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Satellite precipitation - data and applications

Agnes Lane
Bureau of Meteorology
Melbourne, Australia

presenting the work of

Dr Beth Ebert
The International Precipitation Working Group (IPWG)

The Second Asia/Oceania Meteorological Satellite Users' Conference, 6 - 9 December 2011, Tokyo, Japan

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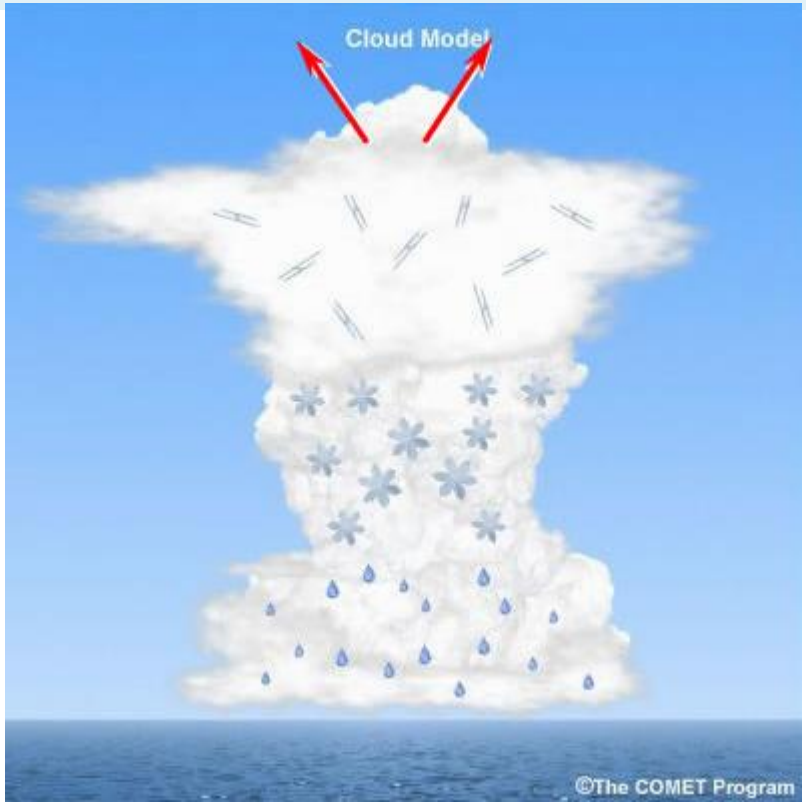
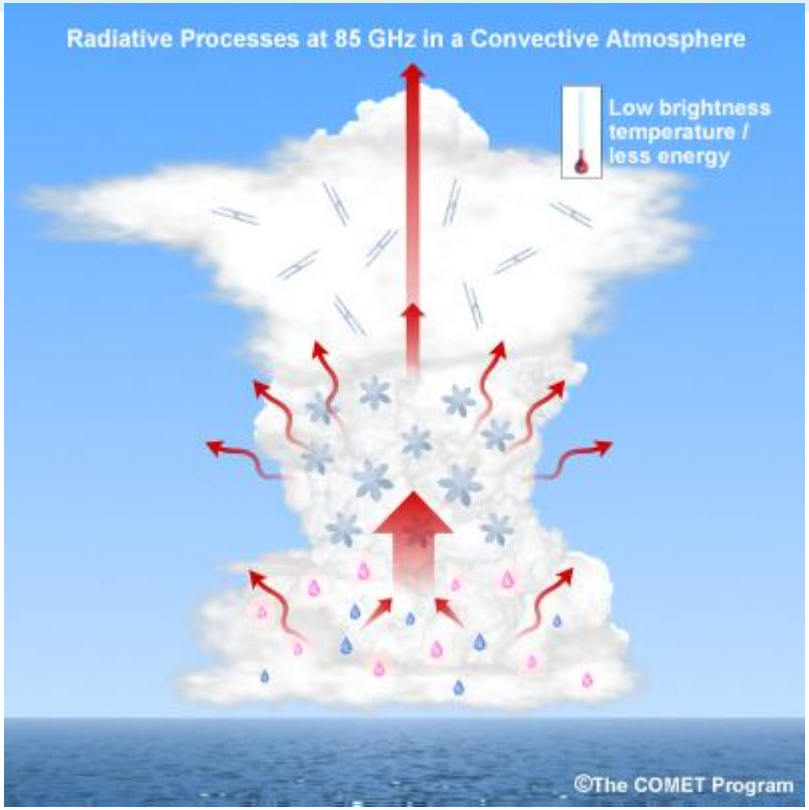
IR and microwave rain estimation

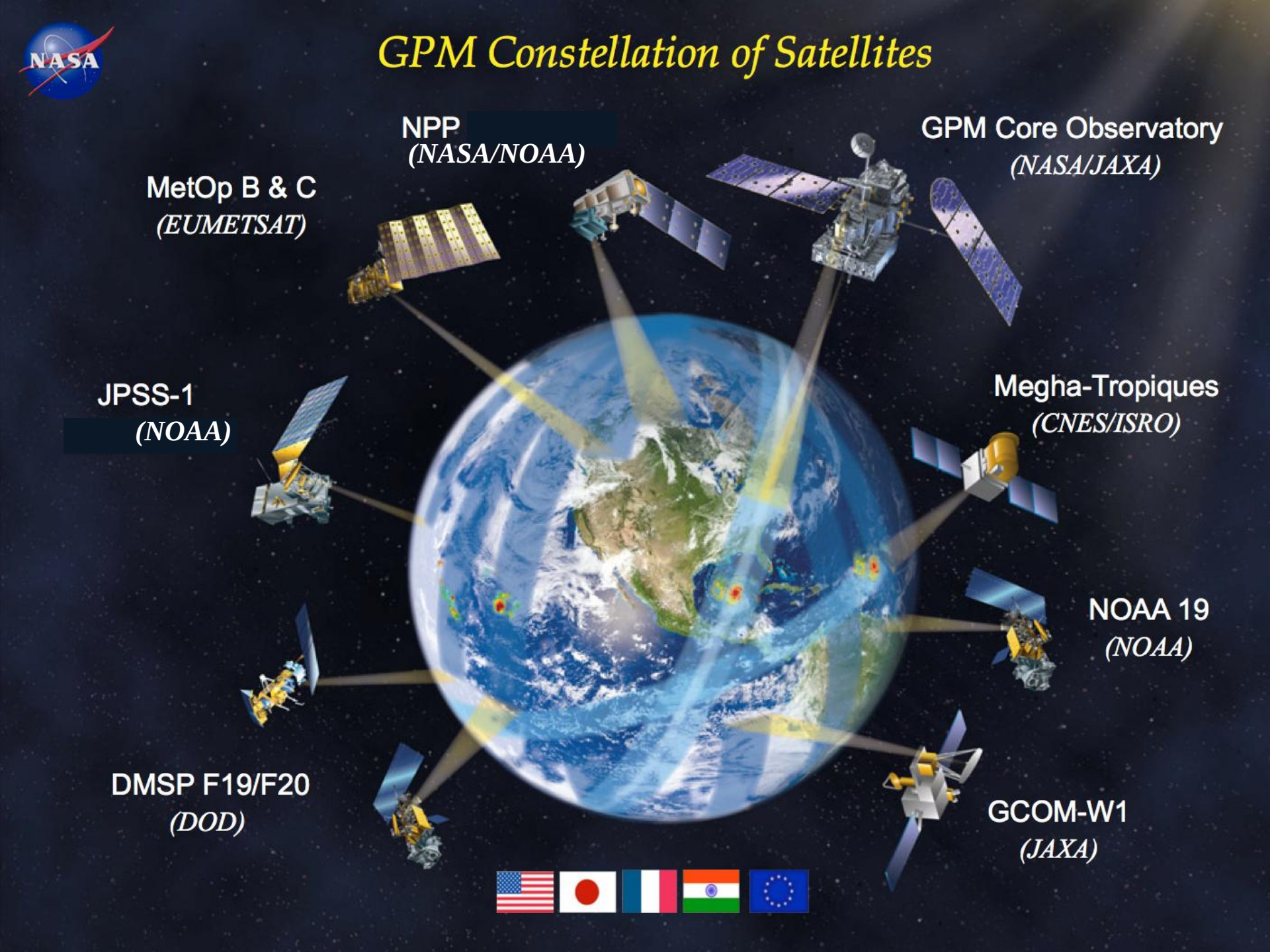


Infrared



Microwave – 85 GHz

GPM Constellation of Satellites



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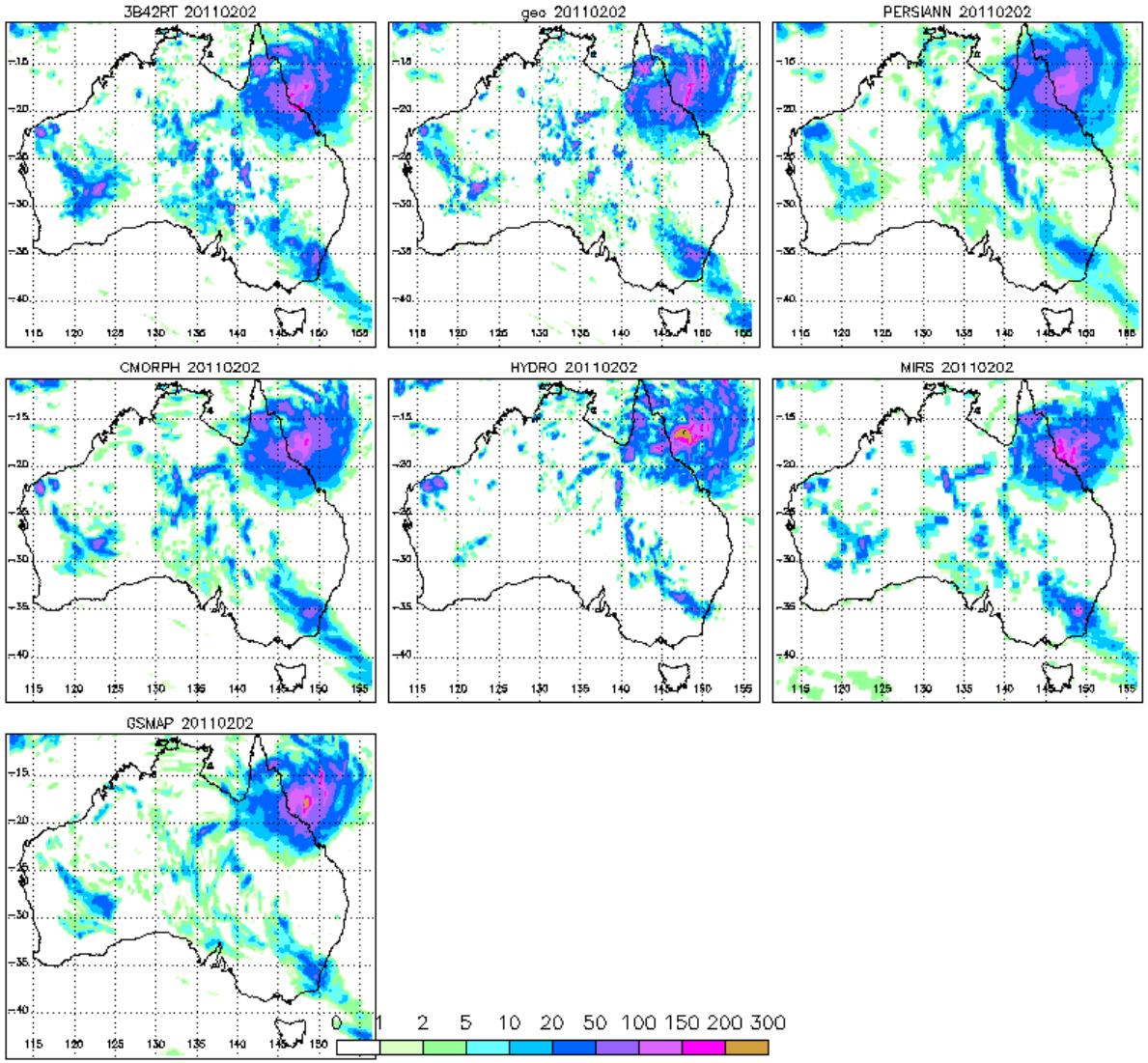
Near-real time global precipitation models



Product	Source	Resolution
TMPA	NASA	0.25º, 3 hr
NRLblend	NRL	0.10º, 1 hr
PERSIANN	UC Irvine	0.25º, 1 hr
CMORPH	NOAA	8 km, 30 min
HYDRO	NOAA	5 km, 1 hr
MIRS	NOAA	0.25º, daily
GSMaP	JAXA	0.10º, 1 hr

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Additional precipitation estimates for climate monitoring

Product	Source	Resolution	Data record
GPCP	NOAA	2.5º, pentad & monthly, global	1979-present
CMAP	NOAA	2.5º, pentad & monthly, global	1979-present
TRMM 3B42	NASA	0.25º, 3 hr, 50ºS-50ºN	1998-present

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GSMaP near-real time data viewer

