2019 IOVWST Meeting Summary (rough version)

Mark Bourassa, Paul Chang, Naoto Ebuchi, Marcos Portabella, Stefanie Linow, Ernesto Rodriguez, and Ad Stoffelen

- I'd like to add Raj Kumar to this list

2020 Meeting

The 2020 meeting will be held in Bangalore, India. Attendees asked that the meeting be later in the year than we had planned earlier. The following conflicts were noted.

April 20 to 24: IWW15

May 3 to 8: EGU

May 10 – 15: AMS Trop Meeting and GODAE Ocean Predict Meeting

May 25: major US holiday

The above points were discussed with Raj Kumar. He suggests that the first week in June should be fine. He is checking on the venue.

Attendees from multiple countries have advised us that we must set the date early to facilitate paperwork for visas. In general, we need to be more proactive about this in the future.

Communications

As a community, we are not adequately communicating the capabilities, strength, and weaknesses of different types of wind sensors, nor are we communicating how different types of sensors can and should be used together. Better communication is needed to aid decision makers and operational users. Our OceanObs19 papers provides the basics, but is insufficient in detail.

The solution to this problem is to produce a peer-reviewed document with appropriate details. It must have

1. An easy to digest summary,
2. details of the capabilities, strengths and weaknesses
3. Requirements for applications. Except for very specific cases, these requirements are more easily communicated as identification of key phenomena for the application, and requirements for those phenomena.
4. We need explain the synergies between the different elements of the wind observing system.

Calibration and Intercalibration

We need to be clear that sensors measure the space and time integral of the surface conditions, (weighted by the antenna pattern for remotely sensed data). In the vast majority of cases, these surface conditions are a function of local stress-equivalent winds (stress). This averaging limits the ability of platforms to accurately observe features with spatial scales finer than those imposed by the averaging

and the observation method. Atmospheric eddies/rolls will impact dropsondes and SFMR, and the spatial scale of these features should be considered when trying to compare these smaller scale observations to satellite observations. Averaging over scales that partially resolve vigorous features causes large uncertainty, which could also contribute to errors in calibration and an overly pessimistic assessment of accuracy. Therefore, we must carefully consider the averaging scales when intercalibrating instruments.

These problems are related to land contamination issues in coastal products. These issues need to be better explained for users of coastal products.

Extreme Winds and Stress Discussion Summary

Greater improvements to calibration and applications are expected if we improve our understanding of the physics and environmental context that the various instruments (e.g., dropsondes, SFMR, satellites, buoys and aircraft) are responding. This understanding is need in order to translate the measurements between instruments for calibration and validation. The measurements from different platforms are correlated, but there are differences in scaling and noise.

Recommended Actions

1. Mark will create a Google document discussing these issues (for extreme winds) and how to approach solving them. Once Google document is complete with community input, we will take best ideas, summarize, publish article and ask sponsors for funding to support path(s) to improvements. The deadline for contribution will be 4 week after the page is posted.
2. A suggested partial solution is to coordinate a multi-year field campaign that will collocate the various instruments (remote sensing and in-situ) from multiple platforms in hurricanes and extratropical systems to address the issue of measurement scale and understand the physical processes driving these scales. The NOAA P-3 routinely collects SFMR, dropsondes, IWRAP, TDR data in these systems. New addition would be collocating with satellite (SAR, scatterometers, radiometers, etc.) overpasses. Another new addition would be connecting the surface to the boundary layer via IWRAP with new measurements. We could also try using high fall speed sondes and new sampling patterns to get better collocations between in situ and remote sensing data.
3. The IOVWST recommends that EUMETSAT consider the orbit phasing of METOP-B and METOP-C to minimize the gaps between the ASCAT swaths in the tropical latitudes (The Tristar configuration). The Tristar configuration allows, complemented by a drifting ASCAT-A coverage, at times complete global coverage of high quality and timely vector winds in both the morning and the afternoon.
4. The IOVWST endorses the need for a written report that objectively addresses the question: “What is really needed for the satellite OSVW observing system constellation?” A workshop is being planned in the November timeframe with invited experts from the remote sensing and application communities.

5. The IOVWST recognizes the need for wind product comparisons at algorithm level. These are very useful and lead to further product enhancement and standardization.
6. For coastal applications, we recommend that coastal needs for high resolution be considered when designing on board merging of observations. The most flexible and likely to succeed approach is to perform the aggregation of observations on the ground.
7. The coupling of the ocean and atmosphere is strongly influenced by surface currents, SSTs and surface waves, all of which modify surface stress and surface stress derivatives. Therefore the IOVVWST recommends that
    a. The observing system be designed to Acquire coincident observations of surface winds and currents (e.g., WaCM, CFOSAT) and ideally wave and SST. We note that for much of the globe, SST from geosynchronous orbits might be combined with winds, currents and waves observed from low Earth orbit.
    b. With SKIM flying in convoy with SCA, a SCA Doppler capability would usefully extend the SKIM capabilities to provide vector ocean motion information by providing much greater global coverage, which would be highly advantageous because SKIM derivative fields are limited in accuracy by sampling. Alternatively, nearly coincident observations of winds, waves and currents would be provide insights into air/sea coupling processes and the impacts of spatial averaging of currents (as is done in most coupled air-sea models).
8. The recommendation for one or more non-sun-synchronous orbit for one or more scatterometers is still valid.
9. Examine the advantages and disadvantages of the choice of orbit(s).
    a. What is better for examining the diurnal cycle?
    b. What is better for inertial variability?
10. Winds are valuable for a wide range of applications. It would benefit the winds community to expand annual events to include more activities related to ocean and atmospheric boundary-layers.
    a. More coincident observations of boundary-layers and surface winds are needed to better understand coupling processes.
    b. Key coupling processes depend on spatial derivatives of wind and stress. We recommend improved resolution in future missions to allow the calculation of higher resolution spatial derivatives.
    c. Coincident observations of winds (or stress) and other flux-related variables would be very useful
    d. Make further use of satellite observations to improve the parameterizations of air-sea interaction processes.