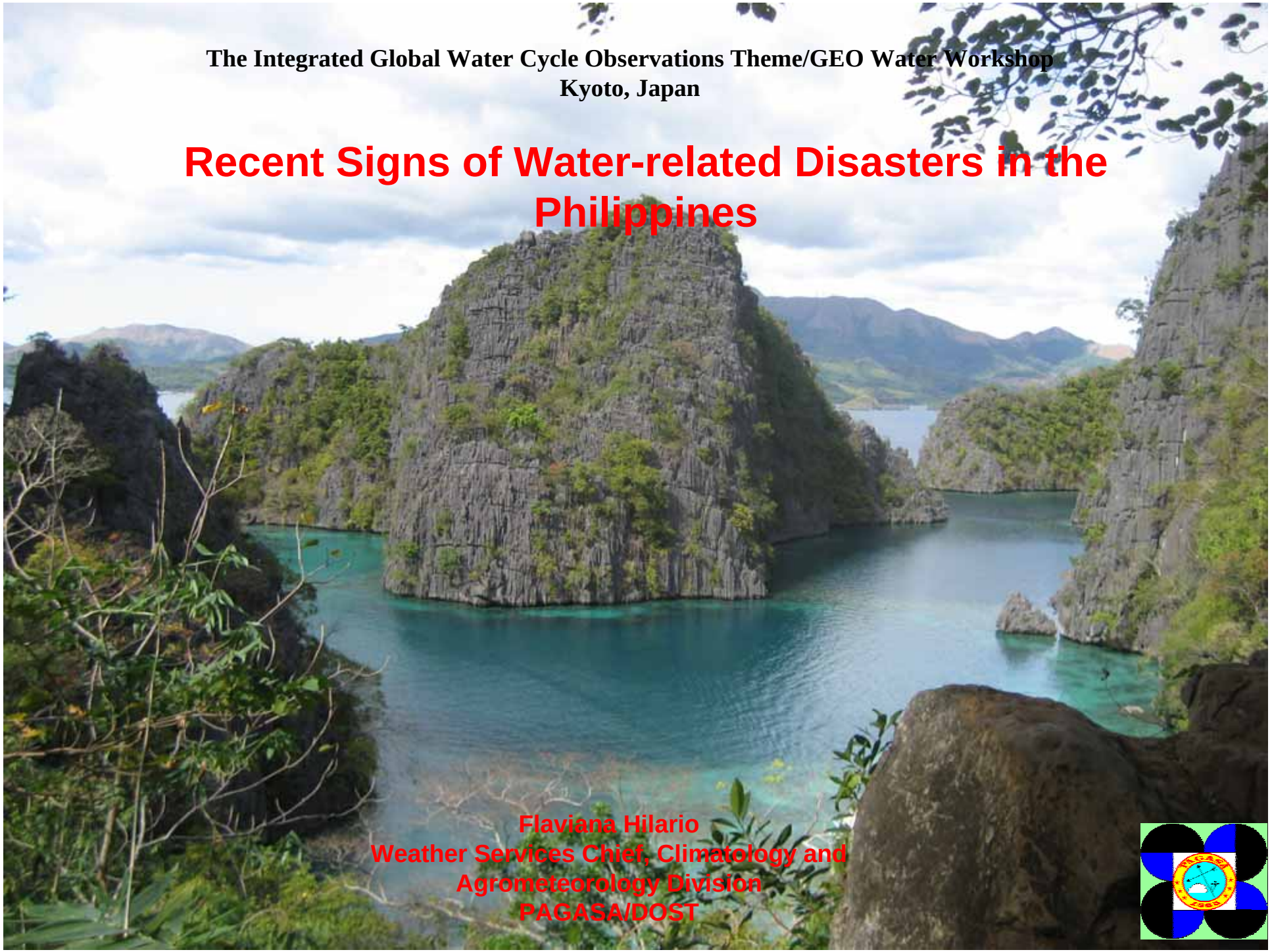
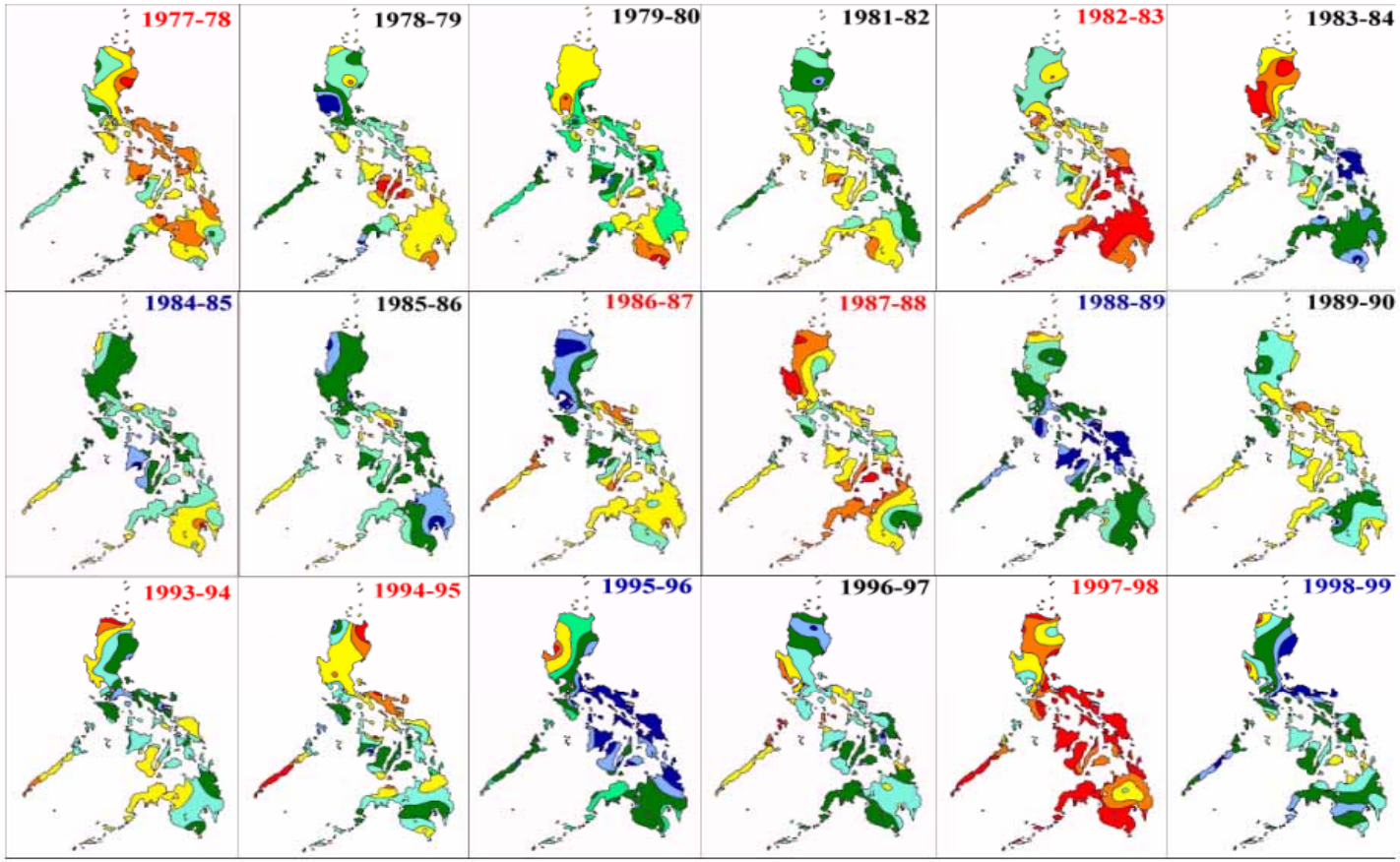
The Integrated Global Water Cycle Observations Theme/GEO Water Workshop
Kyoto, Japan

