Week-2 and day 6-10 NAEFS Product Development and Planning

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Outline

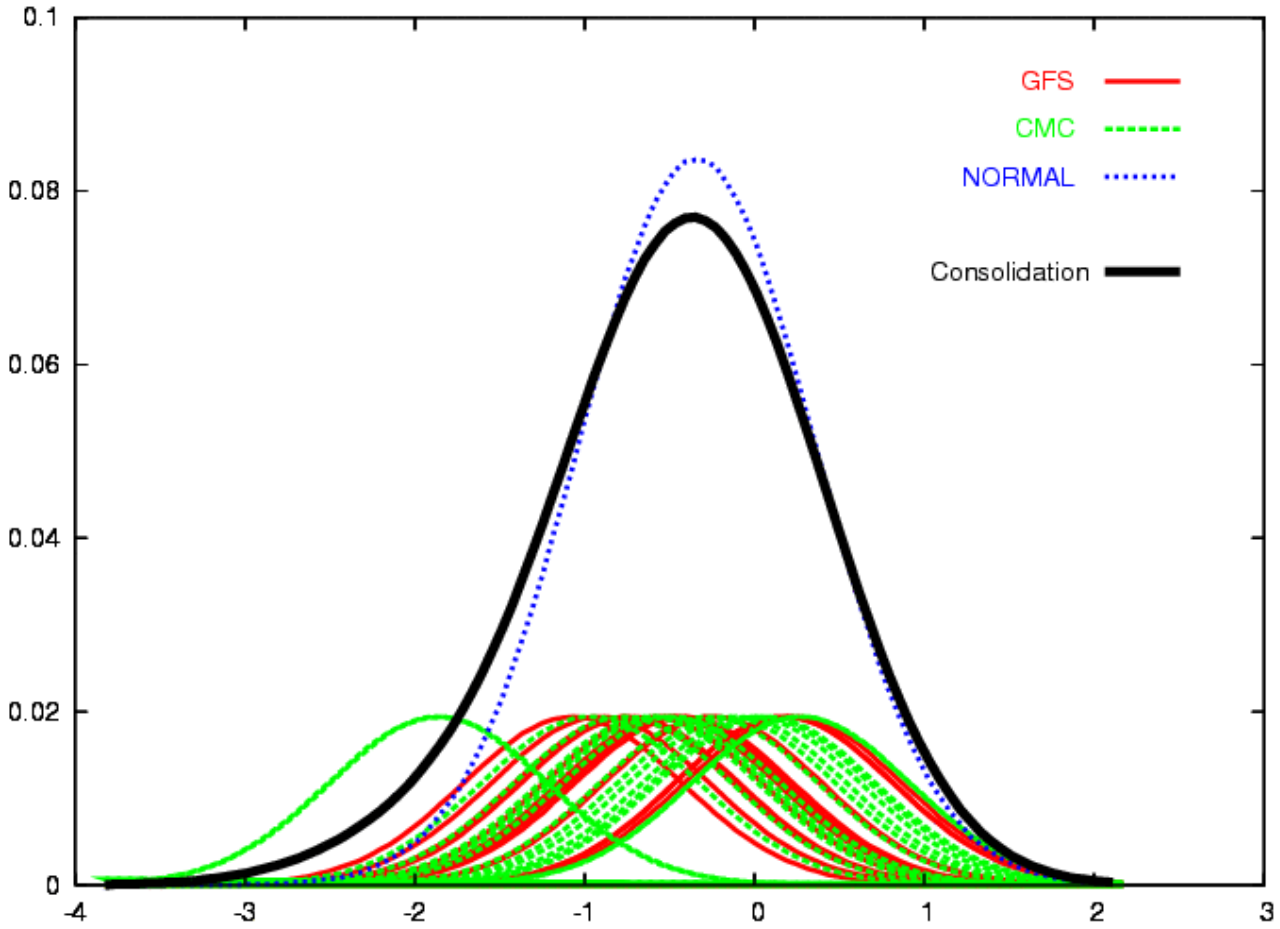
- Review current CPC NAEFS products
- Recently developed products
- In development
- Summary of Plans

