TC Analysis & Forecasting
Using CIMSS Products

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Joint Typhoon Warning Center
July 2005
Overview

- JTWC Forecast Process
  - CIMSS environmental products
- AMSU Intensity Estimates
- Experimental Shear Product
- Morphing Animations
- AODT
JTWC Forecast Process

1500Z Watch Turnover

- 1800Z Warning Cycle
- 1900-2030Z

Situational Awareness
- Review Old Data & Forecasts
- AOR Weather Overview
- Assess Current & Potential Suspect Areas
- Streamline Analysis
- Issue Sig. Wx. Bulletin
- Morning Discussion

0300Z Watch Turnover

- 0000Z Warning Cycle
- 0100-0300Z

Warning Cycle
- Review fixes
- Update BT
- Send Bogus
- SAFA Analysis
- Create Consensus
- Lay Forecast Track
- Intensity Assessment
- Define Wind Radii
- Create Warning Graphic & Message
- Issue Warnings
- Generate & Post 5-Day Aids
- Customer Notification Calls

0000Z Warning Cycle includes
- Prognostic Reasoning Bulletin
Review AOR Weather

- Hemispheric satellite loops – WV, IR, Multi-spectral – on TeraVision and Mark IVB
- FNMOC & NRL TC pages – Microwave & QuikSCAT
- CIMSS Real-time Winds & Analyses
- Streamline Analysis
- Numerical Model Analyses & Forecasts
Assess Current & Potential Suspect Areas

• Analyze environment surrounding current and potential systems
  – CIMSS products
  – Satellite imagery & products
  – Observations
AMSU Intensity Estimates

CIMSS/NESDIS-USAF/NRL Experimental AMSU TC Intensity Estimation:
Storm position corresponds to AMSU-A FOV 16 [1<-->30]
Raw Ch8 (~150 hPa) Tb Anomaly: 0.41 C
Raw Ch7 (~250 hPa) Tb Anomaly: 0.53 C
AMSU-A MSLP (Ch7): 1000.8 hPa
RMW value: 36.6 Km
TROPICAL STORM BEATRIZ
Thursday 23Jun05 Time: 1330 UTC Latitude: 16.81 Longitude: -109.616
Satellite: NOAA-15

ATCF data for Month: 06 Day: 23 Time (UTC): 1200 For imagery, go to http://amsu.ssec.wisc.edu/epac42.html
For all comments and questions mailto:chrisv@ssec.wisc.edu

JTWC uses microwave to help determine RMW!
AMSU Intensity Estimates

- Non-homogeneous comparison by storm
- Compared to preliminary JTWC best track data
- Pronounced negative bias in CIMSS; positive bias in CIRA
AMSU Intensity Estimates

- Homogeneous characteristics by storm
  - Head-to-head comparison of CIMSS & CIRA estimates
- Compared to preliminary JTWC best track data
- Pronounced negative bias in CIMSS; positive bias in CIRA
STY 09W (Dianmu)
Jun 2004

Mean error: -0.2 kt
Experimental Shear Product

- Provides a 24-hour favorability estimate for intensification based on vertical wind shear every 6 hours
- Used by TDOs in conjunction with other tools to assess short-term intensification trend

TROPICAL DEPRESSION AGATHA  18:00UTC  24May2004
UW-CIMSS Experimental Vertical Shear TC Intensity Trend Estimates

Current Conditions:

<table>
<thead>
<tr>
<th>Latitude</th>
<th>19°16'45&quot; N</th>
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<tbody>
<tr>
<td>Longitude</td>
<td>111°16'45&quot; W</td>
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<tr>
<td>Intensity (MSLP)</td>
<td>1009.0 hPa</td>
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<tr>
<td>Max Pot Int (MPI)</td>
<td>1005.8 hPa</td>
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<tr>
<td>MPI differential (MSLP-MPI)</td>
<td>3.2 hPa</td>
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<tr>
<td>CIMSS Vertical Shear Magnitude</td>
<td>4.7 m/s</td>
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<tr>
<td>Direction</td>
<td>195.6 deg</td>
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Outlook for TC Intensification Based on Current Env. Shear Values:

Forecast Interval:  6hr  12hr  18hr  24hr

N    N    N    N

Legend:
- VF - Very Favorable
- F - Favorable
- N - Neutral
- U - Unfavorable
- VU - Very Unfavorable

-- Mean Intensity Trend (negative indicates TC deepening) --

<table>
<thead>
<tr>
<th>5hr</th>
<th>12hr</th>
<th>18hr</th>
<th>24hr</th>
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<tbody>
<tr>
<td>VF</td>
<td>&lt;-3.0mb/6hr</td>
<td>&lt;-5.0mb/12hr</td>
<td>&lt;-9.0mb/18hr</td>
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<tr>
<td>F</td>
<td>-3.0 - -1.0</td>
<td>-5.0 - -2.0</td>
<td>-9.0 - -3.0</td>
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<tr>
<td>N</td>
<td>-1.0 - +1.0</td>
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<td>+2.0 - +6.0</td>
<td>+3.0 - +9.0</td>
</tr>
<tr>
<td>VU</td>
<td>++3.0</td>
<td>++6.0</td>
<td>++9.0</td>
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</table>
Morphing Animations

- Operational use limited due to microwave data latency
- Used primarily to train new TDOs and analysts on tropical cyclone evolution
- Used during post-storm analysis when available
AODT

SeaSpace TeraScan interface currently in use
- Time intensive process with cryptic output
- Values differ significantly from Subjective Dvorak estimates early in development and during weakening stages
- Untested on new (Jun 05) TeraVision upgrade
- Uncertain if algorithm will work with MTSAT-1R imagery

Web-based program at UW or NRL is ideal
- Direct readout desired
- Access to archived storm AODT history files for researchers & JTWC
- Give analysts ability to manually override center location & scene type
Questions?

Operational Site:
https://metoc.npmoc.navy.mil/jtwc.html

Public Reference Site: