STUDY OF ENVIRONMENTAL ARCTIC CHANGE

Sea Ice Outlook | Background

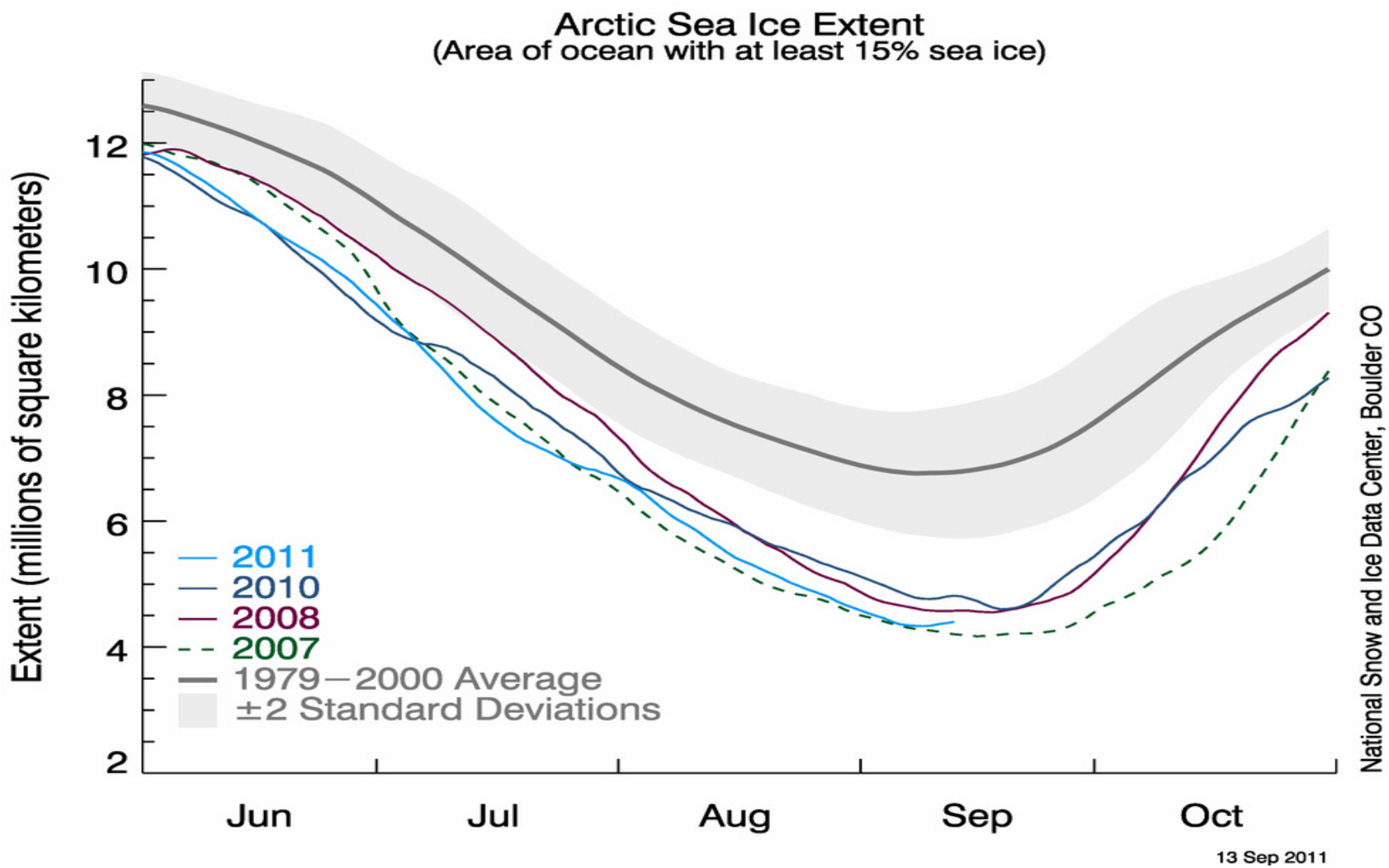
Reports: June | July | August

The SEARCH Sea Ice Outlook effort, which emerged from discussions at the "Arctic Observation Integration Workshops" held March 2008 in Palisades, NY, is a response by the scientific community to the need for better understanding of the arctic sea ice system, given the drastic and unexpected sea ice decline witnessed in 2007.

