

# IPWG7 Research Activity Working Group

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# Research Working Group Recommendations (1/4)

## Community-Related Recommendations

- Strive to increase connections between application/validation and research with respect to spatial and temporal scale interactions; including both ancillary and “direct” observations, simulations, and retrieval algorithms, for both ground and space-based paradigms.
- Recommend that CGMS subgroups and parallel group share reports at IPWG *and vice-versa*, to identify connections and deficiencies in inter-group activities (e.g., ITOVS, ICWG, snowfall workshop, etc.).

# Research Working Group Recommendations (2/4)

## Observation Related Recommendations

- Encourage use of scatterometers (and other active observations) to improve total-scene retrievals with a goal of increasing observational accuracy of the entire spectrum of precipitation type, intensity, distribution, and location in order to quantify how the weather and climate are changing regionally and globally.
- Ensure over-ocean precipitation processes are consistently observed, encourage communication and interaction with broader research community, taking advantage of specialized knowledge

(Most of our CGMS recommendations are observationally related)

# Research Working Group Recommendations (3/4)

## Retrieval Related Recommendations

- Improve understanding of 4-D precipitation *processes*, rather than independent 1-D individual pixel retrievals
- Support activities that promote physically consistent physical basis between ground, aircraft, and satellite based simulations and retrievals
- Encourage multi-parameter column retrievals (versus surface-only precipitation), maximizing information content available from remote sensing platforms
- Exploit visible and IR observations (or VIS/IR based-retrievals) to identify precipitation processes to guide microwave-based retrievals
- Reduce PSD-related uncertainties by exploiting process knowledge within aerosol, cloud, and precipitation interactions (e.g., 4-D scale, lifecycle, regional characteristics), and quantify impact on retrieved precipitation parameters

# Research Working Group Recommendations (4/4)

## Product/User Related Recommendations

- Identify and encourage data availability and communicate with community to improve understanding of how to access and utilize various datasets.
- Encourage interaction, training, and communication with user and peripheral communities with a mind toward developing user-need based products (e.g., Hydrology, aerosol, cloud, operations, etc.)
- Investigate and quantify influence of consistency, accuracy, and uncertainty between individual sensor (e.g., level 2) products on merged (e.g., level 3) products
- Encourage precipitation products to be more applicable toward climate applications, or at least quantify uncertainties under the assumption that products may be used in climate applications.
- Preserve long term data records from heritage satellites, e.g., TRMM for Climate Data Record / FCDR (observations and retrieval) type applications, and encourage understanding the variability of the instruments themselves, improved accessibility.
  1. Reprocessing existing datasets using updated database(s) reflecting improved knowledge.

# Research Working Group Action Items

- **Action:** Coordinate similar community research focus groups, e.g., hydrometeor physical properties and scattering properties simulations (**Who? TBD**)
- **Action:** Study impacts of unplanned loss of observations (e.g., loss of instrument or satellite) on precipitation data products at all levels (**Who? TBD**)
- **Action:** Compile the “successes” of precipitation remote sensing over time, highlighting our progress. Recommend development of a systematic metric to gauge progress of algorithms (e.g., skill improvement), and attempt to quantify how user communities have benefited from these improvements. (**Who? TBD**)
  1. redesign systematic assessment / intercomparison of precipitation retrievals (scales/types? climate, instantaneous, assimilation, regional assessments) à Inquire about GEWEX assessment program (Rémy)
  2. Feedback loop into algorithm development

# Research WG CGMS Recommendations (IPWG7)

- IPWG recognizes the need for improved global measurement of precipitation for both weather and climate monitoring, recommends continued multi-national cooperation in ensuring comprehensive observation and precipitation datasets are available to the community with transparency and efficiency.
- IPWG recognizes that active microwave observations of precipitation strongly enhances the value of CGMS passive assets, and recommends CGMS members take responsibility for sustaining these capabilities.
- Recommend an operational constellation of conically-scanning microwave platforms to guarantee sustained support for the current level of capability.
- IPWG recognizes the value in constellation-based (e.g., A-Train) active and passive multi-parameter observations in improving precipitation process understanding and its role in the climate system, recommends continued science-driven international cooperation and collaboration in preparation for future missions.
- Ensure continuity of geostationary coverage and data access over the current METEOSAT-7 coverage area.
- Recommend CGMS subgroups and parallel group reports are shared at respective subgroup meetings, to identify connections and deficiencies in communication (e.g., ITOVS, ICWG, snowfall workshop, etc.).