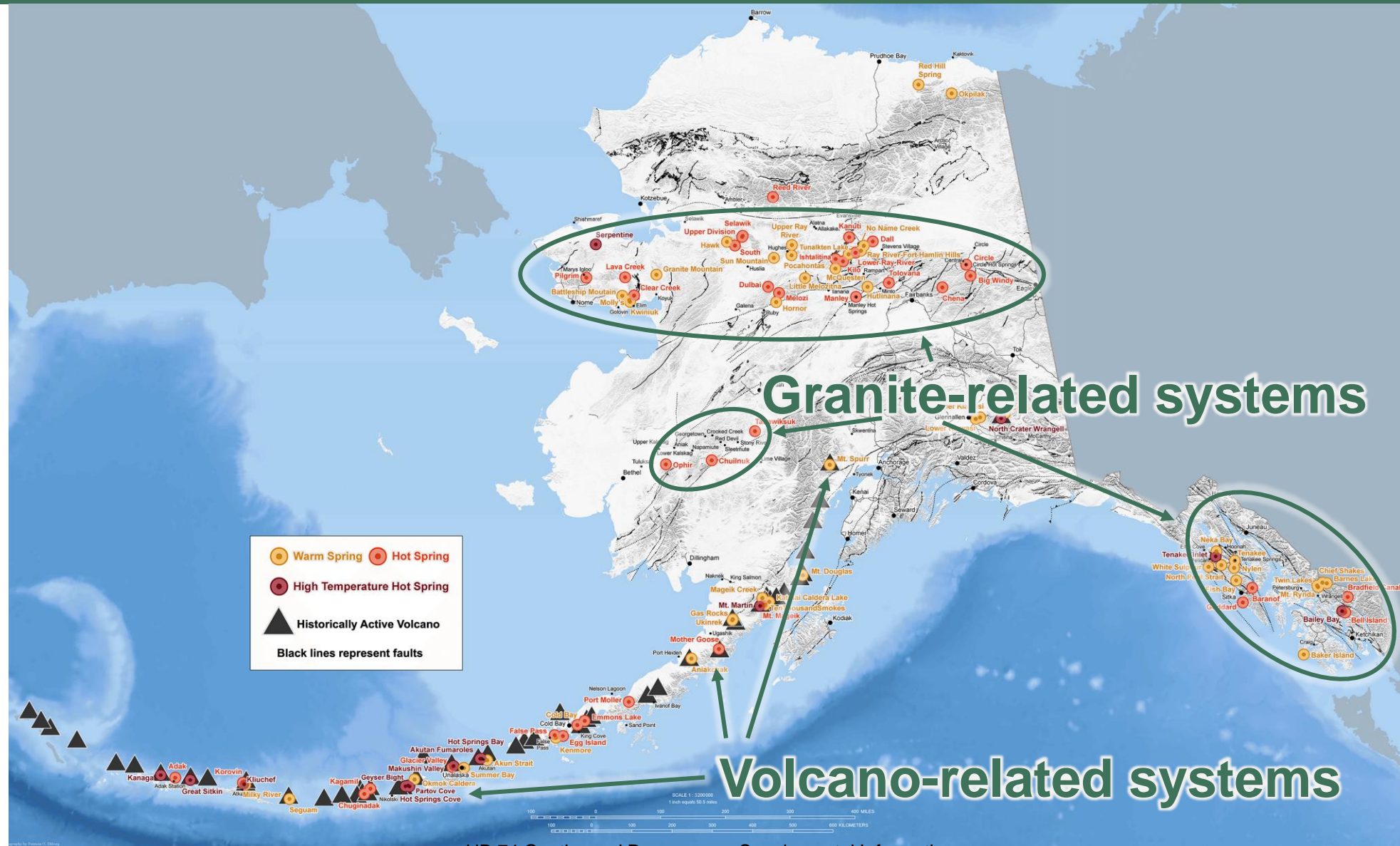


# SUPPLEMENTAL INFORMATION

## The logo of the Alaska Department of Natural Resources is a circular emblem. It depicts a landscape with a large evergreen tree on the left, a winding river in the foreground, and a mountain range in the background. A red sun is positioned on the right side of the mountain. The text "ALASKA DEPARTMENT OF NATURAL RESOURCES" is written in a circular border around the central image.





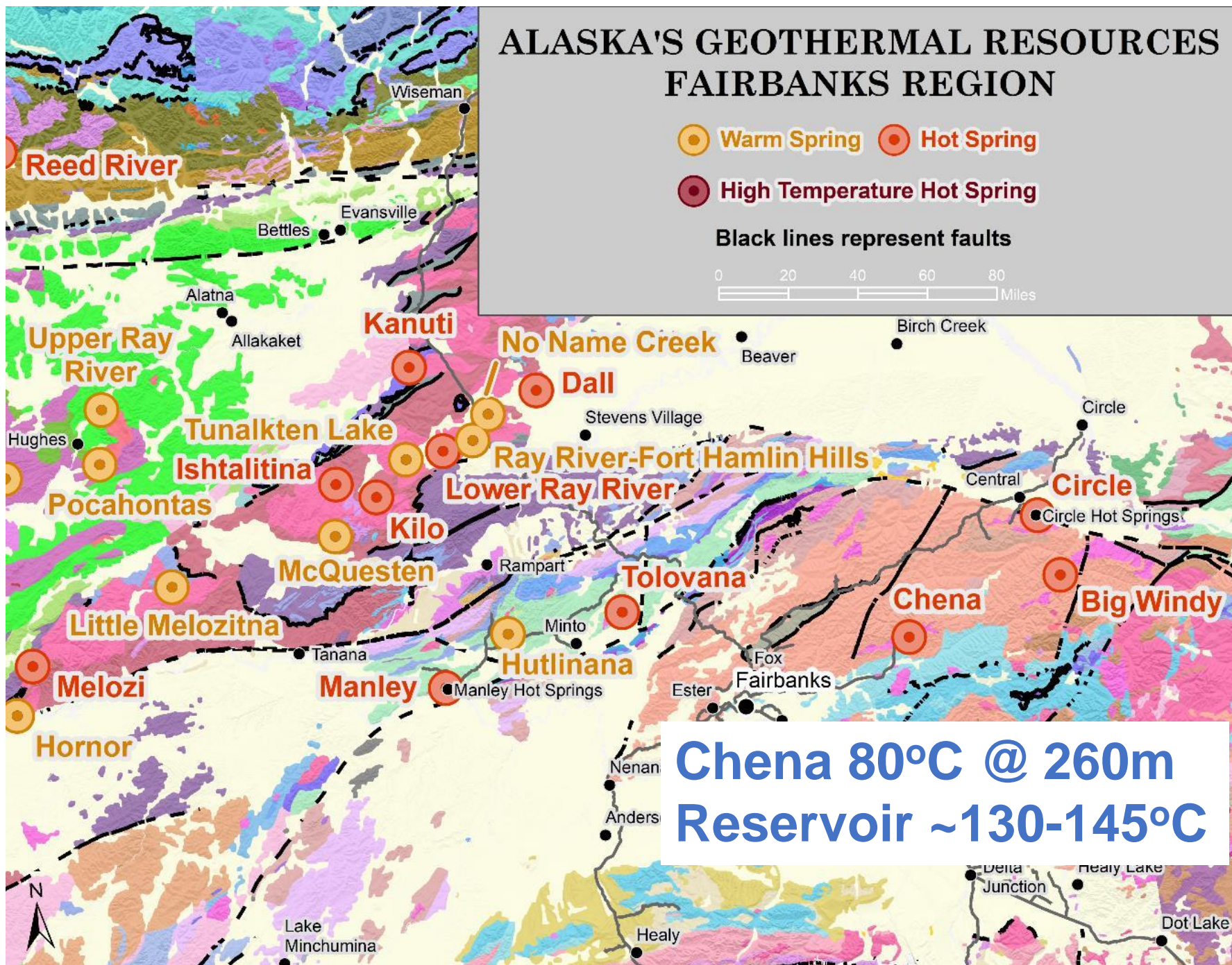
# ALASKA'S GEOTHERMAL RESOURCES FAIRBANKS REGION

Warm Spring Hot Spring

High Temperature Hot Spring

Black lines represent faults

0 20 40 60 80 Miles



**Chena 80°C @ 260m**  
**Reservoir ~130-145°C**

## GEOHERMAL SYSTEMS: FAIRBANKS REGION



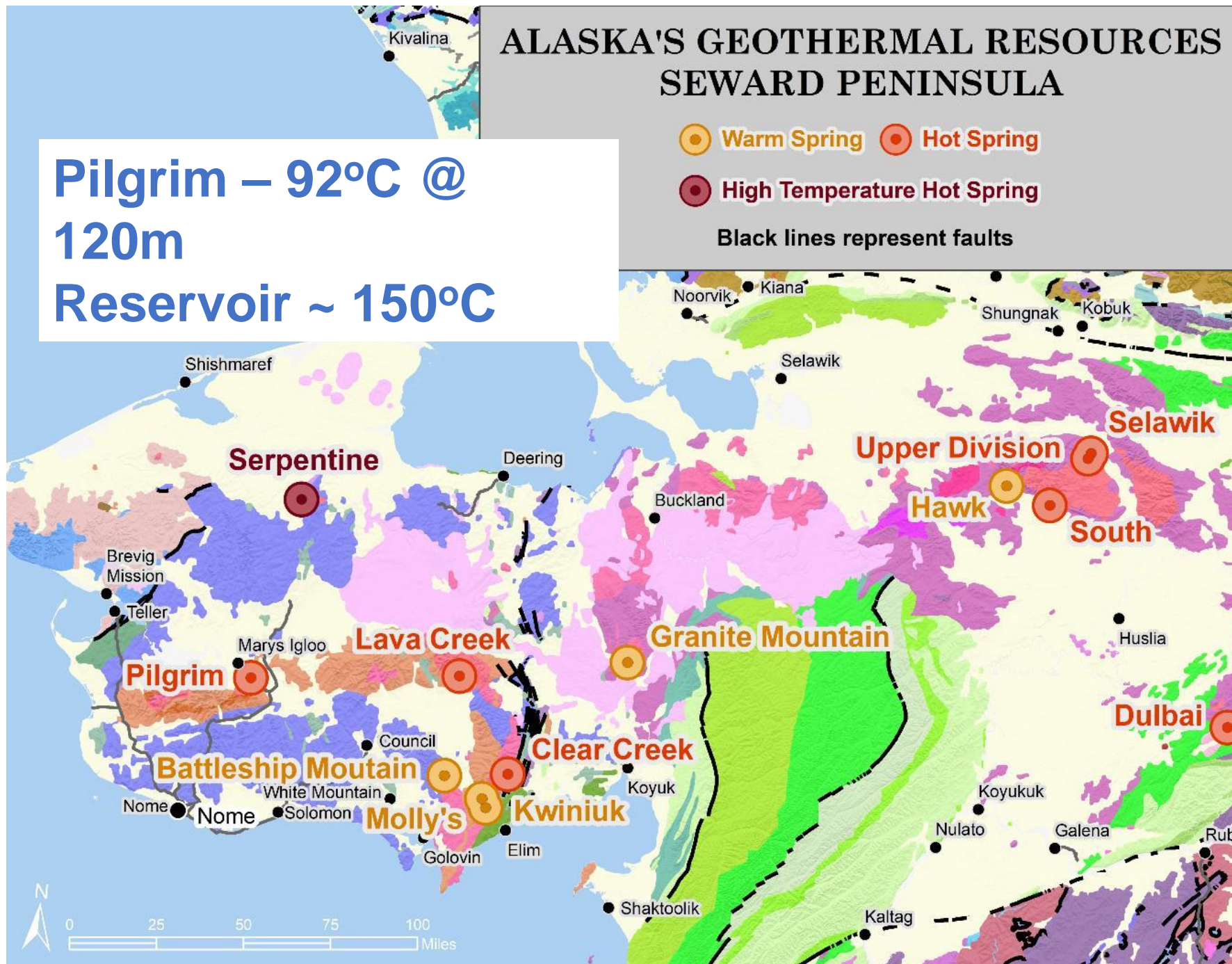
# ALASKA'S GEOTHERMAL RESOURCES SEWARD PENINSULA

