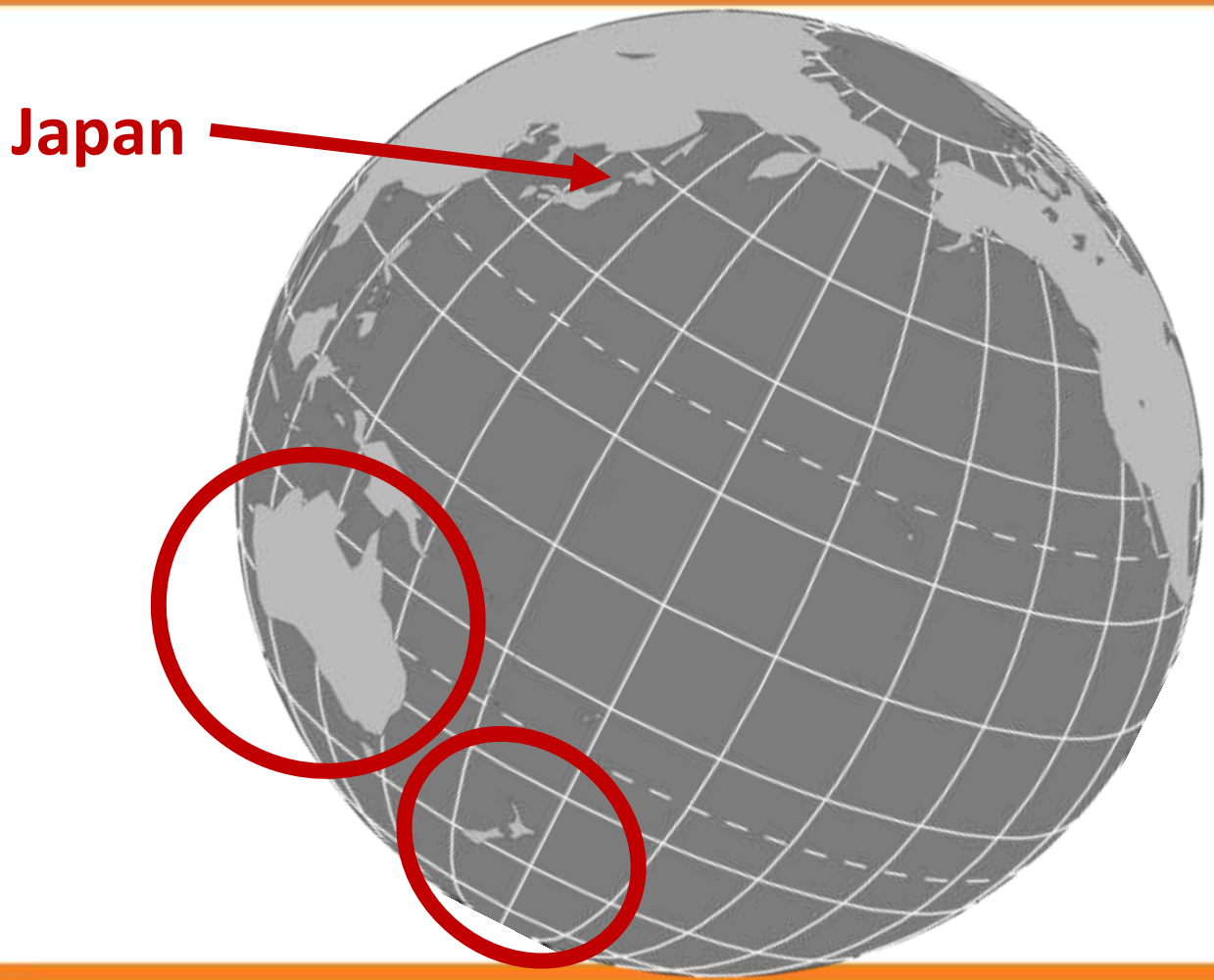
GHANZ
GEOTHERMAL HEAT-PUMP ASSOCIATION OF NEW ZEALAND

Geothermal Heat Pumps
2014 New Zealand Review

IEA-GIA Annex 8 Task A Workshop 19 October 2014

AIST Renewable Energy Centre, Koriyama, Japan

Where are we !!



info@ghanz.org.nz

Presentation Outline

- Introduction
- GNS
- New Zealand snapshot
- Heat Pump Market
- Market Barriers
- Research
- Its All About Awareness
- Future directions

Introduction – Brian Carey

- **Geothermal Resource Management Specialist**
  GNS Science
- **President New Zealand Geothermal Association**
- **Chair – Geothermal Heat Pump Association of NZ**
  GHANZ
- **Career in Geothermal Energy**
  Spans over 30 years
- **Mechanical Engineer**

GNS Science

Chief Executive — **Dr Mike McWilliams**

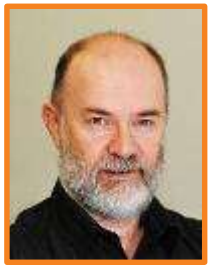
Finance | Strategy | Maori Strategy | Human Resources | Business Development | Research

Information Services | **Geological Resources** | **Natural Hazards** | **Environment and Materials**

Geological Time
Hydrocarbons
Geothermal Science
Geomicrobiology
Marine Geoscience

