AMF3 Relocation to Southeast US (SEUS)

Operations Team:

Sandia Labs ARM Team

Sandia Labs AMF3 Relocation Planning Team:
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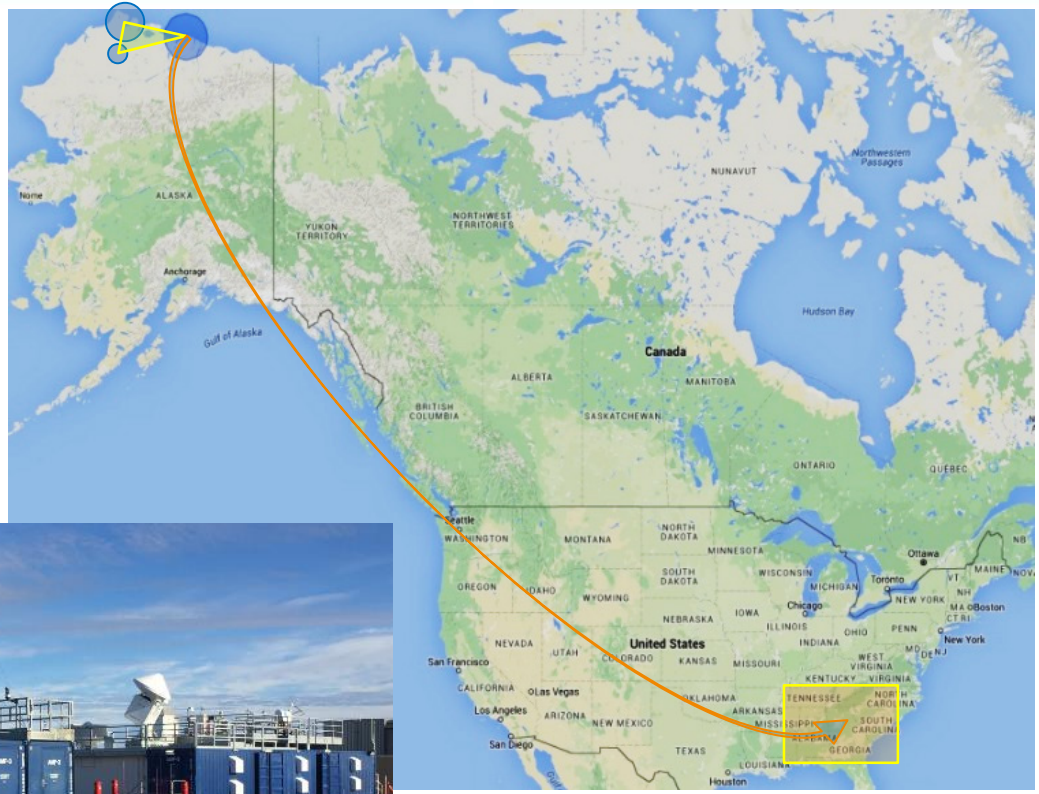
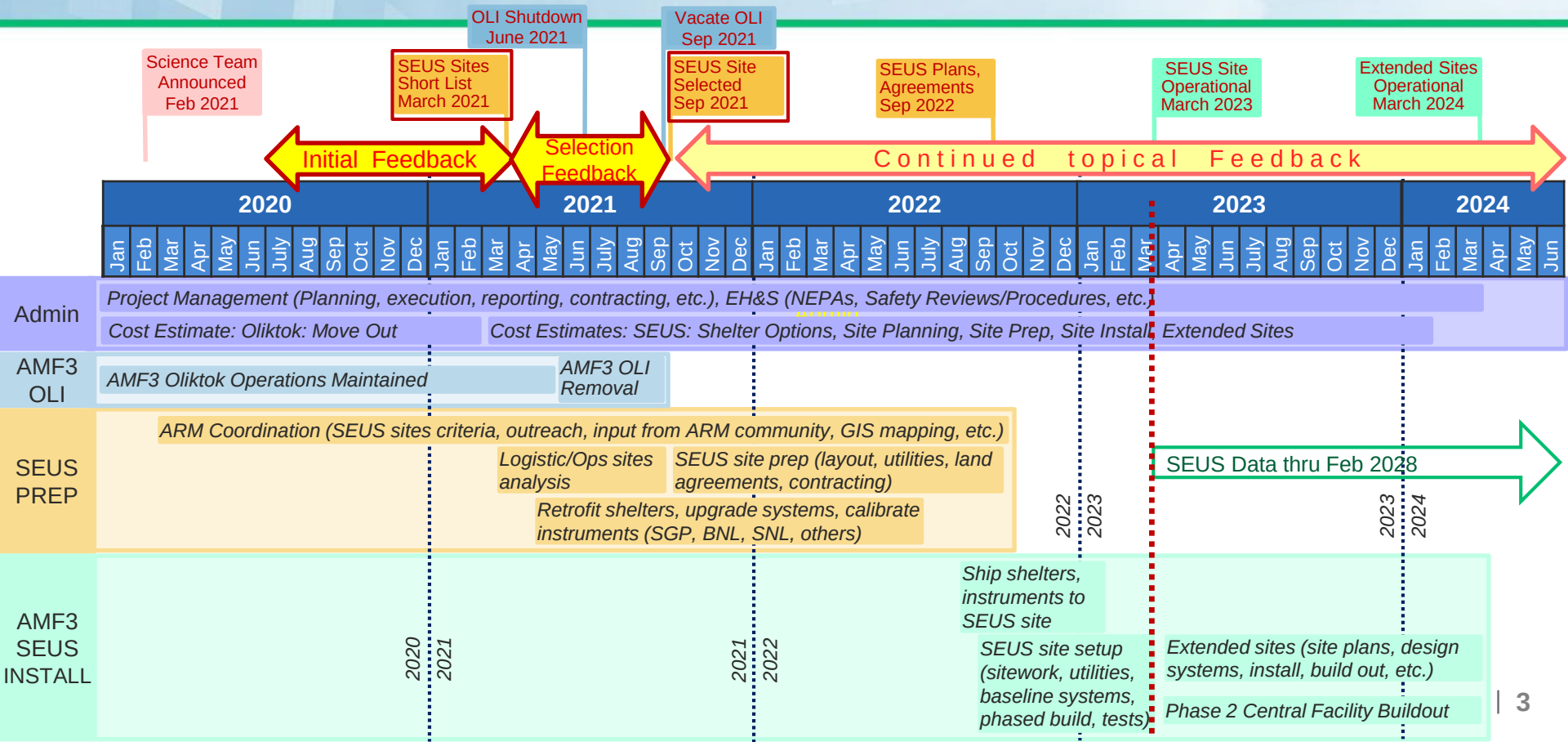
Questions, comments, suggestions?
Send us a Q&A message during this presentation or email us so we can follow up with you.

