Proposal for establishing an In Situ Testbed

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Why do we need a testbed?

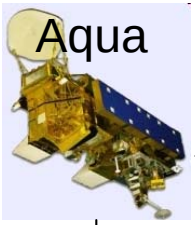
1. Co-location and comparison of multiple in situ technologies

2. How do measurement techniques with different scales compare?

3. Investigate profile measurement comparison (how do we extend surface measurements to root zone)

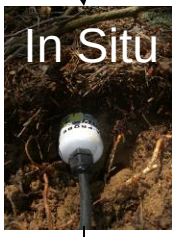
4. How to different installation techniques affect measurements?

Measurement Scales



Long Term

Short Term



50 km | 3 km | 200 m | 5 m | 5 cm

100 km | 10 km | 1 km | 100 m | 10 m | 1 m | 10 cm | 1 cm

Satellite Scale | Field Scale | Measurement Scale

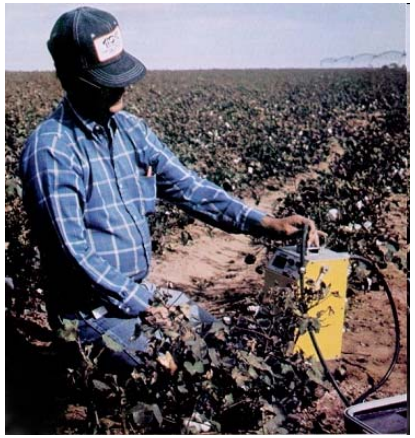
Measurement Methods-Gravimetric

Individual

- Gravimetric Collection
- Neutron Probes

What are the pertinent depths?

- 0-1 cm
- 0-5 cm



How do we extend the measurements through the vadose zone?

Measurement Methods-Automated

Automated

- TDRs
- FDRs: Hydras, Thetas, Echo
- Capacitance: Sentek
- GPS
- COSMOS

At what depths?

Orientations?

Replications?

Reporting increment?

Instantaneous or averaged?

Measurement Methods- Intensive Campaigns

Intensive

- Truck/Tower Mounted
- UAV
- Aircraft
- Satellite

What types of coordinated activity should there be?

How big should the test bed be?

Is it necessary to have this site embedded in a validation site?

To be Decided

Monitoring Depths and Replications

Depths: 5, 10, 20, 50, 100 cm?

Size of Testbed?

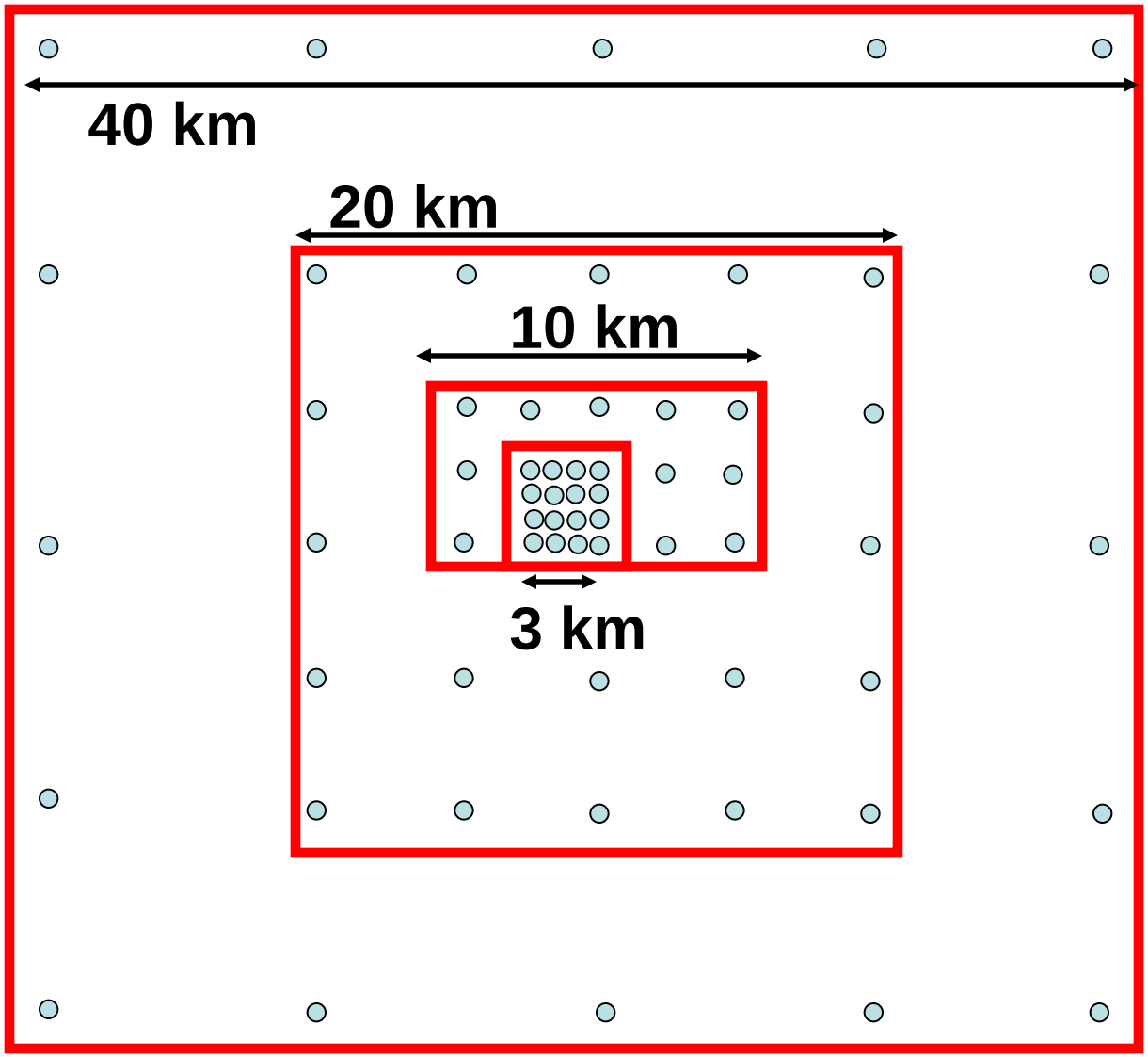
Sampling Frequency?

