



Understanding the function and importance of sponge grounds

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WP4: ecosystem function, service and goods



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Sponge ground ecosystems

Sponges are ecosystem engineers

- substrate
- shelter
- food
- nursery

Are they ecosystem engines?



Surviving in a Marine Desert: The Sponge Loop Retains Resources Within Coral Reefs

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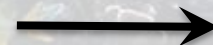
Sunlight



The Sponge Loop



Dissolved Organic Matter

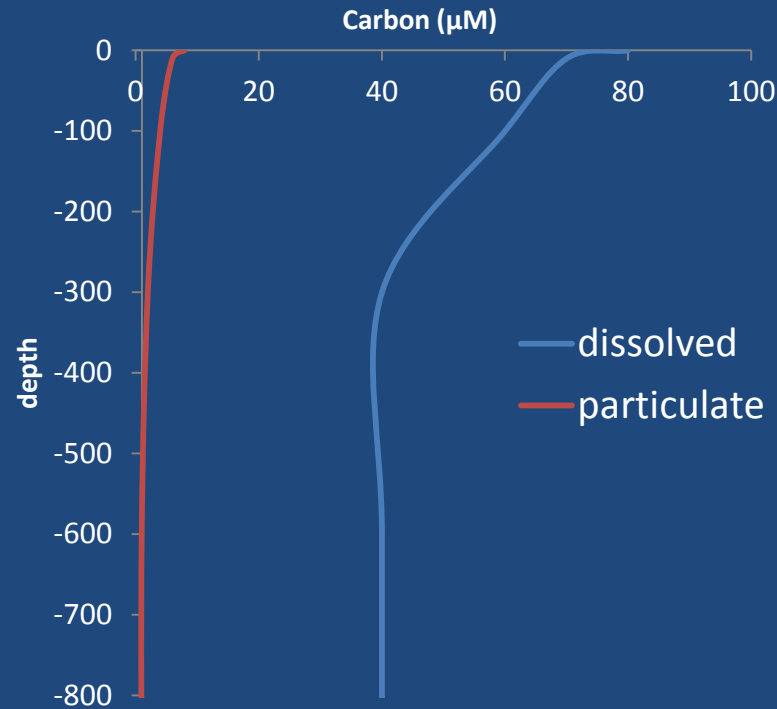


Particulate Organic Matter (sponge poo)



A sponge loop in the deep?

Largest organic matter reservoir in oceans is dissolved



Inaccessible for most animals, but not for sponges



Ecosystem functioning

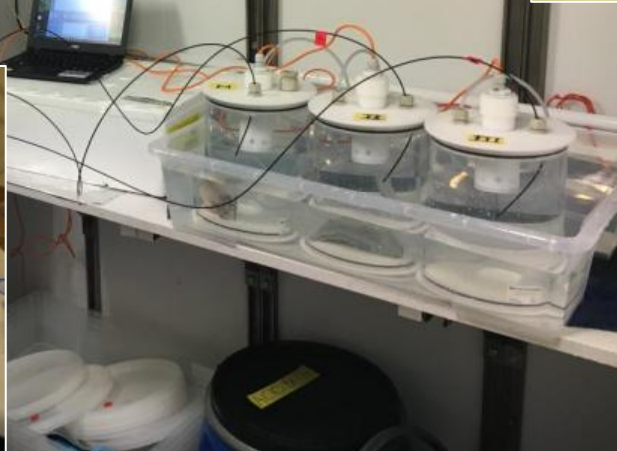
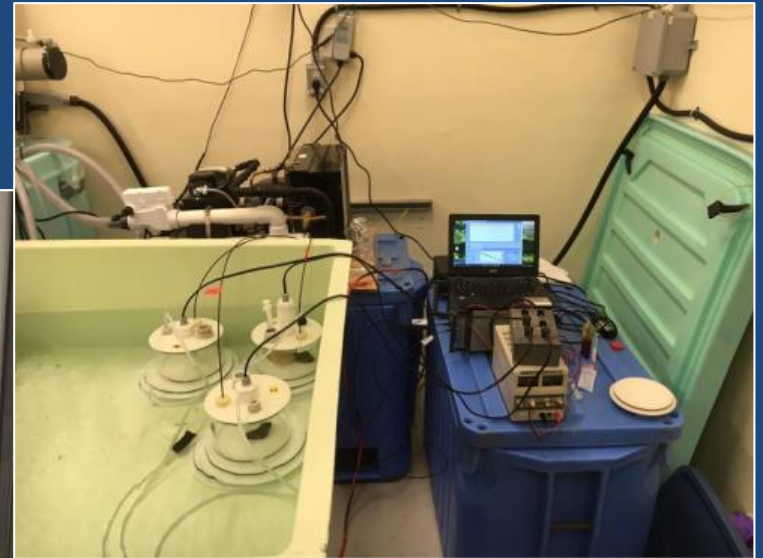
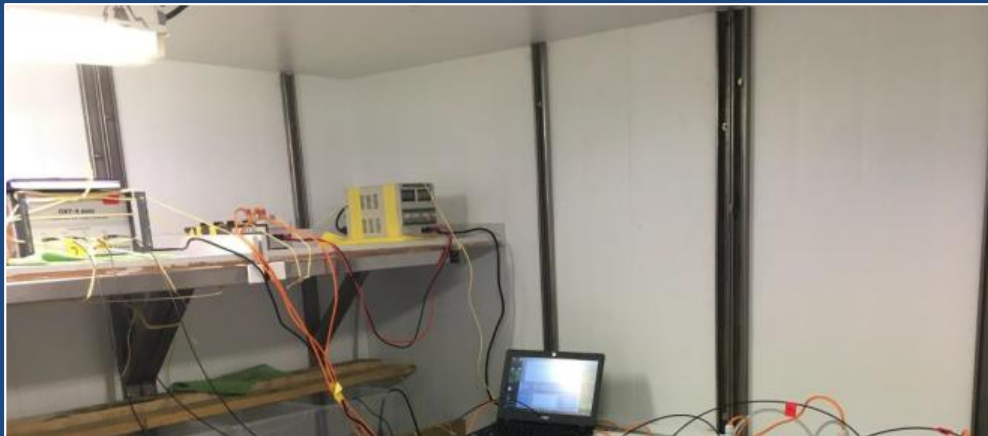


biomass

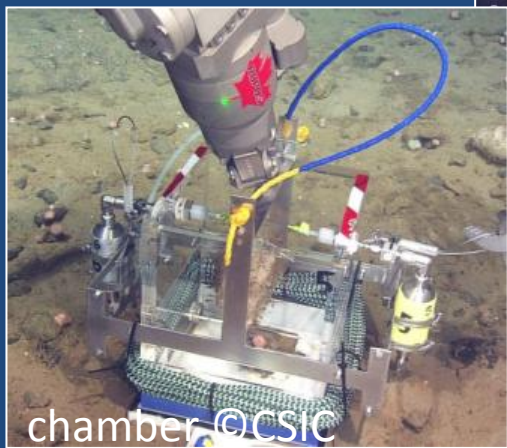
sediment
interactions

?

Sponge functioning in controlled aquaria set-up

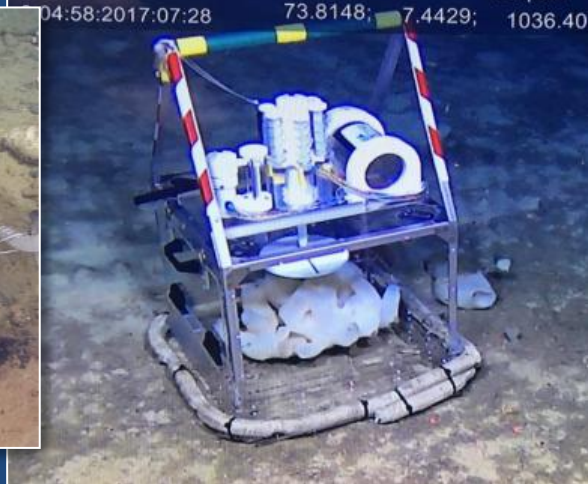


Sponge functioning in the deep....



chamber ©CSIC

Date/Time:	Position:	Depth:
04:58:2017:07:28	73.8148; 7.4429;	1036.40



University of Bergen, G.O Sars	Date/Time:	Position:	Depth:	Heading:	Altitude
ORMAR /EGIR 6k SponGES Dive:17	9:56:33:2017:07:31	73.8305; 7.5613;	583.37;	270.83;	0.49;



chamber ©NIOZ/UvA

From organism to ecosystem scale : *in situ* fluxes of carbon and nitrogen at community level

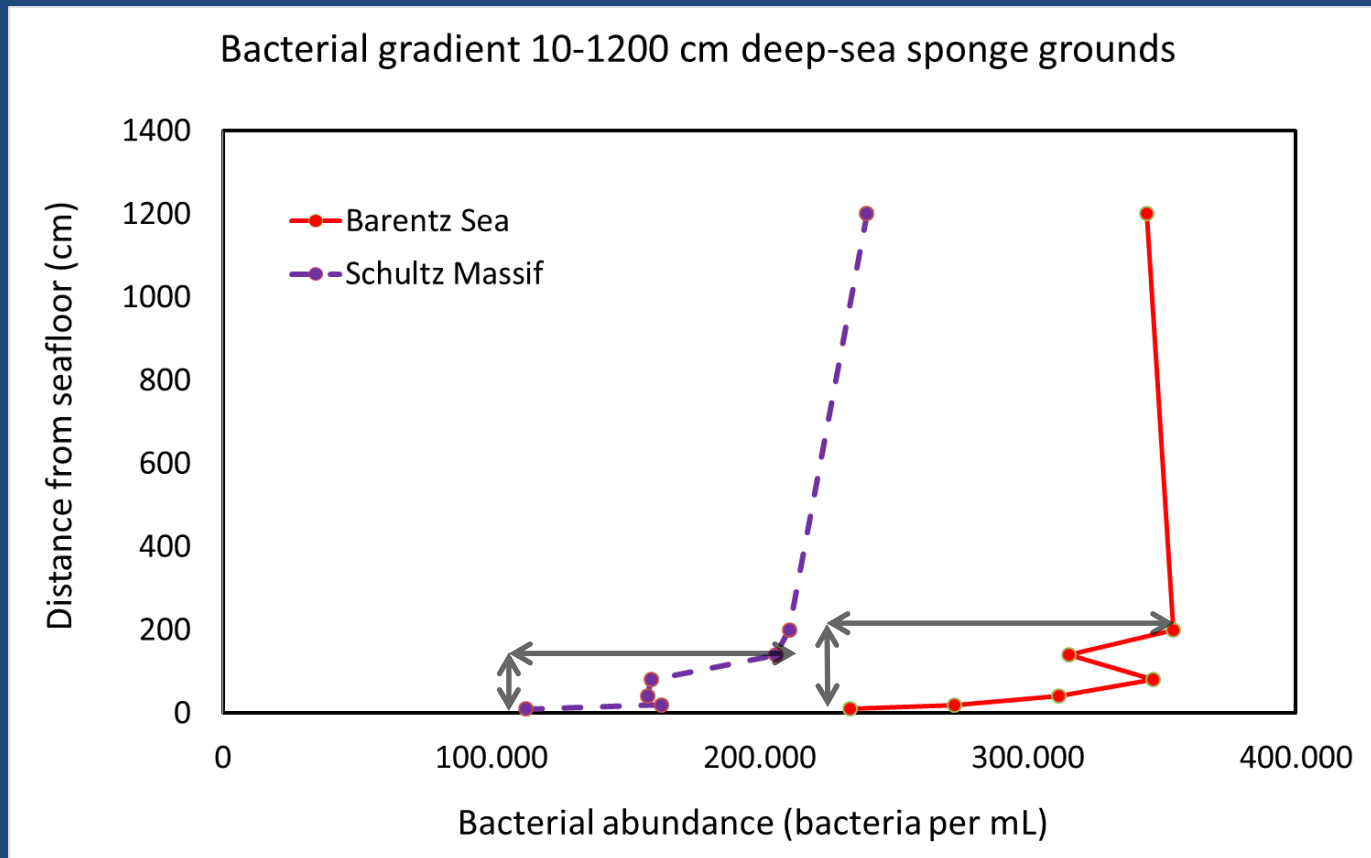


Gradient pump:

- Small-scale gradient at sites with and without sponge communities
- High detail benthic-pelagic interface
- Carbon, nitrogen, silicate fluxes



From organism to ecosystem scale : *in situ* fluxes of carbon and nitrogen at community level



Sponges
continuously
remove up to 66%
of local bacteria
at boundary layer

Sponges can
create an almost
bacterial-free
environment

A budget - carbon recycling by sponge ground ecosystem \sim 1/2 of primary production

Are sponge grounds ecologically important?

yes!



SponGES



www.deepseasponges.org

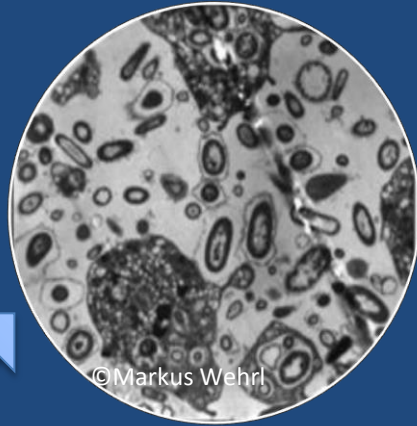
thank you



Deep-Sea-Sponges
@DeepSea_Sponges

SponGES has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 679849. This document reflects only the authors' view EASME is not responsible for any use that may be made of the information it contains

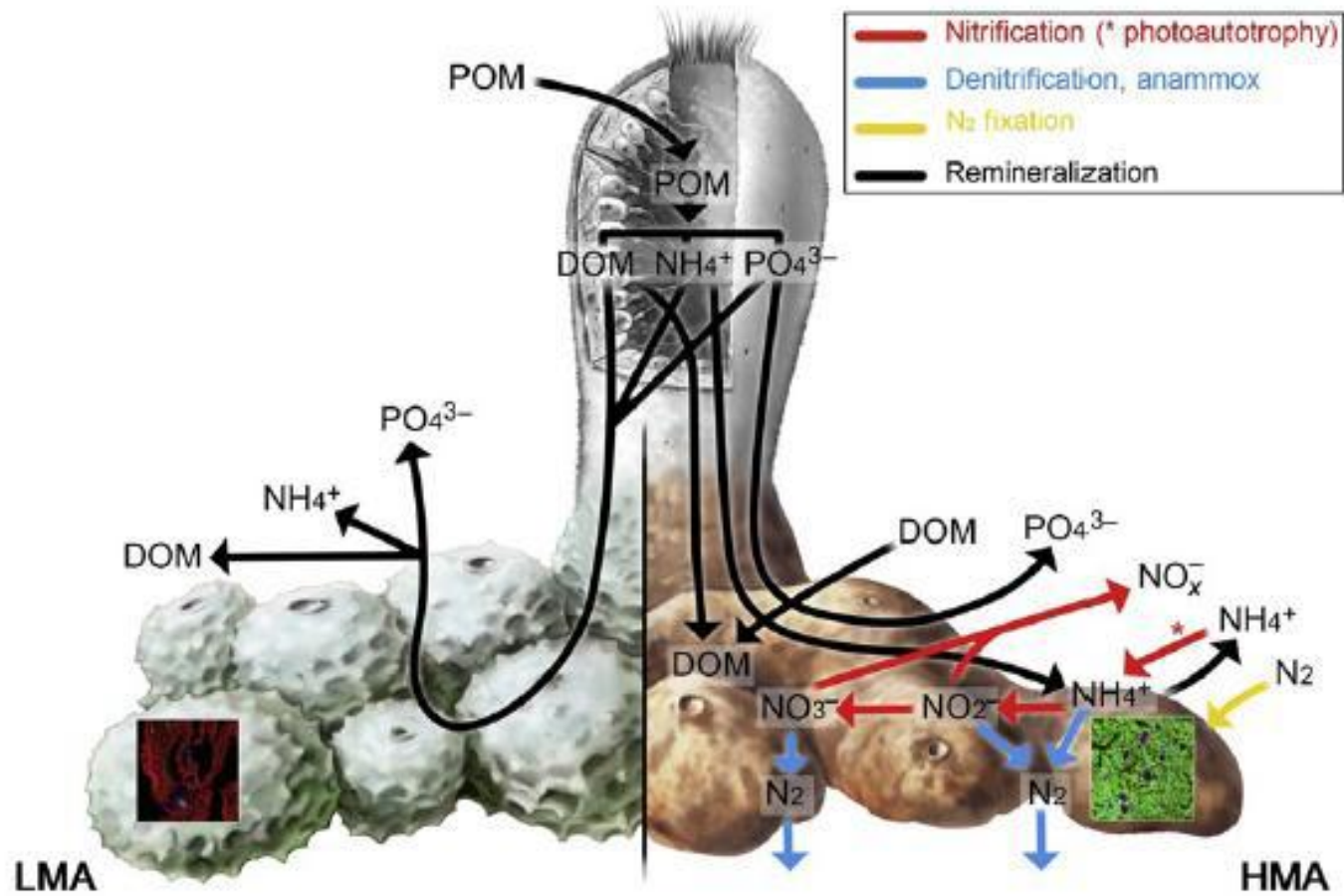
Sponges are mini ecosystems



Half of sponge biomass consists of associated microbes

Complex biogeochemistry transforming

- Carbon
- Nitrogen



Maldonado et al. 2012