CPC NAEFS Products

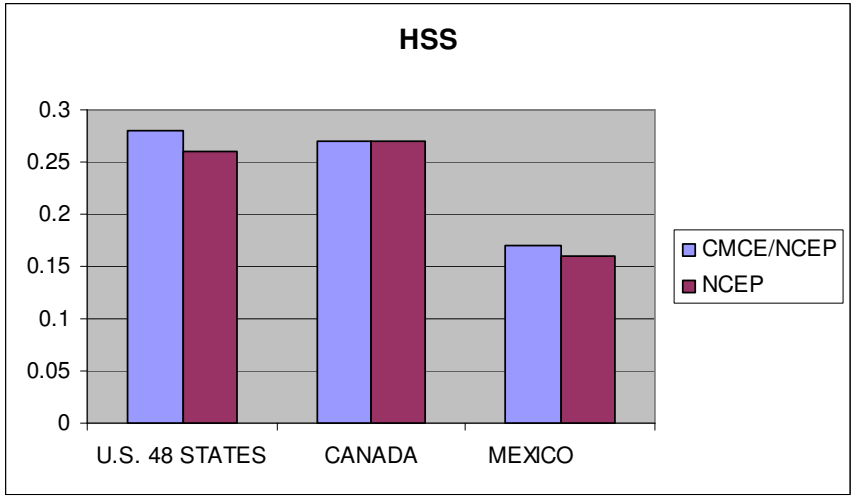
- Week 2 temperature forecasts of above, below and near-normal categories
- Category forecasts correspond to official CPC / National Weather Service forecast product with forecaster input
- Generate both ensemble member count probabilities, which assumes reliability of the ensemble probabilities and kernel-smoothed, skill-estimated calibration of probabilities
- Calibrated temperature and precipitation used by CPC forecasters as a primary tool in 6-10 day and 8-14 day forecasts

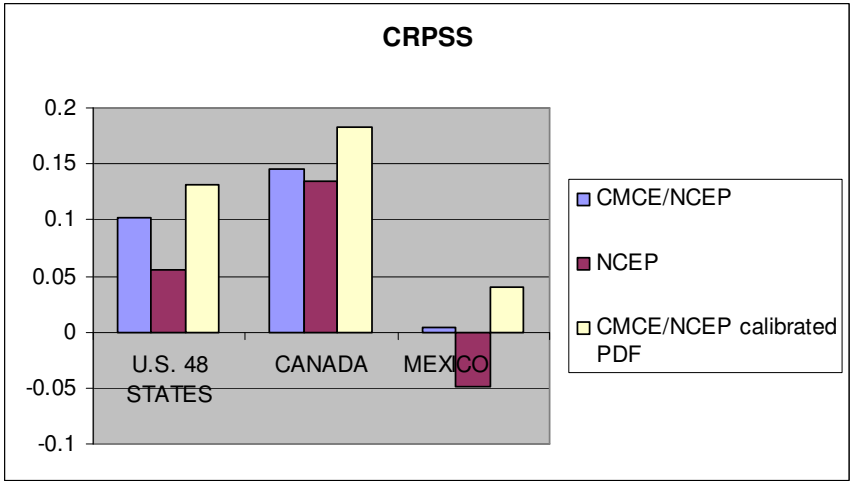
Kernel-smoothed ensemble forecast:

- Estimated skill determines width of kernel
- Summation of probability density functions : Non-normal distributions