AMF3 Relocation: A Change of Latitude

- Adaptation:
  - Change of conditions:
    - Arid → Humid
    - Cold → Hot
    - Tundra → Temperate/Forest
    - More accessible to visitors
    - Heterogeneous, complex region
      - Spatially distributed sites
  - o Facilities:
    - Instruments
      - Arctic instruments now at OLI?
      - New instruments for SEUS?
    - Cooling vs heating
    - Power grid
    - Plumbing?
    - Tower types?



AMF3 Relocation: Notional Timeline

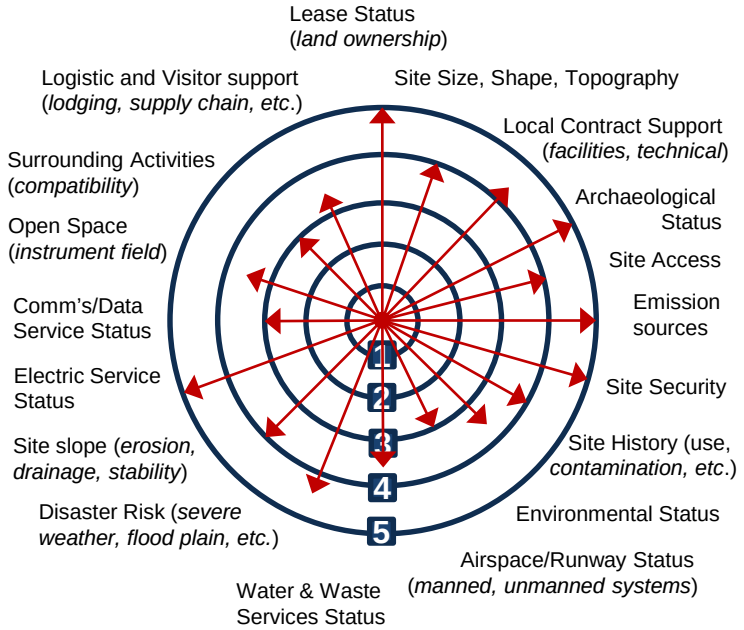


AMF3 Relocation: Site Ops Considerations

- **Operational Conditions**
  - **Land ownership** (Federal, State/City, Private)
  - **General Site location/conditions** (terrain, site history, disturbed/undisturbed, nearby activities/emissions)
  - **Ecological status** (protected habitat/watershed, migratory birds/nesting area, wildlife corridor, etc.)
  - **Utility Infrastructure** (power, comms, water, waste)
  - **Instrument Fields** (power/comms, open space (*fetch/obstruction/shading*), central facility proximity)
  - **Aerial/UAS considerations** (airspace types, FAA COA viability/restrictions, launch/runway area, comms/power)
  - **Logistics** (transportation, lodging, supply chains, local support/opposition, site security/visibility)
  - **Shelter/site systems/attributes** (HVAC, plumbing, tornado shelter, fencing)
  - **General Ops** (supplies storage, sheltered prep areas)