Warm Spring Hot Spring

High Temperature Hot Spring

Black lines represent faults

Pilgrim – 92°C @  
120m  
Reservoir ~ 150°C

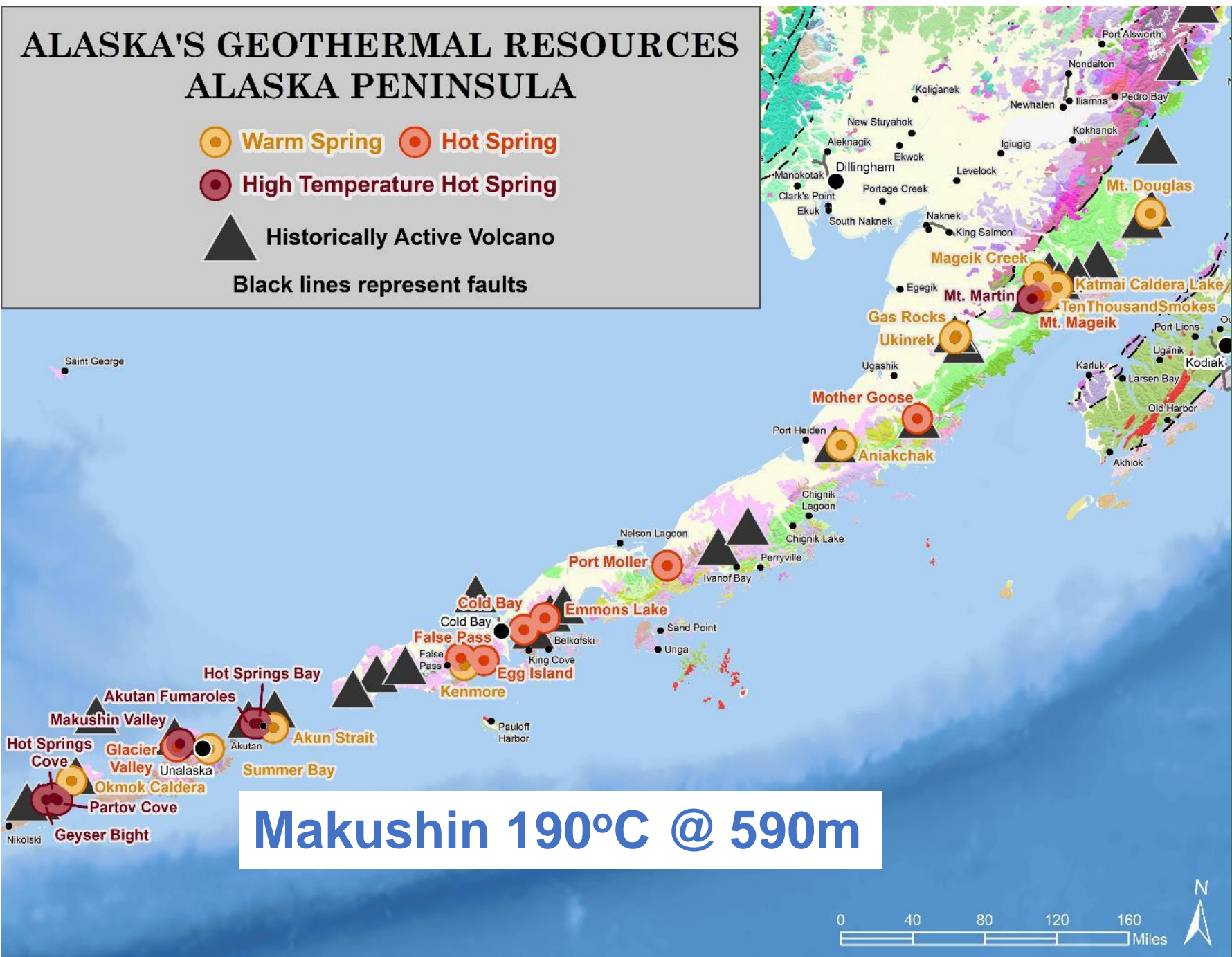


GEOOTHERMAL  
SYSTEMS:  
SEWARD  
PENINSULA  
REGION

ALASKA'S GEOTHERMAL RESOURCES  
ALASKA PENINSULA

- Warm Spring
- Hot Spring
- High Temperature Hot Spring
- Historically Active Volcano

