

## **Template for Submission of Scientific Information to Describe Areas Meeting Scientific Criteria for Ecologically or Biologically Significant Marine Areas**

### **Title/Name of the area:**

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### **Abstract**

The North Water polynya is one of the largest polynyas in the Northern Hemisphere, it is also one of the most biologically productive regions north of the Arctic Circle.

The Pikialarsorsuaq/North Water Polynya Cooperation Workshop in Nuuk, Greenland September 2013, with participation of hunters' and science community representatives.

Hunters have observed changes in sea ice, snow conditions, and distribution and behaviour of the marine mammals. In addition, new species or subspecies have been observed around the North Water during recent years.

The mixing of different water masses (originating from the Atlantic and the Pacific) and their transformation along the journey in Arctic conditions are contributing to the area's extraordinary high biological productivity. The high biological productivity is also highly dependent on the formation of an ice bridge in Kane Basin, which is a major determinant for the opening of the polynya and for the local oceanography that sustain the productivity.

### **Introduction**

On the 24<sup>th</sup> and 25<sup>th</sup> of September 2013, over 20 participants, including regional Canadian and Greenlandic representatives from communities that surround Pikialarsorsuaq/the North Water Polynya, and science community representatives, met at Inuit Circumpolar Council – Greenland's (ICC-Greenland) office in Nuuk to discuss the importance of this region. The goal was to identify common visions for the conservation of the area that is important for the biological production as well as for the indigenous communities around the area.

Hunters from the Northwestern parts of Greenland and the Northern parts of Baffin Island and Grise Fiord described observed changes in sea ice, snow conditions, and distribution and behaviour of the marine mammals. In addition, new species or subspecies have been recognized around the North Water during recent years.

The mixing of different water masses originating from the Atlantic and the Pacific, and their transformation along the journey in Arctic conditions, are contributing to the area's extraordinary high biological productivity. Water masses originating from the Pacific Ocean are driven through the Bering strait, around the Polar Sea with the polar gyre and through the Fram Strait to Pikialarsorsuaq as surface water (<200m depth). Water masses from the Atlantic Ocean are driven in the deep layers through the Davis Strait along the west coast of Greenland, north towards Pikialarsorsuaq. This mixing together of water masses, along with ice conditions makes the area up to ten times more biologically productive as other areas in the Arctic.

The high biological productivity is highly dependent on the formation of an ice bridge in Kane Basin. The ice bridge is a major determinant for the opening of the polynya, as the ice bridge and the predominant northerly wind are preventing ice floes from moving south over Pikialarsorsuaq, leaving it open for light to reach the water and fuel the primary production. When the ice bridge is absent the productivity is much lower. Over the past two decades, the polynya occurrence and timing has changed significantly, affecting the timing, the localization and the intensity of the spring bloom.

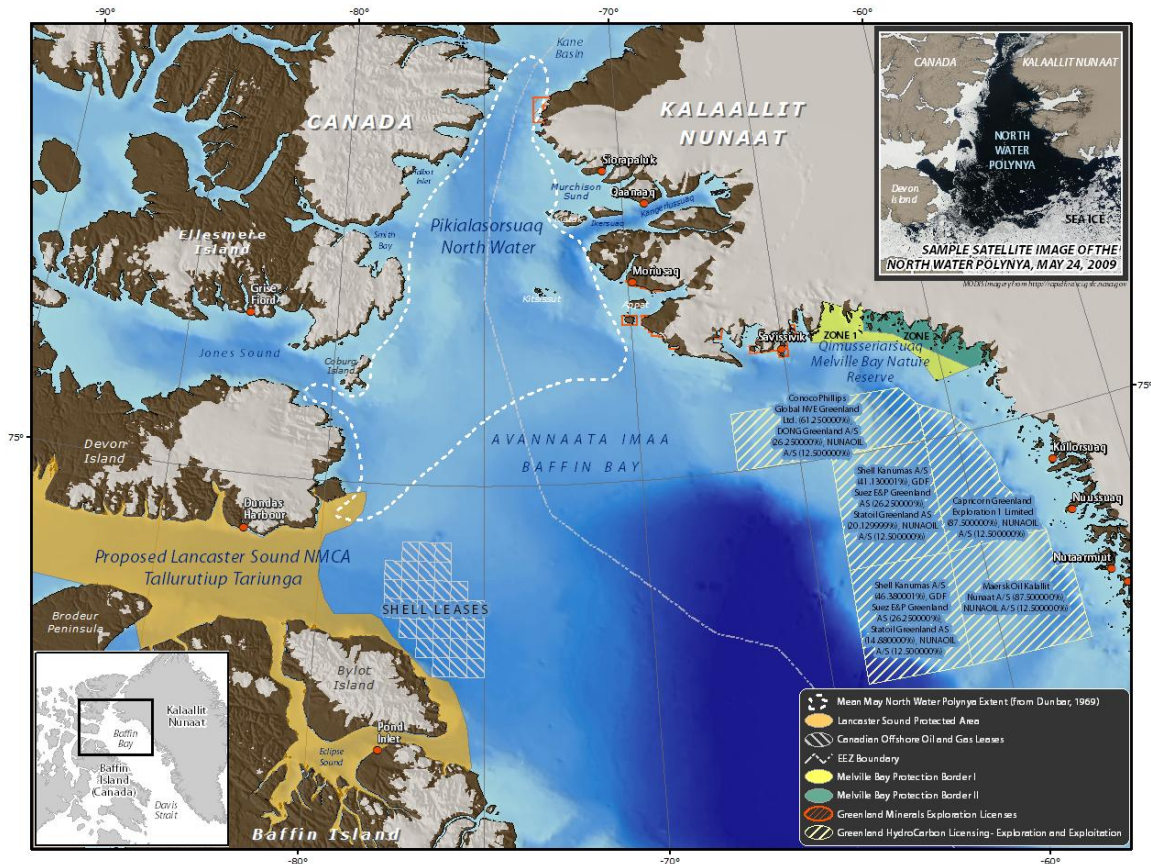
For the North Water, several recent years show a decrease in periods of monthly mean sea ice coverage or earlier timing of ice breakup over the last years. As ice conditions are highly variable from year to year, overall trends are mostly noticeable when expressed as 10 year averages or when looking at adjacent areas in Kane Basin and Baffin Bay.