JAXA Global Rainfall Watch

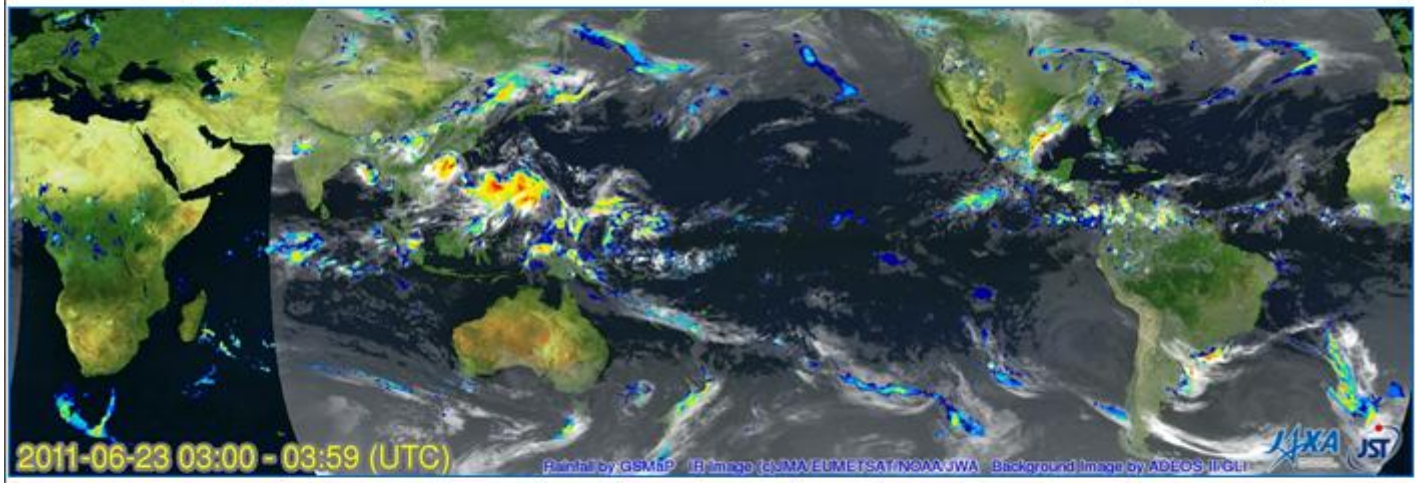
JAXA/EORC

>> Members Page
>> Japanese

Last up date: 2011/Jun/25 07:55:06 UTC

Date: 2011 / Jun / 23 03:00-03:59 UTC Submit

Latest 10 hours | 24h Movie | Pre << | Latest | >> Next | MWR Coverage | Google Earth



Rain 0.1 0.5 1.0 2.0 3.0 5.0 10.0 15.0 20.0 25.0 30.0 [mm/hr]

We offer hourly global rainfall maps in near real time (about four hours after observation) using the combined MW-IR algorithm with TRMM TMI, Aqua AMSR-E, DMSP SSM/I and SSMIS, and GEO IR data. Background cloud images are produced from IR data observed by JMA's MTSAT satellite, NOAA's GOES satellites and EUMETSAT's Meteosat satellites (see NOTICE), and provided through JWA.

Because of limited use permission for Meteosat cloud images, we only display images of them at

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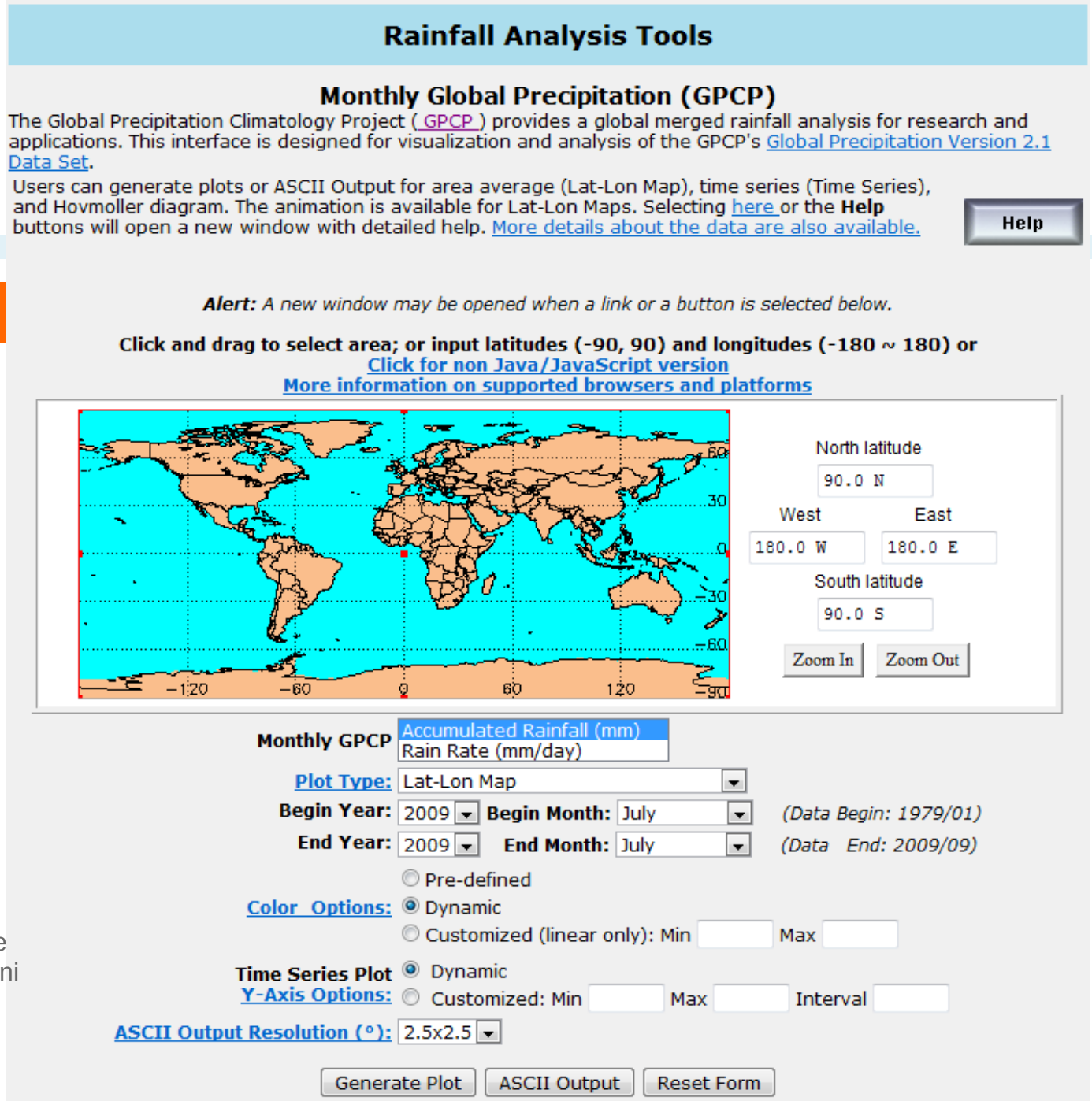
Giovanni

