NASA Airborne Data Workshop

Mark Tschudi
Senior Research Associate
CCAR, Aerospace Engr.
Univ. of CO, Boulder

Airborne Datasets Used

- IceBridge Sea Ice Freeboard, Snow Depth, and Thickness (IDCSI2)
- IceBridge KT19 IR Surface Temperature (IAKST1B)
- IceBridge CAMBOT L1B Geolocated Images (IOCAM1B)
- IceBridge DMS L1B Geolocated and Orthorectified Images (IODMS1B)
- IceBridge Mission Flight Reports (IFLTRPT)
- IceBridge L1B Flight Reports (IPFLR1B)

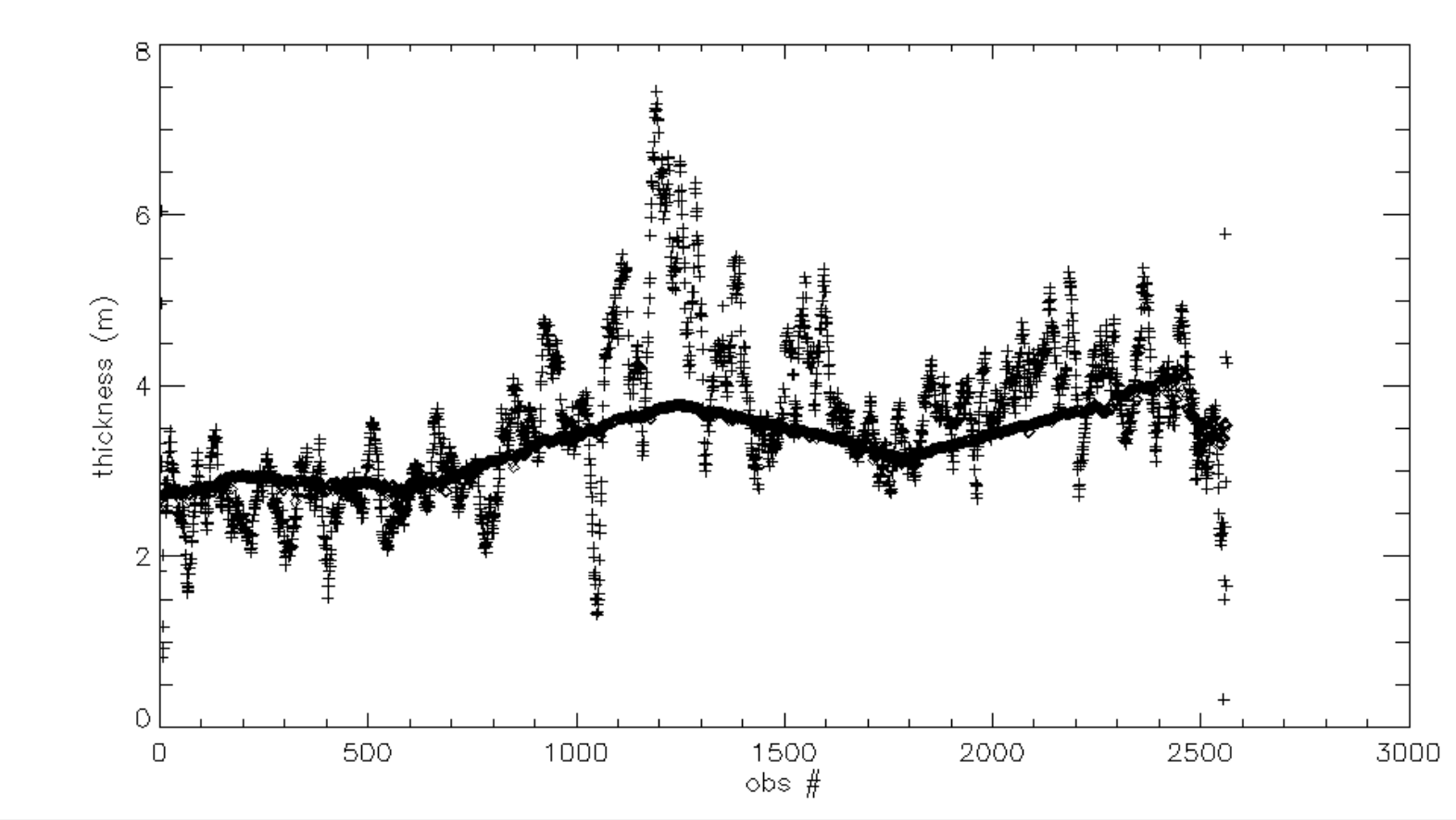
Data access