Land cover type?

Multiple Sites?

Where?

Ideal Nested Testbed



Field Scale
16 Stations

Multi-Field Scale
+11 Stations

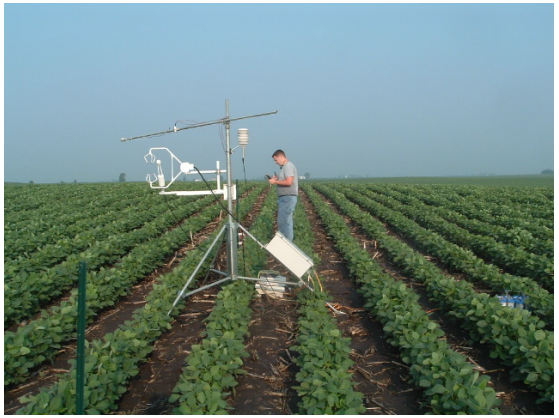
Watershed
+19 Stations

Regional
+16 stations

= 62 sites total

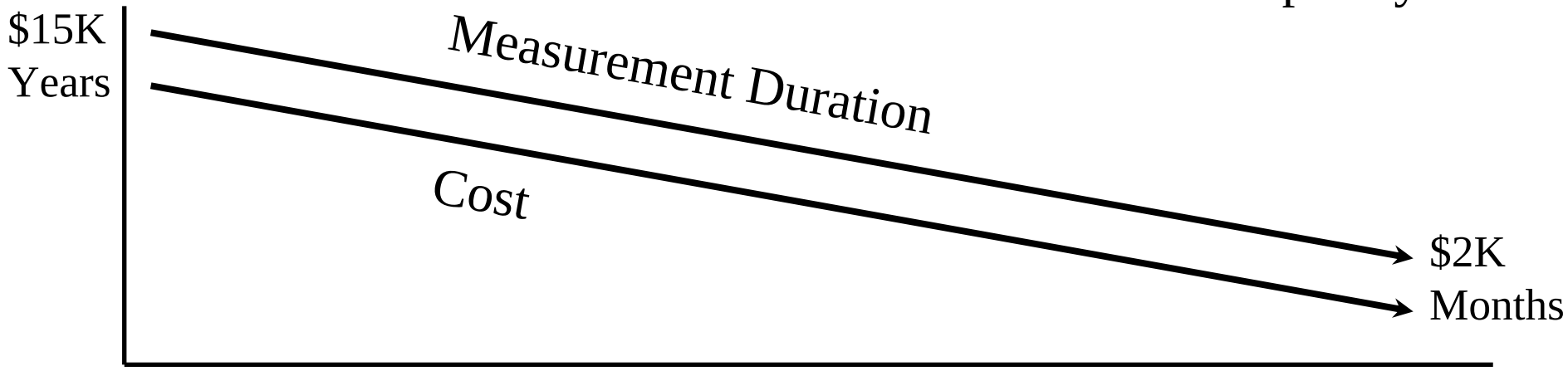
Permanent, Semi-Permanent, and Temporary Sites