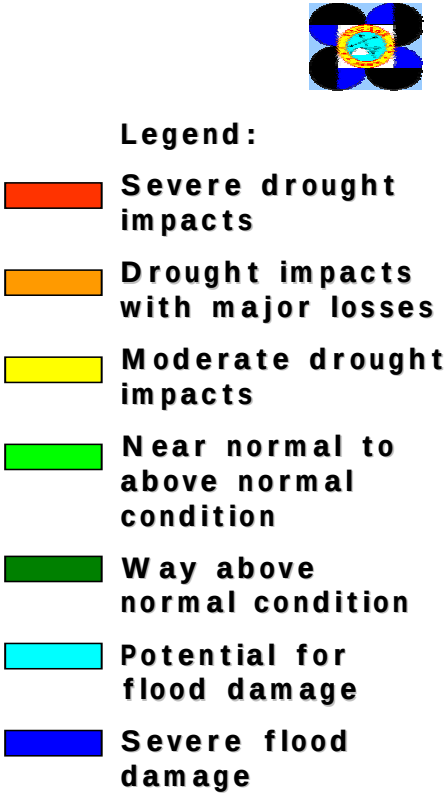
Recent Signs of Water-related Disasters in the Philippines



Flaviana Hilario
Weather Services Chief, Climatology and Agrometeorology Division
PAGASA/DOST

IMPACTS OF ENSO ON PHILIPPINE RAINFALL

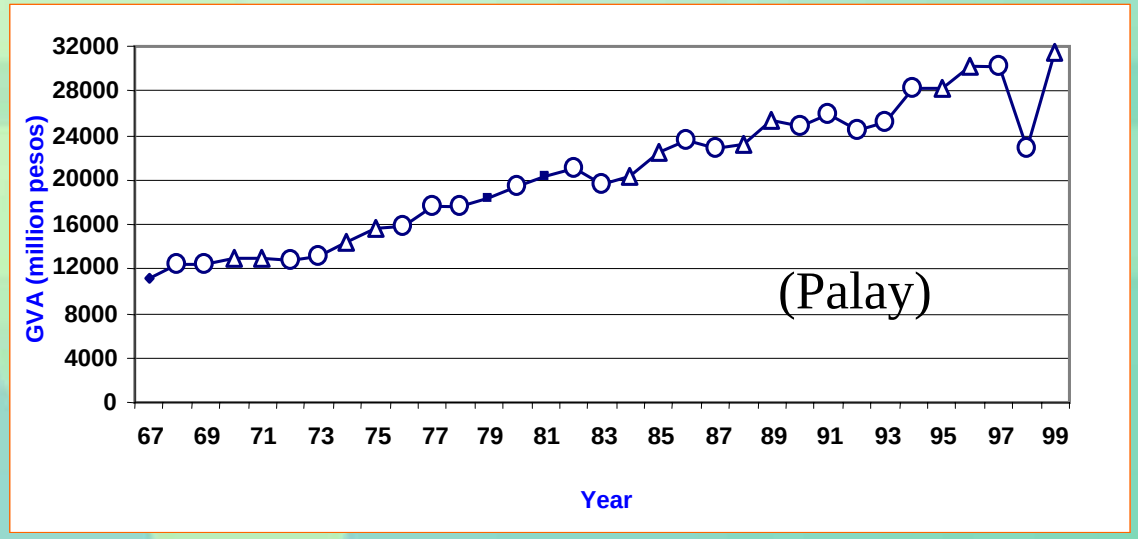


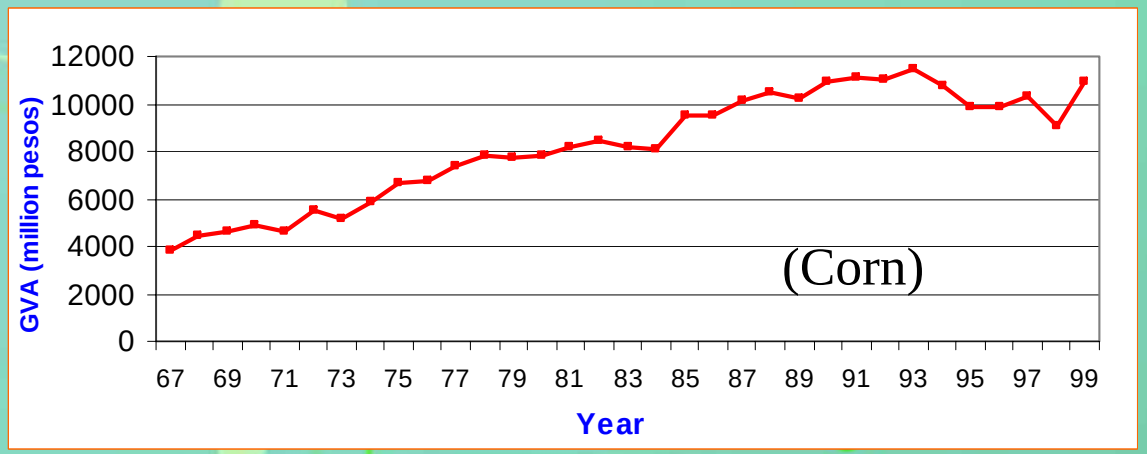


RED colored years are EL NINO years, BLUE colored years are LA NINA years and BLACK colored years are NON_ENSO years

- Seasonal rainfall in the Philippines is modulated by ENSO
- ENSO warm events (El Nino) cause drought in many areas
- ENSO cold events (La Nina) cause excessive rainfall

