

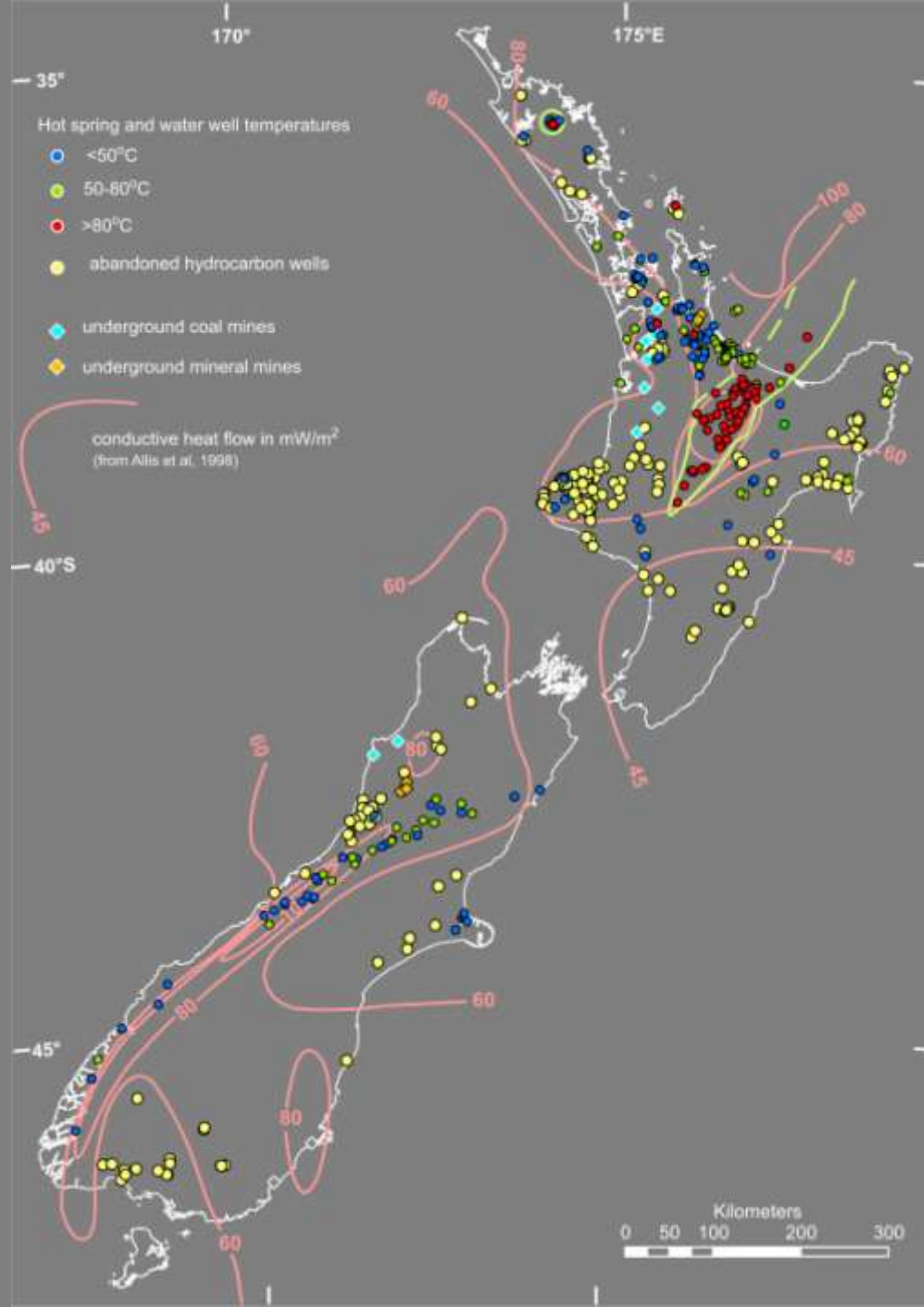


# Huge Untapped Geothermal Reserves in New Zealand

A. G. Reyes

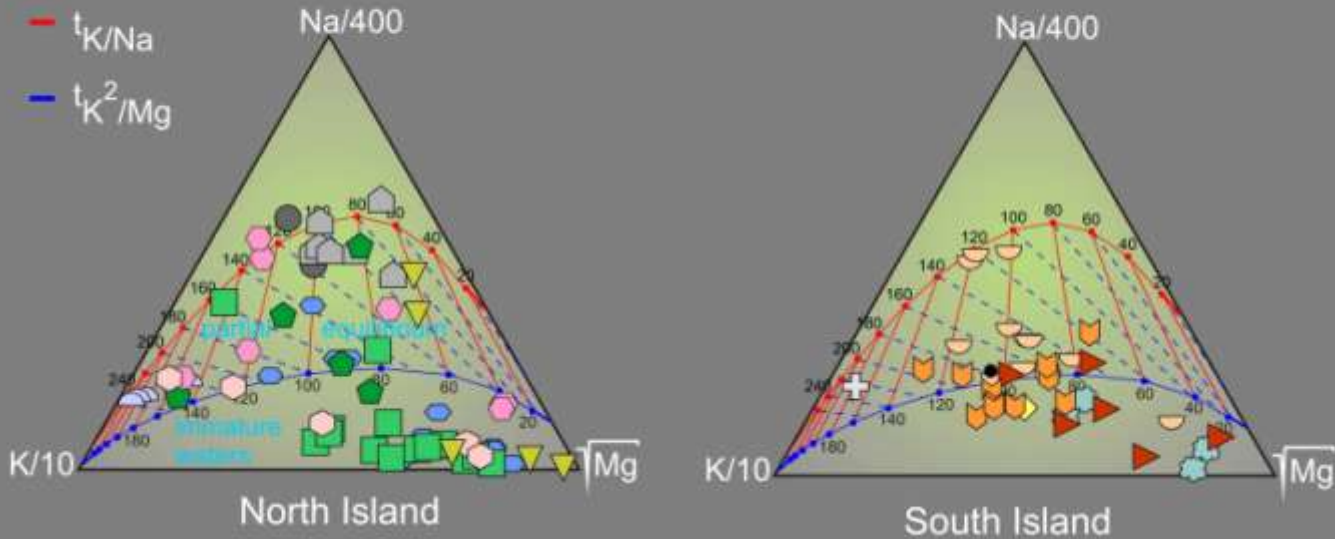