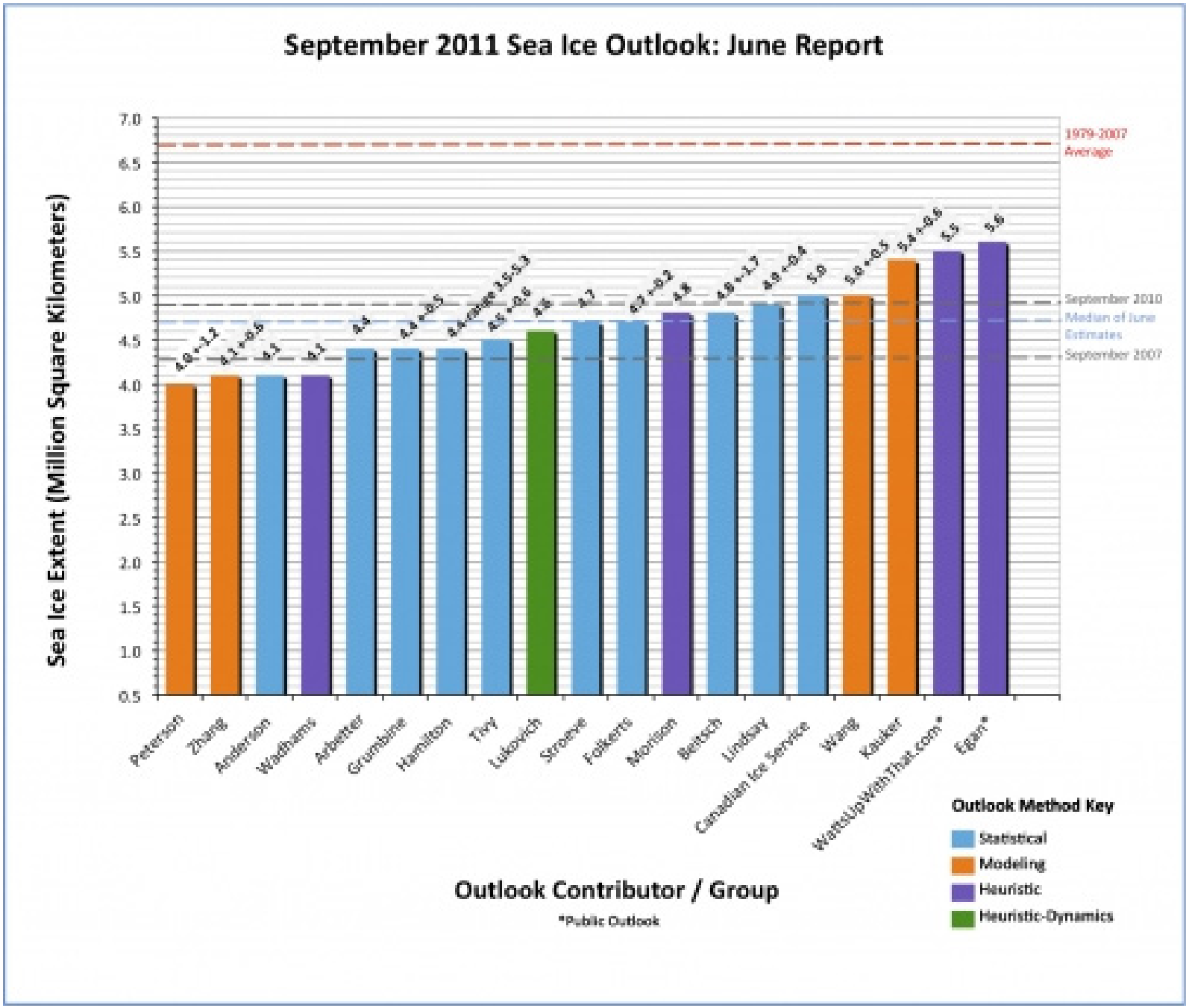
The Sea Ice Outlook produces monthly reports during the arctic sea ice season, based on an open and inclusive process that synthesizes input from a broad range of scientific perspectives:

1. Each month during the summer sea ice melt season, a request to the international arctic science community solicits information on the expected state of the September arctic sea ice.
2. The community submissions are synthesized and reviewed by the Sea Ice Outlook Core Integration Group and Advisory Group.
3. An integrated monthly report is produced that summarizes the evolution and expected state of arctic sea ice for the September mean arctic sea ice extent, based on the observations and analyses submitted by the science community. These reports are posted in the "monthly reports" section of this website and widely distributed.
4. The process for producing the monthly Sea Ice Outlook reports is repeated through September of each sea ice season.
5. A retrospective analysis after the season examines the success of the Sea Ice Outlook in advancing scientific understanding of the arctic sea ice system, and provide guidance to future research efforts.

