ARM Mobile Facility Deployments:

SAIL

AMF2 SAIL: Daniel Feldman (LBNL)
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Southeastern U.S.

AMF3 SEUS: Chongai Kuang (ckuang@bnl.gov),
Shawn Serbin, Scott Giangrande (BNL)

ARM: Jim Mather (PNNL), Nicki Hickmon (ANL), Joe Hardesty (SNL), Heath Powers (LANL), David Chu (LANL)

Questions, comments, suggestions?
Send us a chat message during this presentation or email us so we can follow up with you.

Atmospheric Radiation Measurement (ARM): DOE User Facility

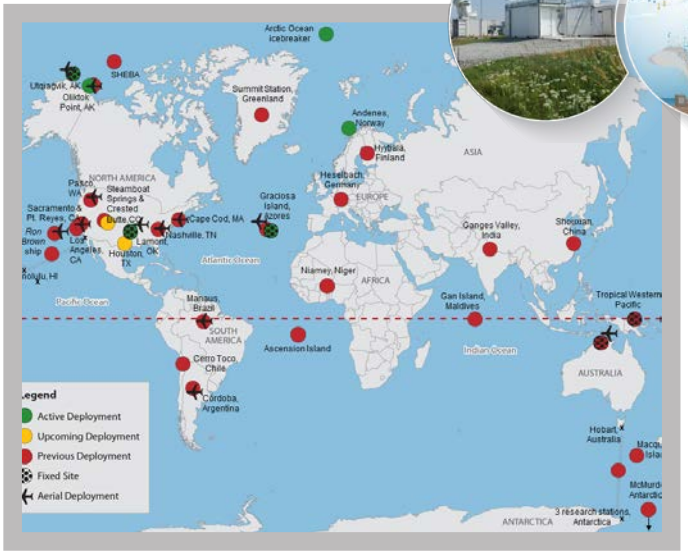
- **Strategically located atmospheric observatories** to improve scientific understanding of clouds, aerosols, precipitation, and radiation and their interactions with the Earth's surface to improve Earth System Models.

- **Comprehensive measurements**: atmospheric state, surface mass and energy exchanges, albedo/net radiation, aerosol, cloud/precipitation - **PUBLICLY AVAILABLE**

- Fixed-location and **ARM Mobile Facilities (AMF)** in diverse climate regimes.

- **AMF2: SAIL**, September 2021 - June 2023

- **AMF3: SEUS**, Fall 2022 - Fall 2027



SAIL: The Surface Atmosphere Integrated Field Laboratory

- Uncertainties in atmospheric inputs to watersheds complicate mountainous hydrology research.
- SAIL will directly address these uncertainties by working closely with SBR's Watershed Function SFA to achieve atmosphere-through-bedrock observations.
- SAIL will deploy the AMF2 to the East River Watershed near Crested Butte, Colorado from 09/2021 – 06/2023.
- Goal: characterize atmospheric processes that impact energy and mass budgets of Upper Colorado River watersheds.