# HEAT SOURCES



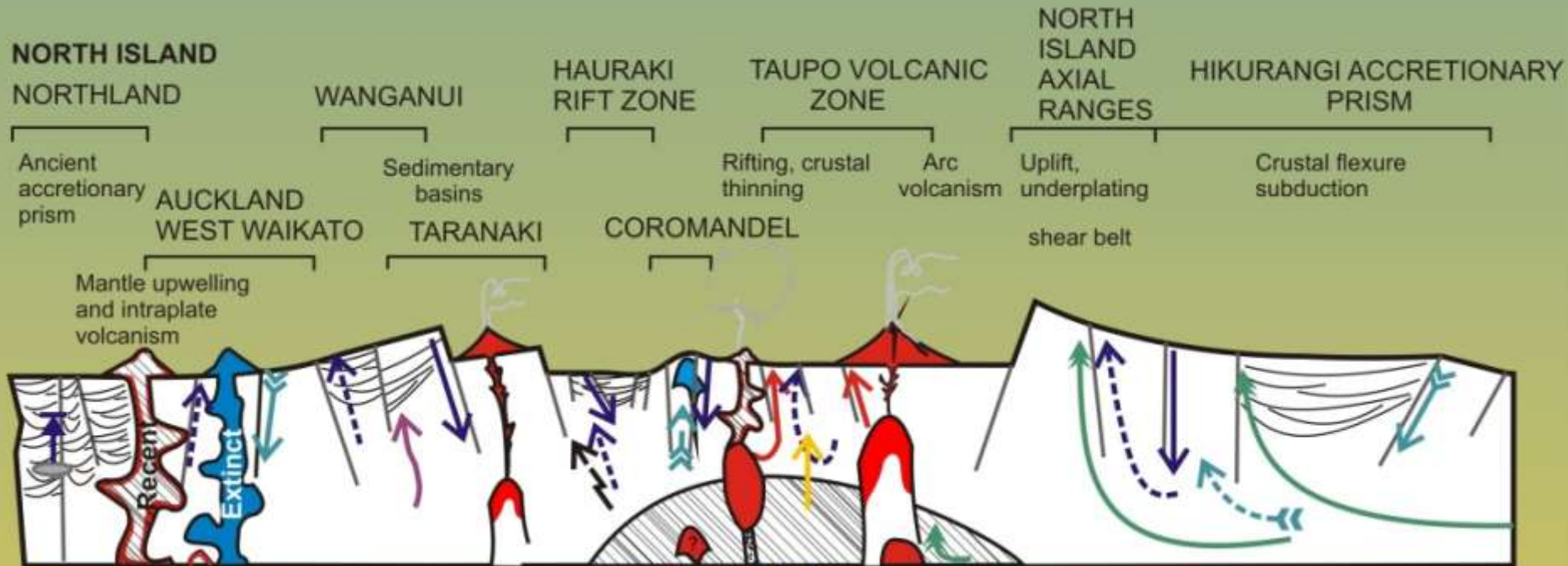
# ESTIMATED SUBSURFACE TEMPERATURES

## LOW-TEMPERATURE THERMAL SPRING SYSTEMS

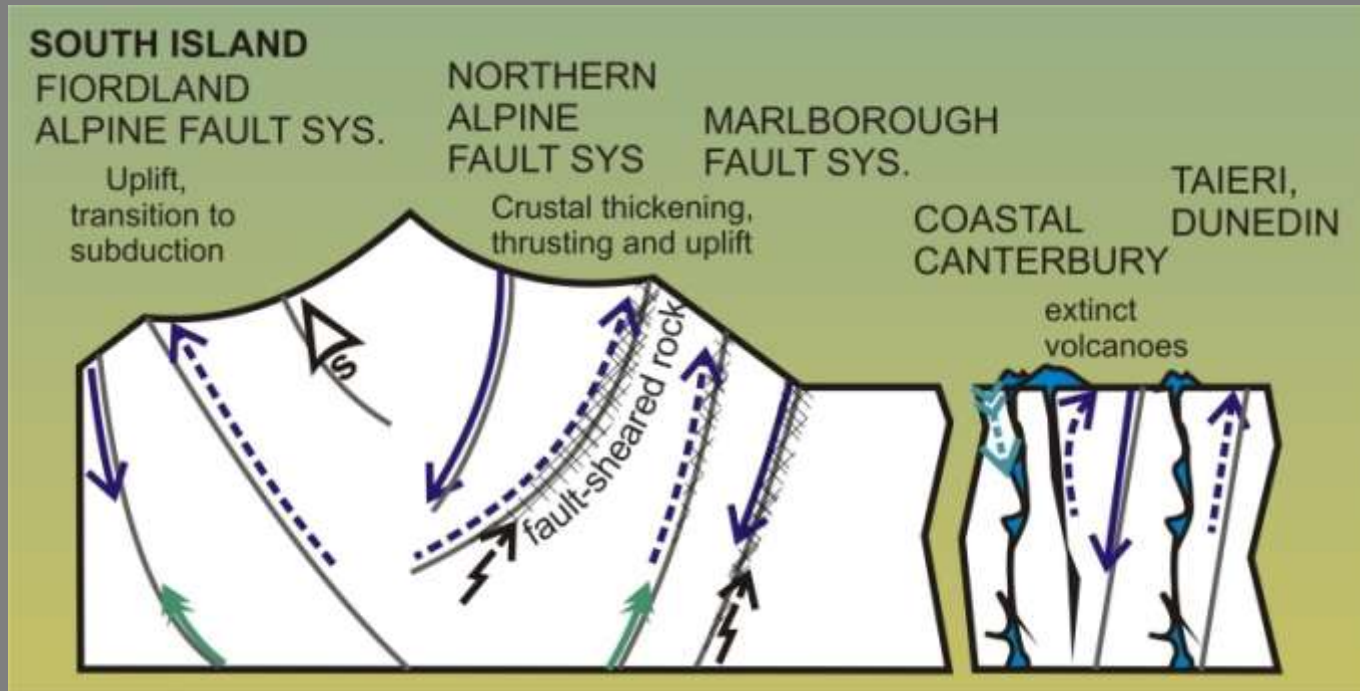