Effects of ENSO on Major Agriculture Crops

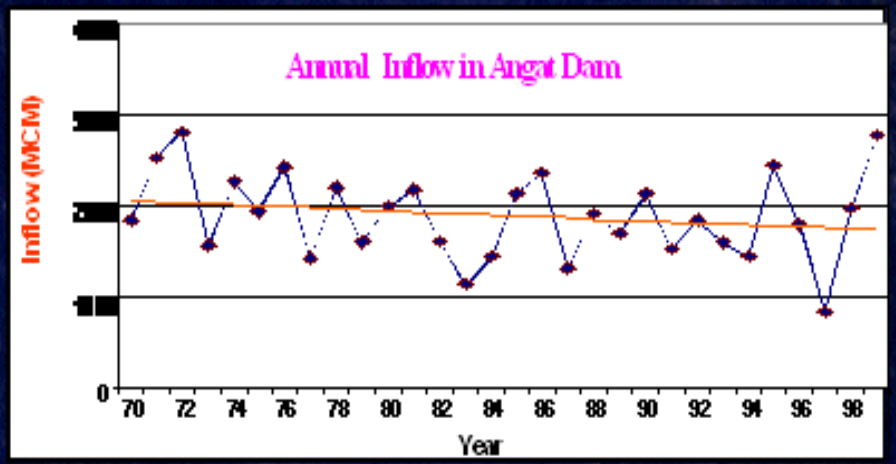


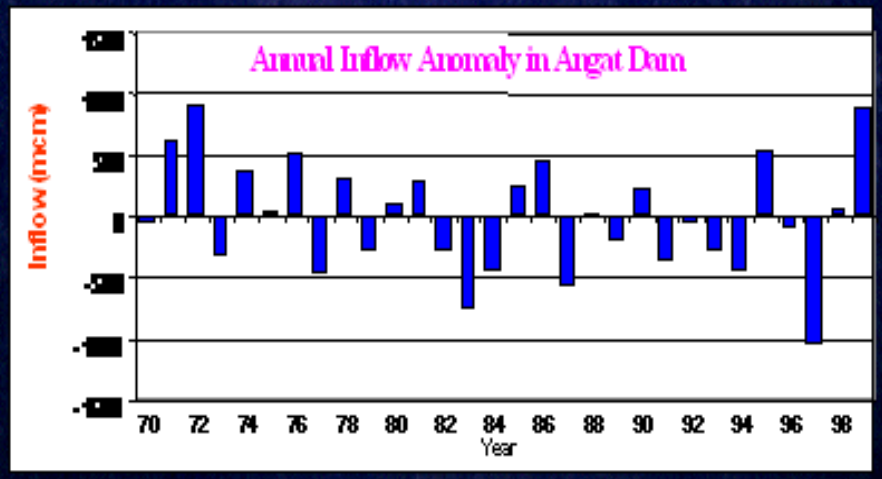


- **EL Niño is associated with below normal rainfall (drought) in the Philippines**
- **Biggest drop in palay and corn productions were during the 1982-83 and 1997-98 El Niños - strongest El Niño episodes of the century**

Effect of ENSO on Water Resources

- on water resource management





- ***The frequency of occurrence of extreme events affects the rainfall and inflow patterns of the reservoirs.***
- **Annual inflow at Angat dam were most deficient during the 1983-84 and 1997-98 strong El Niños** ***(resulted in water rationing in Metro Manila)***
- ***During the 70s, more cold, La Nina-type episodes dominated resulting to a relatively moist decade***

Effects of 4-successive Typhoons in Nov.-Dec. 2004

Landslide

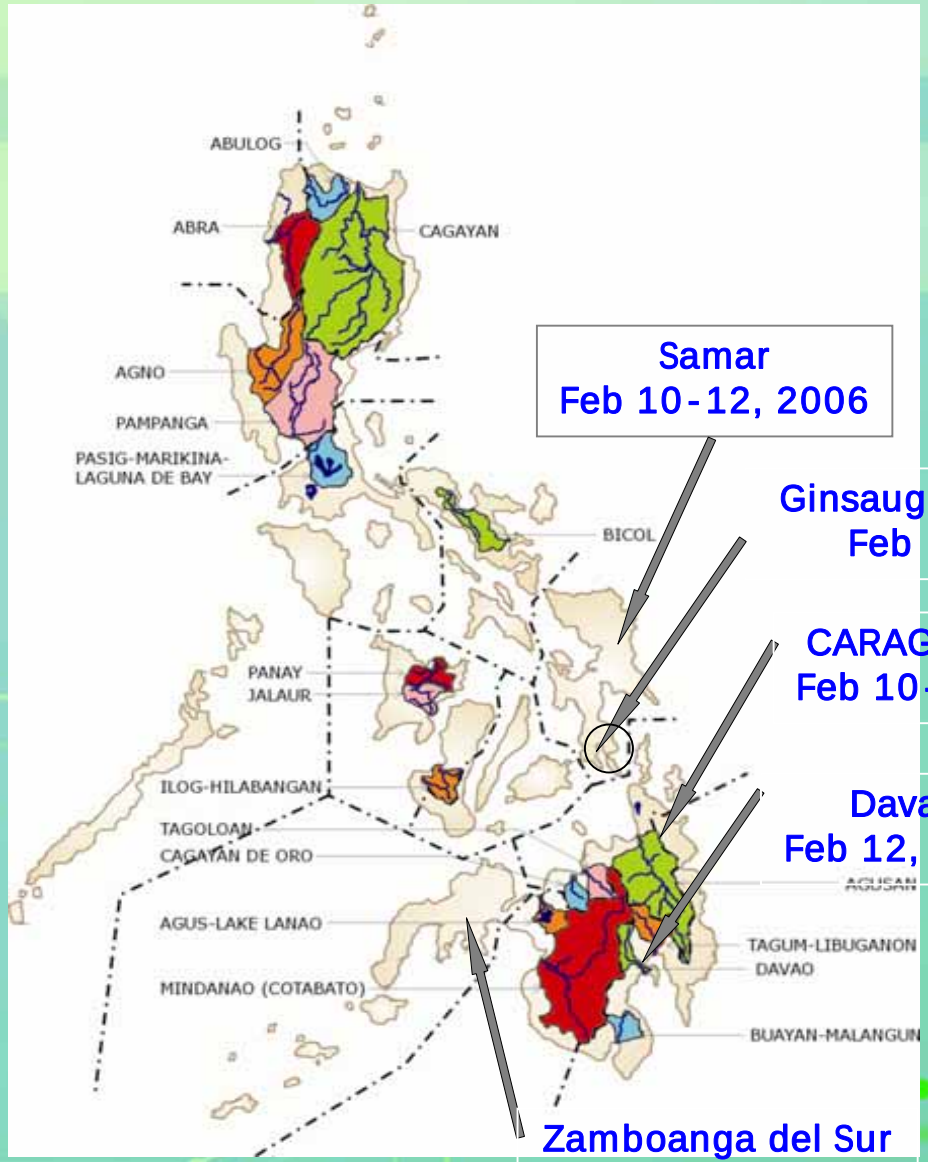
Destroyed houses

OVERALL DAMAGE	Ph 7.6 B
DEAD	1,068

Floods

Strong winds toppled electric wires, billboards...

