Iowa Flood Studies or IFloodS: Enhancing the Satellite-based Observations of Precipitation Events

Witold (Witek) Krajewski
Global Precipitation Measurement (GPM) Mission
Measurements at multitude of scales

Radar to function as a “BRIDGE” between scales

Gauge Network

ΔX O[0.1 to 10 km]

Radar (volume)

ΔX[4 km - 50 km]

Satellite

Scanning radiometer /radar

Research

Operational

Scanning Precip Radar (variable δt)
GPM Measurement Infrastructure for IFloodS

GPM Ground Validation

GPM Measurement Infrastructure for IFloodS

DROP Farm (NSSTC)

NPOL Radar

D3R Radar

2DVD

2DVD Hail Image

DROP Parsivels in Finland

Laser Disdrometer

DROP APU

Micro Rain Radar

Precipitation Video Imager (PVI)

YES Hot Plate V2

Rain Gauge
Soil Moisture Active Passive (SMAP)
IFloodS Schedule

- Campaign Begins
- In-situ instruments deployed in the field
- NASA’s NPOL and D3R Radars Deployed
- Campaign Ends
IFC Radar-Rainfall Products

Stage IV  IFC and Q2  HNX-1
Dominant Processes

Rainfall → Snow → ET → Hillslope Processes

Snow melt → Infiltration → Transport → Subsurface Flow

Transport in River Network → Transport in Floodplains

Continuous

Model 3: Space-time rainfall, snow melt, runoff, and evapotranspiration, non-linear overland flow and stream velocity

Digital Topography: ASTER, SRTM, LIDAR, NED

Space-time rainfall: Radar, CMORPH, PERSIANN

Soil Properties: SSURGO, ISRIC-WISE

Land Cover: NLCD, MODIS

Soil moisture AMSR-E, NLDAS-2

Streamflow Velocity: Hydraulic measurements

Snow melt AMSR-E, NLDAS-2

Evapotranspiration MODIS16, NLDAS-2
Useful links:

http://ifis.iowafloodcenter.org/ifis/more/ifloods/

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