

SMAP Cal/Val Team: In Situ

Tom Jackson (USDA)

May 4, 2011

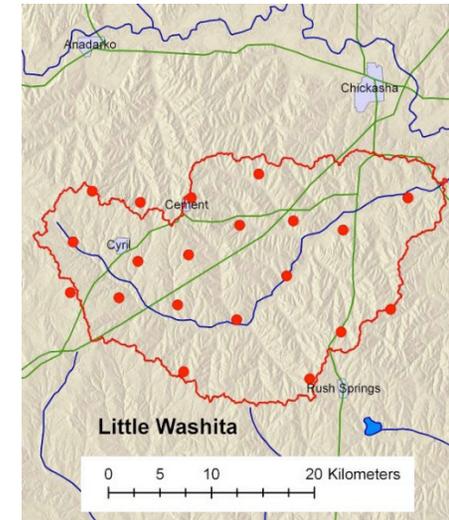
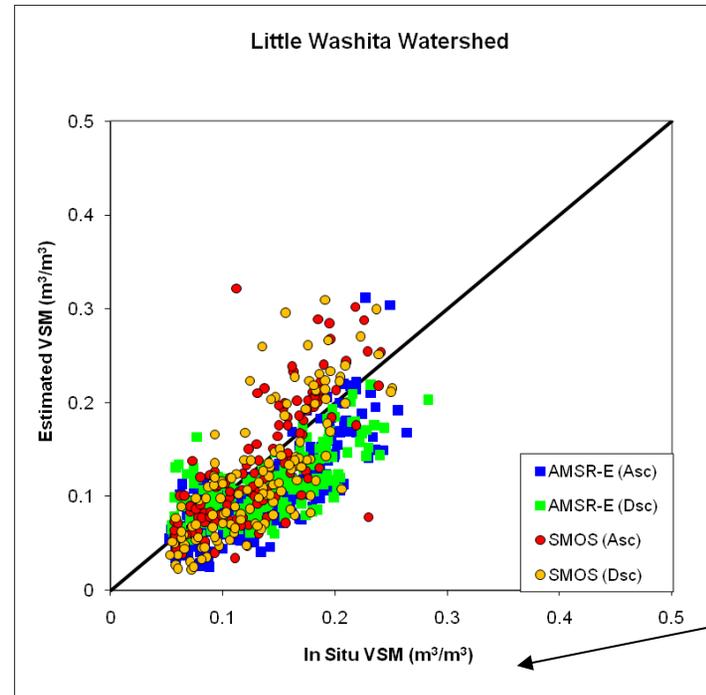
SMAP Cal/Val Team: In Situ

- Background
- Summary of Results
- Info Request
- Timeline
- Discussion
- Short Presentations

Core Validation Sites

- Background
 - Sites that provide accurate estimates of SMAP products at matching scales.

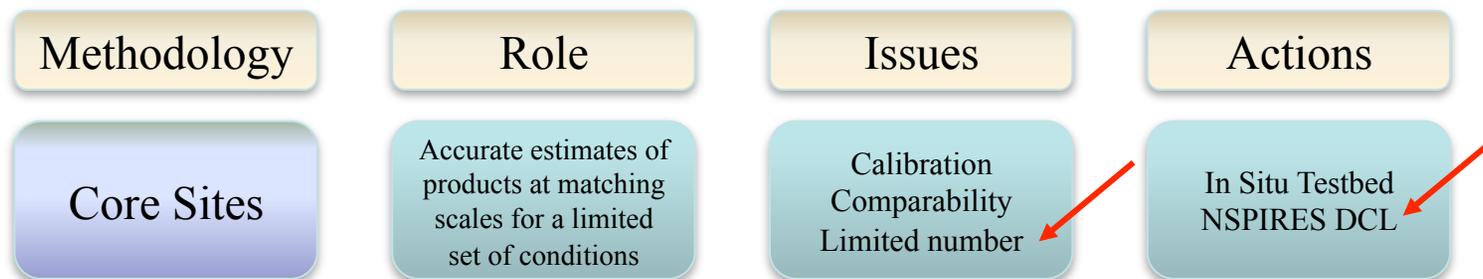
Core Validation Site SM Example (Little Washita, SMOS, and AMSR-E)



Product	SMOS Asc. 0600 AMSR-E Dsc 0130				SMOS Dsc. 1800 AMSR-E Asc. 1330			
	RMSE	Bias	R	N	RMSE	Bias	R	N
SMOS	0.042	0.002	0.773	130	0.044	-0.008	0.775	134
AMSR-E	0.046	-0.029	0.709	214	0.048	-0.035	0.790	244

Core Validation Sites

- Background
 - Sites that provide accurate estimates of SMAP products at matching scales.
 - Increasing the number of these sites was identified as an initiative at the 1st SMAP Algorithms and Cal/Val Workshop.



