SMAP Data So Far

- Exceptional quality global L-band radiometry.

- Limited-duration but valuable L-band active-passive *global* field campaign

- Available beta-data L1 products at NSIDC and ASF public-access (since August)

- Soon-available (mid-September and ahead of schedule) beta-version of L2_SM_P

- Intense Cal/Val Period on-going

- 2015 field campaigns completed (August for SMAPVEX15) and to-start (September for SMAPEx-5)
1. Review Intense Cal/Val Period early results

2. Review the forthcoming early-release of L2_SM_P product

3. Plan and refine continuing Intense Cal/Val activities plan and cal/val to EOM

4. Collect and integrate new ideas on:
   a) Algorithm calibration priorities
   b) Dealing with bias
   c) SMOS-Aquarius-SMAP science products transitions
   d) New validation assets
   e) New ideas on metrics and error characterization (e.g. representativeness)
Radiometer Products: Reduced RFI Data Loss and High Performance

Example of radiometer-based soil moisture cal/val

Texas Soil Observation Network (TxSON):

Pick example of a good comparison.

Shows height/upper-limit of what comparisons can be if algorithm and in situ representativeness errors can be minimized.
Value of Limited-Duration But High-Quality Data Active-Passive Data

- April 14 to July 7 (2.5+ months = 84 days) of high-quality 3km and 9km Global surface soil moisture data

- NH Spring/Summer science analyses
- Test-bed for resolution-enhancement and disaggregation approaches
SMAP Radiometer Wind Speed for Super Typhoon Maysak on Mar 31, 2015 reached 120 knots
Path Forward: SMAP Resolution Enhancement

**Process Over-Sampled SMAP Radiometer Data**

Take advantage of SMAP radiometer over-sampling to produce 20 km\(^1\) (TBC) resolution brightness temperature product

Global coverage every 2 – 3 days

Compared to global 10 km active-passive SMAP baseline

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**Use Multi-Platform Data**

Use other radar data in SMAP’s active-passive algorithm

- Better-than 10 km resolution but
- 8-day revisit
- Regional coverage (60% of land)
- C- versus L-band

Use geostationary Satellite IR/Vis (10km; 3-day revisit)

**Sentinel-1 IW Scan-Mode (Green)**

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\(^1\)Adequate resolution of an object can only be achieved if at least two samples are made for each resolvable unit
SMAP Science and Application Returns
Impact of Lower Resolution Data

Science Returns

Soil Moisture *Links* the Global Land Water, Energy, and Carbon Cycles

1. Estimating global surface water and energy fluxes  
   \{ No major impact \}

2. Quantifying net carbon flux in boreal landscapes  
   \{ Increase data-loss due to in-land water bodies $^1$ \}

3. Reduce uncertainty of climate model projections  
   \{ No major impact \}

4. Enhancing weather forecasts  
   \{ No impact on global NWP. Reduced capability for regional NWP. $^2$ \}

5. Improving flood prediction and drought monitoring  
   \{ No impact on drought monitoring. Much reduced capability for flood monitoring \}

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1 $^1$ ~80% of pixels with less than 5% inland water body at 3 km
2 $^2$ ~70% of pixels with less than 5% inland water body at 18 km

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$^1$ NWS Global NWP at 13-35 km.
$^2$ NWS North America NWP at 12 km.
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• beta-version of L2_SM_P (earlier than scheduled in mid-September) and L2-L4 data

• Intense Cal/Val on-going

• 2015 field campaigns completed (SMAPVEX15) and to-start (SMAPEx-5)
SMAP Data So Far

Exceptionally made possible by:

- Volunteer participation of you (Cal/Val partners and participants): Sharing of data, pre-launch rehearsals, regular on-going interaction,…

- Exceptional cal/val team leadership:
  
  L2-4 Lead = Tom Jackson  
  Tools and more = Andreas Colliander  
  L1 Leads = Mike Spencer, Sid Misra and Jeff Piepmeier  
  SMAPVEXnn & SMAPEx-n campaigns = Tom Jackson & Jeff Walker

- Intense Cal/Val on-going

- Close coordination between Algorithm Development Team and ST Algorithm Science Leads

- 2015 field campaigns completed (SMAPVEX15) and to-start (SMAPEx-5)

- Support of the Project through exceptional SDS Team and OASIS testing environment
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Thank You!
Timing and Objectives of This Community Workshop

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