***Hypothetical* Site Ops Evaluation**

Total Score: 69.5



AMF3 Relocation: Coordination

Coordinated development of SEUS Site

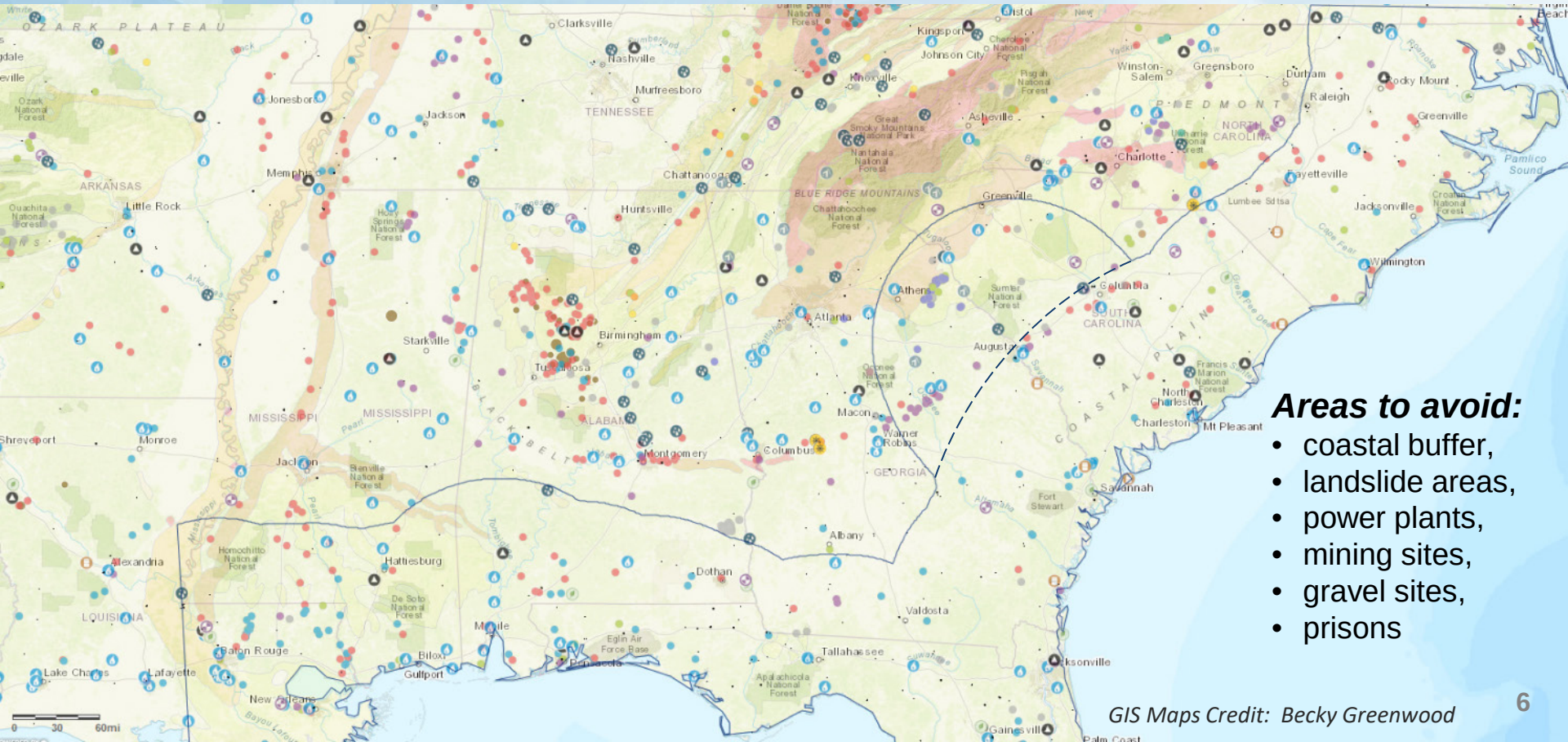
- SEUS teams telecons
- SEUS teams/project website
- ARM and ASR leadership
- ARM mentors
- ARM focus groups
- SEUS teams development of GIS maps
  - Site selection
  - ARM community outreach
  - Partner outreach