Permanent

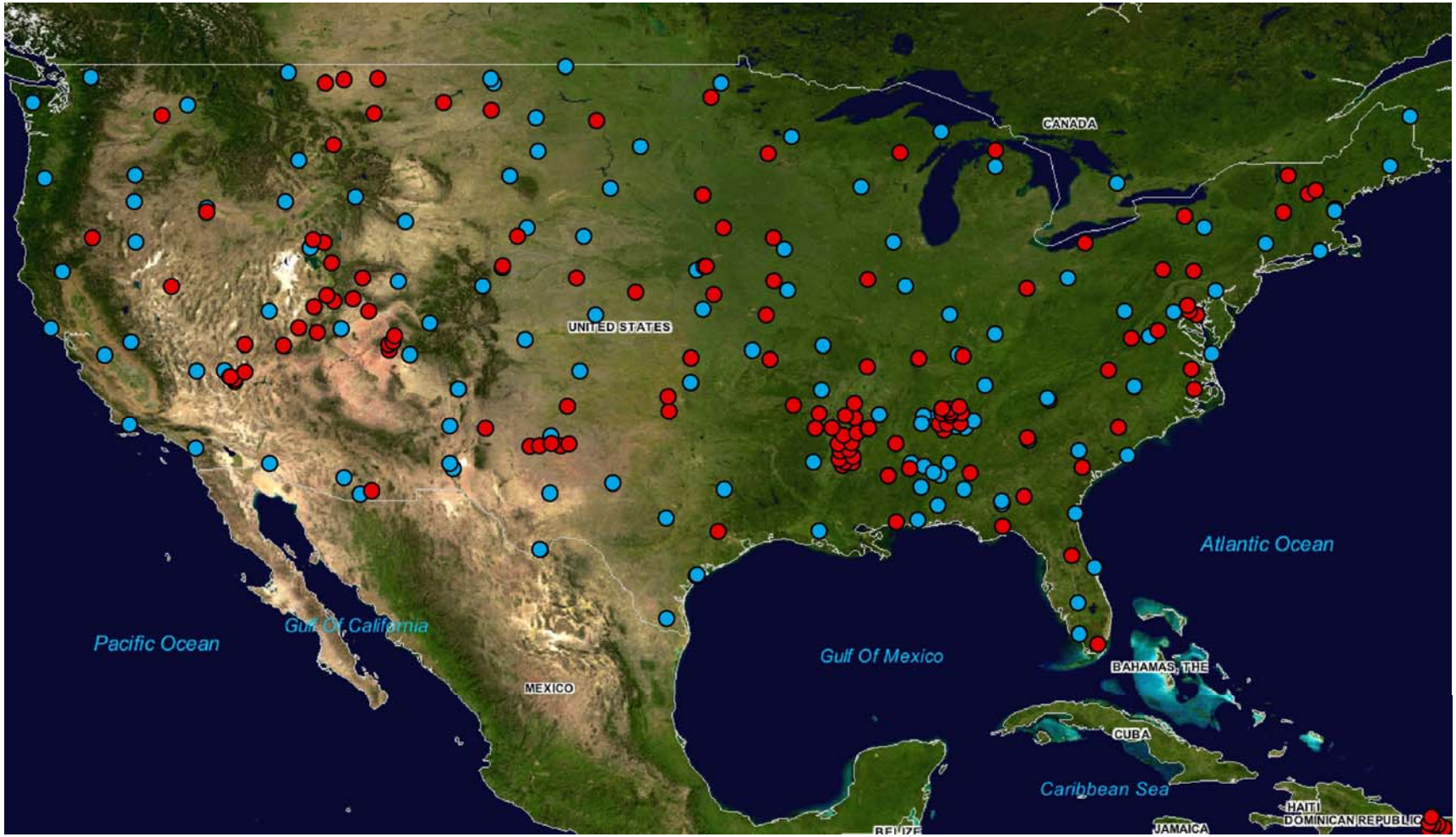


Semi-Permanent

Temporary



SCAN and CRN



800 km

400 km

80 km