The SEARCH Sea Ice Outlook is implemented through close cooperation with the DAMOCLES program and other relevant national and international efforts. Sea Ice Outlook activities are supported in part through the National Science Foundation (NSF) and the National Oceanic and Atmospheric Administration (NOAA).



there is evidence that conditions are changing in the Pacific Arctic that may lend more possibility for seasonal forecasts of September sea ice conditions from end of spring data.


September 2011 Sea Ice Outlook: June Report
Sea Ice Extent (Million Square Kilometers)
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
1979-2007 Average
September 2010
Median of June Estimates
September 2007
4.0 +-1.2
4.1 +-0.5
4.1
4.1
4.4
4.4 +-0.5
4.4 range 3.9-5.3
4.5 +-0.6
4.6
4.7
4.7 +-0.2
4.8
4.8 +-1.7
4.9 +-0.4
5.0
5.0 +-0.5
5.4 +-0.6
5.5
5.6
Peterson
Zhang
Anderson
Wadhams
Arbetter
Grunbine
Hamilton
Tivy
Lukovich
Stroeve
Folkerts
Morison
Beitsch
Lindsay
Canadian Ice Service
Wang
Kauker
WattsUpWithThat.com*
Egan*
Outlook Contributor / Group
*Public Outlook
Outlook Method Key
Statistical
Modeling
Heuristic
Heuristic-Dynamics

Seasonal Sea Ice Forecasting

We are primarily concerned with the state of sea ice at the end of summer (September), especially north of Alaska as the Chukchi and Beaufort Seas are major areas of summer sea ice retreat.

Major approaches for the Sea Ice Outlook include running high resolution sea ice/ocean models with hindcast weather data during winter to initialize the sea ice field and then an ensemble of previous years' summer wind fields to obtain a range of outlooks for September sea ice. Other approaches include probabilistic methods and those based on observed sea ice conditions. Certain groups are looking at summer atmospheric climate predictions.

Objectives for NOAA Sea Ice Forecasting on Seasonal Scales are:

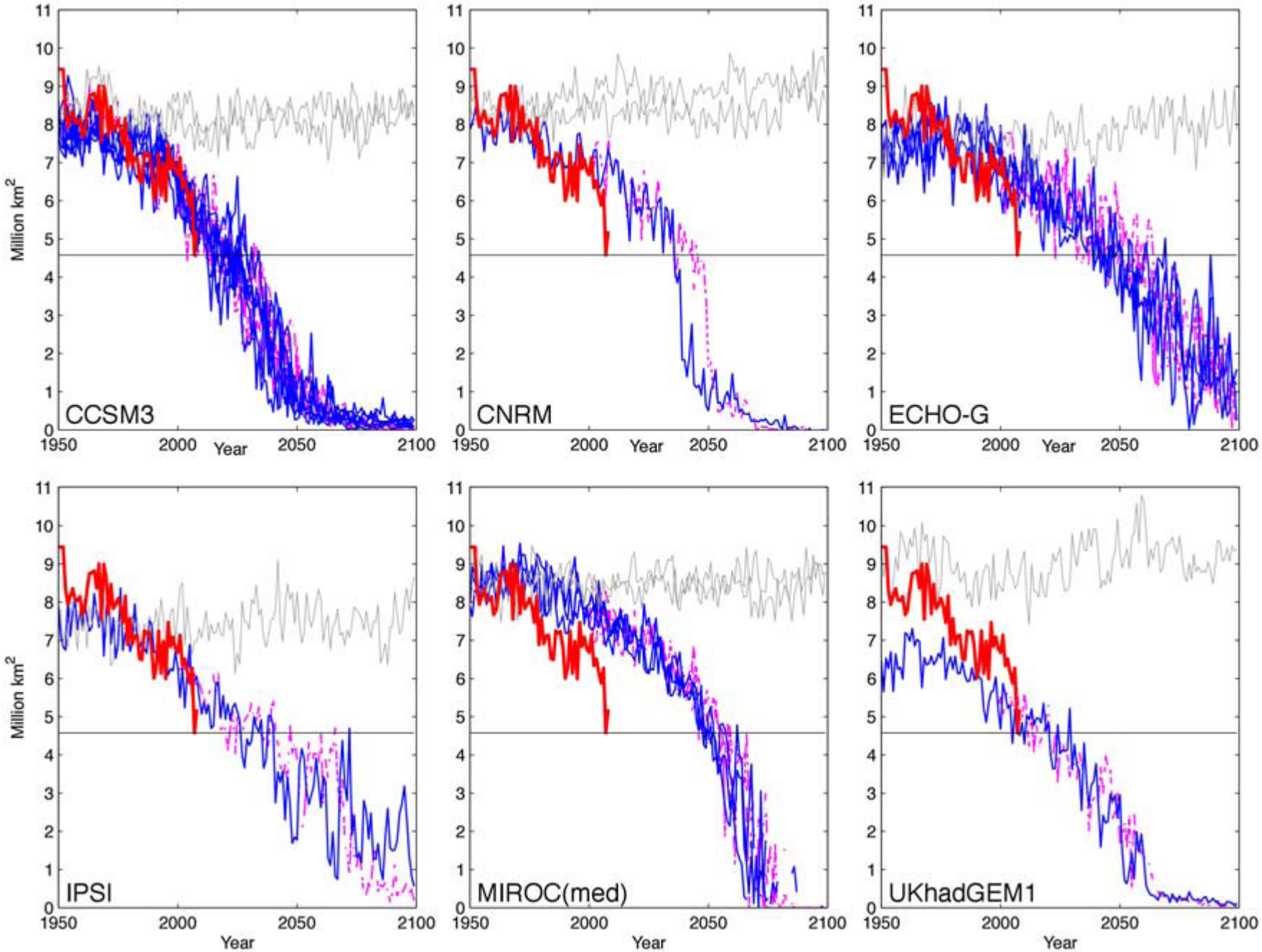
*Continue with model development, particularly focusing on how to assimilate sea ice information. What are the causes of different projections from different modeling centers?

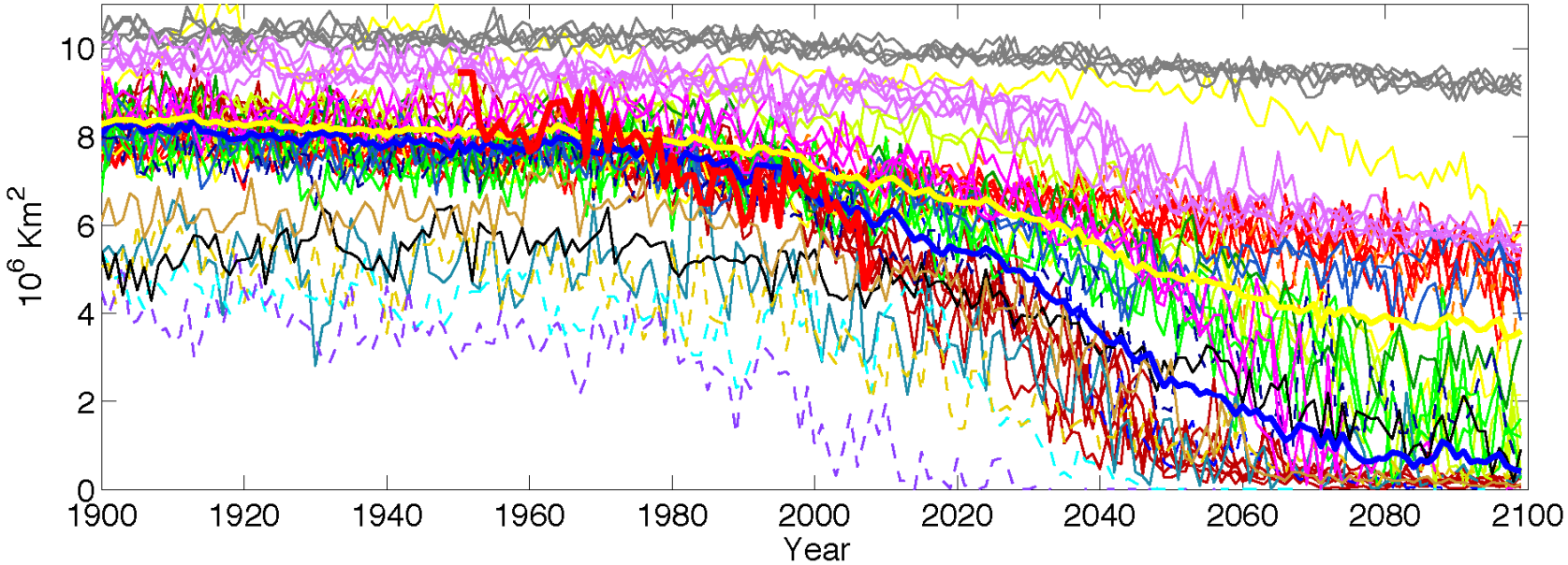
*Explore current Arctic climate and sea ice conditions to determine if the Arctic is truly in a new climate state based on increased summer open water and changes in the seasonal cycle of sea ice.