***Multi-team, multi-partner coordination*

Example Universities in SE US

GIS Maps Credit: Becky Greenwood

AMF3 RELOCATION: GIS MAPPING

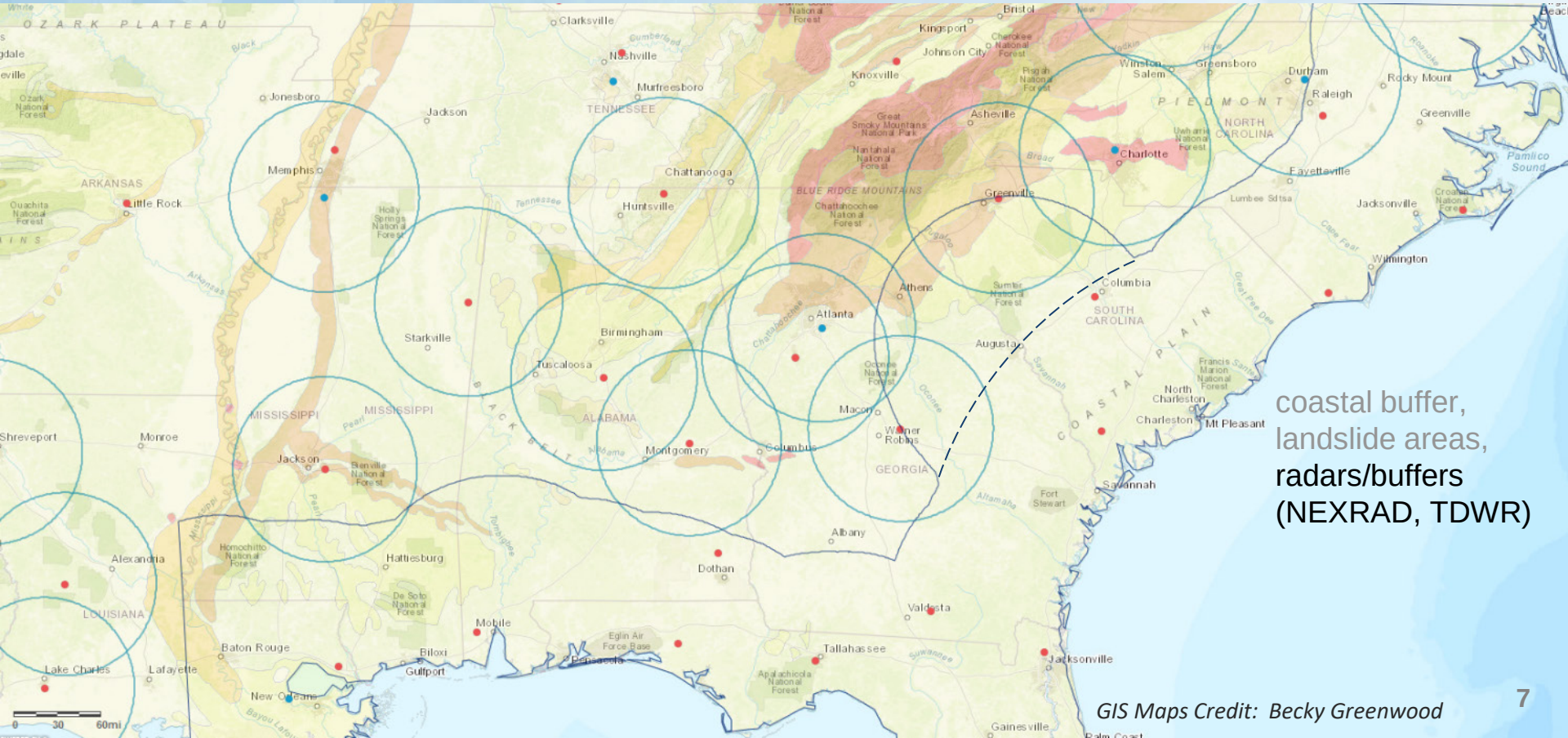


Areas to avoid:

- coastal buffer,
- landslide areas,
- power plants,
- mining sites,
- gravel sites,
- prisons

GIS Maps Credit: Becky Greenwood

AMF3 RELOCATION: GIS MAPPING



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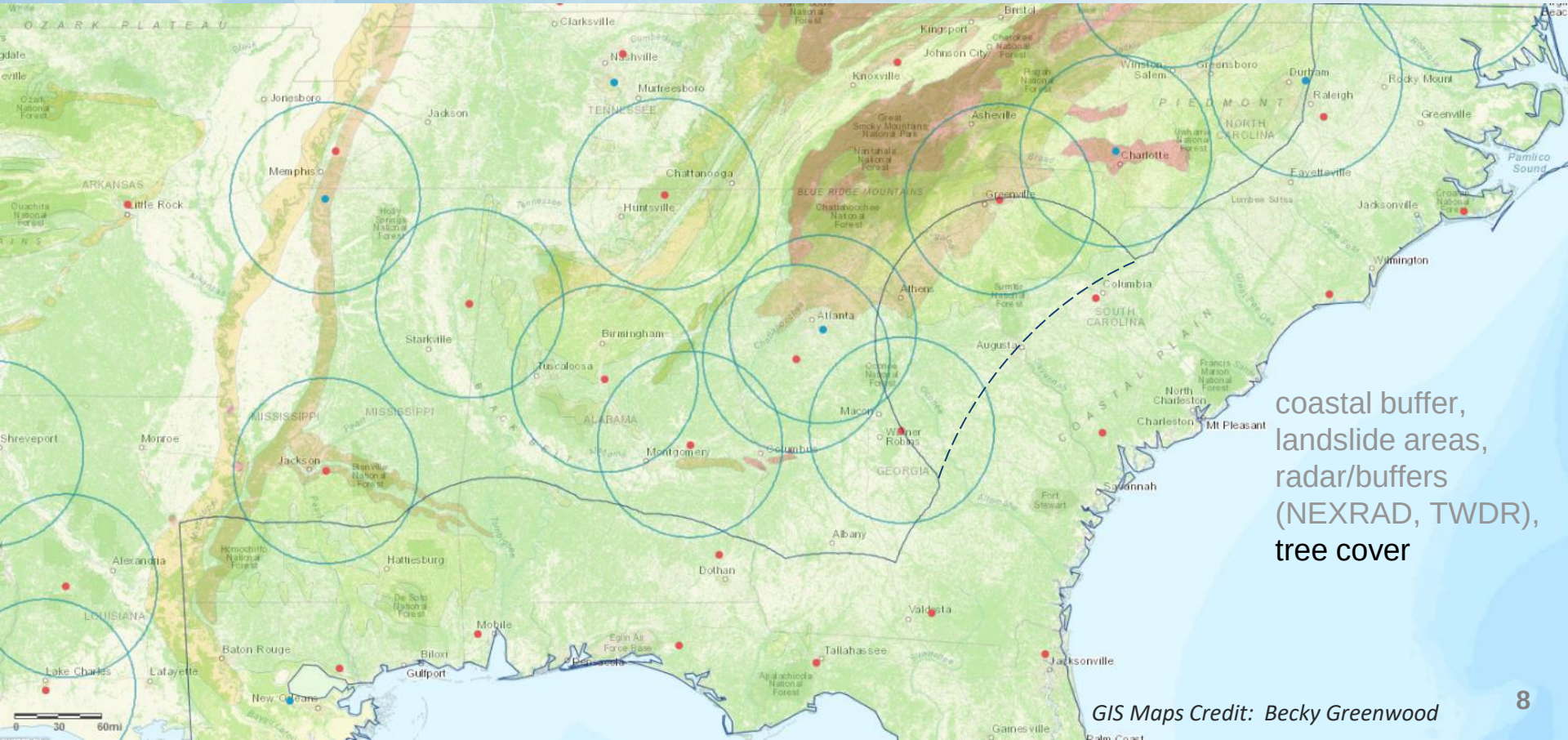

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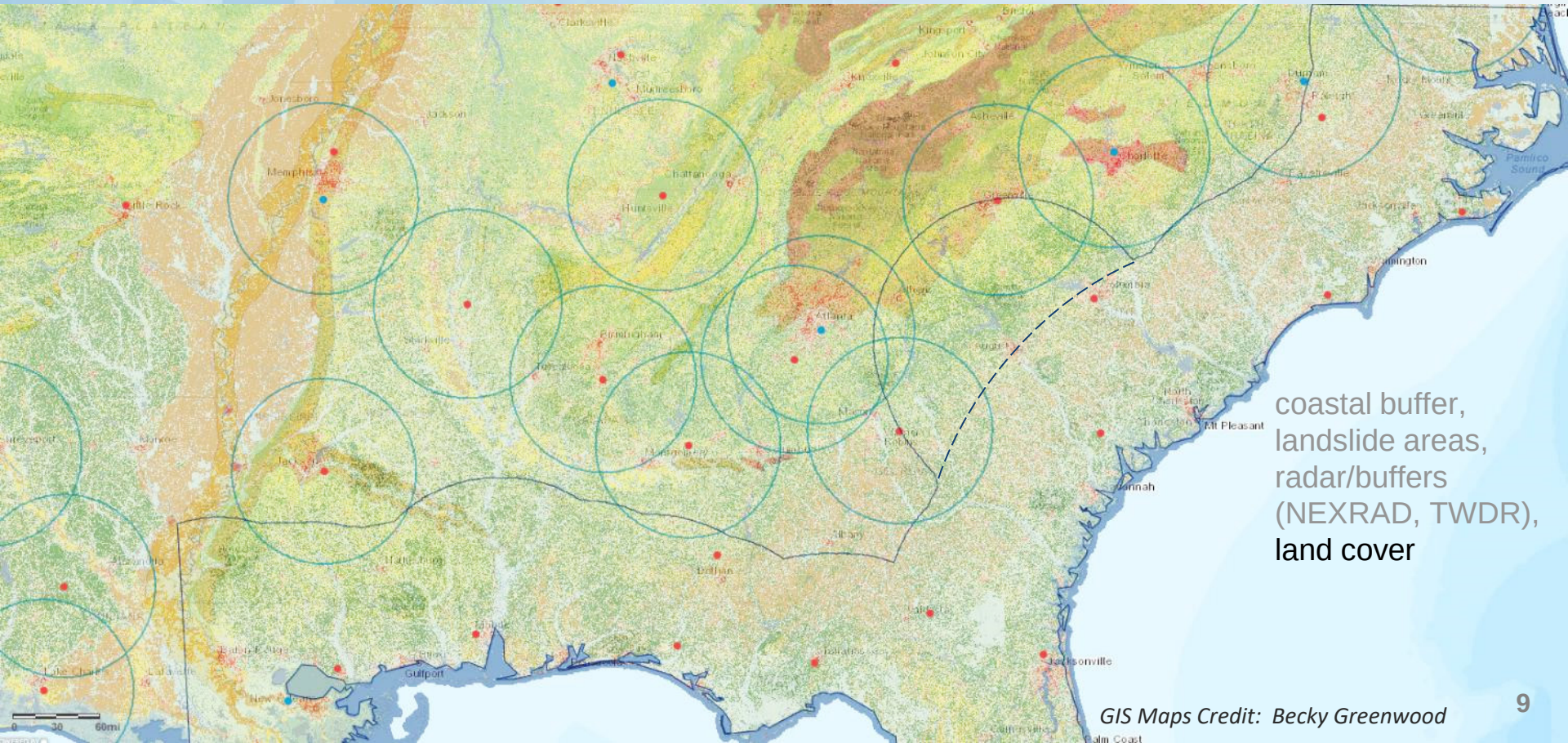

