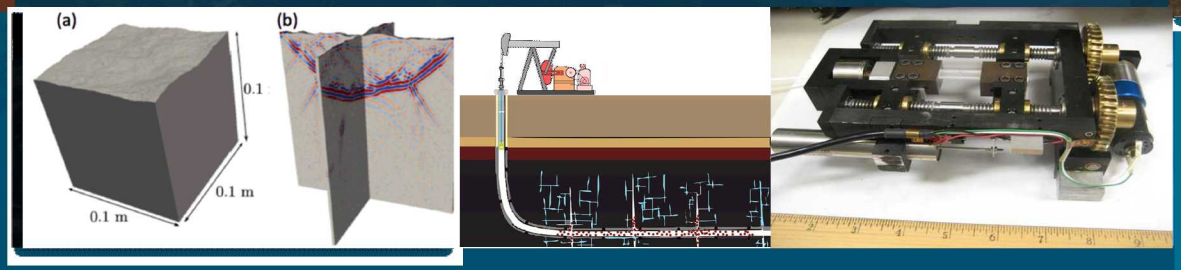
SAND2019-0738PE

FY19 Earth Science Research Foundation: Strategy & Rebranding



PRESENTED BY

Lori Parrott, Atmospheric Sciences
Rebecca Ullrich, Recorded Information Management

From "Geoscience" to "Earth Science"

2018 External Advisory Board Report:

- "…there is a need for a rebranding of the Geoscience RF capability at Sandia"
- "… there may be many individuals who strongly associate "geo" with rocks and who incorrectly assume that this is the extent of the purview of the RF"
- "**Earth systems conveys a more holistic, integrated view** and enhances approaches that better link natural and social sciences. **Key national security and defense** may be more readily identifiable."
- "Thus, to convey the breadth of the RF's capability, both internally and externally, we recommend adopting an alternative title such as Earth Sciences or Earth Systems or Earth Systems Sciences."

Rebranding: Planning

- Discovery sessions with Sandia Portfolio Leaders helped us identify connections and drivers to the earth sciences
  - ***Global Security (GS)****: ground-based nuclear detonation detection, determination of explosive yield and burial conditions, and proliferation assessments*
  - ***National Security Programs (NSP)****: detection and characterization of underground structures; effective countermeasure planning; sea floor characterization; energy harvesting; sonar accuracy*
  - ***Nuclear Deterrence (ND)*** *test readiness; weapon system interactions with earth systems*
  - ***Advanced Science & Technology (AS&T)****: nano/microscale to the macroscale, multi-physics view of the Earth and its processes ; climate change monitoring, modeling; geoengineering*
  - ***Energy & Homeland Security (E&HS)****: homeland security emergency response activities, nuclear waste disposal; geothermal energy and fossil energy production and optimization; deep subsurface energy storage*

Rebranding: Mission Connection Meetings

	Met with	Individual	Topic
AS&T	Yes	Sarah Allendorf	Basic Energy Science (BES), Basic Energy Research (BER), Geoengineering
AS&T	Yes	Charles Barbour	
AS&T	Yes	Grant Heffelfinger	Climate Modeling, Subsurface, BES, Geoengineering
AS&T	Yes	Bob Hwang	BES
GS	Yes	Gary Laughlin	Geoengineering, Treaties
GS		Max Decker	Nuclear Winter
GS	Yes	Justine Johannes	Test Readiness
GS		Kathy Simonson	Seeing through the atmosphere
GS	Yes	Neill Symons	Treaties
GS	Yes	Toby Townsend	Non-proliferation
GS	Yes	Jen Gaudioso	Geoengineering
E&HS	Yes	Heidi Ammerlahn	Border Screening
E&HS	Yes	Holly Dockery	Arctic Domain Awareness
E&HS	Yes	Wen Hsu	Monitoring, Chem-Bio
ND	Yes	Kent Meeks	Test Readiness
ND		Scott Holswade	
ND	Yes	Karim Mahrous	Cyber
ND	Yes	John Merson	Spectrum System Analysis
ND	Yes	Mark Rosenthal	Weapon Testing
ND		Colin Smithpeter	
ND	Yes	John Sullivan	Weapon Effects
ND	Yes	Tommy Woodall	Nuclear Yield
ND	Yes	Sheryl Hingorani	HDBT, Weapons Effects
NSP		Christina Czuchlewski	
NSP		Kim Denton-Hall	
NSP		Kathy Jackson	Monitoring
NSP	Yes	Leann Miller	Monitoring
NSP	Yes	Michelle Stevens	Monitoring
NSP	Yes	Mike Valley	Seedlings, HDBT
Other	Yes	Justin Newcomer	Spatial Strategy

