

Forecasting

FORECAST CHECKLISTS AND DECISION TREES

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The Forecasting and Analysis Committee is pleased at the number of forecast operational checklists and decision trees that have been received in response to an initial solicitation. The Committee wishes to thank all the NWS offices that have submitted these objective forecast aids and plans to publish them in each issue of the Digest.

The two initial presentations both deal with explosive cyclogenesis; one in the Gulf of Mexico, and the other in the North Atlantic Ocean. Readers are invited to submit comments on all forecast checklists and decision trees.

EXPLOSIVE CYCLOGENESIS IN THE NORTH ATLANTIC OCEAN

(Valid north of 40°N and west of 60°W.)

Forecast checklist 2G

Boston NWSFO
Boston, MA

1. Does a 500-mb absolute vorticity max of $17 \times 10^{-5} \text{ s}^{-1}$ or greater exist as an initial NGM condition in an area bounded by 30° to 50° N and 85° to 110° W? VALUE: _____
 YES NO
2. Does this 500-mb vorticity max maintain its initial intensity or strengthen on successive 12, 24, 36, and 48 hr NGM charts?
 YES NO
3. Is this 500-mb vorticity max forecast to move an average of 30 kt or greater through 48 hr?
 YES NO
4. Does the initial NGM-produced 500-mb vorticity max cross the coast between 32° and 45° N?
 YES NO
5. Does a jet streak of 110 kt or greater exist at 250 or 300 mb in a position just south of the initial 500-mb vorticity max?
 YES NO
6. Does the NGM develop a surface low of 990 mb or deeper over the waters north of 38° N and west of 55° W during the 48 hr period?
 YES NO

If four or more questions are answered affirmatively, the situation should be closely monitored for the possibility of explosive cyclogenesis. Assuming a perfect prognosis of NGM-produced 500 mb vorticity:

- Time zero (the midpoint of the 24 hr period of maximum deepening) will occur when the overtaking 500-mb vorticity max is, on the average, 300 nm west of the surface low.
- Storm-force winds will begin close to time zero. The strongest winds will occur in the west quadrant of the system.

EXPLOSIVE EXTRATROPICAL CYCLOGENESIS IN THE GULF OF MEXICO

Forecast Checklist 2H

Slidell NWSFO
Slidell, LA

1. Does a 500-mb absolute vorticity max of $16 (\times 10 \text{ rad/sec})$ or greater exist about 100 nm upstream from the Gulf as an initial condition with longer range guidance indicating this vort max moving towards the northwest Gulf or south Texas?

2. Does this 500 mb vorticity max maintain or increase in intensity during the successive 12, 24, 36, and 48 hr charts?
3. Is this 500-mb vorticity max forecast to increase to at least a value of 20 or higher with a speed of 30 kt or greater during the forecast period?
4. Does a jet streak of 130 kt or greater exist at 250 mb or 300 mb in a position just south of the initial 500-mb vorticity max?
5. Does the NGM develop a surface low of 1000 mb or deeper over the forecast area during the 48 hr period? (with a pressure fall of 12 mb or greater in 24 hr—if so, a storm warning for the Gulf may be required)
6. Does the 500-mb trough show negative-tilt as it moves toward the forecast area?
7. Is the upstream 500-mb height falls at least 70 m/12 hr?
8. Is a 500-mb Low and/or vorticity max of at least 20 or higher forecast within 2–3 degrees of the deepening surface Low (sometimes superimposed) during the 48 hr period?
9. Is there an intrusion of tropical moisture (mid/hi-level) indicated from the tropical Pacific under the influence of a strong sub-tropical jet? (most always present when rapid intensification is observed)
10. Is there a strong, cold high pressure system forecast over the eastern section of the country with a central value of 1028 mb or higher during the forecast period? (normally occurs with a deep 500-mb trough over the northeast U.S.)—not that important a factor)

NOTE: “Explosive Cyclogenesis” normally occurs with an UPPER VORTEX PATTERN. This occurs more often during an EL NINO event.

Most cyclones developing in the Gulf of Mexico will probably require a GALE WARNING for a portion of the Gulf with pressures of 1006 mb or lower, and possible storm warnings for pressures of 1000 mb or lower.

NOTE: Items #2..3..4..6..7..8..and 9 are considered rather essential for “explosive cyclogenesis.”

Folklore

METEOROLOGY—THE ART AND THE SCIENCE OF IT. . . .

by Sue Mroz

Science likes to be as exact and specific as possible. In dealing with wind, for example, knots and degrees are used for speed and direction and they tell the meteorologist a great deal. But folklore writers, song-writers and poets seem to fill in the gaps and embellish weather data or put it in a more colorful, easier-to-remember form sometimes.

Longfellow seems to have captured the force and the eloquent beauty of an autumn wind with this line from his poetry. “Wild with the wind of September wrestled the trees of the forest.” The increasing presence of strong polar winds can be felt as cyclones and Canadian cold fronts march us even closer to winter.