



# Building a NOAA Data Collection at NSIDC

## - While Breaking the Researcher-Contributor Hesitancy Barrier

Florence Fetterer, Ann Windnagel, and Jennifer Roebuck

National Snow and Ice Data Center, Cooperative Institute for Research in Environmental Sciences, University of Colorado Boulder

<https://nsidc.org/noaa>

## Introduction

NOAA@NSIDC receives financial support from NOAA NESDIS and is allied with its National Centers for Environmental Information. We work within the larger NSIDC infrastructure of developers, IT systems, User Services professionals, and scientists.

While most of our collection consists of data from operational services such as the US National Ice Center or from satellites, like the Sea Ice Index, we have an increasing number of data sets from individual researchers. These are often unique collections of historical data.

The researchers who assemble these collections do so with painstaking care, knowing that they are working for future generations. AGU's position statement on data reinforces this point of view, stating

*“Earth and space science data are a world heritage, and an essential part of the science ecosystem... Trusted domain-specific data repositories must be available to curate, archive, and disseminate data and other research artefacts without restriction, ensuring accessibility well into the future.”*

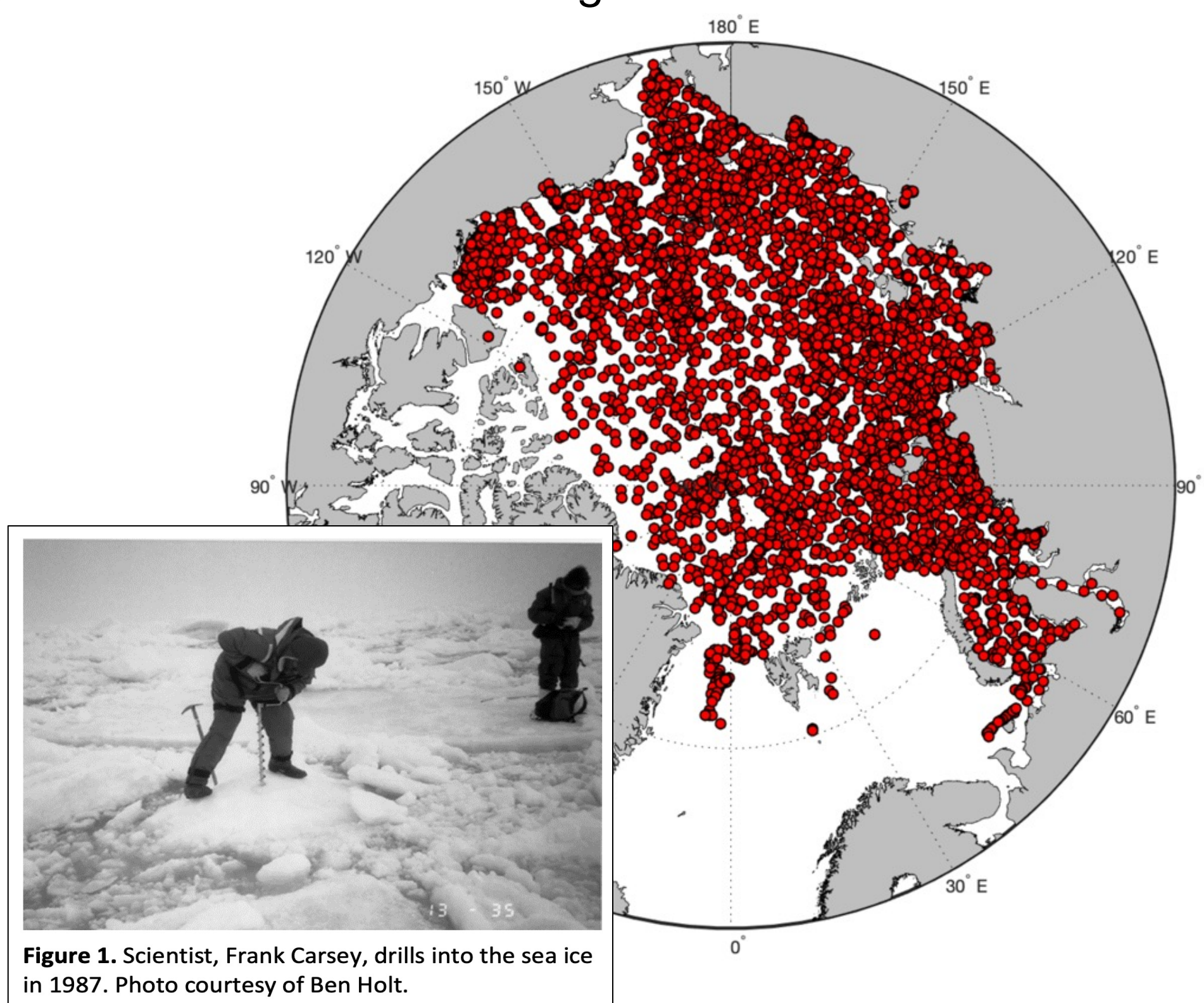
## Researchers who contribute data gain:

- A secure home for their data in a trusted repository.
- Credit for their work, through the citation for the data set that contains their name in author position and through the User Guide description.
- Satisfaction of knowing others will more easily build on their work.
- Usage statistics! We track the number of users downloading data and registering for data sets.
- Assistance in documenting and, when needed, reformatting their data before the data are published and appear in the NSIDC data catalog. The hands-on, personal nature of this interaction is vital to ensuring success.

## Examples of Data Sets from Individual Researchers

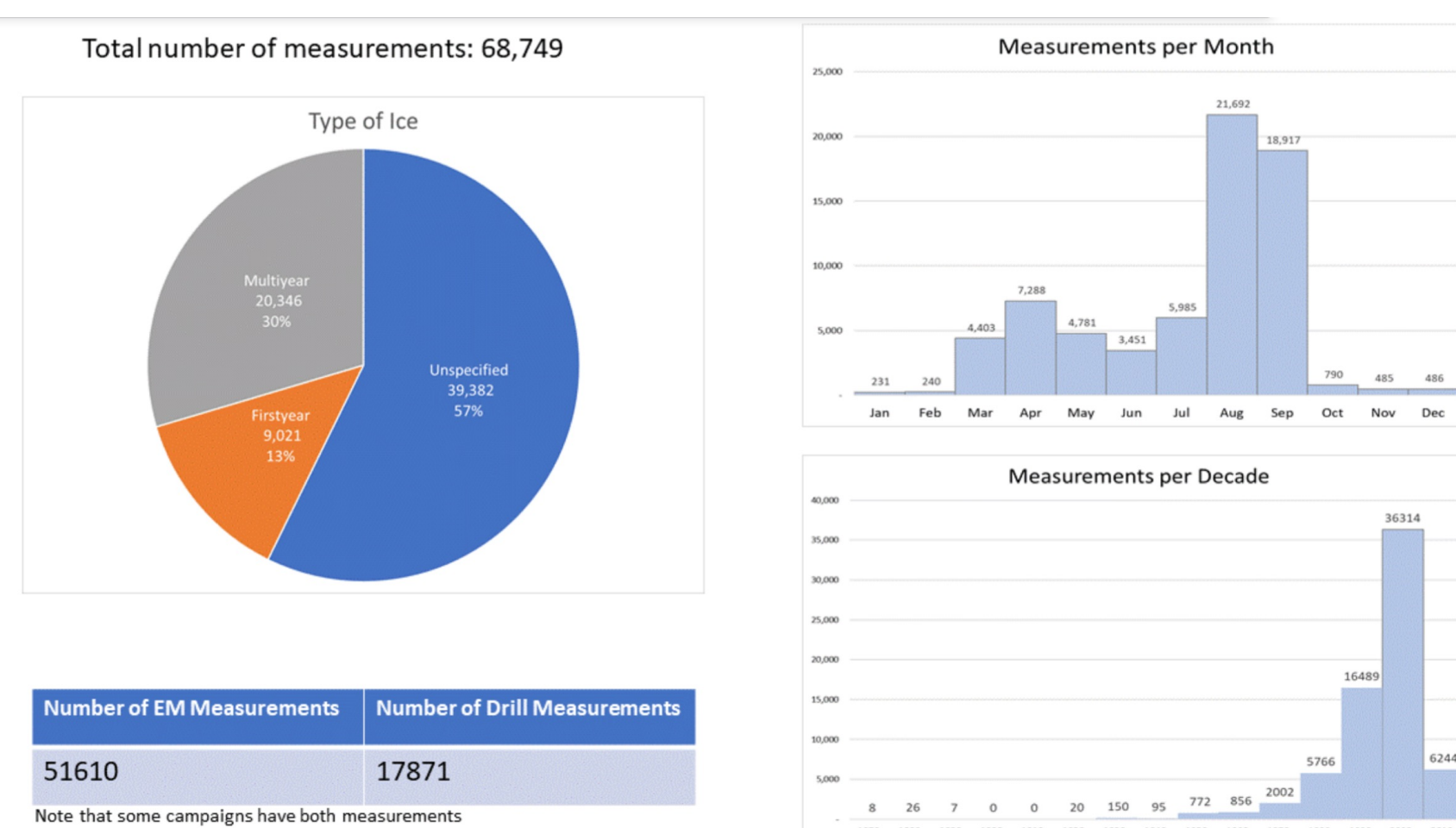
### On-Ice Arctic Sea Ice Thickness Measurements from the Late 1800s Onward

