

# Throughflow: NTA-3 Preliminary Report

Nicholas Fraser

## Neogene Circulation Patterns and Biogeography of Foraminifera in the Indo-Pacific Connection

Christian-Albrechts University of Kiel



# Project Objectives

“To provide constraints on the timing and magnitude of environmental changes in the Indonesian Throughflow on glacial/interglacial timescales”

# Outcomes of NTA-2

- Took 167 samples from 10 localities, mainly clustered around Samarinda. The largest continuously sampled sections were at TF101, TF80 and TF78.
- Sampled predominately “deepwater” environments, such as shales, marls, clay, to find well-preserved foraminifera.

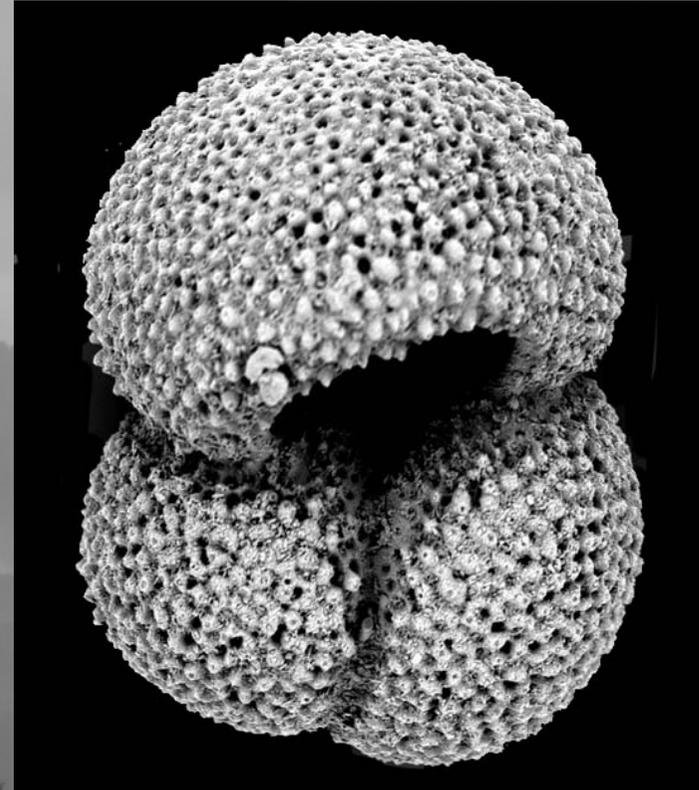


# What can I contribute from NTA-2?

- Isotope curves:
  - carbon ( $\delta^{13}\text{C}$ ) : Ventilation, circulation and water mass changes.
  - oxygen ( $\delta^{18}\text{O}$ ) : Global ice volume, temperature, salinity, pH
- Other geochemical proxies:
  - Mg/Ca ratios : Temperature
  - XRF analysis : Elemental analysis, continental runoff, precipitation regimes
  - Water mass tracers (E.g. Nd)?
- Age constraints and timing of glacial/interglacial cycles.

# What can I contribute from NTA-2?

- Depends on sample preservation and foraminiferal abundance
- Weathering, diagenesis and reworking of sediments can cause difficulty in extracting geochemical signals.



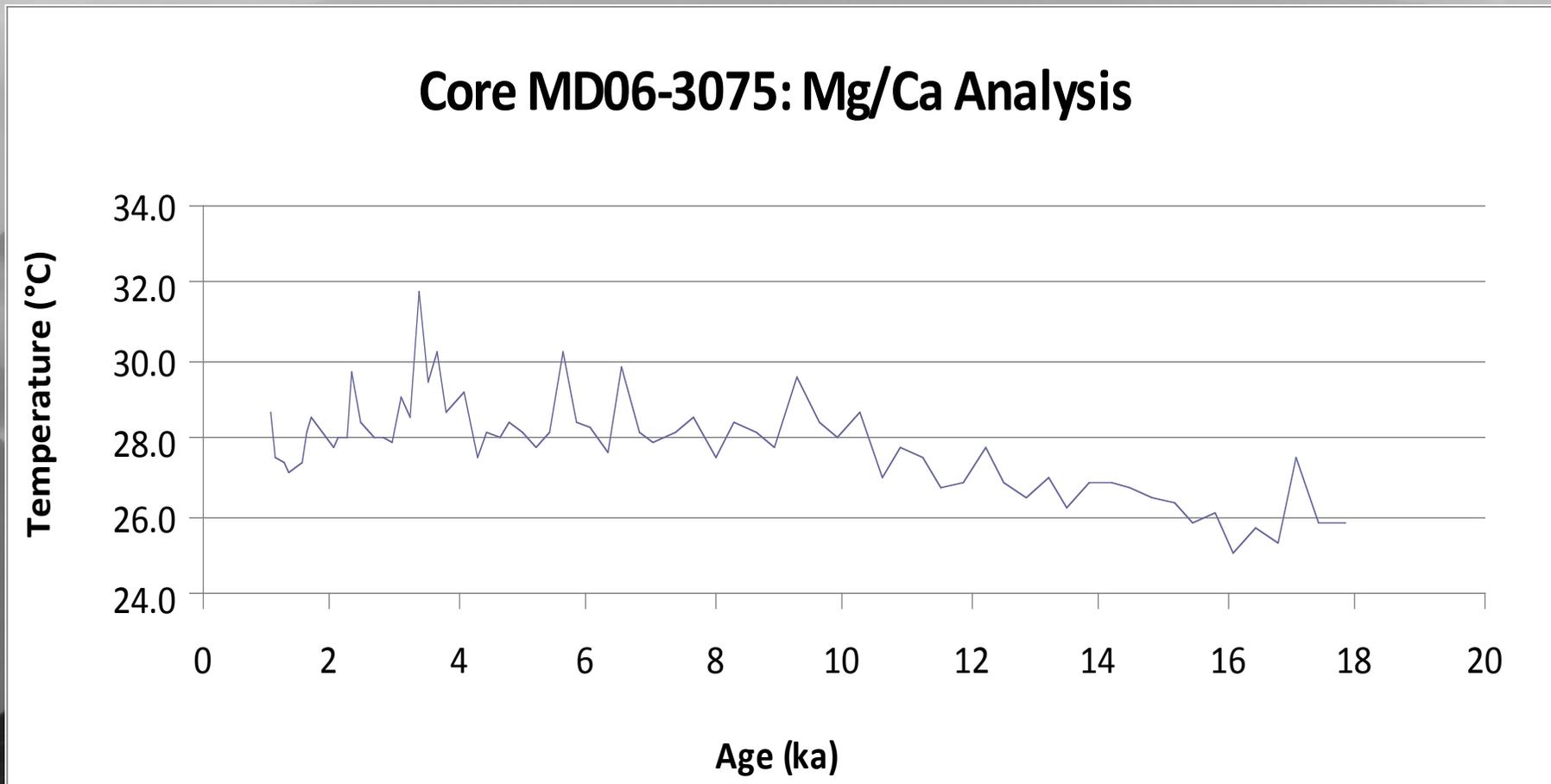
# Recent progress

- Continuation of work undertaken prior to NTA-2, working on an ocean floor core from the Davao Gulf.
- Constraints on recent environmental change during glacial/interglacial cycles are important in reconstructing older glacial cyclicity and palaeoenvironmental conditions.



# Recent progress

- Recently undertook Mg/Ca analysis on the core using G.Ruber, to produce a SST record over the Holocene and LGM.



# Future plans for Quaternary work

- High-res  $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$  isotopes using G. Ruber, planktonic foraminifera.
- XRF core scanning.
- Apply quaternary knowledge to Miocene palaeoenvironmental changes.
- Side project: Radiocarbon reservoir ages in Indonesian Throughflow

# NTA-4 Plans

- Spend 1 week at field workshop, “Palaeoecology, geological analysis, and interpretation of past environments.”
- 1 week(?) of further sampling in field, dependent on quality/abundance of foraminifera in samples from NTA-2. Looking to sample from long, continuous sections to create complete isotope records over the period being studied.

# Other future plans

- Work on cores from Indonesia gathered recently by Wolfgang Kuhnt and Bob Morley. Allows generation of long-timescale isotope curves.
- Cruise on RV-Sonne in July/August 2011, to gather cores directly from the Makassar strait.





Thanks for listening.

Questions?