

Figure H1. CeNCOOS strategic plan mapping of our organization linking governance and management to our focus areas, strategy areas and subsystems, and to engagement to identify user needs, provision of data products for specific end-users and ongoing engagement for continuous improvement.

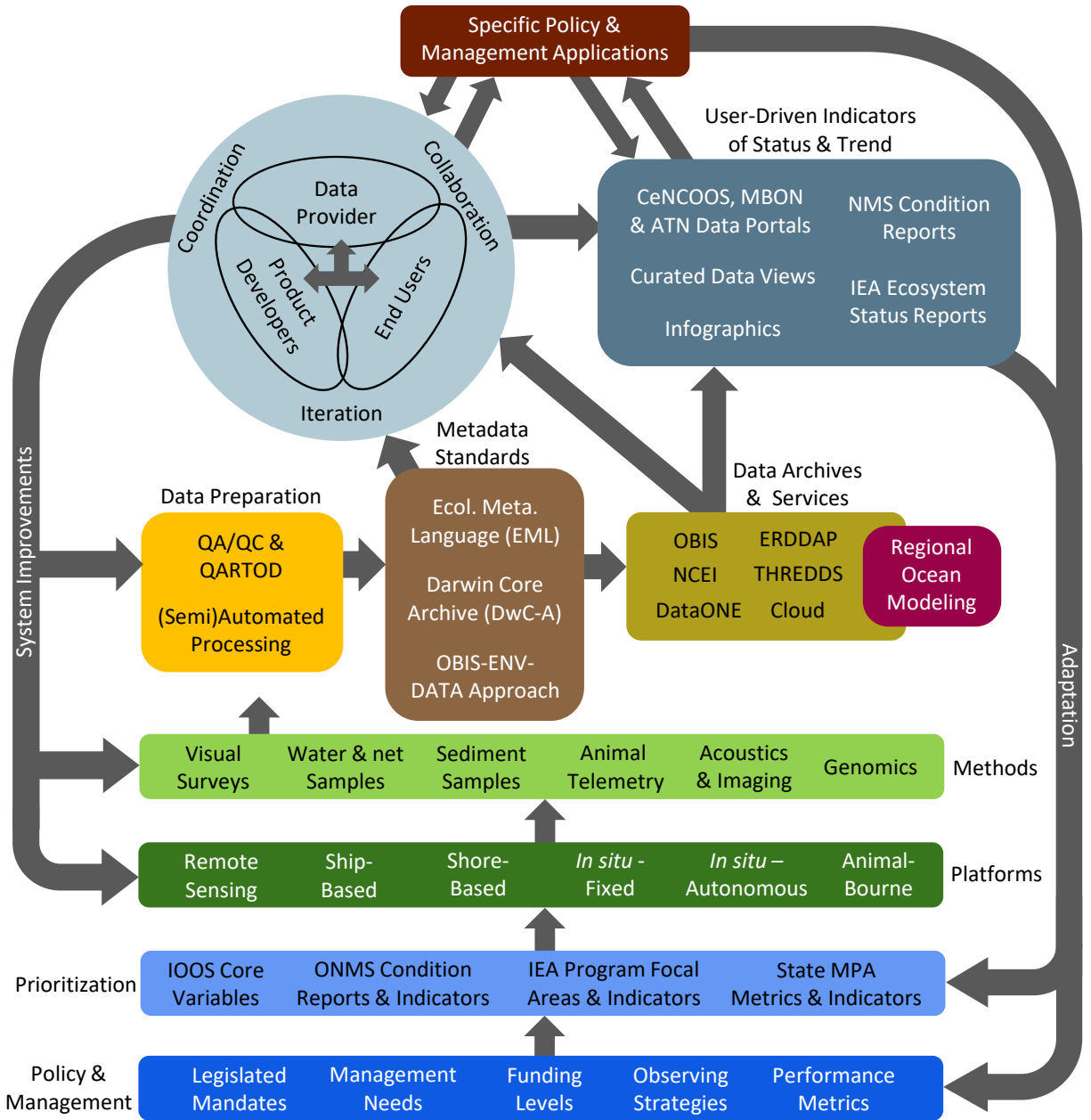


Figure H2. Workflow mapping highlighting MBON-focused relationships between policy, management and priority setting, and their application to ocean observing practices, information handling and the evolution of information provision for users in application-specific decision making.