JPL scientist Ben Holt and interns assembled measurements from 50 expeditions that had not been assembled elsewhere. On-ice measurements are the gold standard for determining sea ice thickness.



Left: Data acquisition with an auger. Photo with caption from the data set User Guide. Right: The location of measurements from all 50 expeditions.

**Holt describes the project:** *“From journal articles, reports, expedition publications, online resources such as Google Scholar and the Defense Technical Information Center, as well as through direct contact with individual sea ice investigators, measurements have been assembled from many types of expeditions, large and small. With version 2, the earliest data extends back to the Jeannette Expedition from 1879–1881, then to the Fram Expedition in the mid-1890s, the Maud Expedition in the 1920s, and includes up to more recent collections occurring through 2016. In one case, an early investigator’s field book was made available to us, providing single point measurements of thickness that had, as yet, only been summarized in published graphs.”*



Holt, B. 2019. *On-Ice Arctic Sea Ice Thickness Measurements by Auger, Core, and Electromagnetic Induction, from the Late 1800s Onward, Version 2*. Boulder, Colorado USA. NSIDC: National Snow and Ice Data Center. doi: <https://doi.org/10.7265/wz0k-4p60>.

### Kenai Fjords National Park Coastal Glacier Repeat Photography Collection

Deb Kurtz, National Park Physical Science Program Manager, compiled and documented this collection. It is one of several special collections within the Glacier Photograph Collection of more than 25,000 photographs dating back to the mid 1800s.

Kurtz developed metadata for existing historical photographs, and then photographed these glaciers, “despite the challenges of precisely replicating and aligning photos taken from boats”.



Kurtz, D. 2013. Bear Glacier: From the Glacier Photograph Collection. Boulder, Colorado USA: National Snow and Ice Data Center.



Grant, U.S. 1909. Bear Glacier: From the Glacier Photograph Collection. Boulder, Colorado USA: National Snow and Ice Data Center

