

# Update plan for 2015 field season

## Japan

Takashi Kikuchi (JAMSTEC)  
with inputs from other Japanese scientists

## Japanese Arctic Ocean observation in 2015

### 1) Japanese research vessel cruise

- R/V Mirai Arctic cruise in September-October 2015

### 2) Participations in ice-breaker cruises

- IBRV Araon Arctic cruise;
- CCGS Louis S. St.- Laurant cruises;

*Sea ice observation, hydrography & water sampling*

### 3) Others

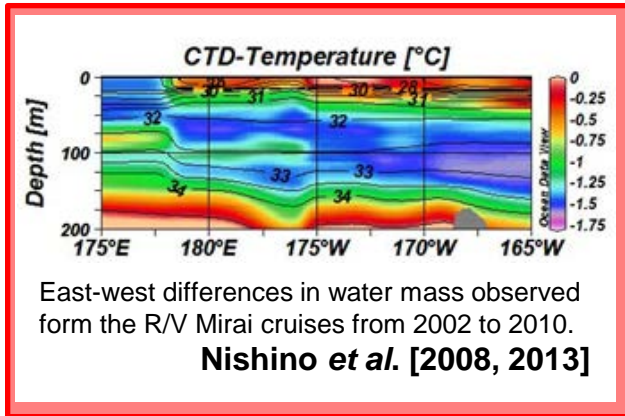
- Ice thickness monitoring off Barrow, Alaska
- XCTD observation in the Arctic Ocean and more ? . . .



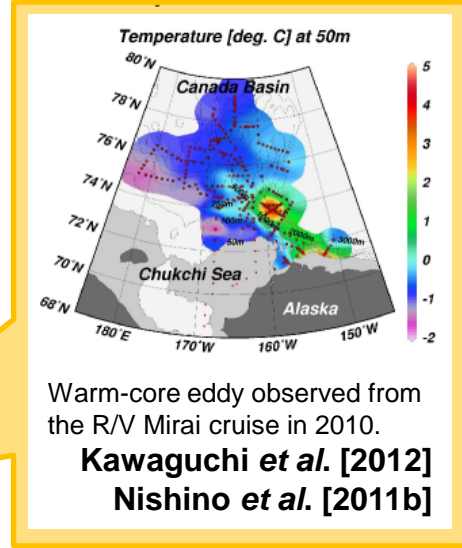
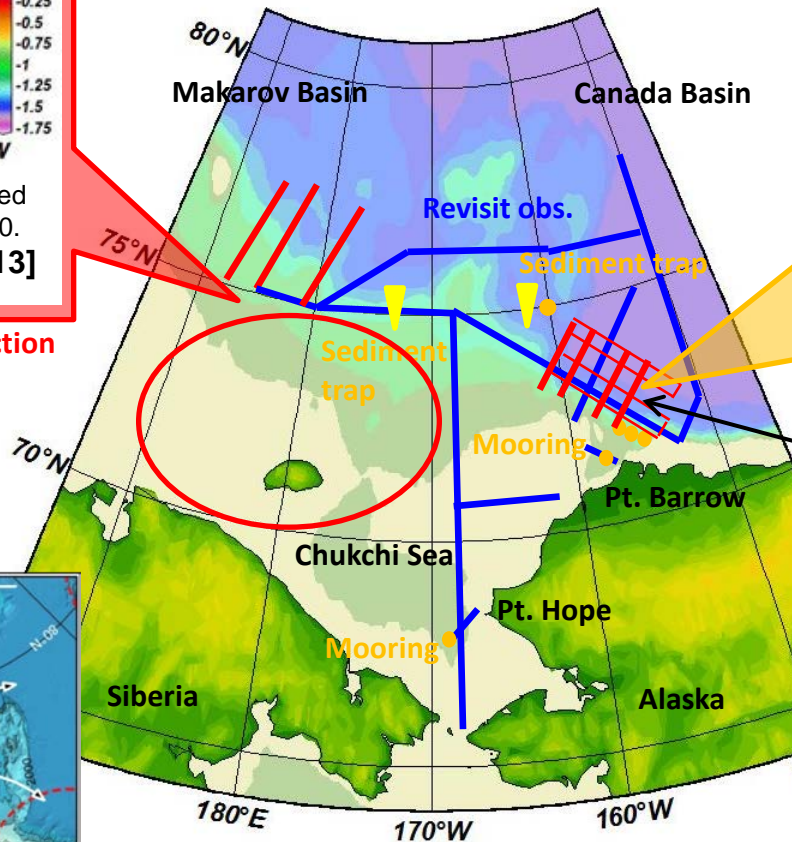
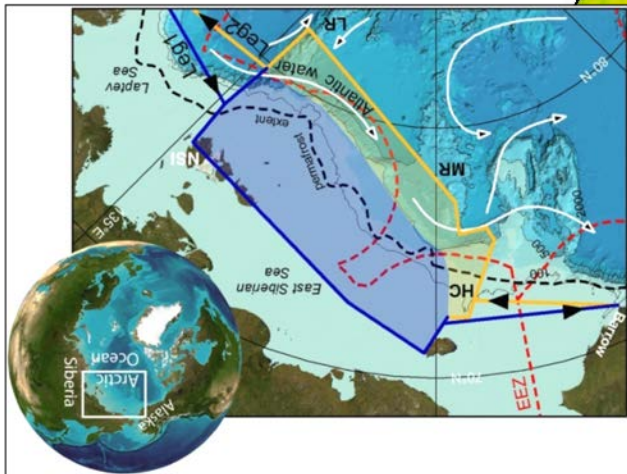
# Japanese research vessel cruise in 2015

