Automating Model Skill Assessment with Python

Rich Signell (USGS, Woods Hole, MA)
Filipe Fernandes (SECOORA)
Kyle Wilcox (Axiom Data Science, Wickford, RI)
IOOS® Plan defines:
- Global Component
- Coastal Component
  - 17 Federal Agencies
  - 11 Regional Associations
### IOOS Recommended Web Services and Data Encodings

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Web Service</th>
<th>Encoding</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-situ data (buoys, piers, towed sensors)</td>
<td>OGC Sensor Observation Service (SOS)</td>
<td>XML or CSV</td>
</tr>
<tr>
<td>Gridded data (model outputs, satellite)</td>
<td>OPeNDAP with Climate and Forecast Conventions</td>
<td>Binary DAP using Climate and Forecast (CF) conventions</td>
</tr>
<tr>
<td>Images of data</td>
<td>OGC Web Map Service (WMS)</td>
<td>GeoTIFF, PNG etc. -possibly with standardized styles</td>
</tr>
</tbody>
</table>
Interoperable Access in Python (Iris)

```python
model = 'USGS/COAWST'
url = 'http://geoport.whoi.edu/thredds/dodsC/coawst_4/use/fmrc/coawst_4_use_best.ncd'
var = 'sea_water_potential_temperature'
lev = -1
icube = var.lev_date(url=url, var=var, mytime=mytime, lev=lev, subsample=1)
map_plot(icube, model=model)
```
slice retrieved in 9.351569 seconds

```python
model = 'Global RTOFS/NCEP'
url = 'http://ecowatch.nodc.noaa.gov/thredds/dodsC/hycom'
var = 'sea_water_temperature'
lev = 1
icube = var.lev_date(url=url, var=var, mytime=mytime, lev=lev, subsample=1)
map_plot(icube, model=model)
```
slice retrieved in 2.475246 seconds
Boston Light Swim

8 mile swim
No wet suit
How cold will the water be?
Dynamic Reusable Workflows for Ocean Science

Richard P. Signell, Filipe Fernandes and Kyle Wilcox

1 U.S. Geological Survey, Woods Hole, MA 02543, USA
2 Southeast Coastal Ocean Observing Regional Association, Charleston, SC 29422, USA
3 Axiom Data Science, Wickford, RI 02892, USA

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Demo
Conda-Forge is Awesome

CONDA-FORGE

A community-led collection of recipes, build infrastructure and distributions for the conda package manager.
2900+ packages and growing!

Conda-Forge

Organization created on Apr 11, 2015

https://conda-forge.github
Summary

• Standardized framework makes skill assessment easy and powerful
• Services are now easy to install and maintain
• Skill assessment notebooks are reproducible by others (for free)
• More assessment leads to more appropriate use of modeling products
• More assessment of models leads to better models
Demo
Boston Light Swim Notebook

for station in dfs:
    sta_name = all_obs[station]
    df = dfs[station]
    if df.empty:
        continue
    p = make_plot(df, station)
    maker = make_marker(p, station)
    maker.add_to(m)

Out[24]: