

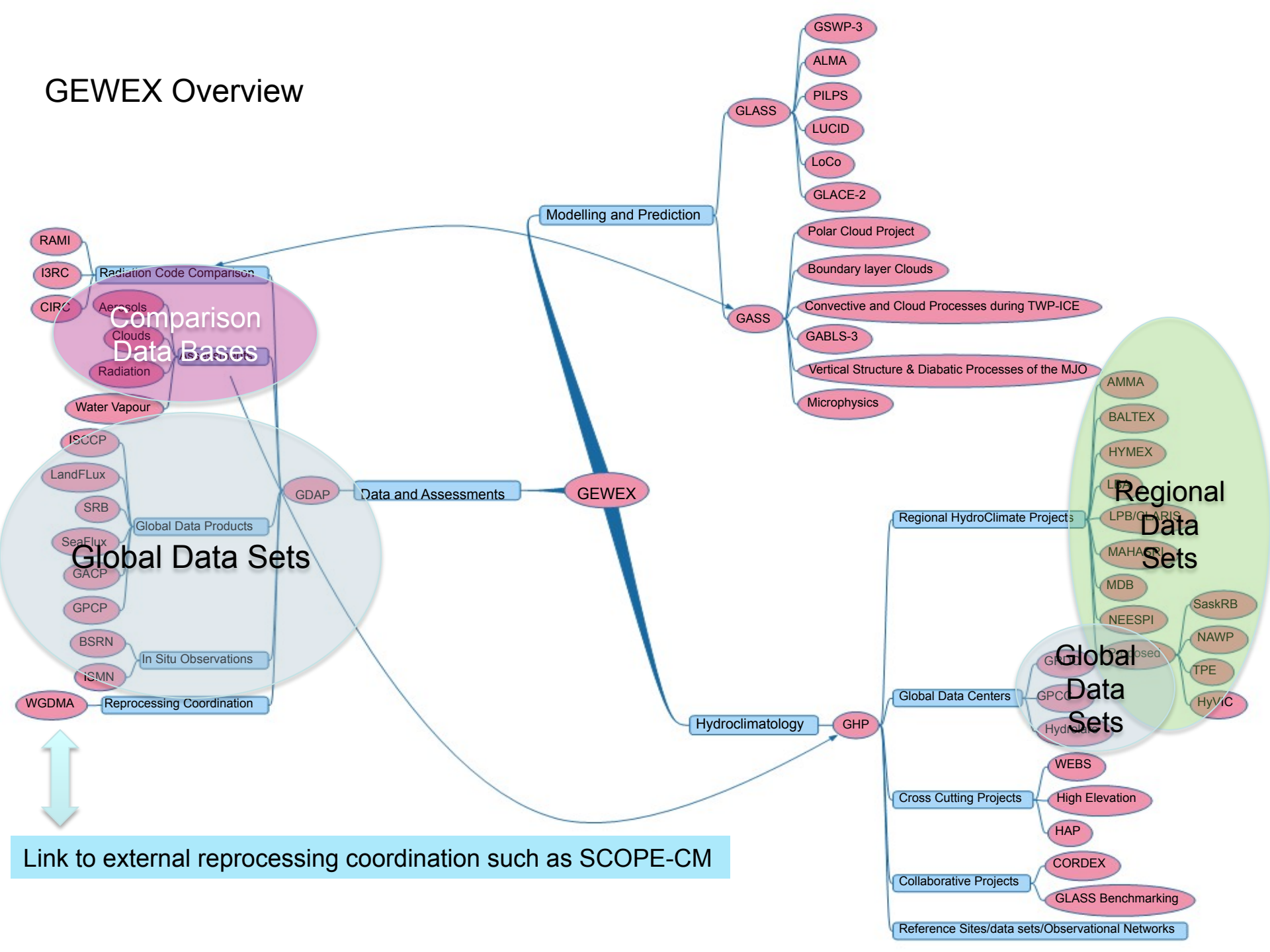
Data Initiatives from GEWEX inclusive the new NCAR Climate Data Guide

Jörg Schulz (EUMETSAT)
Vice-Chair of GEWEX GDAP

Content

- GEWEX as a data resource
- GEWEX reprocessing activities
- GEWEX assessments
- NCAR's Climate Data Guide
- Discussion Points

GEWEX Overview



GEWEX Panels

GDAP

- Radiative processes and understanding
- Global Data sets on radiative and turbulent fluxes as well as cloud properties and precipitation
- Global In-situ observational networks, development and standardization (BSRN, Soil Moisture)
- Development and improvement of radiative transfer codes
- Intercomparison studies and data set assessment
- <http://www.gewex.org/projects-GRP.htm>

GHP

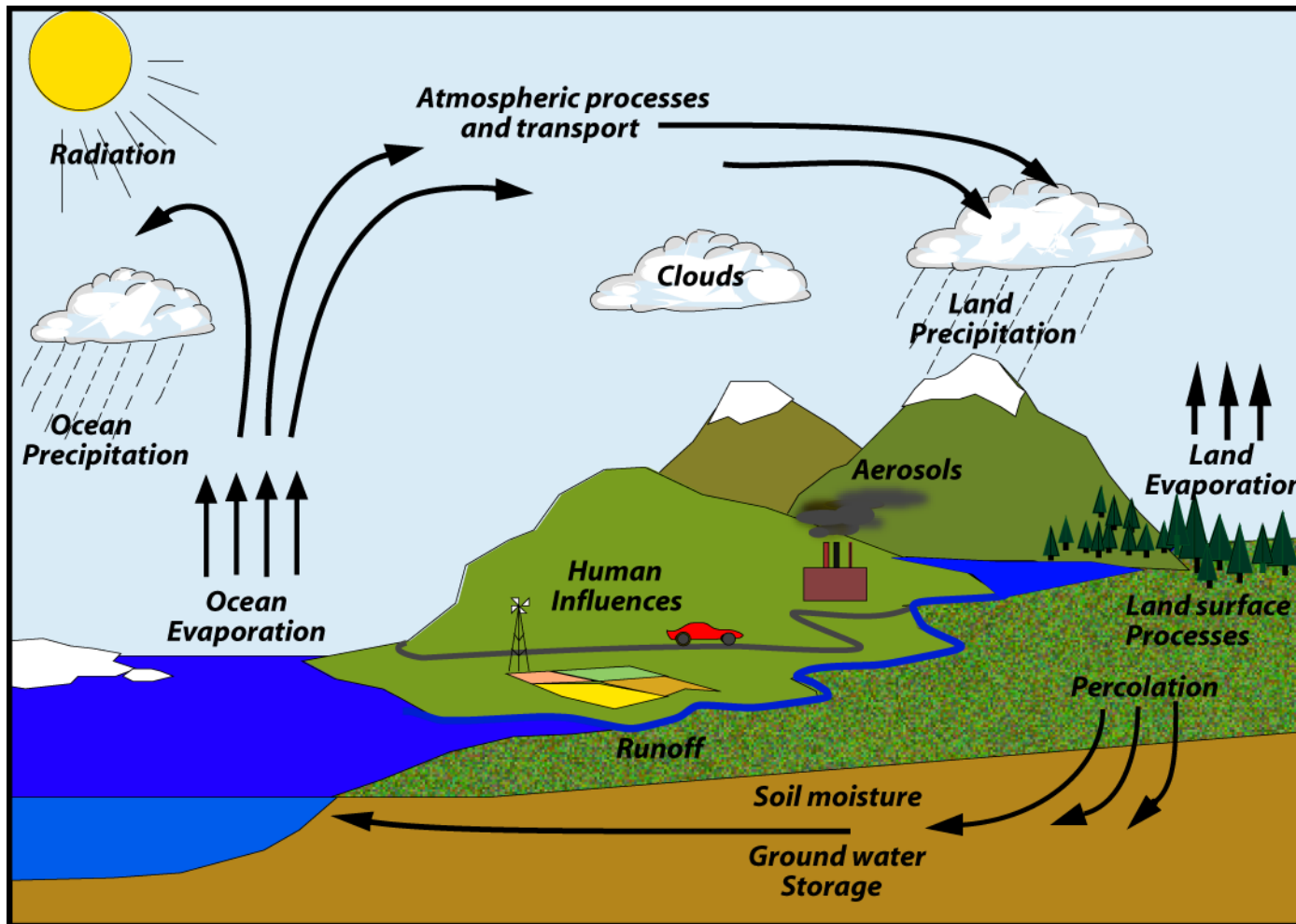
- Globally distributed extensive regional data sets covering water and energy cycle observations (in situ and space borne and modeling data)
- Data management system / GEO Prototype for Water Cycle Observations
- Regional Climate Modeling and Process Descriptions (Monsoons, Extremes, etc)
- Hydrological Applications and Forecasting (Drought monitoring, Hydrological Ensemble Predictions...)
- Coupling with Global Modeling and Global Data sets (GDAP and GMPP)