Photo Credit: Connor Scalbom

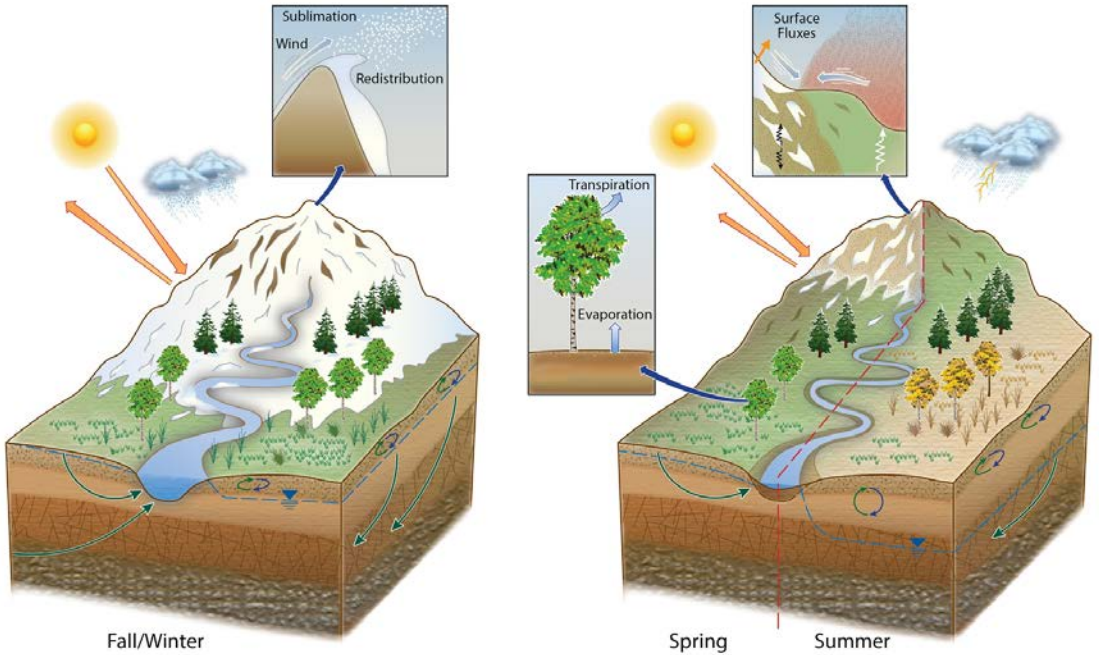
SAIL Instruments and Team

- SAIL will have ~34 AMF instruments and an X-band scanning precipitation radar.
- The science team covers 4 National Labs, 10 universities, and 2 research centers.

SAIL Science Objectives

With these observations, SAIL will characterize processes across seasons for end of WY21, all of WY22, and ½ of WY23.

1. Precipitation: how and how much.
2. Winds: sublimation and snow redistribution.
3. Aerosols: radiative impacts on the surface and atmosphere, and their interactions with precipitation.
4. Controls on surface fluxes and the surface energy balance.



Email me drfeldman@lbl.gov or visit https://sail.lbl.gov for more details.

Relocation of the 3rd ARM Mobile Facility to the Southeastern U.S. - AMF3 SEUS

- Motivators for going to the SEUS:
  - Abundant surface-forced shallow to deep convection
  - Large amount of vegetative-driven biogenic emissions
  - **Strong local coupling of land surface with atmospheric processes**