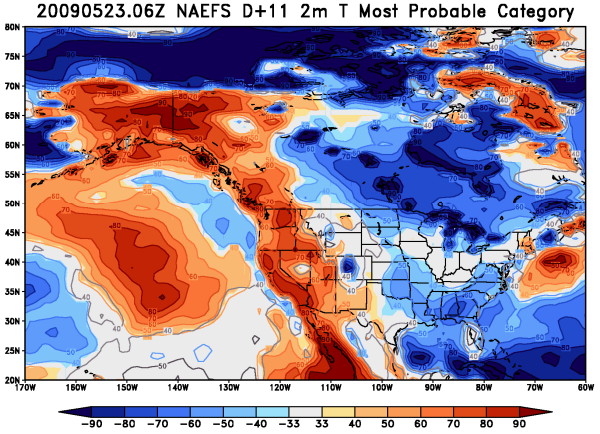
Week-2 Temperature: 3-category skill

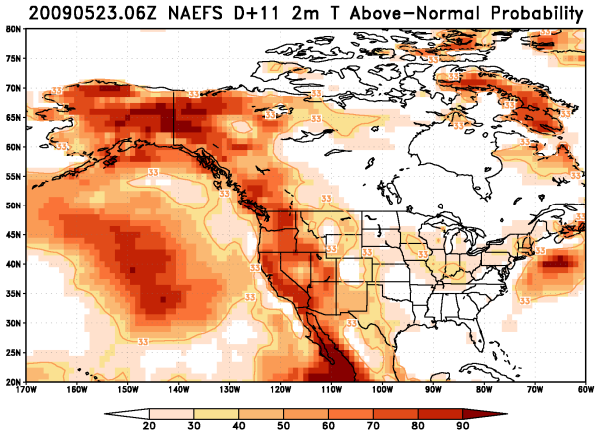


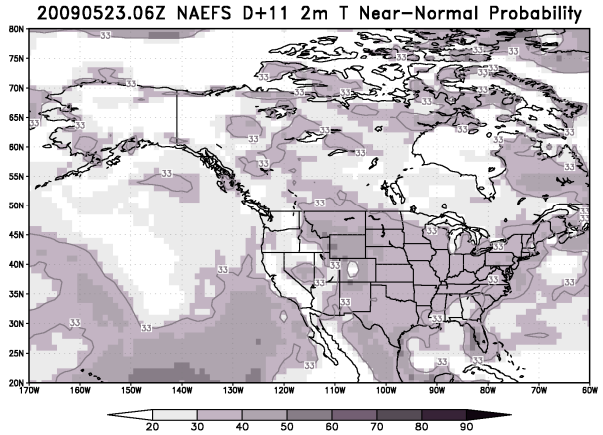


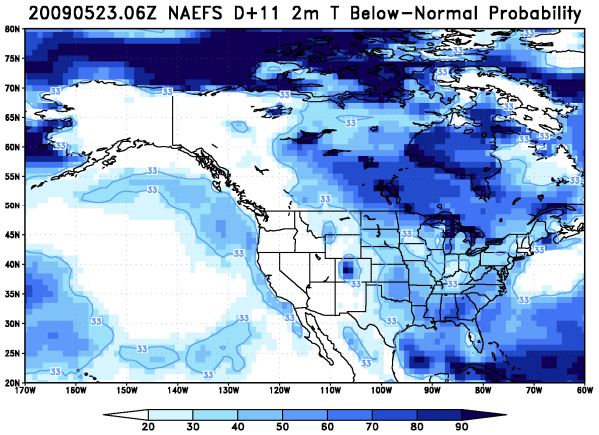
- Slight improvement in the Heidke skill score (HSS) with the addition of CMC ensemble to the NCEP ensemble
- Significant improvement in the probabilistic skill.

3-category forecasts
Probability of exceeding any temperature threshold of interest can be determined.
(Threshold could be user-defined.)

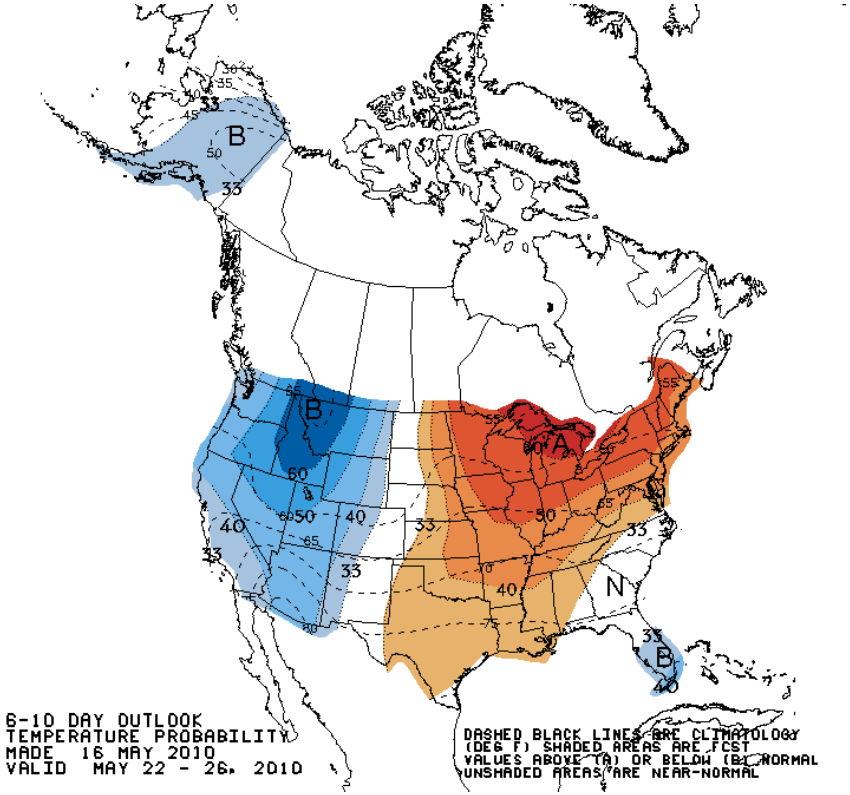


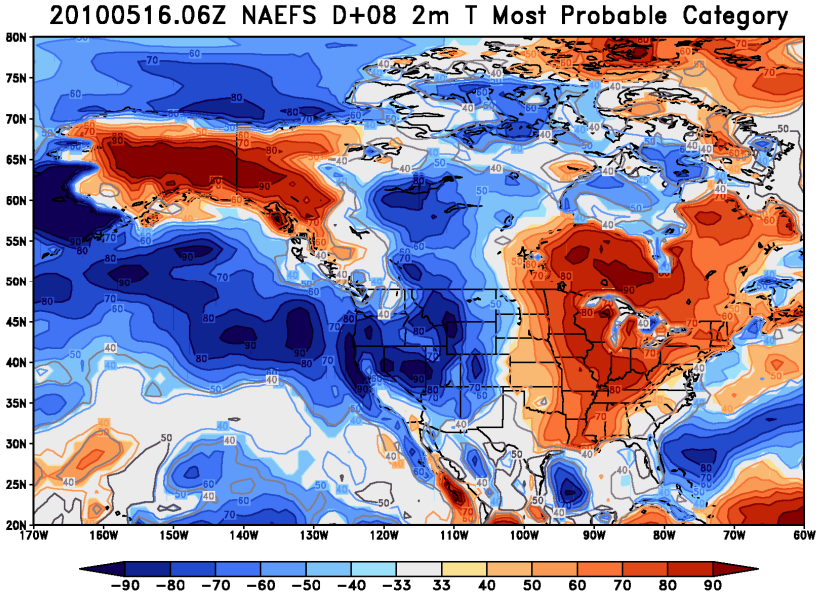




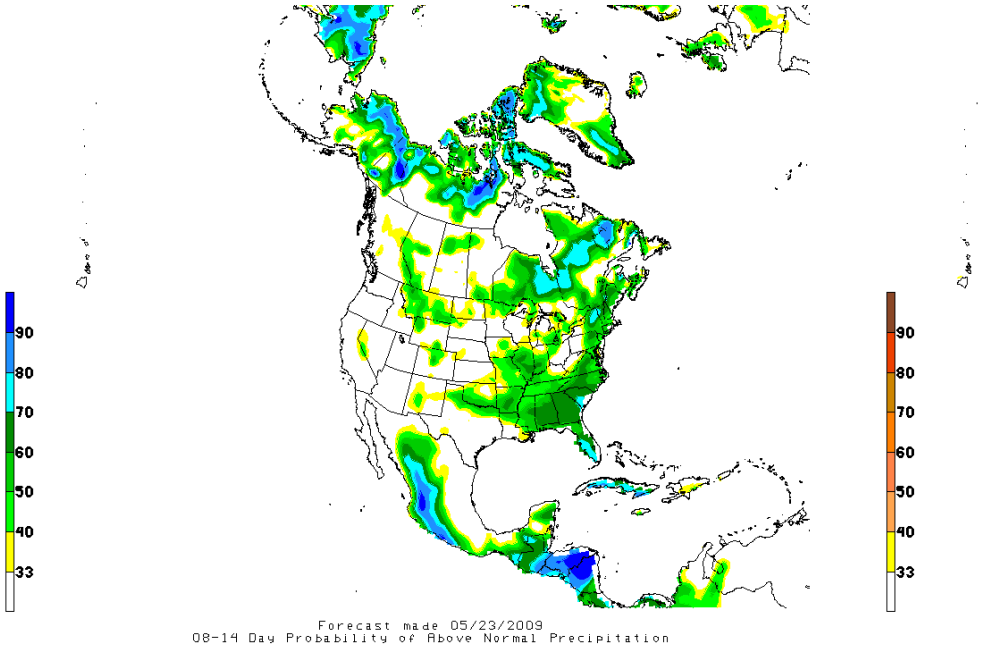


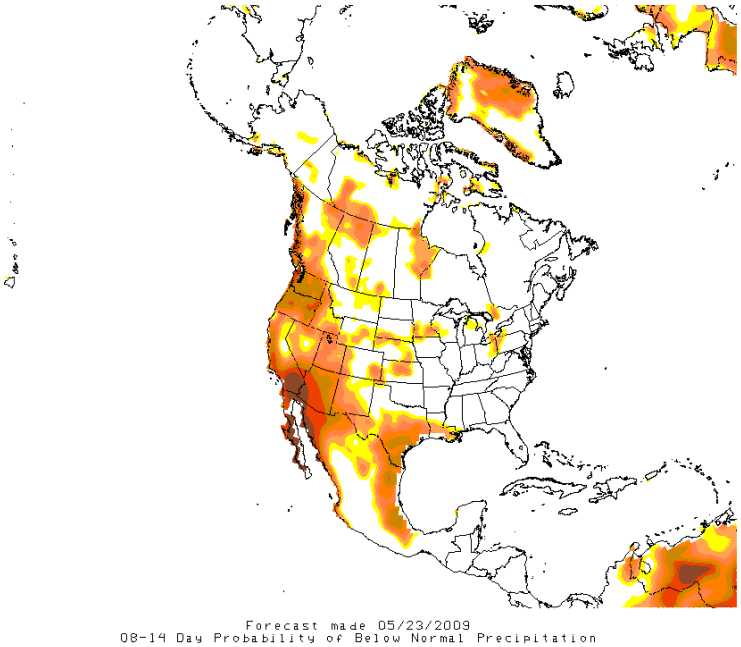
Official forecast (left) & “Calibrated” NAEFS (right)





