

Spatial-temporal variations in dinoflagellate cyst records of the Chukchi margin sediments: implications for paleoceanographic changes



극지연구소 극지기후연구부
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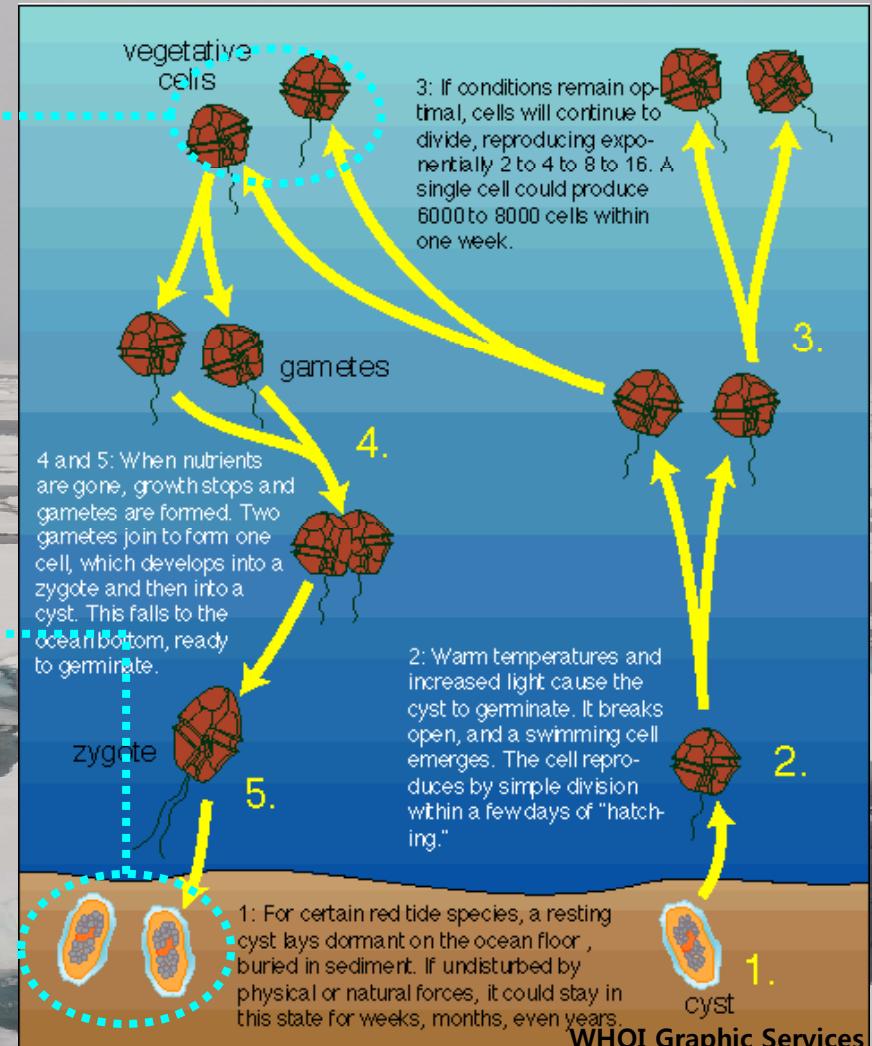
Research Tool

DINOFLAGELLATE

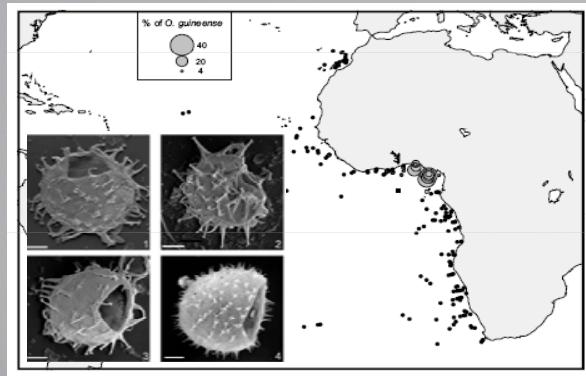
- Microscopic unicellular organisms
- One of the major groups of microplankton
- Present in all aquatic environments
- More than 2100 marine species of dinoflagellates (ca. 10% produce 'CYST', a benthic resting stage)

DINOFLAGELLATE CYST

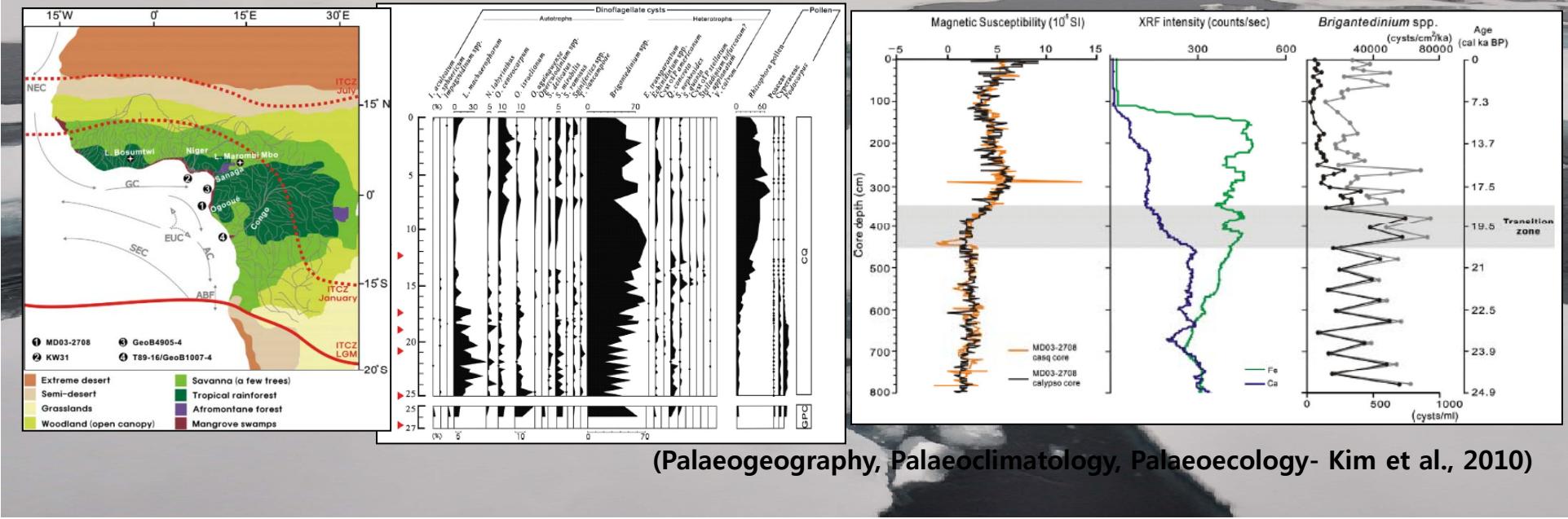
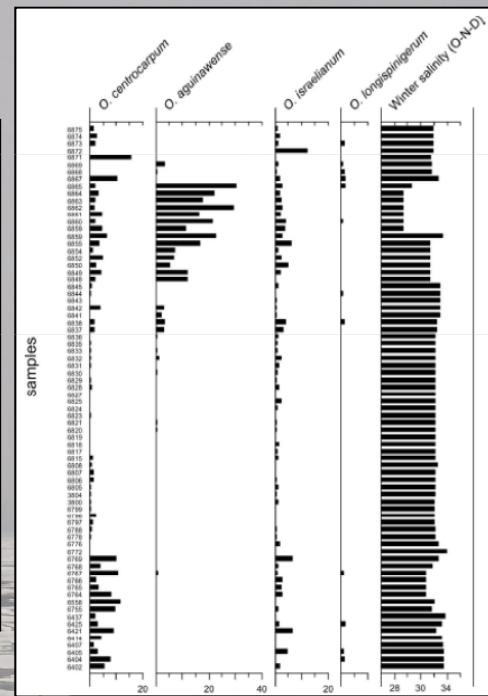
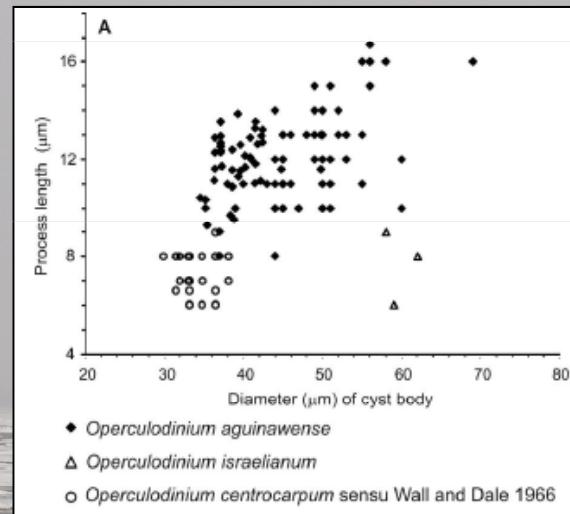
- Thick cyst wall: extremely resistant to physical, chemical breakdown
- Fossilizable
- Size: 30~65 µm
- Act like fine particles



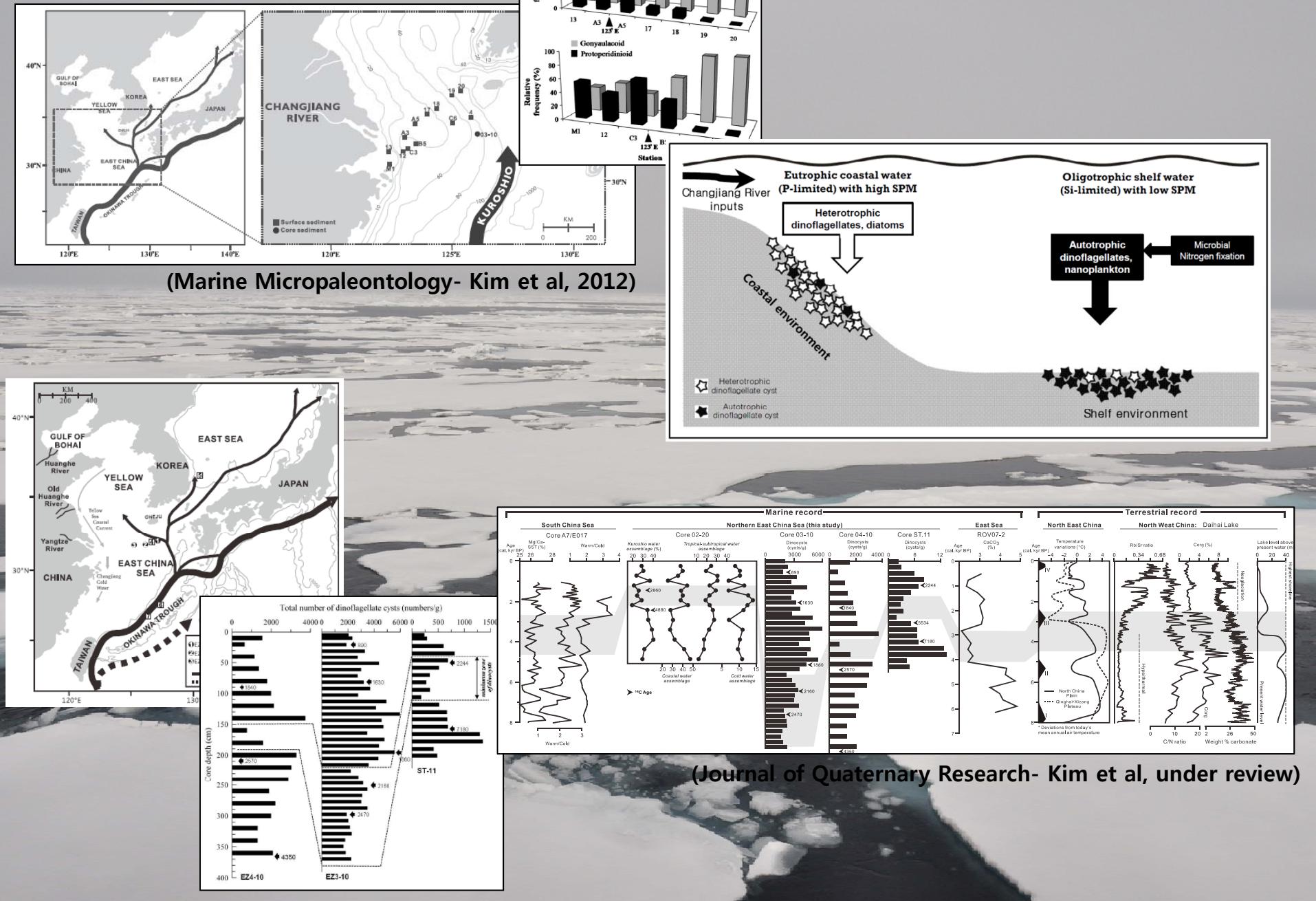
Research Tool



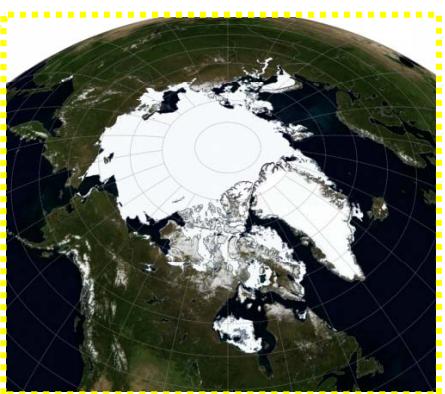
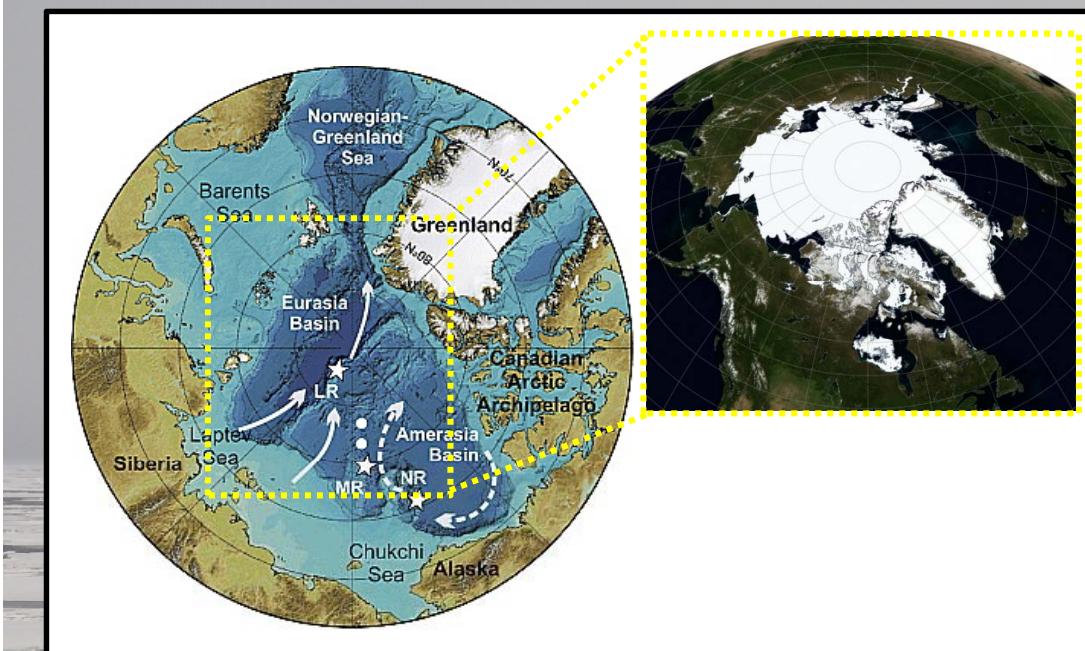
(Palynology- Marret and Kim, 2009)



Research Tool



Research Background



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종합

"동장군·폭설 원인은 북극진동"...1월에도 계속될 것

기사보기 SNS댓글 쓰기

입력: 2011-01-02 14:15 / 수정: 2011-01-02 14:15



최근 지구촌에 이어지는 한파와 폭설의 원인이 북극진동의 영향인 것으로 밝혀졌다.

2월 기상청은 "북극의 기온이 평년보다 약 10도 높은 상태가 지속되며(북극진동), 북극의 매우 찬 공기가 충돌로까지 남하하여 북미, 유럽, 동아시아에서 한파와 폭설을 유발하고 있다"고 밝혔다.

북극진동은 북극에 존재하는 찬 공기의 소용돌이가 수십일 또는 수십 년 주기로 강약을 되풀이하는 현상으로, 이 변동을 지수화 한 것을 뜻한다.

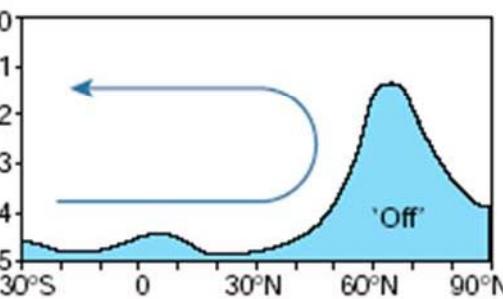
실제 북극진동의 영향으로 영국에는 100년만에 한파와 17년만의 최악의 폭설이 내렸다. 또 미국 중서부에서 시작된 기록적인 폭설과 한파가 동남부까지 길러 하는가 하면 중국 북부에서는 평년보다 10도나 낮은 한파와 폭설이 내리는 등 지구촌은 동장군의 맴버로 꼴꼴 열어있는 상태다.

우리나라는 동아시아 대륙으로부터 저기압의 이동통로가 형

Fresh angle on the polar seesaw

Trond M. Dokken and Kerim H. Nisancioğlu

During the last glacial period, climatic variation in the Northern and Southern Hemispheres was evidently linked. Modelling work points to freshwater discharge into the North Atlantic as a driving factor.



Palaeogeography, Palaeoclimatology, Palaeoecology 301 (2011) 31–36
www.elsevier.com/locate/palaeo

Contrasting glacial/interglacial regimes in the western Arctic Ocean as exemplified by a sedimentary record from the Mendenhall Ridge

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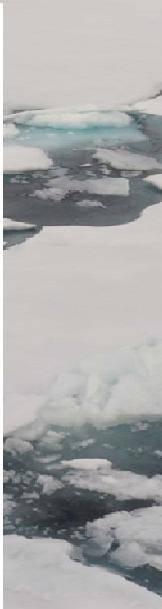
Abstract
Dense sediments in lithology and microfacies transition across over the Mendenhall Ridge in the western Arctic Ocean were deposited ca. 1.5 km offshore during glaciogenic sedimentary periods. We used the sedimentary record from the Mendenhall Ridge to contrast glacial and interglacial conditions. Glacial regime events are characterized by a decrease in the amount of organic matter and a decrease in the amount of carbonates. An increase in the amount of organic matter and an increase in the amount of carbonates are characteristic of interglacial events such as the last deglaciation at c. 12,000 yr BP. The permafrost interval is characterized by a decrease in the amount of organic matter and an increase in the amount of carbonates. An independent stratigraphic control of sedimentary facies from the Mendenhall Ridge and other deep-drilled sites in the western Arctic Ocean is provided by the presence of a thin layer of glaciogenic sediments deposited during the last deglaciation. This study provides a new perspective on the development of the Arctic Ocean during the last deglaciation and postglaciation and provides the tool to estimate a relatively thermocline for the Arctic Ocean.

Keywords: Arctic Ocean; Mendenhall Ridge; paleogeography; paleoclimate; ice rafting; biostratigraphy; facies

* Corresponding author. Tel.: +1 734 936 0682.

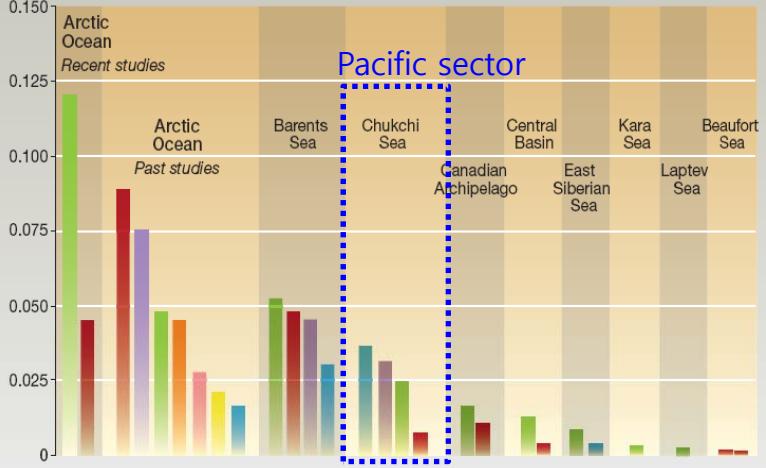
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URL: <http://dx.doi.org/10.1016/j.palaeo.2011.09.012>.

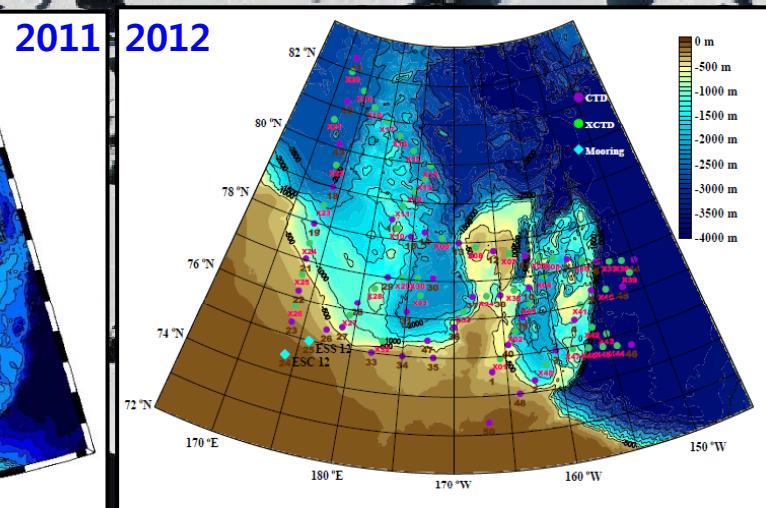
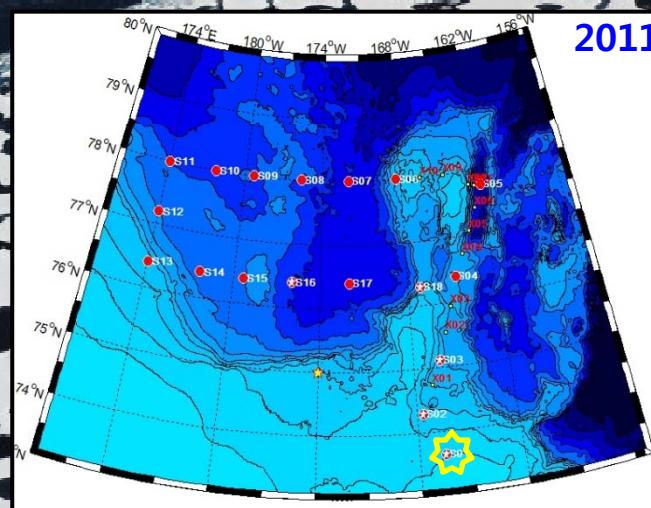
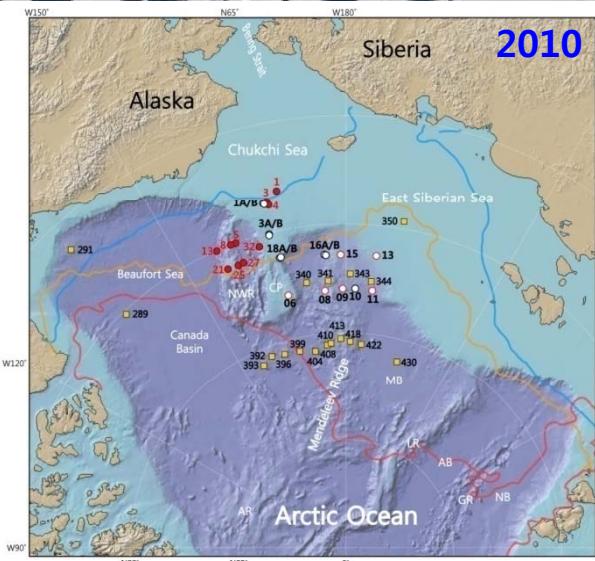


Uptake of carbon dioxide from the atmosphere

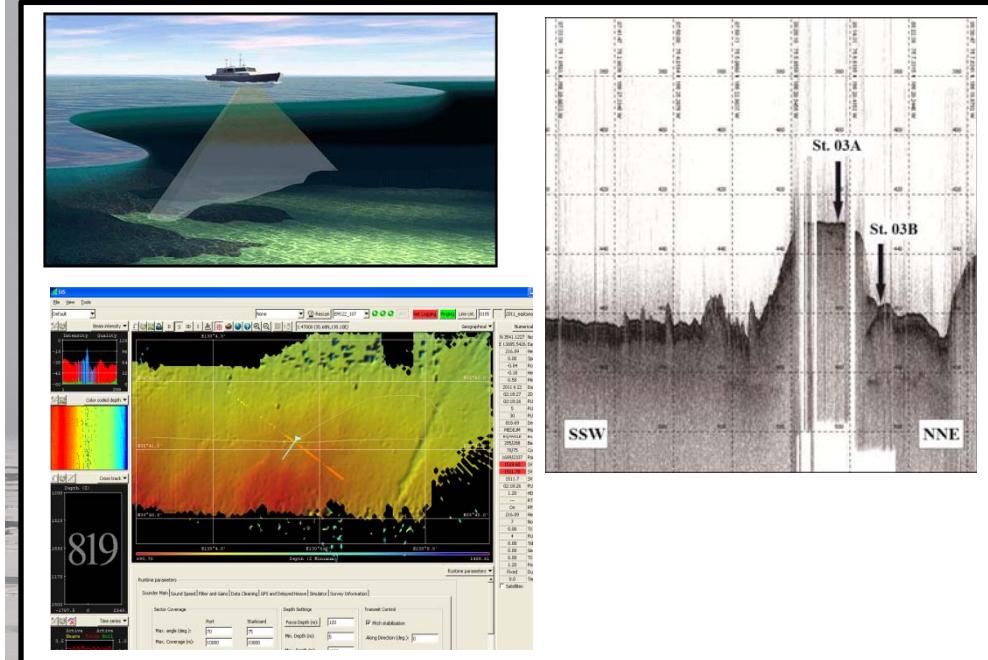
Gigatonnes of carbon per year



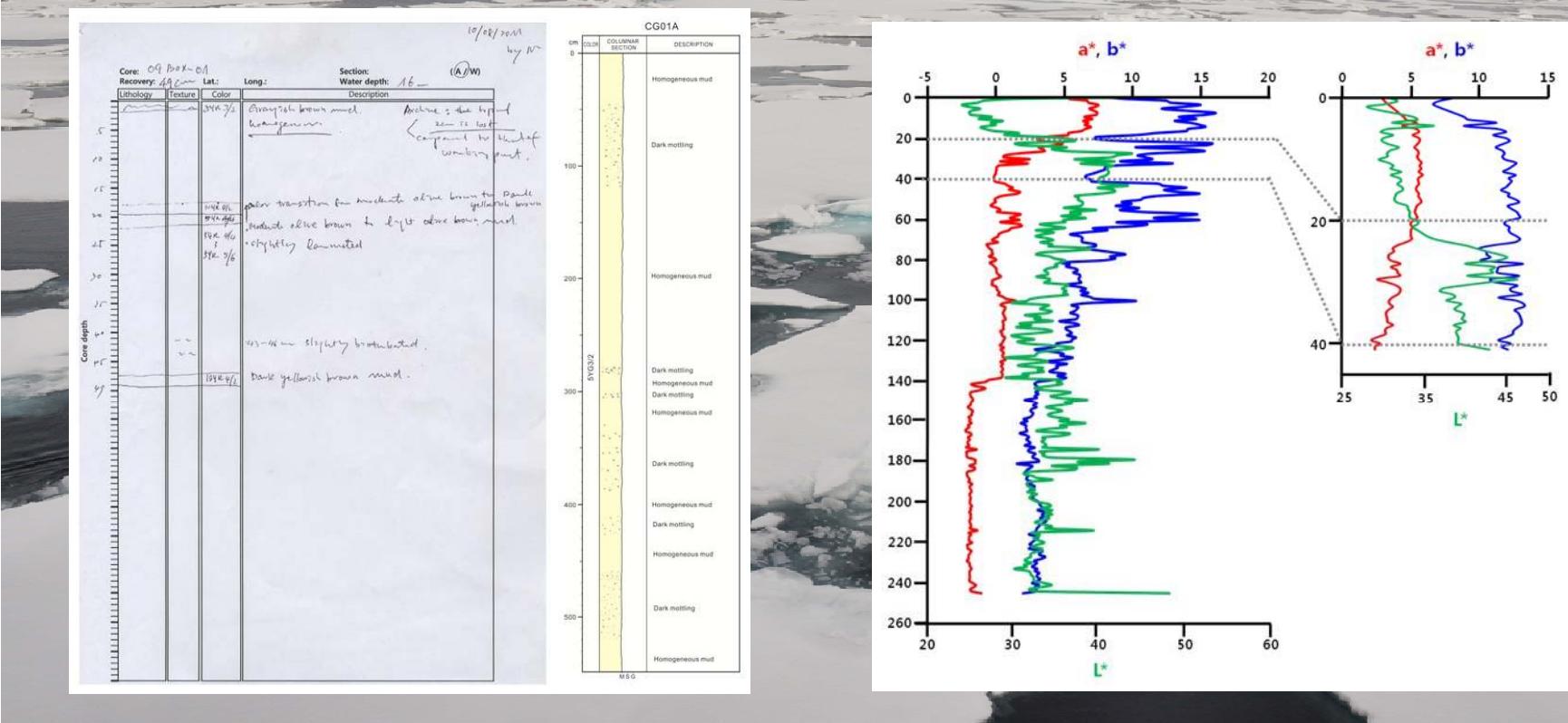
ARAON 'western Arctic' expedition (2010~)



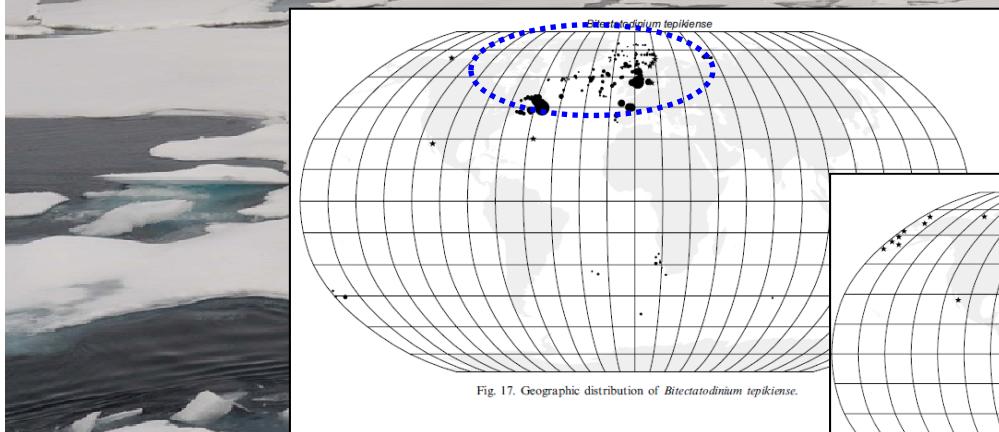
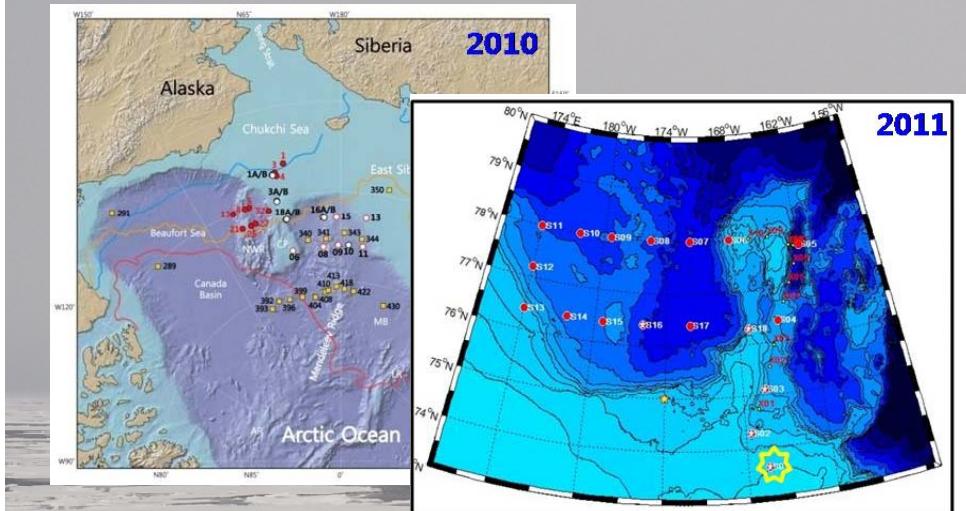
ARAON 'western Arctic' expedition



ARAON 'western Arctic' expedition



Preliminary results

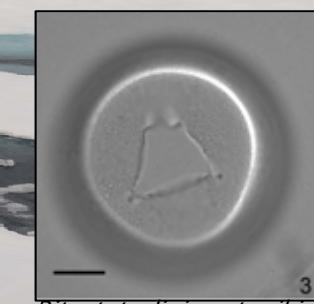
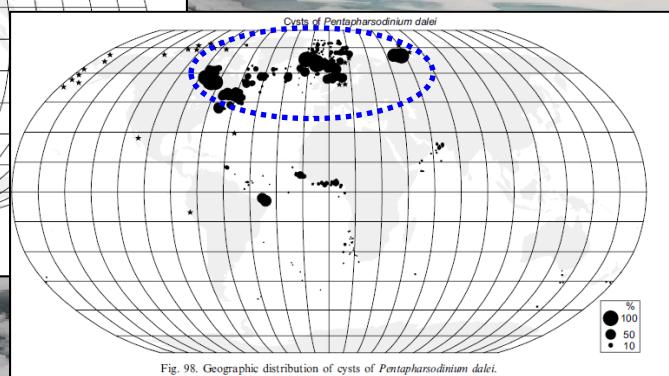
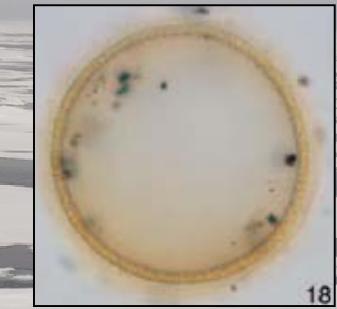
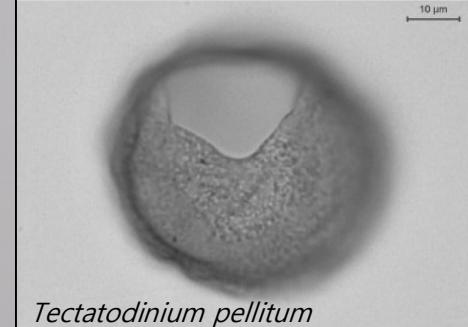


[Dino-Atlas] Atlas of modern organic-walled dinoflagellate cyst distribution

<http://dino-atlas.pangaea.de/>

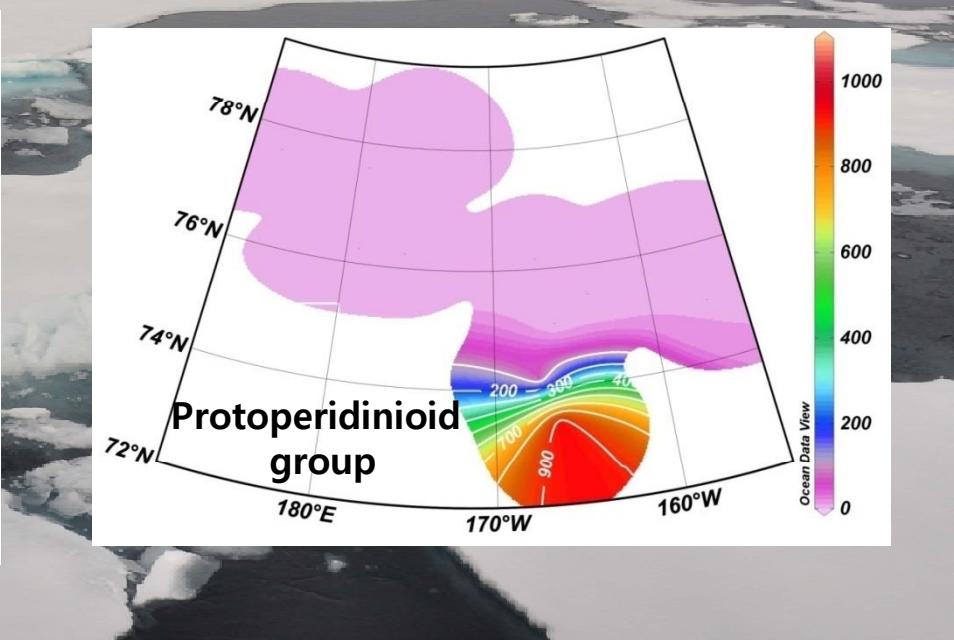
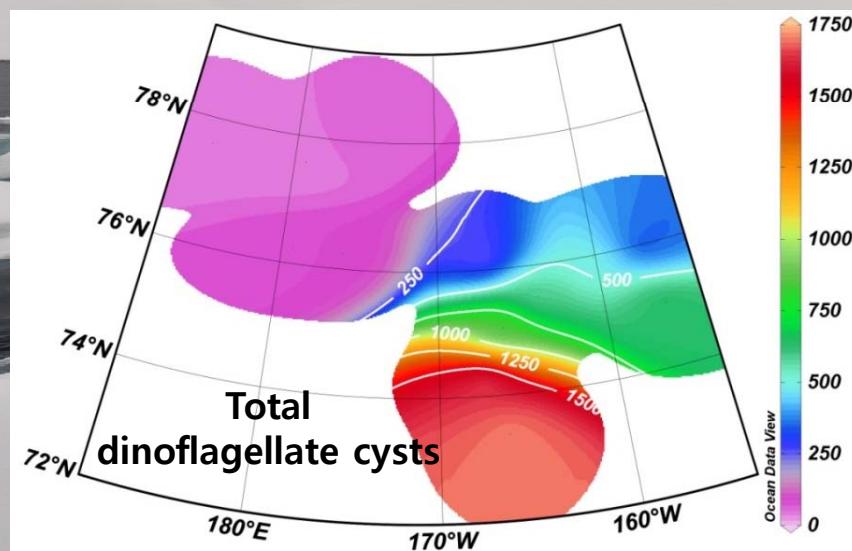
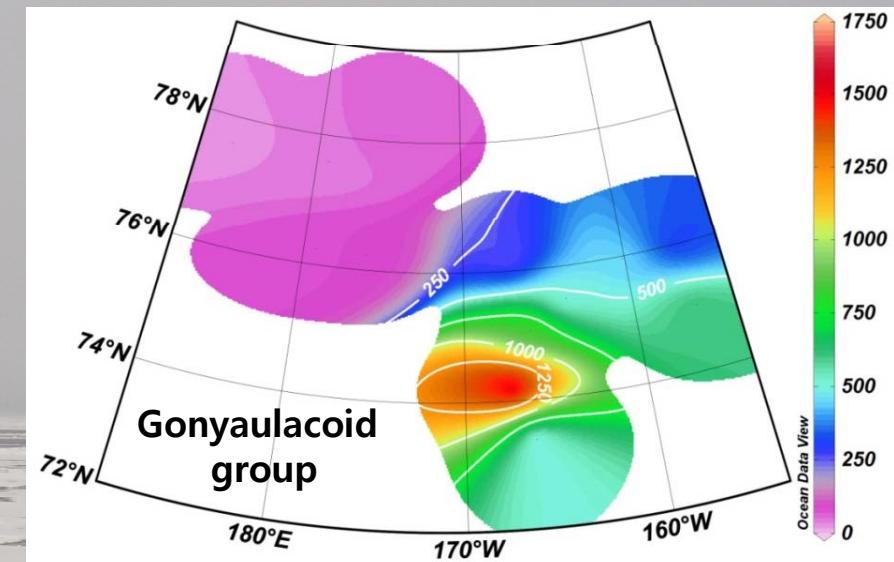
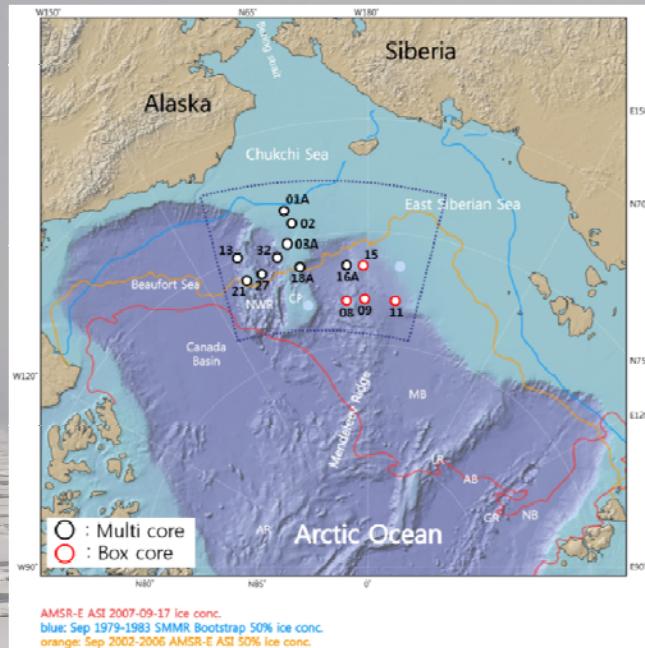


The Chukchi Sea shelf sediments

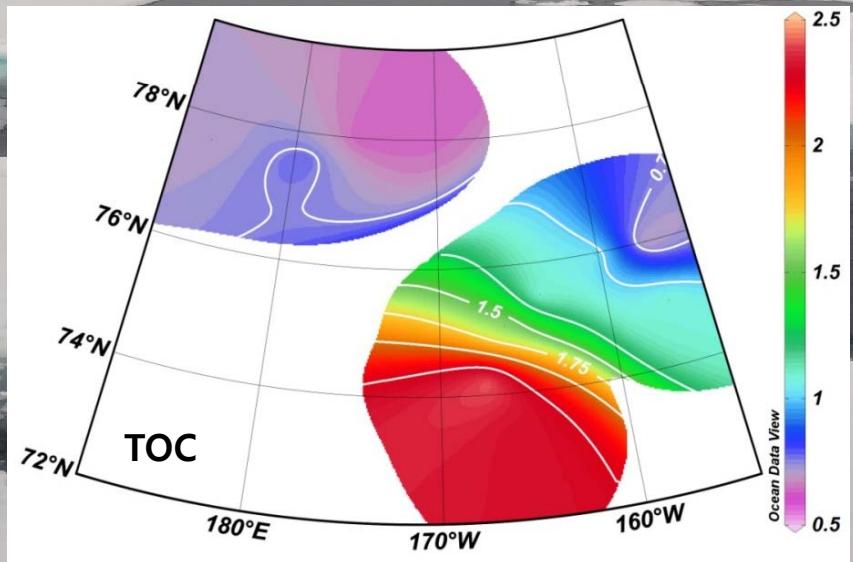
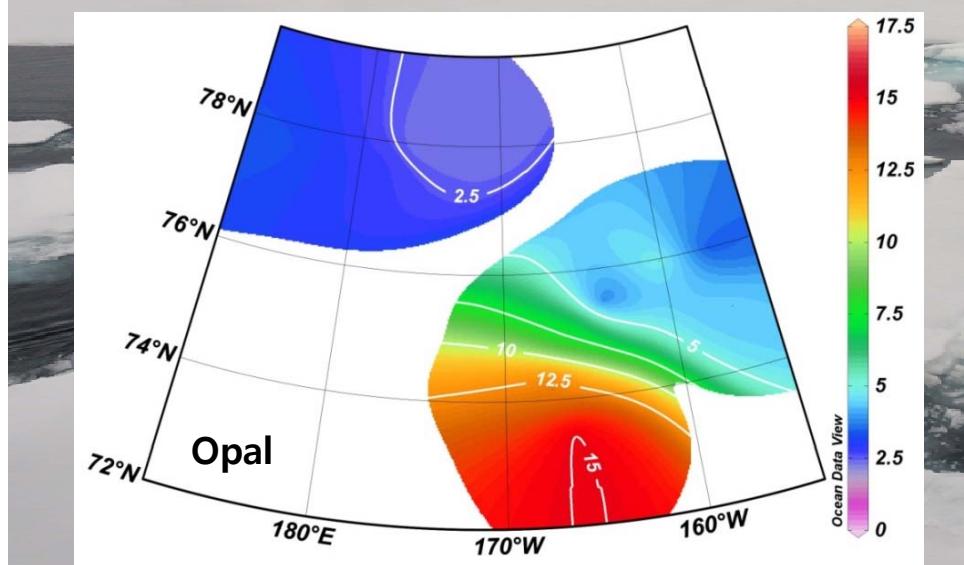
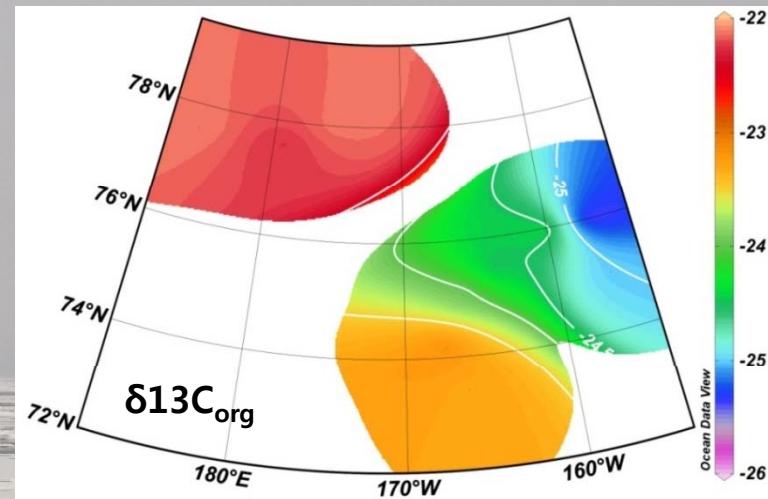
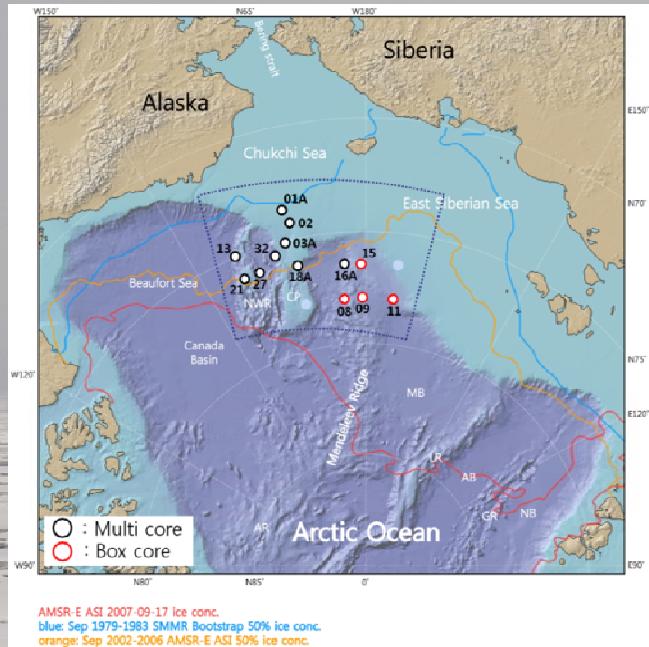


Bitectatodinium tepikiense

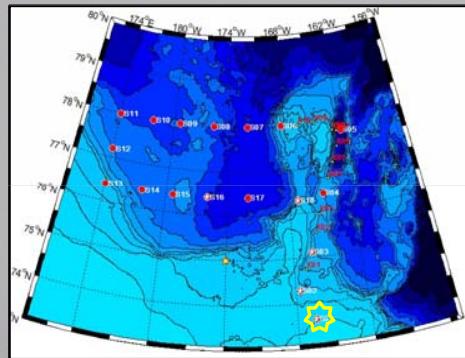
Preliminary results: surface sediments (ARA01/02B)



Preliminary results: surface sediments (ARA01/02B)



Preliminary results: multi core (ARA02B 01A-MUC)

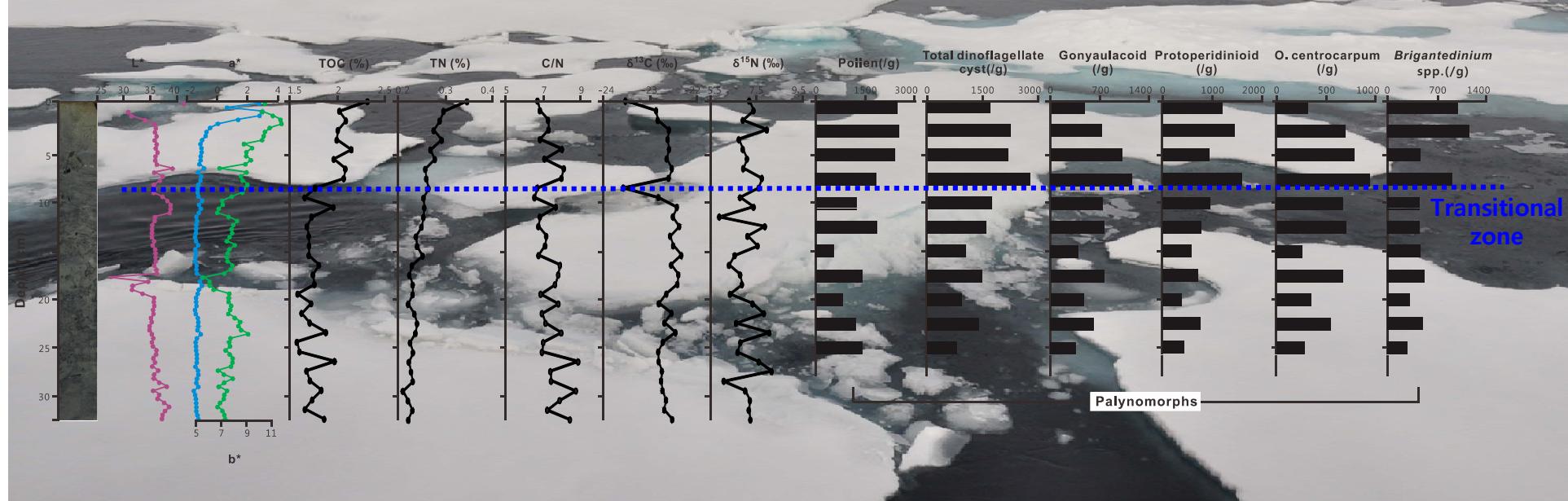
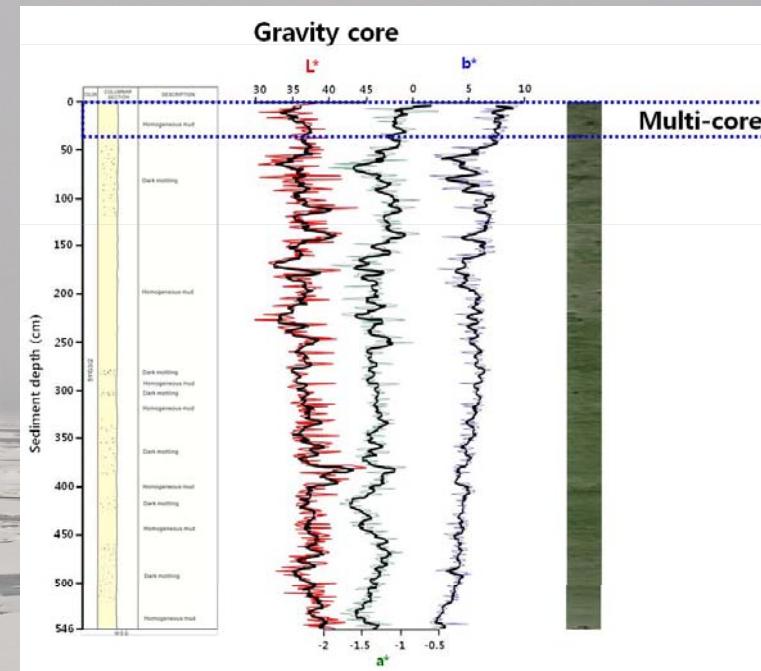


수심: 111m

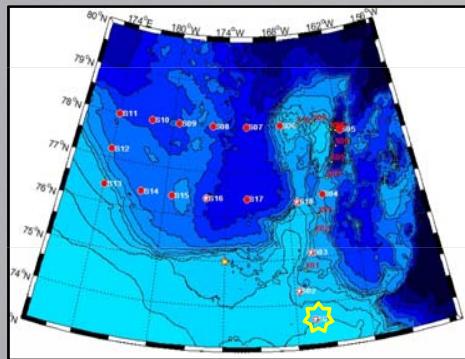
코어시료 길이:

Gravity core: 546cm

Multi- core: 30cm



Preliminary results: gravity core (ARA02B 01A-GC)

