GWINDEX - *G*OES Rapid-Scan *WIND*s *EX*periment:

Applications for West Coast Forecasting

Chris Velden and Dave Stettner
University of Wisconsin - Cooperative Institute for Meteorological Satellite Studies, Madison, WI

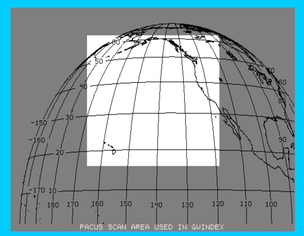
What Is GWINDEX?

Overall Objective: To demonstrate improved quantity and quality of cloud-motion winds using 7.5 minute interval rapid-scan visible and infrared imagery from GOES-10

Goals: To provide improved remotely sensed data products over the eastern North Pacific for NWS forecasters, support PACJET and THORPEX initiatives, and assess data impact on the RUC model short-term forecasts

Experiment Duration: 10 January through 31 March, 2001

Coverage Domain: Eastern North Pacific and western North America (see figure below for scan area); winds limited to 60ºN and from 115ºW to 175ºW



Product Types: Winds produced from three image channels

7.5 minute interval images:

• 0.65 µm channel (VIS) winds available 1500 UTC - 0300 UTC

• 10.7 µm channel (IR) winds available around the clock

Hourly interval images:

• 6.7 µm channel (WV) winds available around the clock (run at NESDIS)

Data Set Availability: Hourly, around the clock (few exceptions due to satellite blackout periods), products available about one hour after image sequence; archived image products can be found at

http://gale.ssec.wisc.edu

Participants: UW-CIMSS and NOAA/NESDIS/ORA/ FPDT, NWS, NOAA/FSL, PACJET community

Contact:

Chris Velden - chrisv@ssec.wisc.edu

Automated Satellite-Derived Winds Processing Developed at UW-CIMSS

Uses a sequence of geostationary satellite images to generate three dimensional wind products by the following procedures:

•Check image registration

•Track targets

•Assign target height

•Calculate displacement vectors

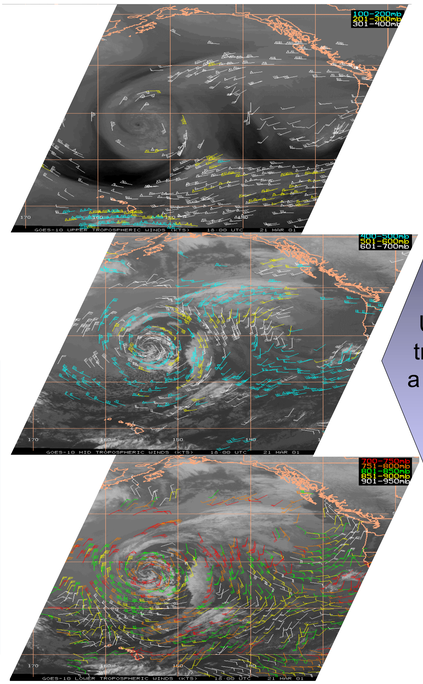
•Perform quality control steps

What Are Rapid-Scan Winds?

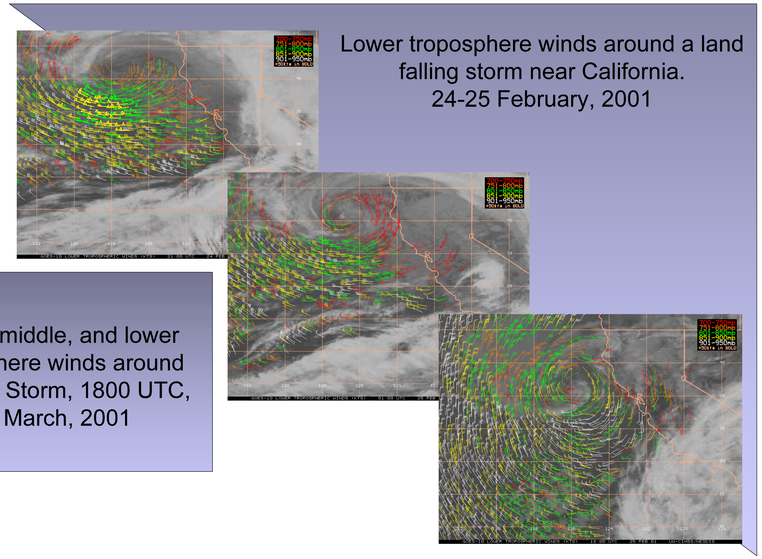
Geostationary satellite-derived wind sets have traditionally been generated from image triplets with 30 or 60 minute intervals, and occasionally 15 minute intervals.

During GOES special rapid-scan operations, co-located images are available at intervals of 7.5, 5, 3, and even 1 minute. The area covered is reduced as the interval decreases.

This experiment used the 7.5 images made available with PACUS area coverage (see figure at left).

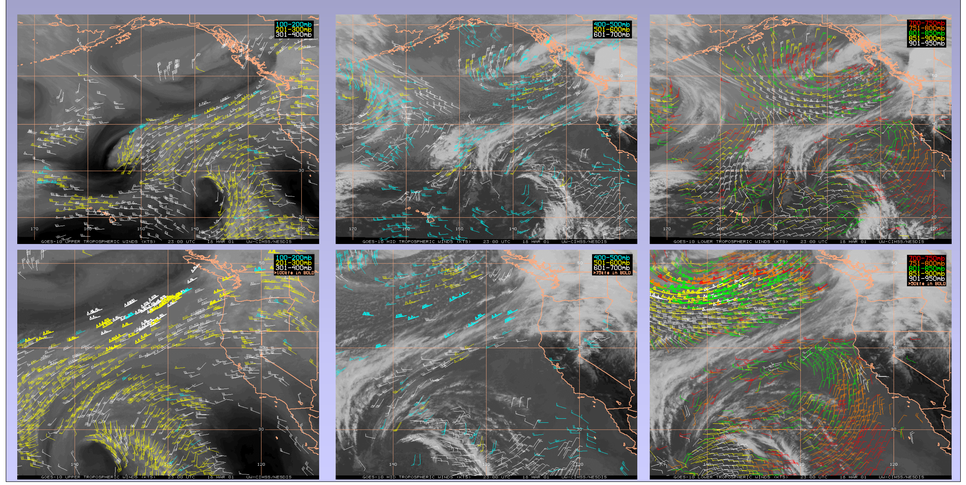


Upper, middle, and lower troposphere winds around a Pacific Storm, 1800 UTC, 21 March, 2001



Lower troposphere winds around a land falling storm near California. 24-25 February, 2001

North Pacific (upper panels) and PACJET (lower panels) sectors, 2300 UTC, 18 March, 2001
Upper, middle, and lower troposphere wind plots



Summary and Future Work

•Real time rapid-scan winds production success rate ~95%

•Data sets delivered to RUC model for assimilation tests (see poster by Weygandt et al.)

•Data impact studies (case analysis and NWP) are underway

•Good response from PACJET mission planners and west coast forecast community

•Similar special scanning from GOES-8 planned for CAMEX-4 (Aug.-Sep., 2001)

•GWINDEX-II follow-up planned during next PACJET in early 2002

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