Seismic Monitoring at FORGE Shallow Borehole/Posthole Stations

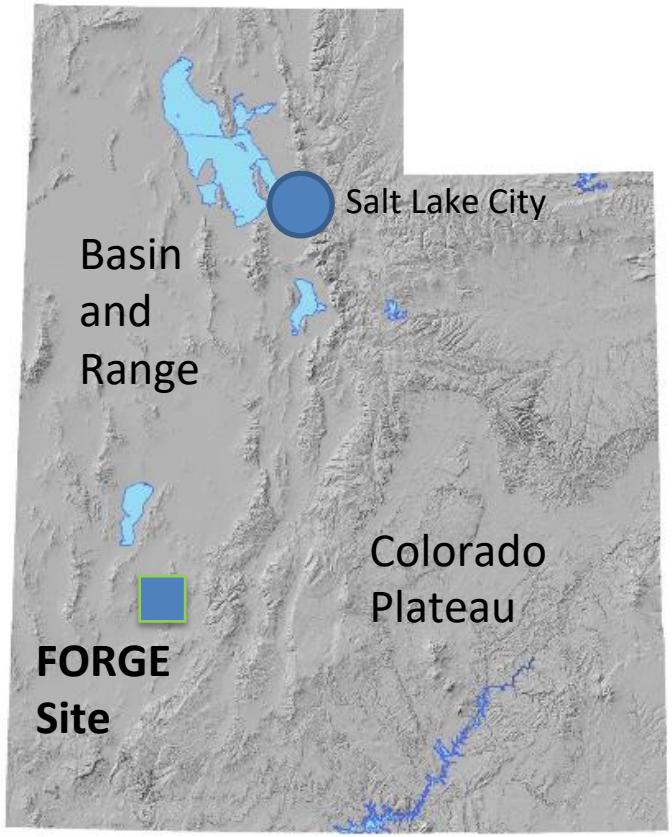
Kristine Pankow & Corey Hatch

Arvind Parapuzha, Wes O'Keefe, Jon Rusho, Maria Mesimeri, James Pechmann & J. Mark Hale

