

As the Ice Keeps Thinning

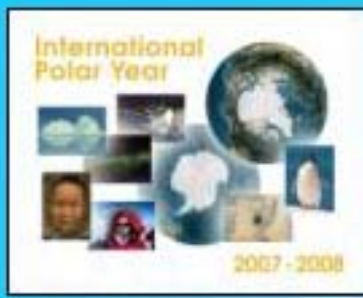
Update on Arctic People-Sea Ice Connections, 2007-2009

Igor Krupnik,
Smithsonian Institution

"Impact of an Ice-Diminishing Arctic
on Naval and Maritime Operations"

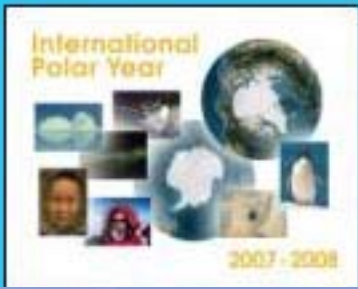
June 11, 2009





IPY 'people' projects supporting indigenous climate and sea ice observations:

- Understanding environmental change in national parks and protected areas of the Beringian Arctic, #21
- Community Adaptation and Vulnerability in Arctic Regions (CAVIAR) #157
- Circum-Arctic Rangifer Monitoring and Assessment (CARMA) # 162
- Sea Ice Knowledge and Use (SIKU) # 166
- Exchange for Local Observations and Knowledge (ELOKA) # 187
- Bering Sea Sub-Network: International Community-Based Observation Alliance for Arctic Observing Network (BSSN) # 247
- Reindeer Herders Vulnerability Network Study (EALAT) # 399
- Inuit Voices Exhibit: Observations of Environmental Change, # 410

