

NWS Operational Impacts from QuikSCAT Loss

THINGS YOU MUST KNOW:

- The loss of QuikSCAT has highlighted the criticality of this high resolution wind observing system to predicting dangerous marine conditions that threaten lives and property. In particular, forecast accuracy and timing of marine warnings has been degraded as documented by an operational survey conducted in April 2010.

BACKGROUND (OPERATIONAL IMPACTS SURVEY RESULTS):

- Impacts are preliminary since only 5 months have passed since QuikSCAT failure on 23 November, 2009. In addition, this season was a non-typical El-Nino winter where a higher frequency of winter-time oceanic storms was expected and did occur.
- Non-Tropical
 - Alaska Coast: Based on buoy and mariner reports off the Alaska coast, a number of marine vessels were caught in open waters during a 27-29 March storm when gale-to-storm force conditions occurred but were missed by forecast models. Fortunately no lives were lost. In previous storms, QuikSCAT data was invaluable in adjusting forecasts based on actual observations.
 - Pacific NW Coast: No QuikSCAT data compounded by inoperable offshore buoys caused wave forecast errors of up to 10 feet when compared to coastal buoy observations. Since a 10-20 foot wave height is potentially dangerous to small craft, a 10 foot error is a critical distinction to mariners.
 - East Coast: Lack of QuikSCAT observations during December 18, 2009, likely caused the magnitude of storm surge to be under-forecast by 3 feet. As a result, coastal flooding in Charleston was worse than anticipated and created unexpected road closures during a peak travel period.
 - Open Oceans: OPC issued many wind warnings but most went unconfirmed. Forecasters based warnings on subjective satellite interpretation techniques, numerical model interpretations, and sparse buoy and ship reports. Significant storms where QuikSCAT loss was acutely felt included:
 - Western Pacific storms in early December 2009 that generated dangerous surf in Hawaii.
 - A North Eastern Pacific storm in January that battered and damaged the container ship Horizon Hunter which lost 6 containers and was forced to divert to Hawaii.
 - A Gulf of Alaska storm of mid-February which generated destructive waves south of San Francisco Bay.
 - A series of Western Atlantic storms in February and March.
 - A Central Pacific storm in March that injured a sailor engaged in a world cup race
 - OPC is conducting a more in-depth analysis of impacts in context of continuous forecast improvements made using QuikSCAT over past 10 years.
- Tropical – Impacts outside of land-falling US hurricanes are expected to increase as we head into the tropical cyclone season without QuikSCAT.
 - One confirmed miss, possibly missed detection of as many as 8 storm-force gap wind events in the Gulf of Tehuantepec in the Central Eastern Pacific. Impact likely occurred to shipping traffic, although event reporting is difficult to trace.

- Combined tropical & non-tropical impacts from Honolulu Tropical Operations & the Honolulu Weather Forecast Office, QuikSCAT loss has caused:
 - surface analysis problems defining feature types & locations
 - difficulty diagnosing tropical cyclones
 - difficulty assessing marine warnings¹
 - difficulty in sea state analysis
- Wind strength in Tropical Storm Omais was under-predicted because of lack of QuikSCAT observations on 23 March, 2010. Islanders in Yap State, Federated States of Micronesia lost 70% of papaya, banana, and bread fruit crops. As a result, islanders were displaced due to lack of food. Prior warnings could have mitigated impact by allowing increased food storage prior to storm.
- Actual surface wind conditions during West Pacific Tropical Storm Nida on 23 November could not be monitored due to loss of QuikSCAT. The impact is unknown since no damage reports were received.

¹ Differentiating between Gales (39-54 mph), Storms (55-73 mph), & Hurricane Force (>74 mph)