While leading polar scientists have focused on the North Water in recent decades, the region has been recognized by Inuit for generations as a critical habitat. Indeed, Inuit use and occupation of Northeast Canada and Greenland is linked to the North Water and the abundance of marine life it supports.

### Location

Located between Greenland and Canada in the region of Smith Sound and Nares Strait, in Northern Baffin Bay, the North Water is one of the primary connections between the Arctic Ocean and the north Atlantic.

The polynya can be described both spatially (lying roughly between 76°N and 79°N and 70°W to 80°W)

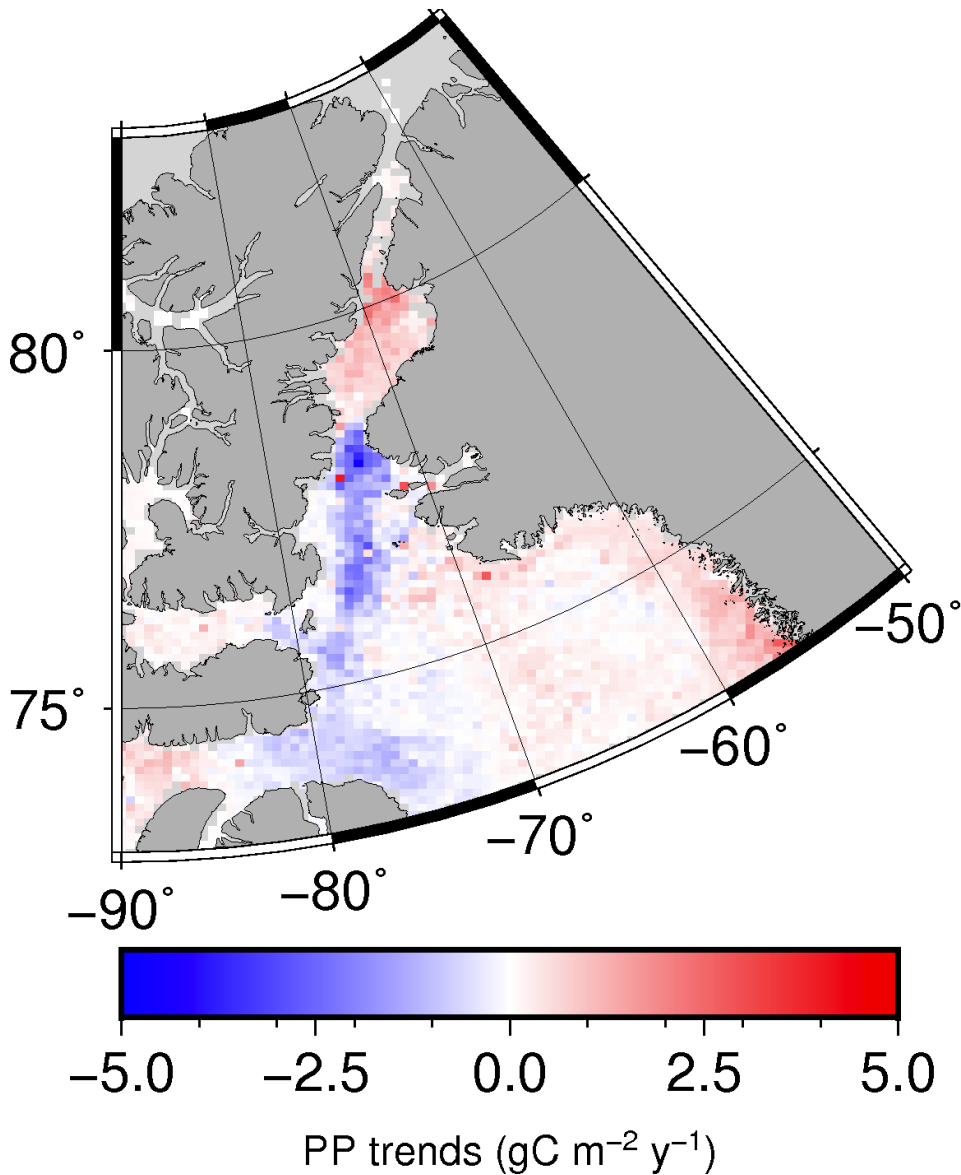


### Feature description of the proposed area

The mixing of different water masses originating from the Atlantic and the Pacific, and their transformation along the journey in Arctic conditions, are contributing to the area’s extraordinary high biological