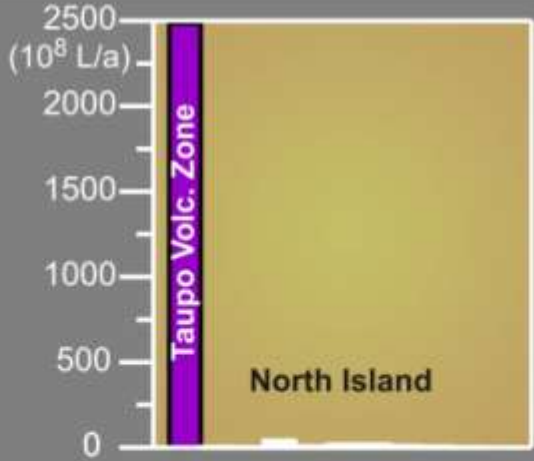
Subsurface T <100 to 250°C

# NORTH ISLAND TECTONIC SETTING

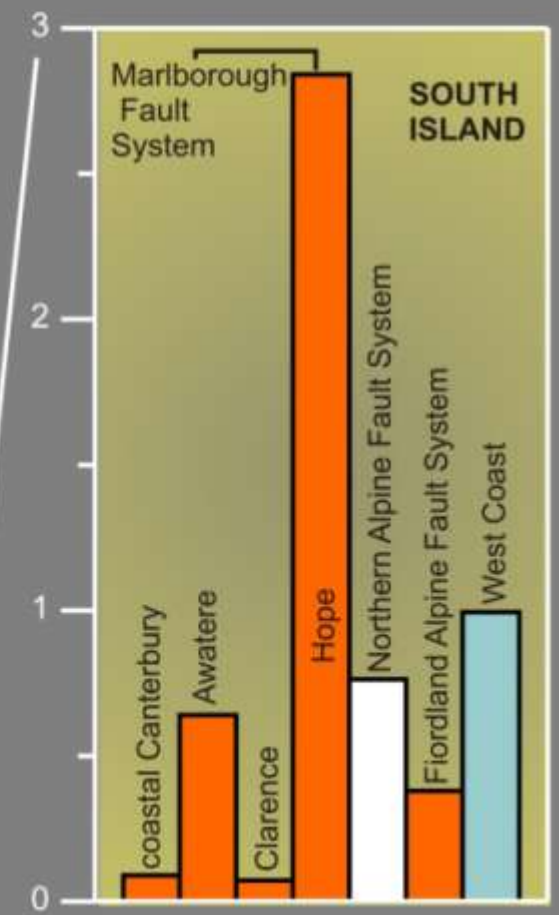
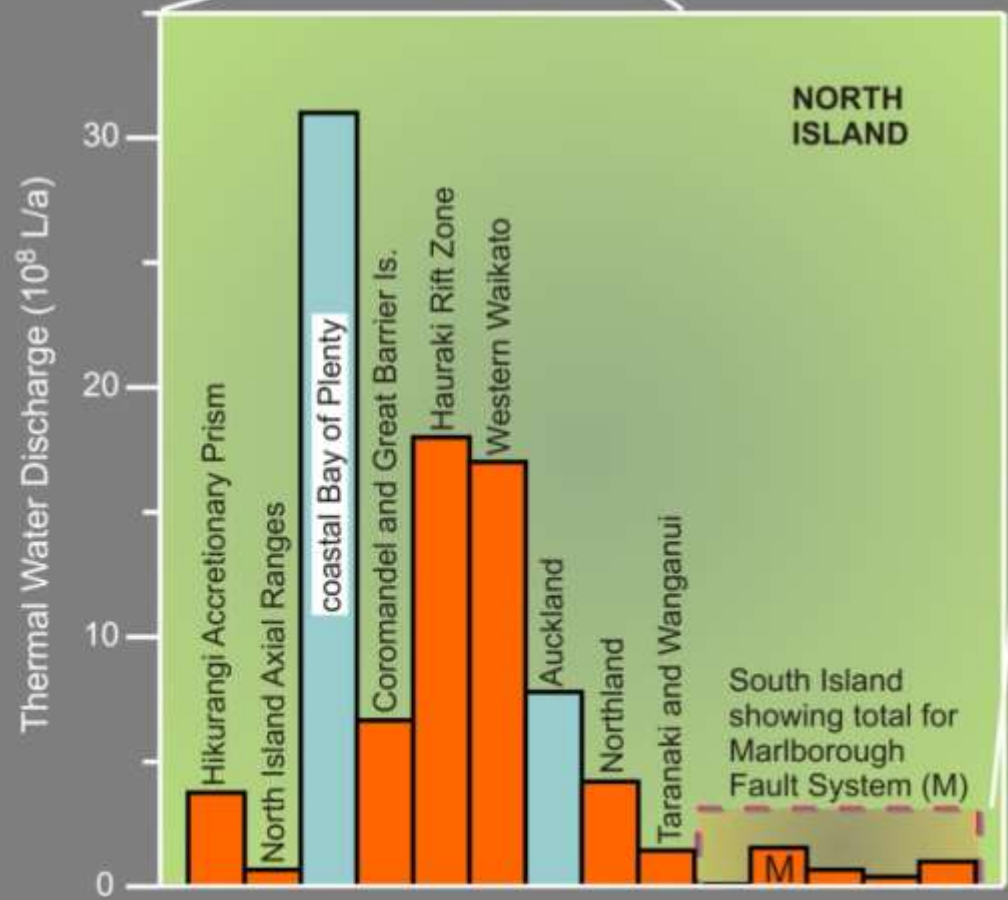