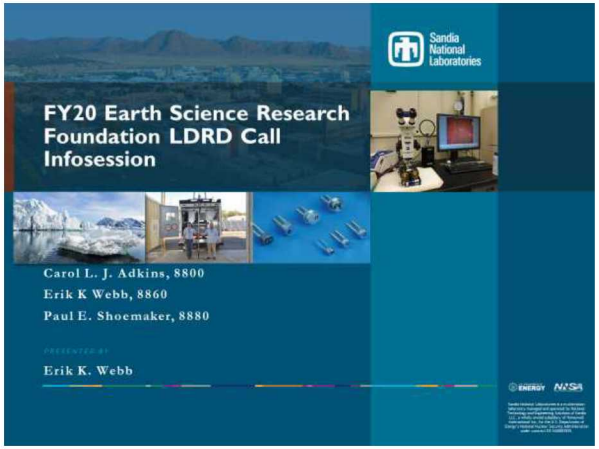
Rebranding: Planning

- Proposed to Chief Research Officer at FY19 LDRD Portfolio Review (July 2018)

- Developing new graphics to represent earth science elements visually

Rebranding: Roll-out

- New official name: Earth Science Research Foundation: Oct 1, 2018
- FY20 Earth Science LDRD Information session: introduced the change to the Sandia research community
- New series of S&T talks
  - January 28 – *"The Influence of Temperature and Cation Substitutions on the Phase, Ordering, Nano-Structures, and Properties Peroskites"* - Darryl Butts, University of Utah
  - May 23 – Fran Ulmer, U.S. Arctic Research Commission Chair
  - Others in planning



Rebranding: Roll-out

- FY19 Earth Science LDRD
  - Concerted effort to connect Earth Science LDRD projects with Sandia portfolios
  - Expanded emphasis: oceans, atmospheres, and Arctic
  - Required inclusion of at least one team member who
    - Is currently engaged with direct-funded work related to National Security Missions
    - Can help bring an understand of Mission needs to the research
    - Is specifically identified in each Idea submission
    - *Cited as a Best Practice by the LDRD Office!*

Rebranding: Roll-out (continued)

FY19 – FY21 Earth Science LDRD Portfolio

Type	PM	PI	Title	E&HS	AS&T	GS	NSP	ND
Continuing	LEE, MOO	YOON, HONGKYU	Integrated Geomechanics and Geophysics in Induced Seismicity: Mechanisms and Monitoring	X		X		
Continuing	PARROTT, LORI	BAMBHA, RAY	Attribution of Methane Emissions in the Arctic and Continental US	X	X		X	
Continuing	VIGIL,STEVE	WEISS, CHET	Prediction and Inference of Multi-scale Electrical Properties of Geomaterials	X	X			
Continuing	MCMAHON, KEVIN	MATTEO, ED	Monitoring and Repair of Damaged Cement-Geomaterial Interfaces in High Pressure High Temperature Repository and Borehole	X		X		
Continuing	GILLICH, DON	ALBERT, SARAH	Unlocking Real Time Infrasound Event Classification Abilities using Machine Learning	X		X		
Continuing	MACKINNON, BOB	KUHLMAN, KRIS	Characterization and Sampling of Ultralow Permeability Geomaterials using Electrokinetics	X	X	X		
New	MACKIINON, BOB	FREDERICK, JENN	Forecasting Marine Sediment Properties On and Near the Arctic Shelf with Geospatial Machine Learning	X	X		X	
New	BETTIN, GIORGIA	SU, JIANN	Direct Subsurface Measurements through Precise Micro Drilling	X		X	X	
New	NEWCOMER, JUSTIN	SHAND, LYNDSAY	Marine Cloud Brightening	X			X	
Baby Grand Challenge	BETTIN, GIORGIA	TBD	Real-Time Subsurface Event Assessment and Detection	X	X	X	*	*
Continuing	PARKS, MIKE	PETERSON, KARA	Arctic Tipping Points Triggering Global Change	X	X	*		

Legend

* Building Connections

X Expand

Rebranding: Future Outreach

- Handouts
- Quarterly Newsletter
- Continued outreach to Labs leadership and to research community
- Speaker Series

Questions

- Our strategy for adding “oceans” under earth sciences is under development. Given Sandia’s capabilities and partnerships, are there specific areas that you suggest we explore?

