Sharing Synoptic Ocean Data Analysis Tools

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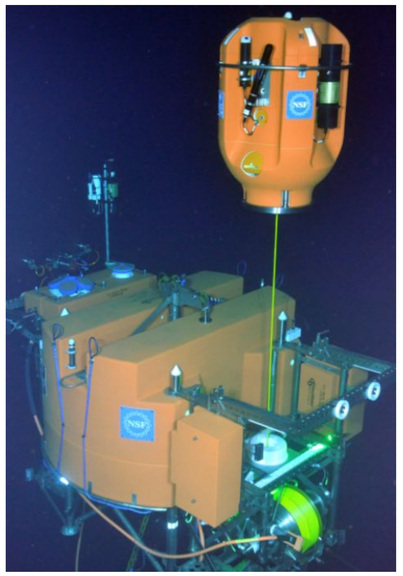
"Tip of the iceberg" **START**

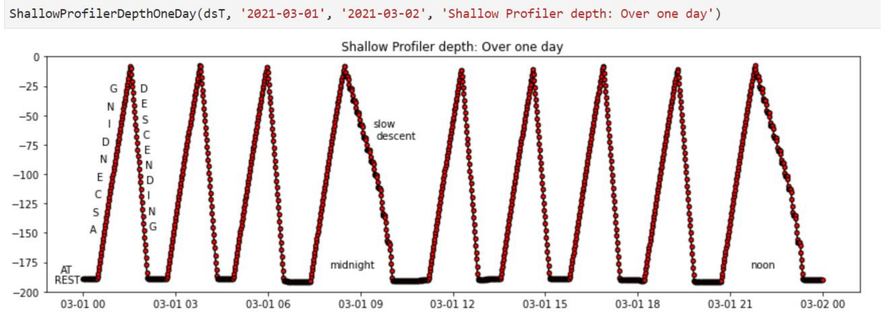


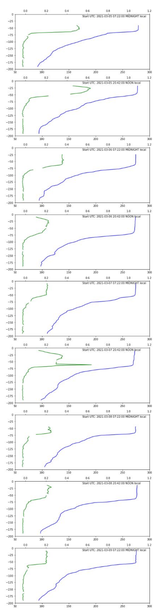
- ❖ Sandbox executable via binder
- ❖ Data narrative: RCA shallow profiler
- ❖ Integrated: ARGO, MODIS, GLODAP, MSLA,
- ❖ Repro by example: Bootstrap documentation
  - ◆ Python, markdown, LaTeX

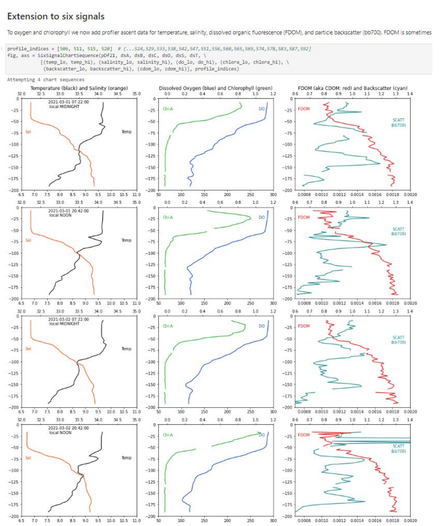
https://bit.ly/3PYqHmR

TLDR Narrative: Project plan here is (1) build a collection of Jupyter notebooks that include **bootstrap-documentation** (2) Place these notebooks together with necessary source data into a **GitHub repository** with (3) a working link to **binder** (see QR code at upper right of this poster). The binder link opens the ensemble in a working Python environment as a kind of "Exploratorium-style" sandbox. The repository can also be cloned into a local environment for deeper, extended engagement. Consequently: An enthusiastic student/scientist has access to a freely available, thorough, self-documenting toolbox for exploring OOI Cabled Array shallow profiler data. The methods extend to other OOI data types. It includes notebooks on using ARGO data, MODIS, etcetera; as well as examples of creating exploratory slider controls, making time-series animations, and more.

```
[3]: ShallowProfilerDepthOneDay(dsT, '2021-03-01', '2021-03-02', 'Shallow Profiler depth: Over one day')
```







