

DUSTSPEC:

Dust records for a warming world

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Lamont-Doherty Earth Observatory

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DUSTSPEC:

Dust records for a warming world

**Co-sponsored
by
NOAA/ACCWW/L-DEO
(Abrupt climate change for a warming world)
and INQUA**

DUSTSPEC: Dust records for a warming world



Moanna St Clair



Please see Moanna and hand her your passport

*Barbara Maher
(by virtual)*



Significance of dust for radiative forcing and biogeochemical cycling

BY ARCHIVE

Terrestrial Sediments

Ice cores

Marine Sediments

Lake Sediments

Corals

Or BY TIME PERIOD

Present

Future

Holocene

Glacial-Interglacial Change

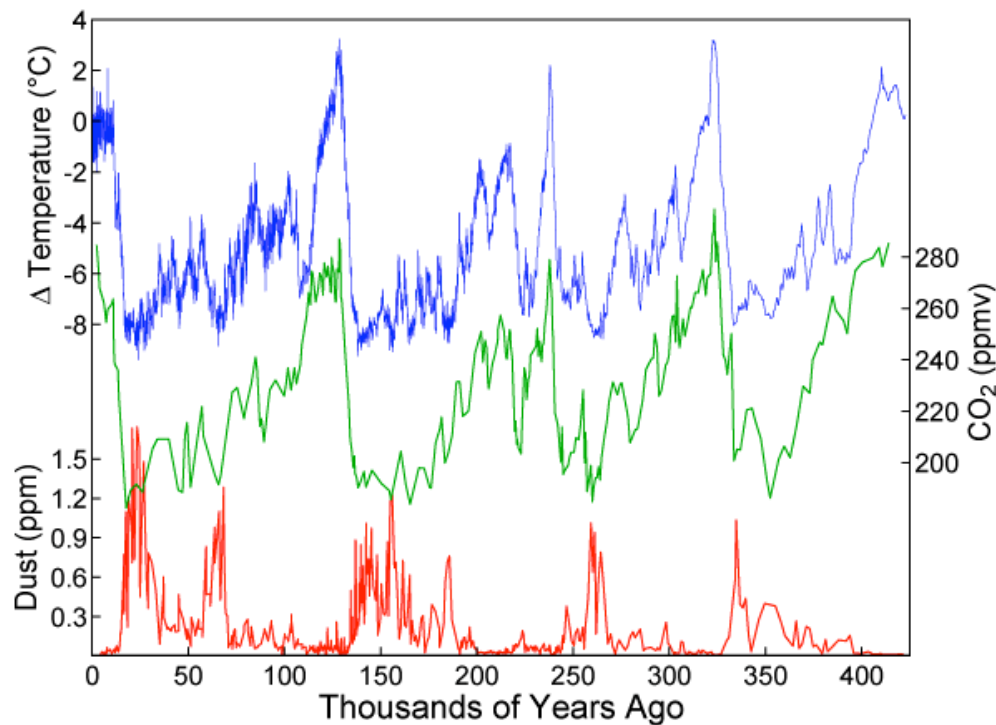
Millennial change

In particular...

DIRECT INTERACTION WITH CLIMATE/ DUST MODELERS

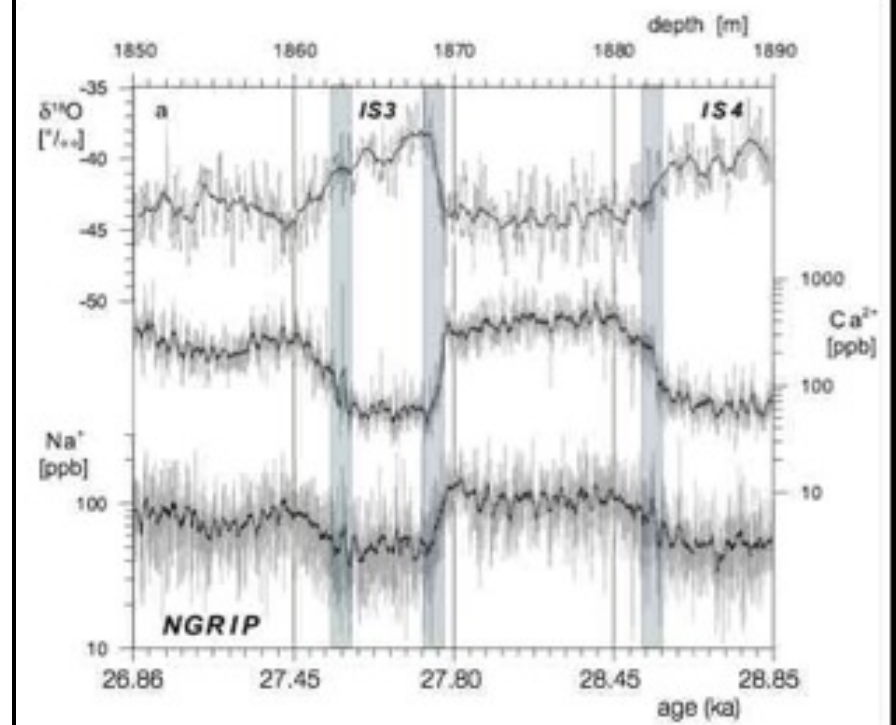
Key Steps in paleo dust research

Vostok Ice Core



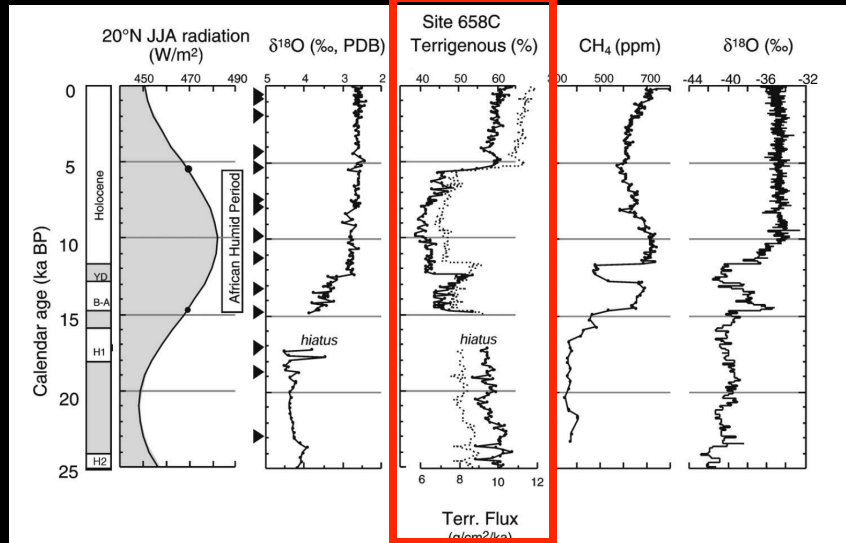
Petit et al., 1999

NGRIP

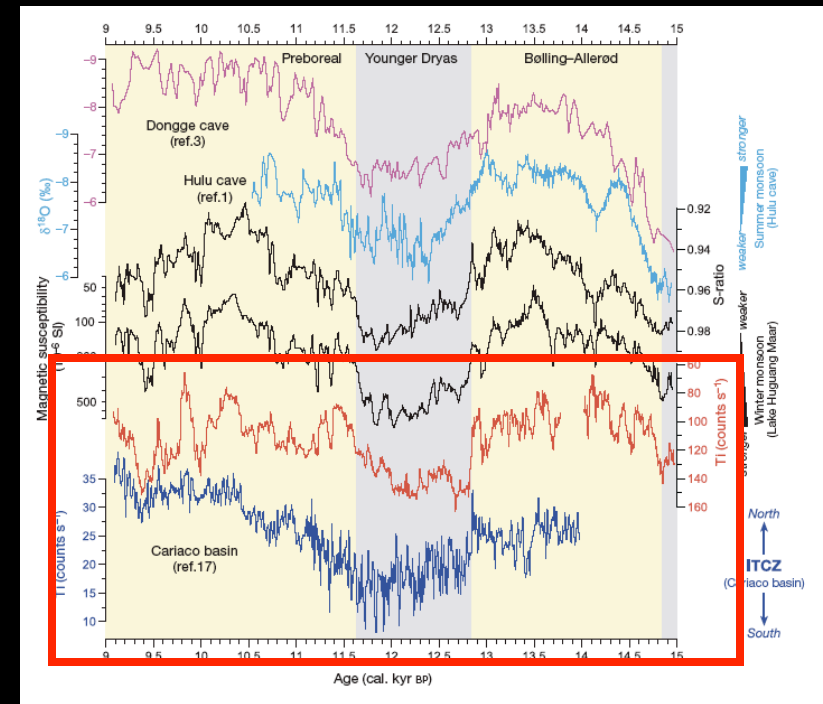


Fischer et al., 2007

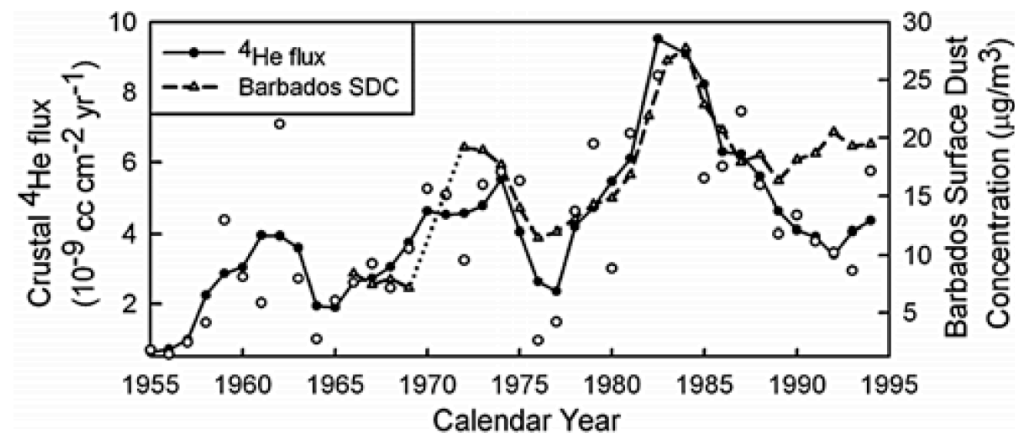
Key Steps in paleo dust research



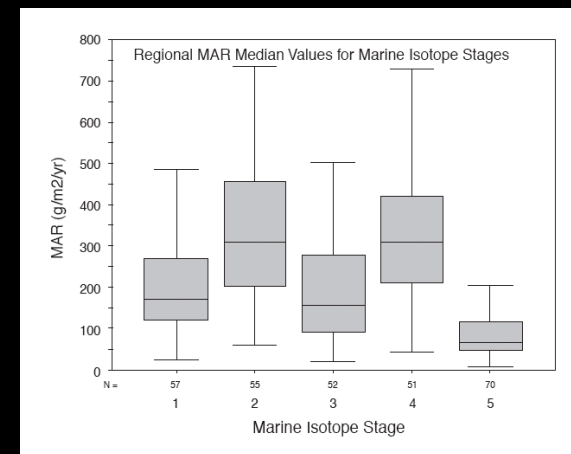
Marine Sed Off NW Africa: deMenocal et al., 2000



Lake Huguang Maar, China: Yanchava et al., 2007



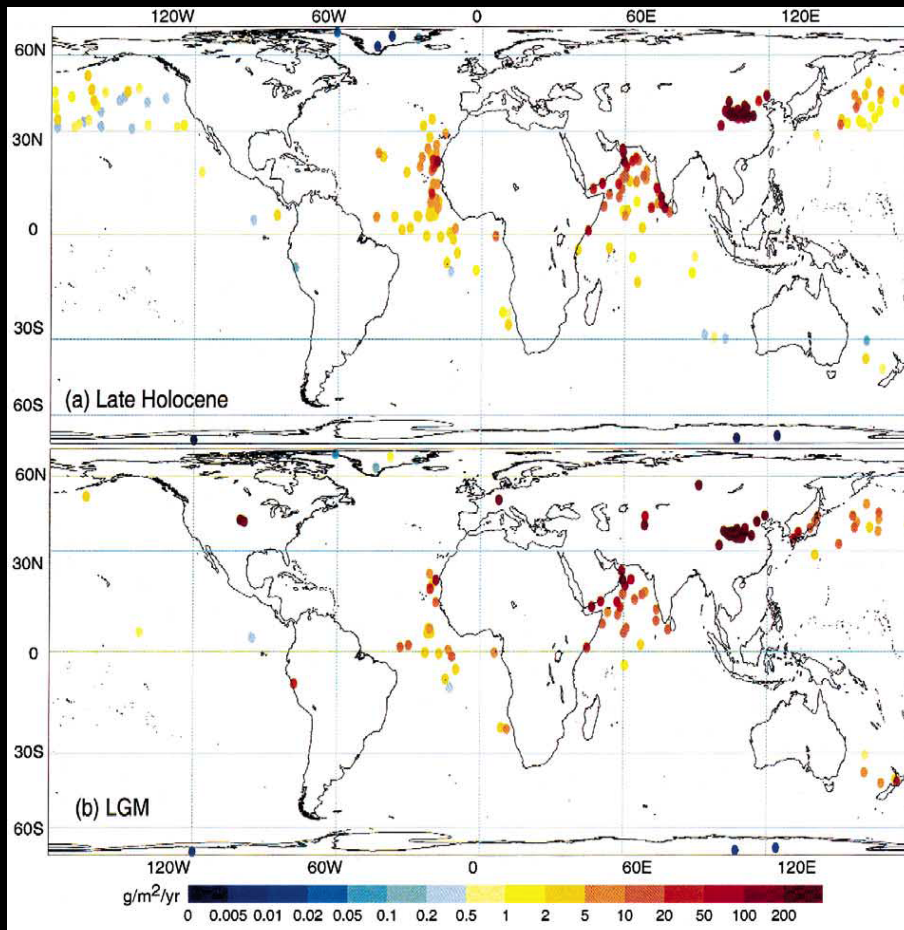
Cape Verde Coral: Mukhopadhyay et al., 2008



Loss compilation: : Kohfeld&Harrison, 2003

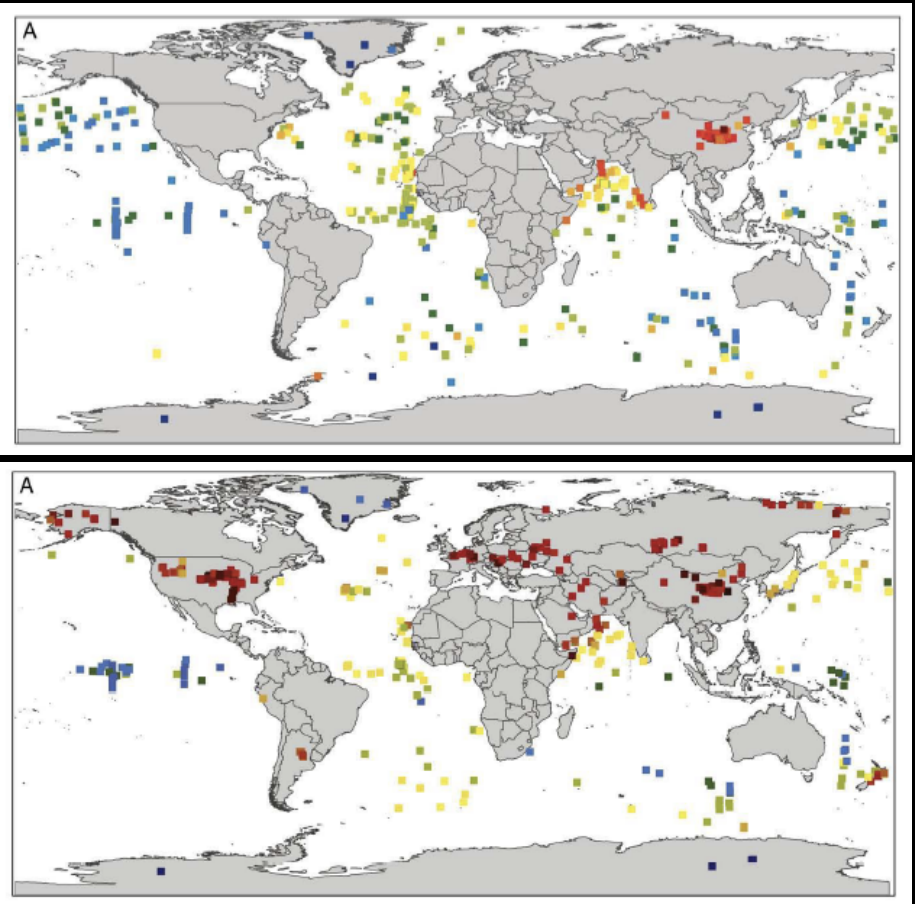
DIRTMAP

Dust Indicators and Records of Terrestrial and MARine Paleoenvironments



2001

DIRTMAP: Kohfeld & Harrison, 2001



2010

DIRTMAP-3: Maher et al., 2010

A new generation of a data set?

DUSTSPEC ?

- ✓ Expand to time series over the last glacial/interglacial cycle

- ✓ Include new data types (e.g., grain size distribution)

outcomes

Natalie Mahowald

Uses of new DUSTSPEC dataset

- Can help identify datasets that are good quality and indicate uncertainties
 - Folks outside field may not realize error bars or issues with individual cores
- Compilation of ‘snapshots’ at different times
 - Helped make clear that LGM/current dep is not 10-100 everywhere: just at some high latitude cores
- Comparison to models
 - Can then obtain estimates of radiative forcing, climate impacts and extrapolate deposition for ocean BGC

Existing DIRTMAP dataset

- Kohfeld and Harrison, 2000
- At certain locations
- Current deposition
- LGM deposition
- LGM/current
- No size differentiation (not just $<10\mu\text{m}$ or $20\mu\text{m}$)
 - Important for terrestrial sources. Mahowald et al., 2006 revised this
- Quality indicated

Ideas for new DUSTSPEC dataset

- Compile over longer time (back to last interglacial?)
- More temporal resolution
 - Use data at resolution available?
 - Interpolate to 6-100 times?
- Include size distribution changes?
- Include provenance information?

Goals for this meeting

- Exchange information on latest datasets
- Exchange information on potential uses of datasets
- Brainstorm new dataset type
- Brainstorm new dataset format (e.g. excel, netcdf, Access)
- Identify viable dataset plans and prioritize
- Make plan for putting together dataset
 - Needs a grant?
 - Easy to do?
- Start work on elements necessary.