



United States Nuclear Regulatory Commission

*Protecting People and the Environment*

# **Workshop on Probabilistic Flood Hazard Assessment**

## **Panel 3: Extreme Precipitation Events**

**Co-Chairs:**

**John England, Reclamation and Chandra Pathak, USACE**

**January 29, 2012**

**Rockville, MD**

# Panel 3 Presentations

- An Observation-Driven Approach to Rainfall and Flood Frequency Analysis Using High-Resolution Radar Rainfall Fields and Stochastic Storm Transposition .....*Daniel Wright, Princeton*
- Regional Precipitation Frequency Analysis and Extremes including PMP – Practical Considerations .....*Mel Schaefer, MGS Engr.*
- High-Resolution Numerical Modeling As A Tool to Assess Extreme Precipitation Events.....*Jason Caldwell for Kelly Mahoney, NOAA-ESRL*
- Precipitation Frequency Estimates for the Nation and Extremes – A Perspective.....*Geoff Bonnin, NWS-OHD*
- Extreme Precipitation Frequency for Dam Safety and Nuclear Facilities – A Perspective.....*Victoria Sankovich, BoR*

# Panel 3 Panelists and Rapporteurs

- Panelists:
  - Daniel Wright, Princeton University
  - Mel Schaefer, MGS Engineering Consultants
  - Jason Caldwell, BoR
  - Kelly Mahoney, NOAA-ESRL (via phone)
  - Geoff Bonnin, NWS-OHD
  
- Rapporteurs
  - Nebiyu Tiruneh, NRC (NRO)
  - Brad Harvey, NRC (NRO)

# Panel 3 Questions for Discussion

- 1. Describe the advancements and improvements in extreme storm rainfall and precipitation observations and data bases over the past 30 years. Are there opportunities with radar, point observations, reanalysis data sets, and other data that can readily be utilized for extreme precipitation analyses, understanding, and applications for critical infrastructure?**
- 2. Outline the advances in statistical and data processing methods that can be used for extreme precipitation frequency estimation. These might include regional precipitation frequency, regionalization of parameters, Geographic Information Systems, climatological estimation (such as PRISM), and other areas. How might these tools be applied in practice, and include uncertainty estimates?**

# Panel 3 Questions for Discussion

- 3. Describe the advances in physical and numerical modeling of extreme precipitation (such as the Weather Research and Forecasting Model, WRF) that can give insights into the processes and magnitudes of extreme precipitation, including spatial and temporal distributions. How can these tools be applied to provide practical limits to extreme precipitation magnitudes, spatial and temporal storm patterns, transposition, and other extreme storm scaling?**
  
- 4. The National Research Council (1994) report on extreme precipitation suggested research in several areas, including: radar hydrometeorology and storm catalog, numerical modeling of extreme storms in mountainous regions, and estimating probabilities of extreme storm rainfalls. Are there existing technical barriers to fully probabilistic extreme storm estimation for assessing critical infrastructure, as opposed to Probable Maximum Precipitation?**