



## NSF Large Facilities Workshop 2017

### Distributed Networks & Facilities Roundtable

Facilitator:

*Rob Hengst*

*NSF Large Facilities Advisor*

Session Information:

*Wednesday*

*May 3<sup>rd</sup>, 2017*

*9:20am – 10:20am*

## Distributed Networks & Facilities

- Example Facilities:
  - National Ecological Observatory Network (NEON)
  - Geodesy Advancing Geosciences and Earthscope (GAGE)
  - Seismological Fac's for the Advancement of Geoscience & Earthscope (SAGE)
  - Ocean Observatories Initiative (OOI)
  - Academic Research Fleet
- Distributed Network & Facility Topics:
  - Centralized procurement
  - Cyber infrastructure
  - Site facilities maintenance
  - Personnel/staffing
  - Parts/storage



## Centralized procurement:

- **Sample topic ideas:**

- What threshold do you use to set procurement authorities?
- Is there a trigger which signals centralized procurement versus local?
  - Dollar amount?
  - Quantity?
- If local procurement exists, what training is done for those employees working around the country, and not at recipient's headquarters?
- Anything else you find pertinent to the topic?



## Cyber infrastructure:

- **Sample topic ideas:**

- What level of cyber infrastructure is controlled locally versus centrally?
- Any network or data product issues with remote sites?
- Were there any CI challenges experienced during construction on distributed sites?
- At what level do data back ups occur?
- How much training do local employees receive concerning maintaining CI equipment and systems?
- Anything else you find pertinent to the topic?



## Site facilities maintenance:

- **Sample topic ideas:**

- How are facilities maintenance needs and activities tracked across the network of the large facility?
- Are maintenance contracts set up centrally, to be performed by local affiliates near sites?
- Are local recipient employees entering into local maintenance agreements?
- What emergency facilities maintenance plans, contracts, etc does your organization have in place to respond quickly (to expediently restore data gathering and distribution)?
- Anything else you find pertinent to the topic?



## Personnel & staffing:

- **Sample topic ideas:**

- What are the challenges associated with hiring into a distributed project during operations?
- Are there any span-of-control issues concerning personnel/staffing particular to a wide-scale distributed project?
- How do you keep widely-distributed employees 'connected' to the overall mission and vision of the organization?
- Are there any additional personnel safety and security issues connected with distributed operations?
- Anything else you find pertinent to the topic?



## Parts & storage:

- **Sample topic ideas:**

- How are decisions made to store spare parts at various locations?
  - Centrally stored and maintained
  - Regionally stored and maintained
  - Locally stored and maintained
- How are controls and good stewardship of property and spares instilled across the widely distributed network and facility?
- How are you measuring parts availability versus up-time for critical pieces of equipment across the distributed network?
- Are self-storage contracts set up centrally, to be utilized by distributed employees locally near sites?
- Anything else you find pertinent to the topic?