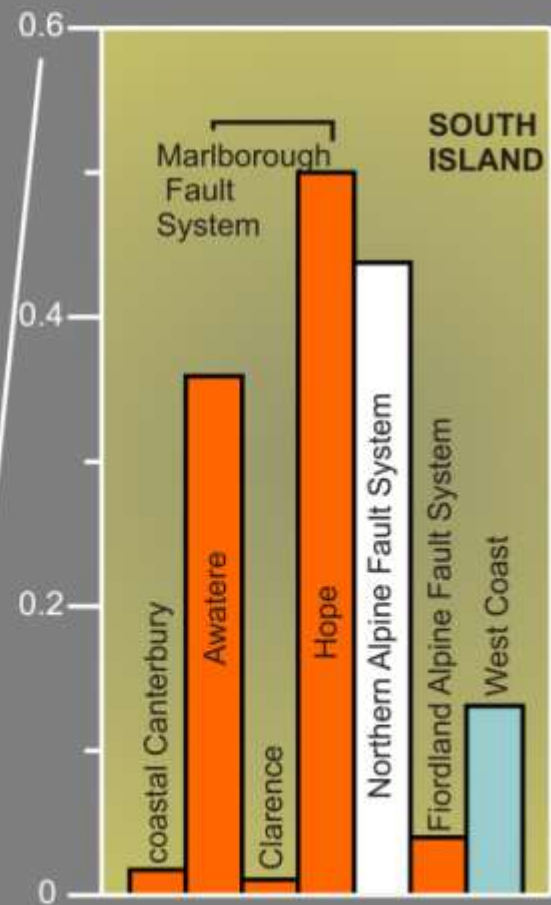
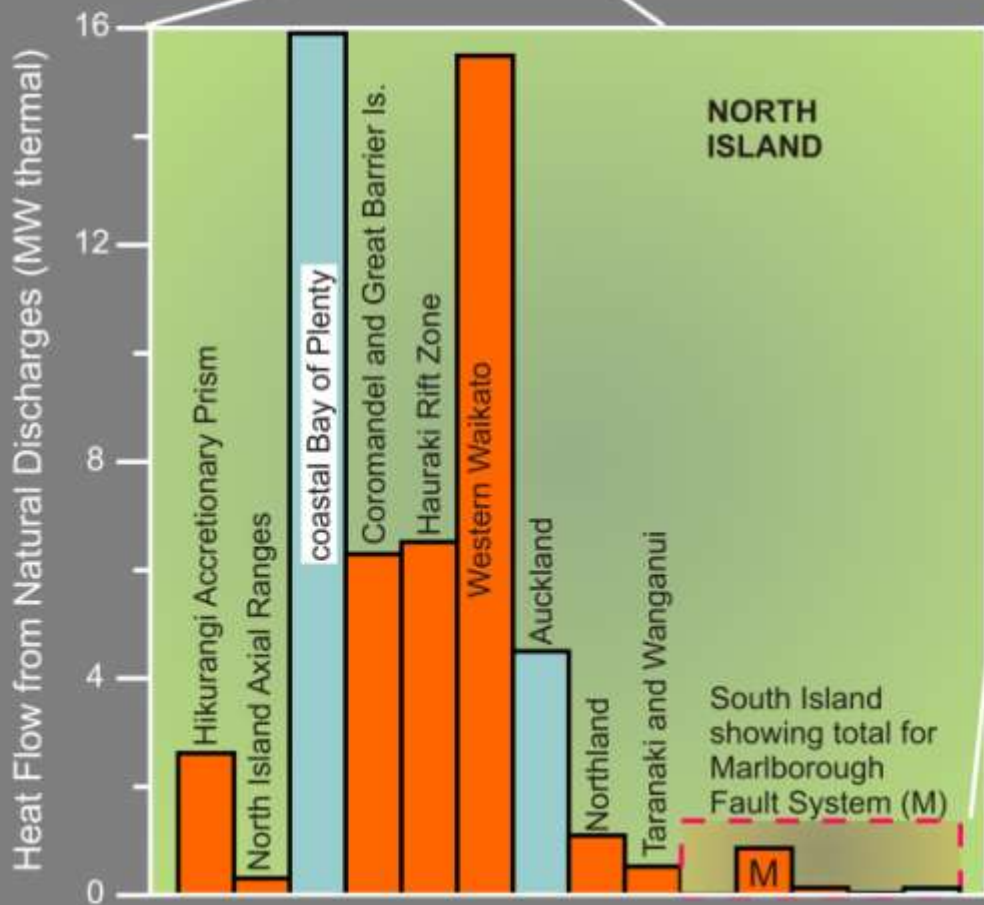
# SOUTH ISLAND TECTONIC SETTING