- NSIDC IceBridge portal
- Google

How I use these data

- Cal/val for NOAA/JPSS/STAR ice products:
  - Ice concentration
  - Ice thickness
  - Ice surface temperature
- Input to Lagrangian tracking program
  - NASA-supported grant (Tschudi, Meier, Brodzik)
  - Same fields as above
- Determining sea ice age vs. thickness

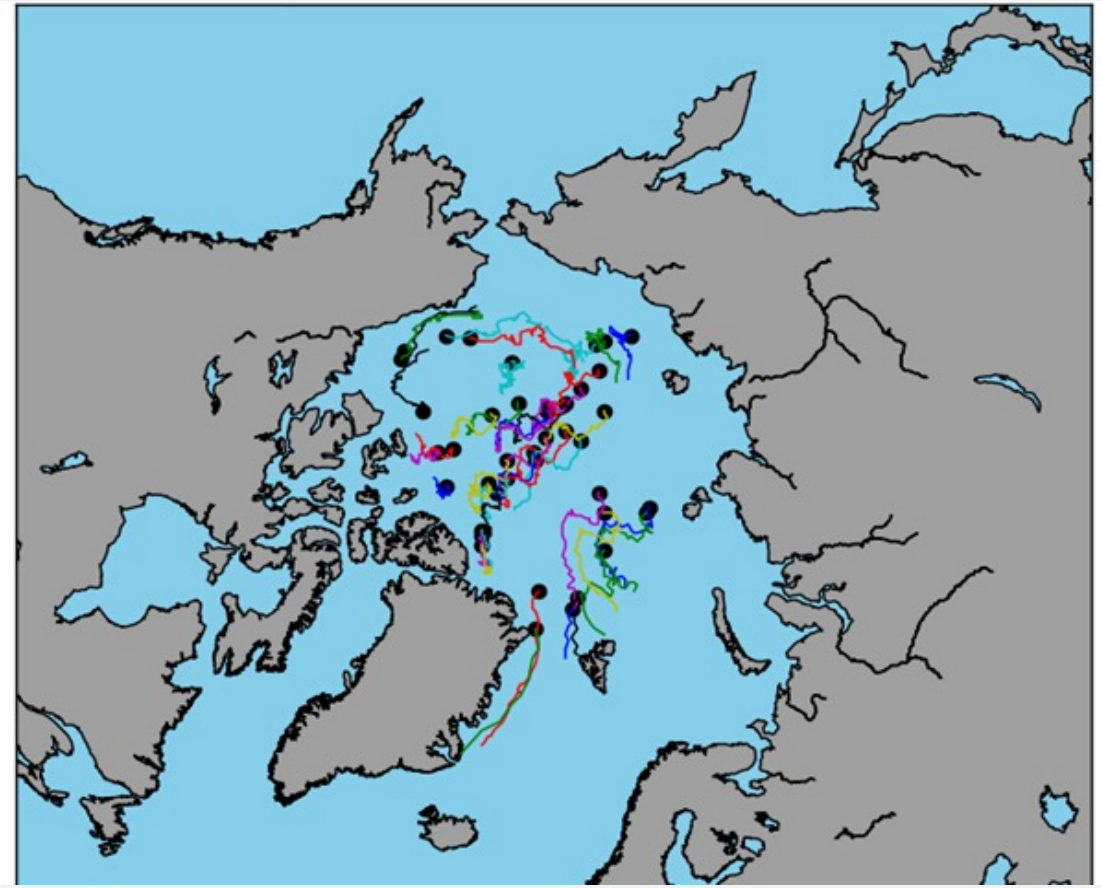
Sea ice product Cal/val



NOAA-20 VIIRS ice thickness product (dark, smoother line) vs. IceBridge ice thickness measurements (jumpy line) along the flight track