Visualize,analyze,and access a variety of earth science remote sensing data



Visualizations used on this slide were produced with the Giovanni online data system, developed and maintained by the NASA GES DISC

Applications – drought monitoring

NLDAS Drought Monitor

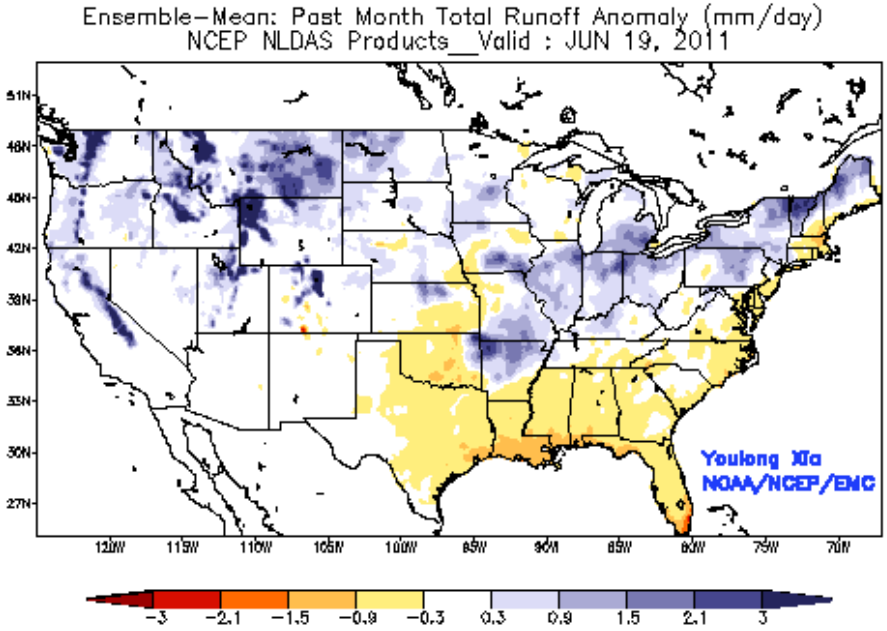
Total Runoff

NOTE: This page is best viewed with a screen resolution of at least 1024x768

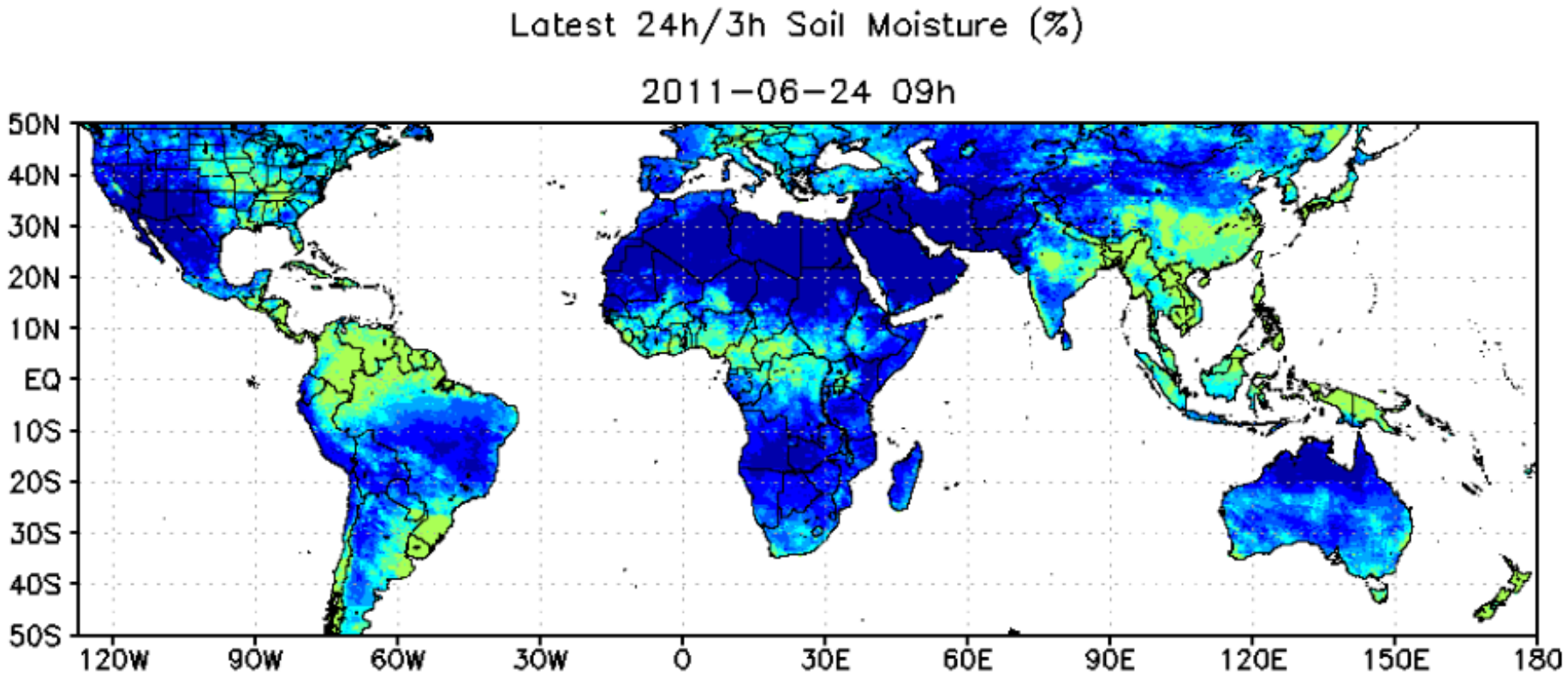
DISCLAIMER: Any data provided on this server should be used for research or educational purposes only. This data should NOT be relied on for any operational use as data gaps can occur due to hardware failure and/or model upgrading procedures.