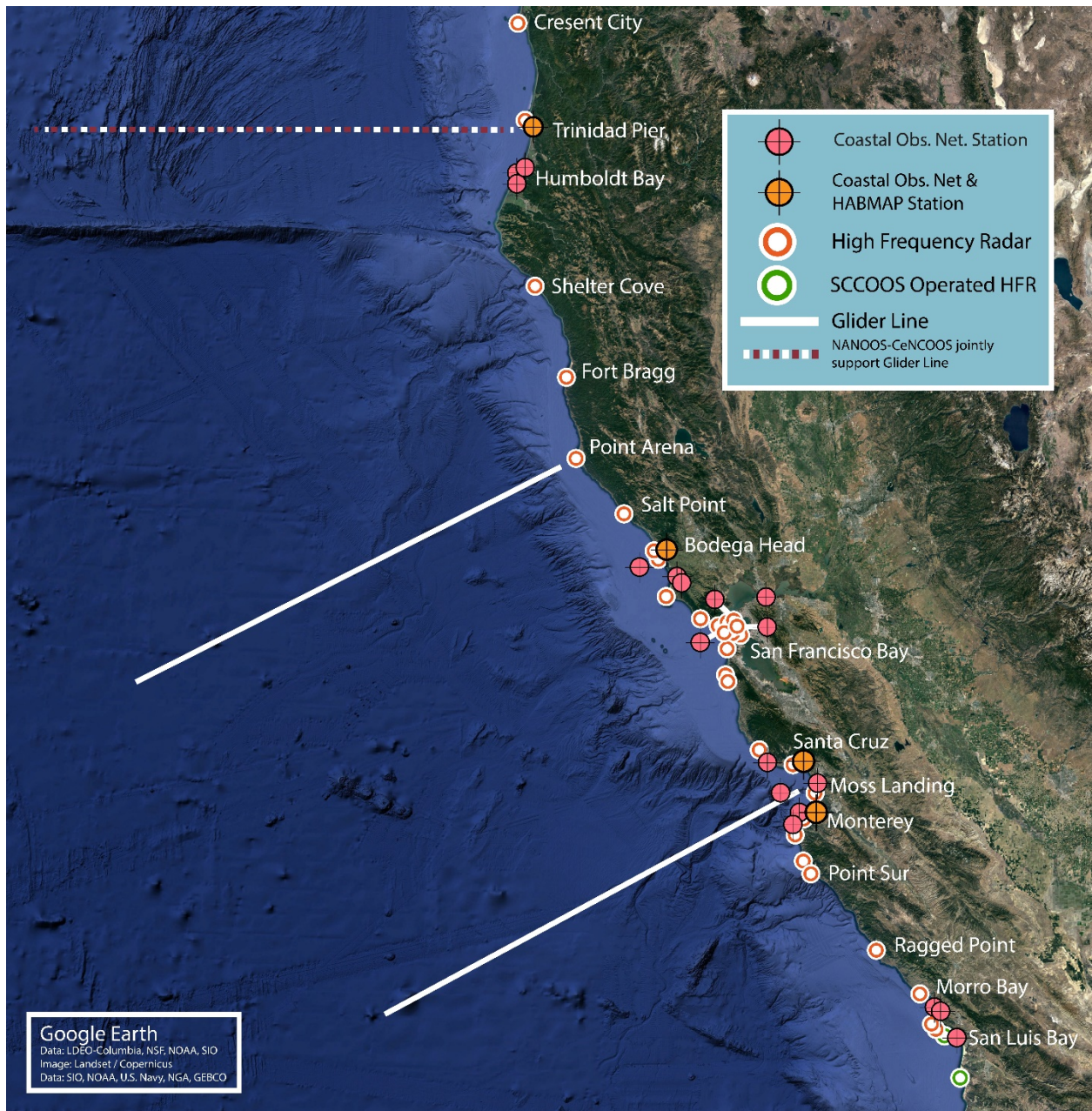


Figure H3. Map illustrating *Tier 1* investments in HFR, Coastal Observing Network, HABMAP sampling stations and gliders lines.

