The ILAMB Benchmarking System - v2.1

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ILAMB Links

- Open source git repository
  https://bitbucket.org/ncollier/ilamb

- Sample output
High level summary of model performance

- Measure model performance against 60 datasets across a wide swath of measurable quantities from land models 24 variables
- Left: absolute performance in terms of an overall score
- Right: relative performance with respect to other models
Now you can install ILAMB with:

```
pip install ILAMB --user
```

this will install almost all the dependencies automatically, except for basemap.

The installation tutorial has been updated and now includes scripts for running on institutional machines.

The runscript `demo/driver.py` was moved to an installed script `ilamb-run`.

There is now an option:

```
--model_year y0,yf
```

which will shift all model results by `yf-y0` years.
Relationship Scores: 1-(Hellinger Distance)

For $P = (p_1, \ldots, p_k)$ and $Q = (q_1, \ldots, q_k)$, then

$$H(P, Q) = \frac{1}{\sqrt{2}} \sqrt{k \sum_{i=1}^{k} (\sqrt{p_i} - \sqrt{q_i})^2}$$
Relationship Scores: RMSE Score

For \( p(x) \) and \( q(x) \), then

\[
S = e^{-\sqrt{\frac{\int (p(x) - q(x))^2 \, dx}{\int p(x)^2 \, dx}}}
\]

![Graph showing relationship between Gross Primary Productivity and Precipitation](image)
Plotting Changes - Biomass example

Mean

Bias

Mean Bias

kg m\(^{-2}\)

kg m\(^{-2}\)
Logfiles

[INFO][0][<module>] Linux phoebeus.orl.gov 4.9.6-200.fc25.x86_64 #1 SMP Thu Jan 26 10:17:45
[INFO][0][<module>] /home/ncf/.local/lib/python2.7/site-packages/ILAMB (2.1)
[INFO][0][<module>] /home/ncf/.local/lib/python2.7/site-packages/numpy (1.12.0)
[INFO][0][<module>] /home/ncf/.local/lib/python2.7/site-packages/matplotlib (2.0.0)
[INFO][0][<module>] /home/ncf/.local/lib/python2.7/site-packages/netCDF4 (1.2.4)
[INFO][0][<module>] /home/ncf/.local/lib/python2.7/site-packages/cfunits (1.5)
[INFO][0][<module>] /home/ncf/.local/lib/python2.7/site-packages/sympy (1.0)
[INFO][0][<module>] /home/ncf/.local/lib/python2.7/site-packages/mpi4py (2.0.0)
[INFO][0][<module>] 2017-03-01 16:12:17.342589
[INFO][1][confront][GrossPrimaryProductivity/Fluxnet][CLM45bgc_CRUNCEP] Success
[INFO][1][confront][GrossPrimaryProductivity/Fluxnet][CLM45bgc_GSWP3] Success
[INFO][0][confront][Biomass/GlobalCarbon][CLM45bgc_CRUNCEP] Success
[INFO][0][confront][Biomass/GlobalCarbon][CLM45bgc_GSWP3] Success
...
[INFO][1][modelPlots][GrossPrimaryProductivity/Fluxnet][CLM45bgc_GSWP3] Success
[INFO][6][modelPlots][SurfaceAirTemperature/CRU][CLM45bgc_GSWP3] Success
[INFO][7][modelPlots][Precipitation/GPCP2][CLM45bgc_GSWP3] Success
[INFO][5][modelPlots][Albedo/MODIS][CLM45bgc_GSWP3] Success
[INFO][1][modelPlots][GrossPrimaryProductivity/Fluxnet-MTE][CLM45bgc_CRUNCEP] Success
[INFO][1][<module>][process time] 281.7 s
[INFO][3][<module>][process time] 215.3 s
[INFO][7][<module>][process time] 440.5 s
[INFO][4][<module>][process time] 272.6 s
[INFO][0][<module>][process time] 58.0 s
[INFO][2][<module>][process time] 214.4 s
[INFO][6][<module>][process time] 418.5 s
[INFO][5][<module>][process time] 333.3 s
[INFO][0][<module>][total time] 494.8 s
[INFO][0][<module>][process balance] 7.60
[INFO][0][<module>][parallel efficiency] 56%
The ILAMB.Variable object now supports layered data, including a new member function integrateInDepth. This has enabled work on marine biogeochemistry (Ogunro Oluwaseun).
We are actively developing ILAMB in new directions, looking to improve our analysis capabilities as well as extend to new domains. We are also dedicating resources to improving the user experience. Many of the features we have added are direct suggestions from our users (thanks NCAR, especially Dave).