Black lines represent faults

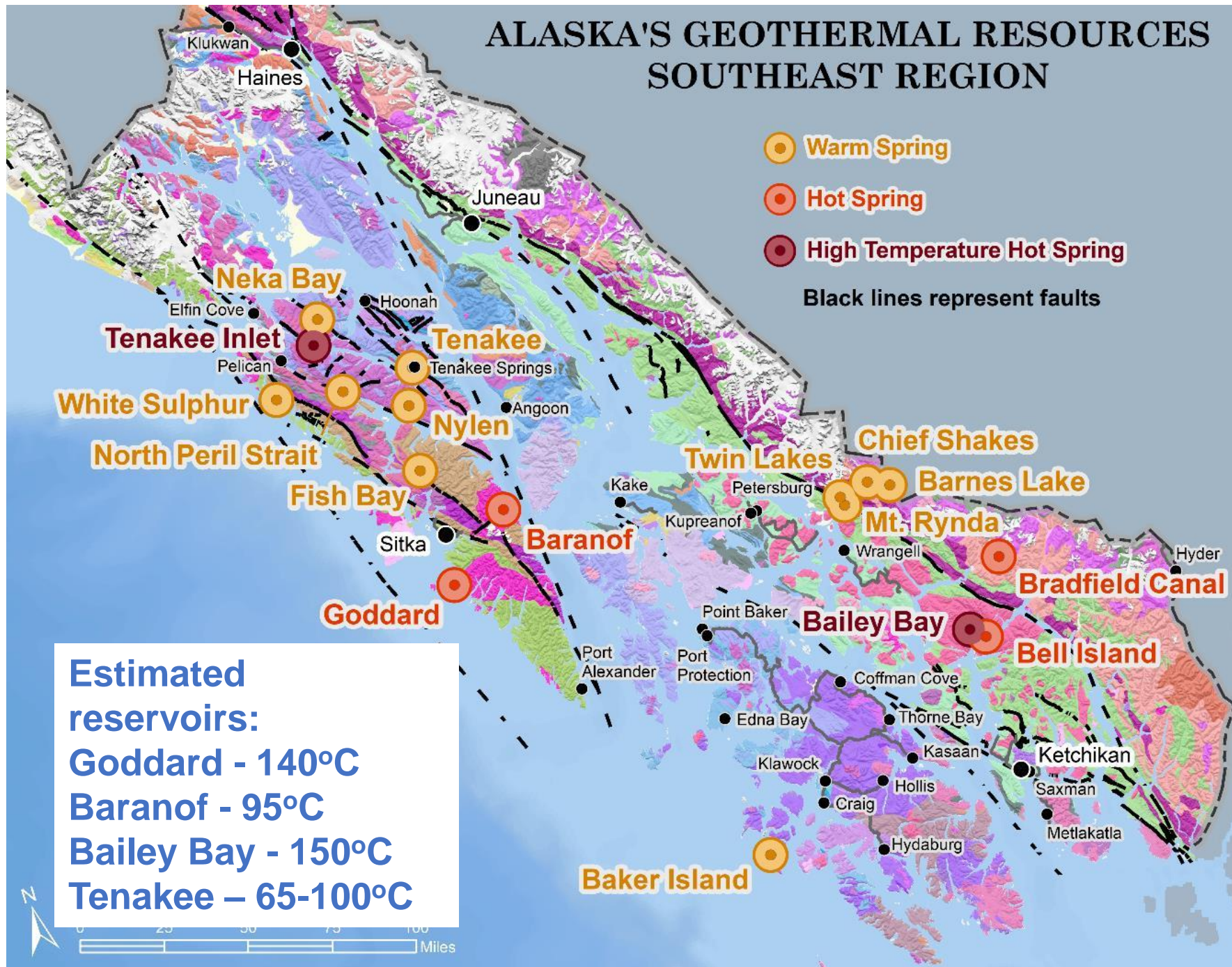


Makushin 190°C @ 590m

GEO THERMAL  
SYSTEMS:  
ALASKA  
PENINSULA  
REGION

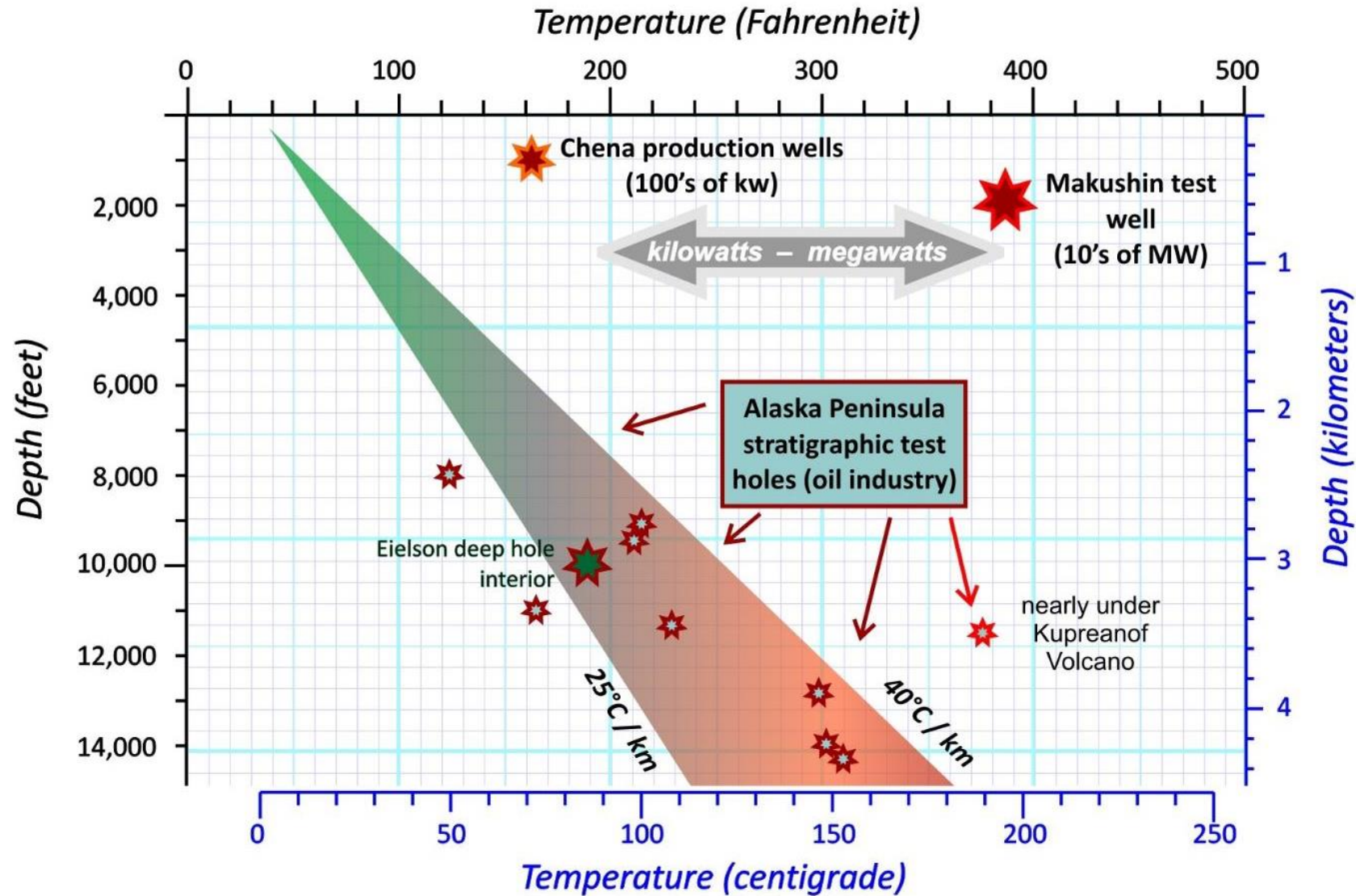


# ALASKA'S GEOTHERMAL RESOURCES SOUTHEAST REGION



## GEOHERMAL SYSTEMS: SOUTHEAST REGION

# GEOHERMAL GRADIENTS





# DRILLING REGULATIONS

## Division of Oil & Gas (DOG)

- Licenses or leases for access to the resource (subsurface use)
- Surface-use permitting (pads, facilities, and infrastructure) in support of exploration and development

## Alaska Oil & Gas Conservation Commission (AOGCC)

- Ensures prevention of waste, protects correlative rights, improves ultimate recovery, and protects underground freshwater aquifers
- Issues of permits to drill wells is AOGCC's jurisdiction
- Jurisdiction over geothermal triggered by temperature ( $>120^{\circ}\text{C}$ ) or commerciality. *New definition ignores temperature*
- Domestic, noncommercial, or small-scale industrial geothermal well not under AOGCC authority
- Exception: if well *may encounter geothermal resources, fluid, or water of enough heat/pressure to threaten life/health*

## Department of Environmental Conservation (DEC)

- If the incidental discharge enters surface water, need Alaska Pollutant Discharge Elimination System (APDES) permit
- DEC Division of Water has permitted geothermal discharges using Plan Review in Lieu of Permit
- Engineering Support and Plan Review (ESPR) conducts plan reviews for smaller systems in municipality (heating or cooling pumps at UAA, U-med district, hatchery, etc.)
- DEC issues permits for *hydrostatic testing, including flushing and aquifer pump testing*
  - General permit AKG003000 provides for coverage of land disposal or discharge to surface water
  - One geothermal-related authorization, issued in 2015 for the Akutan Geothermal Project