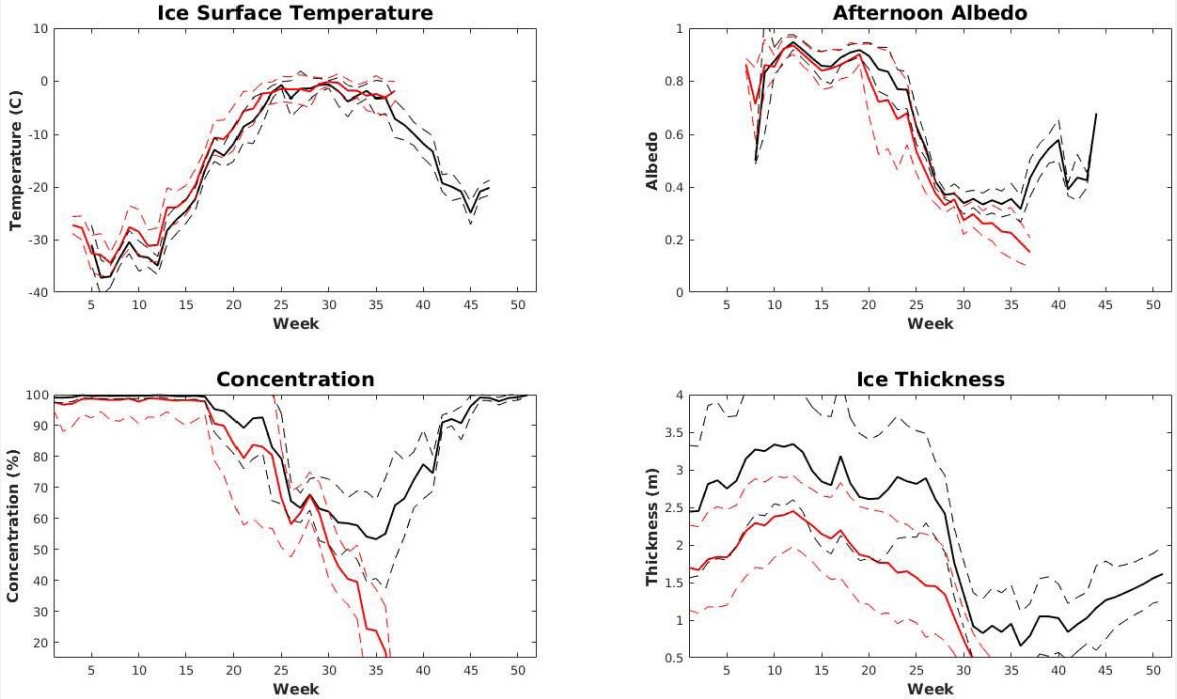
Tracking Sea Ice Properties

- Uses the sea ice motion product to track hundreds of sea ice grid cells as they advect about the Arctic Ocean



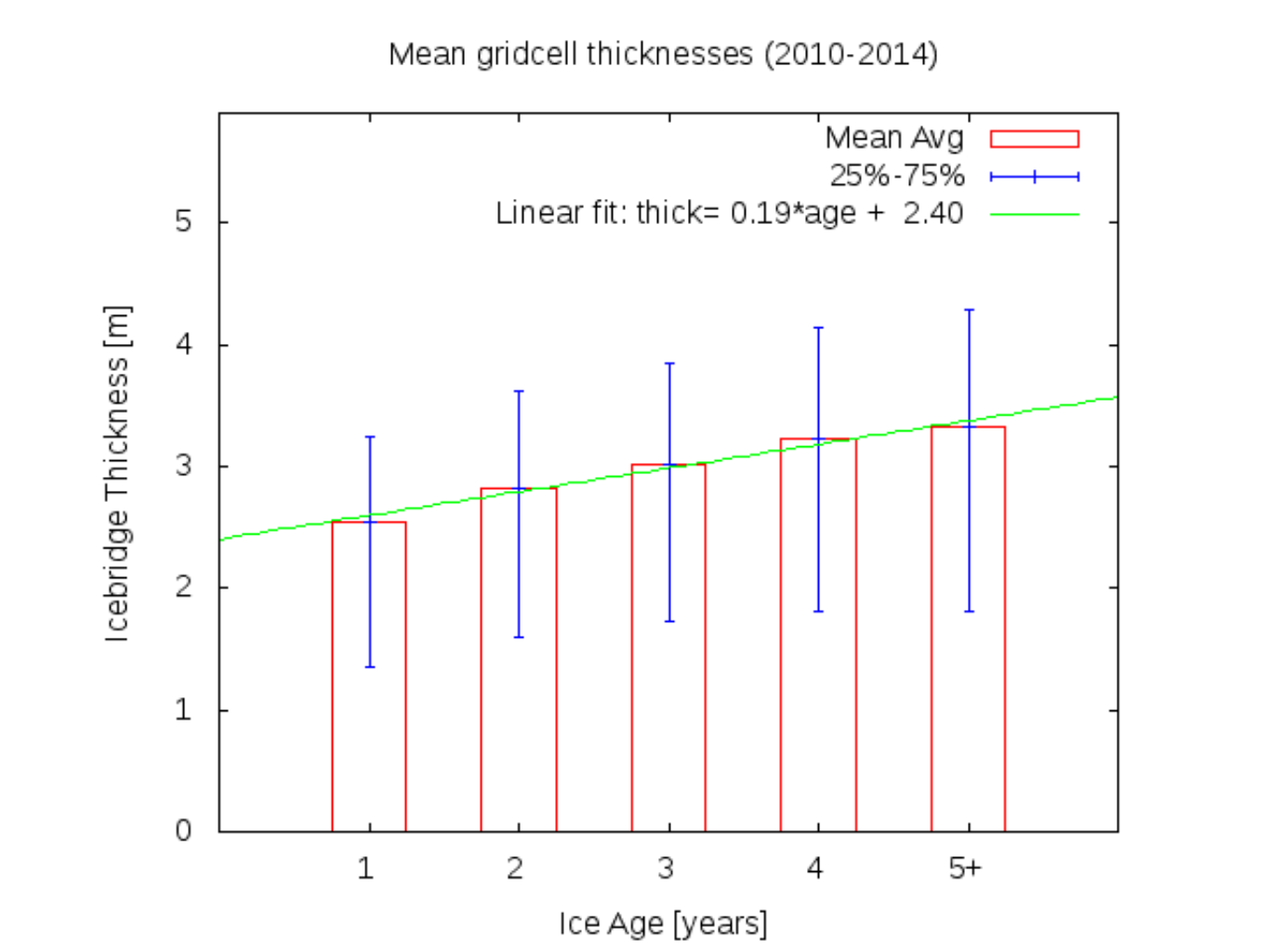
Sample one-year Lagrangian tracks, for 2009.
From *Tooth and Tschudi,* 2018.

Tracking Sea Ice Properties



Example plots of four studied variables for melted (**red**) and surviving (**black**) parcels during 2009. Dotted lines indicate one standard deviation away from the main curve. From *Tooth and Tschudi,* 2018.

Ice Age/Thickness Relationship



IceBridge Ice Thickness Product [*Kurtz et al,* 2013] vs. Ice Age. From *Tschudi et al*., 2016.

What works well

- Data search: IceBridge Data Summaries Page
- Data access: IceBridge portal
- Data staging & download: fast
- Data format: easy to read