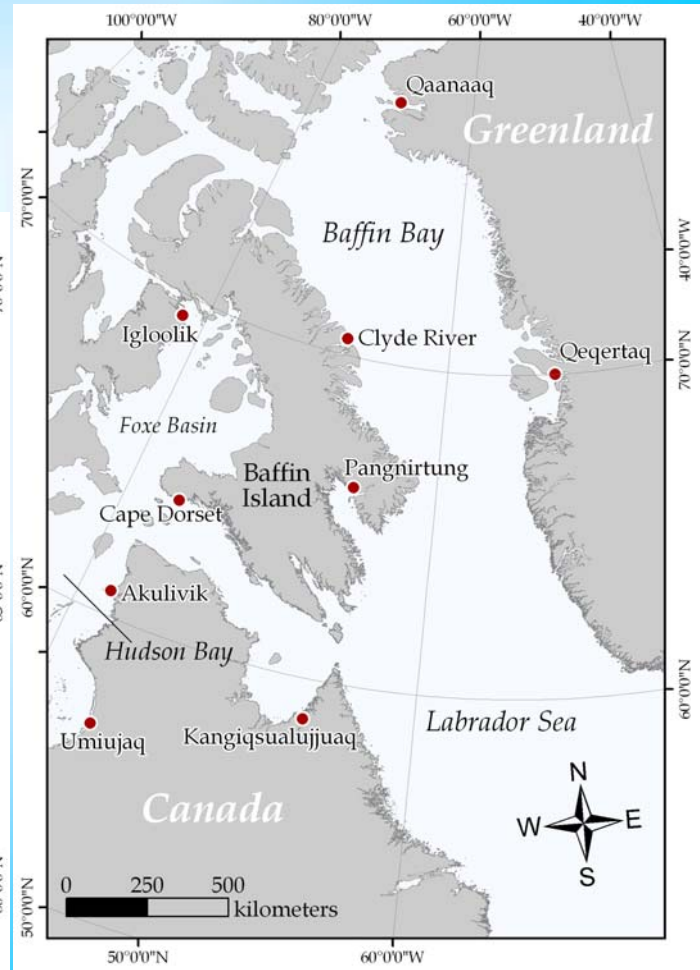
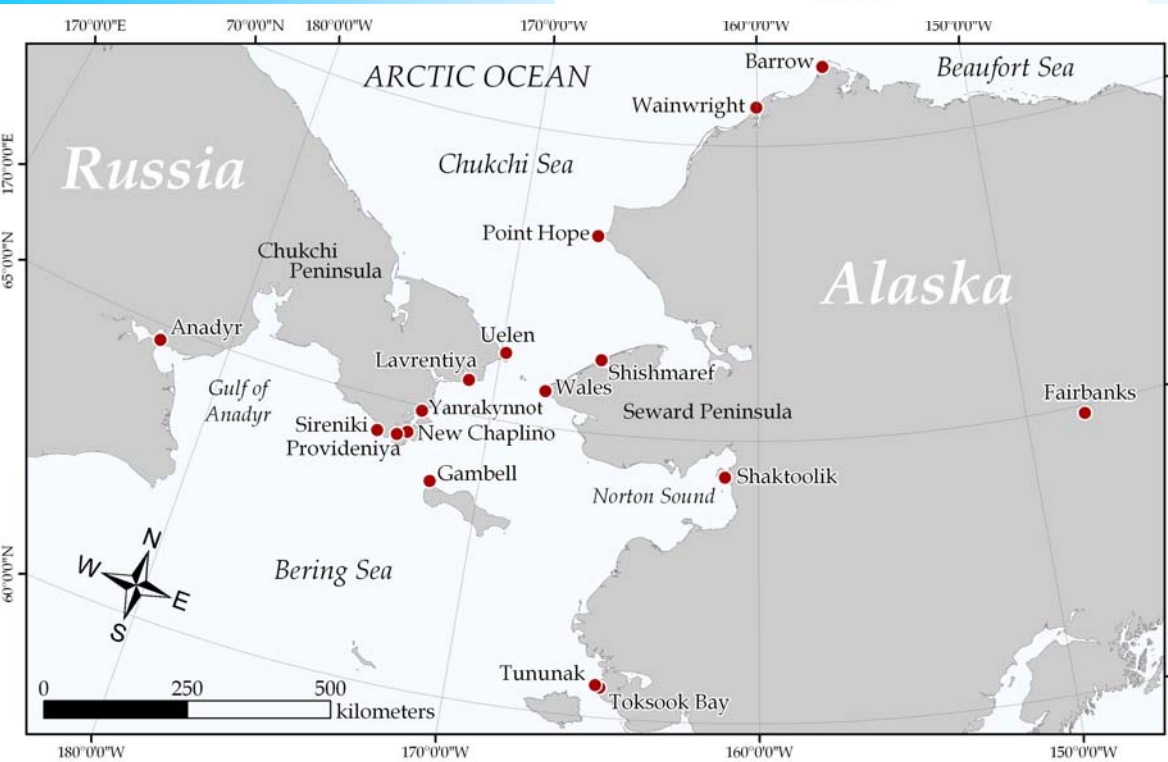
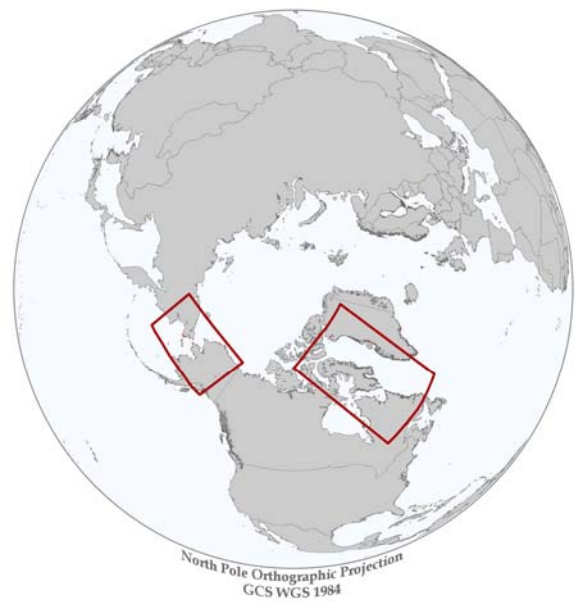
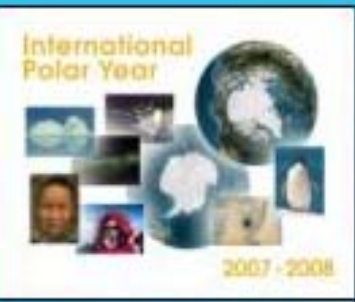


SIKU – Sea Ice Knowledge and Use

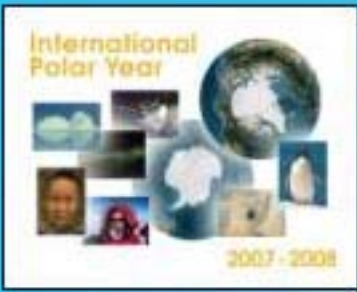


Documenting Arctic Environmental and Social Change
(IPY #166)

Igor Krupnik (Smithsonian Institution)
and Claudio Aporta (Carleton University, Canada), PIs



SIKU Project Activities: 2006-2009



Top: *SIKU* documentation workshop, Provideniya, Russia (April 2008)

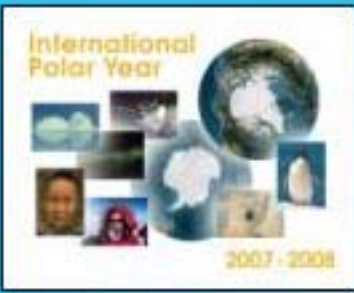
Bottom: Uelen, Russia: *SIKU* workshop (February 2008). Vica Golbtseva speaks to local elders about the preservation of sea ice knowledge





Inuit hunters on shore-fast ice off Igloolik, Canada.