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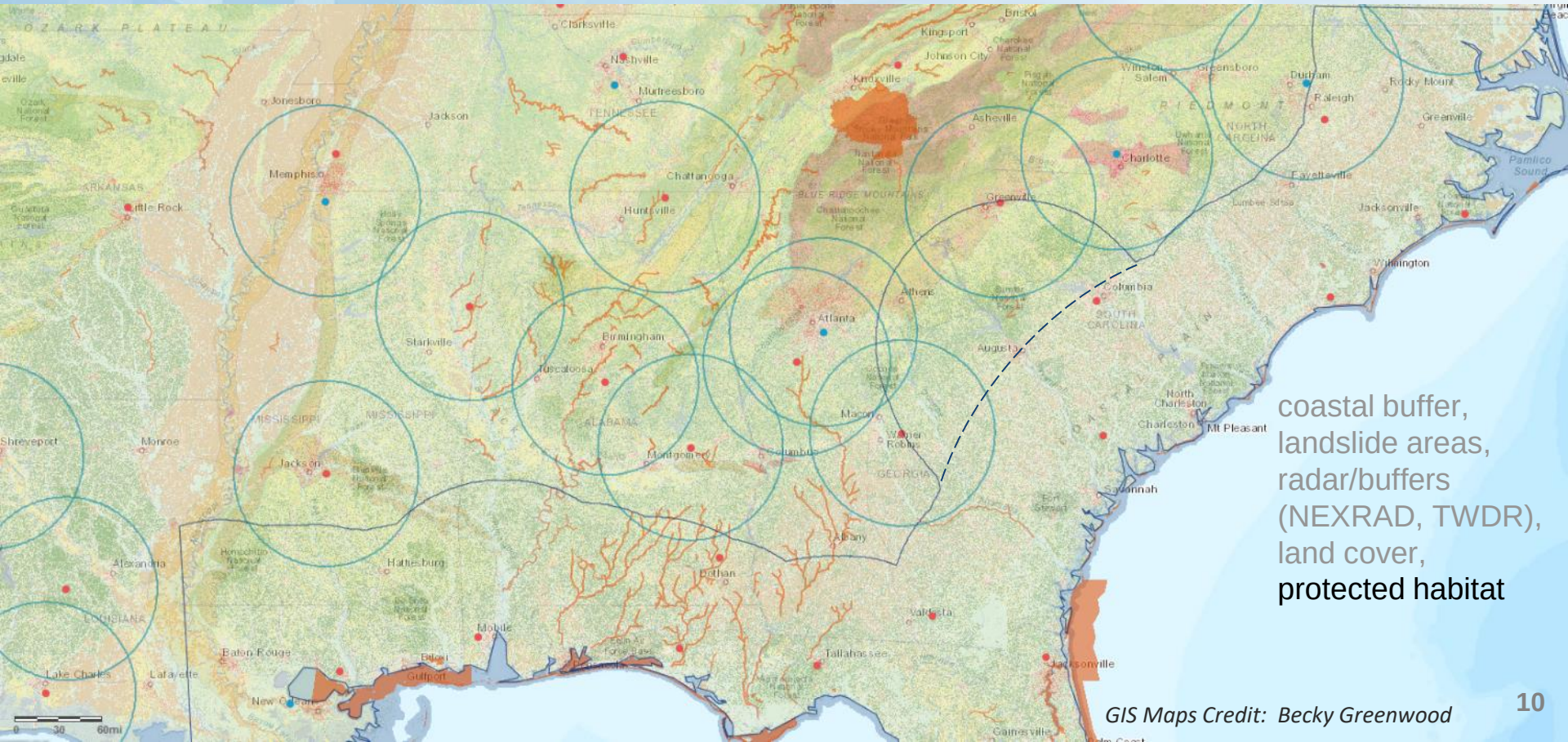

