PTWC Enhanced Products for the CARIBE-EWS Proposal

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Existing Procedures and Products

• Changed little since initiation in 2006
• Procedures based primarily on historical data
• Initial Watch based on:
  1. earthquake magnitude
  2. estimated time left to tsunami impact
  3. distance from earthquake epicenter
• Watch issued if tsunami > 1m at coast possible
• Entire Caribbean in a Watch for Mw ≥ 7.9
• Very conservative for safety, but risk of over-warning
• PTWC Watch confused with NTWC alerts
• Text product only
Enhanced Procedures and Products

- Based primarily on a numerical tsunami forecast
- Initial forecast based on preliminary earthquake parameters (hypocenter and magnitude)
- Initial products now typically issued in less than 10 min – may help for the local tsunami threat
- Later forecasts constrained by computed earthquake mechanism (W-CMT) and sea level readings
- No alert levels, instead 3 general threat levels:
  a. 0.3-1m at coast
  b. 1-3m at coast
  c. >3m at coast
- Reduce conflict with NTWC alert levels
Enhanced Procedures and Products (continued)

- Will still be conservative but should greatly reduce over-warning
- Will provide estimated levels of impact
- Will includes graphical as well as text products
- Will include google-maps enabled (kmz) file of forecast points to facilitate finer spatial resolution
- Real-time model can handle earthquake locations and mechanisms anywhere, and produce quick comprehensive forecasts.
Development since ICG-CARIBE-EWS-VII

- Software development at PTWC to operationalize the products
- Some content refinements based upon feedback received from both CARIBE-EWS and PTWS (Exercises and Task Teams)
- Developed a User’s Guide for both the CARIBE-EWS and PTWS Enhanced Products
- Expect additional feedback on the enhanced products from CaribeWave13 Exercise
- Possibility of further guidance to come from TOWS Task Team on Tsunami Watch Operations.
Suite of Enhanced Products

1. Standard text product with WMO product ID and, for events with a tsunami threat
2. Map showing maximum forecast coastal tsunami amplitude within polygons that encompass islands or island groups or coastal segments.
3. Table of forecast statistics for each polygon
4. Deep-ocean maximum forecast amplitudes map that shows the directionality of the tsunami energy
5. Map of color-coded coastal forecast points to show the threat at a finer scale than in the polygon map.
6. A kmz file to allow drilling down to individual forecast points using a tool like GoogleEarth.
Sample Coastal Forecast

Earthquake: 03/07/2013 09:16 UTC 17.1N 61.1W 20km Mw=8.3
TSUNAMI MESSAGE NUMBER 1
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
0922 UCT WED MAR 6 2013

...TSUNAMI THREAT MESSAGE...

THIS MESSAGE IS FOR ALL COASTAL AREAS OF THE CARIBBEAN AND ITS
ADJACENT SEAS EXCEPT THOSE OF PUERTO RICO AND THE VIRGIN
ISLANDS. IT IS ISSUED AS ADVICE IN SUPPORT OF THE UNESCO/IOC
TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR THE
CARIBBEAN AND ADJACENT REGIONS - CARIBE-EWS.

TSUNAMI THREAT FORECAST
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* 0.3 TO 1 METERS - TSUNAMI WAVES REACHING 0.3 TO 1 METERS
ABOVE THE NORMAL TIDE ARE FORECAST FOR COASTS IN

    ANTIGUA AND BARBUDA... GUADELOUPE... AND MONTSERRAT.
Sample Forecast Polygons

Earthquake: 03/07/2013 09:16 UTC 17.1N 61.1W 20km Mw=8.3
Sample Table of Forecast Statistics

<table>
<thead>
<tr>
<th>Coastal Region</th>
<th>Maximum</th>
<th>Mean</th>
<th>Median</th>
<th>STD</th>
<th>Points</th>
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</table>
Sample of kmz file in GoogleEarth

Mouse-over balloon gives value of forecast point.

Color-scale indicates values of forecast points.

Forecast is computed for model grid points nearest the coast.

Zoom in to area of interest.
Proposed Steps to Implementation

1. Consider feedback from the CaribeWave13 Exercise
2. SOP Training for Member States NTWCs and NDMOs
3. A trial period with overlap of the existing and new products
4. Any last product / dissemination refinements.
5. Acceptance by the ICG with a scheduled start date.
6. Appropriate advance announcement of the change.
Thank You