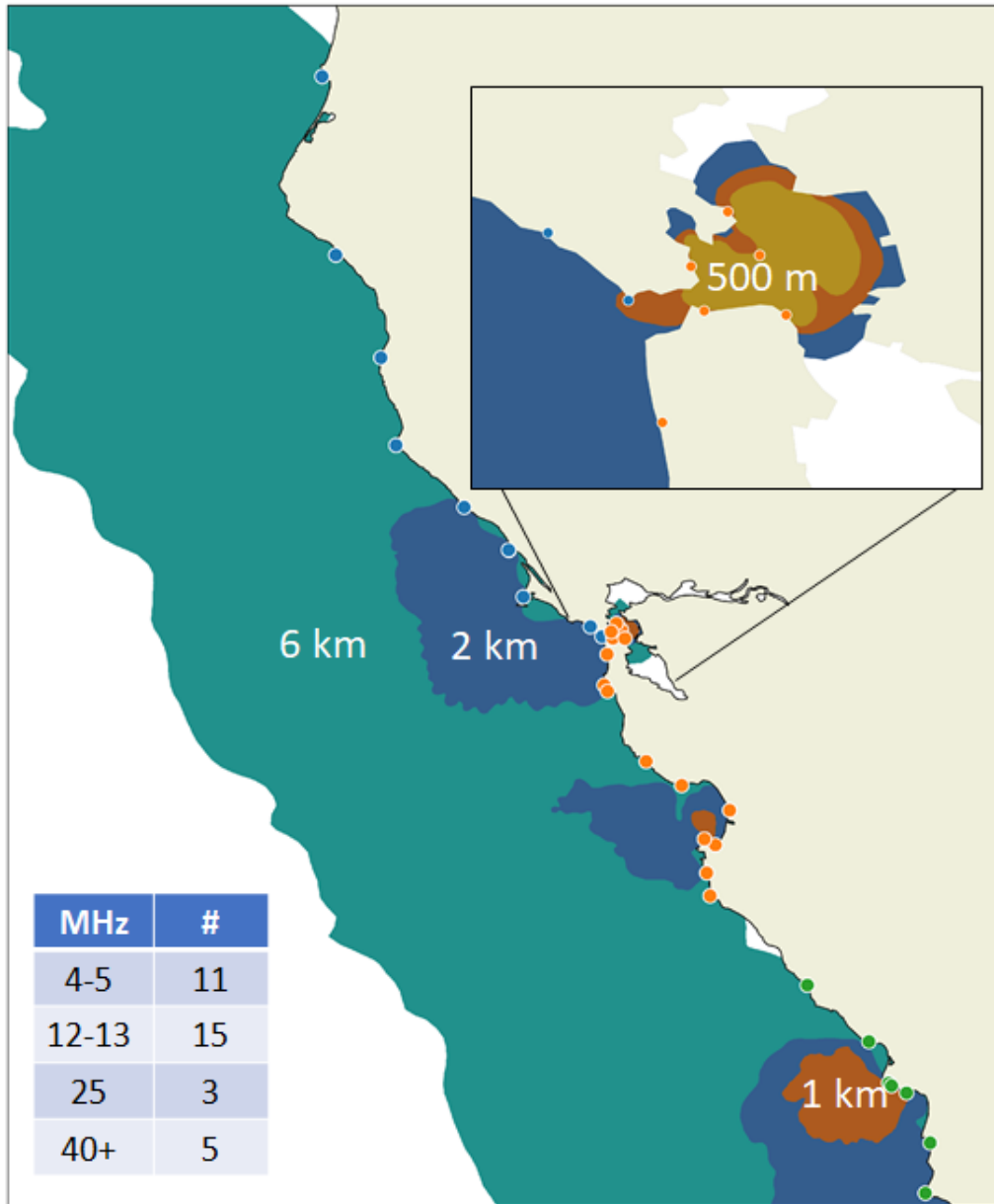


Fig H4. Map illustrating HFR radar coverage at lower to higher frequency and resolution. HFR vector coverage can be viewed here: <https://data.cencoos.org>, and here: <https://www.cencoos.org/observations/sensor-platforms/hf-radar/>.