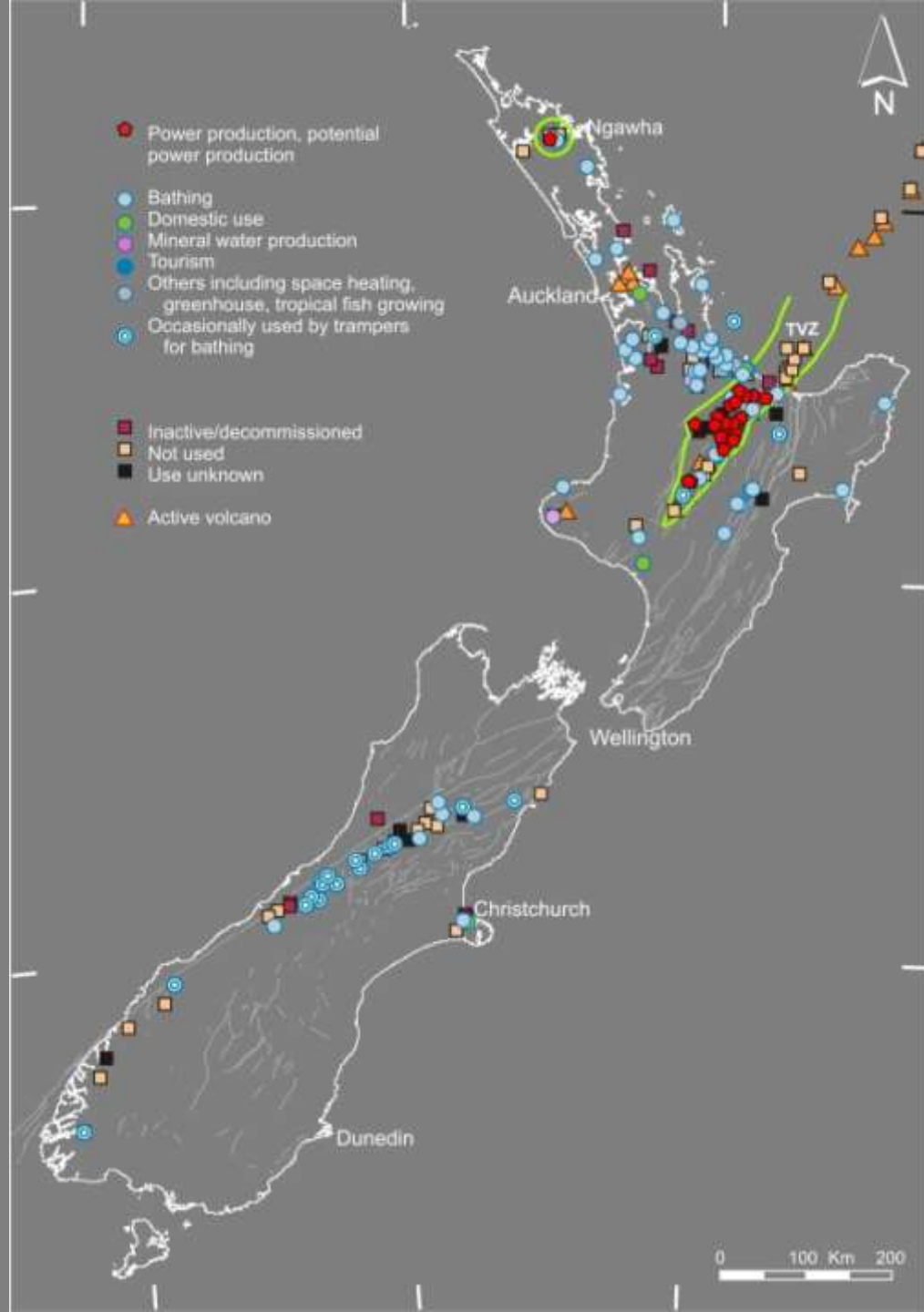


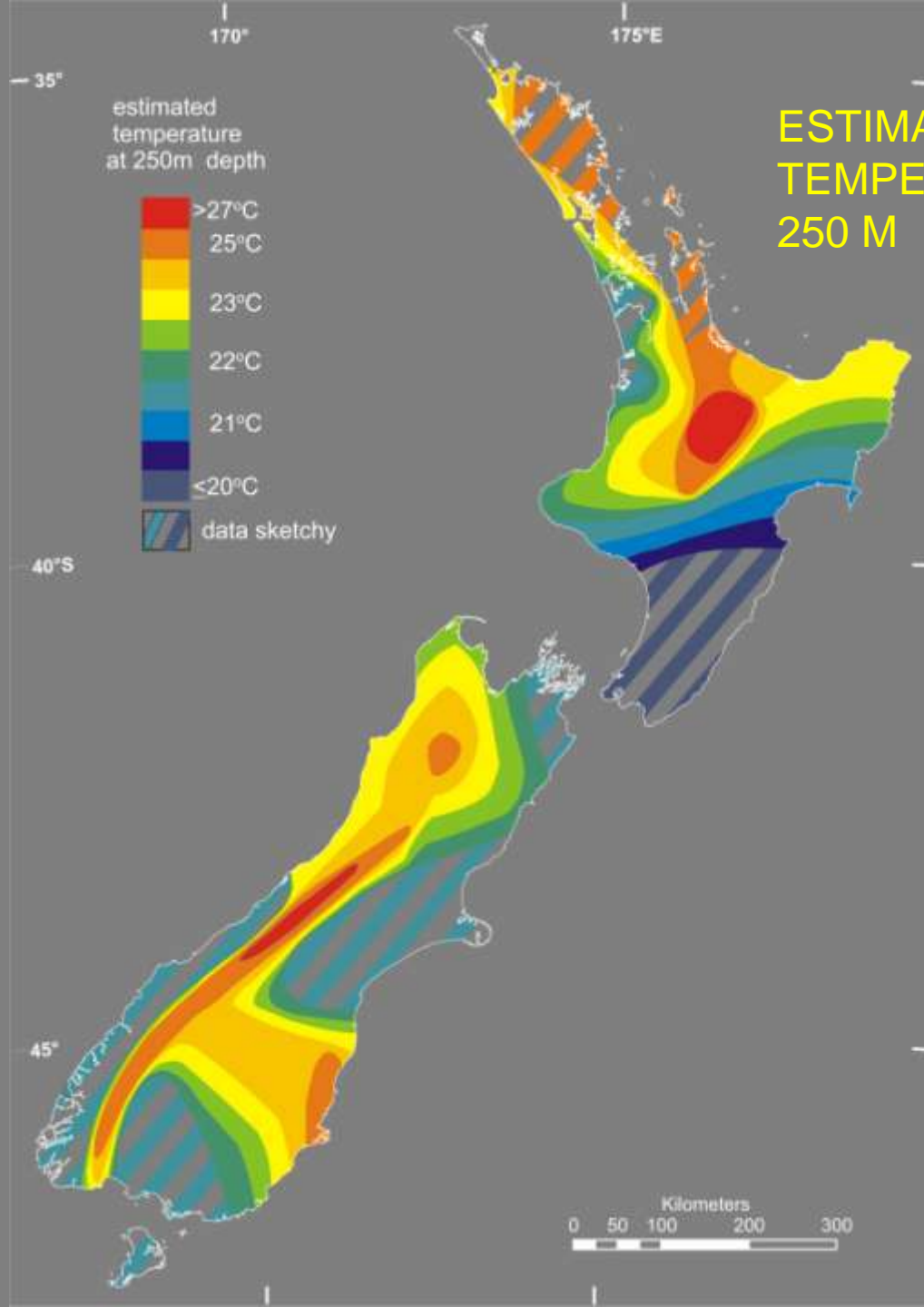
- Only well discharges available
- Spring discharges
- Some flows estimated from literature

