

Sea Ice NOAA Indicators

Freeze-up Break-up Dates derived from NSIDC-0051

January 26, 2019

Progress Update

CODEBASE:

Processing pipeline has been completed and is a simple way for us to run the freeze-up/break-up (FUBU) dates from the NSIDC-0051 daily Sea Ice Concentration time-series. This code base covers all bases from download, prep, smoothing, FUBU, and plotting to mimic what was done in the paper.

Repository: https://github.com/ua-snap/seaice_noaa_indicators

The processing steps are laid out in the readme.md file in the root folder and the script order is listed in the readme.md in the `pipeline` folder. More cleanup and documentation is in the works, for clarity and re-use in the future.

OUTPUTS:

Study Area (with the points I attempted to lift from the paper):

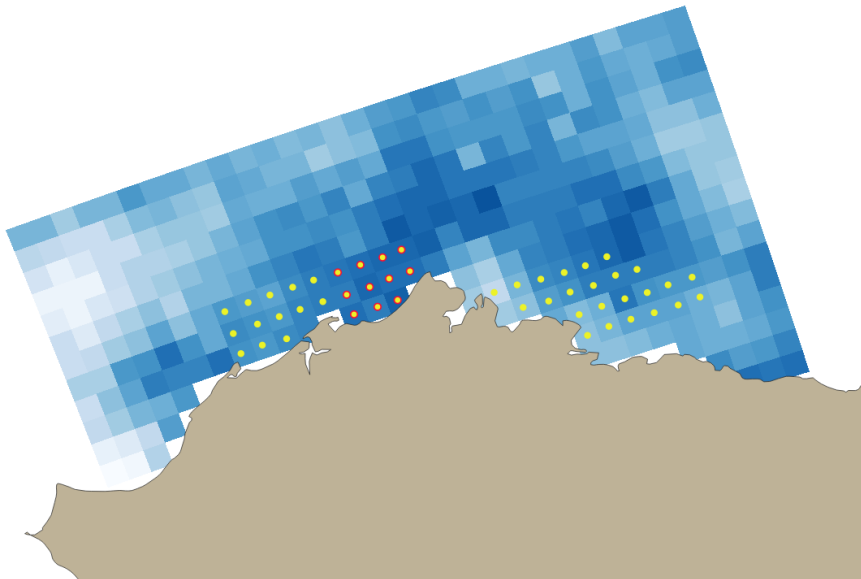


Table 2:

Comparison of sea-ice cycle phenologies for the Chukchi/Beaufort Seas, 1979—2007

	barrow	beaufort	chuckchi	chuckchi-beaufort
freezeup_start	10-18	10-14	10-20	10-16
freezeup_end	11-11	11-01	11-17	11-07
breakup_start	06-12	06-08	05-30	06-05
breakup_end	08-17	08-17	08-05	08-13

Table 3:

Climatological freeze-up and break-up dates with seasonal durations for the Chukchi and Beaufort Sea coastal regions, 1979–2013

	barrow	beaufort	chuckchi	chuckchi-beaufort
freezeup_start	10-07	10-05	10-15	10-08
freezeup_end	11-30	11-16	12-08	11-24
breakup_start	05-06	05-10	05-04	05-08
breakup_end	08-09	08-13	07-28	08-07

Table 4:

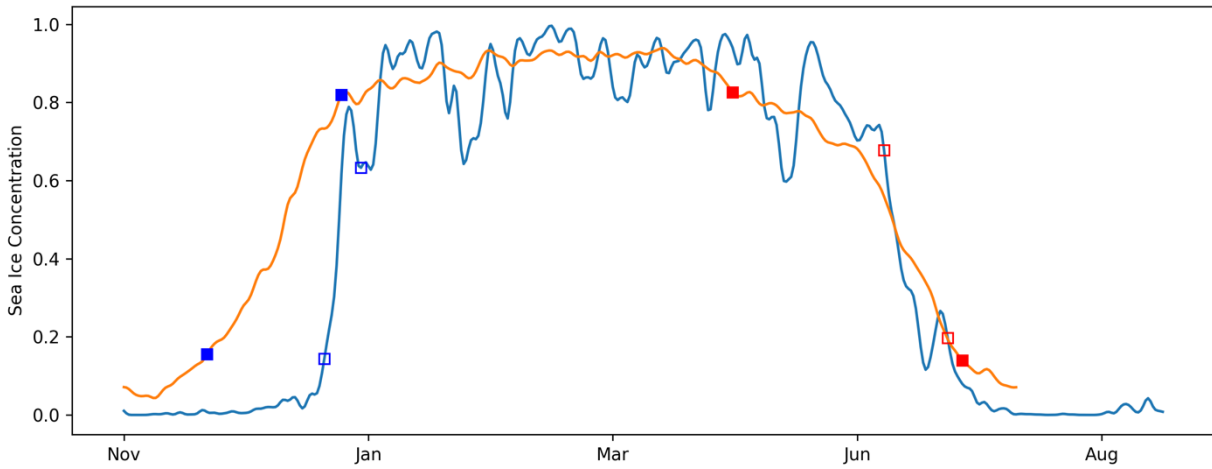
Mean freeze-up and break-up dates and trends for the Chukchi and Beaufort Sea coastal regions, 1979–2013

	barrow	beaufort	chuckchi	chuckchi-beaufort
freezeup_start	10-21	10-16	10-24	10-19
freezeup_end	11-12	11-04	11-18	11-09
breakup_start	06-07	06-06	05-27	06-03
breakup_end	08-12	08-12	07-31	08-07

* [Note]: Some of the above FUBU dates do not fit exactly (or in some cases, even closely) with the dates from the paper. I am still digging in to what might be causing these shifts in dates, but due to the fact that I am not able to fluidly test the old code, nor do I have the *exact* locations of the points used in extraction from the Chuckchi, Barrow, Beaufort regions, this is where it currently falls out.

Figure 4:
Sea-ice concentration record of Barrow, Alaska.

1997-1998:



2005-2006:

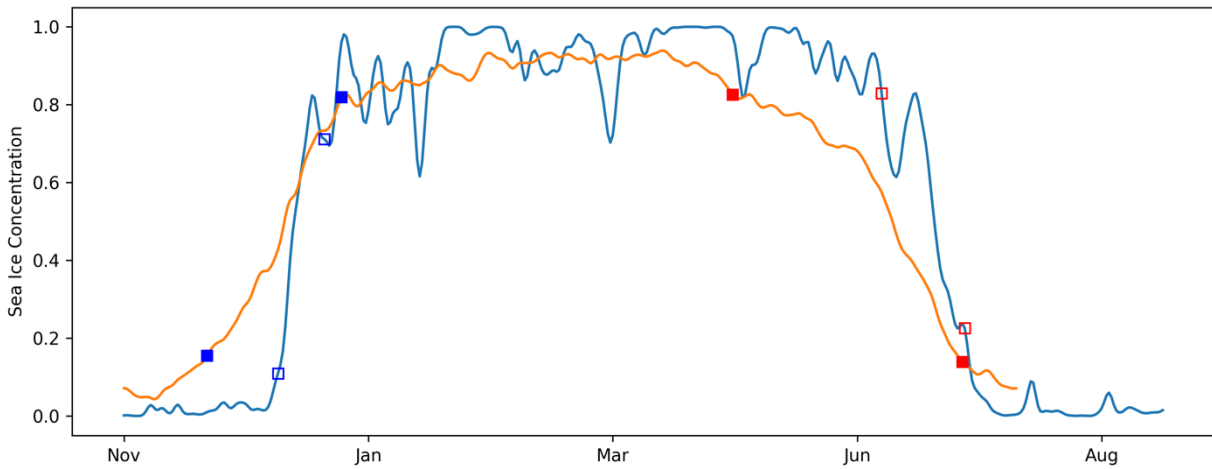


Figure 5:
Freeze-up and break-up with two summer ice events.