Ensemble Mean LSM OUTPUT:

Past Month Total Runoff Anomaly

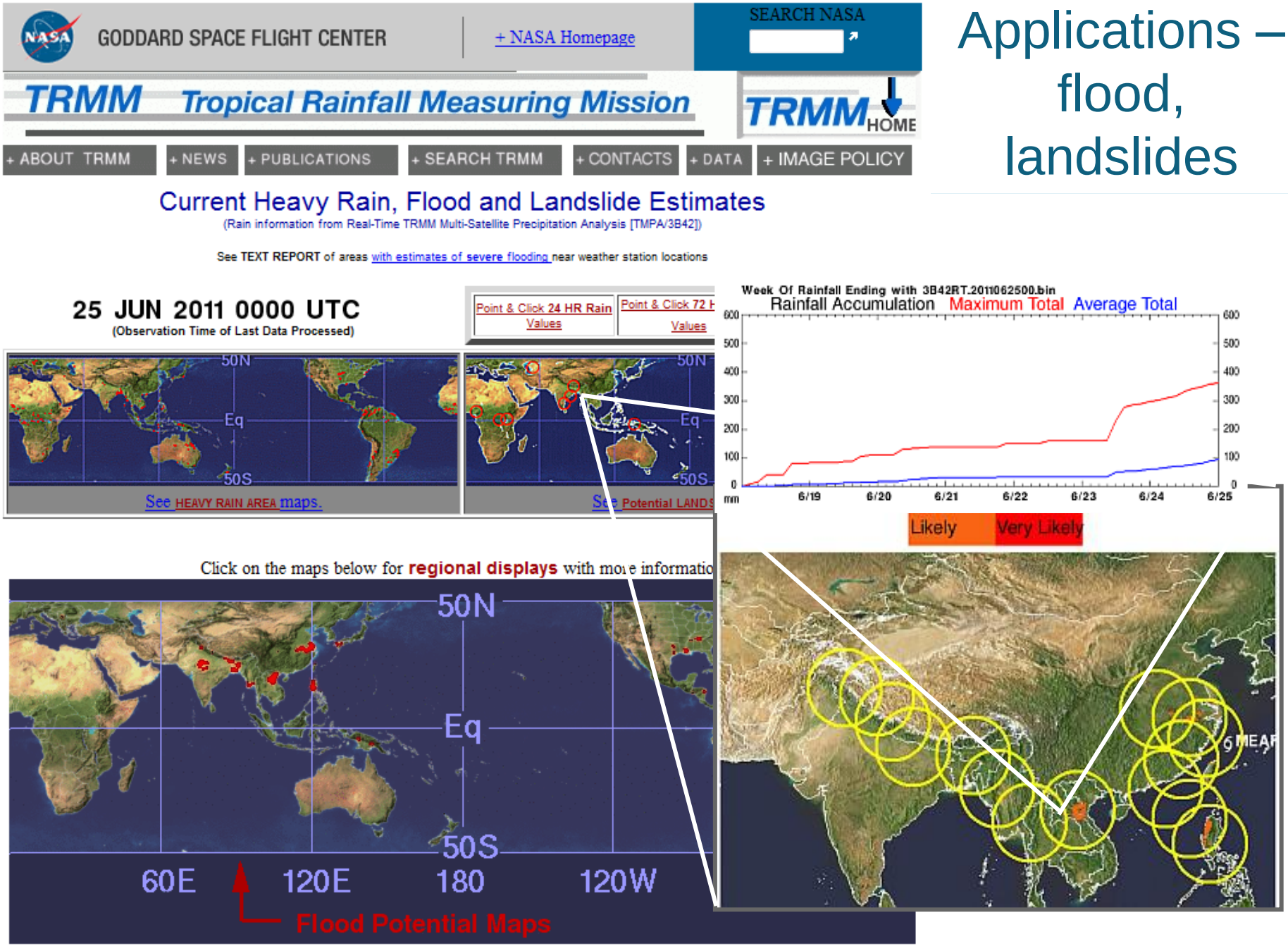


Applications – Global Realtime Hydrological Simulation and Flood Monitoring



(Courtesy Yang Hong, U. Oklahoma)

Applications – flood, landslides



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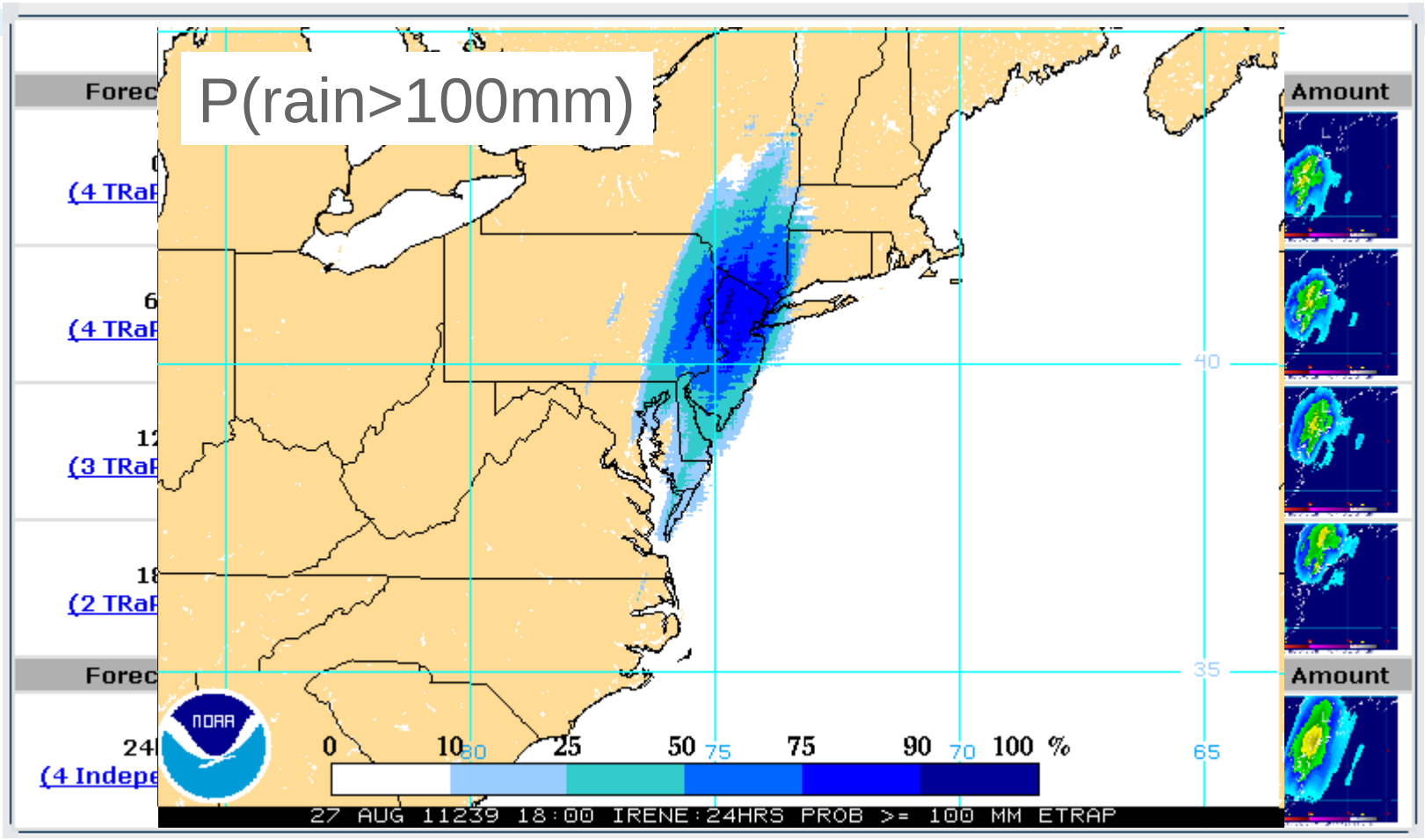
Applications – tropical cyclone heavy rainfall



