<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michael Cosh</td>
<td>HRSL</td>
</tr>
<tr>
<td>Pat Starks</td>
<td>GRL</td>
</tr>
<tr>
<td>Susan Moran</td>
<td>SWRC</td>
</tr>
<tr>
<td>David Bosch</td>
<td>SEWRL</td>
</tr>
<tr>
<td>Stan Livingston</td>
<td>NSERL</td>
</tr>
<tr>
<td>John Prueger</td>
<td>NLAE</td>
</tr>
<tr>
<td>Mark Seyfried</td>
<td>NWRC</td>
</tr>
</tbody>
</table>
USDA-Agricultural Research Service Watershed Networks for the Calibration/Validation of SMAP

Legend
- Micronet Site
- W. Forest
- E. Forest
- Cropland
- Shrubland
- Grassland
- Wetland
- Water
- Barren
- Urban

HRSL-SWRC-SEWRL-NLAE-NSERL-GRL-NWRC
### USDA-Agricultural Research Service Watershed Networks for the Calibration/Validation of SMAP

<table>
<thead>
<tr>
<th>Watershed</th>
<th>No. Sites</th>
<th>Climate</th>
<th>Annual Rainfall (mm)</th>
<th>Land Use</th>
<th>Record</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little Washita, OK</td>
<td>20</td>
<td>Sub-humid Steppe</td>
<td>750</td>
<td>Range/wheat</td>
<td>2002-present</td>
</tr>
<tr>
<td>Little River, GA</td>
<td>33</td>
<td>Humid Subtropical</td>
<td>1200</td>
<td>Row crop/forest</td>
<td>2002-present</td>
</tr>
<tr>
<td>Walnut Gulch, AZ</td>
<td>54</td>
<td>Semi-Arid Desert</td>
<td>320</td>
<td>Range</td>
<td>2002-present</td>
</tr>
<tr>
<td>Reynolds Creek, ID</td>
<td>21</td>
<td>Semi-Arid Steppe</td>
<td>500</td>
<td>Range</td>
<td>2002-present</td>
</tr>
<tr>
<td>Fort Cobb, OK</td>
<td>15</td>
<td>Sub-humid Steppe</td>
<td>750</td>
<td>Crop/range</td>
<td>2006-present</td>
</tr>
<tr>
<td>St. Josephs, IN</td>
<td>15</td>
<td>Humid Continental</td>
<td>914</td>
<td>Row crop</td>
<td>2017-present</td>
</tr>
<tr>
<td>South Fork, IA</td>
<td>20</td>
<td>Humid Continental</td>
<td>812</td>
<td>Row crop</td>
<td>2013-present</td>
</tr>
</tbody>
</table>

**HRSL-SWRC-SEWRL-NLAE-NSERL-GRL-NWRC**
USDA-Agricultural Research Service Watershed Networks for the Calibration/Validation of SMAP

Volumetric Soil Moisture in m$^3$/m$^3$

$R^2 = 0.958$

Bias = 0.001

RMSE = 0.009

Little Washita, OK - 20 Stations @ 5, 25, 45 cm

Fort Cobb, OK - 15 Stations @ 5, 25, 45 cm

Lead Scientist: Pat Starks, GRL

06/18/2005
Thick red lines with circles denote the 36-km grid; dashed magenta lines with squares denote the 9-km grid, and dotted red lines with dots denote the 3-km grid.
Thick red lines with circles denote the 36-km grid; dashed magenta lines with squares denote the 9-km grid, and dotted red lines with dots denote the 3-km grid.
USDA-Agricultural Research Service Watershed Networks
for the Calibration/Validation of SMAP

Lead Scientists: Susan Moran and Dave Goodrich, SWRC

Walnut Gulch, AZ - 19 Stations @ 5, 15, 30 cm
Upper San Pedro, AZ – 31 Stations @ 5, 15, 30 cm

148 & 2700 km² domain
Rangeland & Shrub
Thick red lines with circles denote the 36-km grid; dashed magenta lines with squares denote the 9-km grid, and dotted red lines with dots denote the 3-km grid.
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Reynolds Creek, ID – 19 Stations @ 5, 20, 45, 60 cm

Mountainous rangeland ~238 km

High Topography

Lead Scientist: Mark Seyfried, NWRC

HRSL-SWRC-SEWRL-NLAE-NSERL-GRL-NWRC
Thick red lines with circles denote the 36-km grid; dashed magenta lines with squares denote the 9-km grid, and dotted red lines with dots denote the 3-km grid.
Calibration/Validation

- In most instances, Manufacturer setting for Loam or Sand is used, depending on location.

- Little Washita and Fort Cobb were validated to within 1% or 3% rmse to GVSM in 2003/2007, Scaled not calibrated.

- Little River was validated in 2003.

- Walnut Gulch was validated in 2004 to within 1% rmse. Scaled not calibrated.

- South Fork is ongoing, with soil calibration done specific to soil.

- St. Joseph’s is ongoing

- Reynolds Creek is underdevelopment
Upscaling Method

- Currently using spatially weighted average for most watersheds.

- Arithmetic averages also calculated.

- Developing dynamic spatially weighted average for missing data points

- Developing models to simulate surface soil moisture to bridge data gaps
Pre-Launch Field Campaigns

Potential campaigns:

- Bi-weekly site visits in the summer/active period (3 months) for each watershed
- Gravimetric/Dielectric Sampling for ground-truth
- Provides sensor calibration and network scaling at a minimal level
- South Fork ongoing, St. Joe’s ongoing.