

Recent NANOOS contributions to maritime operations and boater traffic



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The Northwest Association of Networked Ocean Observing Systems (NANOOS®) serves the Pacific Northwest

United States as part of the U.S. Integrated Ocean Observing System or U.S. IOOS®. The U.S. IOOS delivers the data and information needed to increase understanding of our coastal waters so that decision-makers can take action to improve safety, enhance the economy, and protect the environment. NANOOS is a partnership of over 40 entities, including industry, state agencies, local governments, tribes, non government organizations, and educational institutions. NANOOS data and products reach users who need to make a wide range of decisions about our oceans and estuaries, which includes commercial and recreational mariners.

The backbone of the NANOOS enterprise is the NANOOS Visualization System (NVS) that currently distributes data from a myriad of regional and federal assets. While this portal, a sort of “one-stop-shop,” is appreciated by many, over the years NANOOS has become aware that users can be overwhelmed by the abundance of information avail-

able. With this in mind, NANOOS has found success in working with specific user communities, like maritime operators, shellfish growers, and tuna fishers, to make customized versions of NVS providing data of most interest to that community. These applications of the web-based NVS, or web-apps, provide a more efficient experience for the users.

In 2013, NANOOS released a web-app targeting the maritime community. The NANOOS Maritime Operations web-app provides easy access to a suite of existing datasets (observations, model overlays, and tools) that are deemed to be of significant importance to the maritime/fishing community. Of these, climate and ocean conditions are the most important needs identified by this community. “The Maritime Community needs real-time data and accurate forecasts of waves, wind, tides and currents...” Captain Dan Jordan, Columbia

River Bar Pilots told us. Thus, NANOOS placed emphasis for the Maritime Operations web-app on serving high resolution WaveWatch III wave forecasts, virtual wave stations spaced 1km apart along the 25m isobath, NDBC and NOS wave and tide gauge stations, CDIP stations, and integration of the Newport, OR, X-band port radar directly into NVS. The latter station provides real-time radar measurements of wave conditions (wave length, frequency and direction) at the mouth of Yaquina Bay and immediately offshore providing ocean users with critical information about conditions adjacent to the estuary mouth. A new X-band radar site has been installed at the mouth of the Columbia River and these data will soon be integrated and disseminated through NVS.

The Maritime Operations app allows users to composite forecast overlays with

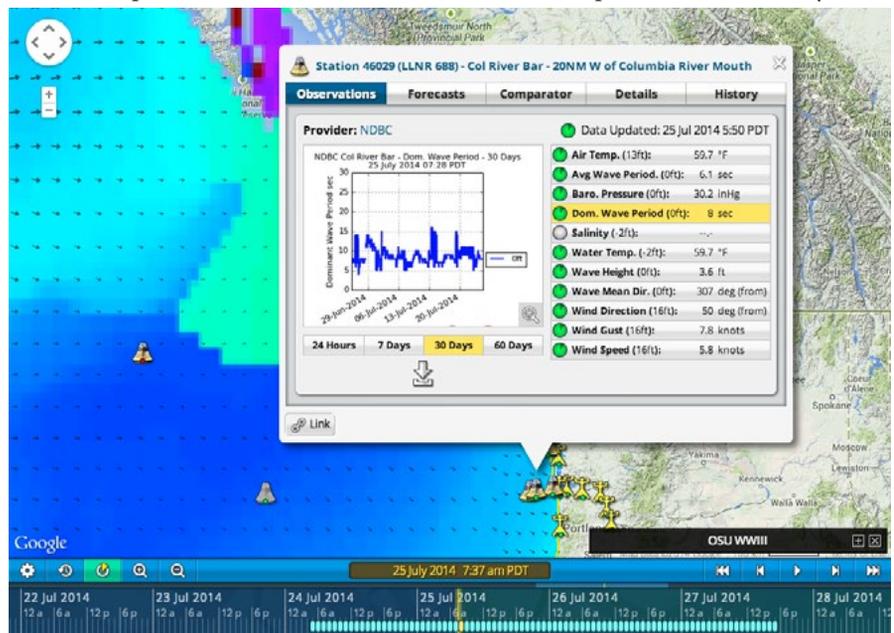


Figure 1. The NANOOS Maritime Operations web application showing dominant wave period as forecast by the OSU Wavewatch III model from 5am July 24 to 5pm July 27 and 30-day observations for the same variable as observed by the NDBC 46029 (Columbia River Bar) buoy.



real-time observations (Figure 1). In this example we are showing dominant wave period as forecast by the OSU Wavewatch III model and 30-day observations for the same variable as observed by the NDBC 46029 (Columbia River Bar) buoy. Users can view different overlay forecast times. Clicking on the Comparator tab provides a direct comparison (not shown) allowing the user to assess performance of the model against the specific platform's location. The app also includes two chart features, which may be interactively selected by the user in order to visualize nearshore and basin-wide bathymetry. This feature, unique to the Maritime Operations web app, includes NOAA RNC charts, which dynamically change as the user pans and zooms, and, CORDC digitized charts that are manually controlled by the user. The latter provides slightly better resolution and detail compared with the former.