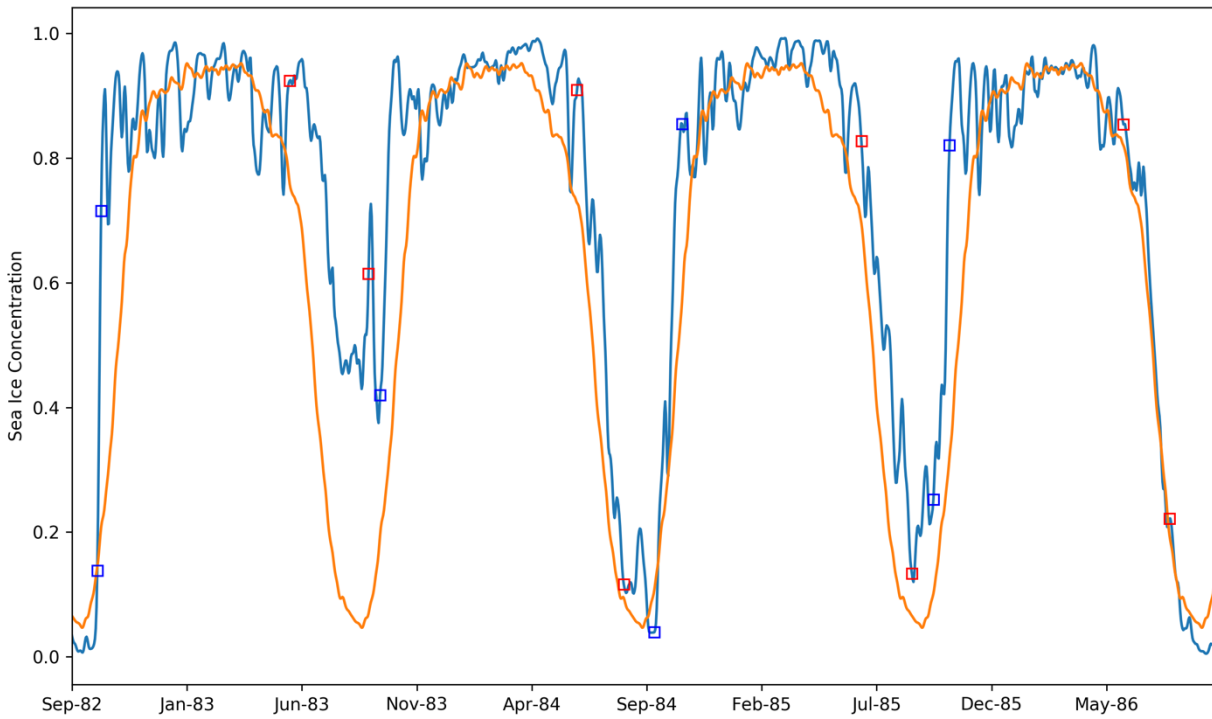


Figure 6:
Freeze-up and break-up from 2007 to 2012.