Manifestations of La Nina: February 2006



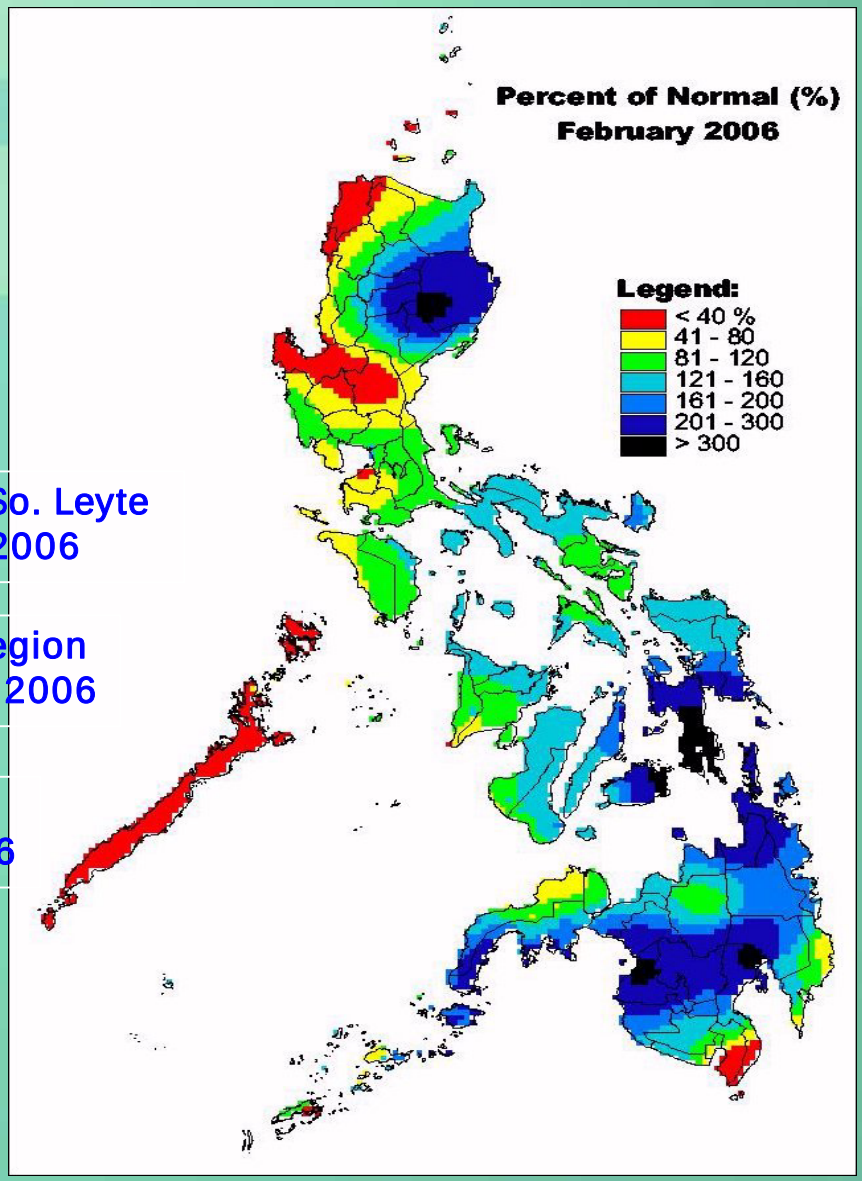
Samar
Feb 10-12, 2006

Ginsaugon, So. Leyte
Feb 17, 2006

CARAGA Region
Feb 10-12, 2006

Davao
Feb 12, 2006

Zamboanga del Sur
Feb 18, 2006



Vulnerability to Extreme Weather Events

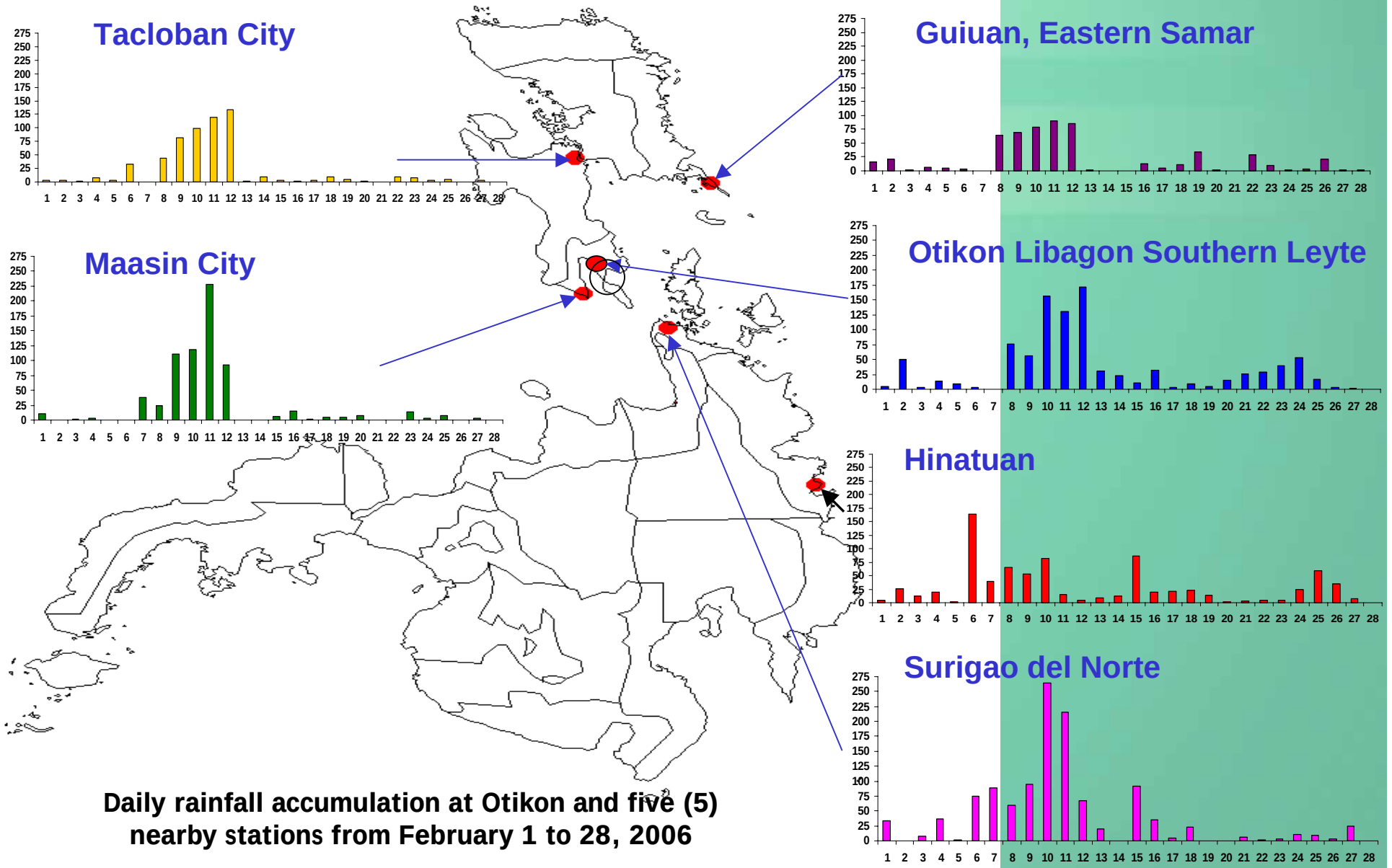
GUINSAUGON LANDSLID

• The large-scale landslide occurred on February 17 was triggered by the heavy rain. The town of Guinsaugon was buried by the landslide and lost about 1,000 lives.

•This is the image which was captured by the Advanced Spaceborne Thermal Emission and Reflection Radiometer(ASTER) in the Leyte island southeast region on March 1, 2006 after this disaster.

