Observers’ Arctic science goes beyond just observing

Hyoung Chul Shin
Korea Arctic Research Consortium
Korea Polar Research Institute

Arctic Circles 2017, Reykjavik, 14 October 14 2017
Outline

Observer state engagement; history, current status and scientific investment & contribution
Real world sample case; more similarity than dissimilarity
Becoming critical ‘links’ of the whole network
Summing up
Observer states to Arctic Council; current status

13 observer states as of May 2017
8 from Europe
5 from Asia (3 from Northeast, 1 from Southeast, 1 from Southwest)
Pending states; EU and Turkey
Significant Arctic investments or stakes
Observer states to Arctic Council; history and evolution

Arctic Policy present for many nations, alike Arctic and non-Arctic members

Arctic policy in similarity; science, environmental stewardship, international cooperation emphasized, economic aspirations not really hidden but plainly indicated
Real world sample case; ocean going survey in the Arctic

Northern coverage

85-90° degree North
70-75° degree North
80-85° degree North

Only a few trips beyond 85 N
Atlantic voyages more northern (heavy traffic around Svalbard)
Pacific voyages not as northern

Complied research voyage tracks 2000-2016
A series of selected oceanographic stations

Arctic coastal states’ programs? More coastal emphasis

Past cruise tracks of 3 non-Arctic research ships 2010-2016 and EEZ boundaries
The pattern; common passage, then to either west or east
Becoming critical ‘links’ of the network; SAON, AMAP, AOOS, or whatever
tighter collaboration among Arctic and non-Arctic

Arctic ocean in rapid transition; research ships operating in the Arctic
Permafrost break down and changing climate
gas dynamics; network of stations
Arctic changes and mid-latitudes; interactions and impacts
What happens in the Arctic does not stay in the Arctic

One way spread-out process?

What happens south of the Arctic does feed into the Arctic

Two-way process between interconnected systems
'Extraordinarily hot' Arctic temperatures alarm scientists

The North Pole is an insane 36 degrees warmer than normal as winter descends

Crazy hot Arctic (20 degree warmer than usual) two years in a row
Major cause of unprecedented Arctic warming in January 2016: Critical role of an Atlantic windstorm

Baek-Min Kim1, Ja-Young Hong1, Sang-Yoon Jun2, Xiangdong Zhang3, Hataek Kwon3, Seong-Joong Kim4, Joo-Hong Kim3, Sang-Woo Kim4 & 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.
Observer investment; ~ 100 days of ship time, 100s of science crew (Pacific Arctic for example)

Data; you will never be able to go back in time and re-collect

If not put into use?

‘remiss’ of both Arctic and non-Arctic stakeholders
Arctic science may assume multiple faces

What Arctic science can be
lubricant, opener, diplomacy, knowledge base

What Arctic science cannot be or should not be
vending machine, sugar coat
Thank you for your eyes
But do something now

Photo courtesy of Dr Hyoung Min Joo at KOPRI