

## APPENDIX A

### METADATA TIERS AND VARIABLES INCLUDED IN EACH TIER

Tier III is considered the minimum needed, Tier II is moderate level of effort, and Tier I is best and most complete.

Tier	Network	Site	Sensors	Soil
<b>Tier III</b> (bold)	<ul style="list-style-type: none"> <li>• <b>Affiliation</b></li> <li>• <b>Mission and intended data application</b></li> <li>• <b>Contact info</b></li> <li>• <b>Frequency of all measurement types</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Station name/ID</b></li> <li>• <b>State/County</b></li> <li>• <b>Latitude/Longitude</b></li> <li>• <b>Elevation</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Depths</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>SSURGO map unit key</b></li> </ul>
<b>Tier II</b> (bold)	<ul style="list-style-type: none"> <li>• <b>QA/QC protocols</b></li> <li>• <b>Telemetry and statement of latency</b></li> <li>• <b>Affiliation</b></li> <li>• <b>Mission and intended data application</b></li> <li>• <b>Contact info</b></li> <li>• <b>Frequency of all measurement types</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Ancillary soil measurements</b></li> <li>• <b>Ancillary weather measurements</b></li> <li>• <b>Station name/ID</b></li> <li>• <b>State/County</b></li> <li>• <b>Latitude/Longitude</b></li> <li>• <b>Elevation</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Sensor model, manufacturer</b></li> <li>• <b>Date installed, if different than site deployment date</b></li> <li>• <b>Raw data types and associated units</b></li> <li>• <b>Depths</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Profile/pedon description</b> <ul style="list-style-type: none"> <li>○ <b>Based on USDA-NRCS classification</b></li> <li>○ <b>Photo of profile or soil core with depth reference (meter stick)</b></li> </ul> </li> <li>• <b>Texture (sand, silt, clay)</b> <ul style="list-style-type: none"> <li>○ <b>Sand, silt, clay percentages at each sensor depth (minimum)</b></li> <li>○ <b>Method used to determine percentages</b></li> <li>○ <b>Fraction of coarse fragments by volume</b></li> <li>○ <b>Textural class (USDA-NRCS system)</b></li> </ul> </li> <li>• <b>Organic matter layer</b> <ul style="list-style-type: none"> <li>○ <b>Depth</b></li> </ul> </li> </ul>

Tier	Network	Site	Sensors	Soil
				<ul style="list-style-type: none"> <li>○ % area covered surrounding site</li> <li>○ Type of vegetation litter- evergreen vs deciduous</li> <li>○ Hydrophobicity</li> <li>○ Changes over time?</li> <li>● SSURGO map unit key</li> </ul>
<p><b>Tier I</b> (bold)</p>	<ul style="list-style-type: none"> <li>● <b>Operations and maintenance information</b></li> <li>● <b>Installation protocol, including soil moisture sensor orientation(s)</b></li> <li>● <b>Metadata update schedule (For those items changing over time, like vegetation)</b></li> <li>● QA/QC protocols</li> <li>● Telemetry and statement of latency</li> <li>● Affiliation</li> <li>● Mission and intended data application</li> <li>● Contact info</li> <li>● Frequency of all measurement types</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Photos</b></li> <li>● <b>Installation date (and date[s] of relocation, if applicable)</b></li> <li>● <b>Slope/aspect/landform (for mountainous sites)</b></li> <li>● <b>Land use/land cover (LU/LC)</b></li> <li>● Ancillary soil measurements</li> <li>● Ancillary weather measurements</li> <li>● Station name/ID</li> <li>● State/County</li> <li>● Latitude/Longitude</li> <li>● Elevation</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Sensor calibration type- manufacturer, site-specific, etc.</b></li> <li>● <b>Location relative to tower</b></li> <li>● Sensor model, manufacturer</li> <li>● Date installed, if different than site deployment date</li> <li>● Raw data types and associated units</li> <li>● Depths</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Bulk density</b></li> <li>● <b>Mineralogy</b></li> <li>● <b>Soil water retention</b></li> <li>● <b>Saturated hydraulic conductivity (<math>K_{sat}</math>)</b></li> <li>● <b>Aggregate stability</b></li> <li>● Profile/pedon description</li> <li>● Texture (sand, silt, clay)</li> <li>● Organic matter layer</li> <li>● SSURGO map unit key</li> </ul>