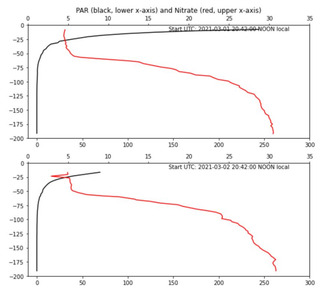
Additional sensor/data types

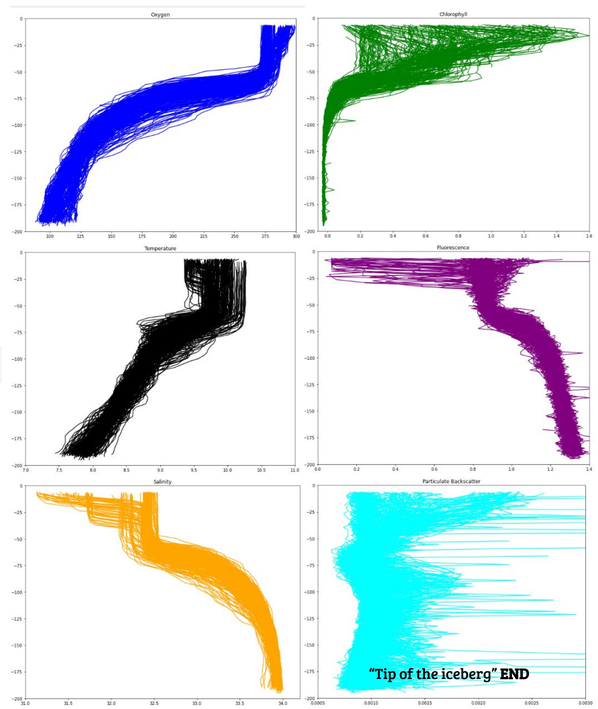
Sensor	Remarks
pCO2	Carbon dioxide concentration: Data not present
pH	Only measured on midnight/noon descent
nitrate	Only measured on midnight/noon ascent
spectral irradiance	Spectrum covered by 7 independent channels
PAR	Photosynthetically Available Radiation, key: 'parad'
Velocity East + North + Up	Local current speed and direction

Energy and Nutrients

```
[6]: pIdcs = GenerateTimeWindowIndices(pDf21, dt64_from_doy(2021, 60), dt64_from_doy(2021, 70), noon0, noon1)
     fig, axs = ChartAB(pDf21, [(par_lo, par_hi), (nitrate_lo, nitrate_hi)], pIdcs, dsP.par, dsP.z, \
                        'PAR', 'black', dsN.nitrate, dsN.z, 'Nitrate', 'red', 8, 3.5)
```

Attempting 11 charts





The Iceberg

- Ocean 01 A Photic Zone Sensor Overview.ipynb
- Ocean 01 B Data Types.ipynb
- Ocean 01 C Cleaning Profiler Level 1+ Data.ipynb
- Ocean 01 D Profile Timestamping.ipynb
- Ocean 01 E Generate Small Datasets.ipynb
- Ocean 01 F Profiler Visualization.ipynb
- Ocean 01 G Compare Ascent Descent.ipynb
- Ocean 01 H Compare Rest SP To Platform.ipynb
- Ocean 01 J Discrete Sample Data.ipynb
- Ocean 01 K Bio-Optics QA.ipynb
- Ocean 01 L Differentiating Profile Curves.ipynb
- Ocean 01 M Photic Zone Spectrophotometer.ipynb
- Ocean 02 Sea Surface.ipynb
- Ocean 03 ARGO.ipynb
- Ocean 04 Global Ocean.ipynb
- Ocean 05 A Sea Floor Axial Inflation.ipynb
- Ocean 05 B Sea Floor Background.ipynb
- Ocean 06 Science.ipynb
- Ocean 07 Data Acquisition And Management.ipynb
- Ocean 08 Programming Resources.ipynb

Motivation

Science Biogeochemical coupling of marine coastal surface waters to terrigenous effluent
Social "The Last 20 Yards": A missing element of active adoption / analysis of the OOI data corpus