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# Antarctic biogeochemical fluxes influenced by melting glacier


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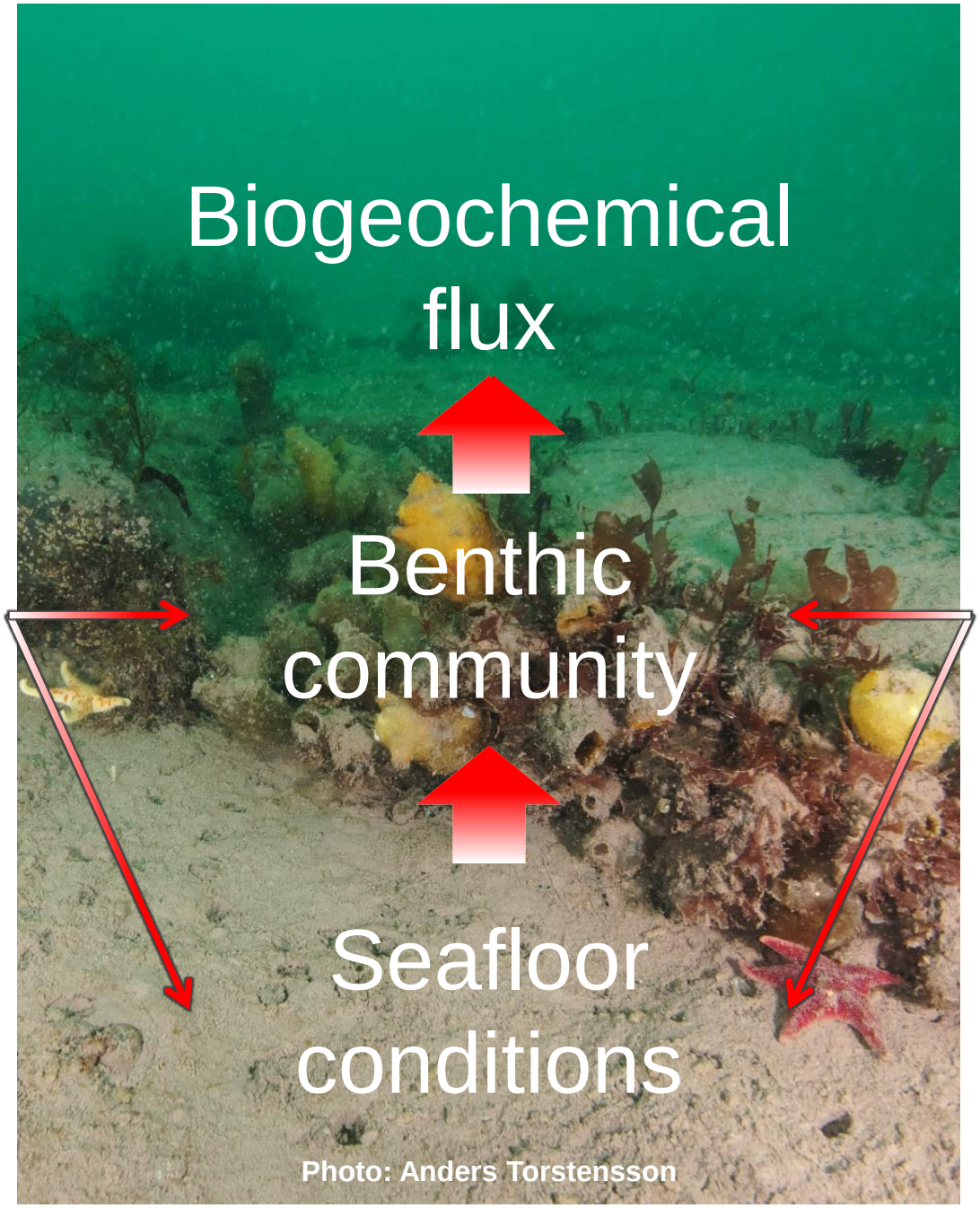
**Braeckman U., Vázquez S., Pasotti F., Torstensson A., Wenzhöfer F.**


## Preliminary results

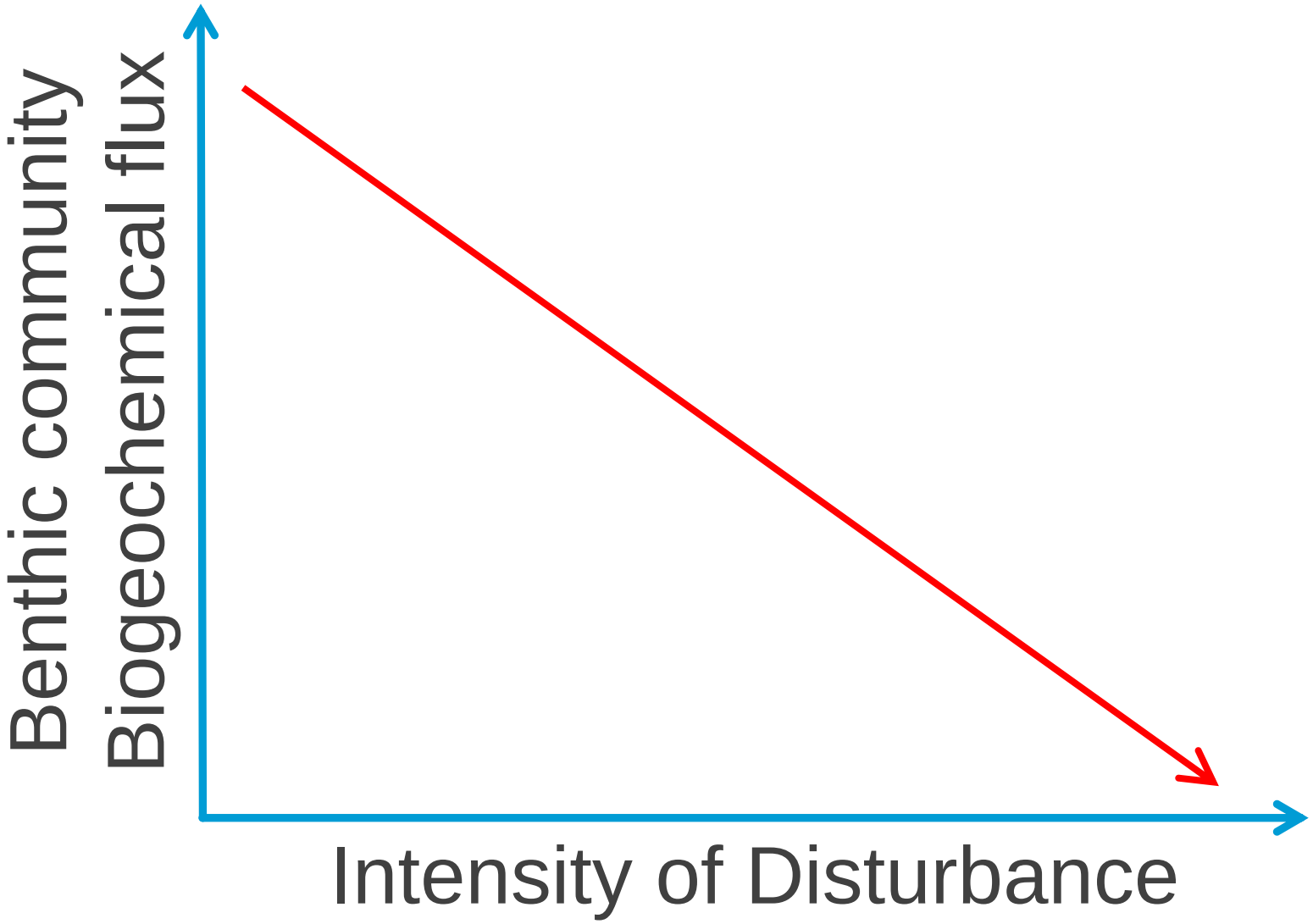


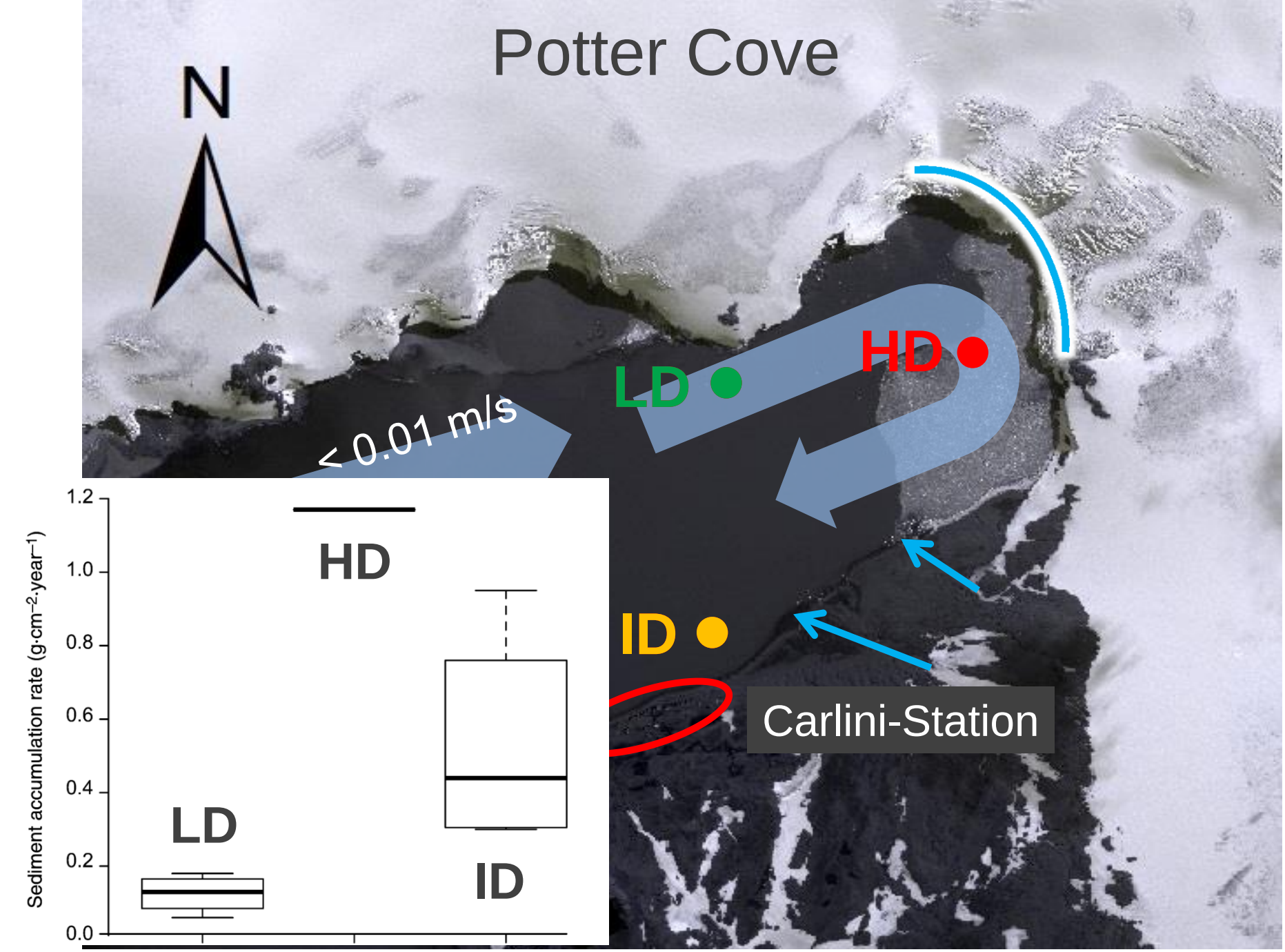

Ice Scouring

Particle Release

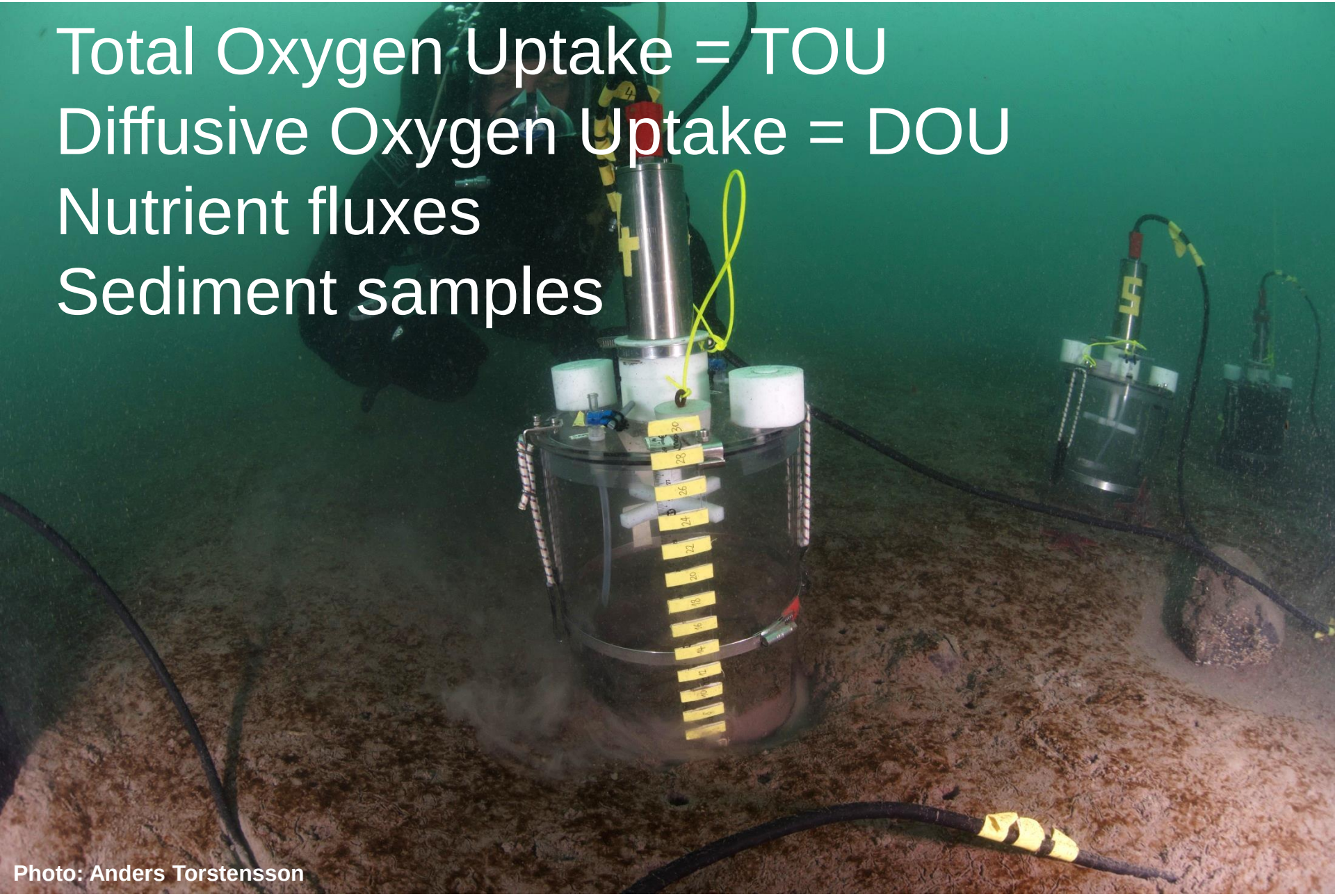
How do glacier melting-related disturbances influence benthic communities and biogeochemical fluxes?

# Hypothesis


Benthic community
Biogeochemical flux
Intensity of Disturbance




Pasotti et al., Marine Ecology (2014) 1–18


Total Oxygen Uptake = TOU
Diffusive Oxygen Uptake = DOU
Nutrient fluxes
Sediment samples
Photo: Anders Torstensson

TOU = Entire benthos energy demand

DOU = Microbial energy demand &
chemical redox reactions

→ Subflux of TOU

Photo: Anders Torstensson

- G/B weather ratio = 1:6
- 68 dives in 14 days
- Dive duration: 4 - 55 Minutes
- Ø = 1.8°C

Photos: Anders Torstensson, Ulrike Braeckman

# Seafloor conditions

| | LD | ID | HD |
|---|---|---|---|
| Depth | 8-9 m | 5-7 m | 7-8 m |
| Ø Light saturation | 0.4% | 4.1% | 0.6 % |
| TOC [% of TC/ml Sediment] | 40 ± 6 | 75 ± 9 | 49 ± 2 |
| Silt, 4-63µm | | | 84 % |
| Sand, >63µm | 62 % | 72 % | |
| Chl a [µg/g] (0-1cm) | 12.5 ± 4.7 | 26.3 ± 4.0 | 5.1 ± 0.9 |

# DOU vs. TOU

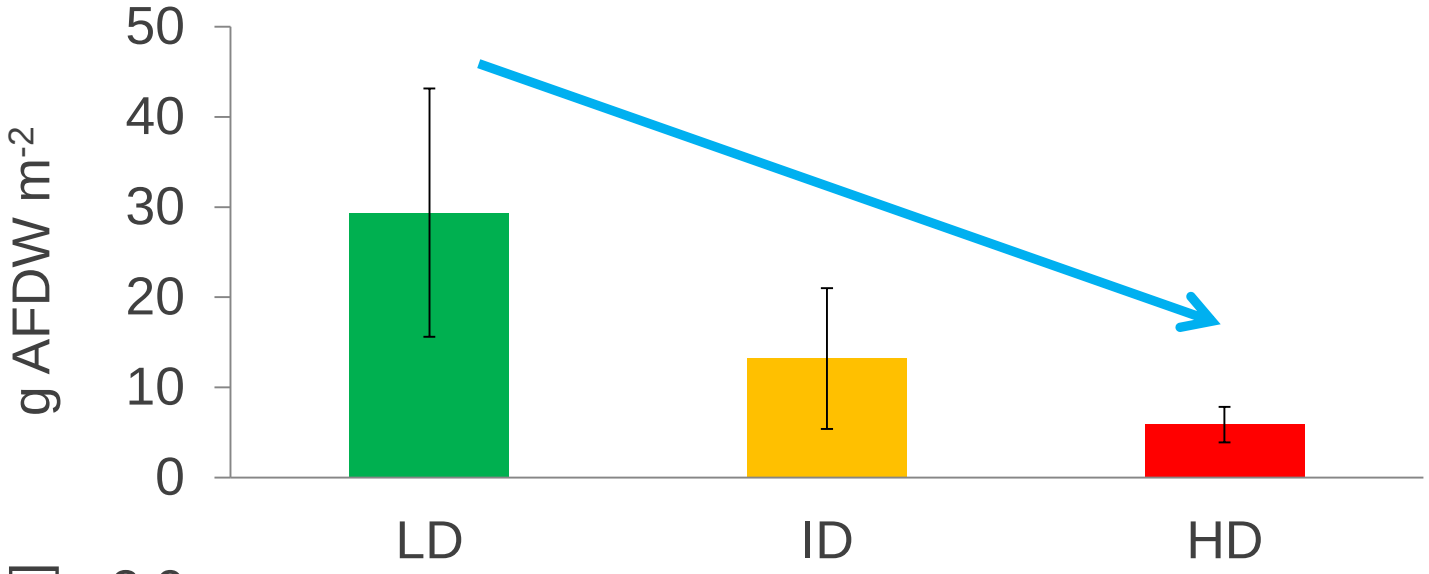
| Site | DOU/TOU [%] |
|---|---|
| LD | 6 |
| ID | 4 |
| HD | 19 |

→ Macro- and Meiofauna dominate oxygen fluxes

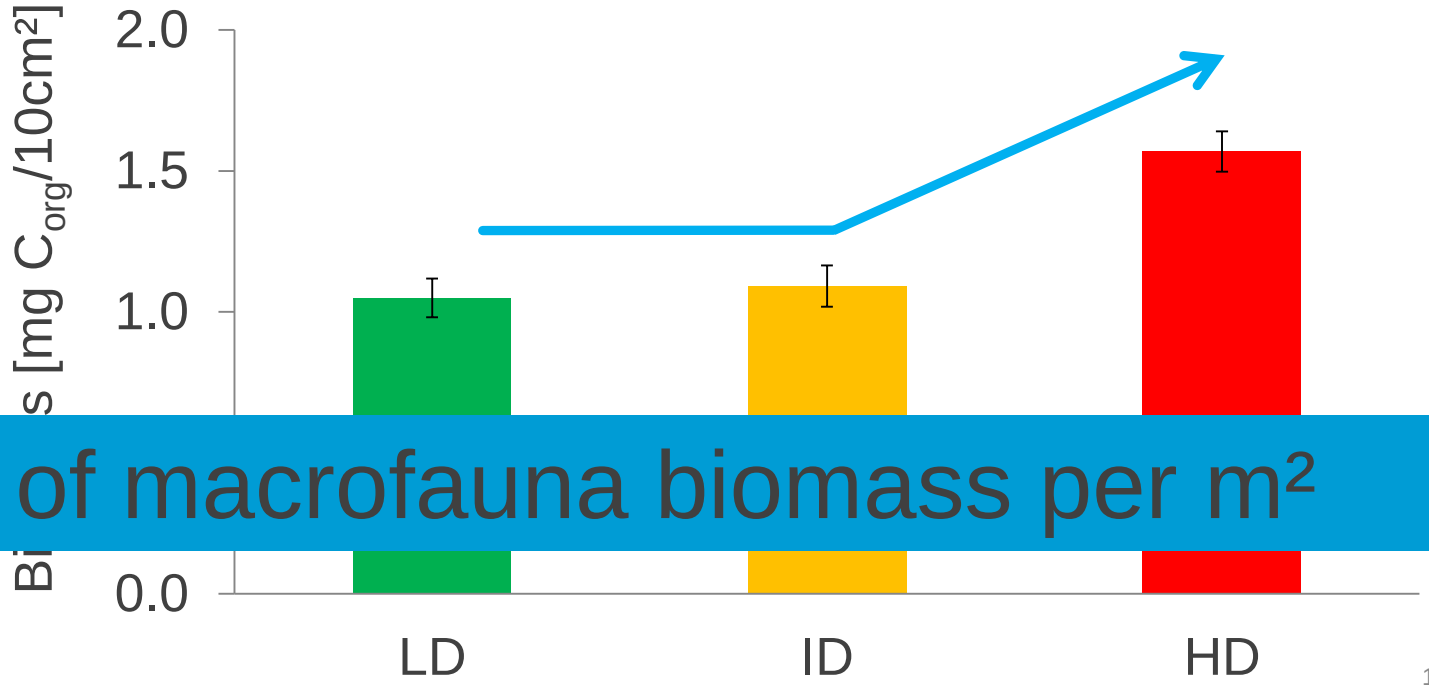
# Benthic community biomass

## Macrofauna biomass

Modified after
Pasotti et al.
Supporting Information
Marine Ecology, 2014