productivity. Water masses originating from the Pacific Ocean are driven through the Bering strait, around the Polar Sea with the polar gyre and through the Fram Strait to Pikiyasorsuaq as surface water (<200m depth). Water masses from the Atlantic Ocean are driven in the deep layers through the Davis Strait along the west coast of Greenland, north towards Pikiyasorsuaq. This mixing together of water masses, along with ice conditions makes the area up to ten times more biologically productive as other areas in the Arctic.

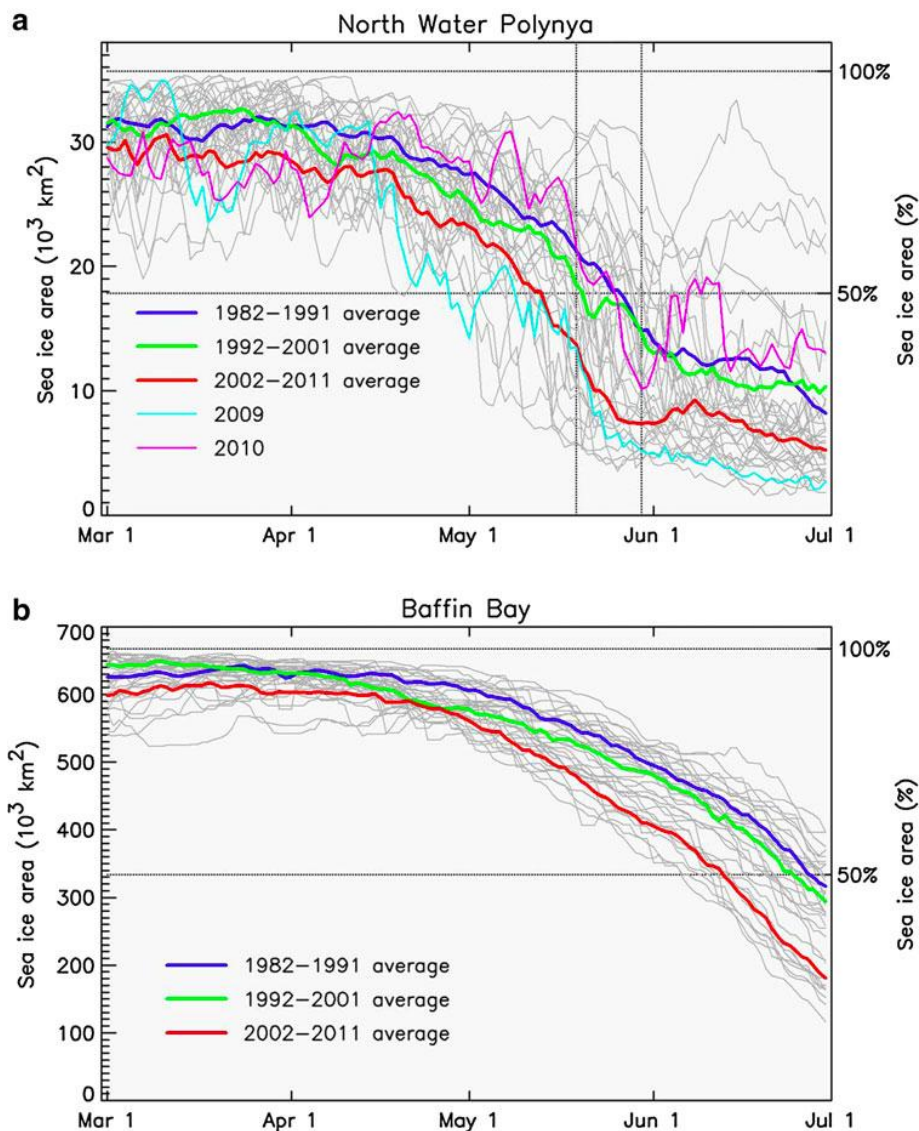
The high biological productivity is highly dependent on the formation of an ice bridge in Kane Basin. The ice bridge is a major determinant for the opening of the polynya, as the ice bridge and the predominant northerly wind are preventing ice floes from moving south over Pikialasorsuaq, leaving it open for light to reach the water and fuel the primary production.