GASS and GLASS

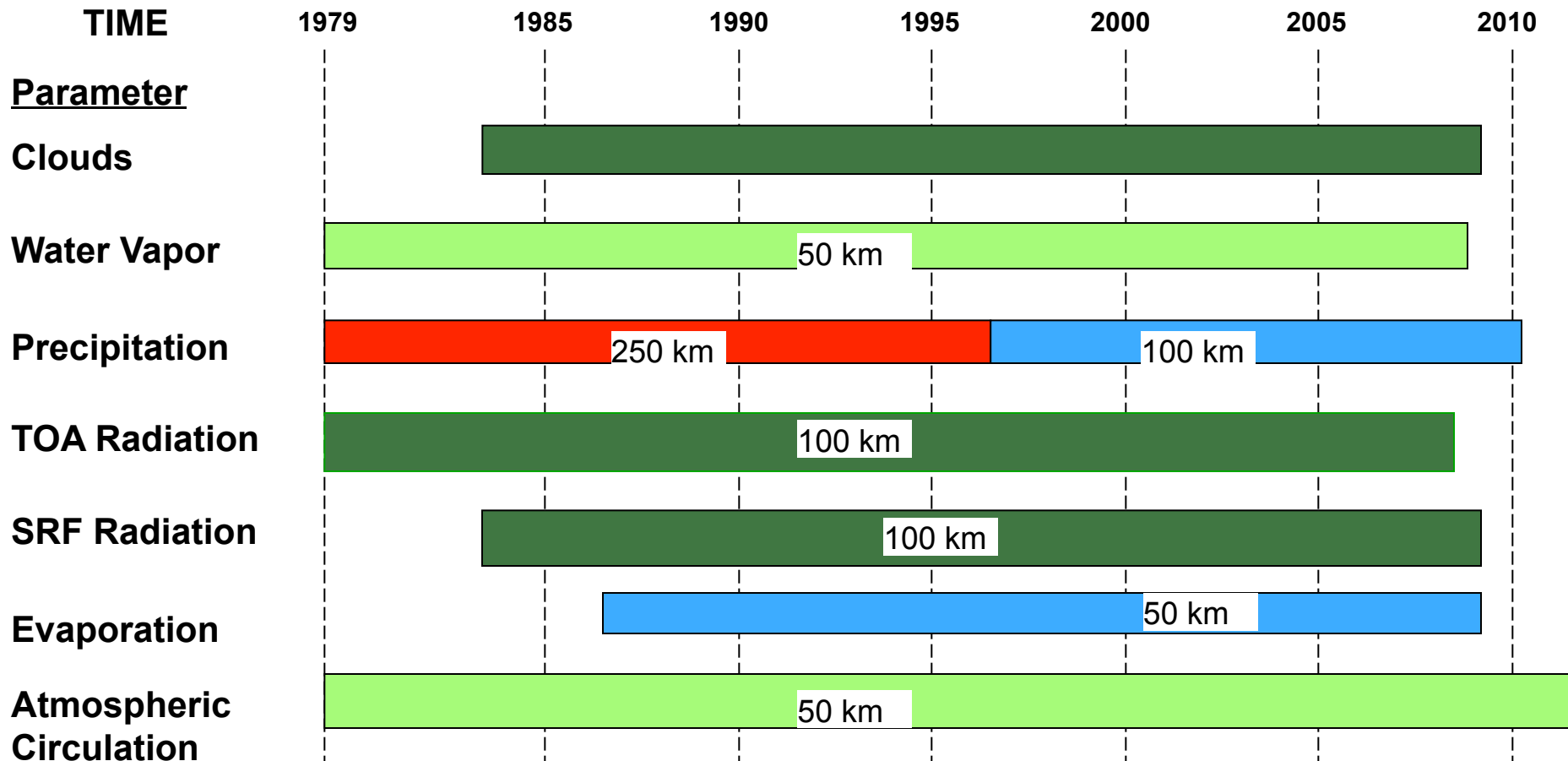
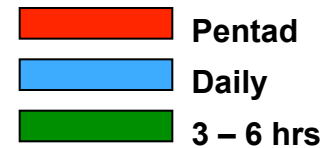
- Model Parameterization and development from land surface process to atmospheric processes
- Cloud process descriptions, parameterizations and model, data sets and tools, intercomparison studies
- Atmospheric Boundary layer studies, descriptions and intercomparison studies (diurnal cycle)
- Strong cooperation with Numerical Prediction Centers and weather forecasting “through” WGNE
- Land surface feed back/coupling studies

