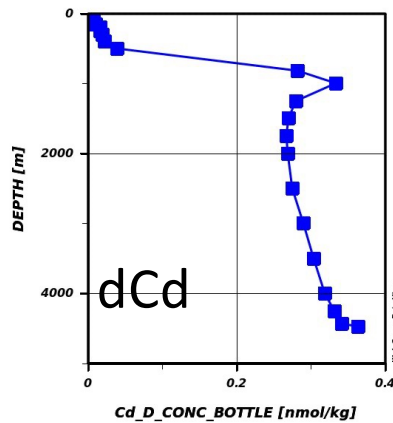
Cd and Zn data from Hein de Baar | Kenneth Bruland | Rob Middag



4

GA02, IDP2021v2

And now with the GEOTRACES IDP, we can now look at sections of trace metals too!



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Using WebODV to build oceanographic intuition in the classroom

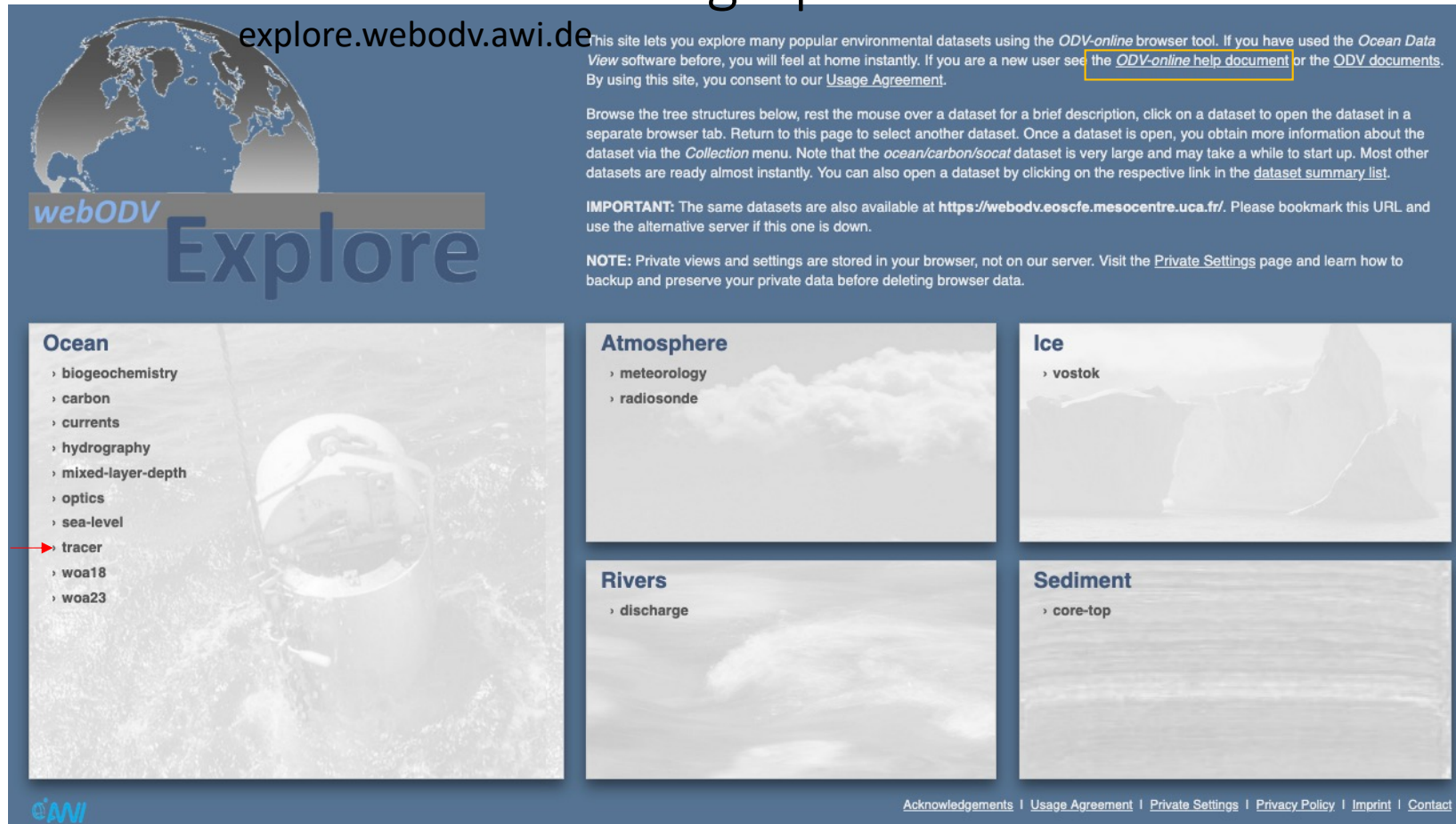
explore.webodv.awi.de

This site lets you explore many popular environmental datasets using the *ODV-online* browser tool. If you have used the *Ocean Data View* software before, you will feel at home instantly. If you are a new user see [the ODV-online help document](#) or the *ODV documents*. By using this site, you consent to our [Usage Agreement](#).

Browse the tree structures below, rest the mouse over a dataset for a brief description, click on a dataset to open the dataset in a separate browser tab. Return to this page to select another dataset. Once a dataset is open, you obtain more information about the dataset via the *Collection* menu. Note that the *ocean/carbon/socat* dataset is very large and may take a while to start up. Most other datasets are ready almost instantly. You can also open a dataset by clicking on the respective link in the [dataset summary list](#).

IMPORTANT: The same datasets are also available at <https://webodv.eoscfe.mesocentre.uca.fr/>. Please bookmark this URL and use the alternative server if this one is down.

NOTE: Private views and settings are stored in your browser, not on our server. Visit the [Private Settings](#) page and learn how to backup and preserve your private data before deleting browser data.



Ocean

- › biogeochemistry
- › carbon
- › currents
- › hydrography
- › mixed-layer-depth
- › optics
- › sea-level
- **tracer**
- › woa18
- › woa23

Atmosphere

- › meteorology
- › radiosonde

Ice

- › vostok

Rivers

- › discharge

Sediment

- › core-top

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Ocean

- tracer
- del13c
- geosecs
- geotraces
- idp2021
 - aerosols
 - cryosphere
 - precipitation
 - seawater
 - GEOTRACES_IDP2021_Seawater_Discrete_Sample_Data_v2
 - GEOTRACES_IDP2021_Seawater_Discrete_Sample_Data_v1
 - sensor
 - idp2017
 - idp2014
 - tritium-helium
 - whp-bottle