When the ice bridge is absent the productivity is much lower. Over the past two decades, the polynya occurrence and timing has changed significantly, affecting the timing, the localization and the intensity of the spring bloom.



**Fig. 2** Trends in primary production (Dumont unpublished)

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**Fig. 3** Trends in sea Ice cover in Pikialasorsuaq and Baffin Bay (Heide-Jørgensen et al. 2012)

**Feature condition and future outlook of the proposed area**

Over the past two decades, the polynya occurrence and timing has changed significantly, affecting the timing, the localization and the intensity of the spring bloom

Observations done by hunters working in and around the area will provide timely informations about conditions and trends of the area.

**Assessment of the area against CBD EBSA Criteria**

*(Discuss the area in relation to each of the CBD criteria and relate the best available science. Note that a proposed area for EBSA description may qualify on the basis of one or more of the criteria, and that the polygons of the EBSA need not be defined with exact precision. And modeling may be used to estimate the presence of EBSA attributes. Please note where there are significant information gaps)*

CBD EBSA Criteria (Annex I to decision)	Description (Annex I to decision IX/20)	Ranking of criterion relevance (please mark one column with an X)			
		No informat	Low	Medium	High

IX/20)		<b>ion</b>				
<b>Uniqueness or rarity</b>	Area contains either (i) unique (“the only one of its kind”), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features.				X	
<i>Some unique oceanographic features and concentrated populations</i>						
<b>Special importance for life-history stages of species</b>	Areas that are required for a population to survive and thrive.				X	
More than 80% of the world population of little auks depend on the area for some part of the year						
<b>Importance for threatened, endangered or declining species and/or habitats</b>	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.			X		
<i>No endangered species depend on the North Water Polynya as a habitat</i>						
<b>Vulnerability, fragility, sensitivity, or slow recovery</b>	Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.				X	
<i>Marine mammals are sensitive to disturbance from increased shipping and resource development activities.</i>						
<b>Biological productivity</b>	Area containing species, populations or communities with comparatively higher natural biological productivity.					X
<i>The North Water Polynya is one of the most biologically productive areas of the Arctic</i>						
<b>Biological diversity</b>	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.			X		
<b>Naturalness</b>	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.					X
<i>No use of natural resources other than traditional hunting, no industrial activities or heavy shipping within the area itself.</i>						

### Sharing experiences and information applying other criteria (Optional)

Other Criteria	Description	Ranking of criterion relevance (please mark one column with an X)			
		Don't Know	Low	Medium	High
<i>Add relevant criteria</i>					

<i>Explanation for ranking</i>					

### **References**

Presentations at the Pikialasorsuaq workshop Nuuk September 2013

Presenters include:

Mads Ole Kristiansen, hunter, Qaanaaq, Greenland

Qaerngaaq Nielsen, hunter, Savissivik, Greenland

Larry Audlaluk, hunter, Grise Fiord, Nunavut, Canada

Levi Barnabas, hunter, Arctic Bay, Nunavut, Canada

James Simonee, Hunter, Pond Inlet, Nunavut, Canada

Dany Dumont, Université du Québec - Institut national de la recherche scientifique,

Mads Peter Heide-Jørgensen, Greenland Institute of Natural Resources, Nuuk, Greenland

Mads Peter Heide-Jørgensen, Louise M. Burt, Rikke Guldborg Hansen, Nynne Hjort Nielsen,

Marianne Rasmussen, Sabrina Fossette, Harry Stern, 2012, **The Significance of the North Water**

**Polynya to Arctic Top Predators**, AMBIO, 41(8), DOI 10.1007/s13280-012-0357-3

### **Maps and Figures**

Provided by Oceans North Canada

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