## R/V Mirai Arctic cruise in September-October 2015

“Observational Studies on the Arctic Ocean Climate and Ecosystem Variability”



Siberian shelf-basin interaction



Intensive obs. of eddy & shelf-break jet by CTD/LADCP/water sampling and TurboMAP



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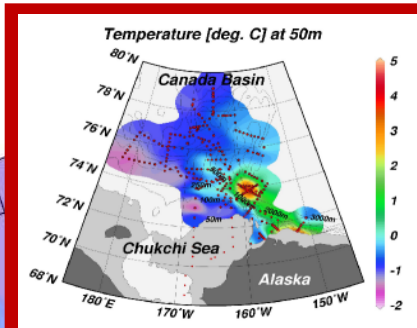
## R/V Mirai Arctic cruise in September-October 2015

“Observational Studies on the Arctic Ocean Climate and Ecosystem Variability”

PI: Dr. S. Nishino (JAMSTEC)



R/V Mirai (JAMSTEC)



Large warm-core eddy & its impact to marine ecosystem  
**Kawaguchi et al. [2012]**  
**Nishino et al. [2011b]**

[ Tentative cruise plan ]

August 25: Hachinohe (JAPAN)

September 4: Bering Str.

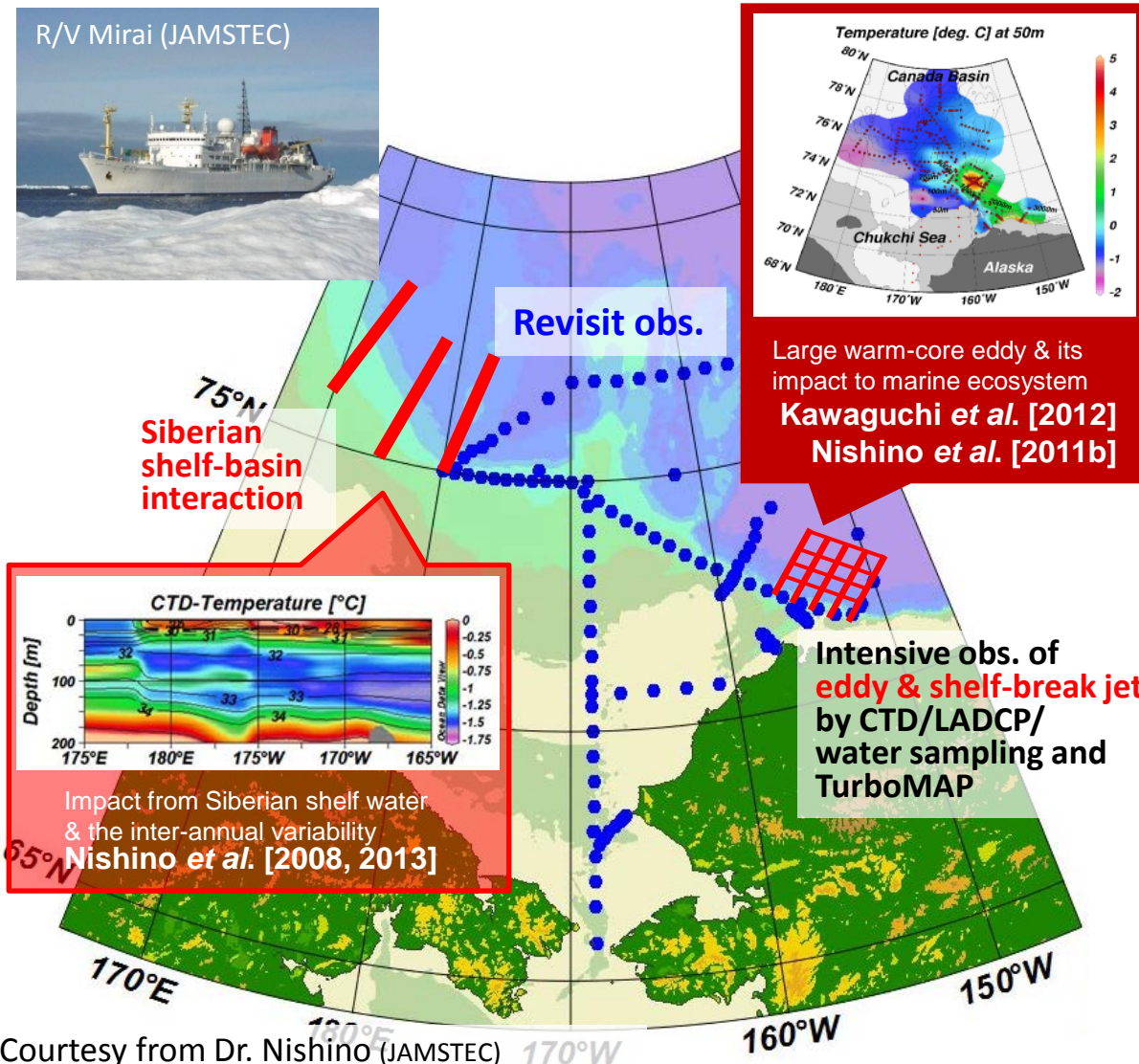
**Observations  
in the Arctic Ocean**

October 3: Bering Str.

October 6: Dutch Harbor (in)

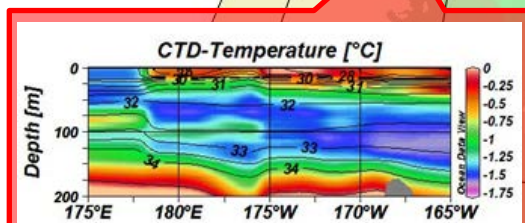
October 9: Dutch Harbor (out)

October 21: Hachinohe (JAPAN)



Revisit obs.

Siberian shelf-basin interaction



Impact from Siberian shelf water & the inter-annual variability  
**Nishino et al. [2008, 2013]**

Intensive obs. of eddy & shelf-break jet by CTD/LADCP/water sampling and TurboMAP