UNIVERSITY OF UTAH SEISMOGRAPH STATIONS

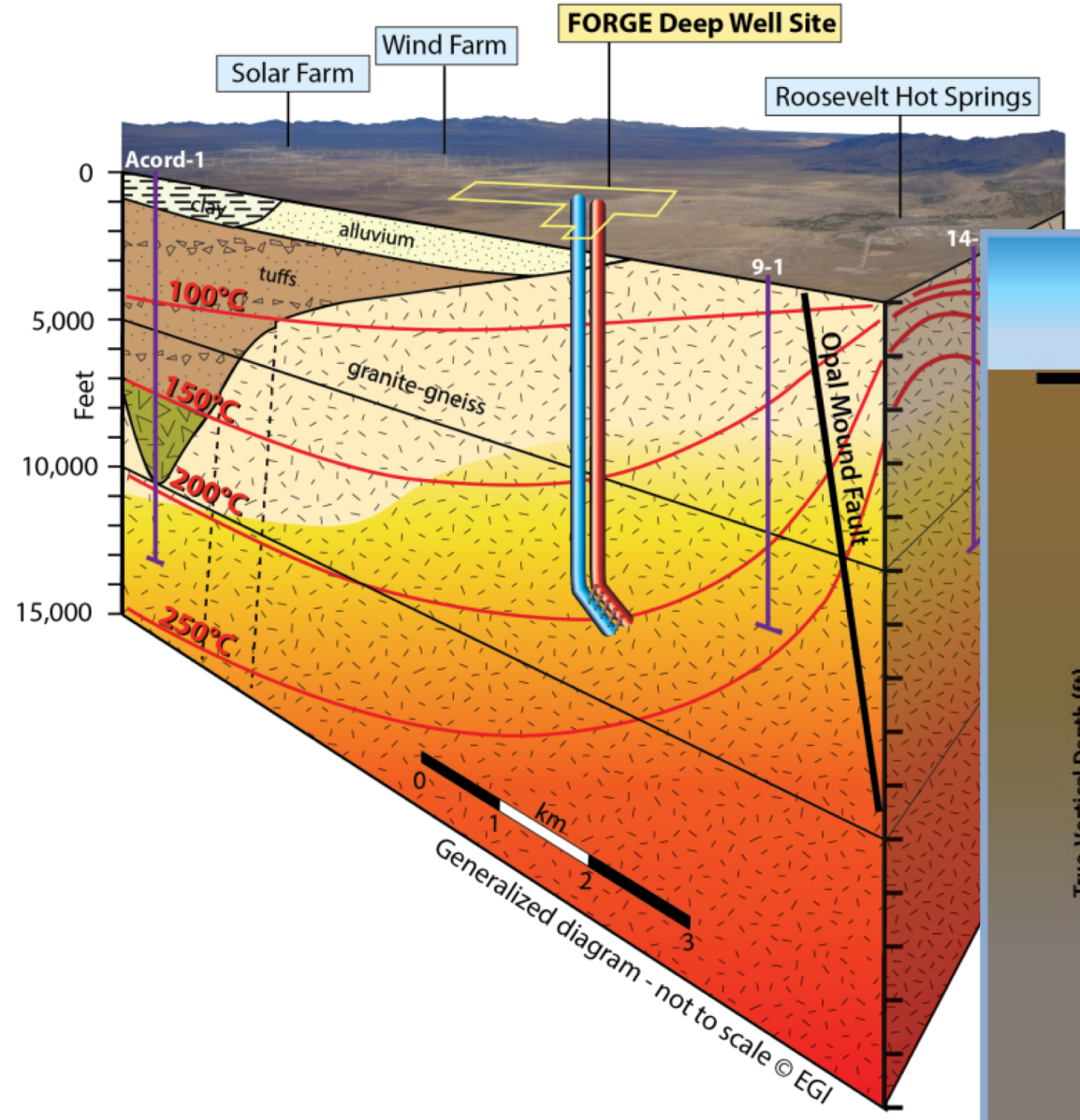
FORGE

U.S. Department of Energy

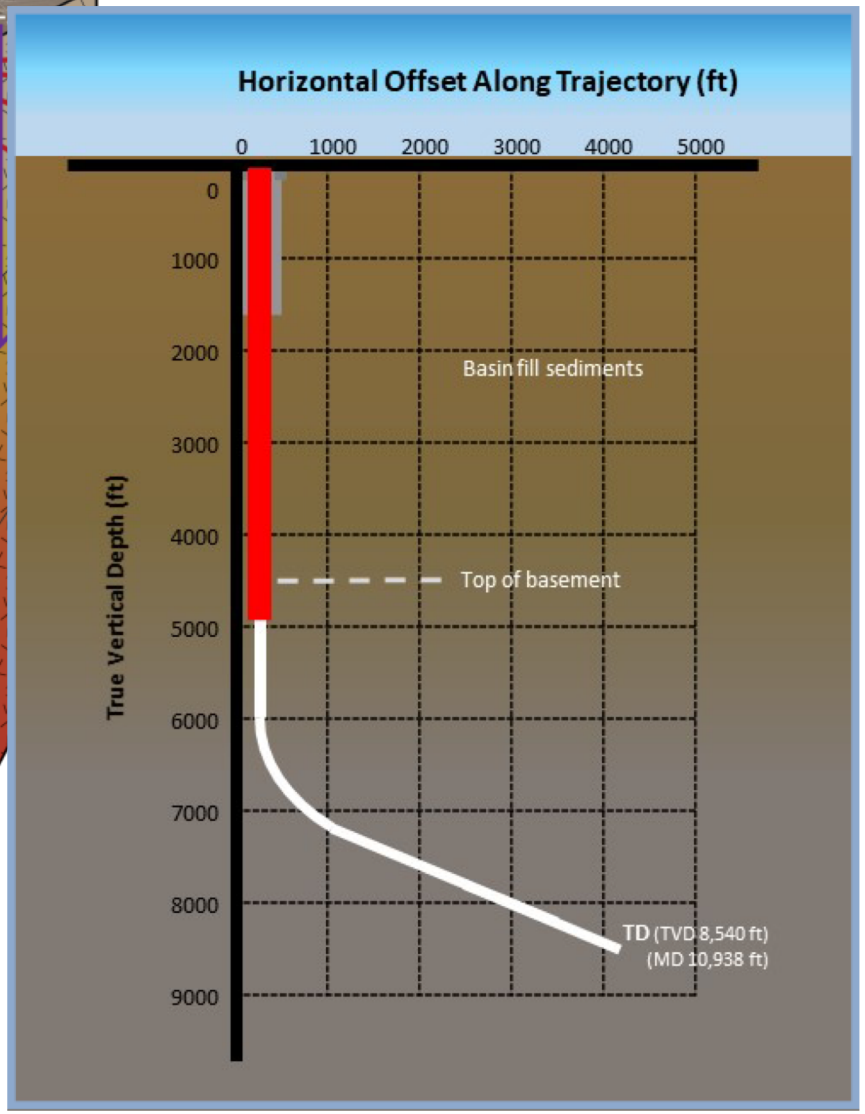


Mission

FORGE's mission is to enable cutting-edge research and drilling and technology testing, as well as to allow scientists to identify a replicable, commercial pathway to EGS



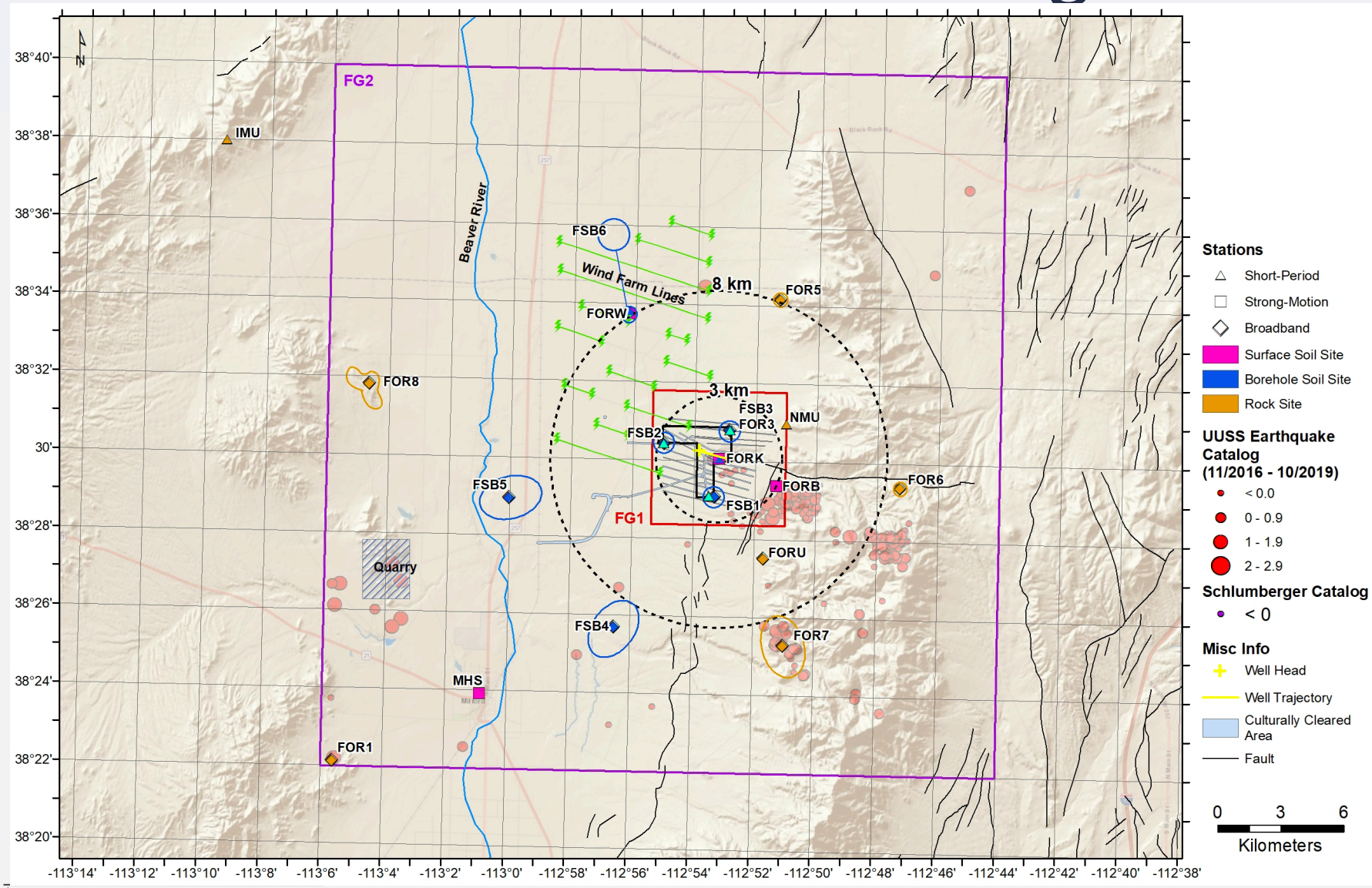
As of November 9, 2020



UTAH FORGE
U.S. Department of Energy

www.utahforge.com

Local Seismic Monitoring



Shallow Borehole -- FORK

Instrumentation

- Shallow hole (~ 280 m):

➢ 3C 15 Hz geophone (4 sensors per component)

➢ 3C Silicon Audio accelerometer

Posthole Stations– FSB-1, FSB-2, & FSB-3

Station Set-up

- Shallow holes (~ 25 m to 30 m)
- Well casing:
  - Steel 20’ lengths with welded joints
  - 6-5/8” OD; 6-1/8” ID
- 6 AWG grounding between tower, both barrels (digitizer and batteries), and well casing

