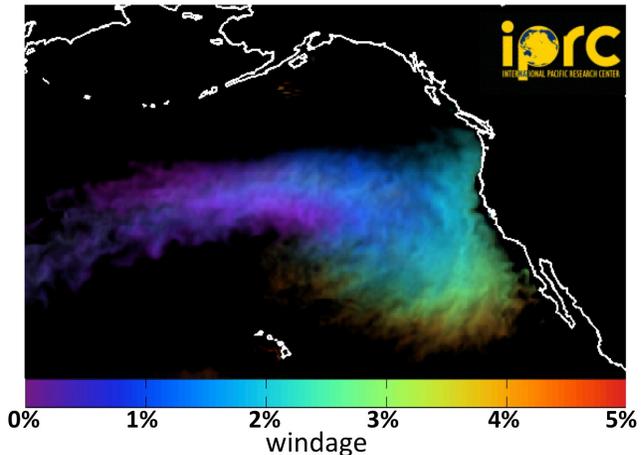


IPRC Model Now Tracks Lighter Tsunami Debris

The IPRC Model for tracking the Japan tsunami debris across the Pacific has been adjusted to reflect the effects of wind on different types of debris. The original model was based on data from scientific drifting buoys with large drogues at 15 meters below the surface to measure the movements of currents. To this model, Senior Scientist Nikolai Maximenko and Scientific Computer Programmer Jan Hafner have now added five levels of windage to provide a more complete simulation of the debris field and a



more accurate estimate of the present location of various types of debris. Objects with the highest windage in the model started to arrive on the West Coast already at the end of 2011. The new animations generated by the model are available to the public at the International Pacific Research Center Marine and Tsunami Debris website: tinyurl.com/IPRCdebrisnews.

The original model version appropriate for heavy debris, immersed mostly in water and flowing mainly with the currents, shows the largest concentration of the debris still floating in the central North Pacific, with the projected arrival to the Canada-US West Coast still at the beginning of next year. The highest windage version, however, shows debris arriving along the northern parts of the West Coast already before Christmas 2011, the time the first light drums from the tsunami were sighted along the Olympic coast.

The multi-windage animation reveals how over time the paths of debris with different profiles above the ocean's surface diverge. During the first several months all types debris floats mostly along the same path eastward, away from the Japan coast. The reason is that here the Kuroshio Current is so fast that light summer winds did not play leading role. However, as the eastward-flowing Kuroshio weakens and the winds grow stronger with coming fall and winter, the debris with different windages starts to move very differently. The more exposed debris breaks away from the bulk and moves ever more quickly northeast across the Pacific. By now, mid-summer 2012, a large portion of the high-windage debris has already arrived along the West Coast, while the lowest-windage debris is still in the central North Pacific.

“A remarkable observation relates to the Papahānaumokuākea Marine National Monument,” says Maximenko, “Last fall we were very concerned about the sanctuary. End of September, 2011, the Russian Sail Training Ship *Pallada* had picked up verified tsunami debris only about 400 miles northwest of the Midway atoll. In most other years, the currents would have continued to shove the debris toward the sanctuary. To our surprise, our model showed during October an oceanic front developing 200 miles northwest from Midway. The current, associated with the front started to channel the tsunami debris northeast, north of the Hawaiian Islands. This front held and has protected the sanctuary, thankfully sparing it until now. No verified Japan tsunami debris has been reported there yet. By now, according to the model, the greatest concentrations of all windage debris types have passed the region to the north.”

Anyone who watches the animation will be astonished by the many ways in which the ocean and wind act on different kinds of floating debris and will appreciate the complexity of predictions of when and where remnants of pieces, swept into the ocean along the Tohoku Coast on March 11, 2011, will wash up.