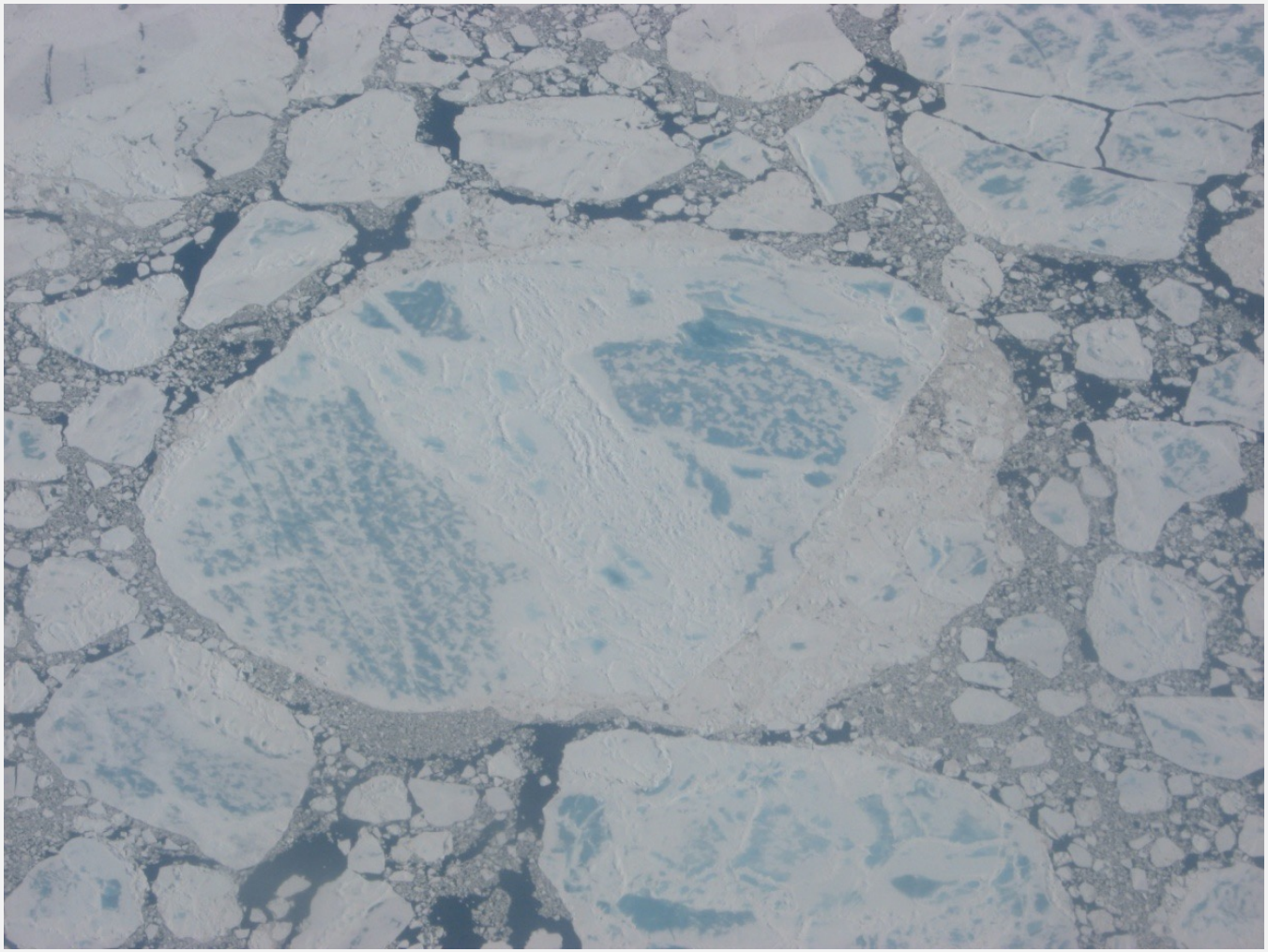
Incomplete datasets

- IceBridge L4 Sea Ice Freeboard, Snow Depth, and Thickness only available through 25 April 2013
- IceBridge Data only through April 2019
  - do not include Fall 2019 Antarctic or Summer 2020 campaigns
  - Sea Ice Freeboard, Snow Depth, and Thickness Quick Look
  - KT19 IR Surface Temperature (Version 2)
- Unprocessed data: FLIR thermal camera

Etc.

- What do I wish I could do but can't?
  - Easily access aircraft flight track data & plot
- Do you have any suggestions for improvement?
  - Have an easy mechanism for user feedback to PI
- Have you tried to use data in the cloud? No
- What support do you need?
  - PI feedback mechanism
  - maybe an FAQ page that PI's can respond to?

Thank you.



Multiyear ice floe ~100km offshore Northern Alaska near Russian border. Photo from window of Coast Guard C-130 by M. Tschudi.