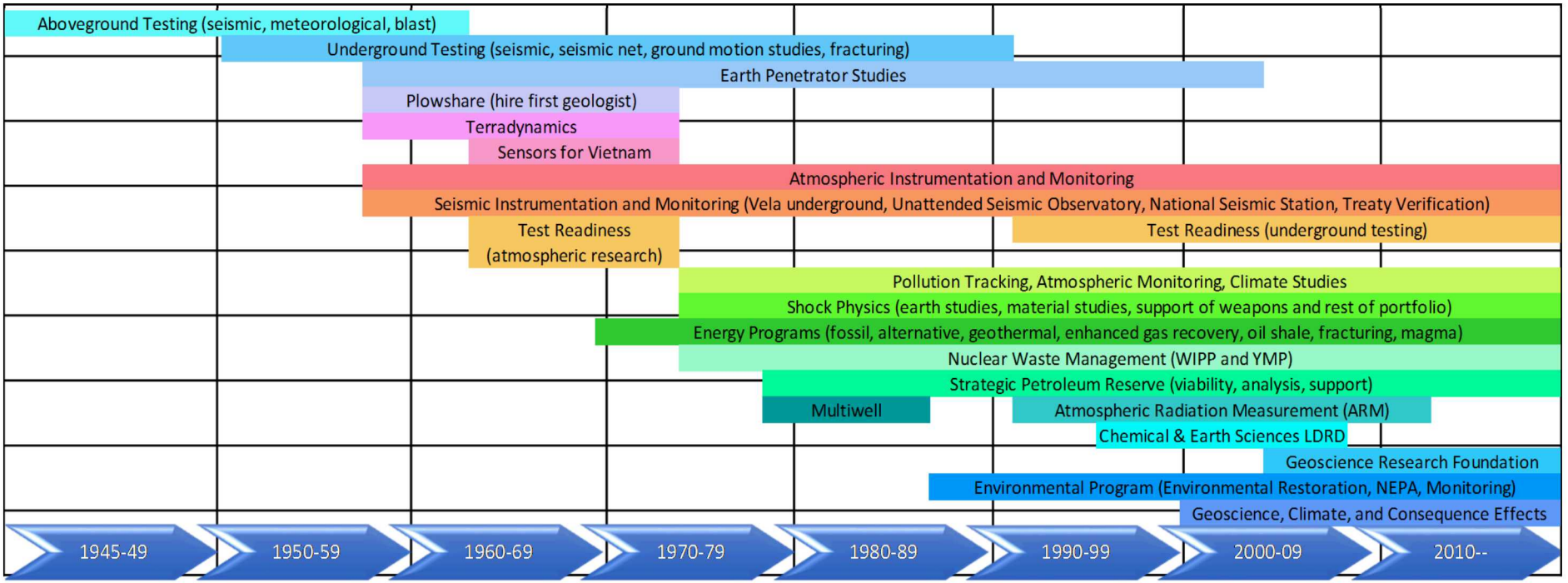
- What are the best ways for Sandia to engage externally with this more encompassing approach to our Earth Sciences Research?

The History of Earth Science at Sandia: a Corporate Project

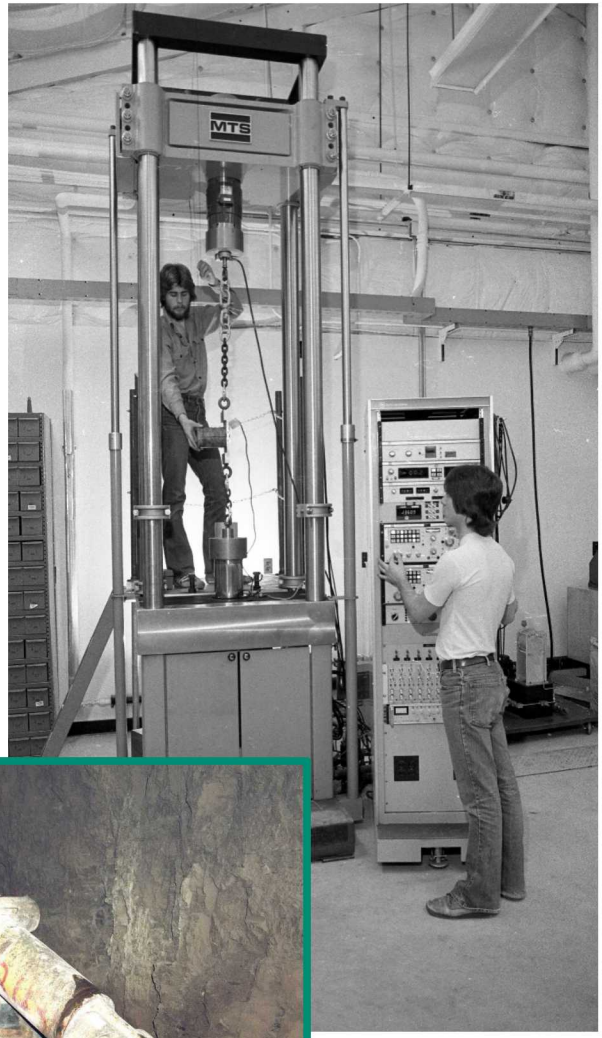
- Objectives:
  - Document the history of Sandia's earth science in its support of Sandia missions since the Labs' inception.
  - Articulate the evolution of Sandia's Earth Science from its earliest presence to its current incarnation
  - Videotape and preserve interviews of key individual contributors

