

SEA-ICE ALGAL PHENOLOGY IN A WARMER ARCTIC

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RESEARCH ARTICLE | CLIMATOLOGY

Sea-ice algal phenology in a warmer Arctic

L. Tedesco^{1,*}, M. Vichi^{2,†} and E. Scoccimarro³

* See all authors and affiliations

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LETIZIA TEDESCO, FINNISH ENVIRONMENT INSTITUTE, HELSINKI, FINLAND



MARCELLO VICH, UNIVERSITY OF CAPE TOWN, SOUTH AFRICA



ENRICO SCOCCIMARRO, CMCC, BOLOGNA, ITALY



EGU SHARE, 4TH OF MAY 2020



OBJECTIVE:

INVESTIGATE FUTURE CHANGES OF ARCTIC FIRST YEAR ICE (FYI) ALGAL BLOOM TIMING AND PRODUCTIVITY (GROSS PRIMARY PRODUCTION GPP), COMBINING A BIOGEOCHEMICAL SEA ICE MODEL (BFM-SI) WITH SEA-ICE PHYSICAL DRIVERS FROM AN ENSEMBLE OF 18 CMIP5 CLIMATE MODELS.

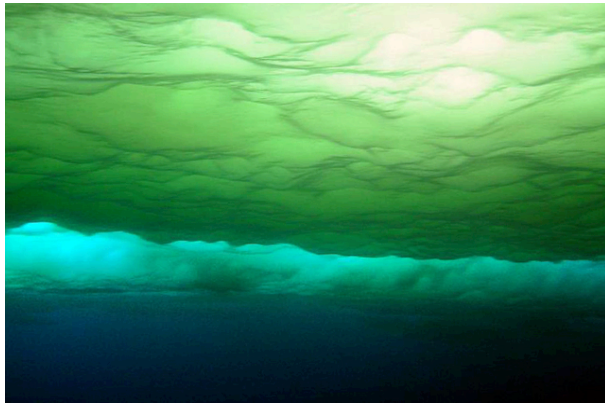
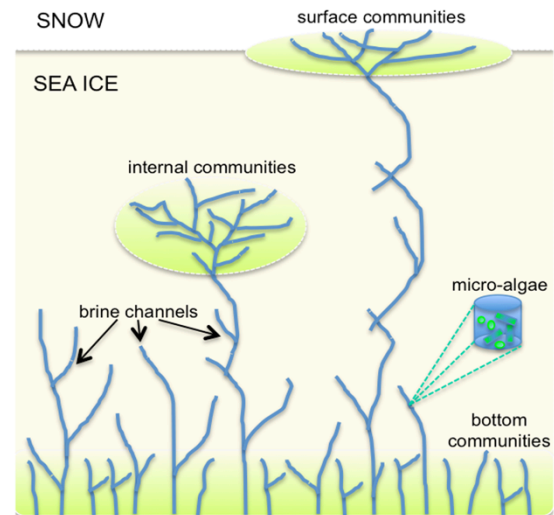


PHOTO CREDITS: CHRIS FRITSEN



TEDESCO AND VICHI (PLOS ONE, 2014)

KEY FINDING # 1 :

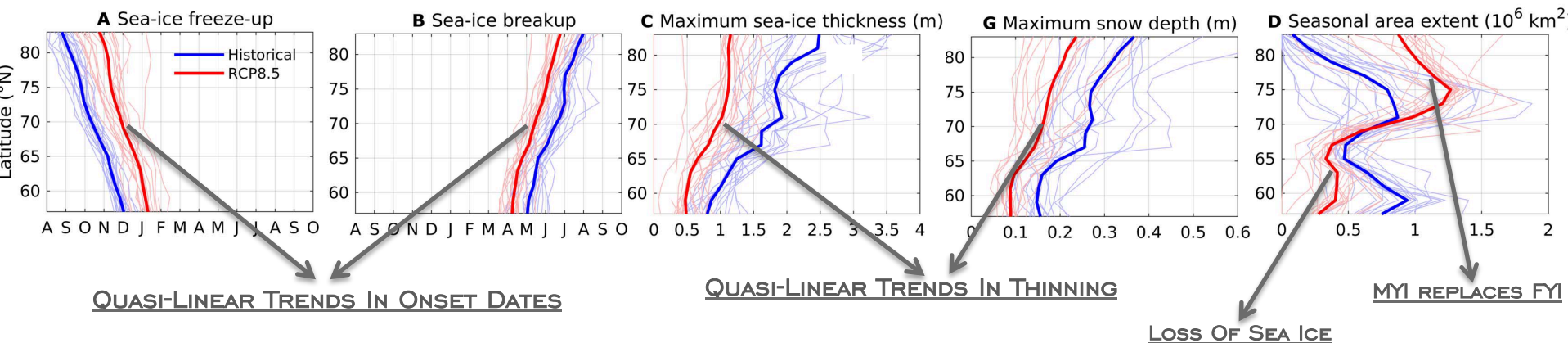
QUASI-LINEAR PHYSICAL CHANGES ALONG LATITUDES FOR FYI

HISTORICAL (1961-2005)

RCP 8.5 SCENARIO (2061-2100)

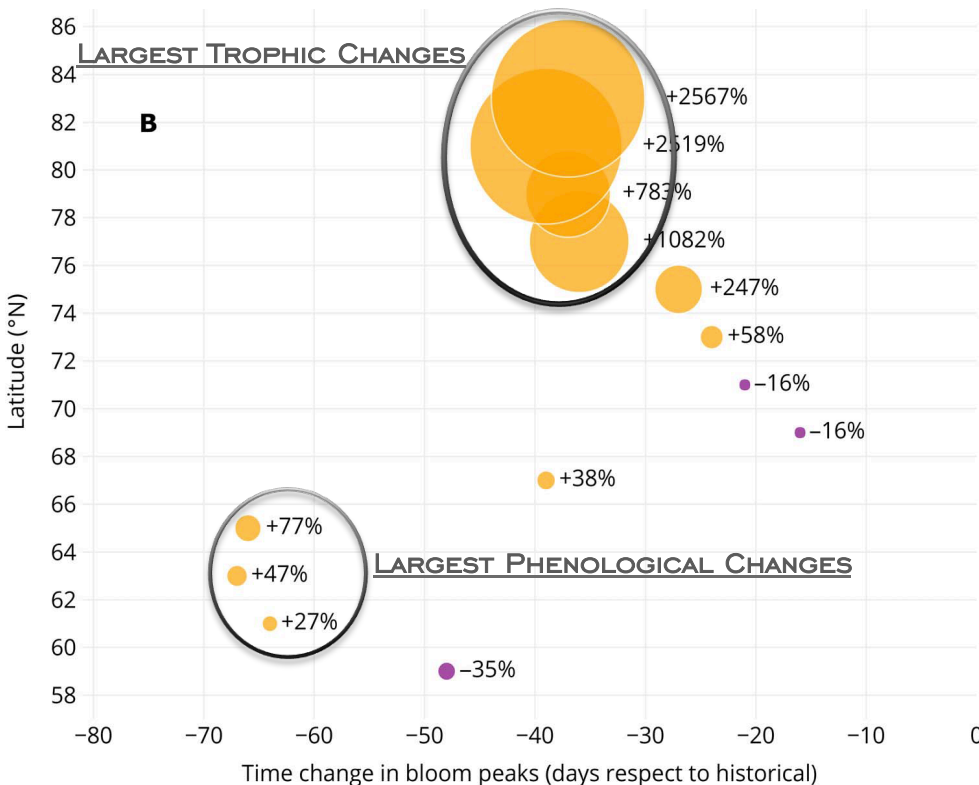
THIN LINES ARE MEDIANS OF THE EMPIRICAL PROBABILITY DENSITY FUNCTIONS FROM 18 MODELS.

THICK LINES AND ENSEMBLE MEAN.



KEY FINDING #2:

NON-LINEAR GPP RELATIVE CHANGES ALONG LATITUDES FOR FYI



CHANGE IN ALGAL BLOOM TIMING:

EARLIER, FROM -68 TO -16 DAYS

RELATIVE CHANGE IN ALGAL BLOOM MAGNITUDE

(GROSS PRIMARY PRODUCTION GPP):

MOSTLY POSITIVE, FROM -35% TO + 2567%

SPATIALLY INTEGRATED PAN-ARCTIC RELATIVE

CHANGE OF FYI GPP:

+63%

- FOR MECHANISMS OF PHENOLOGICAL CHANGES EXPLAINED --> FOLLOW THE LINK TO THE PAPER: [HTTPS://DOI.ORG/10.1126/SCIADV.AAV4830](https://doi.org/10.1126/sciadv.aav4830)
- FOR A PRESENTATION OF THE PHENOLOGICAL AND TROPHIC CASCADES EXPECTED TO BE IMPORTANT AND COMPLEX --> SEE DISPLAY 21368
“TEDESCO ET AL., ARCTIC SEA-ICE DECLINE IMPACTS ON PRIMARY PRODUCTION”, THURSDAY AT 16:15
- IF INTERESTED IN “CRYOSPHERE CHANGE IMPACTS ON MARINE ECOSYSTEMS AND BIOGEOCHEMICAL CYCLING”, CONSIDER ATTENDING ALSO SESSION CR7.1 ON THURSDAY AT 16:15-1830.