Richard Leonard  
Battelle Ecology  
May 3, 2017

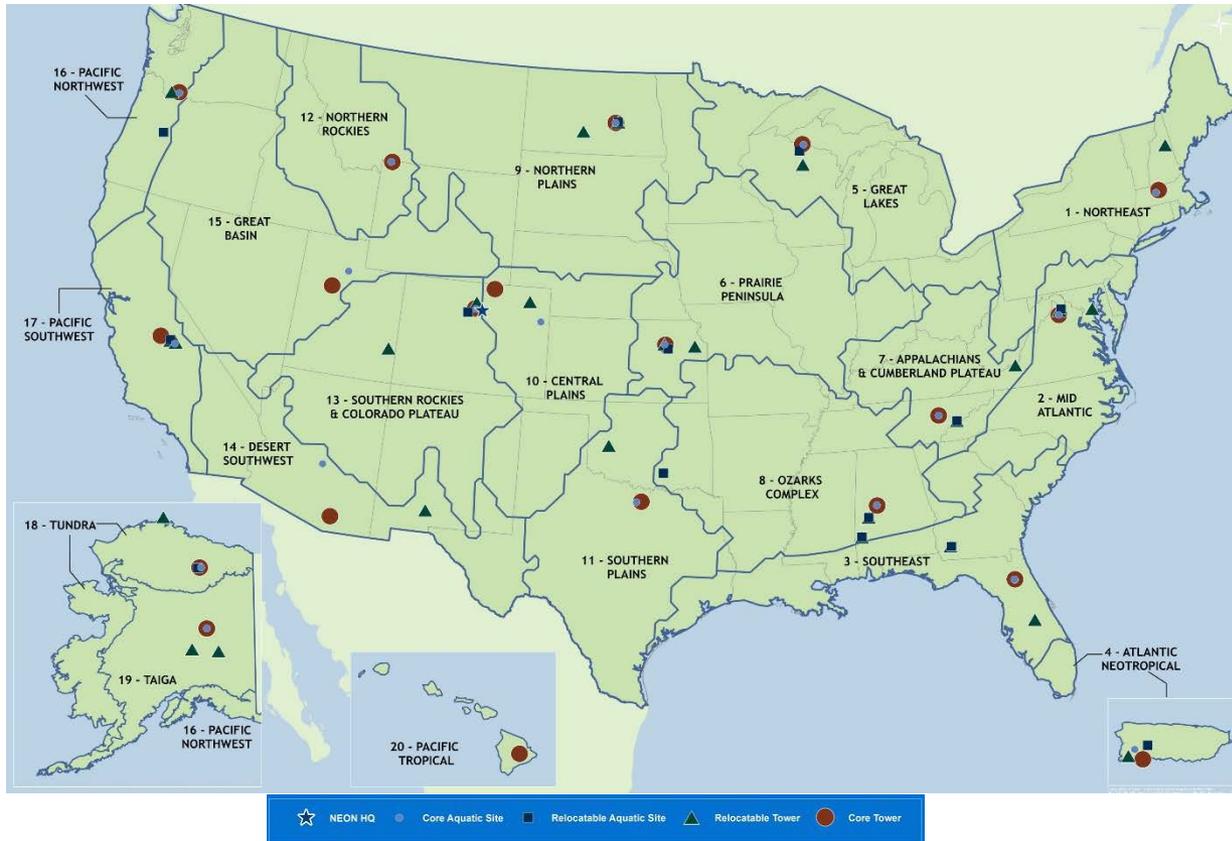


# National Ecological Observatory Network (NEON)

NEON as a Distributed Network

# 81 field sites

- 47 terrestrial
- 34 aquatic



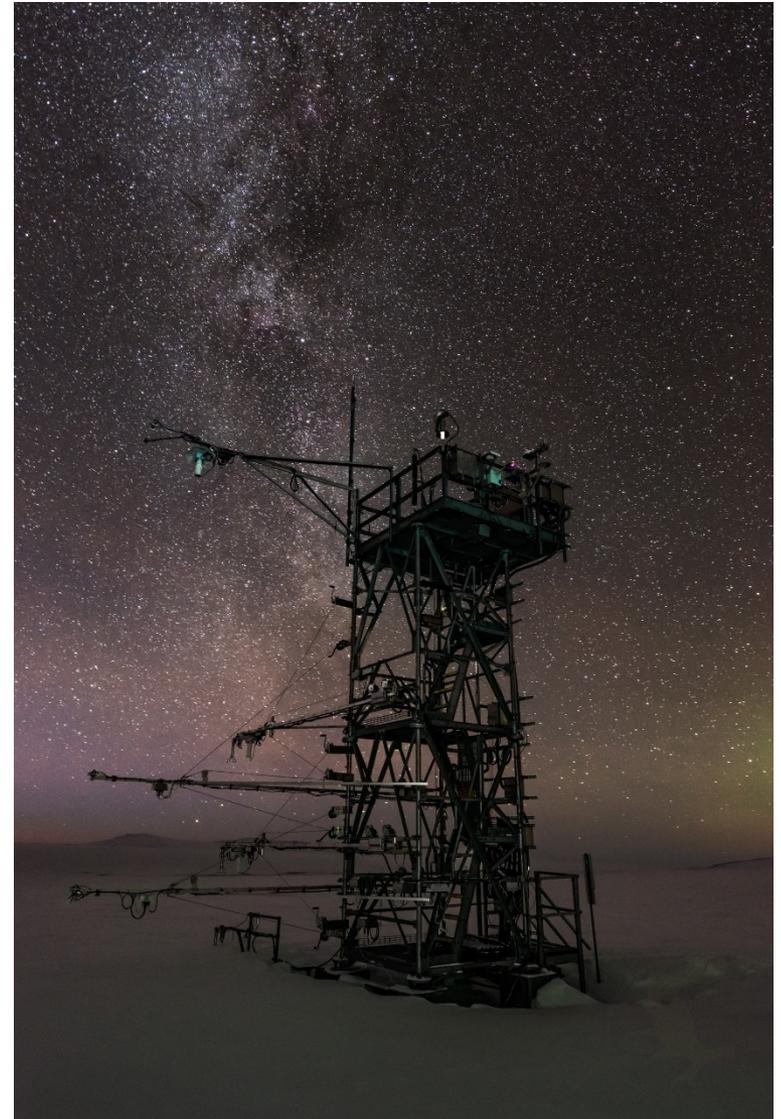
Located in  
**24**  
STATES  
(plus Puerto Rico)