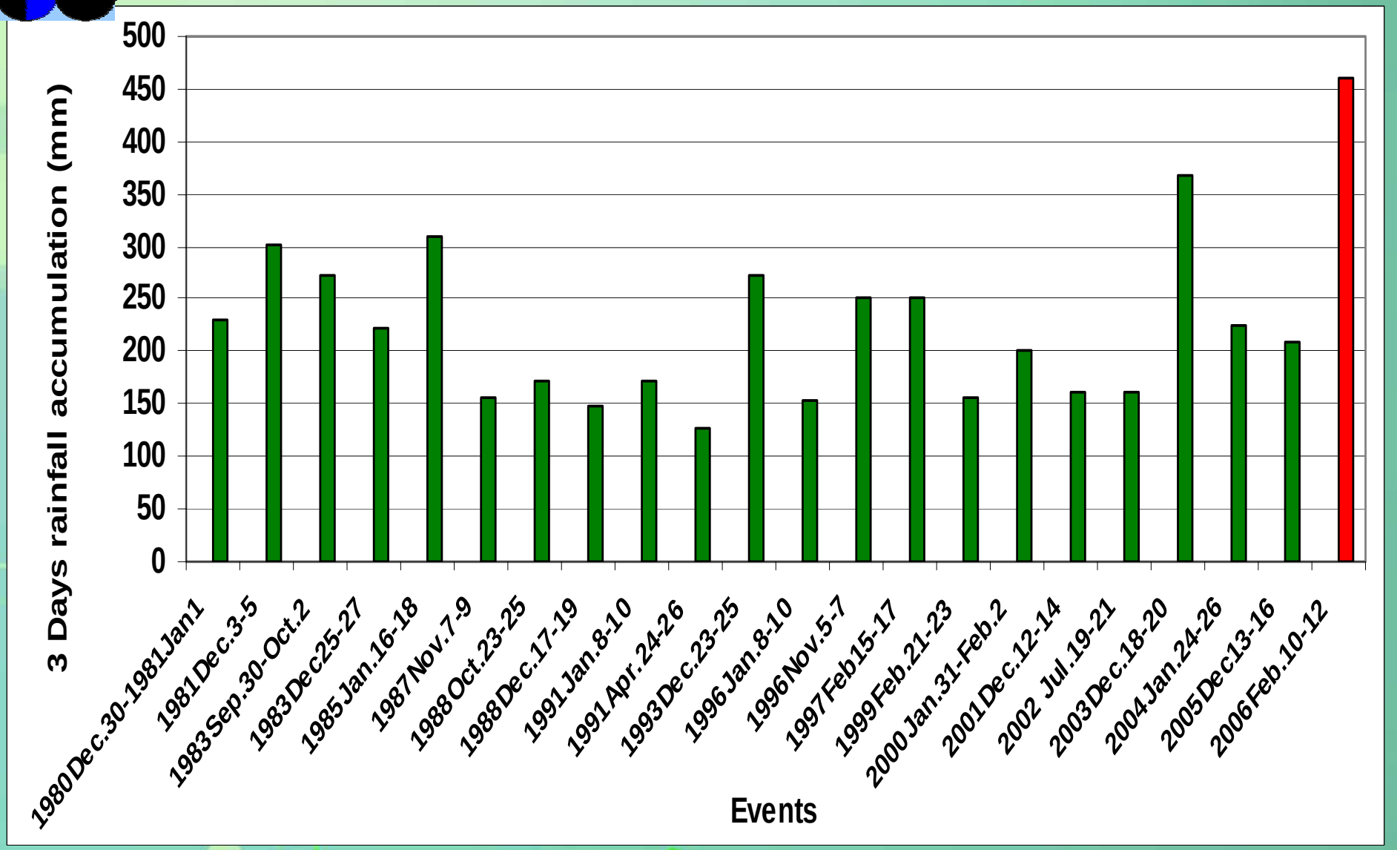
•The landslide was about 800m in width and about 3.5km in length.

RAINFALL ANALYSIS



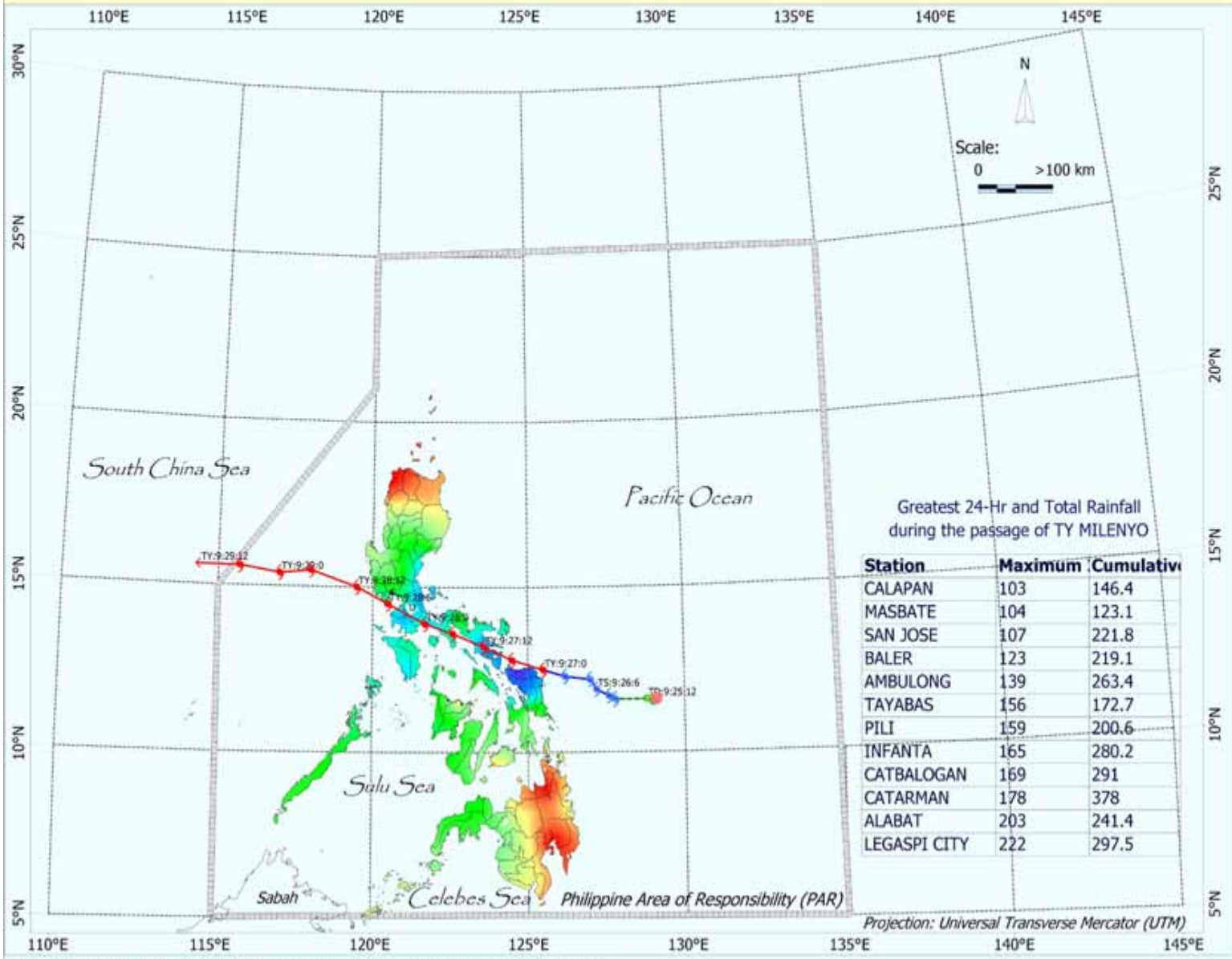
Daily rainfall accumulation at Otikon and five (5) nearby stations from February 1 to 28, 2006

EXTREME RAINFALL EVENTS



Wettest 3 Days at Otikon for the period 1980 – 2006.

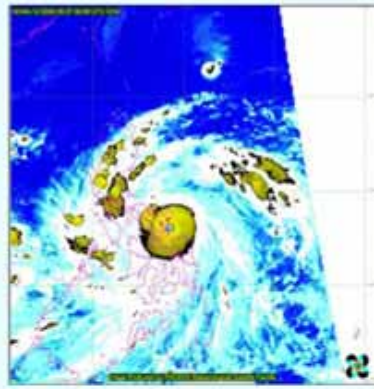
Tropical cyclone track of Typhoon Milenyo



Greatest 24-Hr and Total Rainfall during the passage of TY MILENYO

Station	Maximum	Cumulative
CALAPAN	103	146.4
MASBATE	104	123.1
SAN JOSE	107	221.8
BALER	123	219.1
AMBULONG	139	263.4
TAYABAS	156	172.7
PILI	159	200.6
INFANTA	165	280.2
CATBALOGAN	169	291
CATARMAN	178	378
ALABAT	203	241.4
LEGASPI CITY	222	297.5