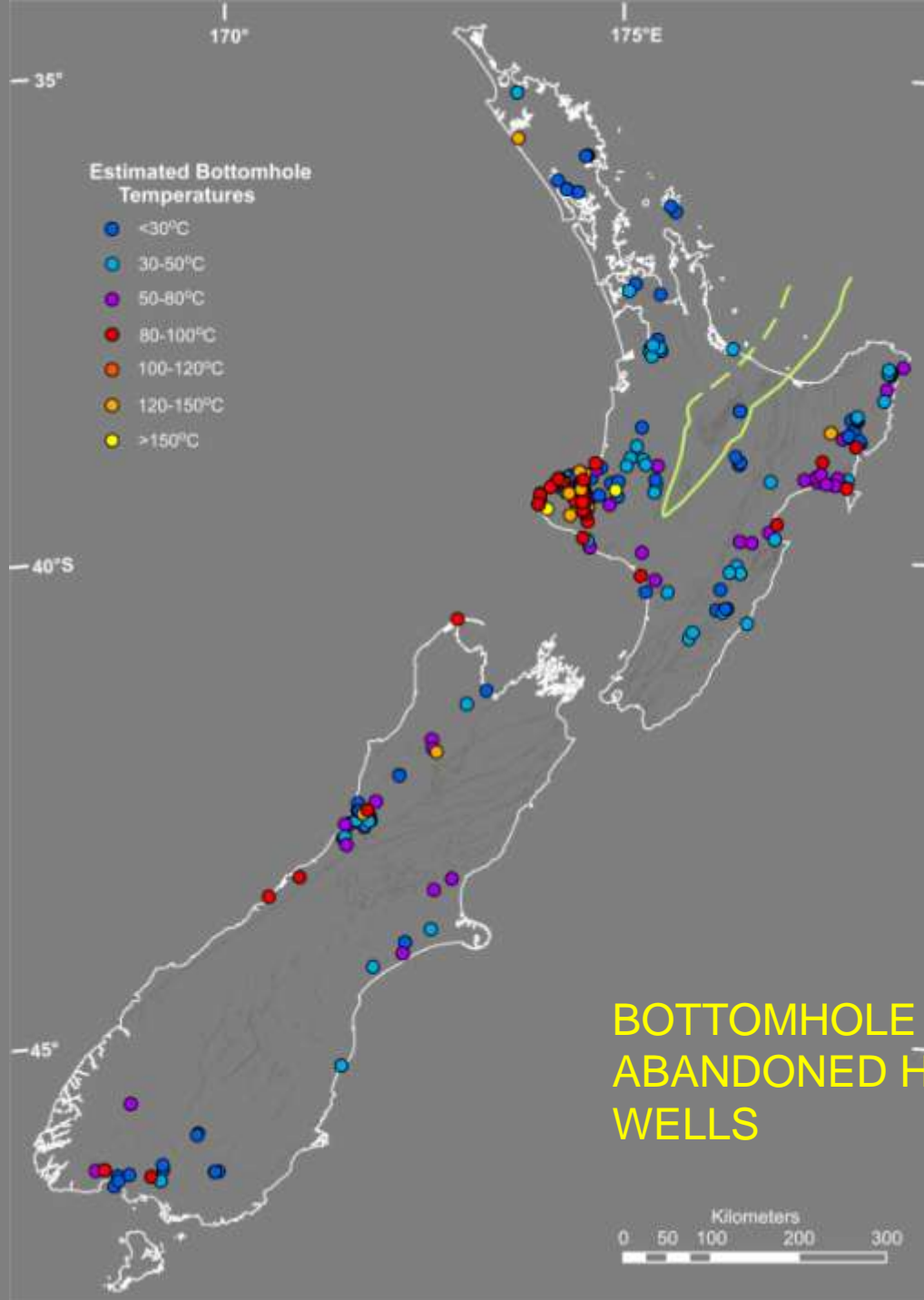




# PRESENT USE OF THERMAL SPRINGS

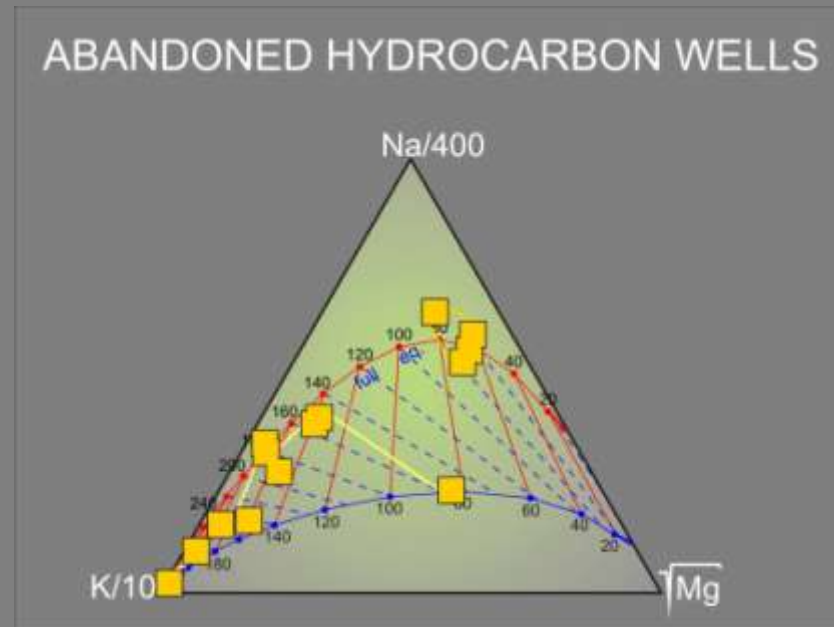






**BOTTOMHOLE TEMPERATURE,  
ABANDONED HYDROCARBON  
WELLS**

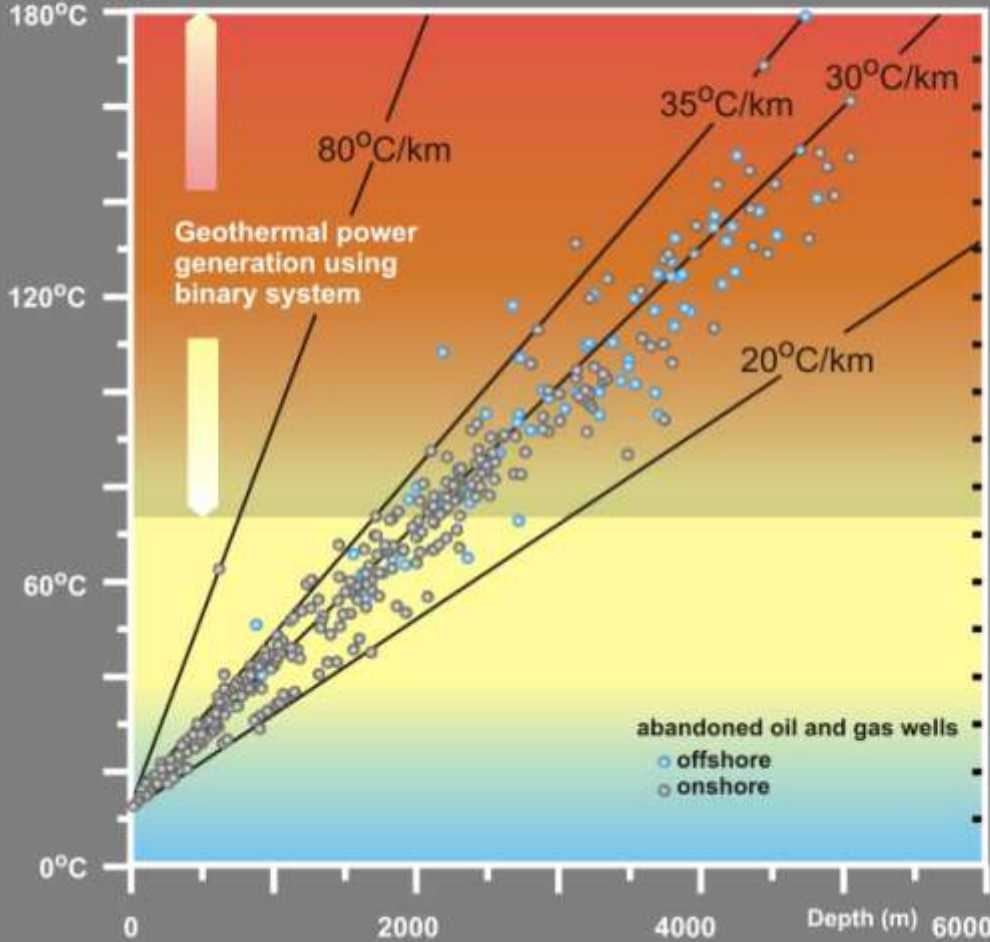
# ESTIMATED FLUID TEMPERATURE, ABANDONED HYDROCARBON WELLS



Subsurface T 50 to 250°C

# POTENTIAL USES OF HEAT FROM ABANDONED OIL AND GAS WELLS

Bottomhole Temperature  
180°C



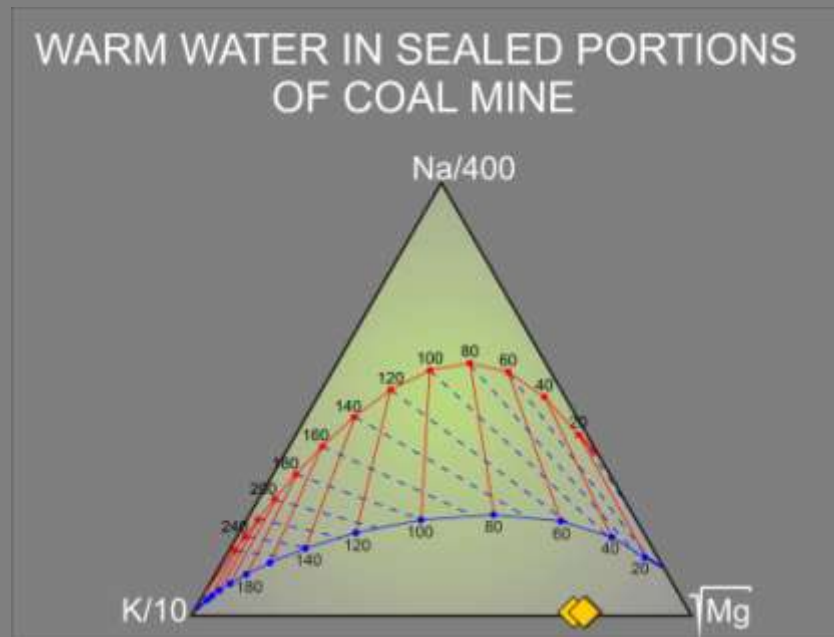
## Direct Heat Uses

- Evaporation of highly concentrated solutions
- Refrigeration by ammonia absorption, digestion in paper pulp, kraft
- Heavy water via hydrogen sulphide process
- Drying of diatomaceous earth
- Drying of fish meal, timber
- Alumina via Bayer's process
- Drying farm products, canning food
- Evaporation in sugar refining
- Extraction of salts
- Fresh water by distillation
- Most multiple effect evaporations, concentrations of saline solutions
- Drying and curing of light aggregate cement slabs
- Drying of organic materials, grass, seaweed, etc
- Washing and drying of wool
- Drying of stock fish, intense de-icing operations
- Space heating, greenhouses
- Refrigeration
- Animal husbandry, greenhouses
- Mushroom growing, balneological baths
- Soil warming
- Swimming pools, biodegradation, fermentation
- Hatching of fish, fish farming