Dr Kevin Faure

Group Manager Geological Resources



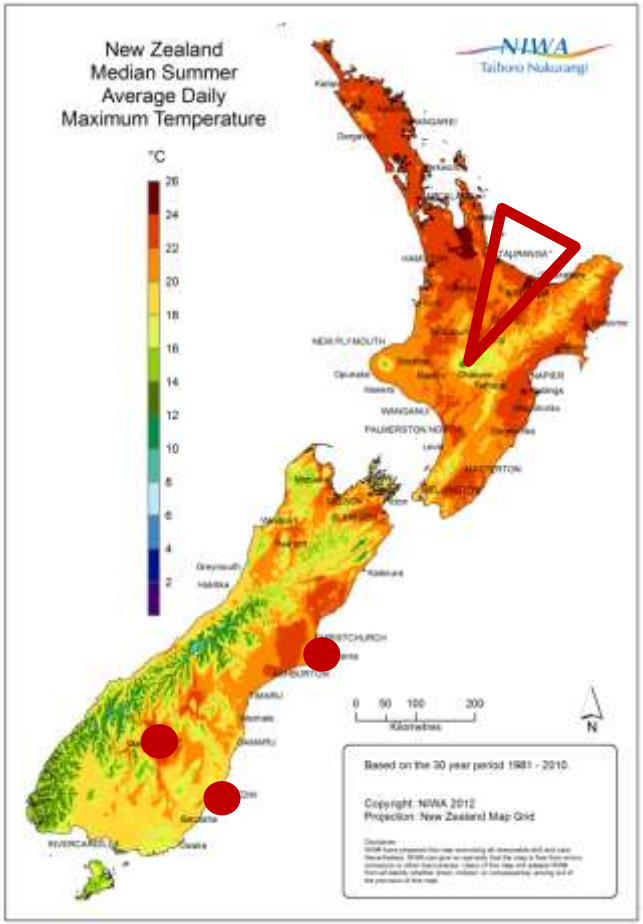
Dr Greg Bignall

Head of Department

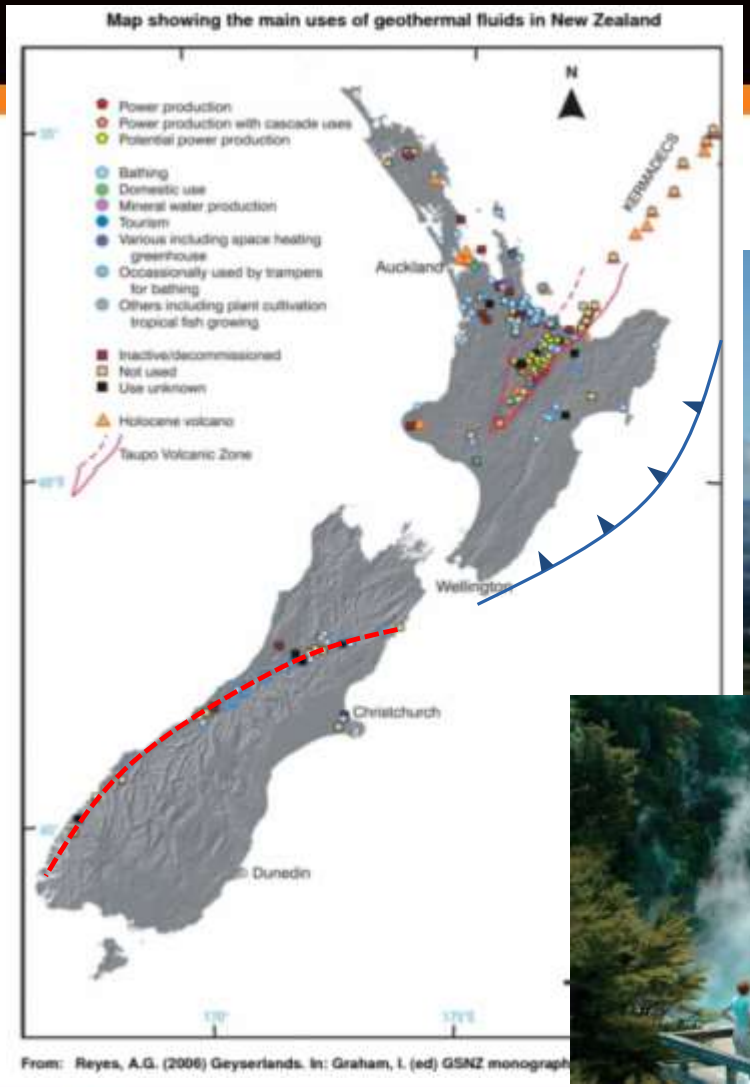
Geothermal Science

New Zealand - Snapshot

- **Land Mass: 267 710 km²**
- **Population : 4.4 million**
- **Climate : Temperate**
  - sharp contrasts from area to area
- **Ground temperatures : 8 – 19 ºC**
- **Ambient : -15 to 35ºC**
- **Active geothermal areas**

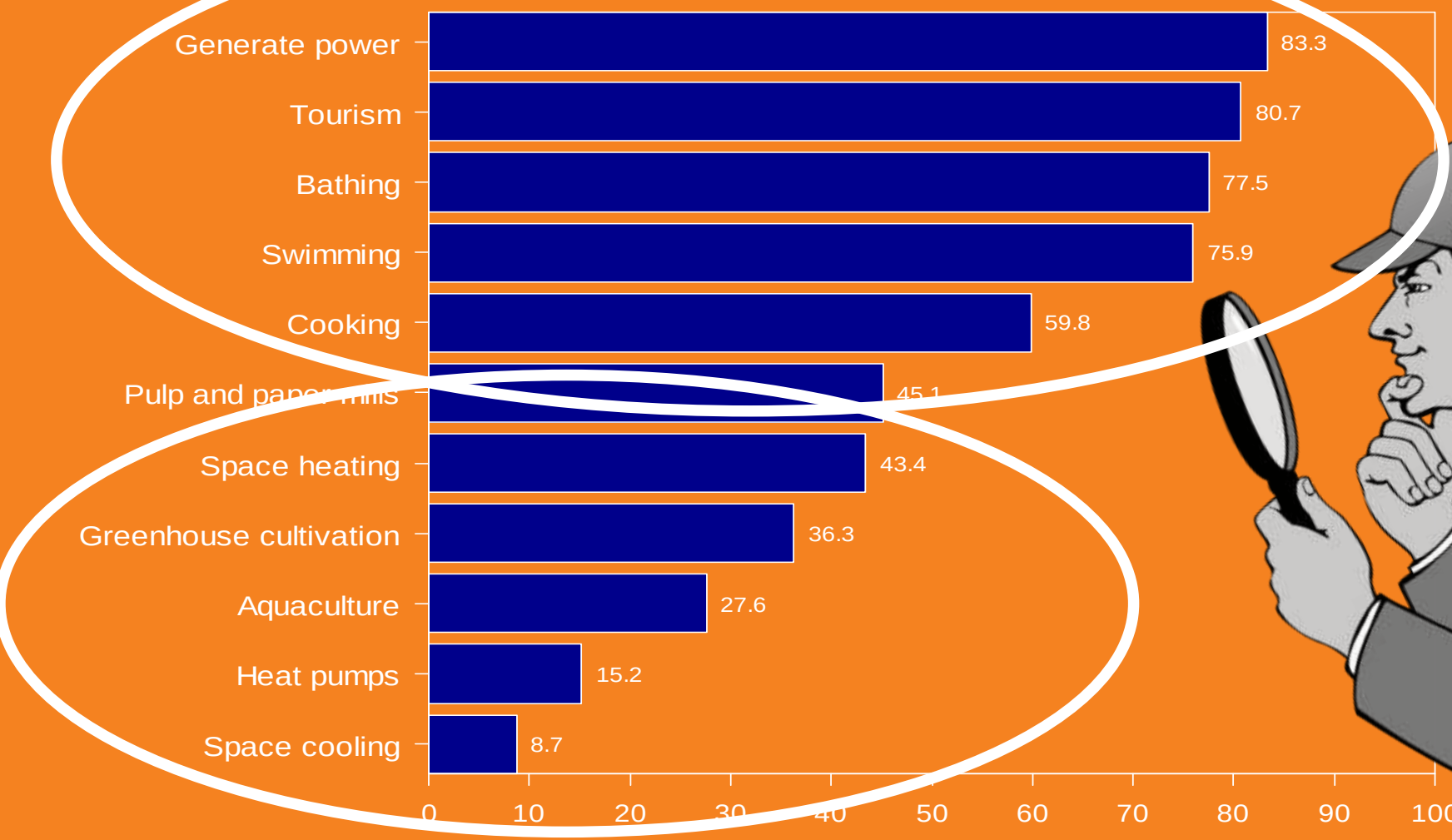


Geothermal

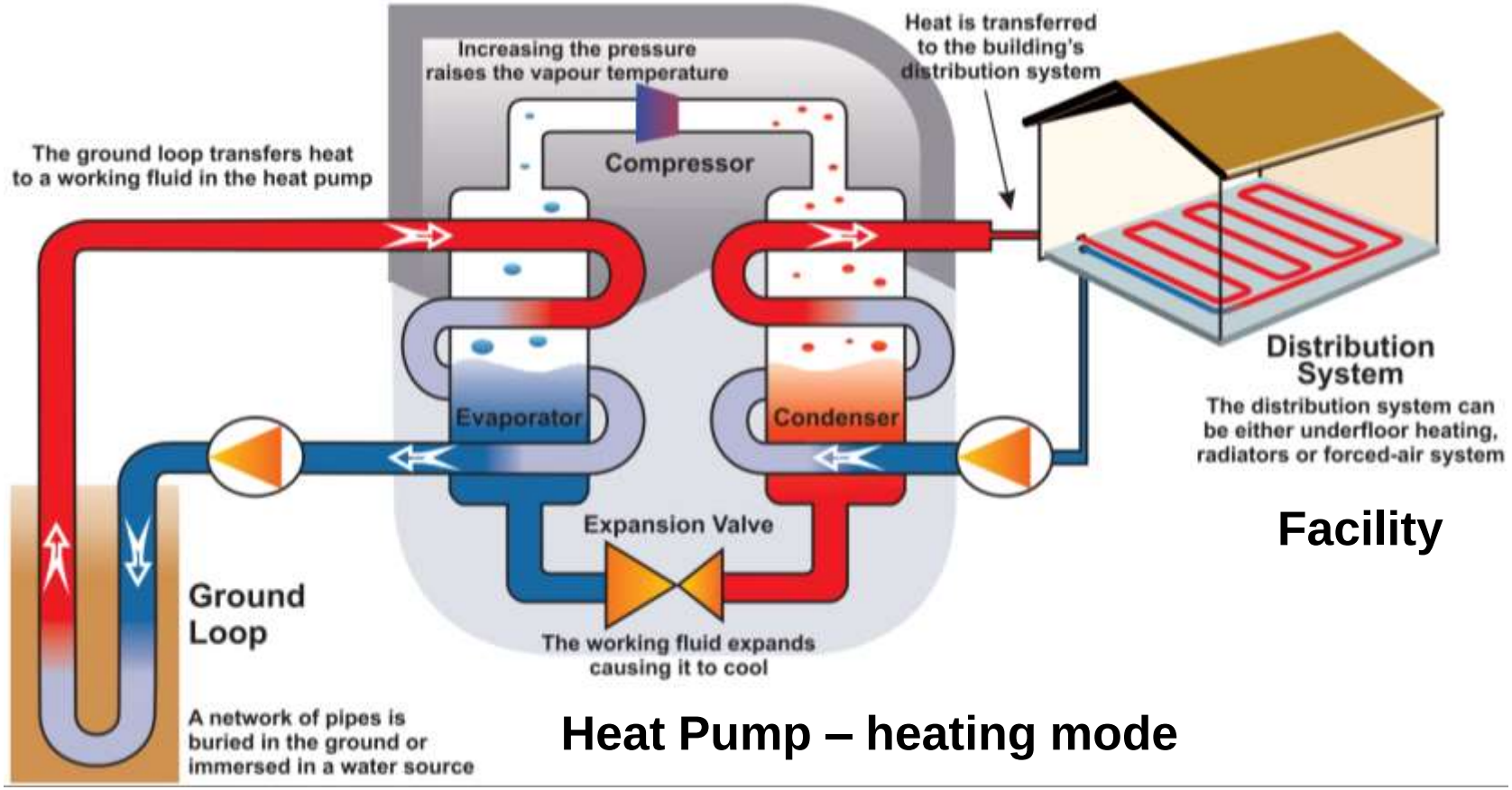


From: Reyes, A.G. (2006) Geyserlands. In: Graham, I. (ed) GSNZ monograph

NZ Geothermal Awareness



Geothermal Heat Pumps



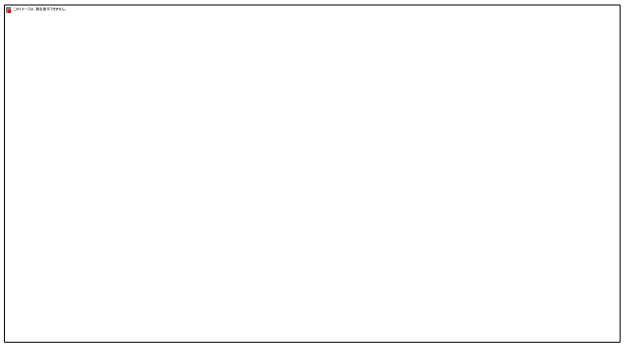
Facility

Heat Pump – heating mode

Ground Side

Geothermal Heat Pumps

- **Currently less than 200 installations**
  - Domestic heating
  - Resort climate control
  - Public swimming pools
  - Town halls
  - Airport terminals



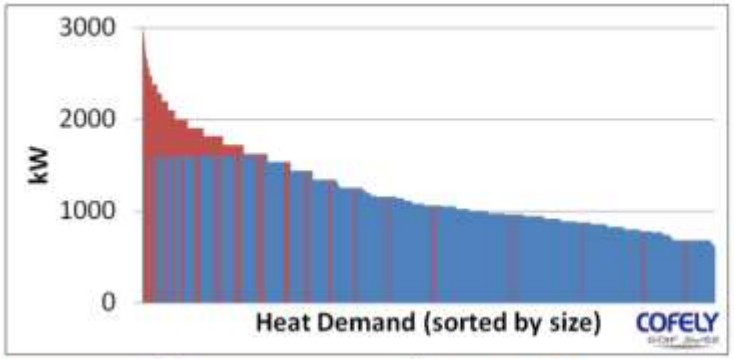
Queenstown Family Home

Manuka Point Lodge

Christchurch International Airport

As part of the rebuild of Christchurch

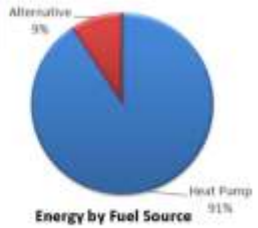
- City energy nodes being established
- Some will use groundwater at 12 ºC as the major source and sink for energy (≈ 90%)
- 10% will be topped up by other energy sources



Solution	Installation	Est. Capital Cost
Individual	5 MW	~$3.5m
DES Integrated	1.5 MW	~$2.5m

PIONEER GENERATION

Cowley Services



www.pioneergen.co.nz/assets/assets/PDF/140623-Christchurch-DES-Presentation-r6.pdf

Uptake Barriers

- Lack of awareness
- Limited consumer confidence
- Approach to environmental comfort
- High capital installation cost
- Absence of market infrastructure
- Professional advisor reluctance

Plenty of potential for growth

Geothermal Heat-pump Association of NZ

- Formed in 2012
- Amalgam of parties
- Raise the profile of ground heat
- Charter
- Web presence

  www.ghanz.org.nz
- Strategic Action Plan – 2014
- Brand

GHANZ

GHANZ Vision

- **Energy from the ground right across New Zealand**

GHANZ Charter - Purpose

To work collaboratively across the geothermal heat pump sector :

- *Expand the market in New Zealand*
- *Promote geothermal heat pump technology*
- *Promote top quality products and professional standards*
- *Develop training and standards for installers and designers*
- *Engage with equivalent organisations overseas*
- *Provide a forum for members*
- *Serve as a point of contact for anyone seeking advice and information*
- *Maintain a website*

