A proposed high resolution record for reconstructing the history of the Indonesian Through Flow near the Philippine Island of Mindanao

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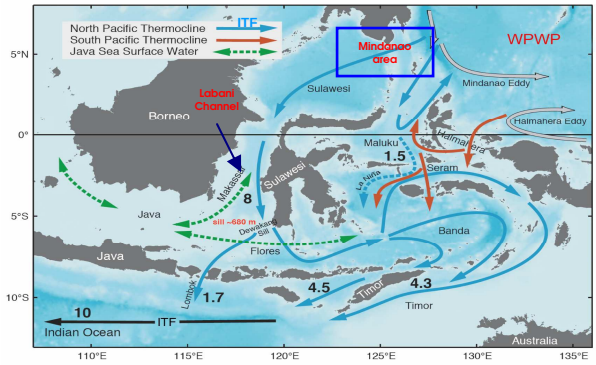
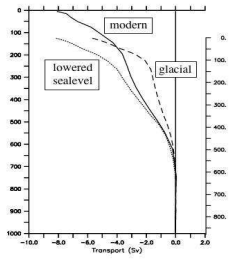
The large north- and westward transporting currents in the Western Pacific play an important role in the Southeast Asian and global climate, through the regulation of the ocean's heat budget. Two parts of this system are the Western Pacific Warm Pool (WPWP) and its western continuation the Indonesian Through Flow (ITF). In order to predict future changes in ITF it is necessary to reconstruct and understand the past changes and the influence of glacial/interglacial variations, the monsoon system and the El Niño Southern Oscillation (ENSO). Therefore a series of high resolution cores has been planned at the origin of the ITF to assess these changes in the past.



Gordon, 2005

What is the ITF ?

- Connection between Pacific and Indian Ocean, because of thermal gradient
- Westward heat transporting current (±16.5 Sv)
- Mainly North Pacific Thermocline waters (100-500 m)



Kuhnt et al., 2004

Glacial/Interglacial influence on the ITF

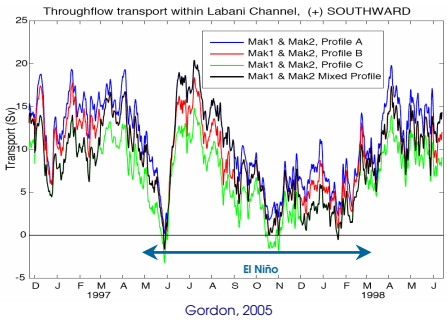
- No effect of sea-level change based on modelled ITF
- Shoaling thermocline and decreased SST in glacial WPWP

▼

decreased thermal gradient

▼

decreased ITF intensity



Gordon, 2005

ENSO influence on the ITF

Strong El Niño

▼

shoaling of North Pacific Thermocline

▼

decreased thermal gradient

▼

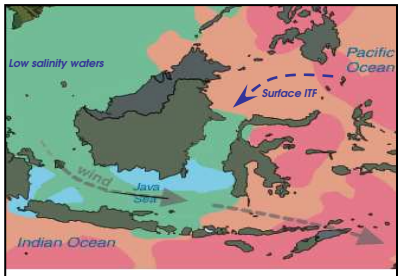
decreased intensity, or even collapse, of ITF

Proposed multi-proxy analysis

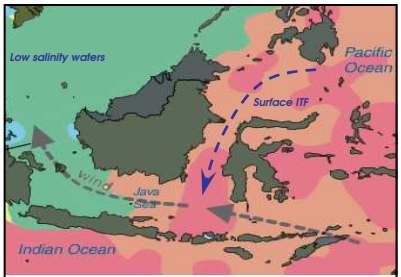
The proposed cores near the Mindanao Island will provide high resolution records for studying past changes at the origin of the Indonesian Through Flow. Reconstructions of past changes will be assessed with the help of $\delta^{18}O$, $\delta^{13}C$ and relative abundance of shallow and thermocline dwelling planktonic foraminifera as well as different benthic species. Also Mg/Ca ratios will be used to assess changes in sea surface temperature and the precipitation-evaporation balance for a better understanding of ITF changes.

Monsoonal influence on the ITF

- **Winter** : reduced surface flow due to low salinity wind driven water input
- **Summer** : no surface ITF blockage
- Levels out on annual time scale



WINTER MONSOON



SUMMER MONSOON

After Gordon, 2005

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