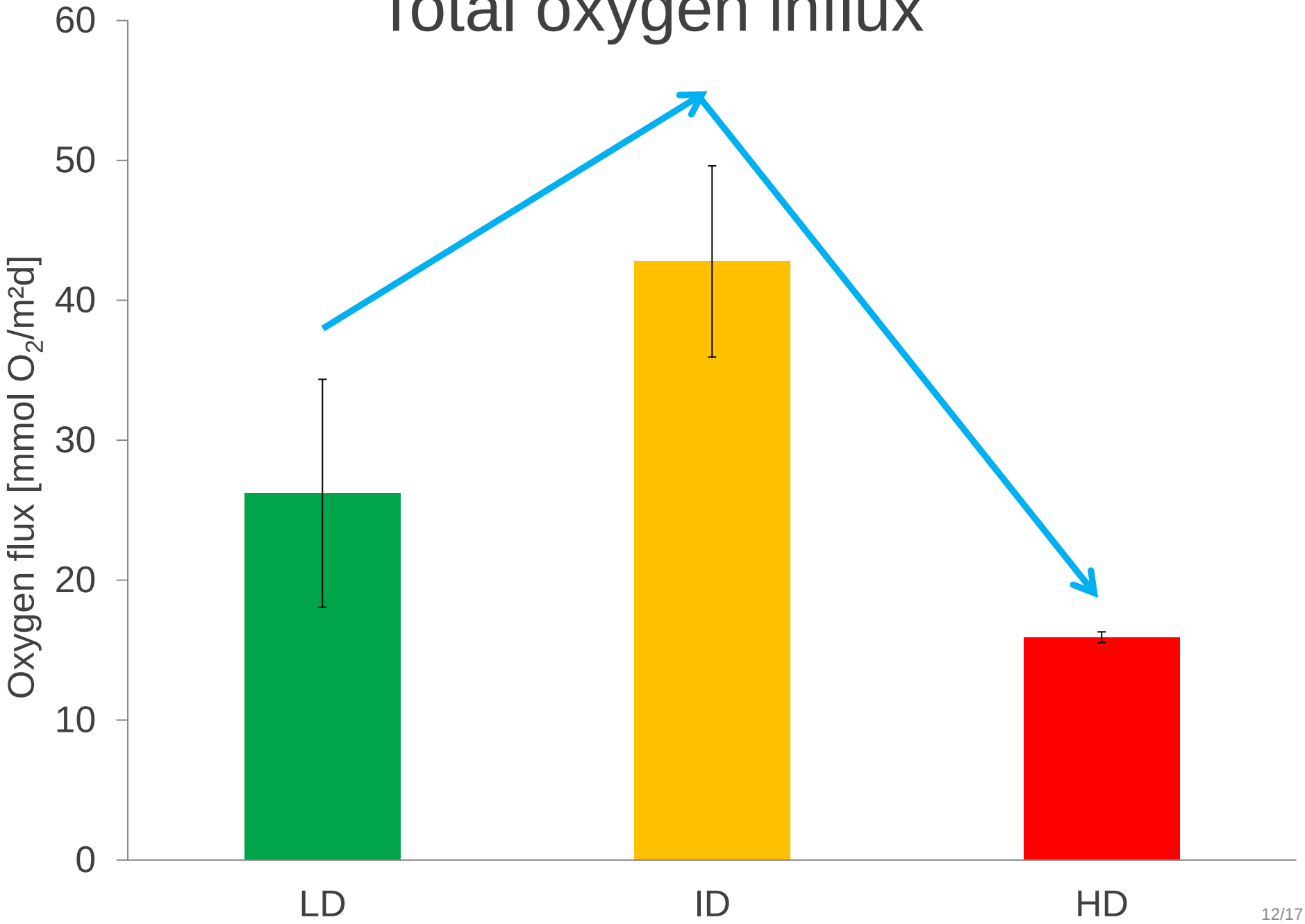



## Meiofauna biomass

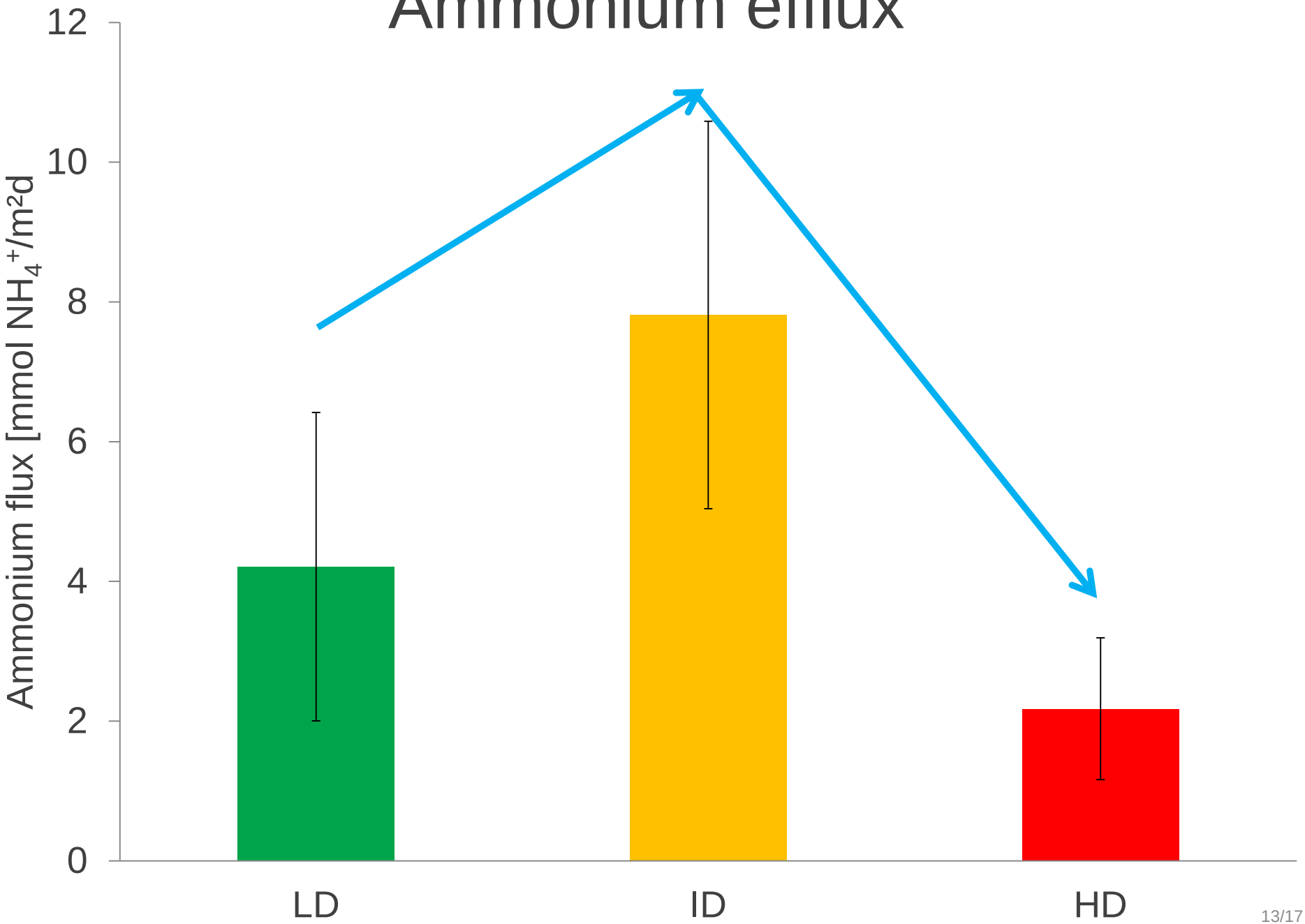



**~ 5% of macrofauna biomass per m²**

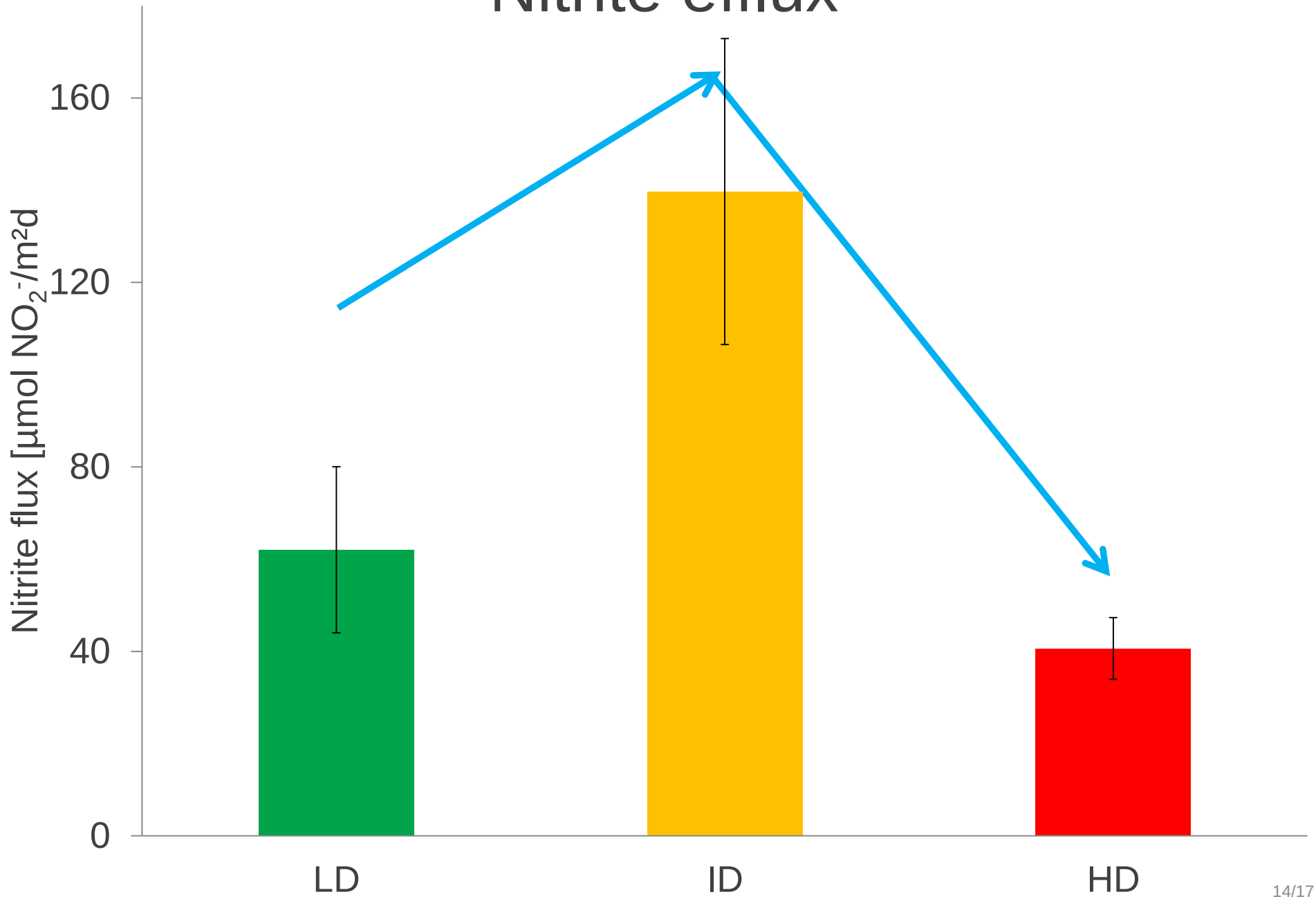
# Total oxygen influx



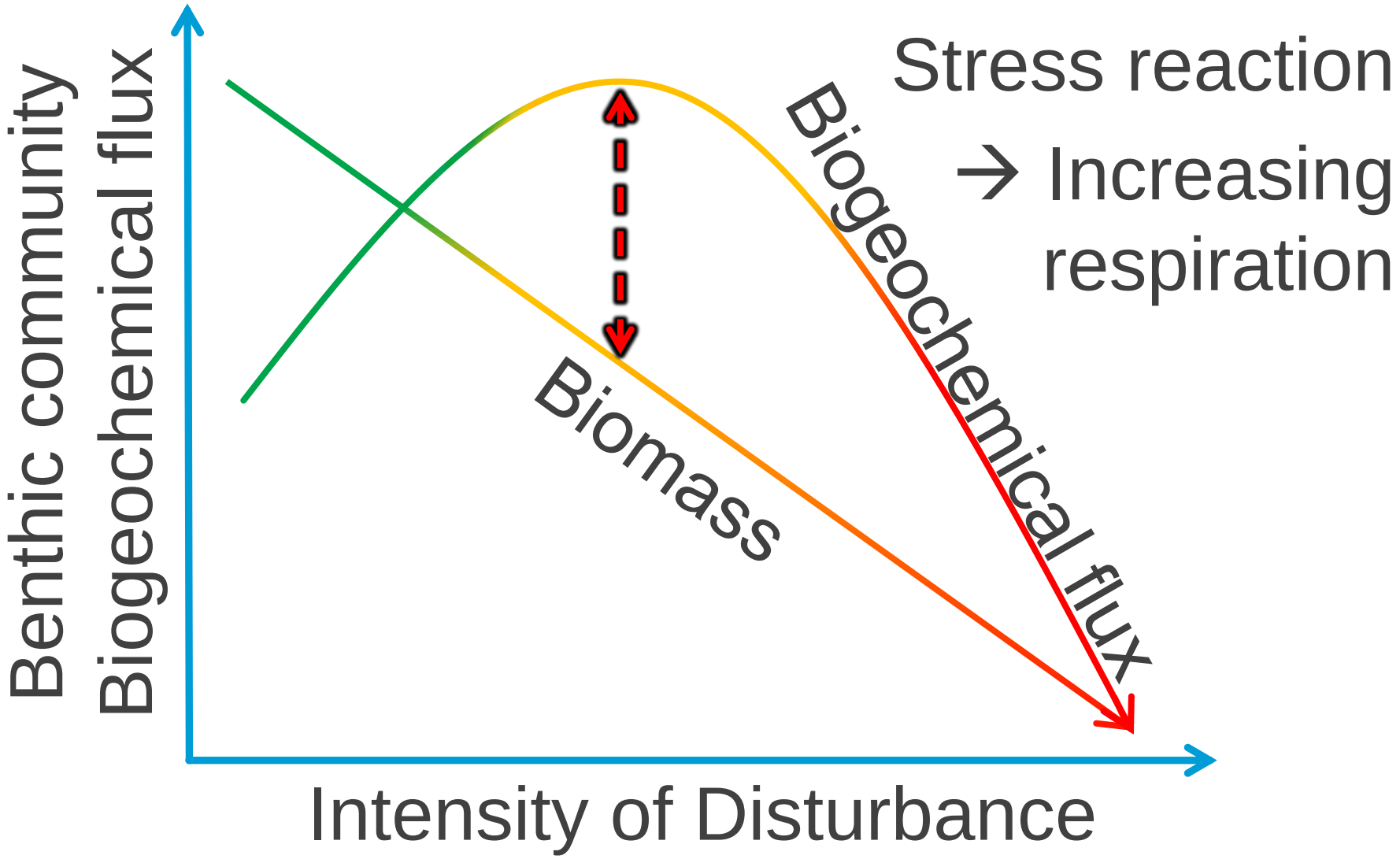
# Ammonium efflux



# Nitrite efflux



# Hypothesis


Benthic community
Biogeochemical flux
Stress reaction
→ Increasing respiration
Biogeochemical flux
Biomass
Intensity of Disturbance

Areas of

intermediate disturbance

increase

Decreasing

benthic biomass but accelerated

biogeochemical fluxes

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# Thank you

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