Approximately  
**180**  
DATA  
PRODUCTS

**NEON is scheduled to complete construction and fully transition to operations in 2018.**

# Instrumentation and People

- Instrumented systems
  - Connected to central data architecture in Boulder
  - Centrally monitored/locally maintained
- Observational systems
  - Local staff
  - Soil/Vegetation
  - Mammals/Insects
  - Experience/Training/Partners



# Quality Systems

- NEON Project Specific Plans
- Organization Externally Audited Quality Systems
  - ISO-9001, Management Systems
  - ISO-17025, Calibration
- Data Quality/Data Confidence
  - 1000's of external users
- Training, 200 new field staff every year
- Consistency across 5000 miles



# Distributed Procurement

- Decentralizing
  - E-Procurement
    - Local domain staff are able to order materials and field supplies under \$3,000, once their requisition is reviewed and approved by the appropriate Control Account Manager (CAM)
  - Controls Costs
  - Improve Responsiveness
- Risk Mitigations
  - Audits
  - Central Review





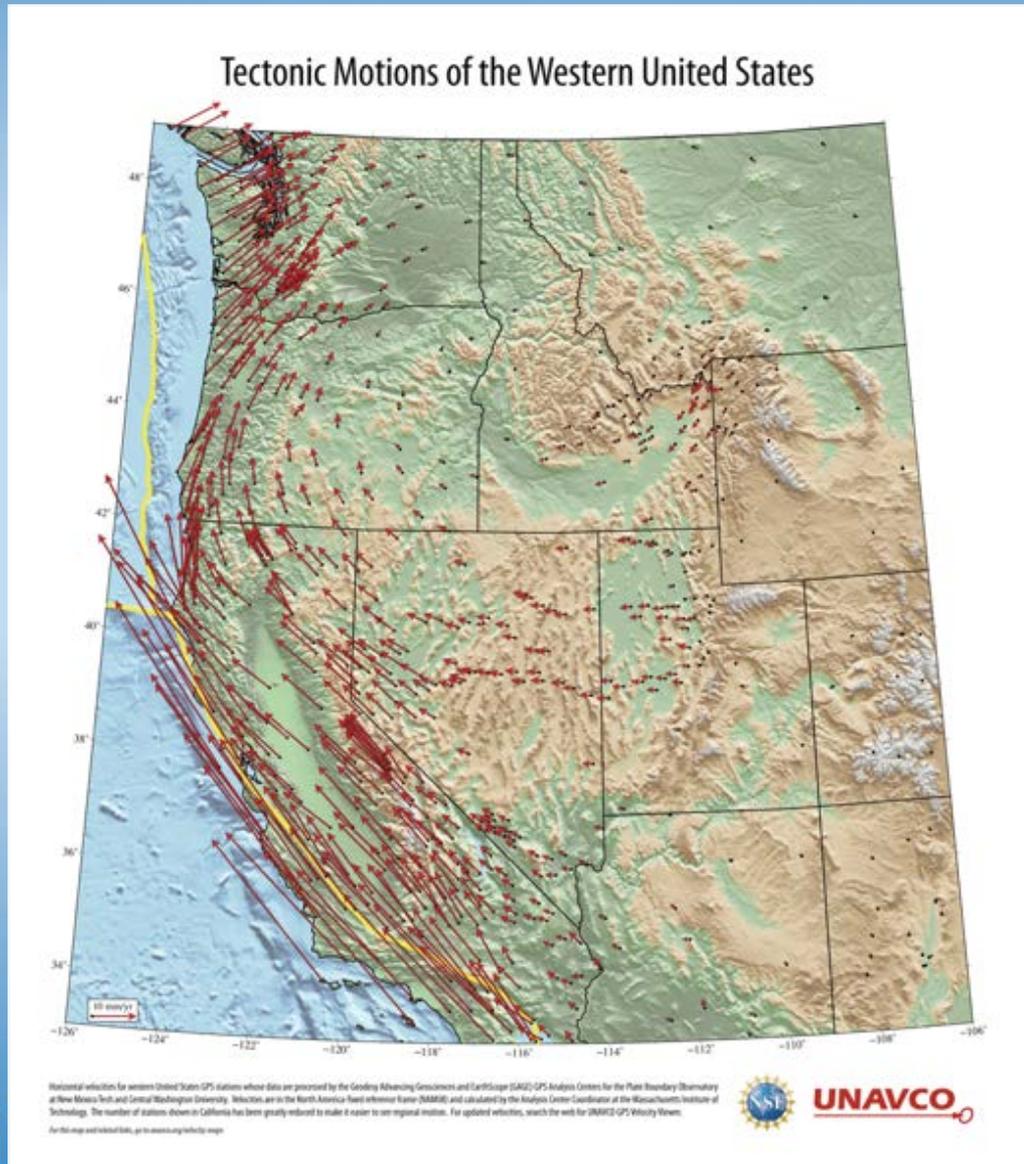
***BATTELLE***

**It can be done**

National Ecological Observatory Network is a project sponsored by the National Science Foundation and operated under cooperative agreement by Battelle.

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## UNAVCO



## Centralized procurement:

- What threshold do you use to set procurement authorities? – *varies by position, most employees up to \$1,000; unless preauthorized travel*
- Is there a trigger that signals centralized procurement versus local?
  - *\$1,000 (unless related to pre-approved travel & travel budget)*
  - *Project Managers approve up to \$5,000; Purchasing agent acquires*
  - *\$5k - \$ 25k: Director approves; Purchase Order required*
  - *Quantities Cannot be artificially disaggregated to evade limits*
  - *Over \$25,000 President approves*
  - *Board review delegation annual*
- Regional staff: *PMs and up - biannual face-to-face training R/A/A*
- Anything else you find pertinent to the topic?



## Cyber infrastructure:

- What level of cyber infrastructure is controlled locally versus centrally? *Only laptops and station communications are decentralized*
- Any network or data product issues with remote sites? *Mostly only when third party Internet providers fail; duplicate connections do not protect against a local cable severed*