Posthole Stations– FSB-1, FSB-2, & FSB-3

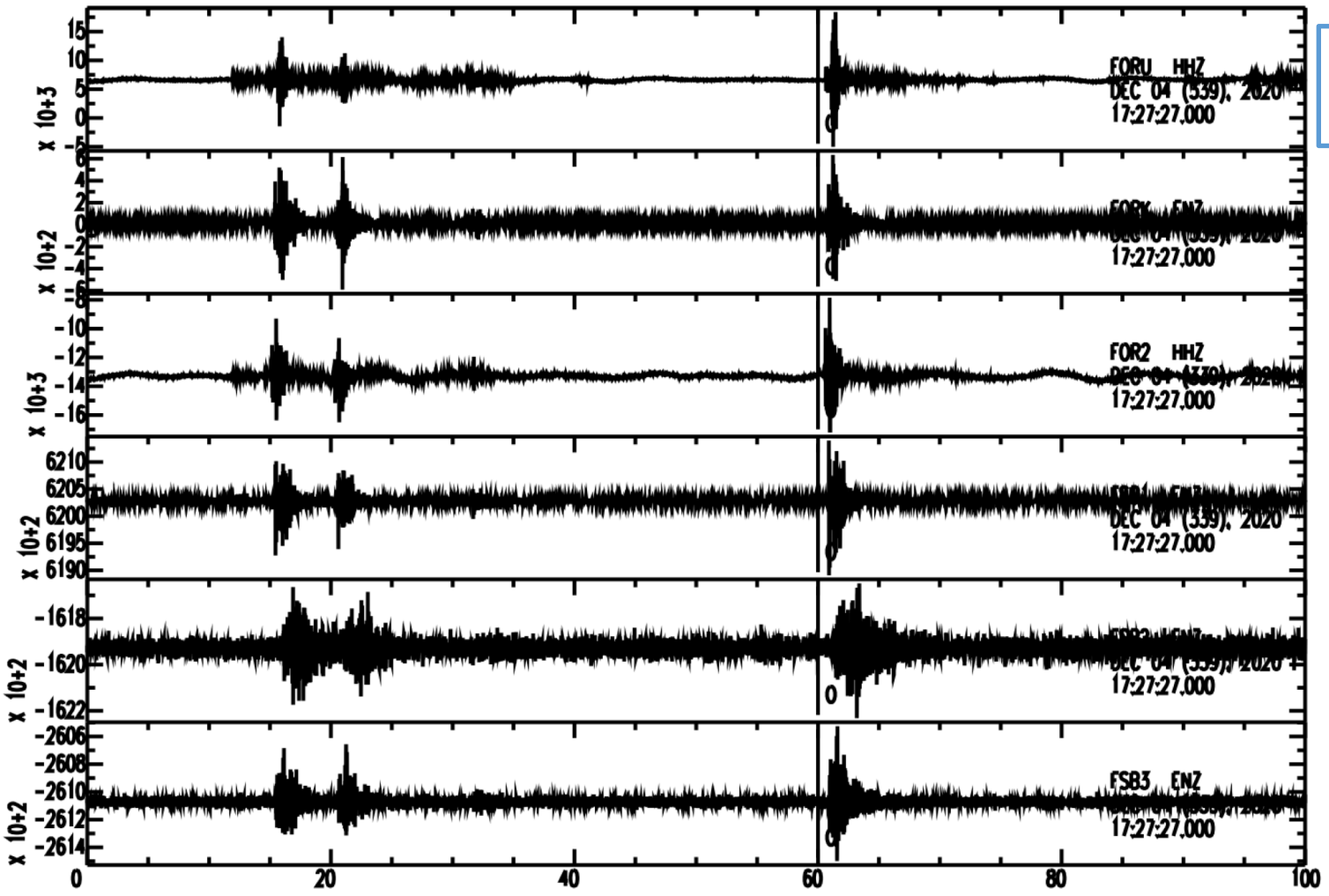
Instrumentation

- Nanometrics Cascadia
  - 3C Trillium Compact broadband sensor
  - 3C 4g Titan accelerometer
- Home-made centralizers
  - Total tilt 0.3 to 0.8 deg

Background Noise: Average Absolute Value (AAV)

STA	CH	SPS	Mean AAV	CH	SPS	Mean AAV
FORK	GHZ	1000	8.6	EHZ	200	5.31
FORK	GNZ	1000	6.32			
FORU	HHZ	100	**8.43**			
FOR3	HHZ	100	**253.06**			
FSB-3	CHZ	500	31.22			
FSB-3	DNZ	500	127.31	ENZ	200	22.21
FSB-2	CHZ	500	134.44			
FSB-2	DNZ	500	106.6	ENZ	200	82.78
FSB-1	CHZ	500	42.89			
FSB-1	DNZ	500	162.05	ENZ	200	29.16

M -0.8 Located ~2 km to the east



D= 4.6 km rock

D= 4.6 km posthole

GRAPH STATIONS

M 2 ~80km to the southeast