Connections

New Zealand Geothermal Association

EECA

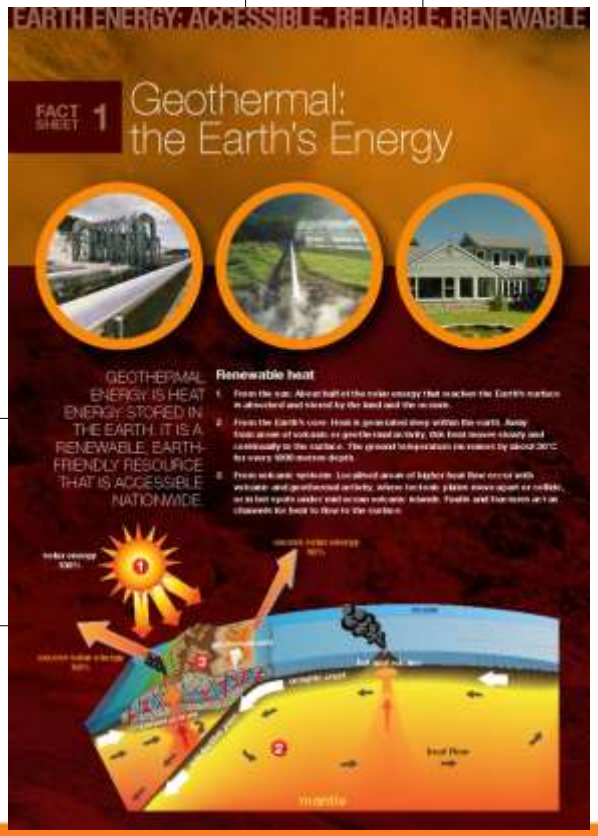
GHANZ

Climate Control Companies Association

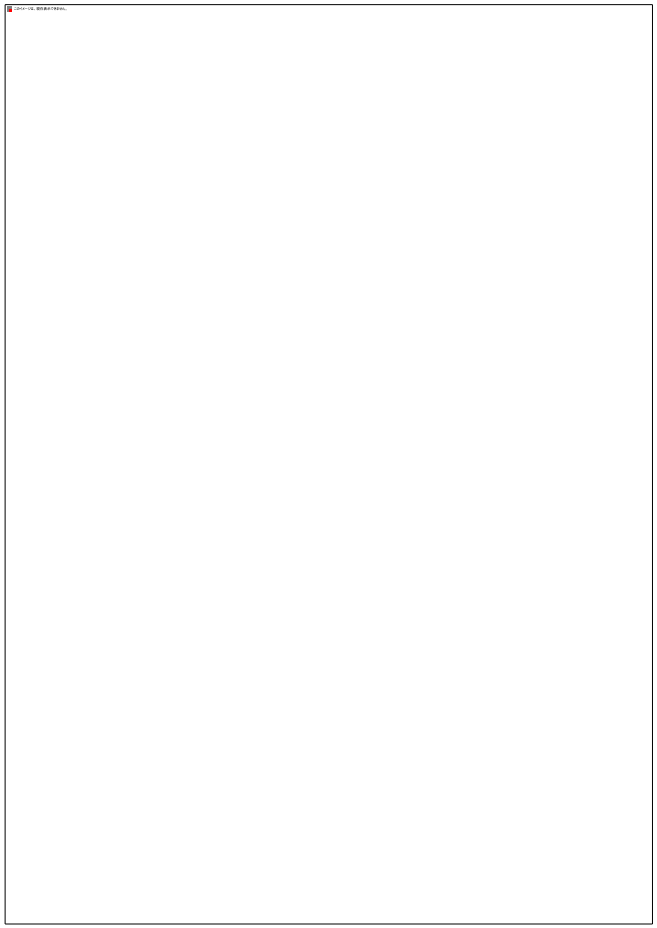
IRHACE New Zealand
The Institute of Refrigeration, Heating and Air Conditioning Engineers of New Zealand Inc.

