

Hydrology Session Report

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Session Summary

- 13 presentations
- Mostly dealing with soil moisture using PALSAR
- Several on inundation and flooding that utilize PALSAR, PRISM, and/or AVNIR-2

General Impression

- Most investigators have not received enough data to perform thorough analyses

Discussion of Soil Moisture Studies(1)

- Most established retrieval algorithms are *semi-empirical* and based on specific sensor configurations or surface characteristics. There is **no general consensus on the best approach** at this point.
- PALSAR acquisitions (in particular the default modes) provide data for a *specific sensor configuration*, which varies by location and time of year.
- Validation or algorithm improvement requires a range of soil moisture conditions with a *consistent configuration*.
- Investigators end up working with *mixed modes*, less than optimal modes, and extending existing algorithms outside their *range of validity*.

Discussion of Soil Moisture Studies(2)

- From a *research point of view*, the polarimetric mode is attractive.
- However, there is a issue that must be considered. The **low incidence angles of the polarimetry mode make it *less compatible with the established retrieval algorithms*** forcing application outside the range of validity.
- The longer term value of PALSAR to a potential *Soil Moisture Active Passive (SMAP)* mission will depend upon how much data is acquired in a compatible configuration (polarimetric, high incidence angle).

Common Observation Requests- Soil Moisture Studies (1)

- The nature of the ALOS PALSAR data acquisition plan makes intensive field campaigns very challenging.
- **High observation frequency and continuous datasets are required for most hydrological applications(flood, and drought assessment, soil moisture derivation).**
- Long term *in-situ* observing sites are of value to the project.
- Acquisitions over such sites are considered a high priority, if the ground based observations will be shared with other PIs.

Common Observation Requests-

Soil Moisture Studies (2)

- Several sites were identified that are currently part of existing PI projects; **Mongolia, Tibet, Oklahoma, Arizona, and Spain**. Other sites can be suggested if they meet the basic requirements.
- A significant increase in frequency of coverage throughout the entire year should be initiated at these sites as soon as possible.
- At this time, polarimetric or high incidence angle FB mode would be of the most value.
- **To have a PALSAR data acquisition strategy over areas prone to natural disaster events (e.g. cyclones or floods in coastal areas of Australia) at particular times of the year.**

Software Tools

- General preprocessing tools available from JAXA or commercially were considered adequate.
- There was a discussion of providing a module of soil moisture retrieval algorithms for different modes. The consensus was that this was premature.
- Flood inundation mapping tools could be improved.
- Hope to distribute interferometry processing tool, if possible.

Catalogues and Data Nodes

- There are problems with the catalogue and node structure that become significant when an investigator in one region is attempting to obtain data in another region. These may be specific to particular nodes. It may also be related to direct downlink acquisitions that don't go to JAXA.