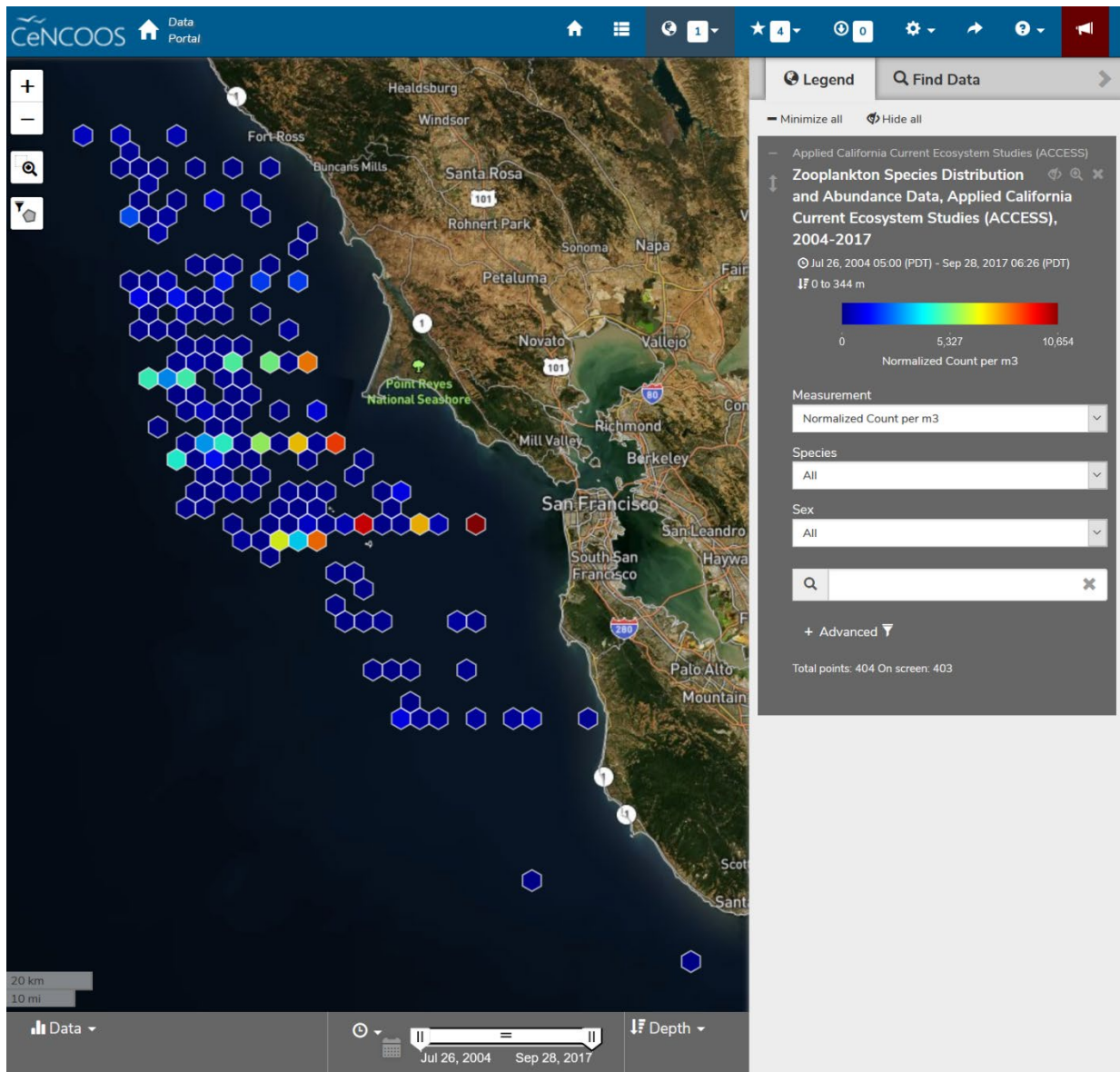


Figure H5. Station location map of the ACCESS program here illustrating zooplankton concentration from net tows. *Tier 1* includes this variable, as well as seabirds and marine mammal survey data. *Tier 2* includes zooplankton imaging via UVP-6 camera to complement the net tow data alongside OAH variable information.

