

Environmental data for Mary Hunsicker

Isaac D. Schroeder

September 25, 2019

Background

On 9/15/19 Elliot H sent an e-mail requesting data for Mary H. The data is list in an excel sheet, and includes: MEI, ONI, PDO, NPGO, SST, SLP, winter sea ice extent, nitrate, pH, oxygen, chla. Monthly and seasonal values were requested, with winter = Dec, Jan, Feb.

Code

code, monthly and seasonal values

- **Note** org babel tangle source code file found at:
file:///home/isaac/Work/IEA/2019/data_for_MHunsicker/get_dataM.py
https://gitlab.com/id_s/work.iea/blob/master/2019/data_for_MHunsicker//get_dataM.py

Results

- A new MEI was used, there doesn't seem to be a reference yet, but see [MEI v2](#).
- ONI (<http://www.cpc.ncep.noaa.gov/data/indices/>), PDO [[Mantua et al., 1997](#)], NPGO [[Di Lorenzo et al., 2008](#)] data was updated for this year's CalCOFI report.
- SST ([OI SST](#)) and CHL ([MODIS chl](#)) are area averages of boxes defined by length (in relation to distance from shore) and height (in degree latitude).

- I picked three latitudes: 33N, 39N, 45N; with heights of 1 degree (e.g. 33N is the average of all points between 32.5N to 33.5N).
- Additional latitudes can be added if needed.
- For SST I used two lengths, 0-75 km and 75-150 km, these should give nearshore and offshore conditions, with gradients suggesting habitat compression [[Santora et al., 2019](#)].
- I only gave 0-75 km lengths for CHL, but offshore boxes can easily be added if needed.
- For SLP I provided two indices: NOI [[Schwing et al., 2002](#)] and the area of the NPH [[Schroeder et al., 2013](#)].
- Pressure gradients were requested, I wasn't sure what was requested, but I can add the Bakun UI which are based on geostrophic winds [[Bakun, 1973](#), [Schwing et al., 1996](#)].
- Nitrate is from BEUTI [[Jacox et al., 2018](#)] and gives the surface nitrate flux, these are given at 33N, 39N, 45N but other latitudes between 33-48N can be added.
- I also include CUTI [[Jacox et al., 2018](#)], which is a new estimate of upwelling.
- Oxygen is observations at CalCOFI stations 80.80, 93.30, 93.110 at 50 & 150 m, background on selected stations can be found in [Bograd et al. \[2019, 2015\]](#).
- Oxygen at Newport lines NH05 at 50 m and NH25 at 50 & 150 m, descriptions of these stations can be found at [NH05 & NH25 metadata](#).

Conclusion

I provided monthly and seasonal CSV files. The seasonal CSV files can be created using the monthly data: IEA_time_series_month.csv. The only data that I did not put into the CSV files are pH and sea ice extent.

References

- A. Bakun. Coastal upwelling indices, West Coast of North America, 1946-71. Us department of commerce, national oceanic and atmospheric administration, national marine fisheries service, 1973.
- S. J. Bograd, M. P. Buil, E. D. Lorenzo, C. G. Castro, I. D. Schroeder, R. Goericke, C. R. Anderson, C. Benitez-Nelson, and F. A. Whitney. Changes in source waters to the southern california bight. *Deep Sea Research Part II: Topical Studies in Oceanography*, 112(nil):42–52, 2015. doi: 10.1016/j.dsr2.2014.04.009. URL <https://doi.org/10.1016/j.dsr2.2014.04.009>.
- S. J. Bograd, I. D. Schroeder, and M. G. Jacox. A water mass history of the southern california current system. *Geophysical Research Letters*, May 2019. ISSN 1944-8007. doi: 10.1029/2019gl082685. URL <http://dx.doi.org/10.1029/2019GL082685>.
- E. Di Lorenzo, N. Schneider, K. M. Cobb, P. J. S. Franks, K. Chhak, A. J. Miller, J. C. McWilliams, S. J. Bograd, H. Arango, E. Curchitser, and et al. North pacific gyre oscillation links ocean climate and ecosystem change. *Geophysical Research Letters*, 35(8), Apr 2008. ISSN 0094-8276. doi: 10.1029/2007gl032838. URL <http://dx.doi.org/10.1029/2007GL032838>.
- M. G. Jacox, C. A. Edwards, E. L. Hazen, and S. J. Bograd. Coastal upwelling revisited: Ekman, Bakun, and improved upwelling indices for the U.S. west coast. *Journal of Geophysical Research: Oceans*, 123(10):7332–7350, 2018. doi: 10.1029/2018jc014187. URL <https://doi.org/10.1029/2018jc014187>.
- N. J. Mantua, S. R. Hare, Y. Zhang, J. M. Wallace, and R. C. Francis. A pacific interdecadal climate oscillation with impacts on salmon production. *Bulletin of the American Meteorological Society*, 78(6):1069–1079, Jun 1997. ISSN 1520-0477. doi: 10.1175/1520-0477(1997)078<1069:apicow>2.0.co;2. URL [http://dx.doi.org/10.1175/1520-0477\(1997\)078<1069:APICOW>2.0.CO;2](http://dx.doi.org/10.1175/1520-0477(1997)078<1069:APICOW>2.0.CO;2).
- J. A. Santora, N. J. Mantua, J. C. Field, E. L. Hazen, S. J. Bograd, W. J. Hazen, Elliott Sydeman, B. K. Wells, J. Calambokidis, L. Saez, D. Lawson, and K. A. Forney. Marine heatwave causes habitat compression impacting

forage species, crab fishery timing and record whale entanglements. In Review, 2019.

- I. D. Schroeder, B. A. Black, W. J. Sydeman, S. J. Bograd, E. L. Hazen, J. A. Santora, and B. K. Wells. The north pacific high and wintertime pre-conditioning of california current productivity. *Geophysical Research Letters*, 40(3):541–546, Feb 2013. ISSN 0094-8276. doi: 10.1002/grl.50100. URL <http://dx.doi.org/10.1002/grl.50100>.
- F. Schwing, M. O’Farrell, J. M. Steger, and K. Baltz. Coastal upwelling indices, west coast of north america. Tech. Rep., 231, National Oceanic and Atmospheric Administration, 1996.
- F. Schwing, T. Murphree, and P. Green. The northern oscillation index (noi): a new climate index for the northeast pacific. *Progress in Oceanography*, 53(2-4):115–139, Jan 2002. ISSN 0079-6611. doi: 10.1016/S0079-6611(02)00027-7. URL [http://dx.doi.org/10.1016/S0079-6611\(02\)00027-7](http://dx.doi.org/10.1016/S0079-6611(02)00027-7).