



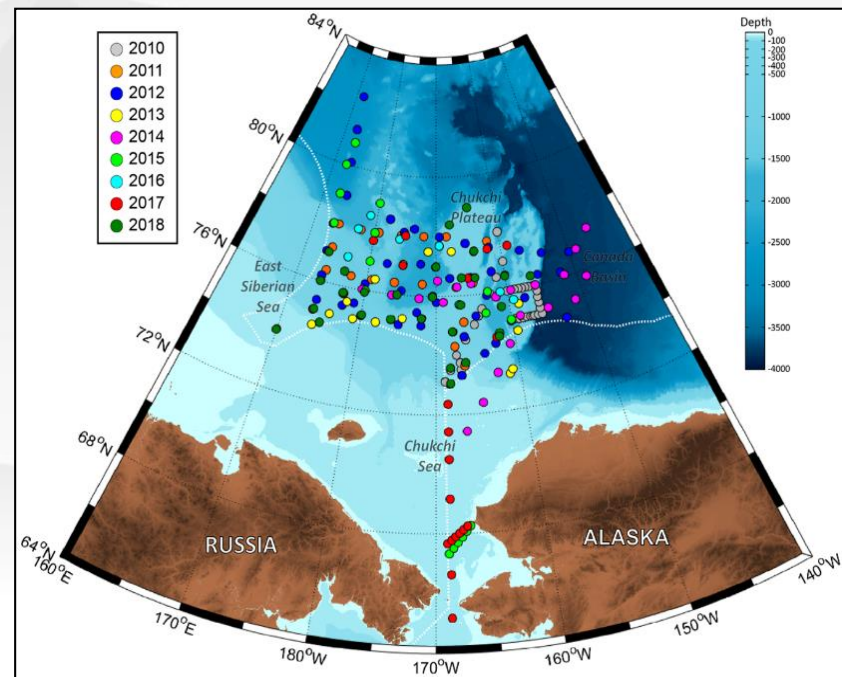
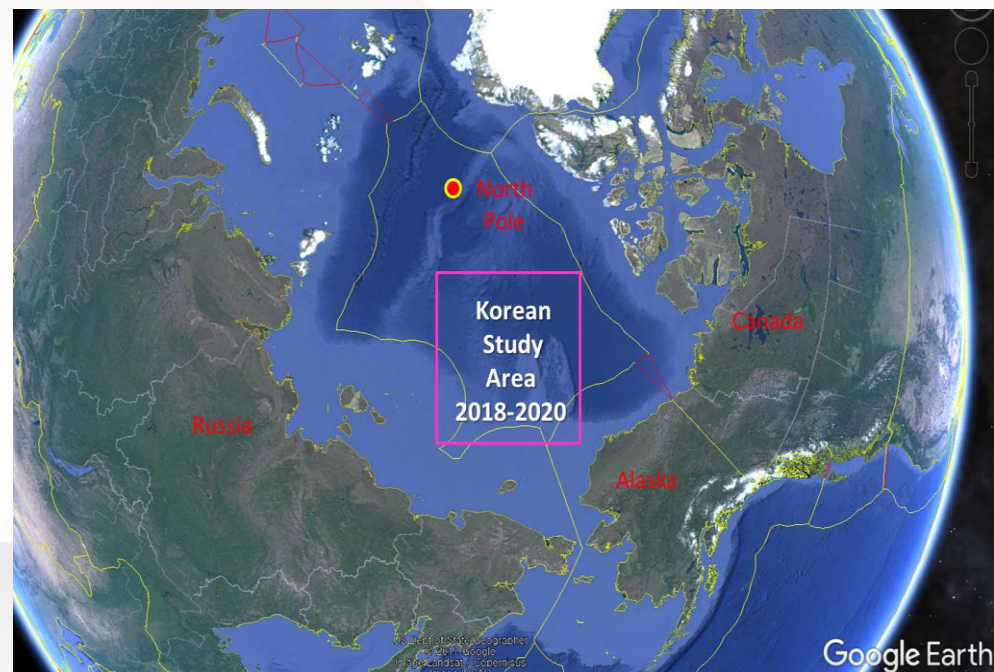
# Korea's Arctic science 2019 update

Strategy and Cooperation Division  
Korea Polar Research Institute



# IB R/V ARAON Arctic Survey (2010~2018)

Long-term Observation Hot spot of Sea Ice Loss, Warming Atmosphere, and Changing Ecosystems in Pacific Arctic Region

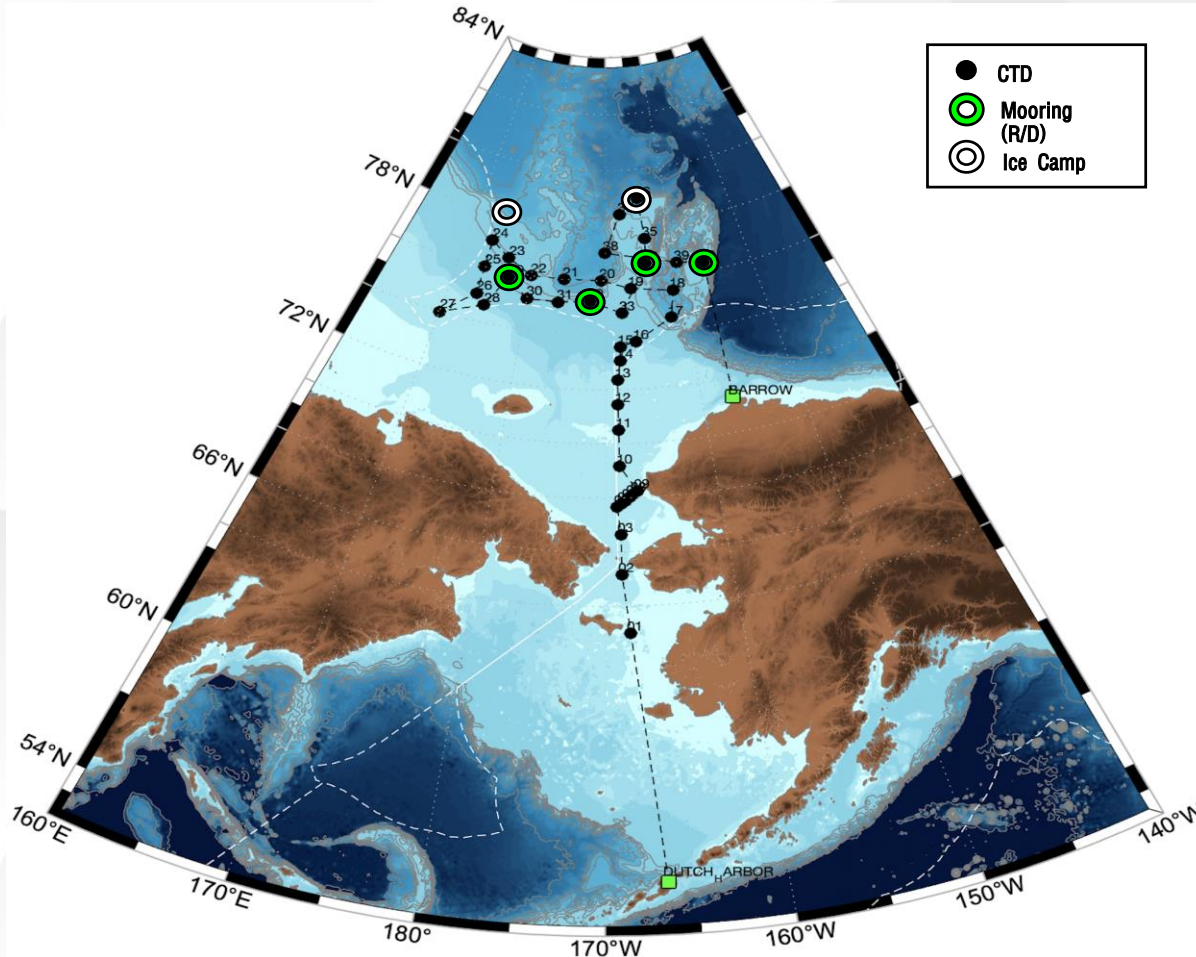


We are collaborating closely with our partners in Pacific Arctic Group (PAG) to find synergies and joint activities to avoid overlapping efforts.

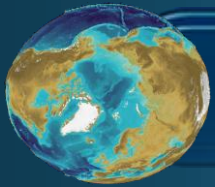
	2010	2011	2012	2013	2014	2015	2016	2017	2018
CTD	38	18	44	16	32	42	34	35	25
XCTD	*	33	48	36	51	61	38	30	30
Period	07/20~08/10	08/02-08/16	08/04-09/06	08/24-09/01	08/01-08/23	08/01-08/21	08/05-08/21	08/06-08/24	08/04-08/25

# 2019 Arctic Ocean Expedition

## 1<sup>st</sup> Leg (ocean-sea ice-atmosphere)



- North of Bering strait
- Chukchi shelf
- Chukchi Borderland to East Siberian Sea
- 2 Sea Ice stations
- Ocean mooring stations (4 stations)



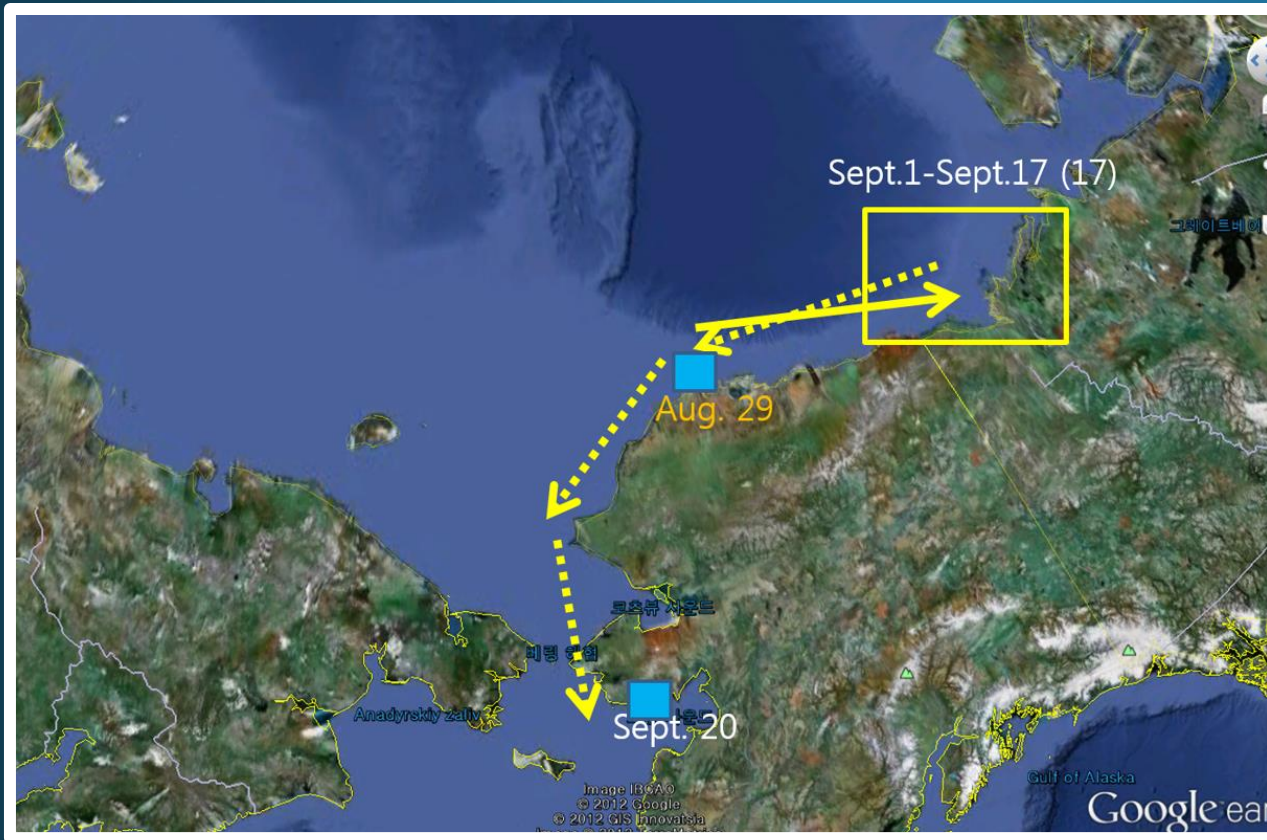
# 2019 KOPRI Arctic Expedition (3<sup>rd</sup> Leg)

- Marine geology/geophysics/oceanology/biology (Canadian Beaufort Sea)
- Aims of the cruise:
  - To map geological features/structures in the Arctic continental margin
  - To examine subsurface geology, permafrost, and gas hydrate and/or free gas accumulation, methane cycle, and methane-related microbiology in the Arctic
  - To document subsea bed geological processes, such as permafrost degradation, submarine slope failure, and methane release on the Arctic shelf/slope
- Period: 2019. 8.29 - 9.20 (from Barrow to Nome)
- Number of participants: 40
- Chief Scientists: Dr. Young-Keun Jin ([ykjin@kopri.re.kr](mailto:ykjin@kopri.re.kr))
- Participating nations: Korea, Canada, Germany



# 2019 Arctic Expedition (3<sup>rd</sup> Leg)

## Study Area: Canadian Beaufort Sea



### ● Research items;

- Multichannel seismic survey
- OBS survey
- Sub-bottom profiling
- bathymetric mapping
- Sediment coring
- Heat flow measurements
- Water column study
- Methane flux study
- Microbiological study

## DMS measurement & Monitoring Activities in Iceland

DMS measurement system installed in the Storrhofði observatory



## Atmospheric Observation in Nord, Greenland

Eddy-covariance system installed on Villum Research Station



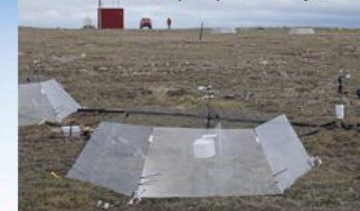
Iceland  
Cambridge Bay, Canada  
Nord, Greenland  
Council, Alaska  
Ny-Alesund, Svalbard  
Bolshevik Island, Russia

## Environmental Research & Monitoring Activities in Cambridge Bay, Canada

Greenhouse Gas Flux ( $\text{CO}_2$ ,  $\text{CH}_4$ )



Installation of open top chamber, 5<sup>th</sup> year



Greenhouse Gas Flux ( $\text{CO}_2$ ,  $\text{CH}_4$ )



## Atmospheric Observation in Council, Alaska

Greenhouse Gas Flux ( $\text{CO}_2$ ,  $\text{H}_2\text{O}$ ) LED sensor



Under the research permission of IARC, UAF

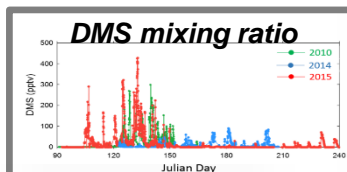
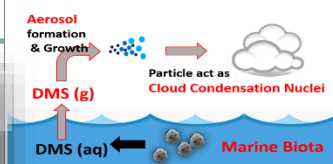
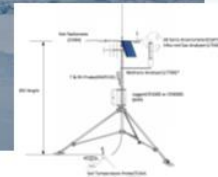
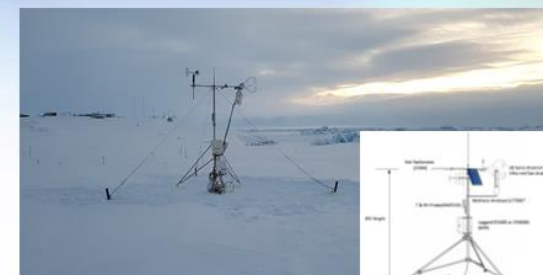
Net  $\text{CO}_2$  Exchange Measurements



A snow-fence and two OTCs

## Atmospheric Observation in Baranovo, Russia

Greenhouse gas (and energy) fluxes exchanged between the atmosphere and permafrost in the Ice Base Cape Baranova



Zeppelin Station



Trace level DMS analyzer



Satellite-derived biomass  
Satellite-derived DMSP algorithm  
Hourly air mass back-trajectory (HYSPLIT)  
Meteorological parameters (AWS)  
In-situ Aerosol Physics/Chemistry analysis



## Other initiatives

KOPRI's Arctic research fellowship; in its 2<sup>nd</sup> year, earlier career people from the Arctic and to the Arctic (not limited to natural science)

Korean research icebreaker commemorating the 10<sup>th</sup> anniversary of the commissioning and operation



# Korea's first research icebreaker Araon 10<sup>th</sup> anniversary Come on board



- 체험일정 : 2019년 6월 15일(토)~16일(일)/ 1박 2일간
- 체험장소 : 동해 인근 해역
- 모집대상 : 대한민국 국민 30명 내외

- 모집기간 : 2019년 5월 7일(화) ~ 27일(월) / 3주 간
- 신청방법 : 체험단 모집페이지([www.araon10.co.kr](http://www.araon10.co.kr)) 혹은  
극지연구소 홈페이지([www.kopri.re.kr](http://www.kopri.re.kr))  
검색창에 **극지연구소** 검색