Applications – model evaluation

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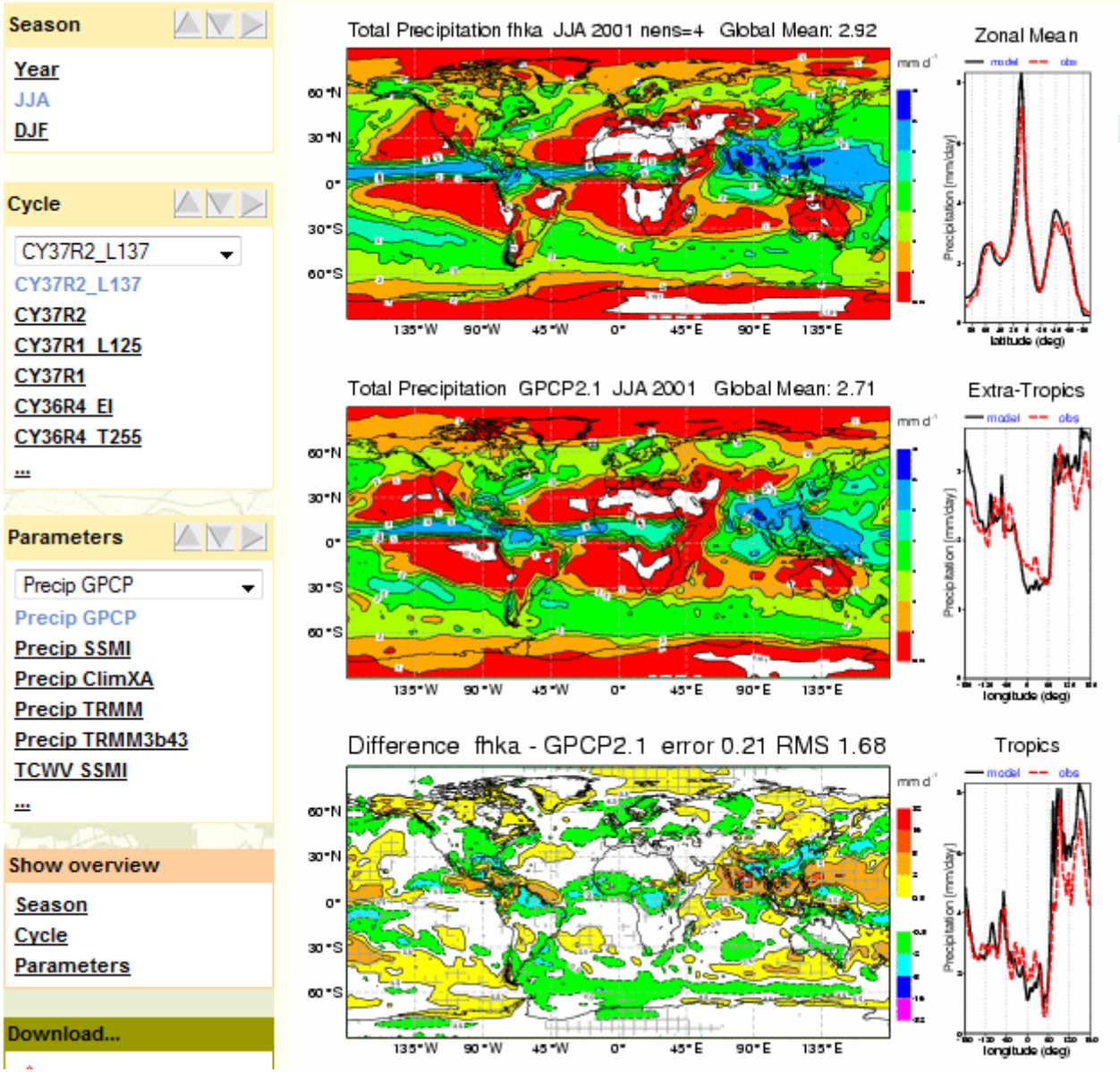
ECMWF model
and
GPCP rainfall

JJA 2001

(Courtesy Peter Bauer, ECMWF)

ECMWF



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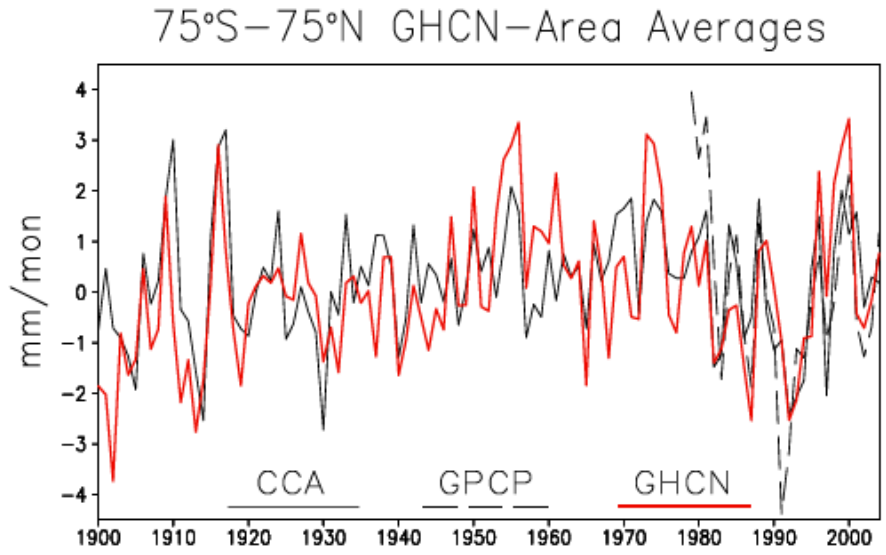
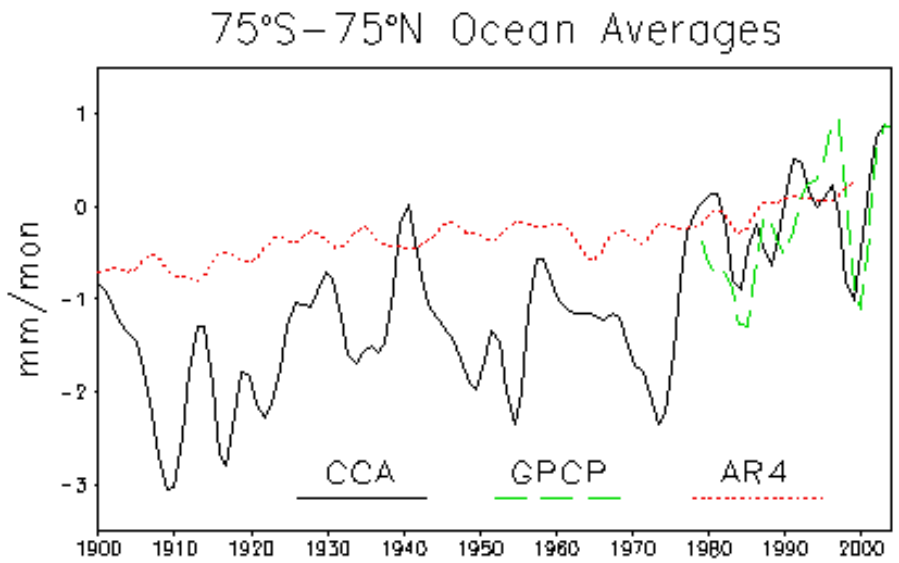
Applications – historical climate reconstruction