Photographer, Claudio Aporta

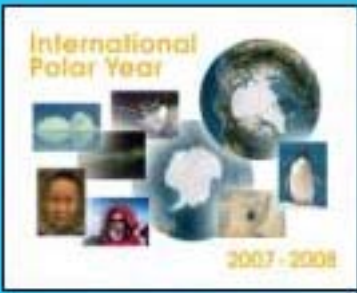


IPY indigenous community monitors

Top: Leonard Apangalook, Sr., 71 –
SIKU project monitor (since 2006)
in Gambell, Alaska



Bottom: Roman Armaergen, 73 –
local *SIKU* ice monitor from the
Chukchi community of Uelen, Russia



Indigenous people monitor the ice for many factors, including safety and the availability of game animals

Top: Hunters in Savoonga, Alaska venture on new ice
Photographer, Hiroko Ikuta



Bottom: Two hunters from Gambell, Alaska watch for walrus from the top of the shore pressure ridge (February 2008)



Indigenous sea ice dictionaries

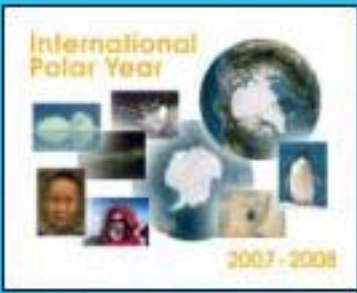


Kinikmi Sigum Qanuq Ilitaavut



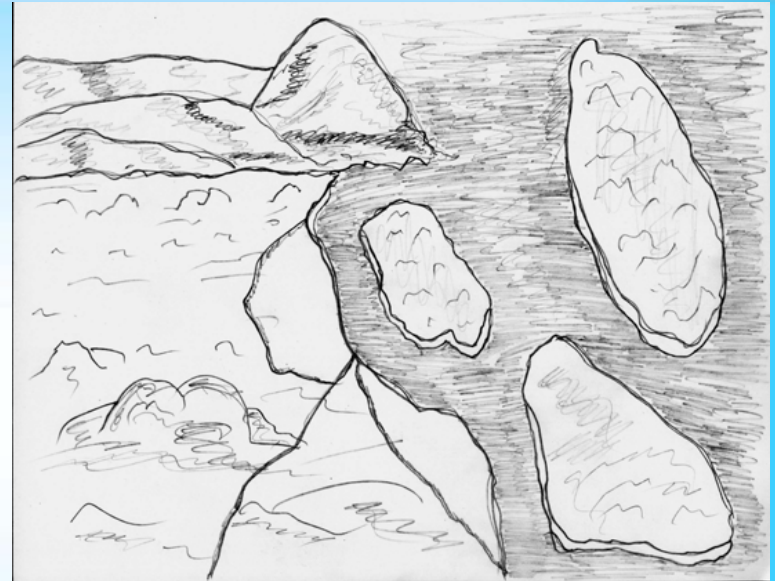
Front cover and title page of the 'Wales Inupiaq Sea Ice Dictionary,' 112 pp. completed in 2008. Photos, Winton Weyapuk, Jr.

Wales Inupiaq Sea-Ice Dictionary



Indigenous sea ice dictionaries

Top: Native drawing used to illustrate terms for indigenous sea-ice dictionary

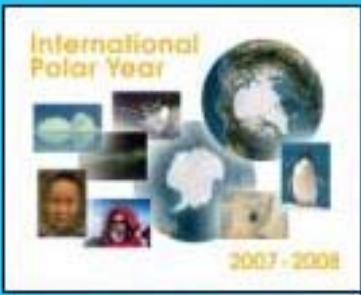


Bottom: Roman Armaergen from the Siberian community of Uelen makes illustrations to his 100-term lexicon of the Chukchi terms for sea ice

(Photo by Vica Golbtseva, March 2008).



Indigenous sea ice terminologies



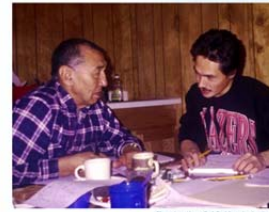
How many Eskimo words for sea ice?

