

Proposal for
Joint Precipitation Intercomparison
Activities between the International
Precipitation Working Group (IPWG) and
WGNE

Beth Ebert
IPWG Evaluation Science Team



Who is the International Precipitation Working Group (IPWG)?

Operational and research users of satellite precipitation measurements exchanging information on:

- precipitation measuring methods
- impact of space borne precipitation measurements in NWP, hydrometeorological prediction, and climate studies



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

... and what do we propose?

- Extend the Program to Evaluate High Resolution Precipitation Products (PEHRPP) to include short-range QPFs from NWP model forecasts and reanalyses.
 - Characterize errors on many spatial and temporal scales, over varying surfaces and climatic regimes
 - Enable developers to improve their products and potential users to understand the relevant characteristics of the products
 - Define data requirements and computing resources needed for retrospective processing of hi-res precipitation products
- Ask WGNE to provide access to model precipitation estimates.

Motivation for IPWG and WGNE to work together on QPF/QPE evaluation

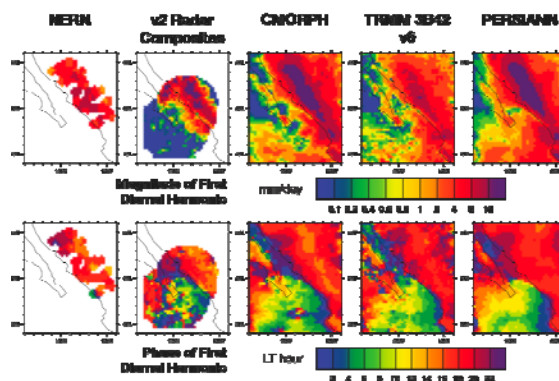
- Precipitation data have different requirements for timeliness and accuracy
 - Weather analysis and prediction, emergency management, agriculture, climate studies, flooding and other hydrological applications
- Studies show satellite and model precipitation products are *complimentary*
 - Satellite good for convective rain, warm season
 - Model better for synoptic scale rain, cool season
 - Combination of satellite and model could take advantage of strengths of both data sources
- IPWG and WGNE have experience in verifying rainfall

Program to Evaluate High Resolution Precipitation Products (PEHRPP)

- Begun in 2006
- Detailed evaluation of the quality of the high resolution satellite-based precipitation datasets
- Scales of interest:
 - 1 to 3 hourly, 0.10° to 0.25° grid, verified against very high quality datasets
 - Daily, 0.25° to 1.00° grid, for which many years of reference data are available
 - Monthly low-resolution validation as a "sanity check".

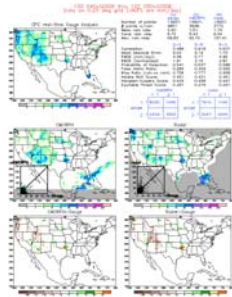
<http://essic.umd.edu/~msapiano/PEHRPP/index.html>.

Sample PEHRPP results – 3-hourly

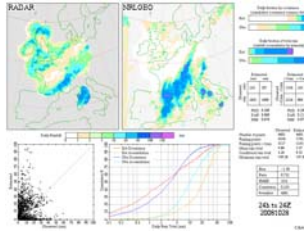


First diurnal Fourier amplitude (top) and phase (bottom) comparisons for July-August 2004 during the North American Monsoon Experiment (NAME)-2004 (Nesbitt et al., *JHM*, 2008)

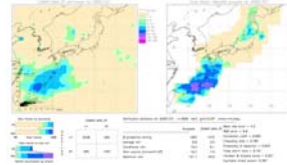
Sample PEHRPP results – daily near real time



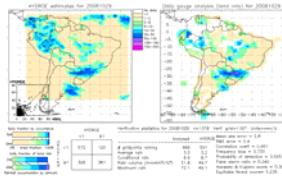
United States



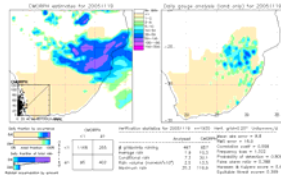
Western Europe



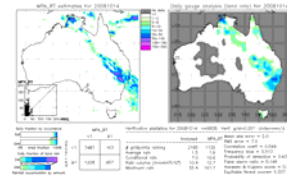
Japan*



South America



Southern Africa*

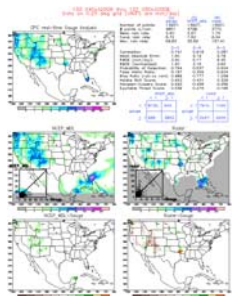


Australia

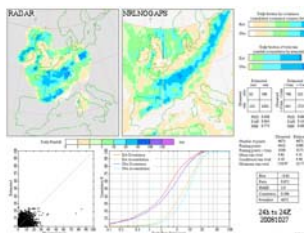


* not yet in regular production

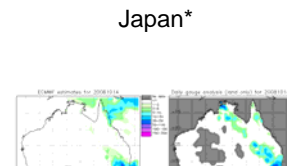
PEHRPP includes some NWP



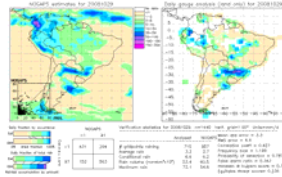
United States



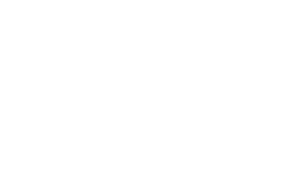
Western Europe



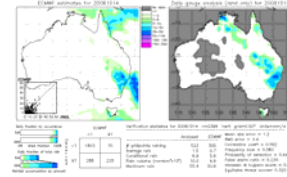
Japan*



South America



Southern Africa*



Australia



* not yet in regular production

Proposed activity

Scenario 1: PEHRPP includes NWP products along with satellite precipitation estimates

- Interested WGNE participants make their model precipitation products available to IPWG scientists via FTP
- Work is performed by IPWG

Scenario 2: WGNE participants add high resolution satellite precipitation estimates to the NWP models being verified in the QPF intercomparison

- Satellite precipitation providers make their products available to WGNE scientists
- Work is performed by WGNE

Scenario 3: (1) and (2)

Issues

- Spatial and temporal scales - what accumulation periods can be supported by the available observational data?
- Can 6h model precipitation accumulations be provided to allow flexibility in the definition of a day?
- Most appropriate forecast lead times to avoid model spin-up
- Interpolation and/or averaging methods
- Are there some scales and regimes in which satellite precipitation estimates are good enough to verify NWP precipitation occurrence and/or amount?
- Effective interaction with users of precipitation data
- Intercomparison of limited duration or ongoing?

Contacts

- Beth Ebert (co-chair IPWG Evaluation Science Team), e.ebert@bom.gov.au
- Chris Kidd (co-chair IPWG Evaluation Science Team), C.Kidd@bham.ac.uk
- Phil Arkin (PEHRPP lead scientist), parkin@essic.umd.edu
- George Huffman (IPWG co-chair), George.J.Huffman@nasa.gov
- Christian Klepp (IPWG co-chair), christian.klepp@zmaw.de.