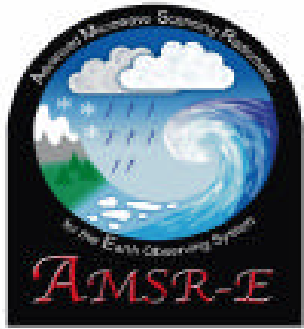


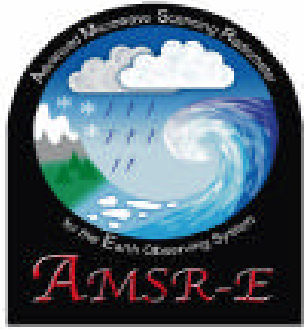
# AMSRE Validation Summary

<http://eosps0.gsfc.nasa.gov/validation/valplans.html>



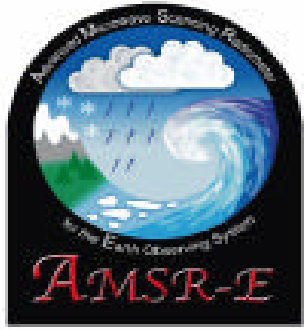
# Validation of Ocean Products

Ocean Parameter	Calibration methods	Rms. Error
Sea-Surface Temperature ( $T_s$ )	Satellite, Buoy	0.5 C
Wind Speed (W)	Satellite, Buoy, GCM	0.9 m/s
Columnar Water Vapor (V)	Radiosonde	0.6 mm
Columnar Cloud Water (L)	Histogram	0.02 mm



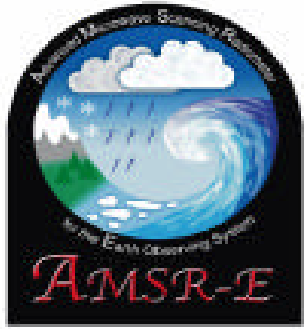
# Rainfall Validation

- Initial validation and data release
  - Intercomparisons with existing satellite rainfall products
- Comparison with ground based radar data
  - WSR-88 radar at Eureka, CA
  - TRMM assets in Kwajalein, Darwin, Australia, Melbourne, FL and Houston, TX.
- Flight campaigns: Winter 2002, Summer 2004



# Sea Ice Validation

- Sea ice concentration: aircraft campaigns and time series of images
- Sea ice temperature: use empirical relationship together with aircraft and satellite (MODIS and AVHRR) thermal infrared data, buoys
- Snow depth on sea ice: in-situ measurements made by ships



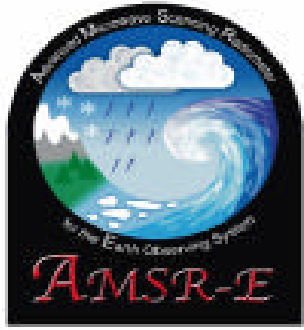
# Sea Ice Validation (cont.)

- Aircraft Campaigns:
  - Meltpond 2000 in the Summer Arctic (Successfully completed!)
  - Winter Antarctic August 2001
  - Winter Arctic Mar 2002
  - Spring Antarctic October 2002
  - Winter Arctic March 2004



# Land Validation

- Algorithm Calibration: eliminate retrieval bias errors
  - Use geographically diverse and homogeneous (over the footprint scale) sites
- Operational Networks: validate the temporal soil moisture changes
  - DOE ARM, Oklahoma Mesonet, USDA SCAN, USDA ARS Micronet, Illinois State Water Survey, FSU, Mongolia and China
- Field Experiments: short-term intensive sampling over a few footprints
  - SGP97, SGP99, SMEX'02, SMEX'04



# Land Validation (cont.)

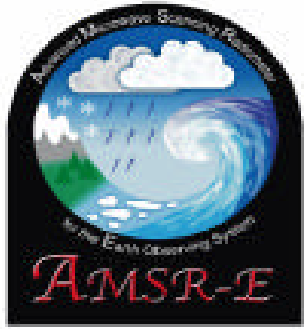
- Modeling and Data Assimilation: used mainly for consistency checking of the spatial and temporal patterns
- Satellite Data Intercomparison: assess brightness temperature calibration levels over land, intercompare between AMSR-E AIRS and MODIS, and evaluate effects of heterogeneity within the footprint



# Snow Water Equivalent Validation

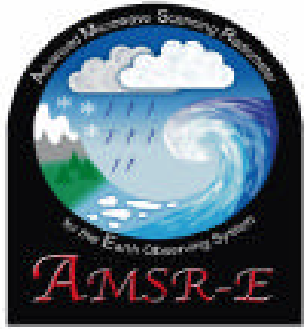
- Type 1: Grid Scale Validation
  - Airborne gamma SWE detector and multi-frequency microwave radiometers flying over flat grid scale areas (25 km by 25 km)
- Type 2: River Basin Scale Validation
  - Satellite derived areal SWE compared with values derived from a snowmelt runoff model
- Type 3: Regional Scale Validation
  - Statistical method to provide SWE estimates from large areas where ground-based network measurements exist





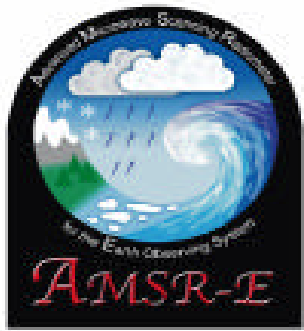
# Snow Water Equivalent Validation (cont.)

- Type 1 validation sites:
  - Airborne microwave radiometer experiments in Sodankyla and Kuusamo, Finland; joint effort with Technical University of Helsinki, University of Reading, USDA, USGS
  - Airborne gamma measurements in Roswell, NM, and Black River, WI; in cooperation with NOHRSC, USDA and USGS, in 2001, 2002 and 2003
  - AMSR-E joint campaign with the sea ice group in Alaska 2002 and 2004; EOS CRYSYS IDS team plans a field campaign in 2002 in the Canadian prairies



# Snow Water Equivalent Validation (cont.)

- Type 2 validation sites:
  - Rhine and Rhone, Switzerland
  - Rio Grande, Colorado
  - Kings River, California
  - Beas Thalot, India
  - Chatkal, Uzbekistan
- Type 3 validation sites:
  - Northern Great Plains
  - Ob River Basin, Russia and Canadian prairie (Possibly)



# Snow Water Equivalent Validation (cont.)

- Field Experiments: obtain grain size profiles and their change with time
  - Sites in New York, Wisconsin, Wyoming, Colorado
- Operational Surface Networks: comparison studies
  - Former Soviet Union Hydrological Surveys (-1990), USDA SnoTel (Western US)
- Satellite Data: use MODIS data for snow extent to verify AMSR-E retrievals