

Riihau Island

100 KM 100 Miles



QuikSCAT image taken from nasa.gov

Scatterometer Wind Estimation Near the Hawaiian Islands

Hawaii image taken from geology.com

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REMOTESE

Ultrahigh Resolution Wind Retrieval

ASCAT UHR Retrieval





RapidScat 2.5 km Advanced UHR

Florida



UHR Validation

RapidScat Buoy Validation







QuikSCAT L2B and UHR Wind Field Comparisons

L2B Wind Field Near Hawaii

UHR Wind Field Near Hawaii



QuikSCAT UHR and Model Wind Field Comparisons

UHR Wind Field Near Hawaii

WRF Numerical Model Winds



Model Wind Speed (collocated to the hour)

UHR Closest to Model Selected Ambiguity Wind Speed



- The white line in the model figure is the land buffer outline that is present in UHR wind retrieval

Model Wind Direction (collocated to the hour)

UHR Closest to Model Selected Ambiguity Wind Direction

15 m/



- The white line in the model figure is the land buffer outline that is present in UHR wind retrieval

Speed (m/s)

10

- The wind direction quivers are unit length

5

UHR Winds Collocated with WRF Numerical Model Winds



- Collocations are within 2.5 km and 10 minutes
- QuikSCAT winds are processed with DIR, nudging field, and median filter based ambiguity selection scheme

Closest to WRF UHR Winds



- QuikSCAT UHR winds nudged with WRF numerical model winds

- There are ambiguities that have directions that represent the reverse flow region features

UHR Comparison to ECMWF Winds Just East of the Hawaiian Islands



Why the difference?

Possible Reasons:

- Median filter based ambiguity selection scheme
- Nudging field
- UHR wind retrieval
- Geophysical Model Function (GMF) issues
 - Neutral Stable
 - (Wind/wave equilibrium) Fetch
 - Swell

UHR Simulation Using WRF as True Wind field (closest to truth ambiguity selection)

WRF Model Winds

Simulated WRF Model Winds



Simulated WRF/UHR Winds Versus WRF Numerical Model Winds (closest to truth ambiguity selection)



Simulated winds have real measurement geometry, added Monte Carlo noise, and a non-uniform footprint.

Median Filter Based Ambiguity Selection





Where do we go from here?

- Specialized GMF
 - Parameterized by fetch and swell
 - Stability?
- Customized WRF regional nudging field
- Alternate near-land ambiguity selection schemes



Knots/sec