Reconstructed monthly rainfall time series, based on spatial modes

courtesy Tom Smith, NOAA



CCA-based reconstruction near-global average over land locations with gauges, with similar averages for gauges and for GPCP



CCA-based reconstruction near-global average over oceans, with similar averages for AR4 and for GPCP.

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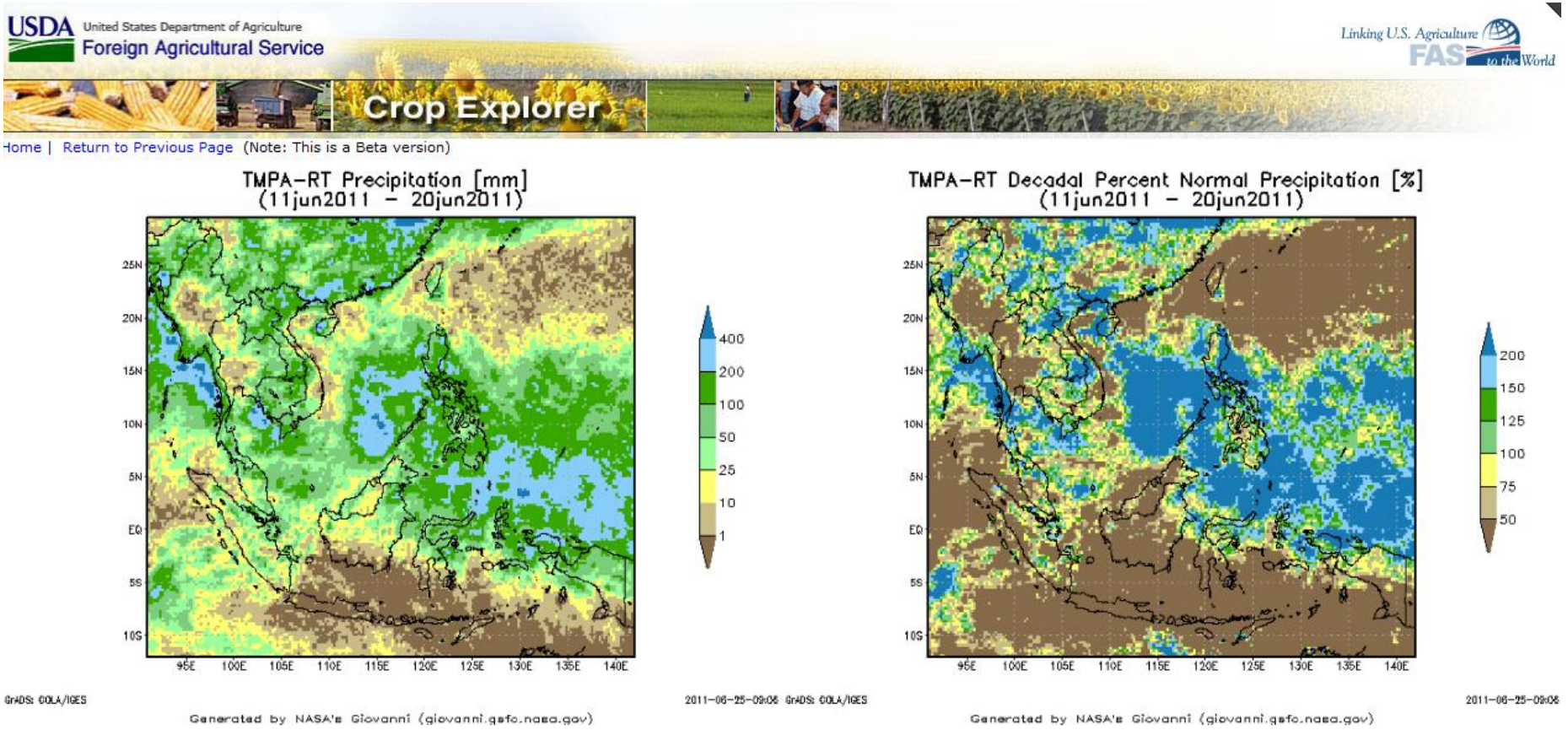
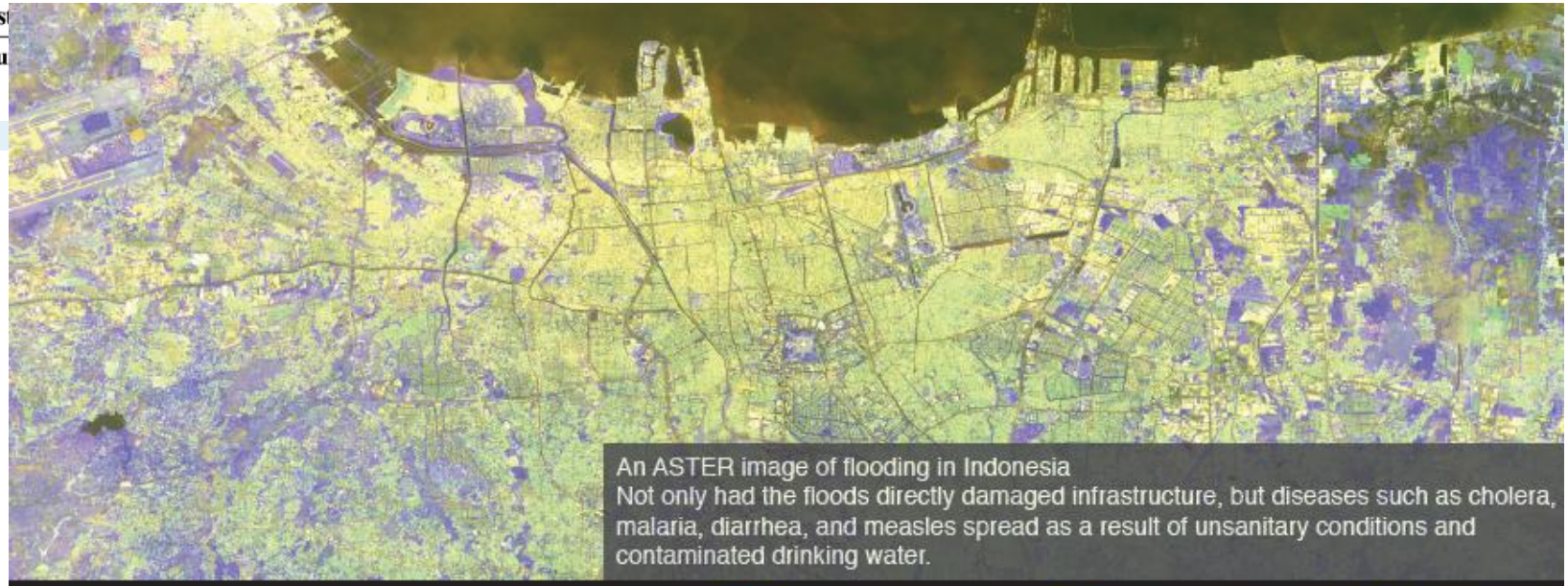
Applications – crop production estimation