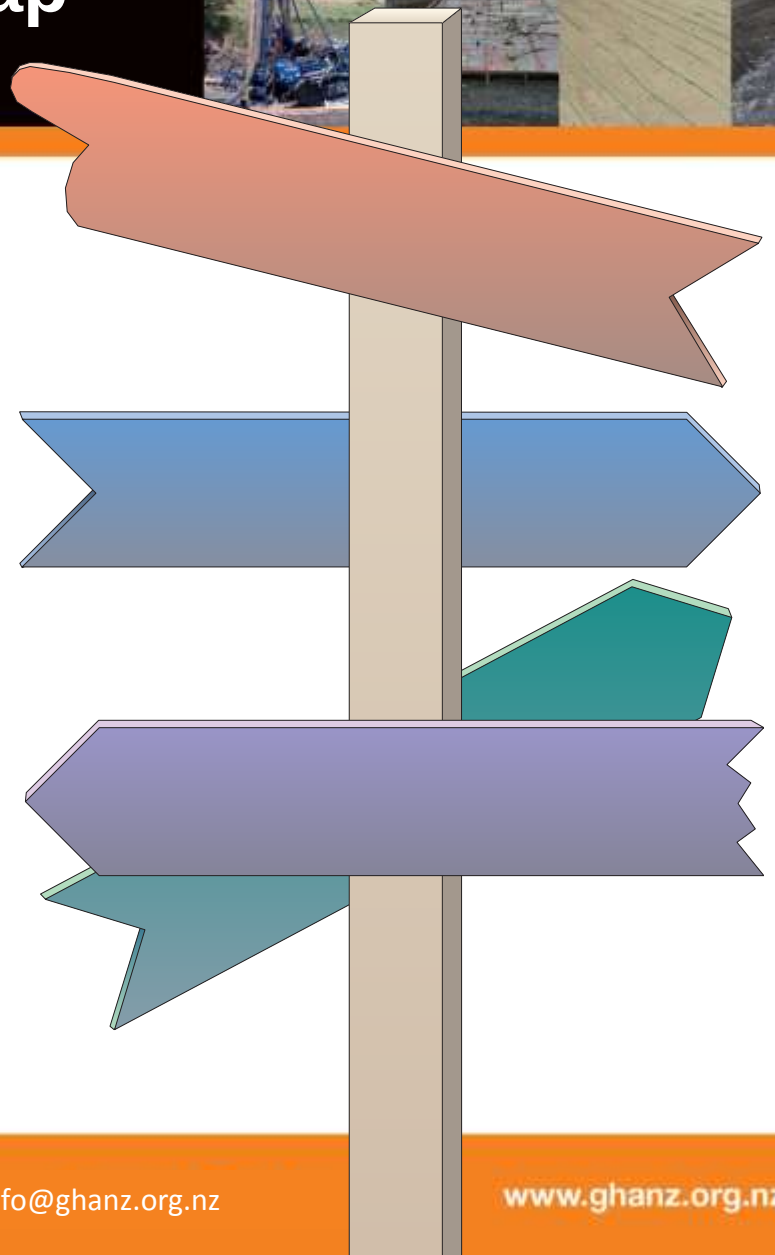
GNS Science Te Pū Ao

Information



Low Temperature Road Map

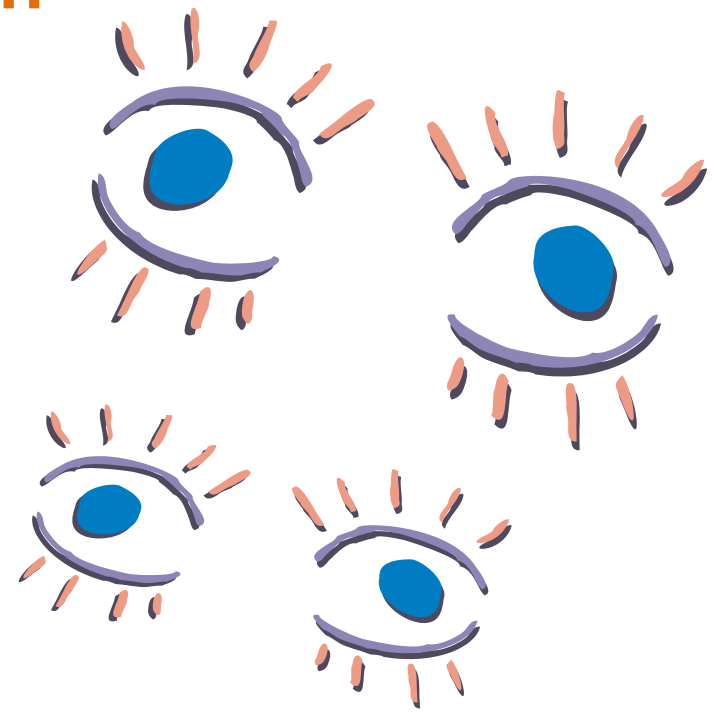




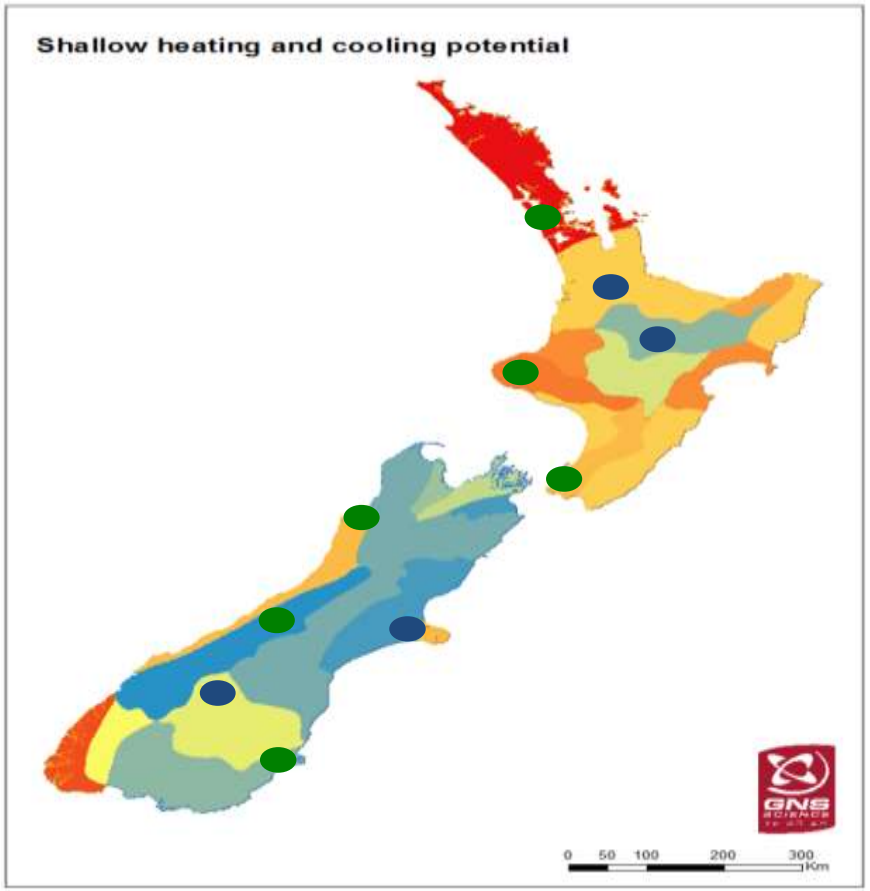