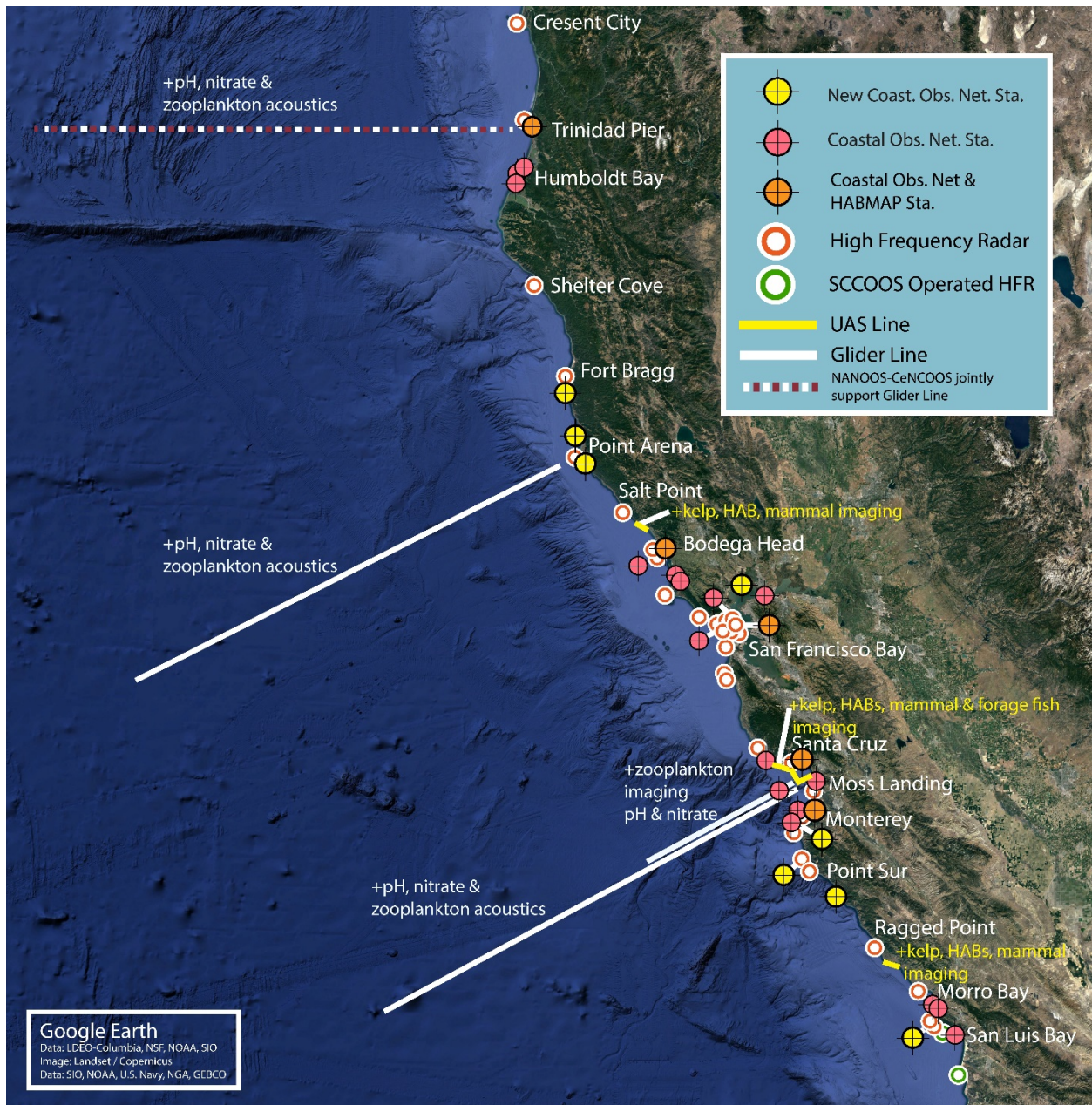


Figure H6. Map highlighting *Tier 2* investments. This includes comprehensive replacements and upgrades of aging HFR equipment across our network; recapitalization of our 3 glider lines, along with the of pH and nitrate sensing and acoustic zooplankton imaging; the addition of a ‘BioEco’ glider in the Monterey area also imaging zooplankton; the addition of UAS surveying in the areas of Mendocino, Monterey Bay and San Simion capturing kelp, HABs, forage fish and marine mammal abundances, an additional HABMAP station in San Francisco Bay (totaling five CeNCOOS supported HABMAP stations), with augmented sampling at other sites to harmonize variables covered, and Coastal Observing Network stations in areas of kelp cover Mendocino, Point Arena, Van Damme, San Pablo Bay, Monterey Peninsula, Granite Creek (via shore lab intake) and Big Creek.

