


## Weather related Disaster Early Warning and Risk Reduction Activities in Asia

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## INTRODUCTION

**NATIONAL WEATHER SERVICE**

National Centers for Environmental Prediction

- Guidance Model Simulations
- Climate & Seasonal Outlooks
- Aviation & Marine Forecasts
- Storm & Tornado Prediction
- Precipitation Prediction
- Hurricane Tracks

**121 Weather Forecast Offices Issue Local Forecasts & Warnings**

River Forecasts

Hydropower, Flood warnings  
Irrigation, River Navigation

Observations

Radar Network, Satellites, Weather Balloons, Ground-level observations at airports, Aircraft, Lightning Network, Data Buoys, 11,000 Volunteer daily-data collectors, Thousands of Volunteer storm spotters



## ACTIVITIES IN ASIA

- **Focus on two major initiatives in Asia**
  - Disaster Management Support Project – India
  - Asia Flood Network - Mekong and the Ganges-Brahmaputra-Megna (GBM) river basins
- **Overview other programs**
- **NOAA involvement**
  - Technical assistance
  - Technology transfer
  - Training



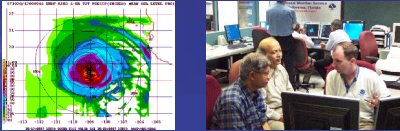
## Disaster Management Support Project India

- DMSP funded by USAID/New Delhi
- NOAA involved in the Climate Forecasting Systems (CFS) component of the DMSP – **training, technology transfer, technical assistance**
- CFS purpose is to implement weather and hydrologic forecasting as part of an integrated early warning and disaster preparedness system
- Primary GOI counterparts – IMD, CWC, NCMRWF, IIT-Delhi



**Disaster Management Support Project India**

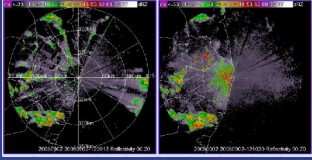
- Primary CFS Activities - **Tropical Cyclone Forecast and Warning**
  - Goals
    - Improve tropical cyclone prediction (*predictive models*)
    - Improve communications and understanding of tropical cyclone warnings (*forecast operations*)



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**Disaster Management Support Project India**

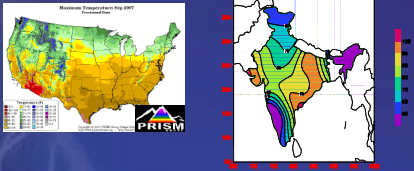
- Primary CFS Activities - **Local Severe Storms (incl. Flash Floods)**
  - Goal
    - Enhance capability for forecasting severe storms (*predictive models for extreme events, weather radar operations*)



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**Disaster Management Support Project India**

- Primary CFS Activities - **Extreme Temperatures**
  - Goals
    - Improve capacity for analyzing and forecasting heat waves and cold waves (*long range temperature forecasting, Climatological Data analysis techniques*)

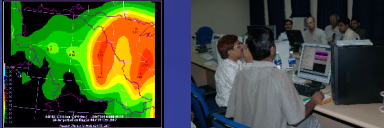


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**Disaster Management Support Project India**

- Primary CFS Activities - **Flood Forecasting**
  - Goals
    - Improve capacity for high resolution rainfall forecasts (for hydrologic modeling applications)
    - Develop a river level forecast capability (*predictive models*)


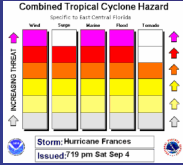
Mahanadi River basin is the pilot for both goals  
(*implementation of NWS River Forecast System*)




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## Disaster Management Support Project India

- Primary CFS Activities - Forecast Communications
  - Goal
    - Establish a comprehensive, understandable, user-friendly, timely, and integrated communication system for warnings (review existing CFS, media workshops, communication systems training)