Geothermal Use Database

Technology Adopters

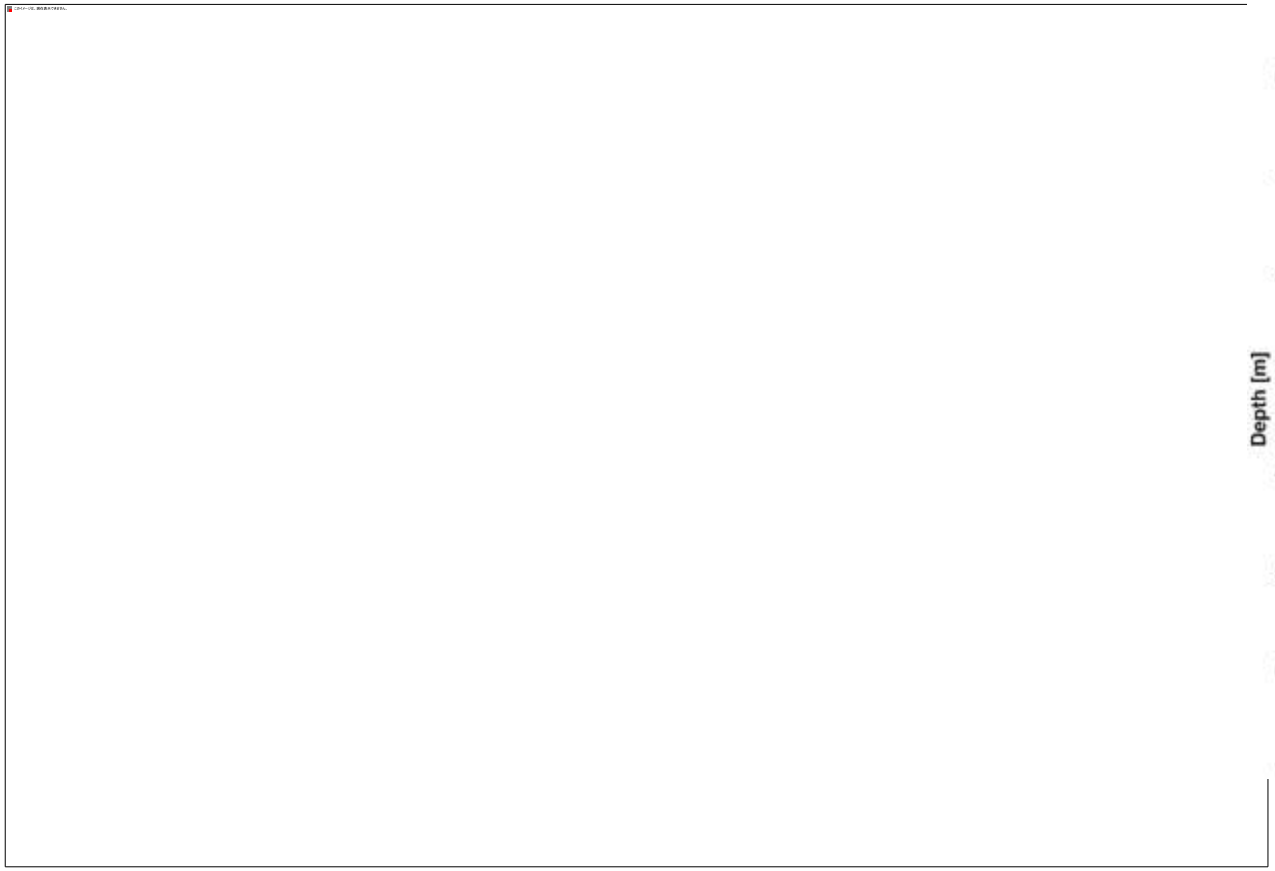
- NZ is not big enough to fund significant effort into primary GHP research
- Our approach
  - Watch
  - Adapt
  - Adopt