GEWEX

GEWEX Data and Assessment Panel



Available Global Datasets



GDAP develops and reprocess **climate data records** of water and energy variables, complete with metadata and error bars.

Clouds - **ISCCP**

Cloud Assessment near completion (final report under review)

Water Vapor – **TBD**

Assessment underway (second workshop in Sep 2012)

Precipitation - **GPCP**

Sfc gauge obs (**GPCC**)

First Assessment completed

Radiation - **SRB**

Surface reference observations - **BSRN**

Radiation Assessment in progress

Aerosols – **GACP over ocean; land is TBD**

Aerosol Assessment underway

Turbulent Fluxes: **SeaFlux and LandFlux**

SeaFlux Assessment underway

LandFLux Assessment just starting

- Soil Moisture

A GDAP product is endorsed by GEWEX/GDAP to conform to a high standard of production and documentation. It consists of a blend of available satellite and in-situ observations and is periodically compared and assessed against other products in an open and transparent fashion. It is openly available to everyone without restrictions.



Data Set Assessments

- Data set diversity can be confusing for users, and without the proper background information and understanding of the limitations of available data, there is a danger that these data may be incorrectly applied or misinterpreted;
- Users need to realise that it is often difficult to define a single best climate data source. Data sets are instead most often complementary in nature with varying strengths and weaknesses;
- Essential elements that define the usefulness of a data set are certainly its accuracy and error characterization, but data products can be evaluated too favourably by the developers themselves in order to encourage data usage;
- Assessments have benefits for both science and applications as well as product providers.
- Also read GEWEX News February 2012 for more ...

Benefits of Assessments

To Science and User Communities:

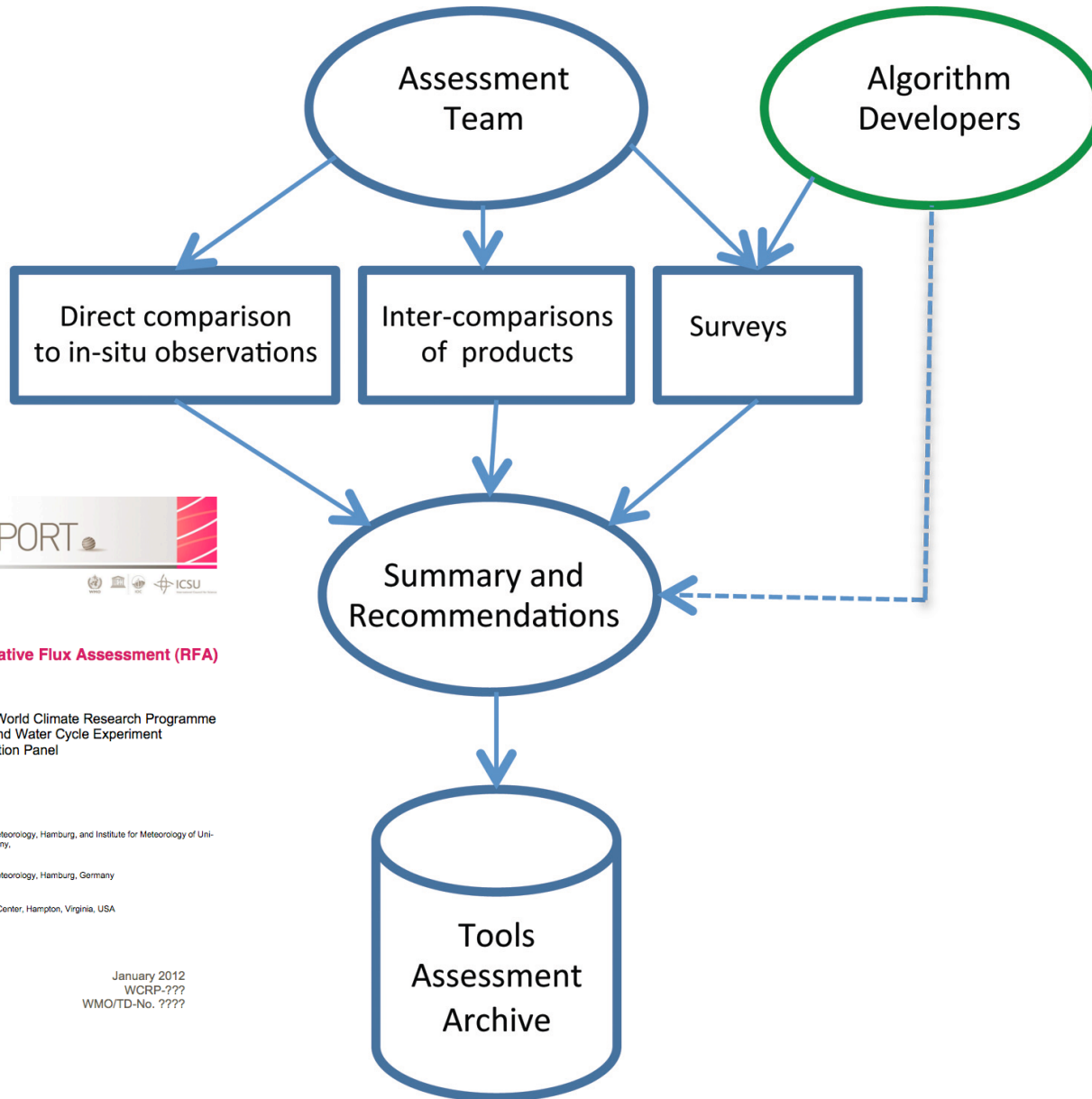
- Provide independent and transparent quality assurance for products;
- Endorse the use and the credibility of products to a broader community;
- Identify key limitations in products to stimulate improvements;
- Allow objective selections of appropriate data products.

Benefits of Assessments

To Product Providers:

- Provide background information on available products;
- Provide easy access to data in a common user friendly format;
- Establish reference data test-beds and tools for external evaluations.

Key Elements of Assessment



GEWEX Radiative Flux Assessment (RFA)

A project of the World Climate Research Programme
Global Energy and Water Cycle Experiment
(GEWEX) Radiation Panel

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WCRP-???
WMO/TD-No. ????