- Were there any CI challenges experienced during construction on distributed sites? *Each of the 1,100 sites have a cost-optimized solution – land line, cell modem, radio shot hubs*
- At what level do data back ups occur? *Sample rate-dependent ring buffers onboard GPS receivers; two independent backup strategies at archive*
- Employee CI training do local employees receive? *Any appraisal- or supervisor-vetted professional development fully supported*



## Site facilities maintenance:

- **Sample topic ideas:**

- How are facilities maintenance needs and activities tracked across the network of the large facility? *Site monitoring, data flow, State of Health, site logs.*
- Maintenance contracts central or local affiliates near sites? *For PBO, regional staff perform routine and responsive maintenance. For community/international networks – partnerships are leveraged.*
- Are local recipient employees entering into local maintenance agreements? *No. Agreements are all negotiated & vetted centrally*
- What emergency facilities maintenance plans, contracts, etc does your organization have in place to respond quickly (to expediently restore data gathering and distribution)? *Varies with capability and diminished funding. Transitioning to best effort basis with cuts.*



## Personnel & staffing:

- **Sample topic ideas:**

- What are the challenges associated with hiring into a distributed project during operations?
- Are there any span-of-control issues concerning personnel/staffing particular to a wide-scale distributed project?
- How do you keep widely-distributed employees 'connected' to the overall mission and vision of the organization?
- Are there any additional personnel safety and security issues connected with distributed operations?
- Anything else you find pertinent to the topic?



## Parts & storage:

- spare parts?
  - Two major regional offices and satellite offices include storage
  - Trucks are uniformly outfitted and interchangeable
  - Other regions have storage unit stashes, near airports if needed
- How are controls and good stewardship of property and spares instilled across the widely distributed network and facility?
- How are you measuring parts availability versus up-time for critical pieces of equipment across the distributed network?
- Are self-storage contracts set up centrally, to be utilized by distributed employees locally near sites?
- Anything else you find pertinent to the topic?