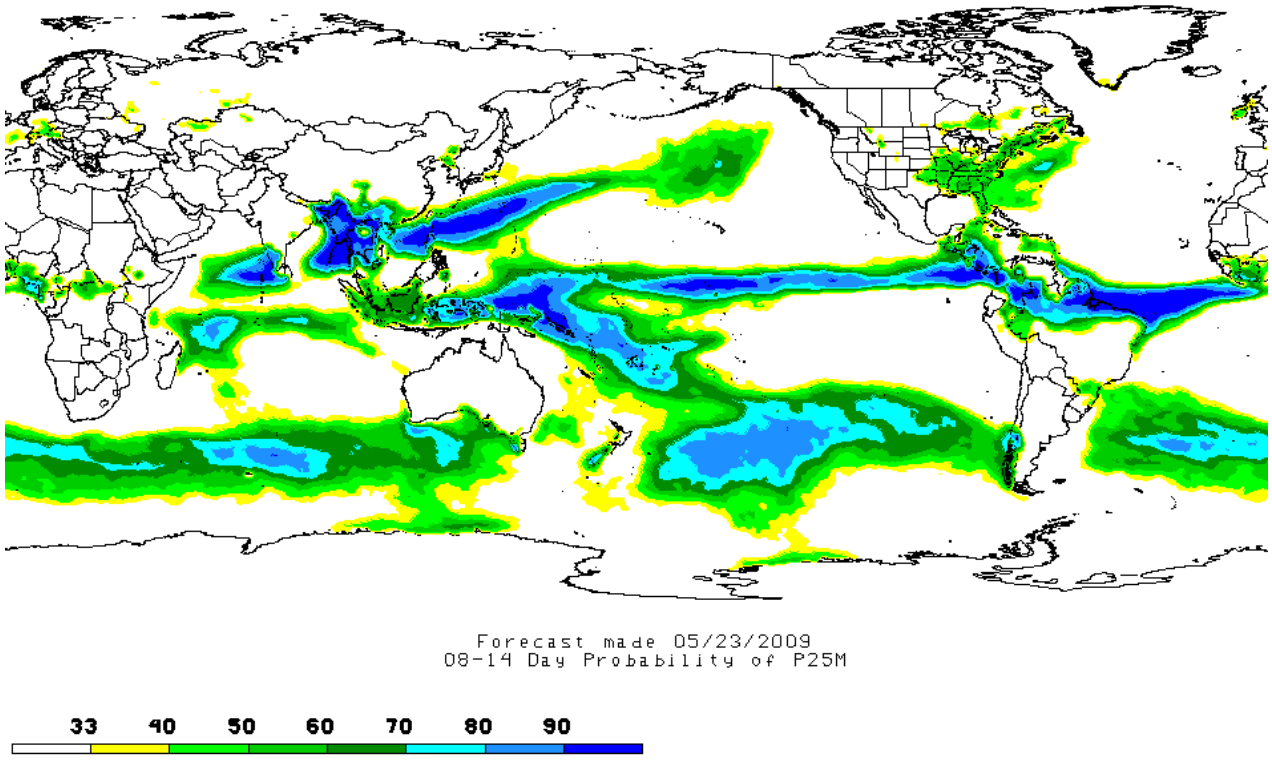
3-Category forecasts for above (left) and below (right) normal week-2 precipitation





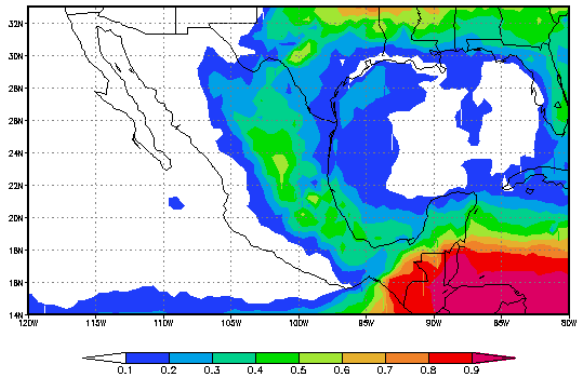
Probability of exceeding 25 mm or 1 inch threshold, as well as 3 inches in the week-2 period.

