

Declining size - a general response to climate warming in Arctic fauna? (DWARF)

Principal investigator: dr hab. Maria Włodarska - Kowalczyk

Duration: 36 M (February 2014 – January 2017)

Budget: 3 956 989 PLN

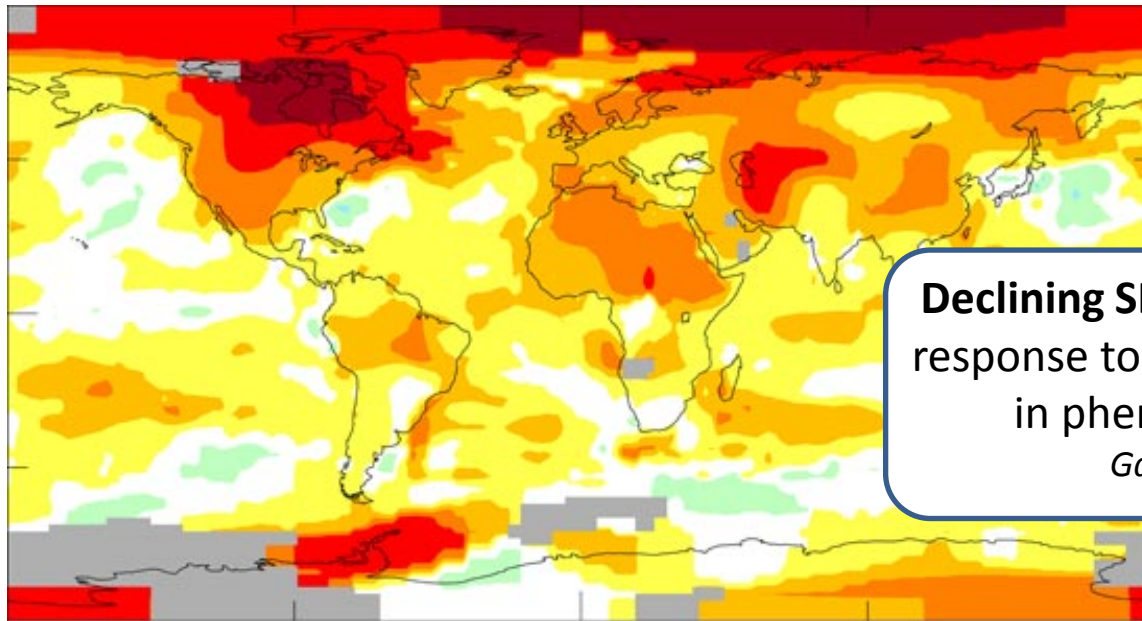
Project Promoter: Institute of Oceanology PAN

Project Partners: Norwegian Institute for Nature Research (NINA), Tromsø
University of Oslo (UiO)
Akvaplan-niva (APN), Tromsø



„**SIZE** is a supreme regulator of all matters biological” – Bonner, 2006
determines the rates of basic processes (metabolism, generation time, longevity, locomotion speed, ...)

SIZE structure shapes ecosystem functioning (e.g. energy flows in food-webs)



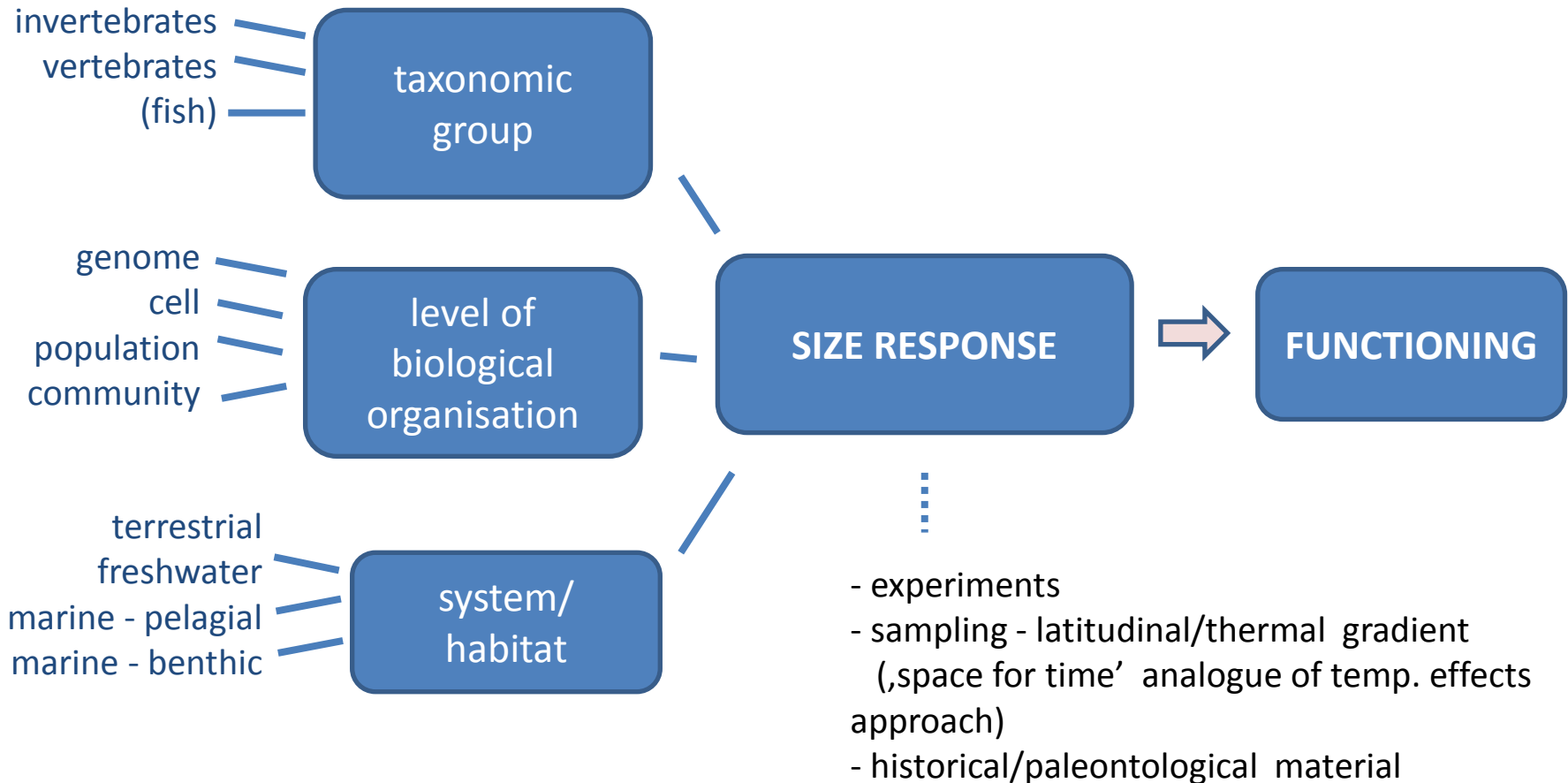
Declining SIZE – predicted as the third universal response to climate warming (alongside changes in phenology and species distribution)

Gardner et al. 2011, Trends Ecol Evol



Difference between the average annual temperature in 2006 and 1951–80. Credit: NASA Goddard Institute for Space Studies

DWARF Hypothesis: Elevated temperatures will induce size reductions in a large range of high latitude ectotherms.



WP1 TERRESTRIAL FAUNA

habitat: terrestrial
faunal groups: springtails
(Collembola); true insects
b.o. level: body-, cell- and
genome-
approach: sampling and
experiments



WP1 Leader:
Prof. Hans P. Leinaas
University of Oslo



Hypogastrura viatica



springtail



the dung fly
Scatophaga furcata

WP2 LIMNETIC FAUNA

habitat: freshwater

faunal groups: fish and
crustaceans

b.o. level: body-, cell- and
genome-

approach: sampling and
experiments



WP2 Leader:
Dr Martin A. Svenning
NINA Tromsø



Arctic char



Photo PH Olsen

Lepidurus arcticus



Mysis relicta



Gammaracanthus sp.
Raskoff MPC/CoML

Gammaracanthus loricatus

WP3 MARINE PELAGIC FAUNA

habitat: marine

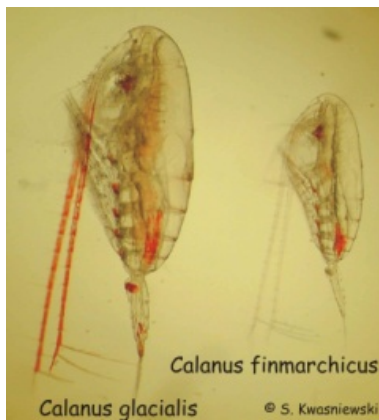
groups: mesozooplankton

b.o. level: community-, and
body-

approach: sampling (direct
measurements and optical
methods)



WP3 Leader:
Dr Sławek Kwaśniewski
IOPAN, Sopot



WP4 MARINE BENTHIC FAUNA

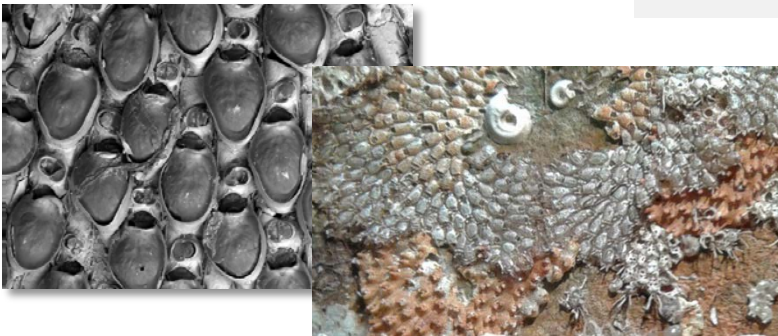
habitat: marine

groups: meio-macrofauna;
Bryozoa

b.o. level: community-, and
body-

approach: sampling and
historical materials

**Bryozoa – encrusting,
colonial taxa**

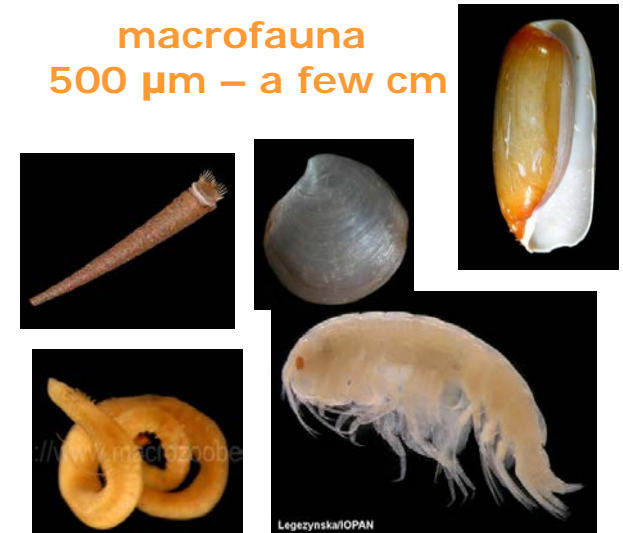


WP4 Leader:
Dr M. Włodarska
-Kowalczyk
IOPAN, Sopot
Akvaplan-niva, Tromsø
PROJECT LEADER

meiofauna
32-500 μm



macrofauna
500 μm – a few cm



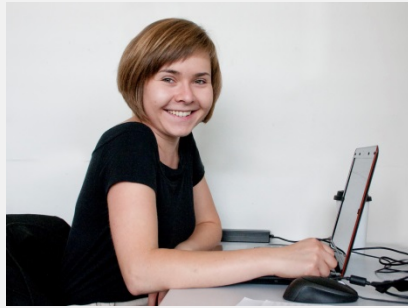
WP5 Paleontological Record in Holocene

habitat: marine

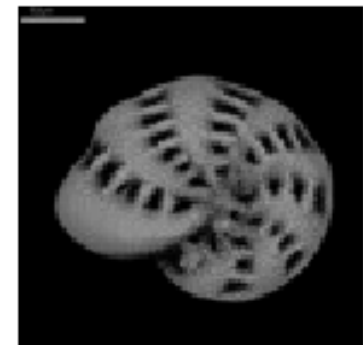
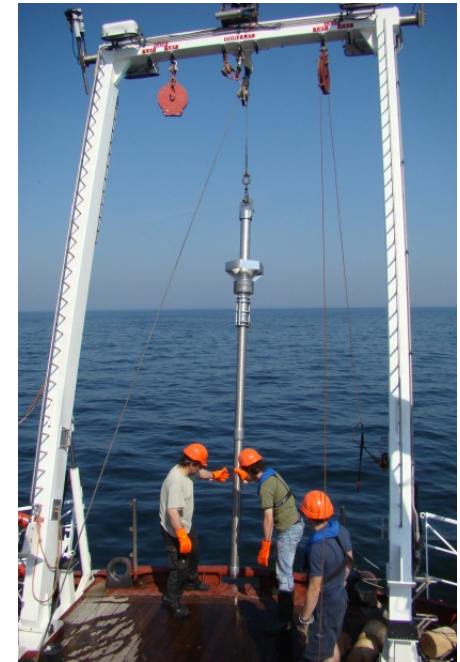
groups: Foraminifera

b.o. level: community-, and
body-

approach: paleontological
sediment cores



WP5 Leader:
Joanna Pawłowska
IOPAN, Sopot



WP1 TERRESTRIAL FAUNA

WP2 LIMNETIC FAUNA

WP3 MARINE PELAGIC FAUNA

WP4 MARINE BENTHIC FAUNA

WP5 Paleontological Record in Holocene

habitat: marine
groups: Foraminifera
b.o. level: community-, and body-
hist
approach: paleontological sediment cores

WP6 DATA BASE and LITERATURE SURVEY

Comparative analyses in genome size across different phyla/thermal regimes
approach: Analyses of data in animal genome database (www.genome.com;



WP6 Leader:
Prof. Dag Hessen
University of Oslo

WP1 TERRESTRIAL FAUNA

WP2 LIMNETIC FAUNA

WP3 MARINE PELAGIC FAUNA

WP4 MARINE BENTHIC FAUNA

WP5 Paleontological Record in Holocen

habitat: marine

groups: Foraminifera

b.o. level: community-, and
body-

approach: paleontological
sediment cores

WP6 DATA BASE and LITERATURE SURVEY

Comparative analyses in genome size across different phyla/thermal regimes
approach: Analyses of data in animal genome database (www.genome.com);

WP7 SYNTHESIS and PUBLIC OUTREACH

INTEGRATION
MANAGEMENT
SYNTHESIS
DISSEMINATION
PUBLIC OUTREACH



WP7 Leader:
Prof. J. M. Węśławski
IOPAN, Sopot

WP1 TERRESTRIAL FAUNA



3 manuscripts submitted M32, M36

WP2 LIMNETIC FAUNA



2 manuscripts submitted M33, M36

WP3 MARINE PELAGIC



2 manuscripts submitted M34, M36

WP4 MARINE BENTHIC



3 manuscripts submitted M34, M36

WP5 Paleontological Record



manuscript submitted M36

WP6 DATA BASE and LITERATURE SURVEY



manuscript submitted M33

WP7 SYNTHESIS and PUBLIC OUTREACH



DWARF synthesis manuscript
submitted M36



Website M3

Information and promotion plan M6

Progress report on dissemination M12, M24, M36

Popular science book M 30

Set of lessons scenarios downloadable from the project web-site M30