SMAP Core Validation Sites Initiative

- *Approach:* NSPIRES Dear Colleague Letter (DCL).
 - No exchange of funds agreement that also allowed international participation.
 - Provided guidance and minimum requirements.
 - Also applied to sparse networks and ground-based SMAP simulators.

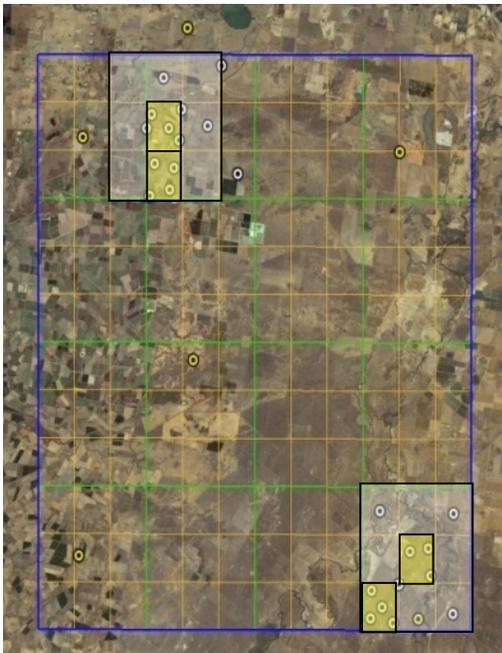
SMAP Core Validation Site Guidance

- A network of sensors with adequate replication
 - Ideally, three nested levels of extent (3, 9, and 40 km)

SMAP Core Validation Site Guidance

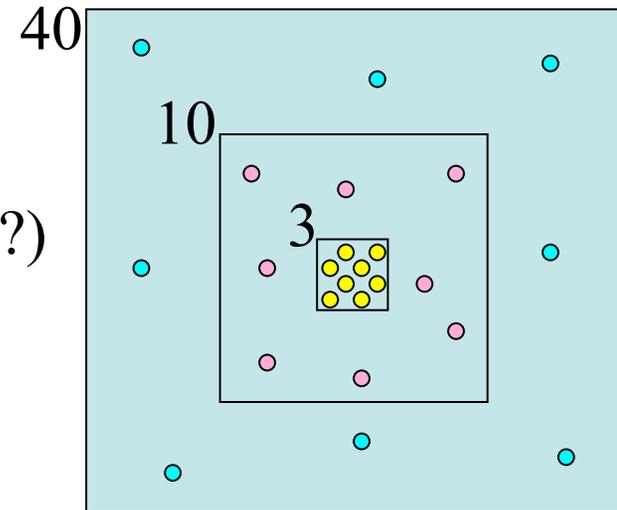
- Design

- Replication (n=?)
- Multiple/nested scales (3, 10, 40 km?)
- Grids and products



Yanco, Australia

- SMAP Radiometer Pixel
- SMAP Radar pixels
- SMAP Combined radiometer/radar soil moisture
- Existing stations
- New stations



SMAP Core Validation Site Guidance

- A network of sensors with adequate replication
 - For soil moisture, ideally, three nested levels of extent (3, 9, and 40 km)
- For soil moisture, verified against gravimetric samples for the 0-5 cm layer
- Minimal latency in providing data to the SMAP project
- Fully operational well before launch and infrastructure to support through 2016