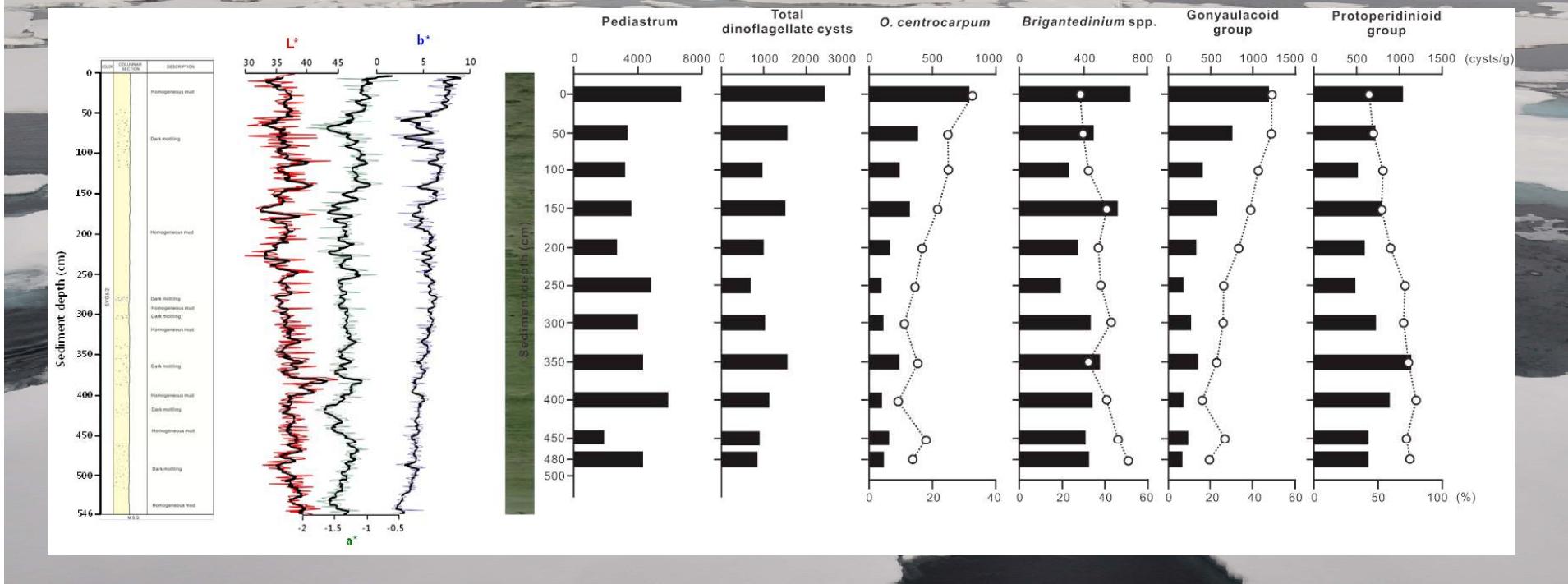


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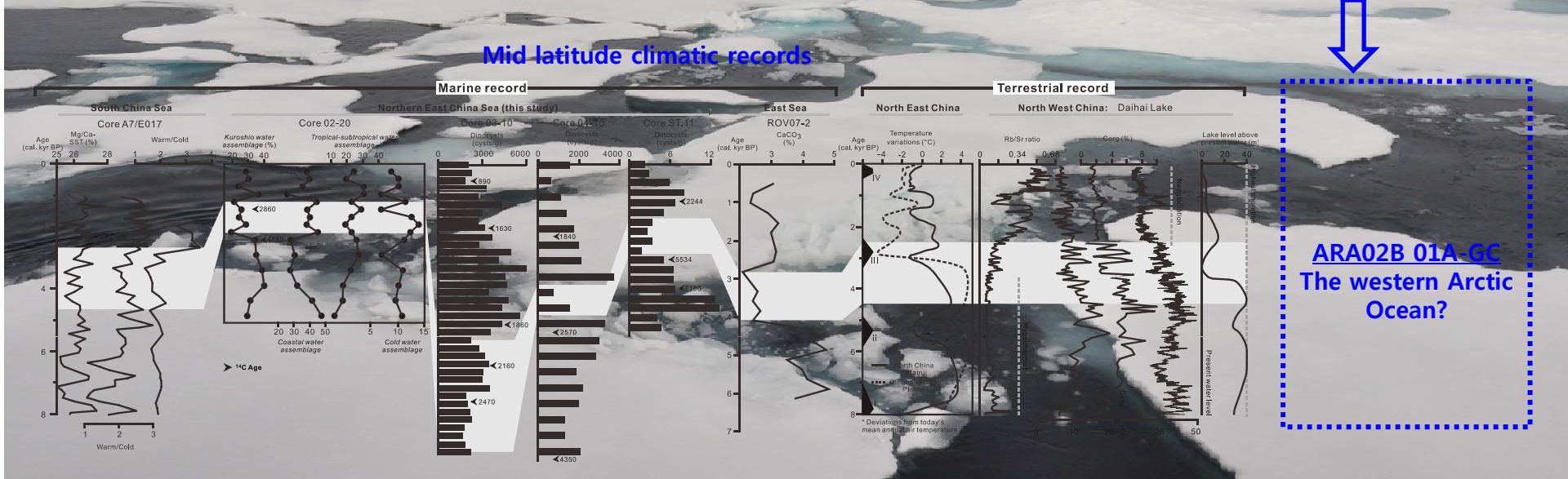
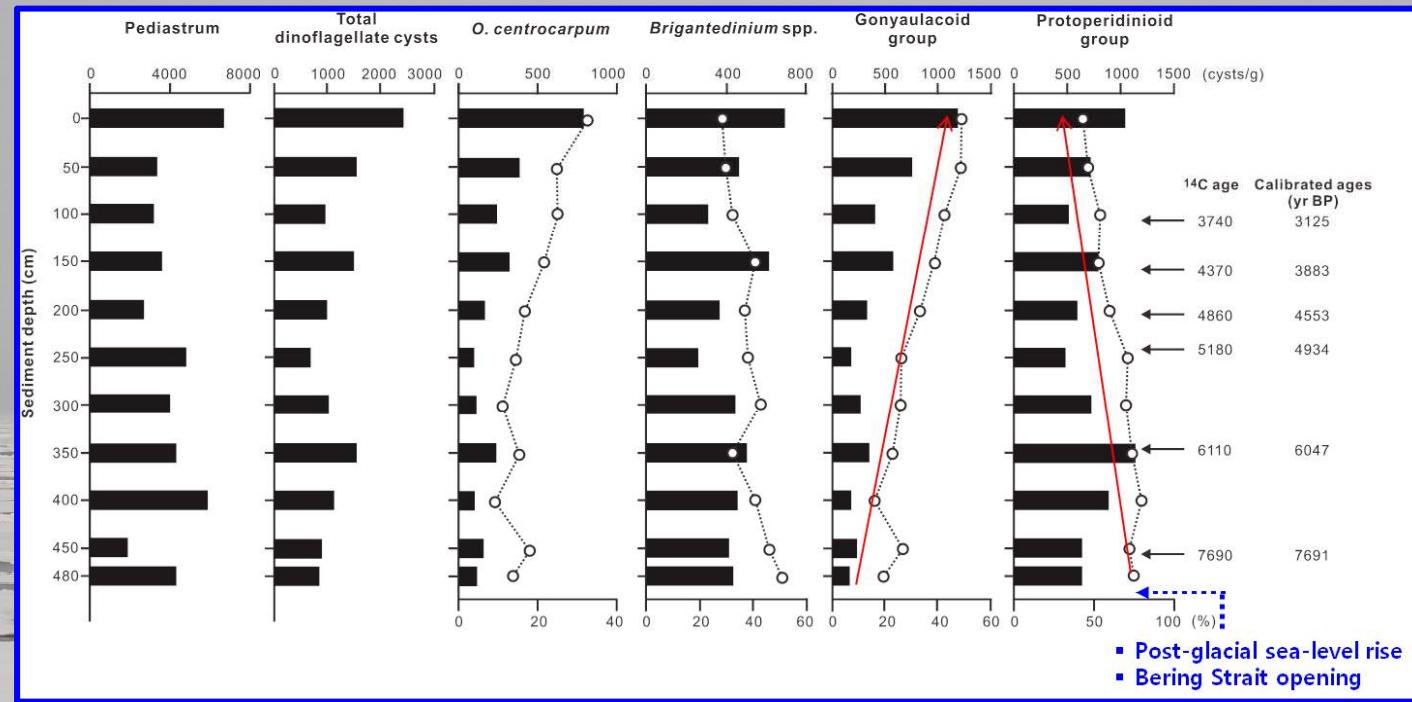
코어시료 길이:

Gravity core: 546cm

Multi- core: 30cm



Arctic climate feedback: global implications



A wide-angle photograph of a polar ocean scene. The foreground is filled with dark blue, slightly choppy water. Large, white, irregular ice floes of various sizes are scattered across the surface. In the distance, the horizon line is visible where the bright white of the ice meets the clear blue sky. The sky is mostly clear with a few wispy, light-colored clouds.

Thank you for your attention-