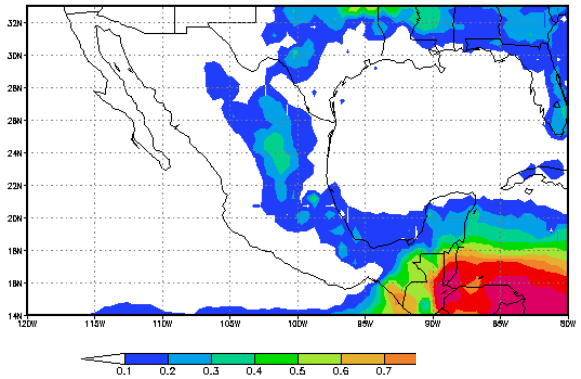
- *Thresholds can be made user specific.*
- *Probabilistic **QPF** (quantitative precipitation forecasts) request to CPC **Africa Desk**.*



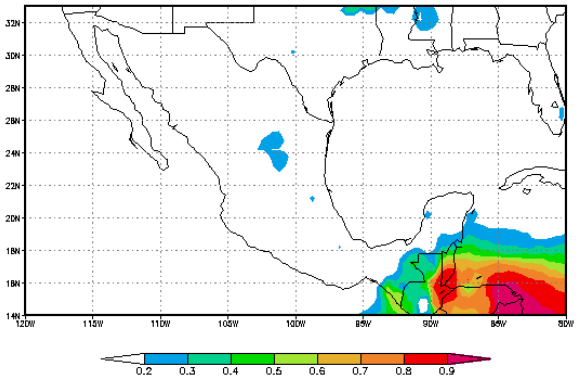
Developing regional products: Mexico example

CPC receives many requests for local forecast information for specific domains and amounts.





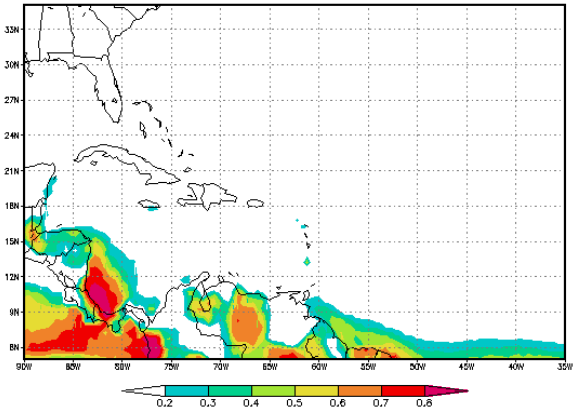
Probabilities of exceeding 15 mm, 10 mm, or 5 mm

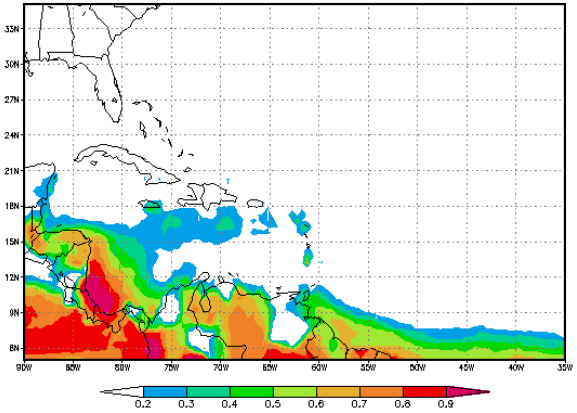


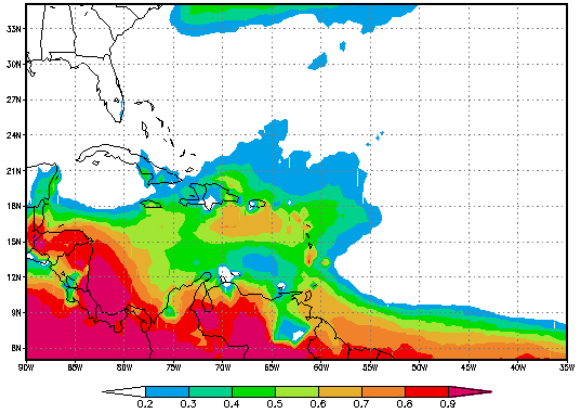
Haiti WMO Effort

- Deriving "heavy rainfall" product: Probability of daily heavy rainfall occurring in the week 2 period.