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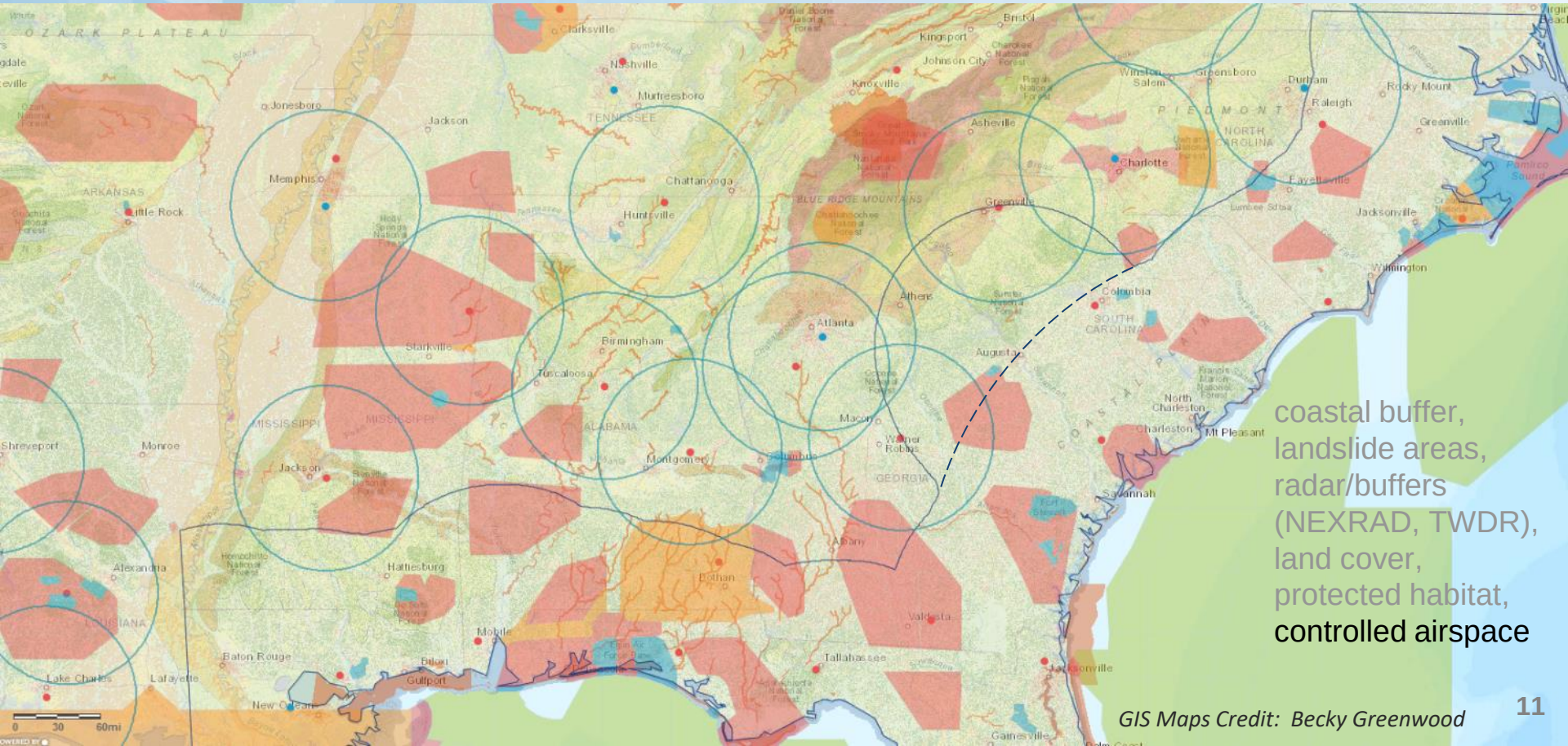