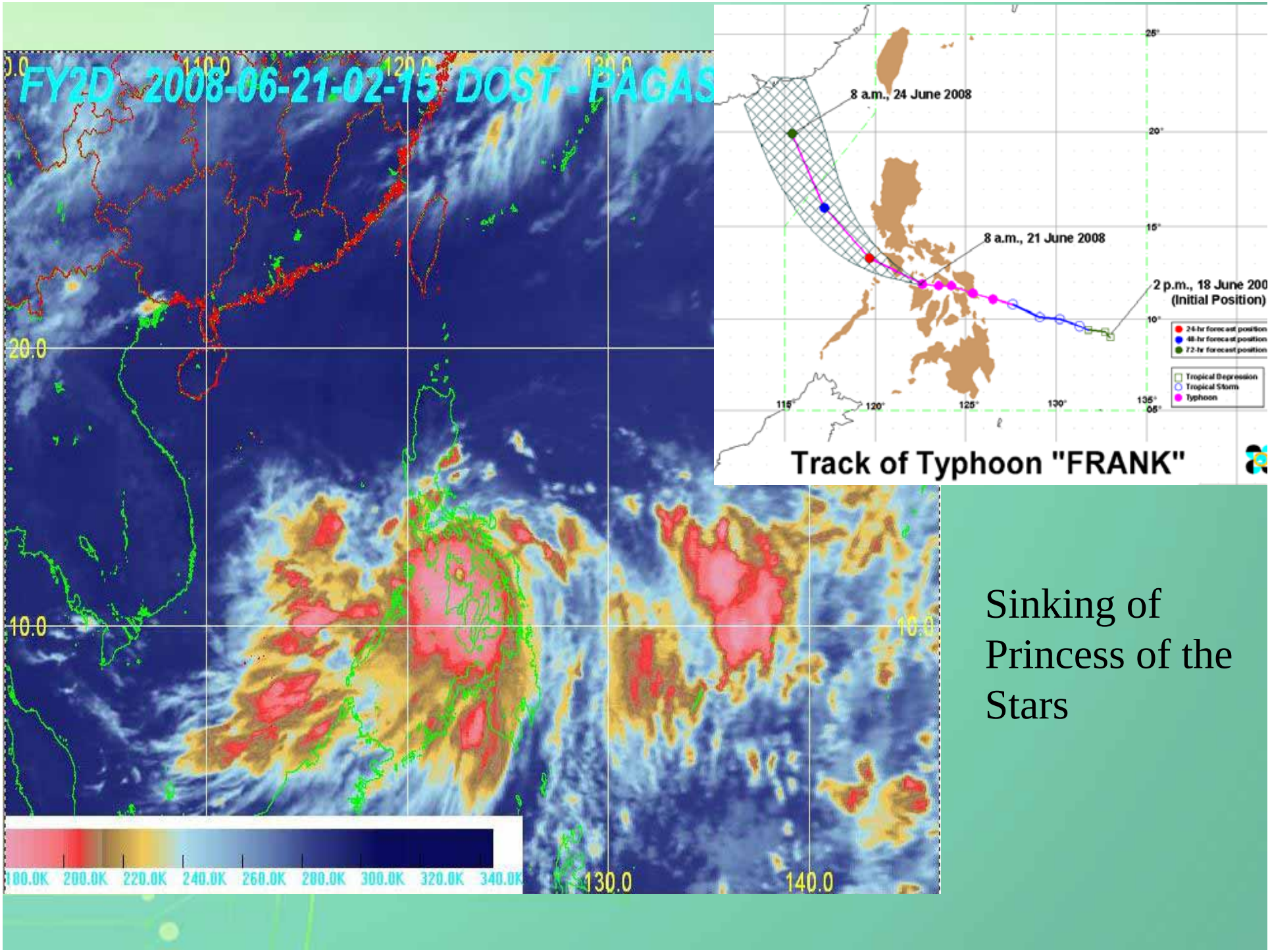
TY MILENYO
Satellite Imagery



Point Symbol
- Low Pressure Area
- Tropical Depression
- Tropical Strom
- Typhoon
- Begin pt (B)
- End point (E)

Line symbol
- Formation or Dissipating
- Tropical Depression
- Tropical Storm
- Typhoon

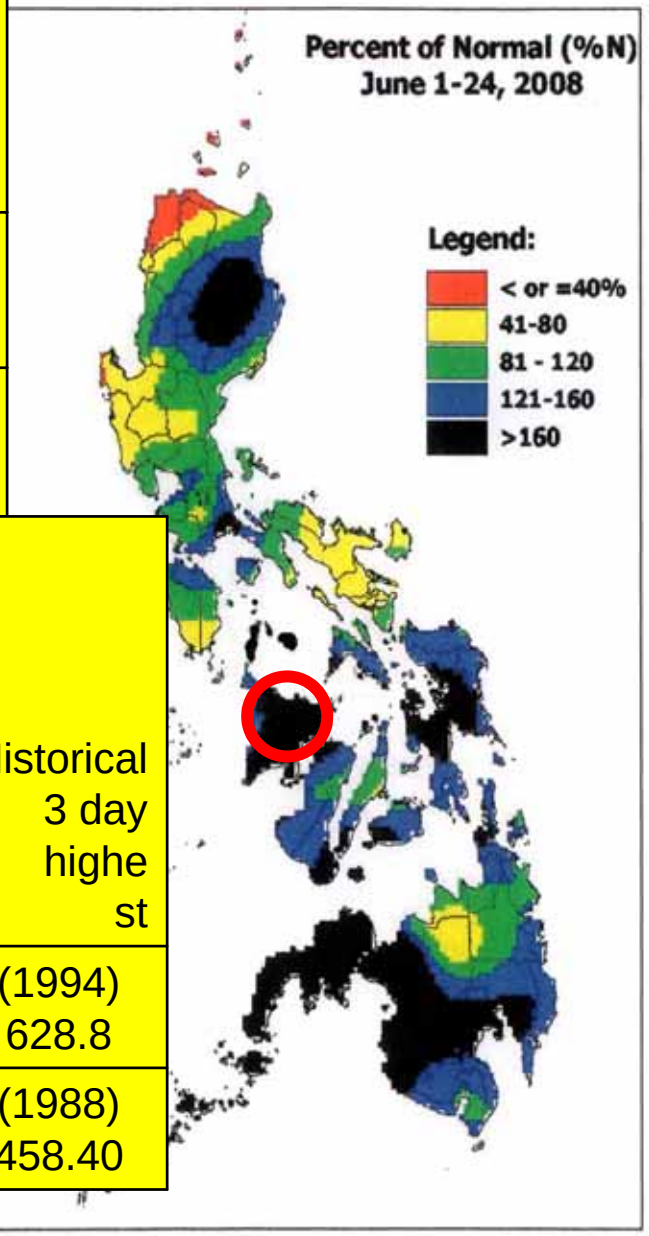
Prepared by: Climate Data Section, Climatology & Agrometeorology Branch, PAGASA,DOST