*Provide improved coverage of sea ice data based on sea ice buoys, aircraft reconnaissance, and satellite products, especially for late spring (initialization) and early autumn (verification). Any new NOAA product will depend on an improved observational base.

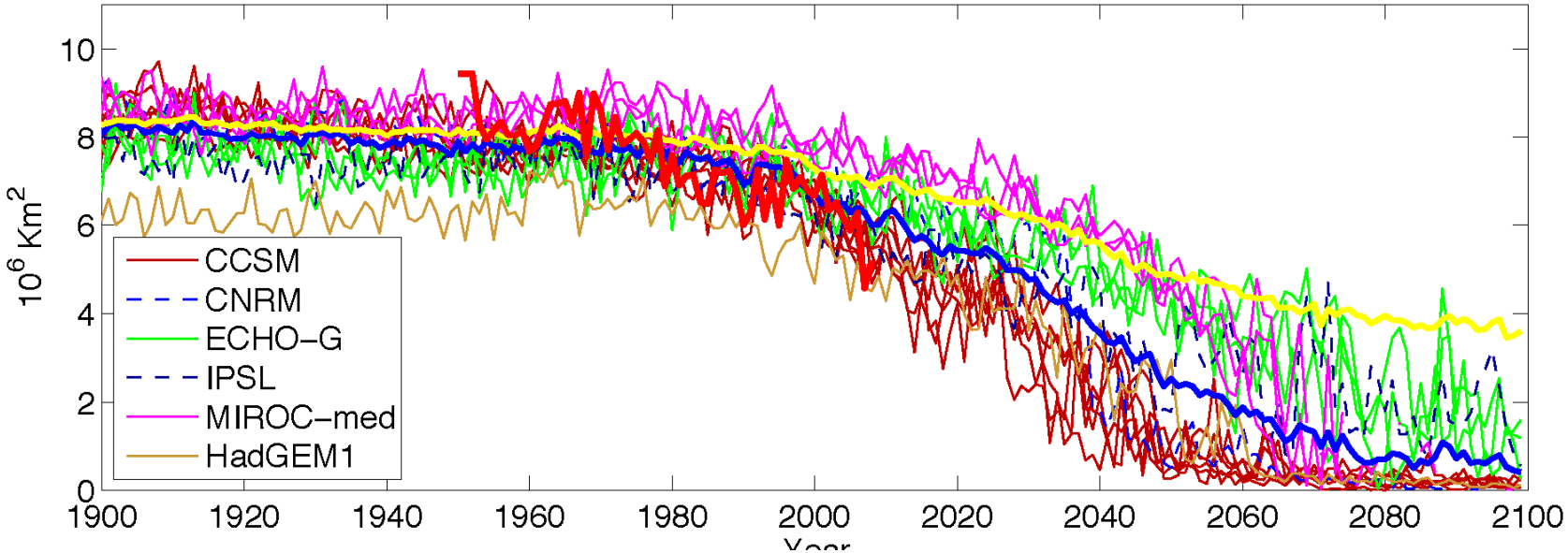
*Continue the Sea Ice Outlook. The UK, Sweden, Canada and US Ice centers are involved.

*Plan for a new robust end-to-end NOAA forecast product.