Atmosphere

- meteorology
- radiosonde

Ice

- vostok

Rivers

- discharge

Sediment

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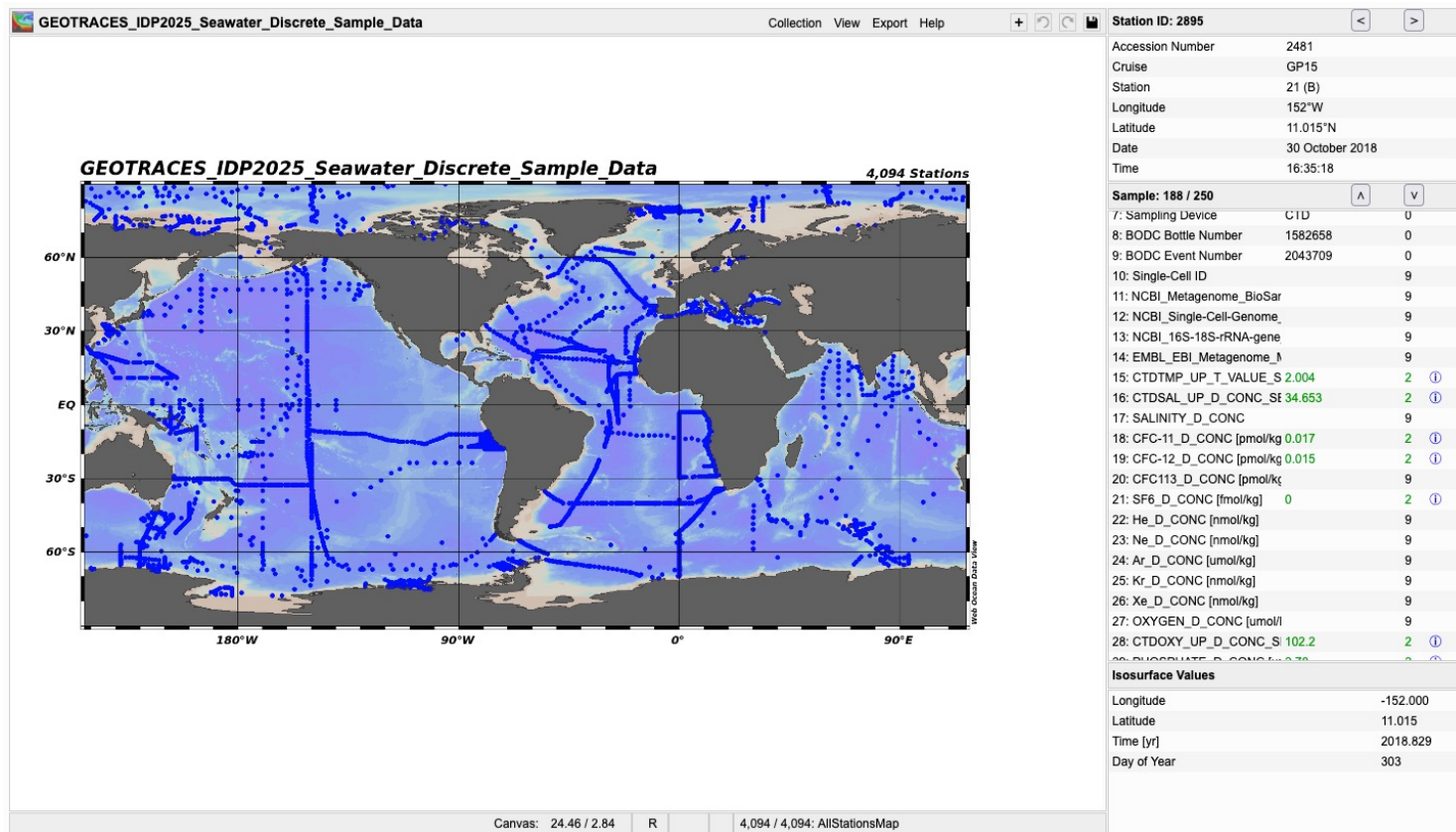
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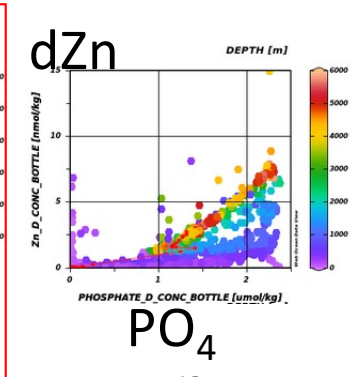
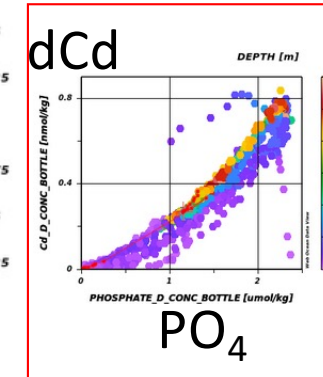
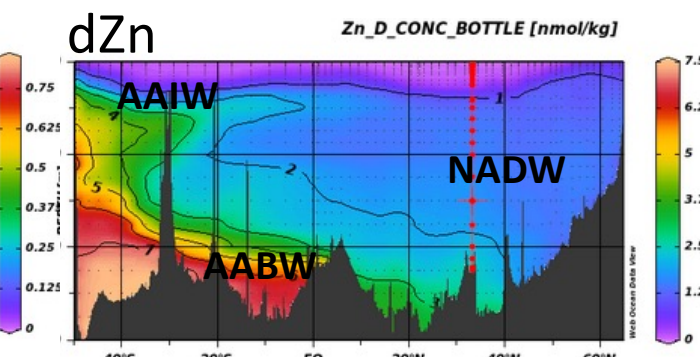
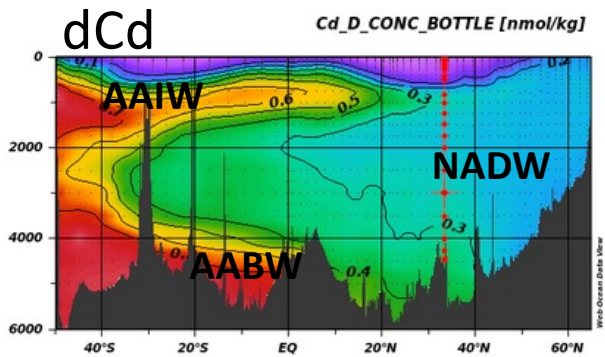
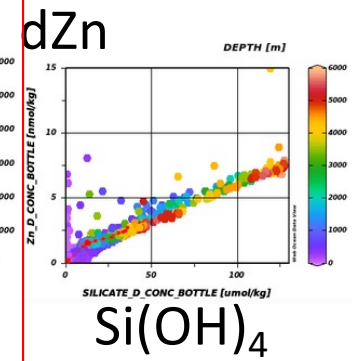
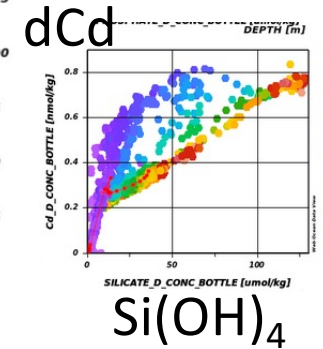
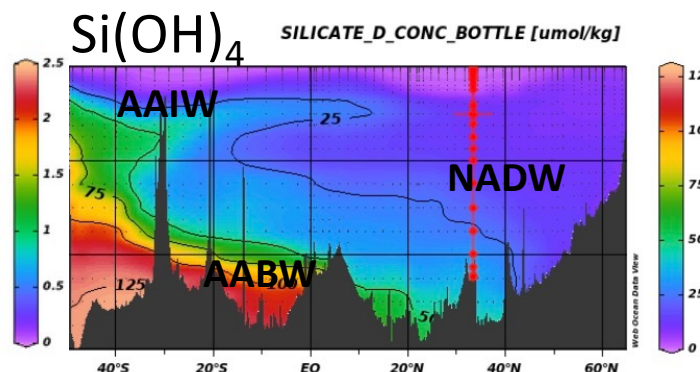
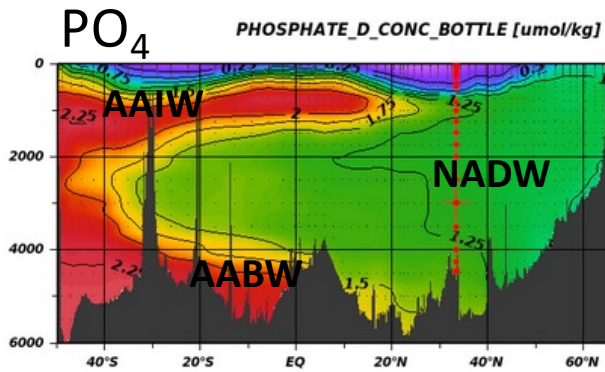
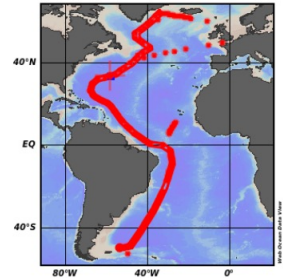
Example homework problem with the IDP

Part III: Trace metals (30 pts)

The goal of Part III is to explore the distributions of some trace metals and compare to those of major nutrients.

- the students are asked to:
 - plot sections of phosphate, silicate, dCd, and dZn
 - make scatter plots between the trace metals (y-axis) and the major nutrients (x-axis)
 - discover which trace metals are best correlated with which major nutrients
- pedagogical goals:
 - for all students, visualizing the data themselves hopefully gives them a better intuition for the 3-dimensional nature of the ocean
 - for graduate students, having them discover the relationships themselves (rather than being told about them) is good training for their transition to knowledge creators rather than consumers

Comparing basin-scale distributions of macronutrients and TMs



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Conclusions

- thanks to GEOTRACES, there has been a rapid expansion of trace element and isotope data and understanding that has exceeded the pace at which textbooks have been able to keep up
- the GEOTRACES IDP makes this data available to everyone to explore
- having students directly interact with the data with easy-to-use applications such as webODV with some guided exploration helps students develop a 3-dimensional intuition of the ocean