Sinking of Princess of the Stars

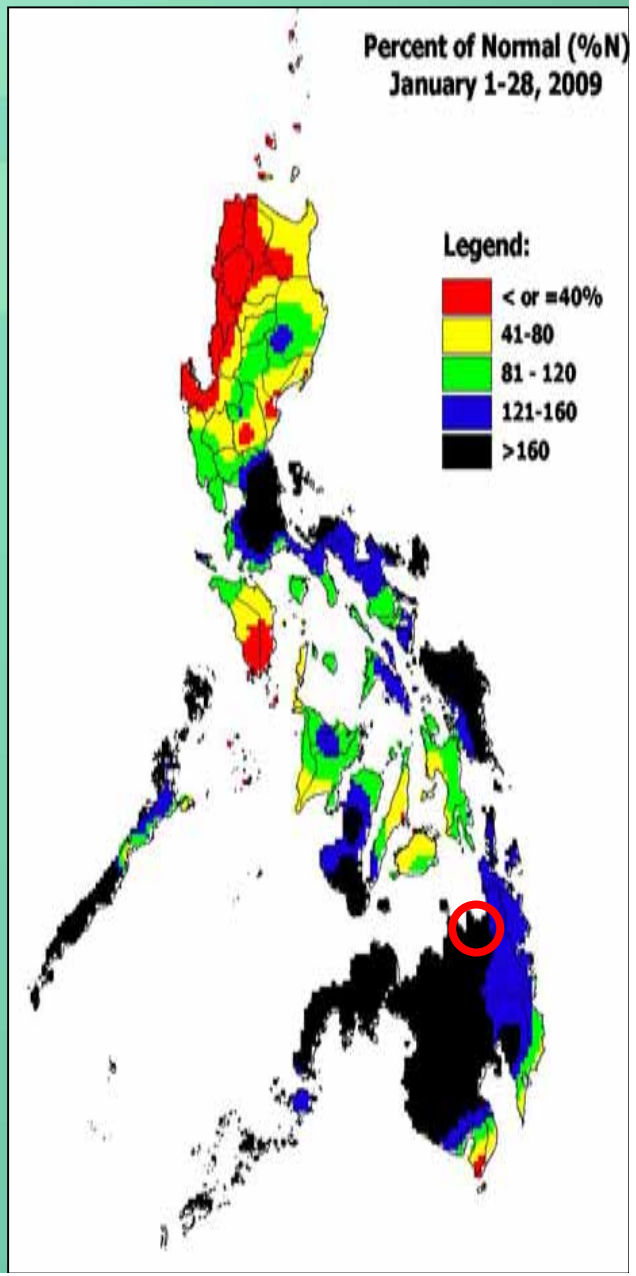
Stations	Actual June 1-24	Normal for June	Highest 24-hr RR for June 2008	Historical highest 24-hr RR
Roxas City	732.0 mm	254.1 mm	300.00	(01-01-16) 370.2
Iloilo City	538.4	308.1	354.0	(07-29-94) 319.8

Stations	Jun19	June20	June21	3-Day Total (Jun19-21,2008)	Historical 3 day highest
Iloilo City	14.6	354.0	99.0	467.6	(1994) 628.8
Roxas City	75.5	300.0	232.5	608.0	(1988) 458.40