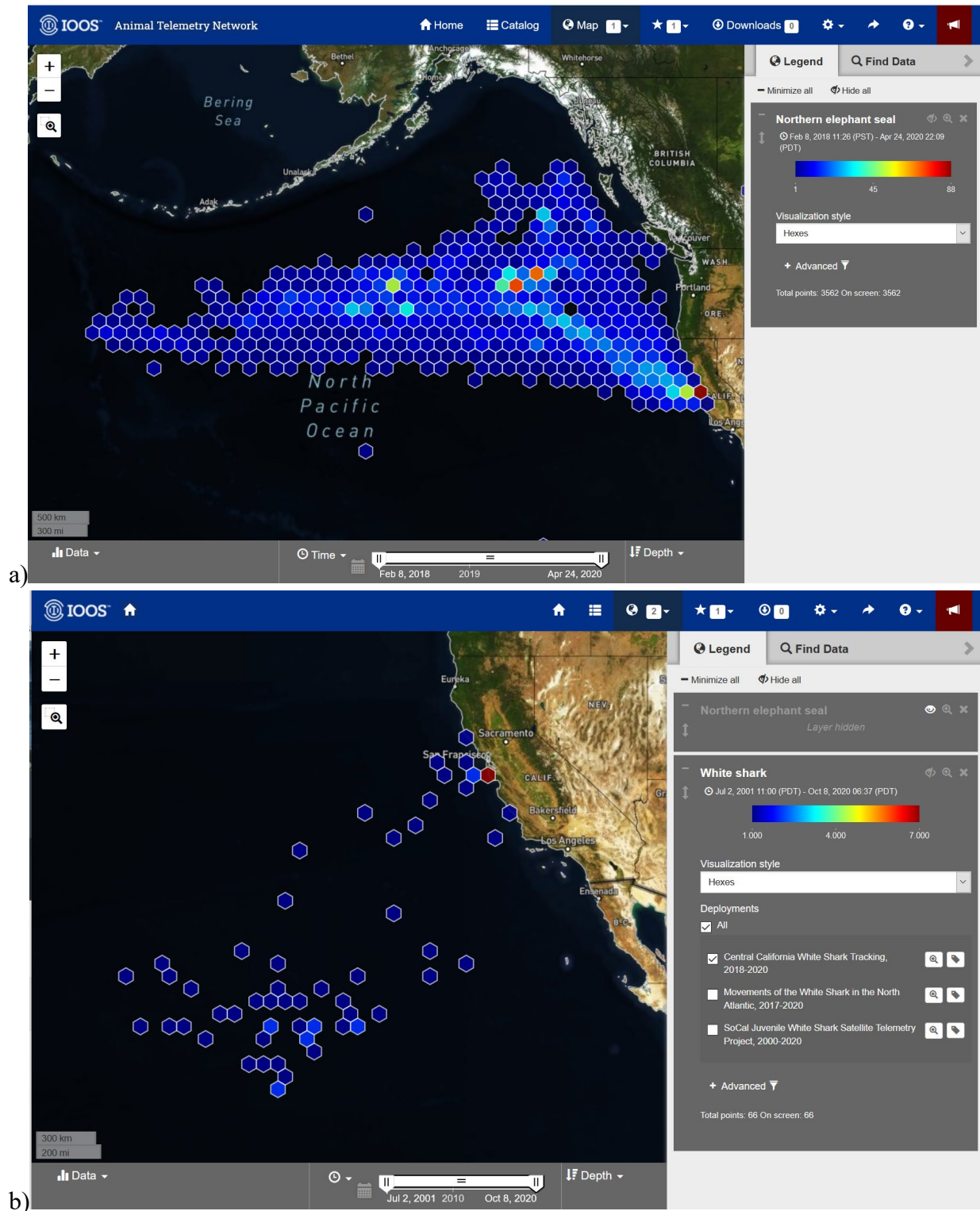


Fig. H7. Animal telemetry coverage for a) elephant seals and b) white sharks for 2018-present.

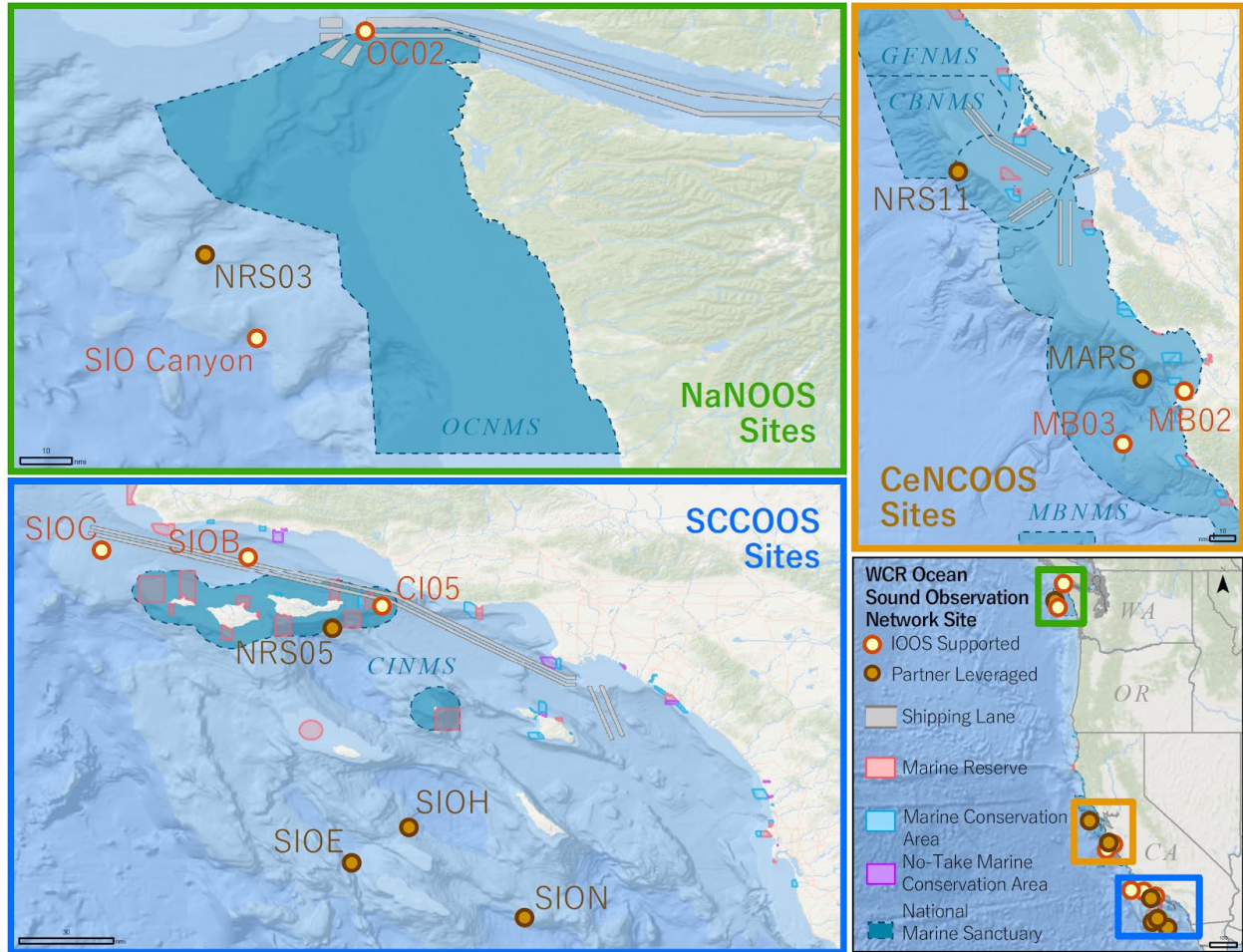


Figure H8. Map illustrating *Tier 2* OSON stations including the NANOOS and SCCOOS sites. There are four stations in the CeNCOOS region, including the Monterey Bay Accelerated Research System (MARS) cabled station reporting data in real-time, two of which to be funded by CeNCOOS. Also shown is their location in relation to National Marine Sanctuaries, MPAs and shipping lanes.