Most local indigenous languages and dialects have 80 to 120 different terms for various types of sea ice, ice conditions, and associated phenomena

A panel from the Smithsonian exhibit, *Arctic: A Friend Acting Strangely* (2006), illustrates Yupik Eskimo knowledge of sea ice on St. Lawrence Island, Alaska.

SEA ICE

Dictionary



Vadin Yenan (right) consults with community elder Chester Noongwook (left) for illustrating the Yupik "Sea Ice Dictionary." More than 90 terms were compiled by another elder, Conrad Oozeva, and then illustrated by Yenan following Noongwook's explanations. Selected drawings are below.



The site of the "Sea Ice Dictionary" project, the Yupik community of Gambrell, St. Lawrence Island, Alaska.

How Many Ways Can You Say Ice?

The languages of Arctic peoples reflect the importance of sea ice to them.

Yupik-speaking Eskimos, for example, have some 100 terms for sea ice and ice formations. New terms are added to describe new ice conditions as they develop.

How many words for snow and ice can you think of?

Smithsonian scientists and many of their colleagues are carefully documenting Arctic people's knowledge of sea ice conditions and how they're changing across the polar region.



Siku
The main term for ice. Also, the ice-covered Bering Sea.



Siinguraq
Stream of dense ice carried by north or south current or pushed by low tide. Dangerous to walk on.



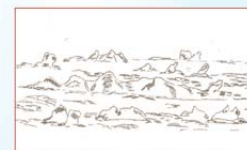
Ughuun
Melting ice in spring that has started to develop holes.



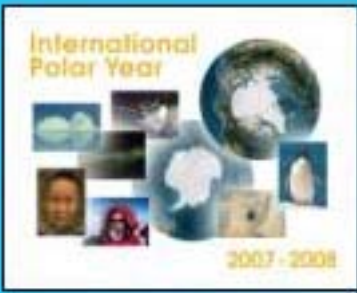
Analghu
Floating pressure ice ridge. Ice piled higher than neighboring ones. (Pressure ridges form where two pieces of sea ice push together.)



Siigin
New ice formed within cracks in an ice floe. Good to walk on.



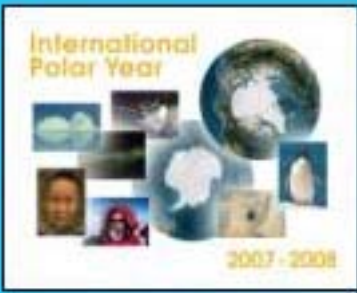
Qivalluk
Large pressure ridge. Must be climbed up and down when going through it. Hard to walk on.



Indigenous sea ice terminologies



The use of many more terms allows indigenous hunters document ice conditions with very high level of precision. Illustration from "Wales Inupiaq Sea Ice Dictionary" (2008). Photo and captions by Winton Weyapuk, Jr.(on top)



Indigenous sea ice terminologies



New ice is being formed off St. Lawrence Island from the chunks of floating icebergs and newly formed slush ice. There are terms for every single piece of ice in this picture and many more in the local Yupik language

(Photograph by Chester Noongwook, St. Lawrence Island, 2000).

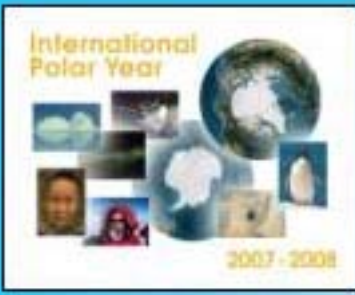


People, Ice, and Sea Mammals

For the past four years, marine mammal and sea ice specialists have been compiling regional-scale satellite imagery and reports from subsistence hunters. Various sources concur that polar ice “seascape” is rapidly being altered in position, extent, and structure, with a predicted threat to many ice-dependent marine animals and cascading impacts on northern indigenous communities.



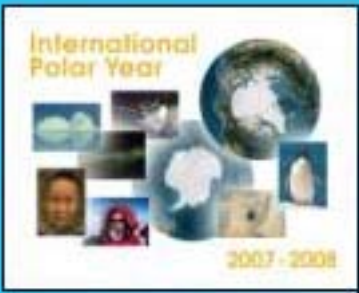
Photographer, G. Carleton Ray



As the Arctic ice gets thinner...



Photographer, G. Carleton Ray



Indigenous observations may offer valuable insight into the status of the ice-free Arctic of today's climate models that predict the loss of multi-year ice by 2050

Photographer, G. Carleton Ray