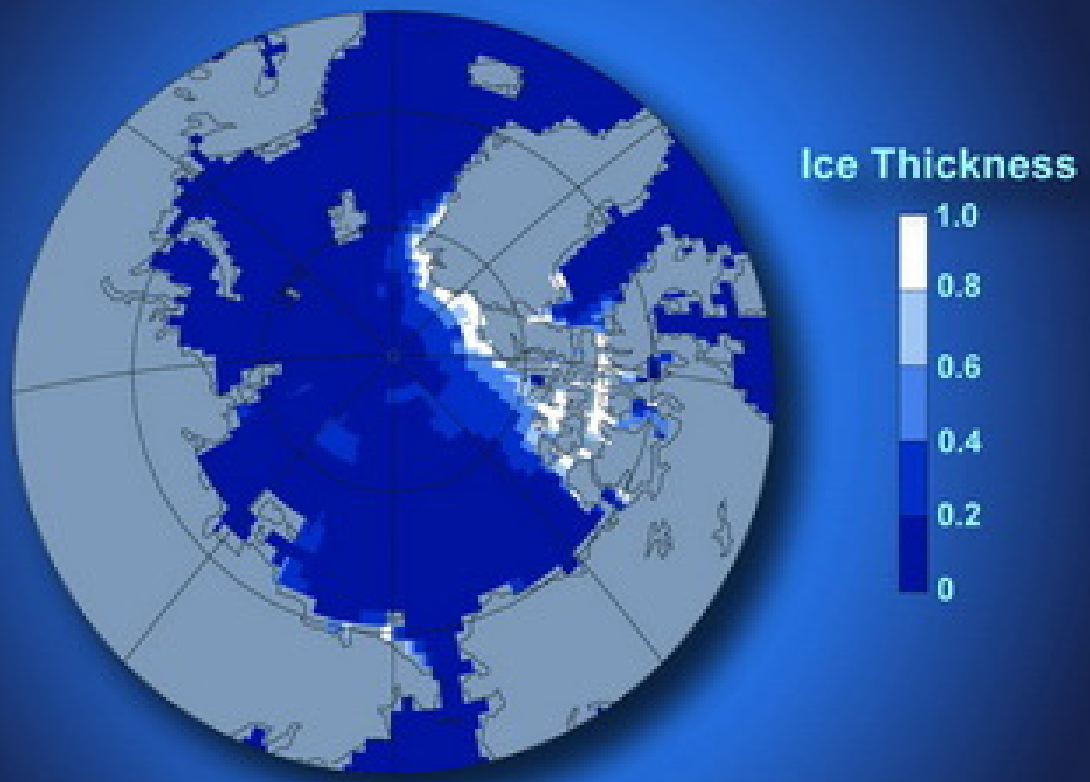

CCSM3
CNRM
ECHO-G
IPSI
MIROC(med)
UKhadGEM1
Million km^2
Year
0
1
2
3
4
5
6
7
8
9
10
11
1950
2000
2050
2100