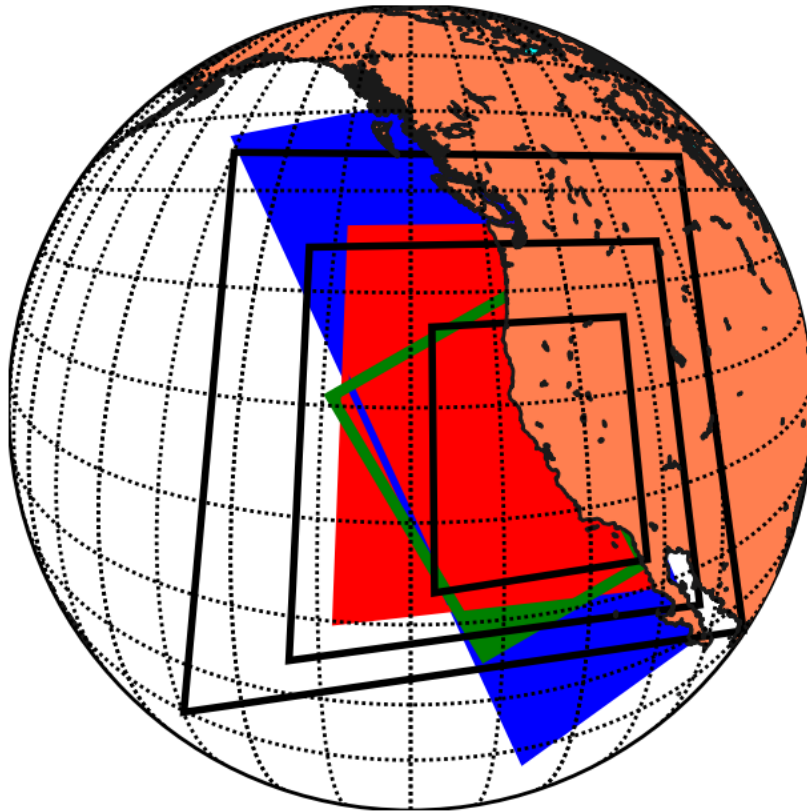


Figure H9. Chart showing *Tier 1* model domains where the box indicates CA ROMS( green) , West Coast ROMS (red), WCOFS (blue, NOAA supported) ocean models and the COAMPS set of nests for atmospheric boundary conditions (black boxes).