# Japanese research vessel cruise in 2015

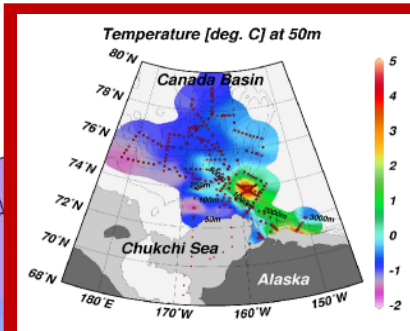
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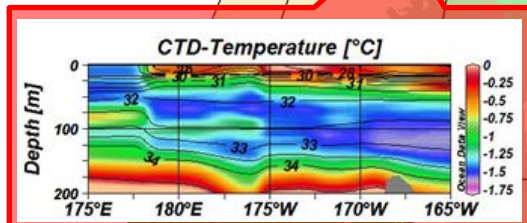
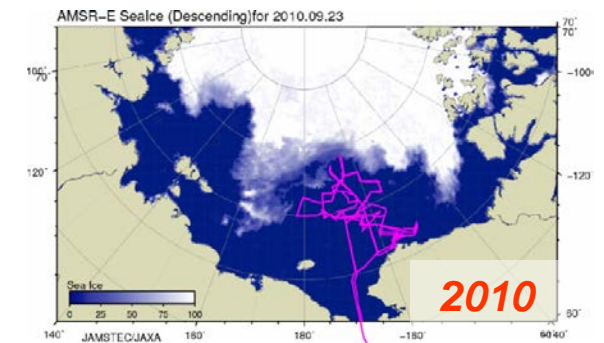
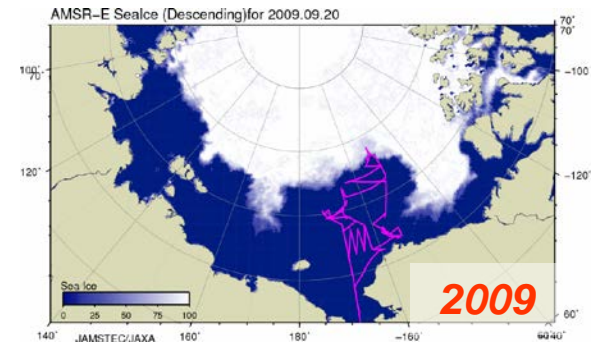
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R/V Mirai (JAMSTEC)



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Siberian shelf-basin interaction

Revisit obs.

# JAMSTEC moorings in the Chukchi Sea and Canada Basin

Sediment trap in the Canada Basin

NAP; 75d 00.171m N, 162d 00.182m W, 1971m dep

One more sediment trap mooring

→ Deployment

**At the mouth of Barrow Canyon**

BCW; 71d 47.742m N, 155d 20.750m W, 170m dep.

BCC; 71d 43.585m N, 155d 11.108m W, 283m dep.

BCE; 71d 40.353m N, 154d 59.742m W, 106m dep.

→ Recovery and Re-deployment

**Barrow Canyon close to DBO-5 line**

BCH; 71d 18.920m N, 157d 08.802m W, 62m dep

→ Recovery

**Hope Valley in the southern Chukchi Sea (DBO-3)**

SCH; 68d 02.002m N, 168d 50.028m W, 60m dep

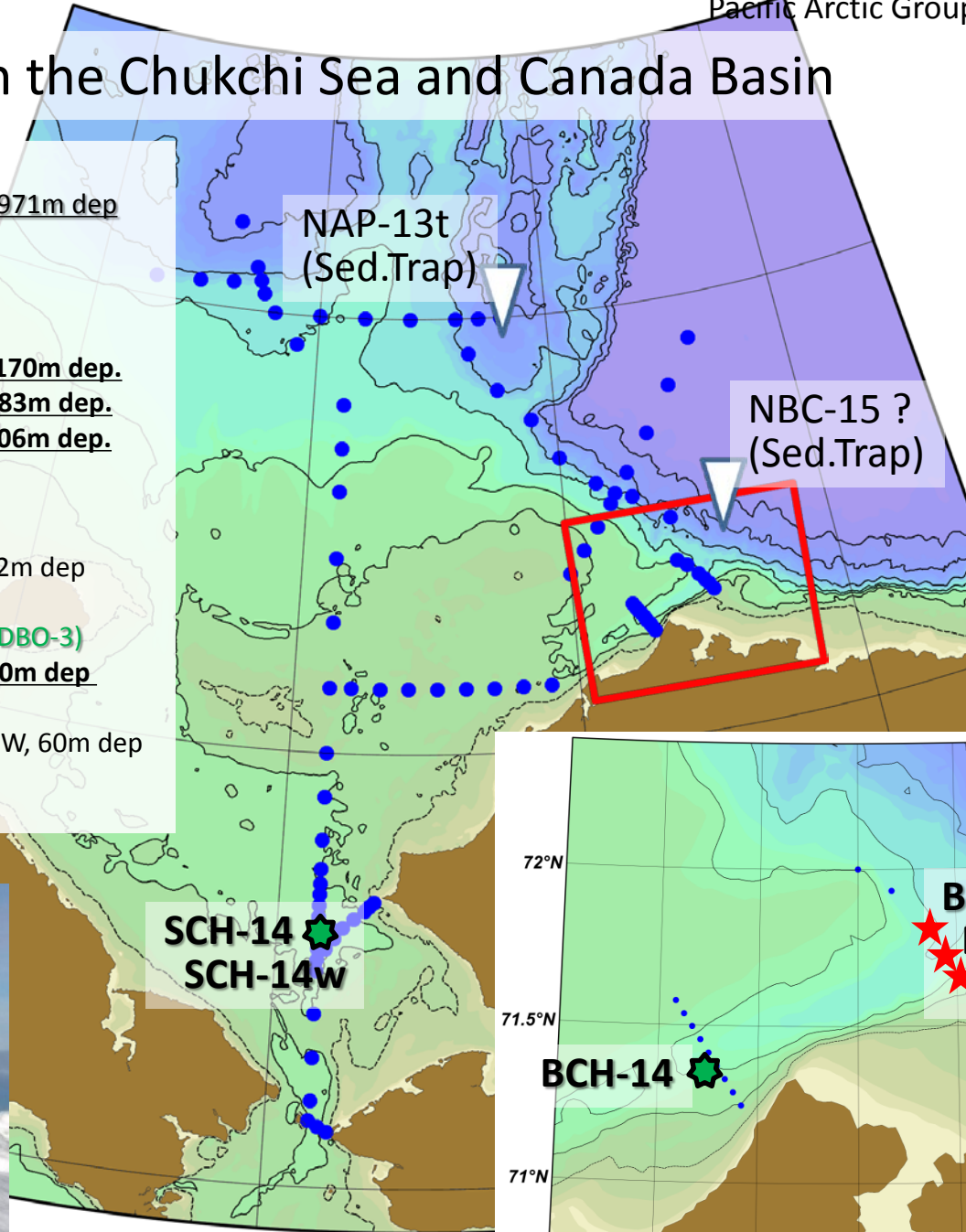
→ Recovered and Re-deployed

SCH-14w; 68d 03.006m N, 168d 50.003m W, 60m dep

→ Recovery



R/V Mirai (JAMSTEC)



NAP-13t  
(Sed.Trap)

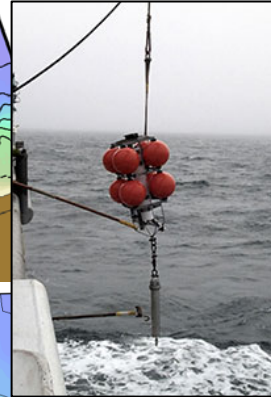
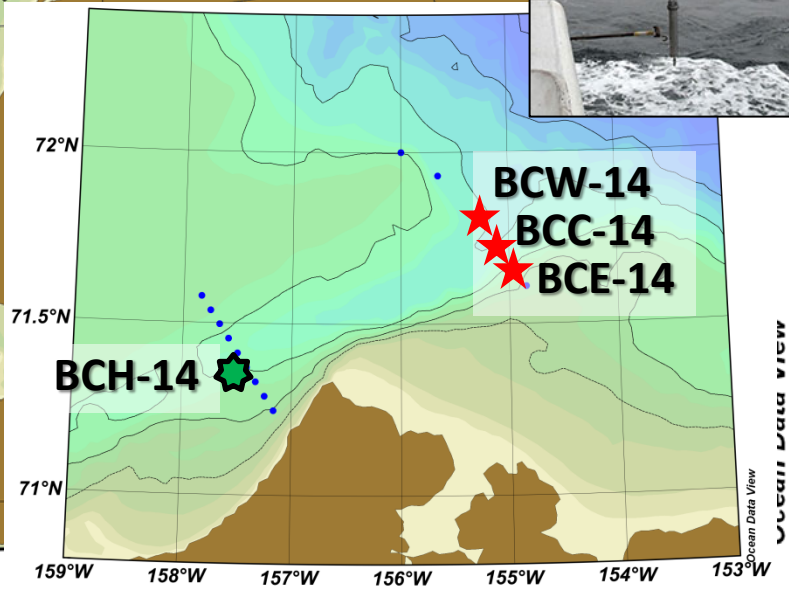
NBC-15 ?  
(Sed.Trap)

SCH-14  
SCH-14w

BCW-14  
BCC-14  
BCE-14

BCH-14

170°W



Ocean Data View

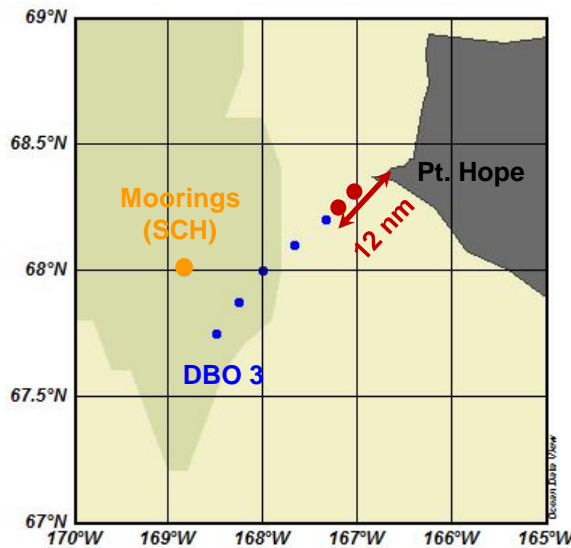
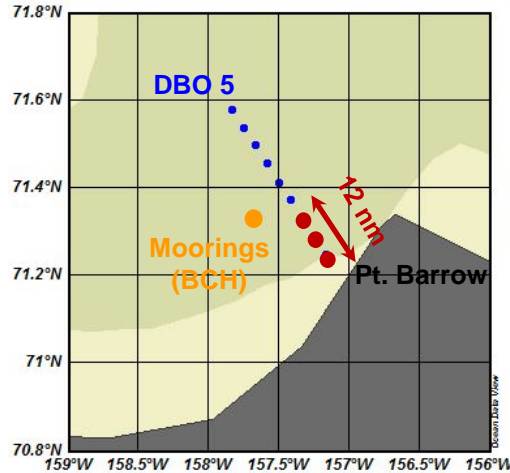


# R/V Mirai Arctic Ocean cruise in Sep.-Oct., 2015 and limited nearshore access by US regulation

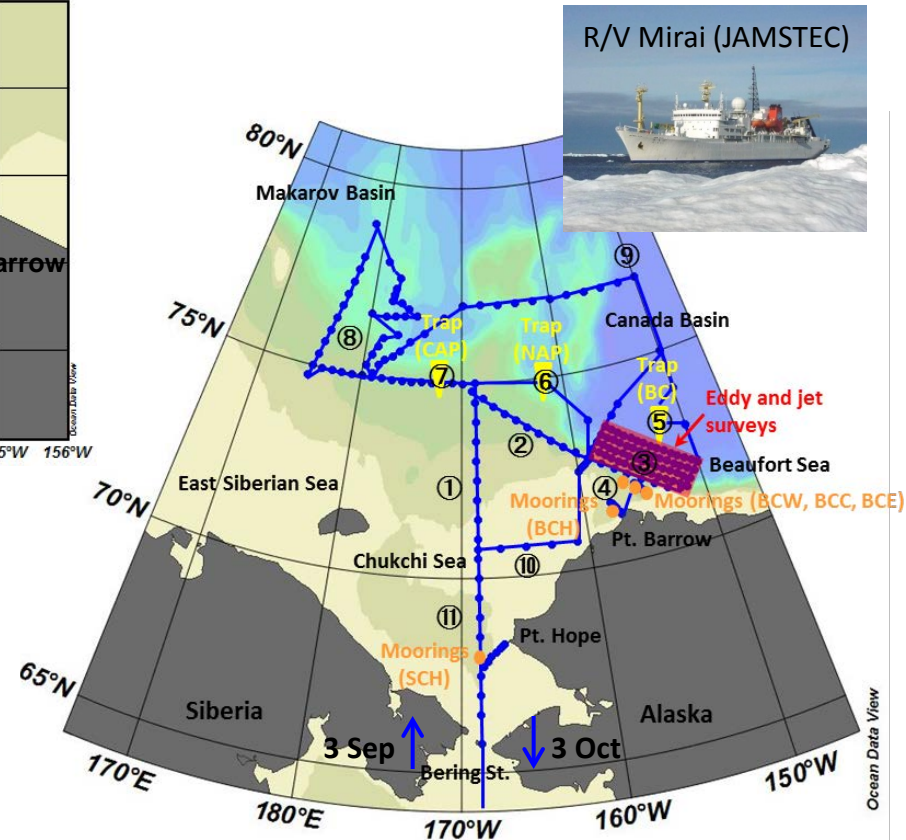
- The R/V Mirai can't complete the DBO lines (DBO 3 and 5) based on an US regulation.

- The US regulation is to deal with the accident of oil spill from a ship.

- We can't enter the areas within 12 nm from the Alaskan coast and within 3 nm from the US coast in the Bering Strait.



DBO 5 and DBO 3 hydrographic stations (blue dots) and restricted stations (red dots) within 12 nm from the Alaskan coast.



The geographical area of the intended work in the Arctic Ocean. We will pass through the Bering Strait into the Arctic on 3 September and from the Arctic on 3 October. Numbers represent the order of cruise tracks. Planned points of stationary observations are represented by blue dots. A detailed survey area of ocean eddies and current jets is indicated by a red square. Locations of moorings and sediment traps are represented by orange circles and yellow triangles, respectively. The stations and cruise tracks are subject to change due to weather, sea ice, and other conditions.



**ALASKA MARITIME  
Prevention & Response Network**

**AK-APC-NTV**

**Operating Procedures**

**Cargo and Passenger Non Tank Vessels**

**Transiting and Operating in Alaska Waters**

December 2013

The Alternative Planning Criteria (APC) Operating Procedures were developed to the mitigate risk of maritime incidents resulting in oil spills and to assist the Master and Operator of nontank vessels comply with all risk mitigation measures when transiting Alaska waters where this APC applies. Compliance with these Operating Procedures is voluntary as a condition of participating in the APC. Nothing in the Operating Procedures is intended to control or limit the ultimate authority of the Captains of nontank vessels in the safe navigation of their ships or constrain the authority of the Captains of the Ports where this APC applies.

