



KOPRI's Arctic activities

2016-2017

Strategy and Cooperation Division
Korea Polar Research Institute





Outline

KOPRI, the central agency for the national polar program; new management and new developments

Research ship-based activities

Land and nearshore based activities

Science highlights

Other initiatives

New development

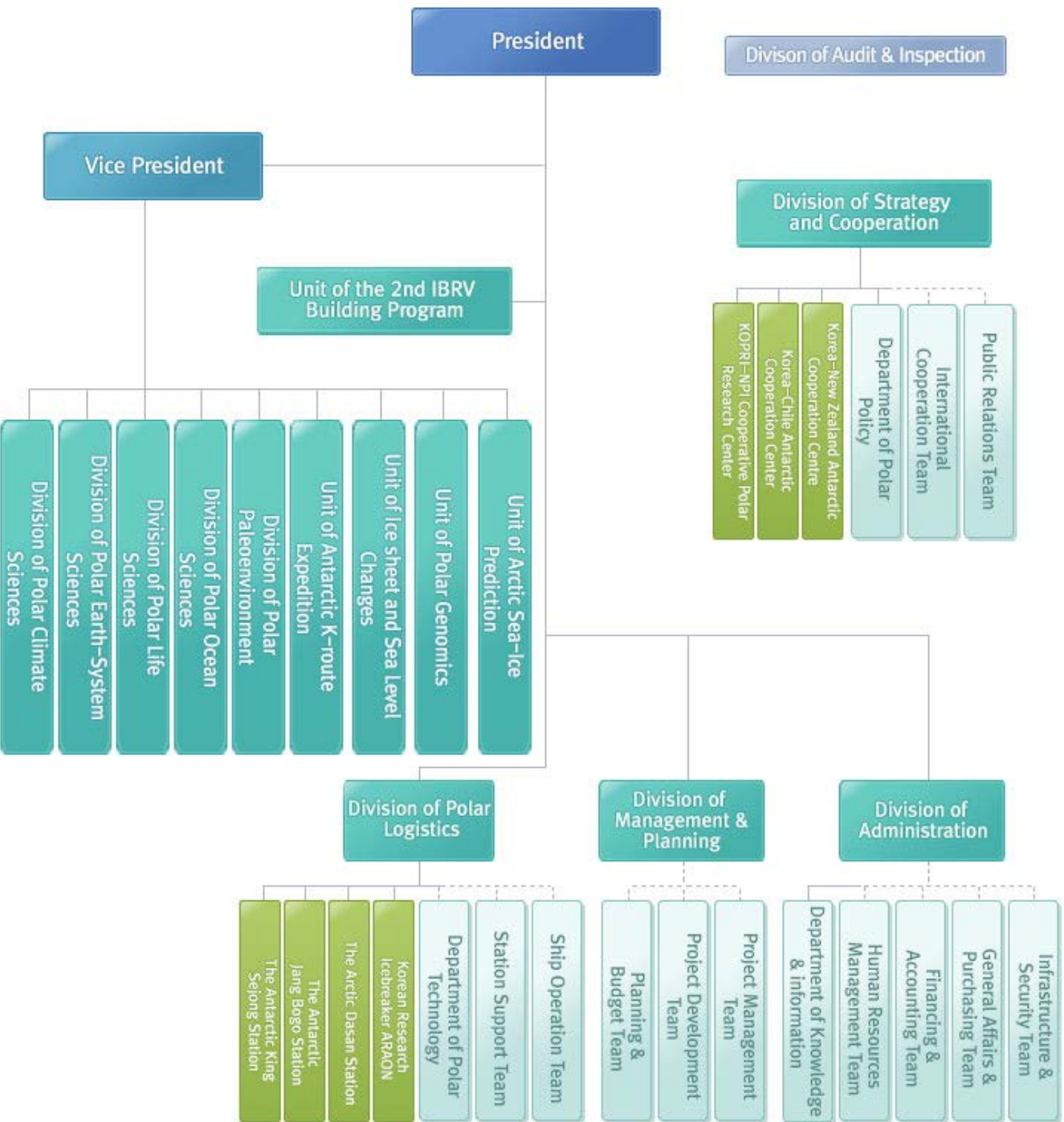
New KOPRI management; Dr. Yoon ta
from August 2016



Restructuring; 5 major research divisions and 4
mission-oriented research units

Arctic Research Center back to individual
research groups, creation of 'Arctic Sea Ice
Prediction Unit'

Strategic Planning and Partnership Division;
policy, cooperation and public outreach



Ship based

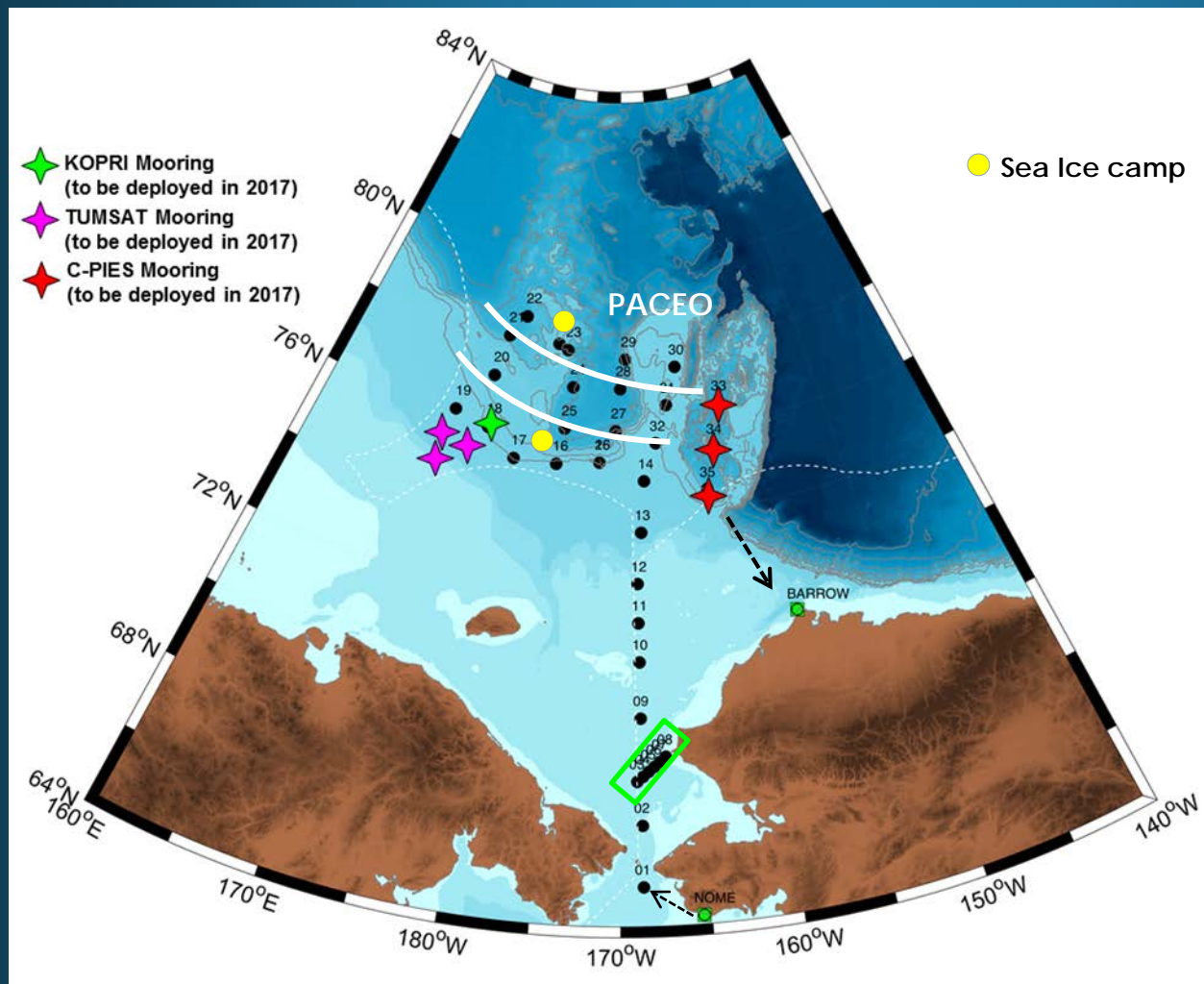
2 legs; 21 July 2017 to 29 September 2017 (home to home)

Leg 1; Arctic ocean changes (Chukchi Sea plus underway, multinational collaboration, contribution to PAG, DBO and PACEO efforts)

Leg 2; Arctic Geo-hazard studies(Canadian cooperation plus ROV operation)

2017 Arctic Survey plan

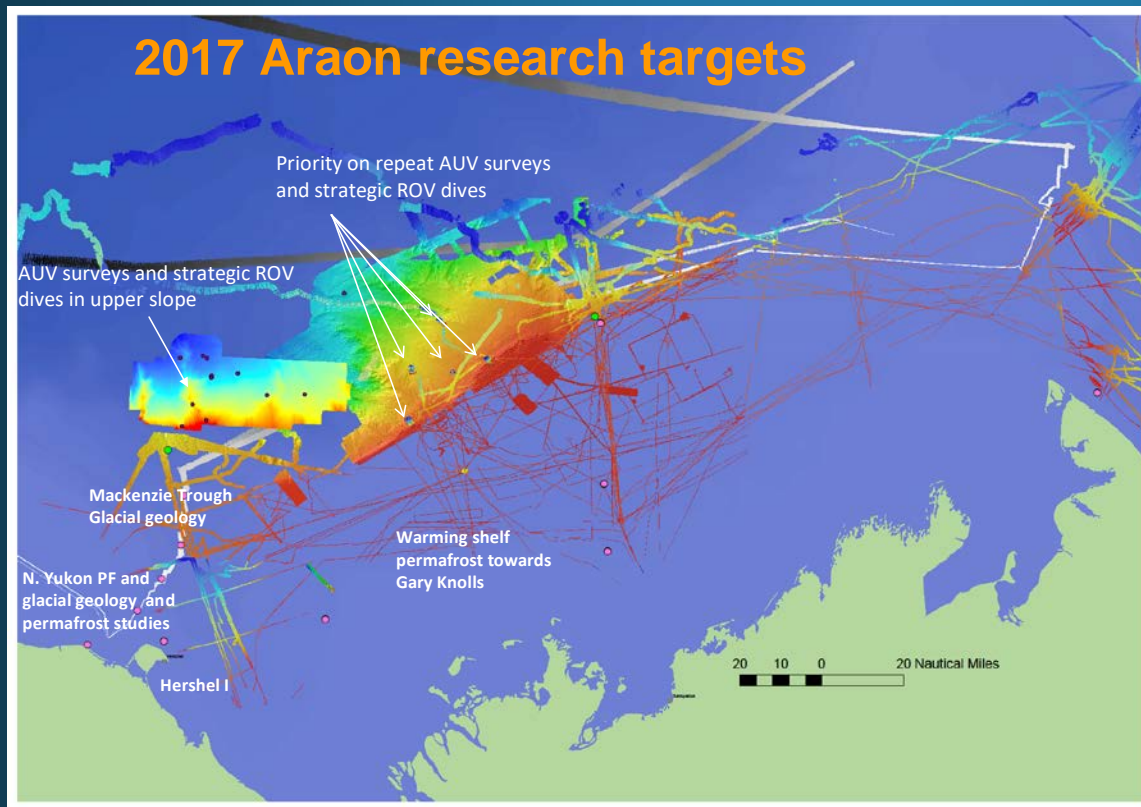
1st Leg (ocean study)



- North Bering Sea (DBO 3)
- Chukchi Sea
- East Siberian Sea & Mendeleev Ridge
- Sea Ice station (2 site)
- Ocean mooring station (6 stations)

2nd Leg

Marine Geological/Geophysical Survey @ the Beaufort Sea



● Research items;

- Multi-channel seismic survey
- ROV/AUV investigations
- Sub-bottom profiling
- bathymetric mapping
- Sediment coring
- Heat flow measurements
- Underway gravity survey
- Water column study
- Methane flux study
- Microbiological study

Land & nearshore based

Ny Alesund; from March 2017 to September, > 50 persons (atmospheric/upper atmospheric studies, pollutant studies, geology and public outreach)

Cambridge Bay, Canada; permafrost (June), sea ice based (April)

Alaska; at Council Site, permafrost and climate gases

Greenland; atmospheric (eddy covariance flux), paleontology

Cape Baranova, Russia; atmospheric measurements (AWS, radiometer/soil sensors)

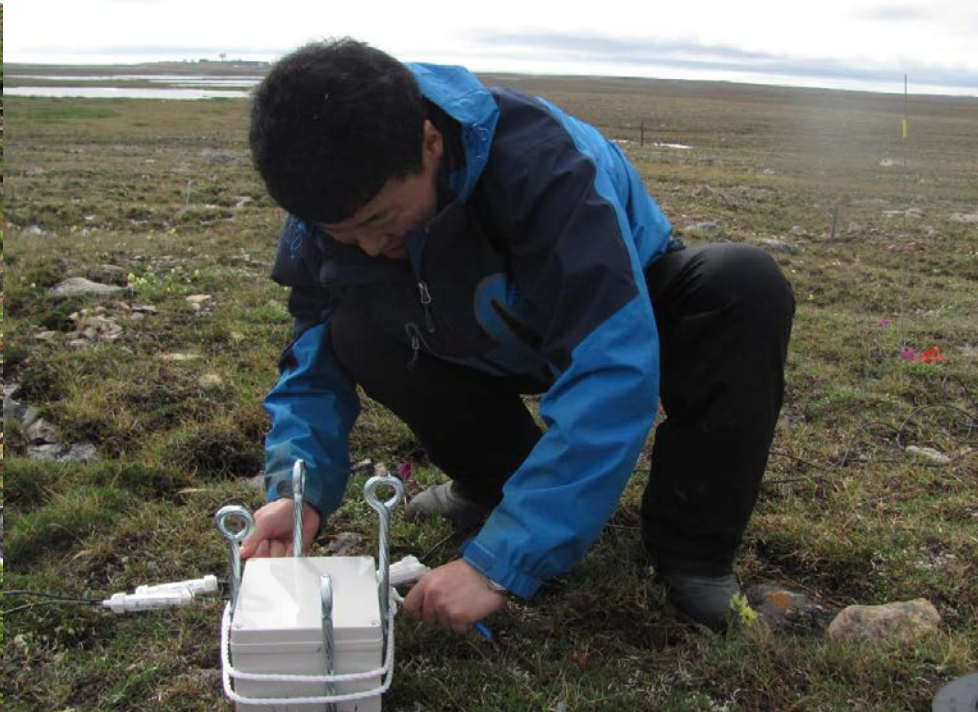
Iceland; atmospheric measurements (DMS, aerosol)



Non-warming & Precipitation



Warming & Precipitation



Science highlights

Crazy hot Arctic?; energy bomb (in the form of wind storm) flown from the mid latitudes and dropped in the Arctic

Gas hydrate encountered off east Siberia

Ice chemistry; frozen pollutant getting benign or detoxed?

OPEN

Major cause of unprecedented Arctic warming in January 2016: Critical role of an Atlantic windstorm

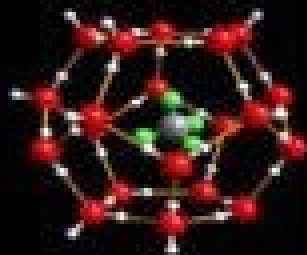
Received: 17 August 2016

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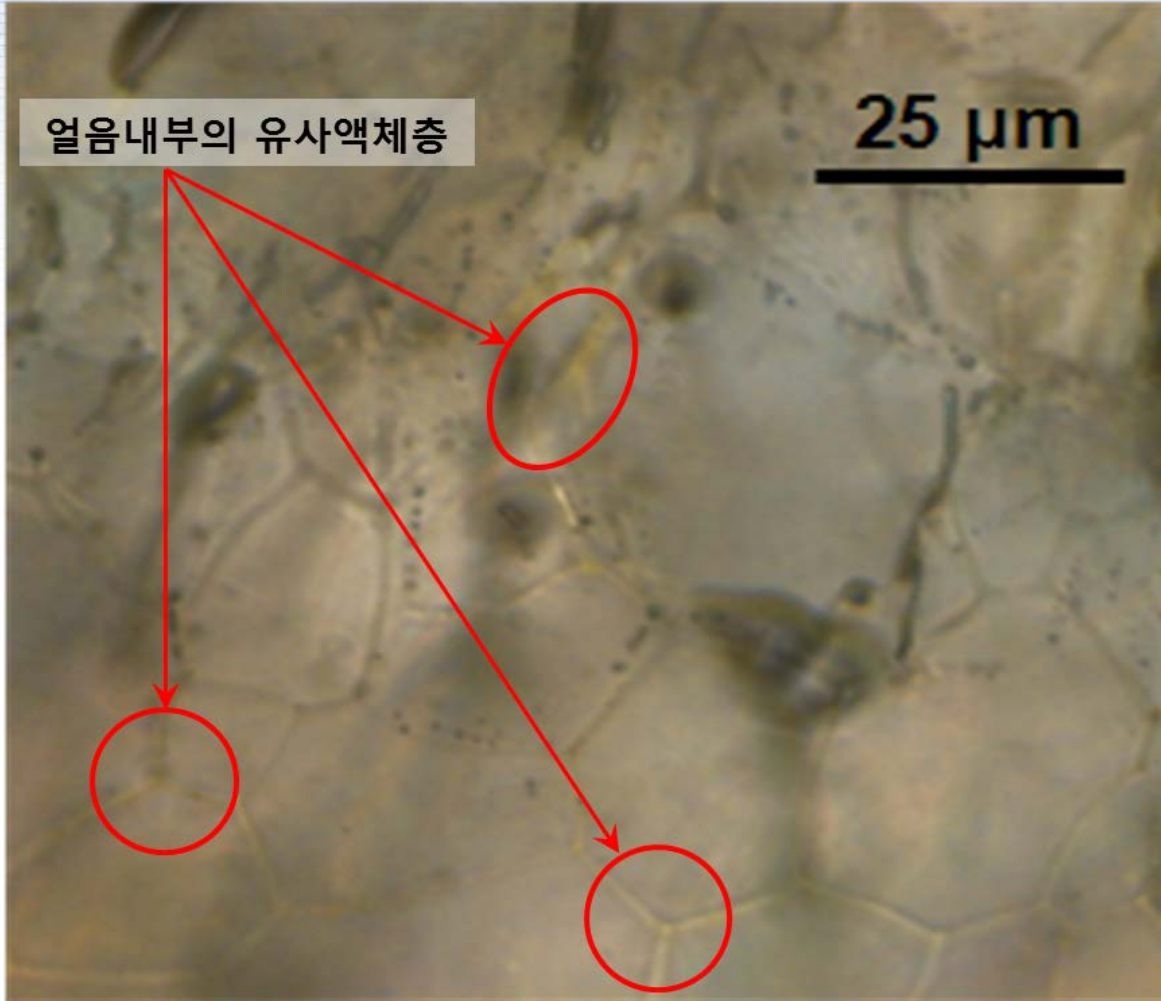
Baek-Min Kim¹, Ja-Young Hong¹, Sang-Yoon Jun¹, Xiangdong Zhang², Hataek Kwon¹, Seong-Joong Kim¹, Joo-Hong Kim¹, Sang-Woo Kim³ & Hyun-Kyung Kim⁴

In January 2016, the Arctic experienced an extremely anomalous warming event after an extraordinary increase in air temperature at the end of 2015. During this event, a strong intrusion of warm and moist air and an increase in downward longwave radiation, as well as a loss of sea ice in the Barents and Kara seas, were observed. Observational analyses revealed that the abrupt warming was triggered by the entry of a strong Atlantic windstorm into the Arctic in late December 2015, which brought enormous moist and warm air masses to the Arctic. Although the storm terminated at the eastern coast of Greenland in late December, it was followed by a prolonged blocking period in early 2016 that sustained the extreme Arctic warming. Numerical experiments indicate that the warming effect of sea ice loss and associated upward turbulent heat fluxes are relatively minor in this event. This result suggests the importance of the synoptically driven warm and moist air intrusion into the Arctic as a primary contributing factor of this extreme Arctic warming event.



얼음내부의 유사액체층

25 μm



Other initiatives

KoARC (Korea Arctic Research Consortium); new plan, 'white paper and roadmap-like blue print 2017 to 2025' in 'science', 'business and industry' and 'policy'

Arctic Partnership Week; 6 to 9, December 2016, Ocean Ministry initiative, with major contributions from KMI (policy focused institute), and KOPRI but many more (research, business oriented public corporations, local governments, local embassy)

북극협력주간
Arctic
Partnership
Week

2016 북극 Arctic 협력 Partnership 주간 Week

2016. 12.06-12.09

세부일정

장소 부산항국제여객터미널, 국립해양박물관

12.06(화) - 정책협력의 날

09:30~11:30 북극협력주간 개최식 / 부산항국제여객터미널 (주최: 해양수산부)
13:00~18:30 북극해 정책포럼 / 부산항국제여객터미널 (주최: 한국해양수산개발원)

12.07(수) - 과학협력의 날

09:30~12:00 북극과학협력 세미나 / 부산항국제여객터미널 (주최: 극지연구소)
13:30~17:30 한-노르웨이 북극연구 협력 세미나 / 부산항국제여객터미널
(주최: 주한노르웨이대사관)

12.08(목) - 산업협력의 날

09:30~18:00 북극해항로 국제 세미나 / 부산항국제여객터미널 (주최: 해양수산부)
13:30~18:00 북극자원개발 세미나 / 부산항국제여객터미널 (주최: 한국지질자원연구원)

12.09(금) - 문화 및 지역 협력의 날

10:00~18:00 북극 비전 국제 콘퍼런스 / 부산항국제여객터미널 (주최: 부산광역시)
14:00~17:30 북극 영화상영 / 국립해양박물관 (주최: 국립해양박물관)

Other initiatives

Asia polar science fellowship; in its 3rd year, 4 related research articles, 2 post-docs back to KOPRI

King Sejong station commemorating the 30th anniversary of the inauguration