Heat pumps

Lindal Diagram

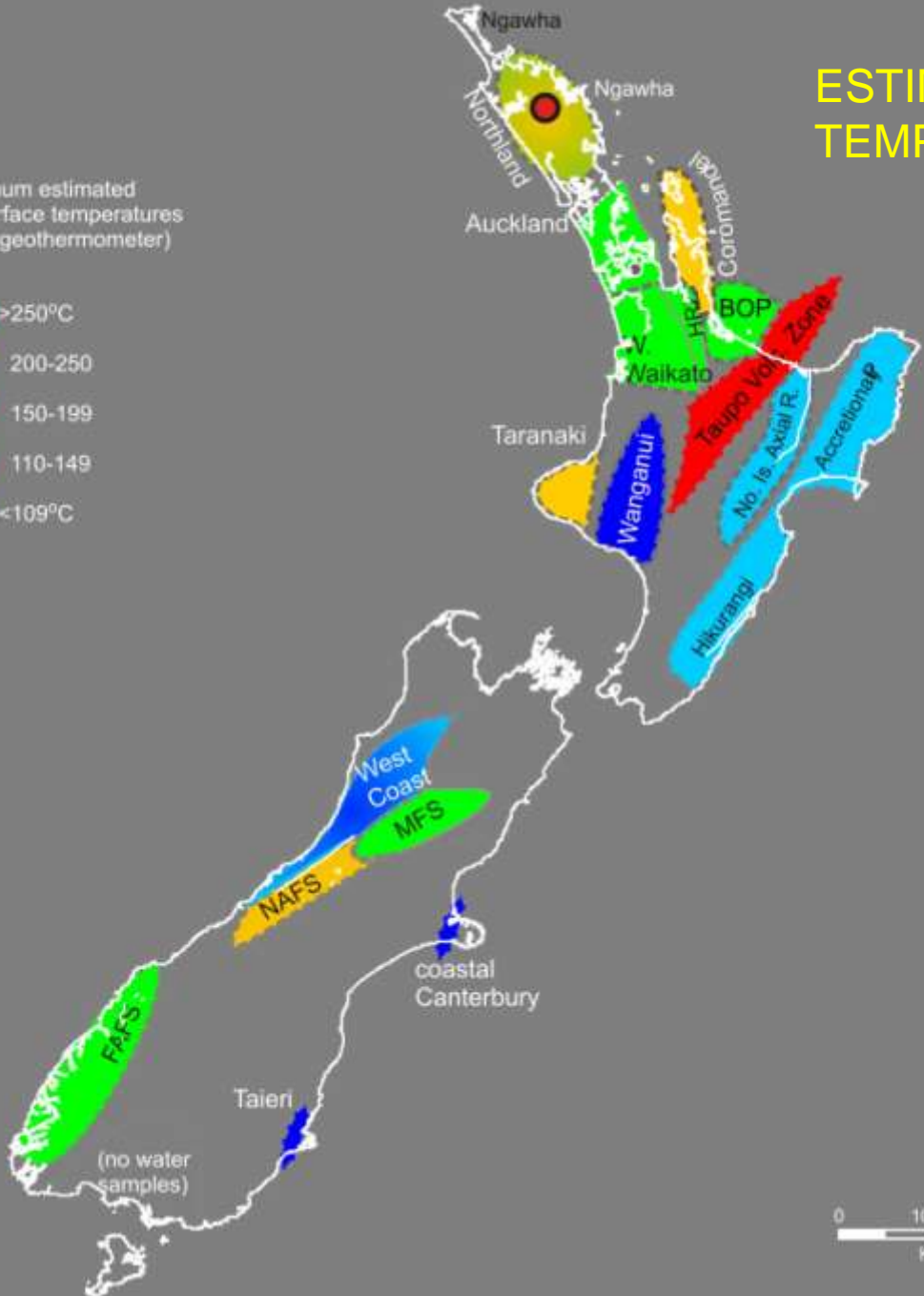
# ESTIMATED TEMPERATURE, COAL MINE WATER

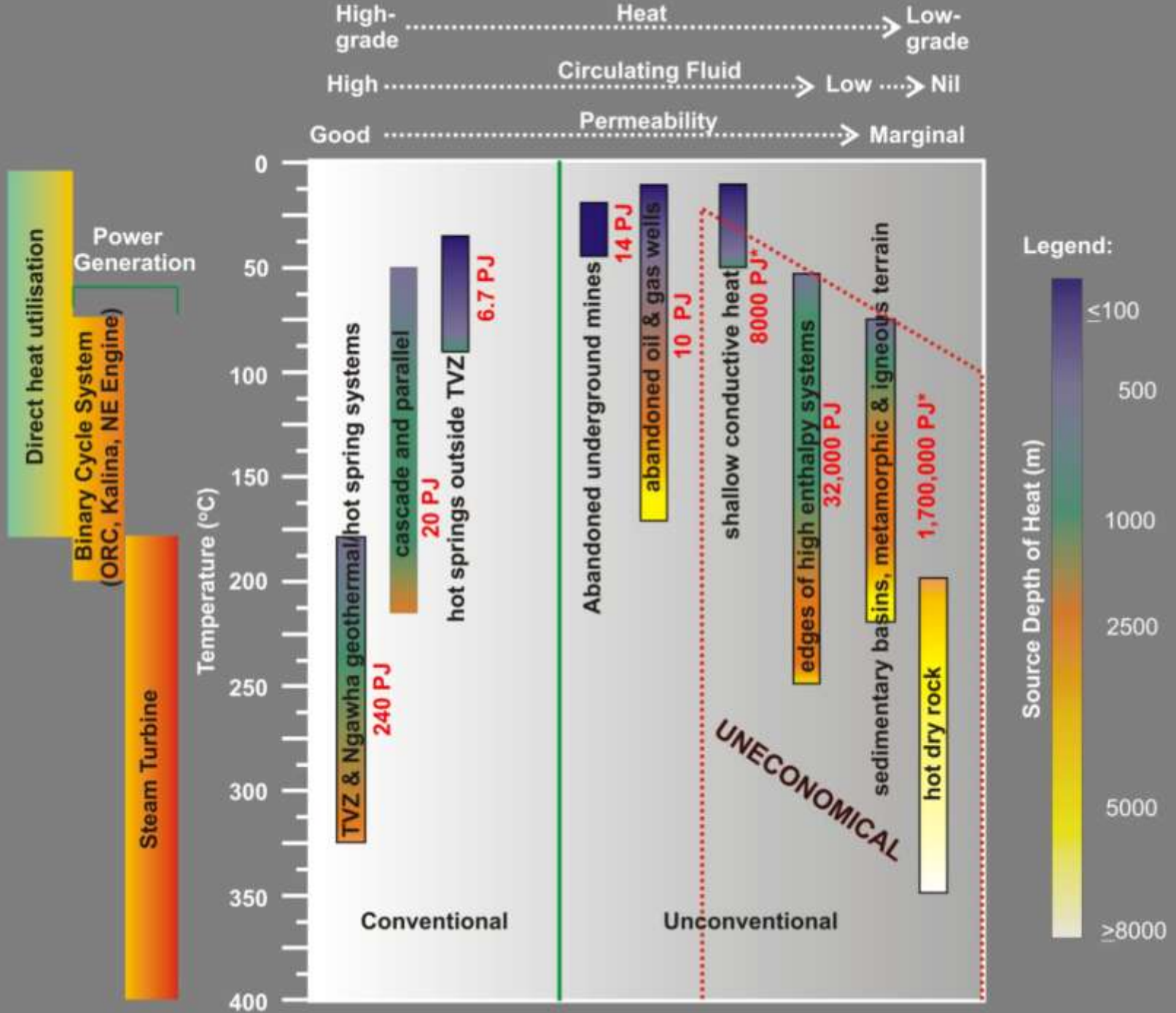


# ESTIMATED FLUID TEMPERATURE

Maximum estimated subsurface temperatures (K/Na geothermometer)

- >250°C
- 200-250
- 150-199
- 110-149
- <109°C





*THANK-YOU*



