Heat-flow measurements

- Weight stand including pressure cases for data acquisition
- Sensor string, containing 22 thermistors and heater wires
- Strength member
- Recorder pressure vessel
- Tripping arm
- Trigger weight
- Piston corer
- Thermistor probe: 1 at 20 m, 2 at 40 m, 10 at 60 m, 5 at 80 m, 2 at 100 m
- Cutting edge
Oceanic heat-flow measurements
North Atlantic
Heat-flow histograms

Basins

Ridges

Trenches
Atlantic heat-flow profile

Mid-Atlantic Ridge Profile

Ridge Flank

Basin

HEAT FLOW

DISTANCE
Pacific heat-flow profile

Trans-Pacific profile of heat flow and station elevation

- Heat flow
- Station elevation

Heat flow, h.f.u.

Depth, km

Japan Sea
Shatsky Rise
Japan Trench
Hawaii
East Pacific Rise

Distance degrees

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

30°S
90°W

Basin average
MOR heat flow

Fe–Mn oxide and hydroxide deposits at surface

Sulphides may be deposited in stockwork and at the surface

Flow of seawater

Magma chamber

Heat flow vs distance
Heat flow and age provinces
HEAT FLOW NORTH PACIFIC

1 OBSERVED HEAT FLOW
THERAPEUTICAL HEAT FLOW
L = 125 KM, T = 1550°C, Kb = 5.6 x 10^8 cal cm^2 s^-1, V = 5 cm yr^-1
L = 0.1 x 10^8 cal cm^2 s^-1, D = 0.3 x 10^8 cal cm^2 s^-1

2 L = 100 KM, T = 1475°C, K = 7.12 x 10^8 cal cm^-1 s^-1, other parameters as in 1

L = 100 KM, T = 1475°C, K = 7.12 x 10^8 cal cm^-1 s^-1, V = 4 cm yr^-1, other parameters as in 1

3 L = 75 KM, T = 1400°C, K = 5.96 x 10^8 cal cm^-1 s^-1, V = 3 cm yr^-1, other parameters as in 1

3A L = 75 KM, T = 1400°C, K = 5.68 x 10^8 cal cm^-1 s^-1, V = 4 cm yr^-1, other parameters as in 1

TOPOGRAPHY ALONG 20°N NORTH PACIFIC

DISTANCE FROM RIDGE CREST IN KM

LITHOSPHERE
ASTHENOSPHERE
Observed sea-floor elevation $D \approx -2500 + 350 \sqrt{t}$
The boundary layer model

AGE (m.y.)

DEPTH (km)

TEMPERATURE (°C)
Predicted heat flow and elevation