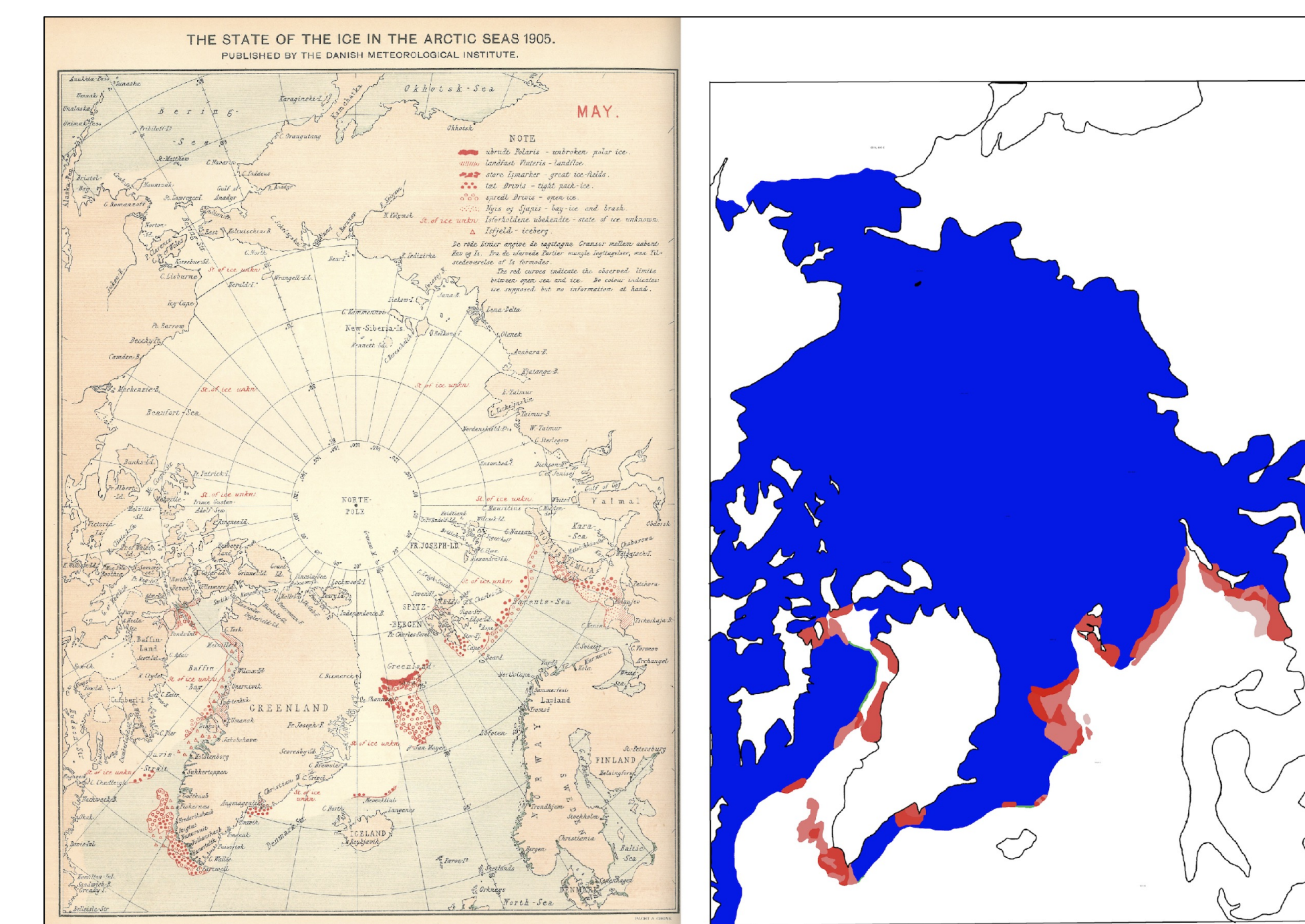
**Kurtz describes the project:** Photos of 40 individual glaciers or glacier groups from southcentral Alaska document “the current but ephemeral state of the park’s changing glaciers and provides a historical record for all”.

National Snow and Ice Data Center (comp.). 2002, updated 2021. *Glacier Photograph Collection, Version 1*. Boulder, Colorado USA. NSIDC: National Snow and Ice Data Center. doi: <https://doi.org/10.7265/N5/NSIDC-GPC-2009-12>

### Arctic Sea Ice Concentration and Extent from Danish Meteorological Institute Sea Ice Charts, 1901-1956

By publishing a data set, a student can make a citable, permanent contribution at an early stage in their career.

These are simple, color-coded fields of ice concentration derived from historical observations from ships that were compiled by mapmakers. Vivian Underhill, an undergraduate at the time, documented previous uses of these charts for research, and devised a way to extract ice concentration and ice edge estimates from the historical charts so that the concentration fields could be used in other data products.



Left, the “State of the Ice in the Arctic Seas” in May 1905. Right, ice concentration derived from ship observations from the chart at left with concentration fields (in shades of red) and extent fields (in blue) mapped out with the coast outline.

Two data products came from this work:

Underhill, V., F. Fetterer, and C. Petersen. 2014. *Arctic Sea Ice Concentration and Extent from Danish Meteorological Institute Sea Ice Charts, 1901-1956, Version 1*. Boulder, Colorado USA. NSIDC: National Snow and Ice Data Center. doi: <https://doi.org/10.7265/N5MP517M>.

Danish Meteorological Institute and National Snow and Ice Data Center. Compiled by V. Underhill and F. Fetterer. 2012. *Arctic Sea Ice Charts from Danish Meteorological Institute, 1893 - 1956, Version 1*. Boulder, Colorado USA. NSIDC: National Snow and Ice Data Center. doi: <https://doi.org/10.7265/N56D5QXC>.

## Considering publishing your data with us?

If you have data that would broadly impact scientific research and would like to discuss archiving it with us, please contact [fetterer@colorado.edu](mailto:fetterer@colorado.edu)