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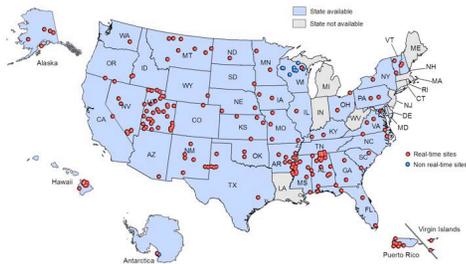
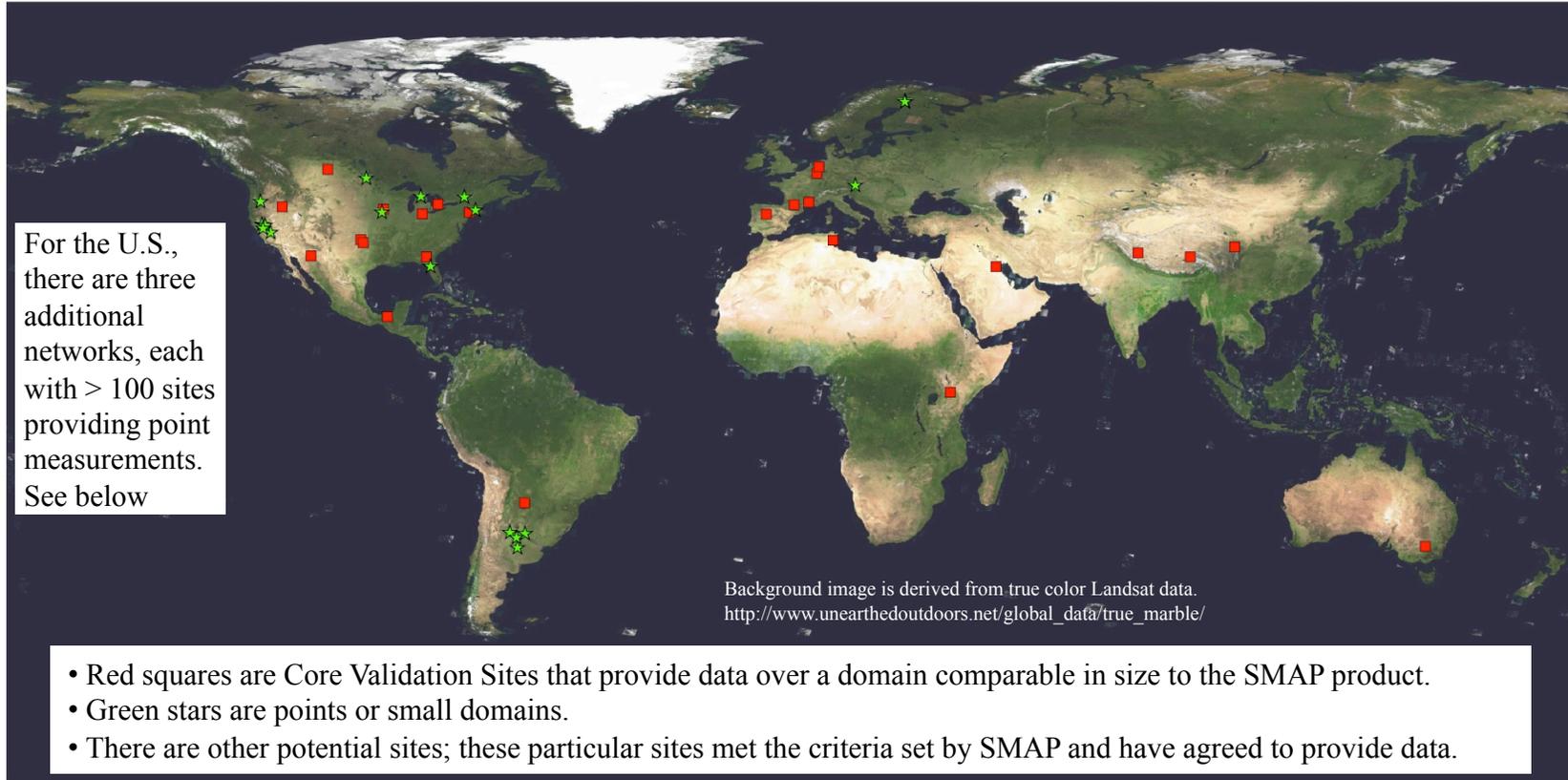
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DCL Responses

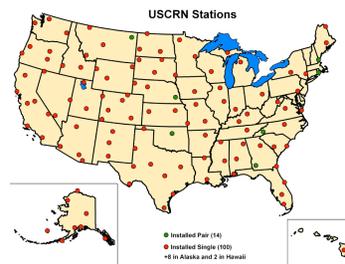
- Good geographic coverage
- Types of responses; core, small domain, point(s)
- Status; existing and proposed
- Products
 - Most were soil moisture
 - Small scale sites – profile soil moisture and NEE
- Most have considered calibration and scaling issues.
- Some expected responses were not received; in some cases this was due to oversight concerning the deadline.

SMAP Cal/Val In Situ Validation Team Sites

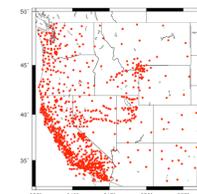
Preliminary Version: Locations need verification by Team.



USDA Soil Climate Analysis Network (SCAN)



NOAA Climate Reference Network (CRN)



GPS Network (~100 of the points will be used)

DCL Responses

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SMAP CVS Info and Schedule

- An information sheet will be sent soon asking for details on each point/site.
- Goal is to have installation complete within the *first year*..keep us informed on progress.
 - Discuss on an individual basis if you think it is feasible to improve the current configuration.
- The *second year* will focus on calibration and formalizing data archival.
- In *year three*, we will conduct an extended pre-launch rehearsal of the end-to-end validation process.
 - For many of the products we can begin the validation process by using AMSR-E and SMOS products.
- An annual workshop is anticipated.

SMAP CVS Timeline

(Based on Nov. 2014 Launch)

- May 2011 Selection
- May 2012 Instrumentation installed/Start data delivery
- May 2013 Calibration report/Validation Rehearsal
- May 2014 Rehearsal Report
- November 2014 Launch
- February 2015 End IOC/Begin validation
- August 2015 Preliminary Validation Report
- February 2016 End Validation Period

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- Short Presentations: 5 Mi

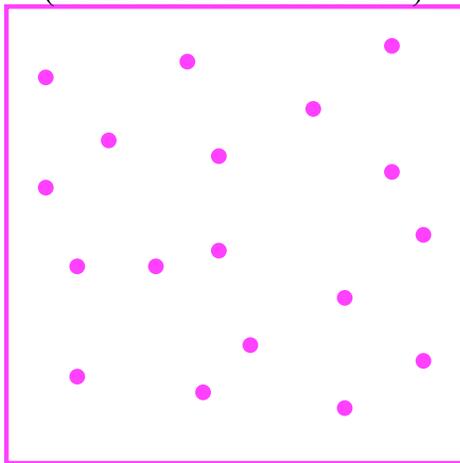
CVS Response Types

Type of Site Proposed

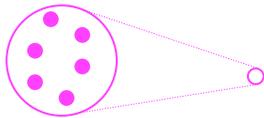
Scaling Challenge



Multiple points over a domain~product
(Some with nested scales)



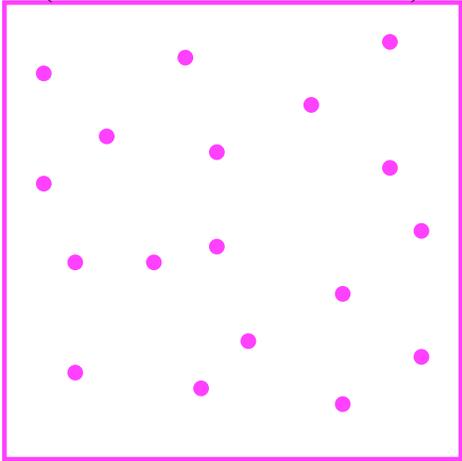
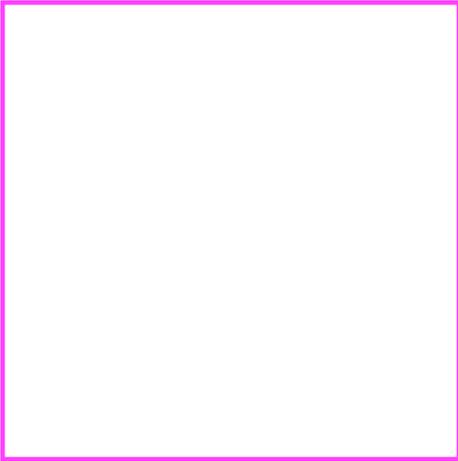
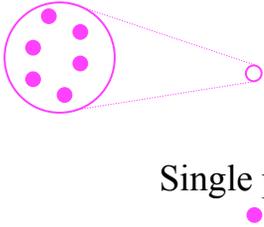
Multiple points over a domain<<product



Single point(s)



CVS Types and Products

	Type of Site Proposed	Scale of Product	Products
Scaling Challenge 	Multiple points over a domain~product (Some with nested scales) 	40 km 	L2 Soil Moisture
	Multiple points over a domain<<product  Single point(s)	9 km 	L2 Soil Moisture L4 Soil Moisture L4 NEE
		3 km 	L2 Soil Moisture L3 Freeze Thaw