- Deriving similar hazardous wind product.







Probabilities of exceeding
15 mm, 10 mm, or 5 mm.

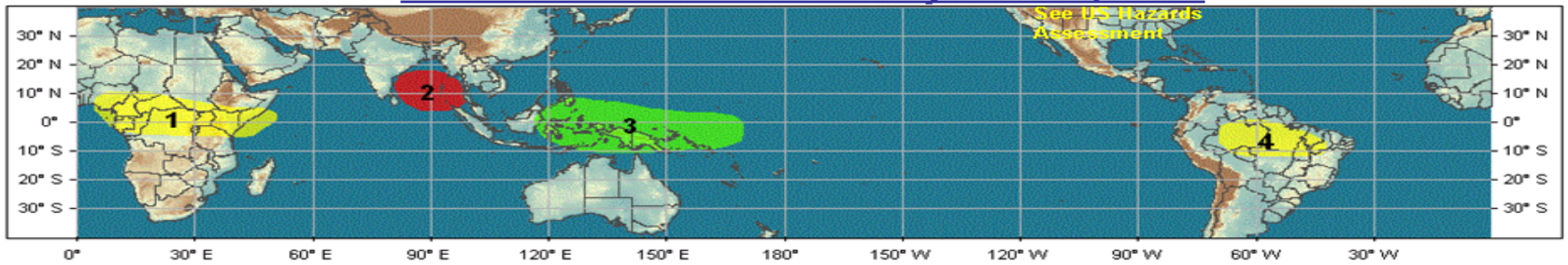
Deriving products for **CPC Global Tropical Hazards**.

Global above and below normal precipitation forecasts.

Global Tropics Hazards/Benefits Assessment - Climate Prediction Center - Issued: 5/10/2010

Product issued once per week with no updates. Conditions are subject to change after issuance time and before next outlook.
Product targets broad scale conditions integrated over a 7 day period for US interests only. Please also consult your local responsible forecast agency.

Week 2 Outlook – Valid: May 18 – 24, 2010



Synopsis:

1. **An increased chance for below-average rainfall for parts of central Africa**. The suppressed convective phase of the MJO and numerical weather forecast favors reduced rainfall in this region. **Confidence: Moderate**
2. **Favorable conditions for tropical cyclogenesis for the Bay of Bengal**. The enhanced convective phase of the MJO and numerical weather forecast guidance support potential development during the period. **Confidence: Moderate**
3. **An increased chance for above-average rainfall for the eastern Indian Ocean, Maritime Continent and parts of the far western Pacific.** The enhanced convective phase of the MJO and above average SSTs in some areas support enhanced rainfall in this region. **Confidence: Moderate**
4. **An increased chance for below-average rainfall for Central America and parts of northwest South America**. The suppressed convective phase of the MJO and numerical forecast guidance are expected to contribute to reduced rainfall in this region. **Confidence: Moderate**

Please note: Confidence estimates are subjective in nature and are not based on an objective scheme. The estimates are given to provide additional information to the user.

Summary

- Inclusion of FNMOC ensemble to be tested and implemented.
- Regional information
  - User oriented
  - Verification by region
- Increase time resolution: Frequency of daily extreme events.
- Future Plans
  - Improved calibration of probabilities
    - Ensemble regression (applied to discontinuous fields, precipitation)
    - Bayesian
  - Downscaling of upper level fields to surface
- Derived products for CPC Global Tropical Hazards forecast


NORTH AMERICAN ENSEMBLE FORECAST SYSTEM
SYSTÈME DE PRÉVISION D'ENSEMBLE NORD-AMÉRICAIN
SISTEMA CONJUNTO DE PRONÓSTICOS DE AMÉRICA DEL NORTE