GIS Maps Credit: Becky Greenwood

AMF3 Relocation:
Phase 1 Instrumentation: *subject to change*

Core Instruments for Initial Baseline Operations

- Radiometry
  - 2- or 3- channel microwave radiometer (e.g. MWR3C)
  - upward + downward looking broadband short- and longwave radiometers (SKYRAD/GNDRAD)
  - sun photometer and/or multifilter rotating shadowband radiometer (MFRSR)
  - atmospheric emitted radiance interferometer (AERI)
- Sky Imager (TSI)
- Standard surface meteorology measurements, bulk precipitation (MET)
- Ka-band zenith ARM radar (KAZR)
- Ceilometer (CEIL)
- Micropulse lidar (MPL)
- Doppler lidar (DL)
- Radiosondes and sounding system (BBSS)
- Disdrometer

- Aerosol Observing System (AOS)
  - aerosol chemical speciation monitor (ACSM)
  - cavity attenuation phase shift monitor (CAPS)
  - carbon monoxide/nitrous oxide/water vapor
  - cloud condensation nuclei (CCN)
  - condensation particle counter (CPC)
  - ultra-fine condensation particle counter
  - CO2, CH4, O3 (GHG, OZONE)
  - humidified tandem differential mobility analyzer (HTDMA)
  - nephelometer
  - particle soot absorption photometer (PSAP)
  - scanning mobility particle sizer (SMPS)
  - ultra-high sensitivity aerosol spectrometer (UHSAS)

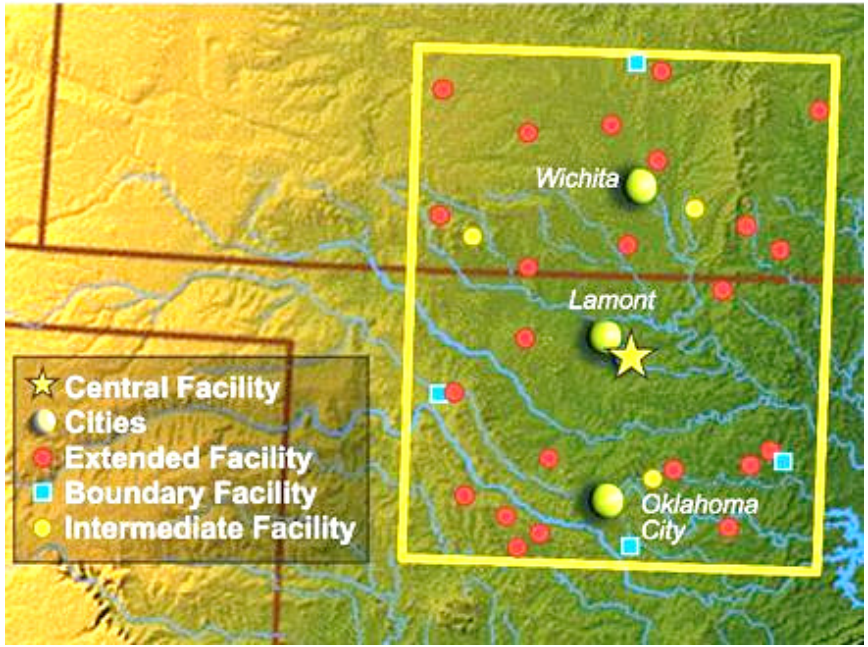
AMF3 Relocation:
Phased Instrumentation: *subject to change*

Phase 2 Core Instruments

- Soil temperature and moisture properties
- Surface fluxes (Eddy correlation/ECOR)
- Scanning precipitation radar (e.g. CSAPR, XSAPR)
- Radar wind profiler (RWP)

Advanced or Spatially Distributed Instruments

- Scanning cloud radar
- Advanced lidar (e.g. Raman lidar/RL, differential absorption lidar, high spectral resolution lidar/HSRL)
- Aerial systems
  - Manned aerial measurements (AAF)
  - Unmanned systems (UAS)
  - Tethered balloon systems (TBS)
- Auxiliary sites
  - similar to SGP extended and boundary layer sites
  - for specific science needs & address regional heterogeneity
  - about 3 sites with limited instrumentation



Example of SGP Central and Remote Facility Sites

AMF3 Relocation: Current Activities

- Refining plans for Oliktok, AK move out
- Planning for SEUS site development
  - identifying key considerations and needs
  - mapping relevant characteristics in a GIS application
- Generating ROM cost estimates:
  - documenting assumptions and sources
  - administrative, logistic, labor, material costs
- Coordination:
  - DOE, ARM, ASR leadership
  - SEUS Site Science team/BNL,
  - NNSA/Sandia Field Office,
  - Sandia Lab resources

We look forward to serving both high and low latitudes!

Fossil of prehistoric Arctic crocodilian: https://calendar.mit.edu/event/fourth-annual-william-f-brace-lecture-kirk-johnson


Thank You!
AMF3 Ops POC
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