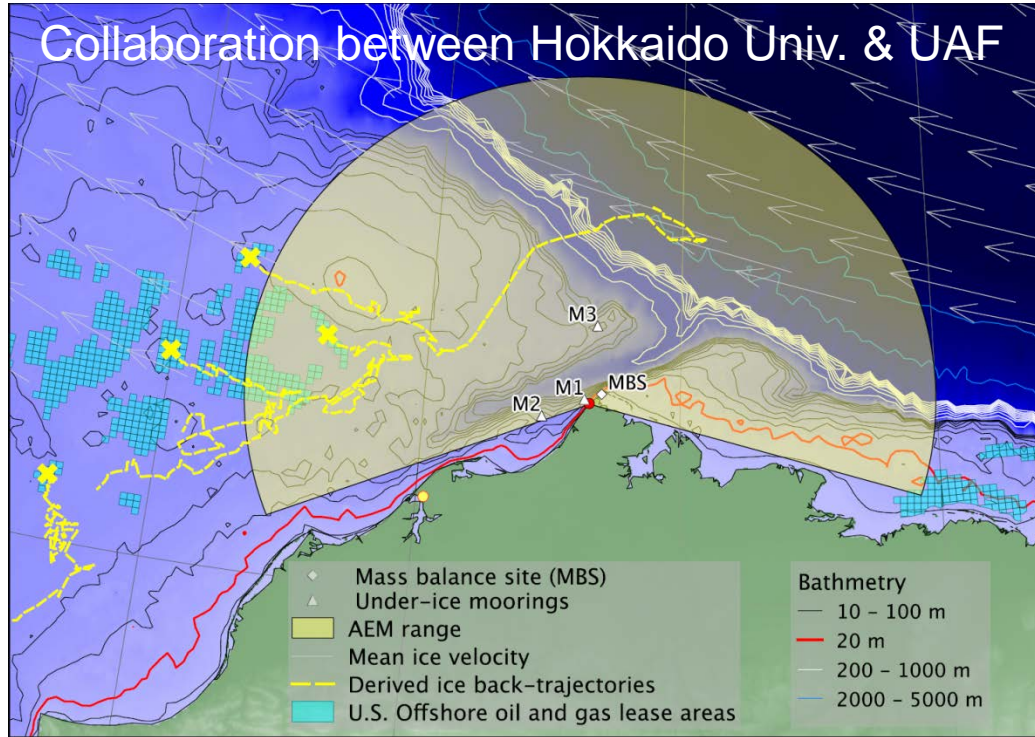


## Adherence to Routing Measures that Reduce Risk

- e. Western Alaska North of the Aleutian Islands: With exception of vessels making port calls, transiting vessels shall sail on a route that ensures a distance of minimum of 12 miles offshore is maintained with exception of the Bering Strait, where a distance of 3 miles offshore shall be maintained.

# Ice thickness monitoring off Barrow

Collaboration between Hokkaido Univ. & UAF

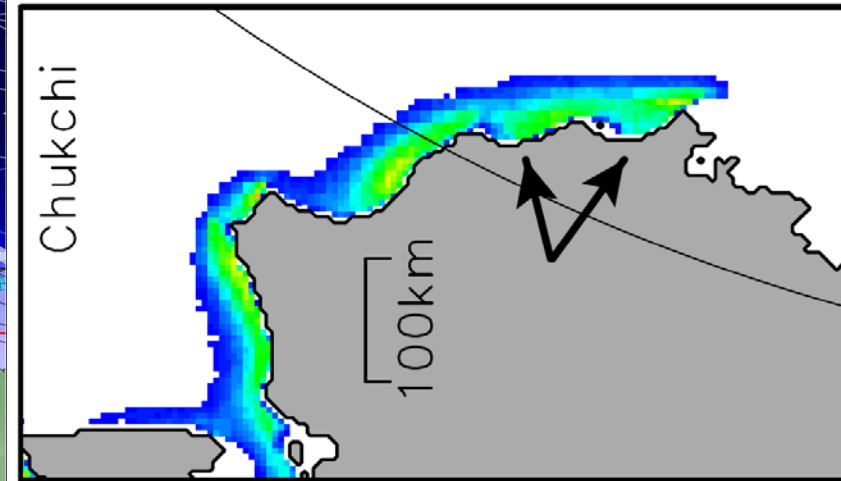


Courtesy of Dr. A. Mahoney (UAF)

July-August 2015:

- Replace mooring M2 and recover mooring M1
- Deploy mooring M3 further offshore for the first time
  - Capture sea ice less influenced by coast and polynya
  - Comparison with airborne EM data

## Sea-ice production mapping by AMSR-E



Annual cumulative production over  
2002/03-2010/11

Iwamoto et al. (2014, JGR)



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