World Climate Research Programme

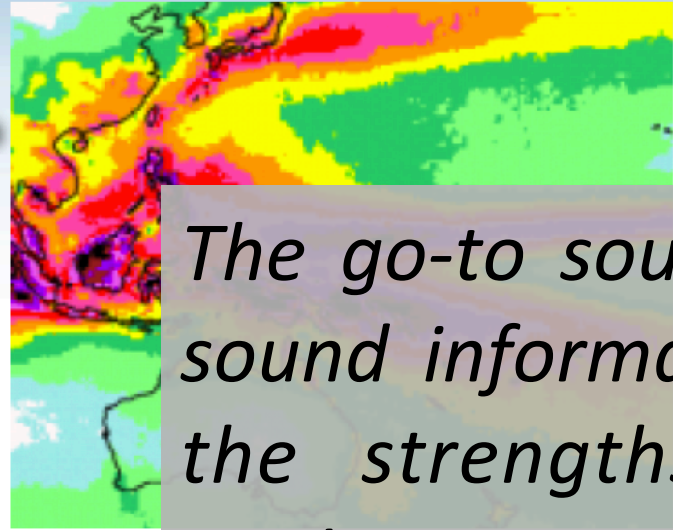


Assessments Facts and Needs

- Assessments usually rely on voluntary efforts, which can take considerable time to finish and can collapse unless there is strong leadership.
- Thus assessments should include:
 - A dedicated, motivated, and respected person to lead the effort;
 - Complementary assessment team members with specialized knowledge;
 - Regular team meetings;
 - A centralized data depot for data sets created specifically for the assessment (e.g., validation data or common gridded products) that can be used to facilitate assessments by new products or new versions of existing products;
 - Seed funding for the centralized activities.



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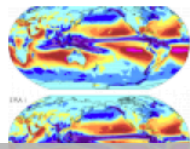


Published a data set or evaluation lately?

Publicize a data set and your perspective on its strengths and limitations and reach the Climate Data Guide's thousands of users

The go-to source for scientifically sound information and advice on the strengths, limitations and applications of climate data.

reanalysis



Atmospheric Reanalysis: Overview & Comparison Tables

Reanalysis a systematic approach to produce data sets for climate monitoring and research. Reanalyses are created via an unchanging

What is the Climate Data Guide?

The Climate Data Guide is the go-to source for scientifically sound information and advice on the strengths, limitations, and

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Several of the inaccuracies exhibited by ERA-40 such...
experts: Dee, Dick

users. Users may participate by posting comments, questions, and links.

climatedataguide.ucar.edu

- **Search** for data sets used in climate analyses and model evaluation;

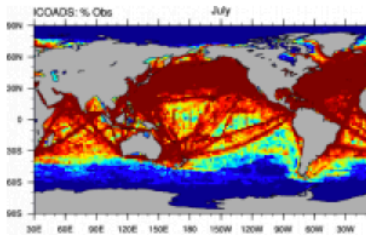
- **Learn** about data sets' strengths and limitations from expert-users;

- **Share** expertise and advice on data sets.

Learn

Data sets are profiled with succinct descriptions of their key strengths, weaknesses, and typical applications

ICOADS Surface Marine Weather Observations



ICOADS (International Comprehensive Ocean–Atmosphere Data Set) is the most comprehensive archive of global marine surface climate observations available. Variables include SST, SLP, air temperature, wind speed, cloud amount, and others. There is no processing beyond initial quality control. ICOADS data are packaged in several different formats with different time periods, timesteps, and grid resolutions. Scattered observations extend back to 1662, but climate scientists will probably be most interested in the monthly summary statistics that span 1800–2007 on a 2°x2° grid, or 1960–2007 on a 1°x1° grid. Preliminary data since 2007 are also provided until the next major release (This summary is based on Release 2.5).

Key Strengths

- Very long timeseries of several climate variables available in many locations
- Provides "ground truth" of the original measurements from which other, interpolated products are derived (e.g. NOAA ERSST; HadSLP2)
- Statistics such as standard deviations, percentiles, and number of observations are published along with the monthly means

Key Weaknesses

- No corrections (e.g., to account for changes in observing practices or instrumentation) are applied beyond basic quality control
- Data coverage is sparse, and creating comprehensible maps of a given climate variable can take some processing and patience
- As of January, 2012, budget cuts at NOAA have left the further development of ICOADS uncertain (see Technical Notes for more information)

Learn

Experts who construct, evaluate and compare data sets contribute expert guidance on data sets, variables, or methods.

Expert Contributors (linked to their Climate Data Guide contributions)

Mears, Carl

Expert Developer Guidance

#The following is by **Carl Mears** (Remote Sensing Systems), February 2012:

Key Strengths: Datasets are stable and well documented. Comprehensive error estimates are available. Datas 30 years, so climate change-related trends and discernable.