In 2014, NANOOS released a new web app targeting the recreational boater community (Figure 2, <http://nvs2.nanoos.org/Boaters>). The NANOOS Boaters web app, designed expressly for

boaters, provides access to two primary types of in situ assets: HF Radar, yielding surface currents, and NOS Tide gauges, yielding tide predictions, along with a suite of forecast overlays (e.g., air temperature, pressure, humidity, waves and winds), and markers depicting the locations of marinas and their address details.

Of particular note is the inclusion of a new tide prediction tool for multiple stations throughout the PNW region; for the purposes of this web app, we use XTide for predicting the hourly tides. Clicking on a particular tide prediction station, activates the timeline and depicts a plot with hourly predicted tide values. As the user navigates the timeline slider, the predicted values are updated automatically in the NVS map window. This last feature is especially powerful enabling the user to query the heights of the tides at any time of the day and for several days into the future. Additional enhancements to the XTide graphical user interface includes symbology that depicts whether the tide is rising or falling, and a change in color of the symbols to highlight those tide predictions

that fall below Mean Lower Low Water (MLLW). Besides the XTide tide predictions, the Boaters app also includes the predicted ebb and flood tidal currents for selected sites along the coast (mostly within Puget Sound and up in the Columbia River where such predictions are available). Finally, the Boaters app also includes the digital nautical charts introduced originally in the Maritime Operations web app in 2013.

NANOOS works with its membership to craft and test these web apps. We thank Captain Dan Jordan (Columbia River Bar Pilots), Captain John Veentjer (Marine Exchange of Puget Sound), and Captain Michael Schoonover (U.S. Coast Guard) who all provided input for the Maritime Ops app, and we thank countless members of many yacht clubs who reviewed the Boaters web app. ☆

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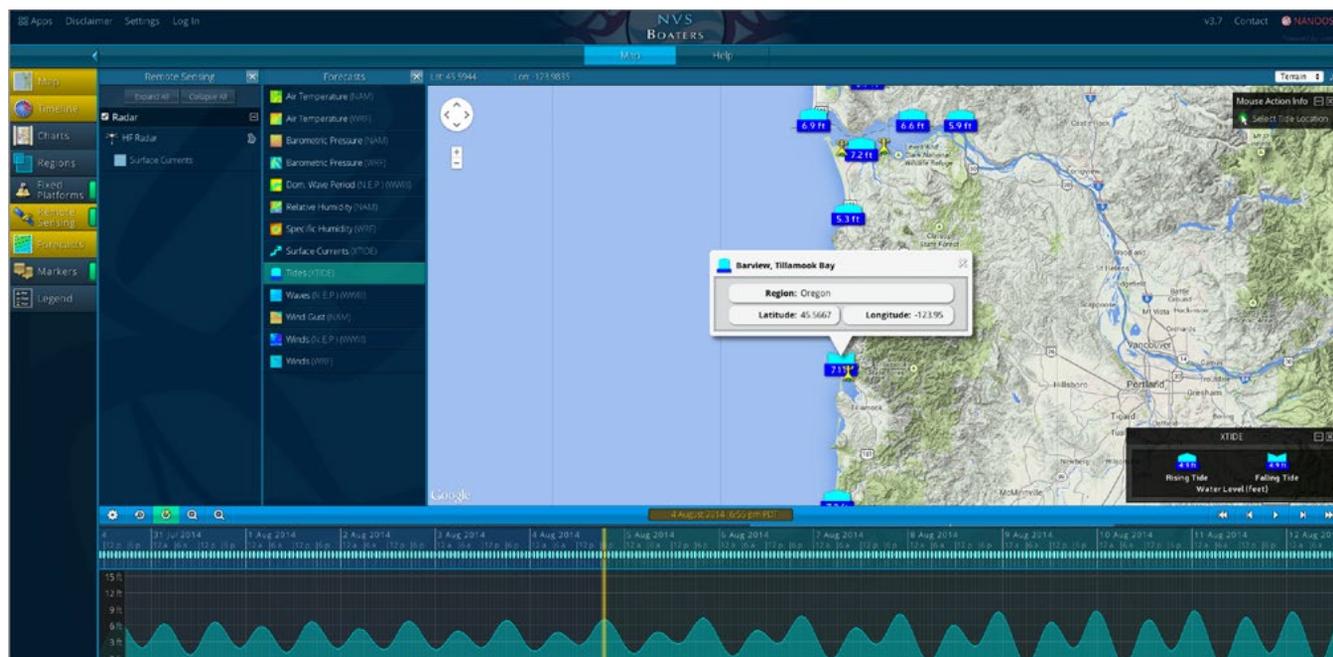


Figure 2. The NANOOS Boaters web application showing the locations of XTide tide prediction stations.