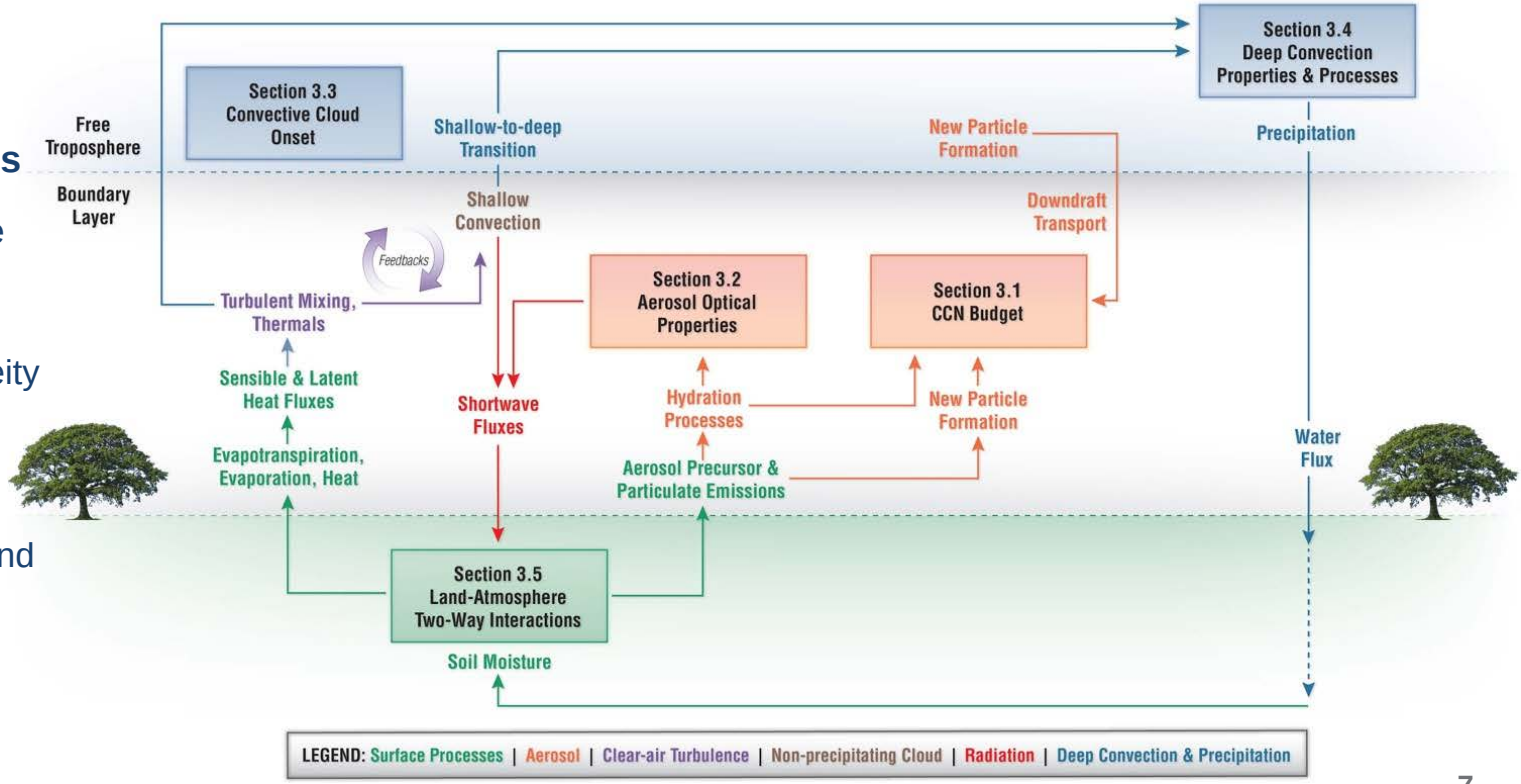
- Expected **5 year** deployment, with operations beginning Fall 2022

- Specifics on site location, configuration, instrumentation to be determined in part through a DOE supported **Site Science Team**
  - Chongai Kuang (aerosol)
  - Scott Giangrande (convection)
  - **Shawn Serbin (land-atmosphere interactions)**

AMF3 SEUS: Cross-Cutting Science Drivers

Land-Atmosphere Two-Way Interactions

- surface-atmosphere coupling
- regional heterogeneity and land-surface modeling
- surface dynamics and regional aerosol



AMF3 SEUS: Engaging with ESS

- **How can AMF3 SEUS support ESS research priorities?**
  - potential targeted Intensive Observation Periods
  - coupled observational-modeling data sets of land-atmosphere interactions

- **What kind of feedback does our site science team want from ESS community?**
  - critical measurement needs
  - necessary spatial and temporal observational scales

- **Virtual Breakout Session (joint ARM/ASR Science Team Meeting)**
  - introduce the AMF3 SEUS and solicit community feedback
  - Thursday, June 25, 2 - 4 PM EDT

- **Plans for ESS AMF3 SEUS virtual workshop**
- website: https://arm.gov/news/blog/post/61585
- email: Chongai Kuang (ckuang@bnl.gov)

How to Engage with SAIL and AMF3 SEUS

- These cross-cutting campaigns with ARM do not happen very often, and provide an exciting opportunity to leverage ARM facility/personnel/expertise to target ESS-ASR cross-cutting science.

- **SAIL:**
  - More details? Email drfeldman@lbl.gov and visit https://sail.lbl.gov

- **AMF3 SEUS:**
  - More details? Email ckuang@bnl.gov and visit https://arm.gov/news/blog/post/61585

- We look forward to working with you!