## SCHISM Model Resolution

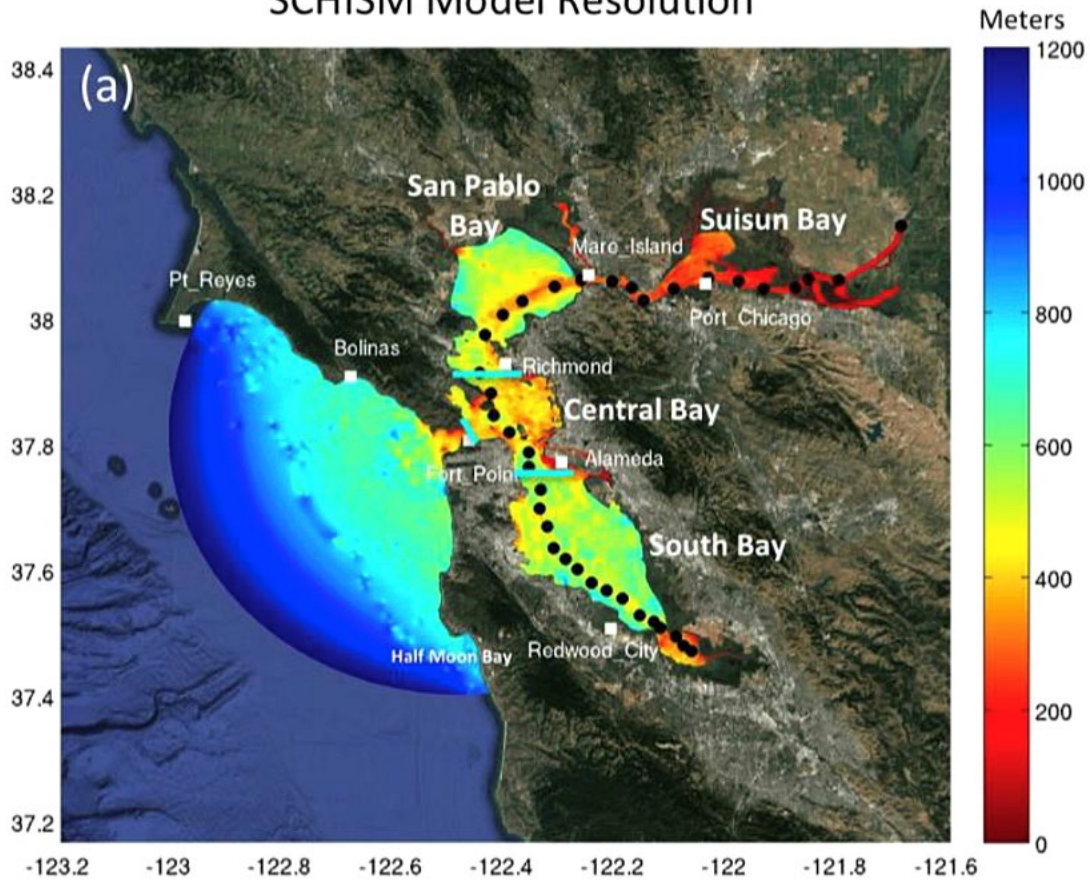


Figure H10. Map illustrating the SCHISM model domain and spatial resolution (meters) of the San Francisco Bay configuration. San Francisco Bay is located at approximately  $38^{\circ}$  N on the west coast of North America in about the middle of the state of California, USA. The black dots show the locations of the 37 USGS water quality monitoring stations used, the red squares show the locations of the tide gauge stations and the cyan lines delineate the horizontal area used to define the control volume used for the heat and salt budget calculations (from Chao et al. 2017).

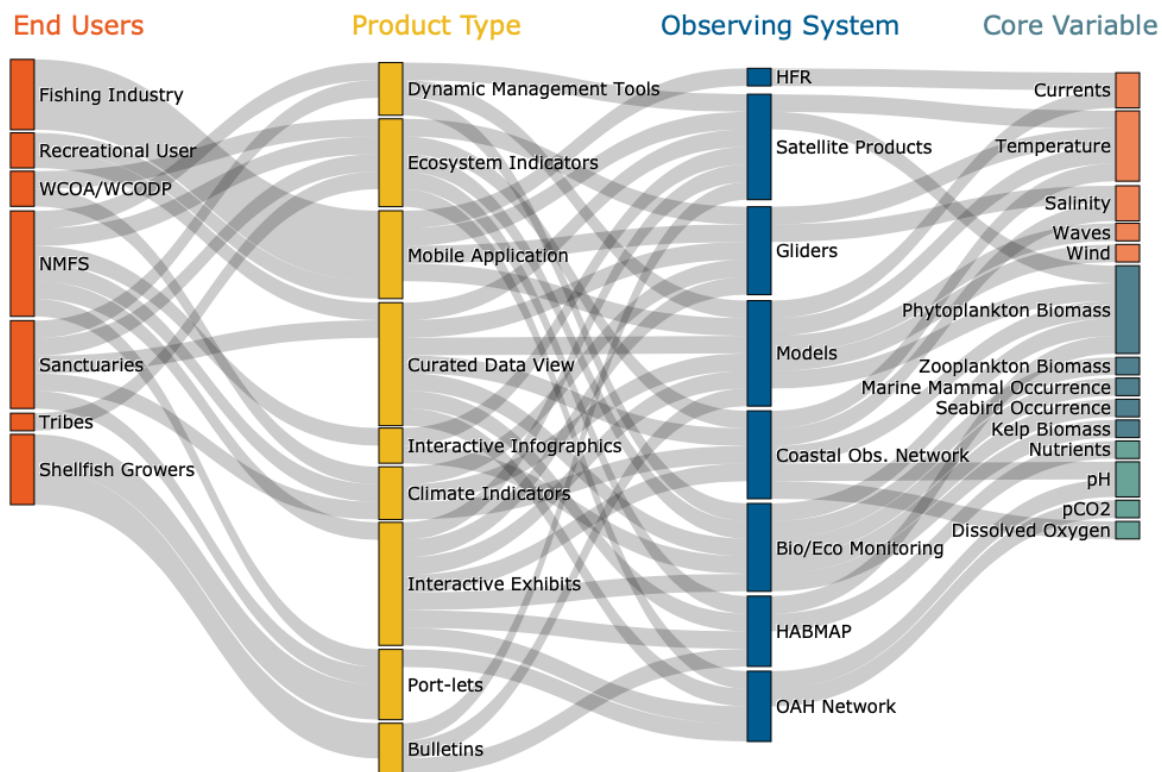


Figure H11. Sankey diagram showing *examples* of links between end users, products, systems and core variables, particularly those that are the focus of our proposed recent and new engagement and product development. CeNCOOS engages with many partners to understand and address diverse stakeholder needs for information. We work closely with local, state, regional, national, tribal and other groups to identify, develop, and deliver information products useful for decision making. We will utilize a ‘toolbox’ of product types and lead the creation of customized, end-user driven products to deliver CeNCOOS observing data in useful formats.