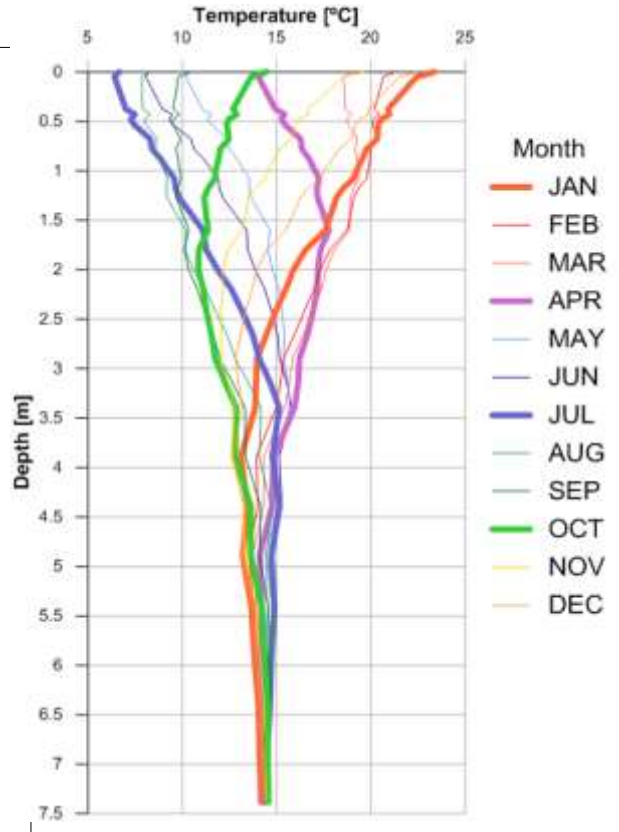


Doing Some Research

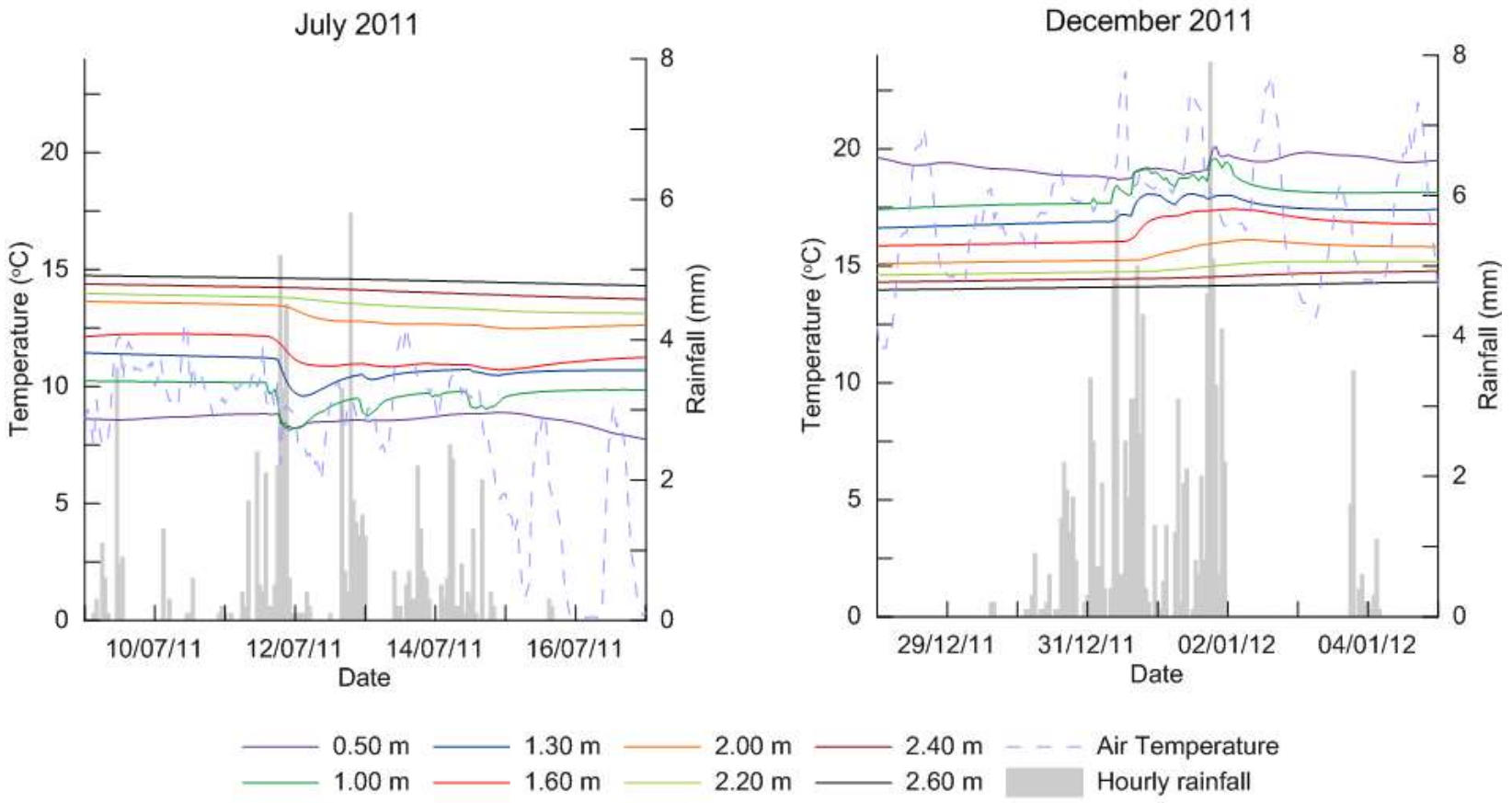


Variation in Temperature





with Rain


July 2011
December 2011
Temperature (°C)
Rainfall (mm)
Date
10/07/11
12/07/11
14/07/11
16/07/11
29/12/11
31/12/11
02/01/12
04/01/12
0.50 m
1.00 m
1.30 m
1.60 m
2.00 m
2.20 m
2.40 m
2.60 m
Air Temperature
Hourly rainfall

IGSPHA

- **IGSHPA Australasia formed in 2013**
  - Established collaborations between New Zealand and Australian GHP organisations
  - Improve training opportunities
  - Possibly prepare shared industry standards

- **Opportunity to learn from each other and the international market sector**

Where to from here?

- Raise awareness
- Raise the profile
- Adapt the technology
- Foster the up take
- Watch the growth of renewable ground heat technologies

GHANZ

- **Want to know more join GHANZ !**
- **Sign up for NZGA membership and tick the Heat Pumps box on the application form**
- **$ NZ 100/year per individual or $ NZ 20/year student**

NEW ZEALAND GEOTHERMAL ASSOCIATION

GHANZ

www.ghanz.org.nz

Questions / Discussion ?

www.ghanz.org.nz

GHANZ

Thanks