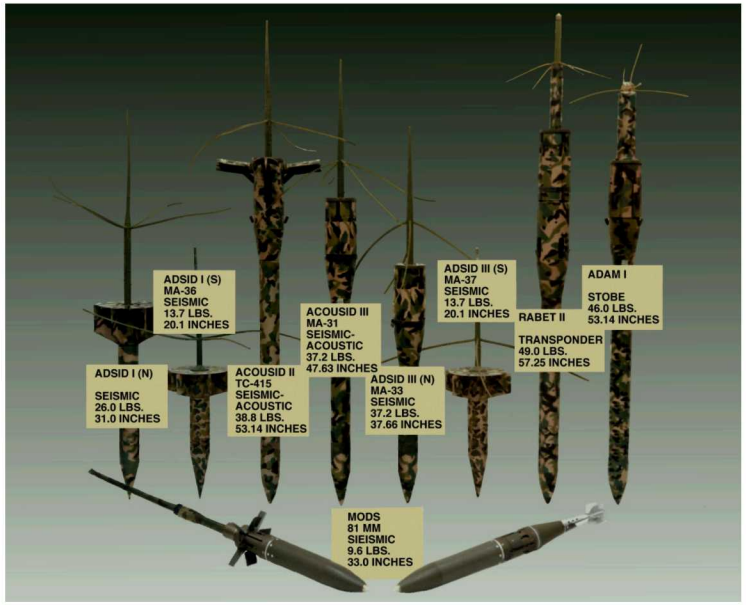
Bottom line: these historical details illustrate the depth and breadth of the Earth Science presence within each of Sandia's missions over time, as well as the variety of earth science subfields embedded in the Labs' work

Earth Science Timeline

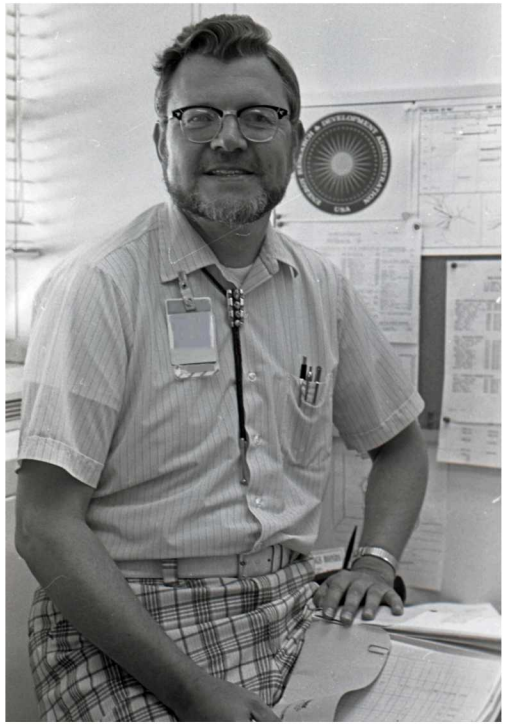


Corporate History Project: Earth Science





Earth Science History Narratives

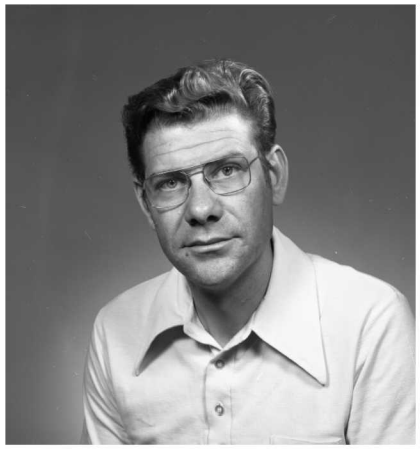


Wendell Weart
"Sultan of Salt"
WIPP
1959-2000

Marianne Walck
Geophysics
Vice President
1984-2017

Terry Stalker
Computing
Earth sciences partner
1974-2019

Additional History Narratives in preparation



Wolfgang Wawersik
Geophysics
Manager
1974-1998

Peter Davies
Geoscience
Director
1989-2017

Larry Costin
Geochemistry
Manager
1978-2010

Neill Symons
Manager
1998-2018