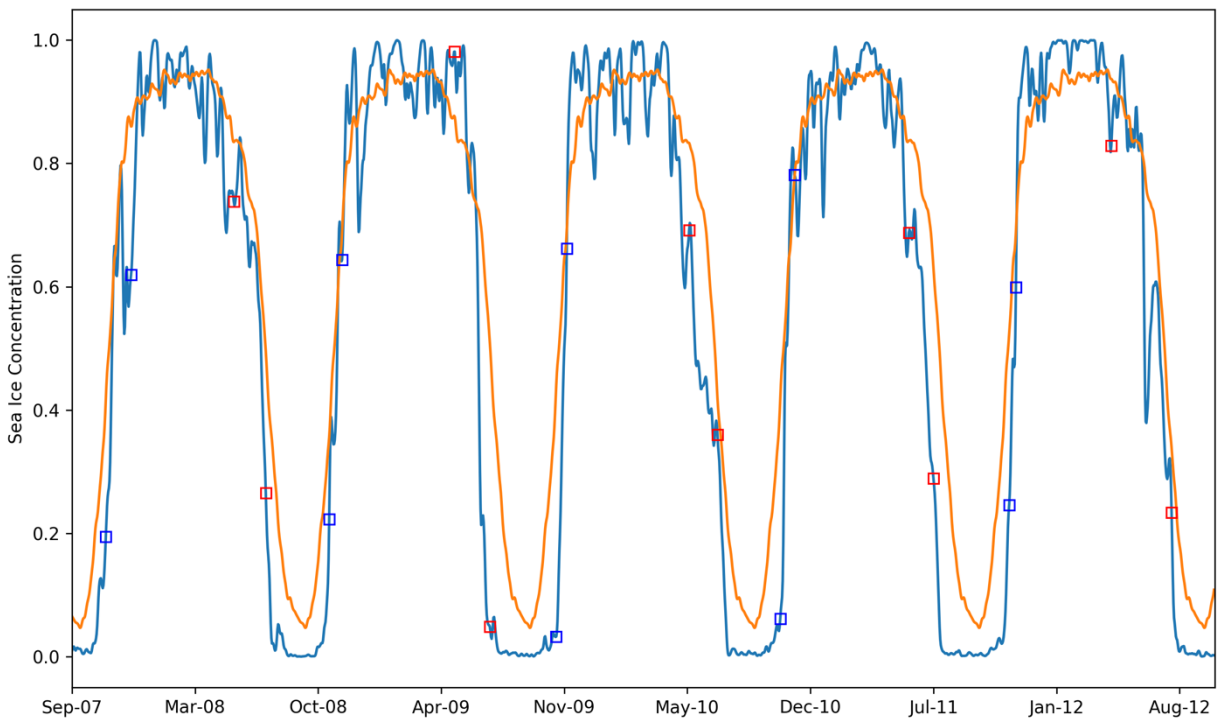
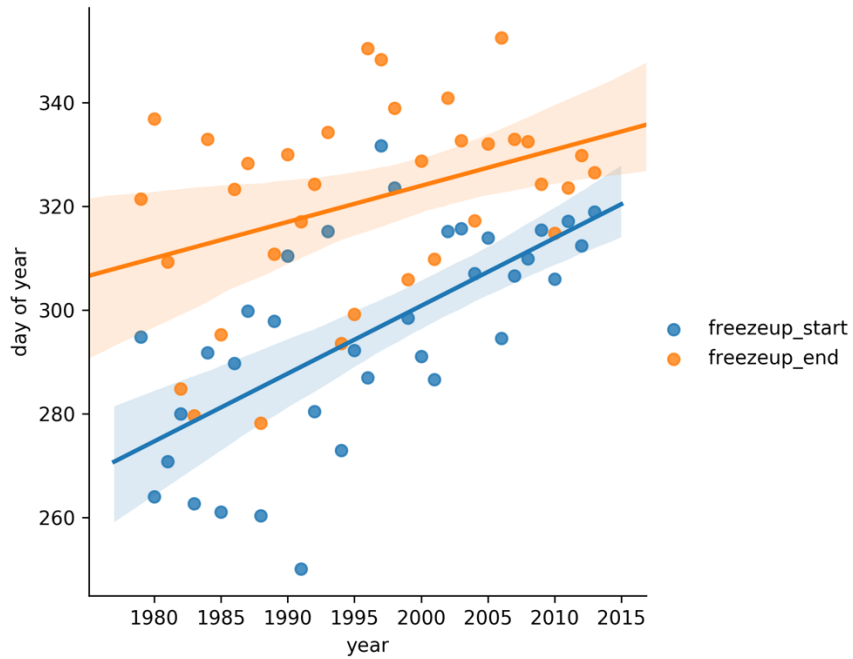


Figure 7:
Chukchi Sea break-up and freeze-up dates.

FREEZE-UP:



BREAK-UP:

