Developing a community of practice for applied uses of future PACE data to address food security challenges

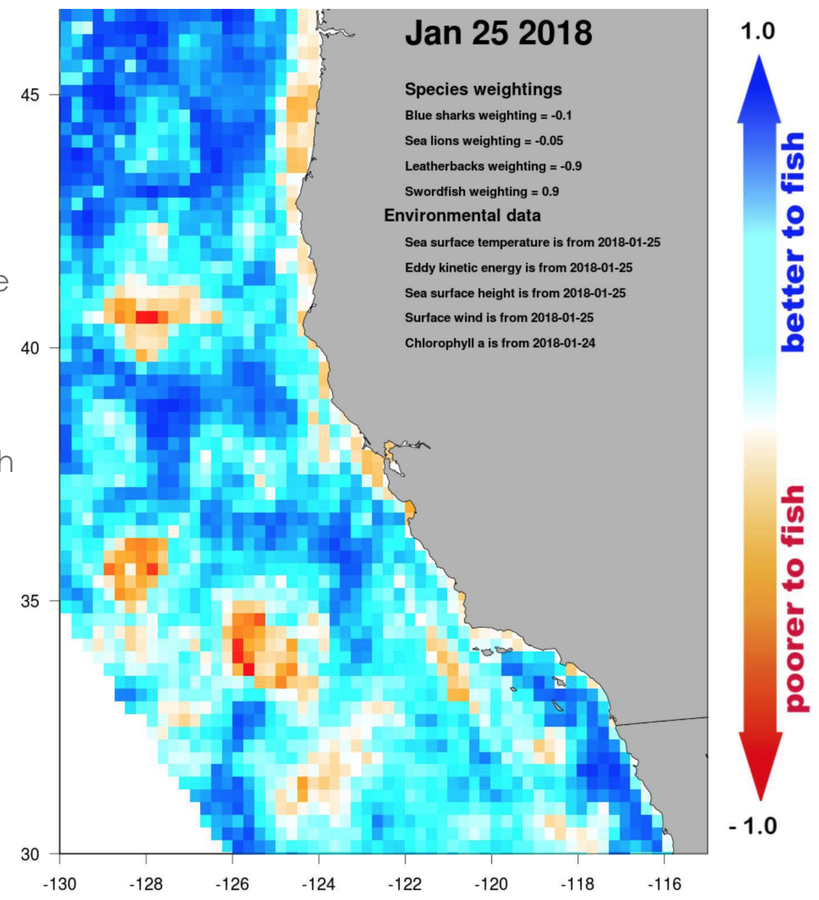
Stephanie Schollaert Uz[1], Woody Turner[2], Cara Wilson[3], Jeremy Werdell[1], Maria Tzortiou[4], Ali Omar[5]

[1]NASA Goddard Space Flight Center, Greenbelt, MD [2]NASA Headquarters, Washington, DC [3]NOAA Marine Fisheries Service Southwest Fisheries Science Center, Monterey, CA
[4]The City College of New York, New York, NY [5]NASA Langley Research Center, Hampton, VA

Abstract

Ocean color satellite measurements have yielded valuable information about the base of the marine food web for over 20 years. The Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) mission is building an advanced spectrometer to further refine ecosystem monitoring. Higher spectral resolution data from PACE will enable identification of additional marine biological indicators and their response to multiple stressors to guide sustainable management. Seafood is an important source of protein for a significant number of people. Wild catches cannot match increasing demand and their sustainability is in question. Aquaculture is an ever more important industry to feed the world's population. We share early efforts to engage a community of practice around food security to increase satellite data product use in support of resource management, business decisions, and policy analysis. Understanding the needs of applied scientists as well as non-traditional users of satellite data early in the PACE mission process will improve planning and preparation for a broader user base and hopefully help to mitigate food insecurity.

EcoCast is a NASA-funded dynamic management project that synthesizes satellite data with *in situ* observations in near-real time to give fishers and managers ecosystem assessment tools to maximize productive catch while minimizing nontarget bycatch. The scale shows areas that are better to fish (blue scale) and worse to fish (red scale). The EcoCast predictive map integrates multiple dynamic species distribution models that account for distribution of catch (swordfish) and bycatch (leatherback sea turtle, blue sharks, marine mammals), building on WhaleWatch, TurtleWatch. Source: Hazen *et al.*, NOAA



Bernard Friedman, Santa Barbara Mariculture, operates a 25-acre mussel farm off the coast of California. During the Ocean Health and Fisheries workshop, he described challenges that satellite imagery could help solve: Using Scientific Muscle to Grow Safer Mussels, *NASA Earth Observatory*, January 18, 2018

Methodology

• Interagency workshops relevant to PACE have been hosted by NASA Goddard Applied Sciences:
  - September, 2017: Water Quality
  - November, 2017: Ocean Health and Ecosystems
  - August, 2018: Chesapeake Bay Water Quality

• Post-workshop surveys and PACE user survey created to identify potential early adopters to help NASA anticipate the scope of PACE science and applications.

• Interagency Chesapeake Bay Working Group, led by NASA Goddard and including NOAA (i.e. Chesapeake Bay Office and others), meets monthly to connect ocean color scientists with resource managers to advance local applications of satellite data products related to water quality and other indicators of ecosystem health.

• Pilot project between NASA/MDE/UMD will explore the use of multispectral airborne and satellite sensors to detect waste discharge into the Chesapeake Bay around oyster beds.

Outcomes

- Various sectors have diverse requirements (i.e. fishing, shellfish aquaculture, ecosystem services). There is a need to integrate multiple data sources into decision-support tools - no single platform can meet all needs.
- Need for capacity building to non-remote sensing scientists (e.g. NASA Applied Remote Sensing Training webinars on Aquatic, Coastal and Ocean Applications, Harmful Algal Blooms)
- Future workshop will focus on integrating observational (in situ and remotely sensed) and modeling efforts

Interagency Workshop on Societal Applications of Satellite Data in Chesapeake Bay. Aquatic community capabilities and needs discussed, focusing on emerging remote sensing products and tools to increase effective use of satellite data

References

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stephanie.uz@nasa.gov