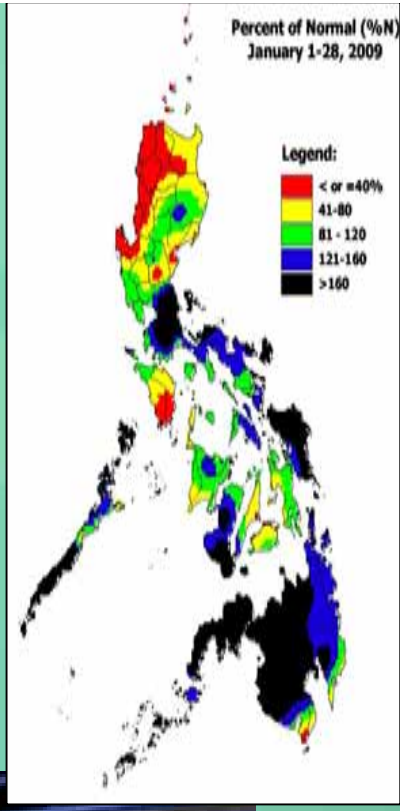


Northern Mindanao Flooding

January 2009

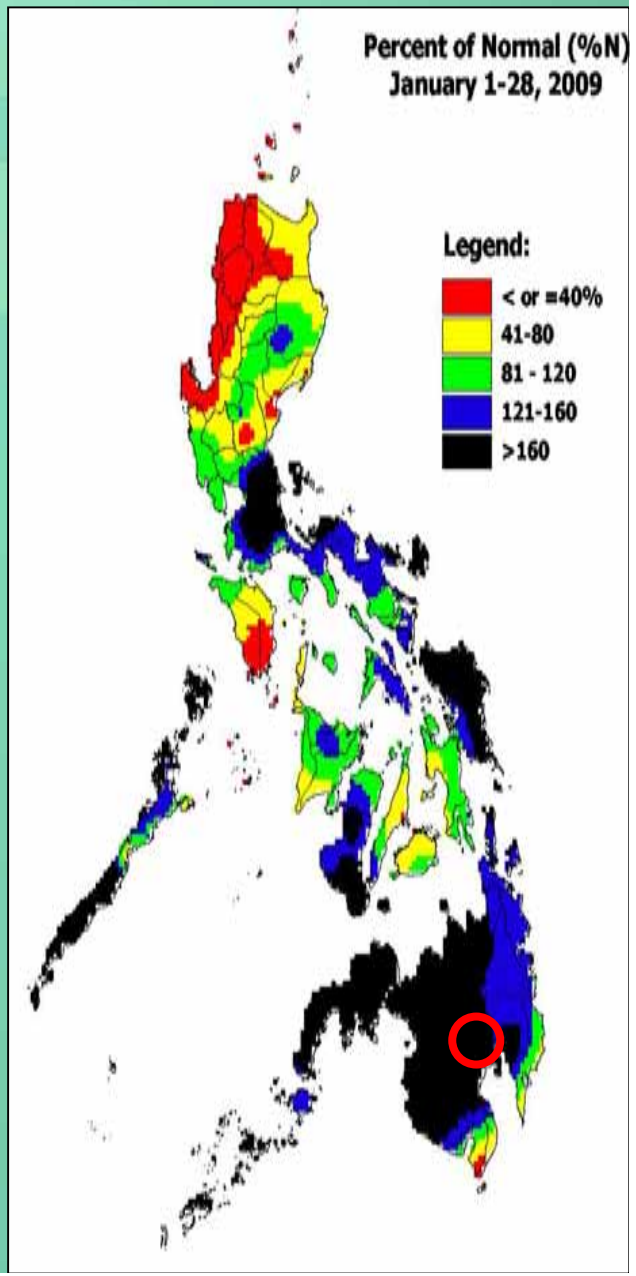


DAVAO DEL SUR Flooding



January 2009

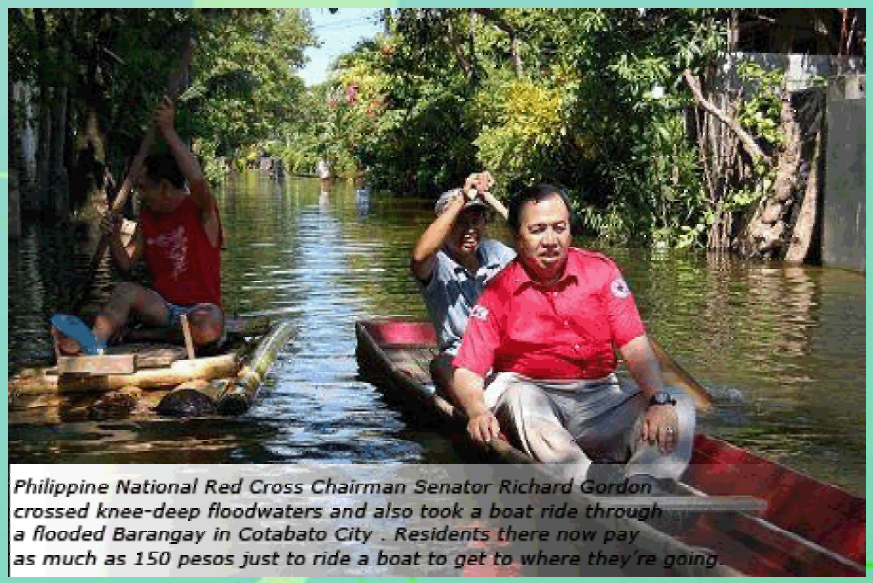
DAVAO DEL SUR landslide



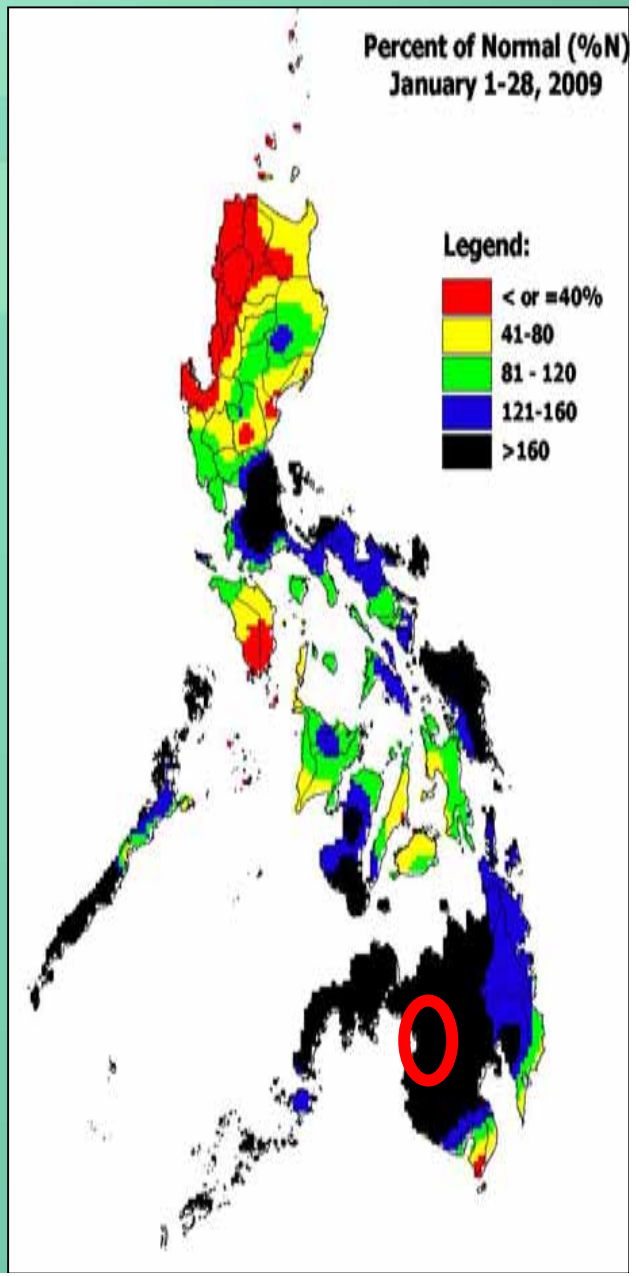
January 2009

COTABATO Flooding

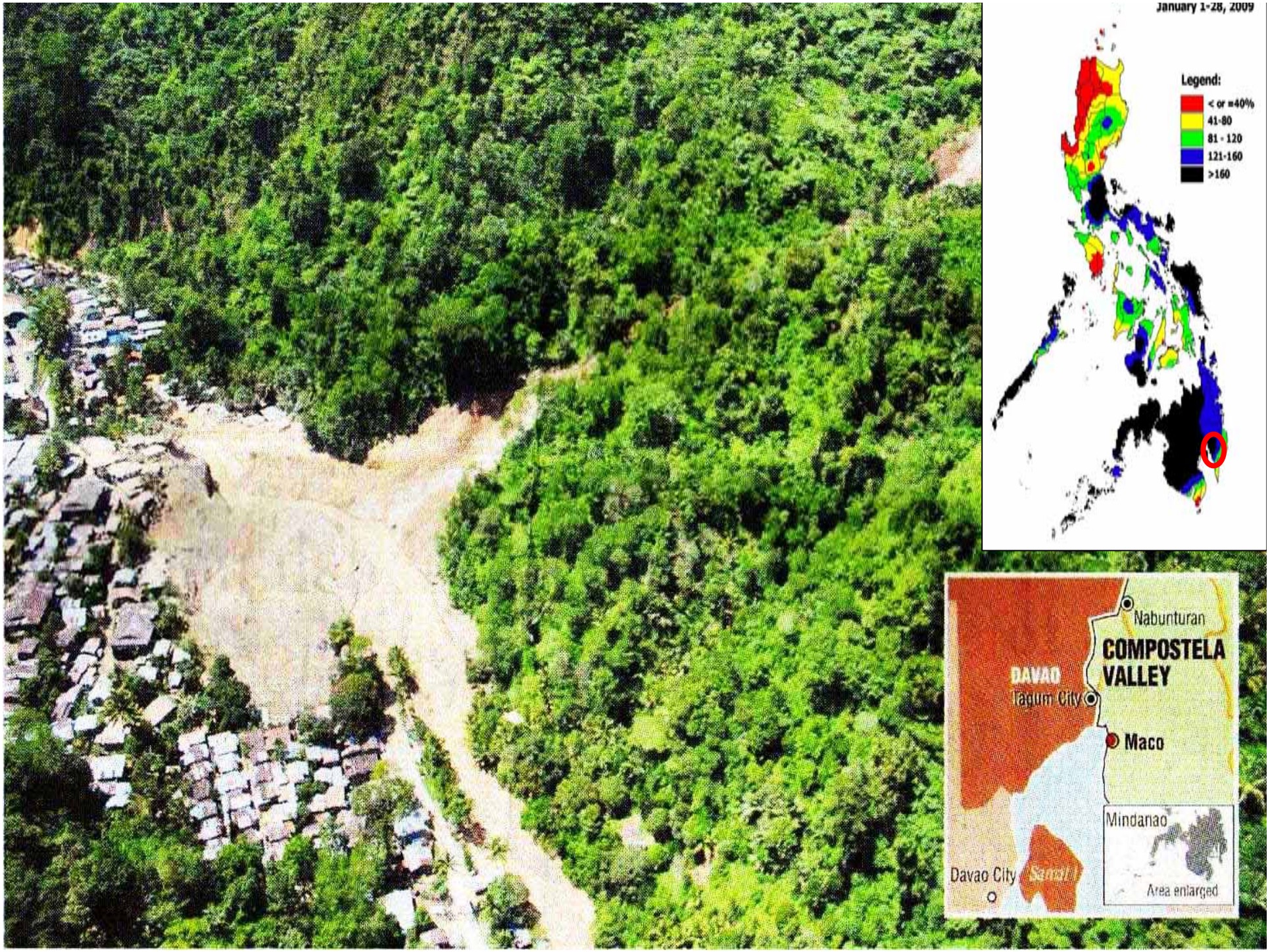
Philippine National Red Cross Chairman Senator Richard Gordon together with local officials view the devastation wrought by floodwaters from the Delta Bridge (which connects Sultan Kudarat and Cotabato City). Note how floodwaters are high enough to reach the roofs of some houses.



Philippine National Red Cross Chairman Senator Richard Gordon crossed knee-deep floodwaters and also took a boat ride through a flooded Barangay in Cotabato City . Residents there now pay as much as 150 pesos just to ride a boat to get to where they're going.



January 2009


January 1-28, 2009
Legend:
< or =40%
41-80
81 - 120
121-160
>160
Nabunturan
COMPOSTELA VALLEY
DAVAO
Tagum City
Maco
Mindanao
Davao City
Samal
Area enlarged

Thank You!

“tracking the sky . . . helping the country”