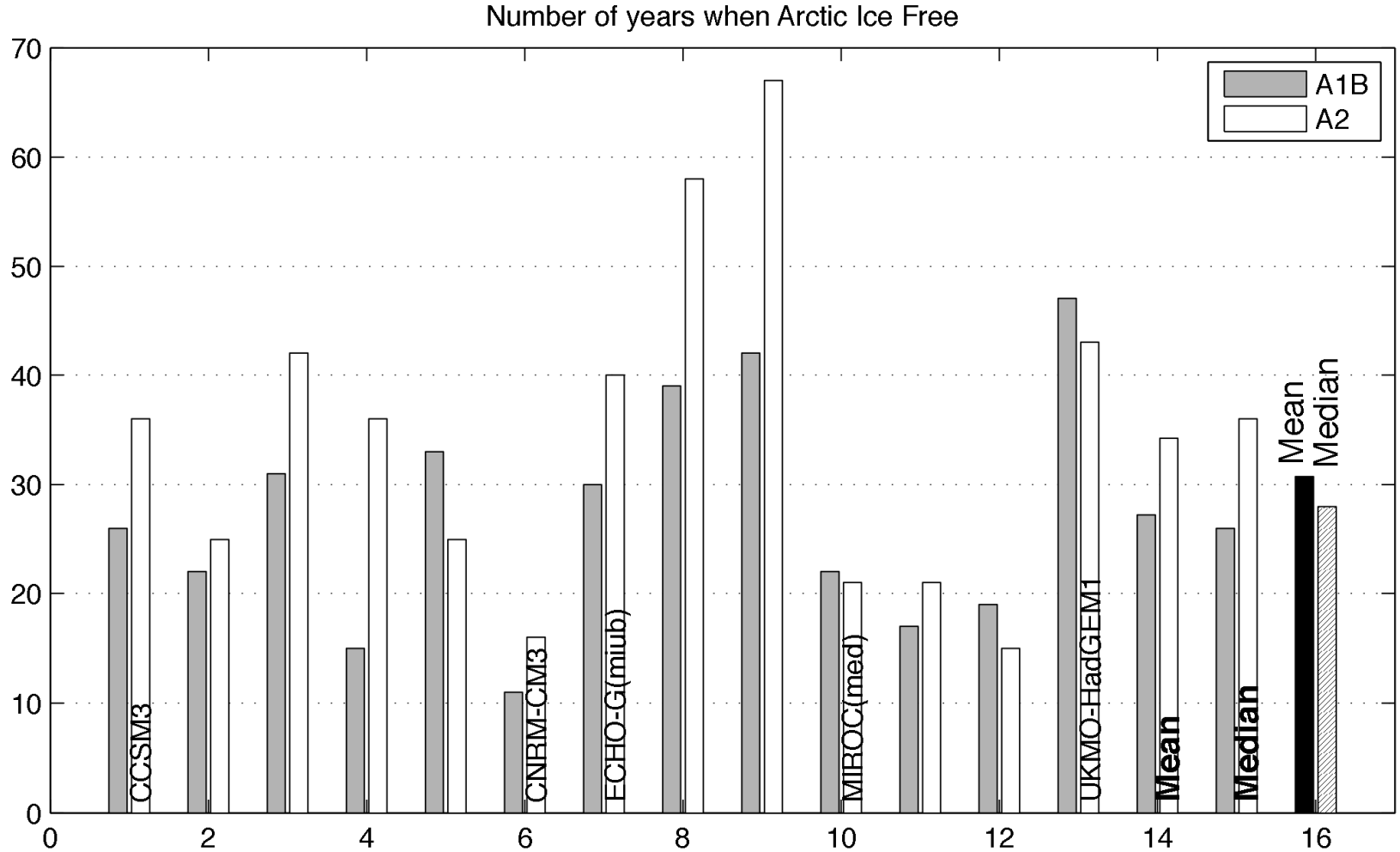
A1B Sep NH Ice Extent



Computer models predict that by 2035, the Arctic could be nearly sea ice-free in summer.



Given Initial Conditions from 2007, How many years will it take for sea ice extent to reach 1.0 M km2 in 6 IPCC Models*?
(Each Bar is an Ensemble Member)



* IPCC AR4 models that have good annual cycle of sea ice extents

Provisional Schedule for the Working Group I contribution to the IPCC Fifth Assessment Report	
2010	
Nov	First Lead Authors Meeting (LA1), **8-11 November 2010**, Kunming, China
2011	
Jul	Second Lead Authors Meeting (LA2), **18-22 July 2011**, Brest, France
Dec	Expert Review of the First Order Draft (FOD), **16 December –** 10 February 2012
2012	
Feb	Expert Review of the First Order Draft (FOD), 16 December **– 10 February 2012**
Apr	Third Lead Authors Meeting (LA3), **16-20 April 2012**, Morocco (TBC)
Jul, 31	WGI AR5 literature cut-off for submitted papers, **31 July 2012**
Oct-Nov	Expert and Government Review of the Second Order Draft (SOD), **5 October – 30 November 2012**
2013	
Jan	Fourth Lead Authors Meeting (LA4), **14-19 January 2013**, Australia (TBC)
Mar, 15	WGI AR5 literature cut-off for accepted papers, **15 March 2013**
Jun-Aug	Final Government Distribution of the WGI AR5 SPM, **7 June – 2 August 2013**
Sep	Preparatory Meeting of WGI AR5 SPM/TS Writing Team & CLAs, **20-21 September 2013**
Sep	WGI AR5 SPM Approval Plenary (WGI-12), **23-26 September 2013**, Stockholm, Sweden