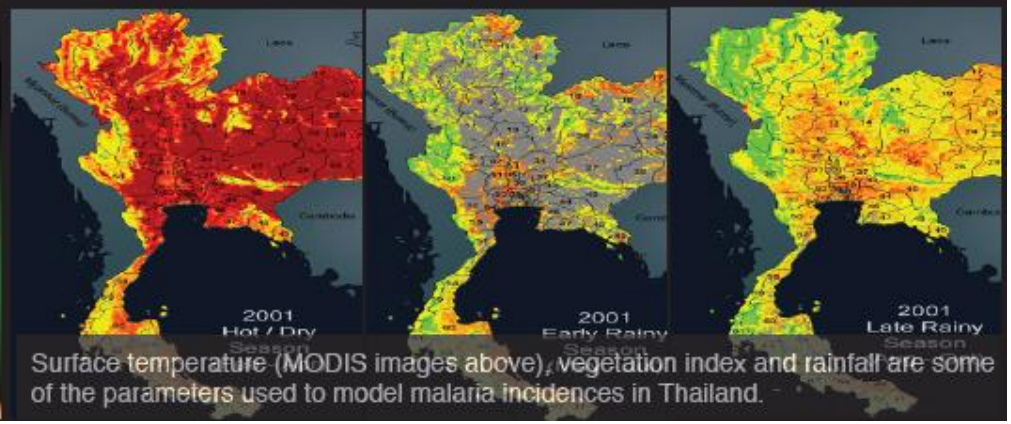


Applications – disease monitoring



An ASTER image of flooding in Indonesia
Not only had the floods directly damaged infrastructure, but diseases such as cholera, malaria, diarrhea, and measles spread as a result of unsanitary conditions and contaminated drinking water.

Malaria is spread by Anopheles mosquitos



Surface temperature (MODIS images above), vegetation index and rainfall are some of the parameters used to model malaria incidences in Thailand.

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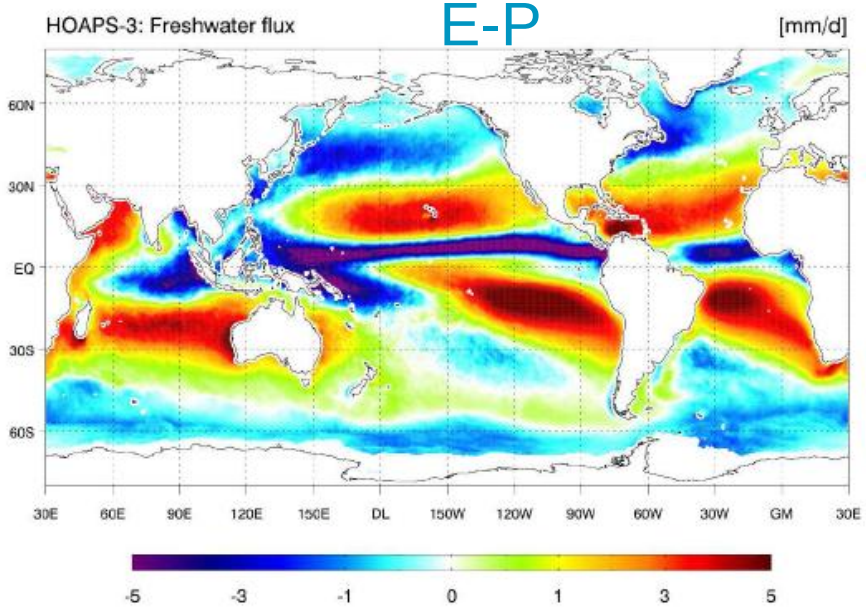
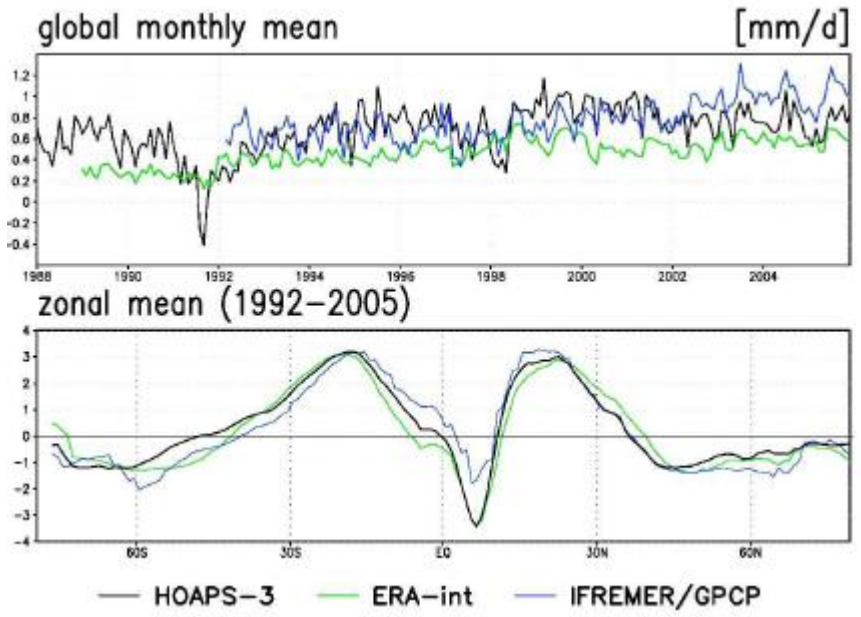
Applications – ocean freshwater budget





HOAPS ocean atmosphere fluxes based on SSM/I microwave data for consistency

Andersson et al., *JAMC*, 2010

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International Precipitation Working Group (IPWG)

http://www.isac.cnr.it/~ipwg/

Meetings

Data

Algorithms

Training

Reports

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(etc.)

CGMS IPWG International Precipitation Working Group

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Thank you…