Key Weaknesses: Long-term trends depend on adjustments for changing local measurement times due to drift orbits. Possible errors in these adjustments cause long-term uncertainty.

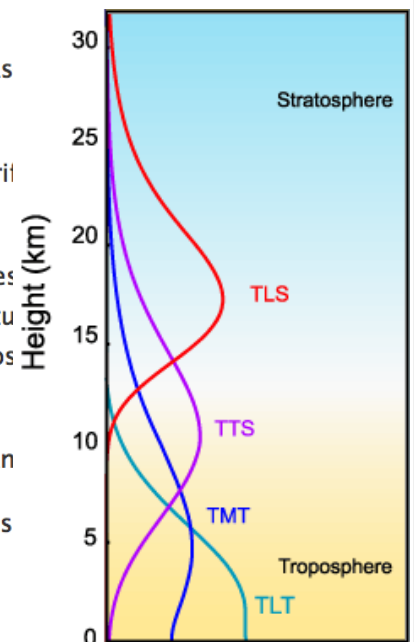
Strategies for Comparing to Models: As these are brightness temperatures, synthetic brightness temperatures model output in order to do a comparison. For the tropospheric channels, the synthetic brightness temperature from surface emission (and thus changing sea ice), water vapor and clouds in addition to the dominant atmospheric contribution.

What corrections/adjustments are applied to the operational data from NOAA/NASA?: The two most important

1. Adjustment made to account for changes in the local measurement time as the orbit of each satellite drifts cycle into the long term record.
2. Adjustments for calibration drifts that occur as the temperature of the hot calibration target changes.

There are also adjustments for Earth incidence angle/satellite height that are particularly important for the lower tropospheric

MSU/AMSU temperature profiles – Carl Mears



Share

data ▾ Processing ▾ Evaluation ▾ resources ▾ Search

Climate scientists engaged in the construction and/or evaluation of data sets are encouraged to participate in this outreach effort by contributing perspectives on various data sets.

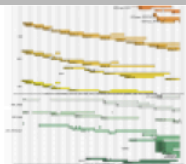
Brief comments/questions from users may also be posted

Increase the visibility of and access to climate data

Highlight your work assessing data sets; improve citations & acknowledgements

Part of data management, outreach and broader impacts

More information: climatedataguide.ucar.edu/contribute



ERA-Interim

Using a much improved atmospheric model and assimilation system from those used in ERA-40, ERA-Interim represents a third generation reanalysis. Several of the inaccuracies exhibited by ERA-40 such...
experts: [Dee](#), [Dick](#)

a Community-driven resource

16,000 Unique Visitors from 148 countries (mid-October 2011 thru early July, 2012)

400 registered users (allows one to upload guidance and/or post comments)

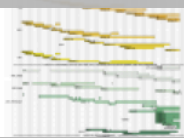
Physical scientists, social scientists, students at all levels, professionals from government, private firms, and non-profits. (~60% university)

25+ experts have contributed and many more are committed

Lightweight infrastructure, little barrier to entry, not a data archiving center

Participation, in the form of expert guidance, is needed to build the resource

More information: climatedataguide.ucar.edu/contribute



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experts: [Dee, Dick](#)

advice on climate data and analysis methods for a broad community of data users. Users may participate by posting comments, questions, and links.

Discussion Points

- Do we need an inventory for all data created within WCRP? If yes, how can that be achieved?
- CDG is a great source of information and thus a very useful tool for users – but we need to avoid any tendency towards marketing rather than objective quality assessment ;
- What are the respective roles of “objective” assessments as done in GEWEX GDAP and useful tools as the CDG with expert guidance? - it would be great if we even can improve on this by connecting this platform with serious assessment activities;
- Shall we extend GDAP style assessments to other areas in WCRP to increase the provision of objective information on data sets and methods?
- Shall this then include the use of a maturity matrix model?
- This may lead to the formulation of an WDAC Assessment task that look into all of these issues ...