Storm: Hurricane Frances  
Issued: 7:19 pm Sat Sep 4



## Asia Flood Network

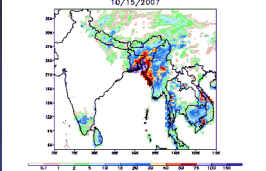
- AFN Funded by USAID/Office of Foreign Disaster Assistance – focus on Mekong and the Ganges-Brahmaputra-Megna (GBM) river basins
- Program to strengthen the capacity of regional and national institutions in climate, weather, and hydrological forecasting to reduce the vulnerability to hydrometeorological hazards
- NOAA works with countries and regional organizations – Mekong River Commission and International Center for Integrated Mountain Development



## Asia Flood Network

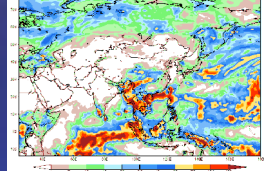
- Satellite Rainfall Estimates – working with the region to develop estimates locally

NDAA CPC FEWS-NET / AFN Rainfall Estimate (mm):  
Based on Satellite and Rain Gauge Data  
10/15/2007




Daily Accumulation

NDAA CPC FEWS-NET / AFN Rainfall Estimate (mm):  
Based on Satellite and Rain Gauge Data  
10/15/2007

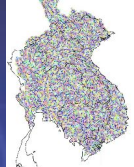


One Week Forecast

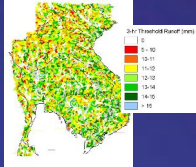


## Asia Flood Network


- Flash Flood Warning Capacity – diagnostic tool for flash flood alerts and warnings for the Mekong basin, based on satellite rainfall estimates and hydrologic modeling



Delineated Basins  
(100-300 km<sup>2</sup>)



3-Hour Flash Flood  
Guidance



**Asia Flood Network**

- **Radio InterNET (RANET)**
  - A cooperative effort of various national, regional, and international partners, to make weather and related environmental information more accessible and useful to resource poor populations for resource decisions and to prepare against natural hazards
  - Improve the dissemination capacities of national hydro-meteorological and related national services and NGOs
  - Effort now is the Mekong basin

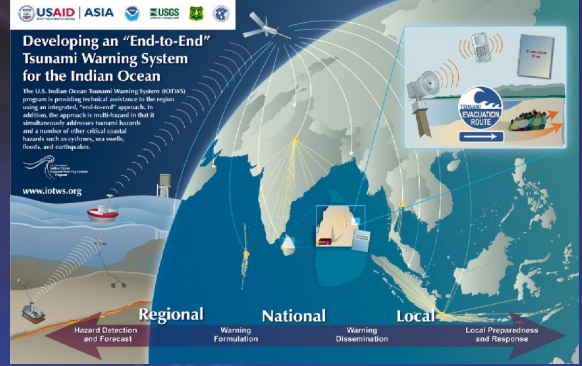



**Establish a regional multi-hazard warning system framework with a tsunami application (with IOC)**

**Developing an "End-to-End" Tsunami Warning System for the Indian Ocean**

The U.S. Indian Ocean Tsunami Warning System (IOOTWS) program is providing technical assistance to the region using an integrated, "end-to-end" approach. In addition, the approach is multi-hazard in that it simultaneously addresses tsunami hazards and a number of other critical coastal hazards such as cyclones, sea winds, floods, and tsunamis.

[www.iootws.org](http://www.iootws.org)



**Other NOAA Activities in Asia**

- Transferred flood forecast technology for the Red River and weather prediction technology for Vietnam
- Apply RANET in Indonesia and Sri Lanka (part of the Indian Ocean tsunami program but multi-hazard)
- Updated Global Telecommunications System for Sri Lanka and Maldives (part of the Indian Ocean tsunami program but multi-hazard)
- Assisted in evaluating potential impacts of debris dam break for India
- Bilateral agreements – Thailand, Indonesia, Vietnam, China, India (MoES pending)

**THANK YOU**

