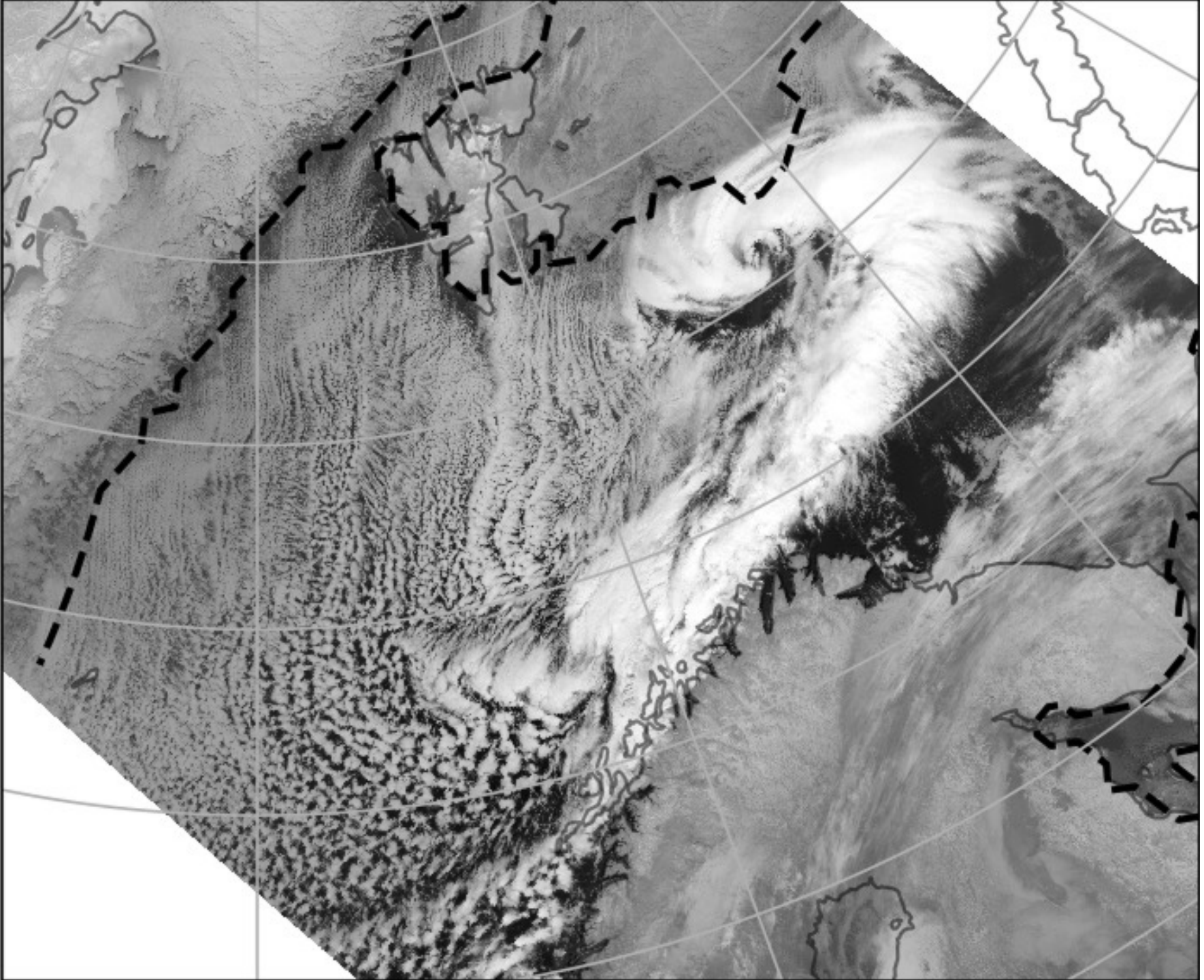
Open or Closed: Tagging recent airborne observations by cloud type

Robert David, Filip von der Lippe, Tim Carlsen, Trude Storelvmo and all of you

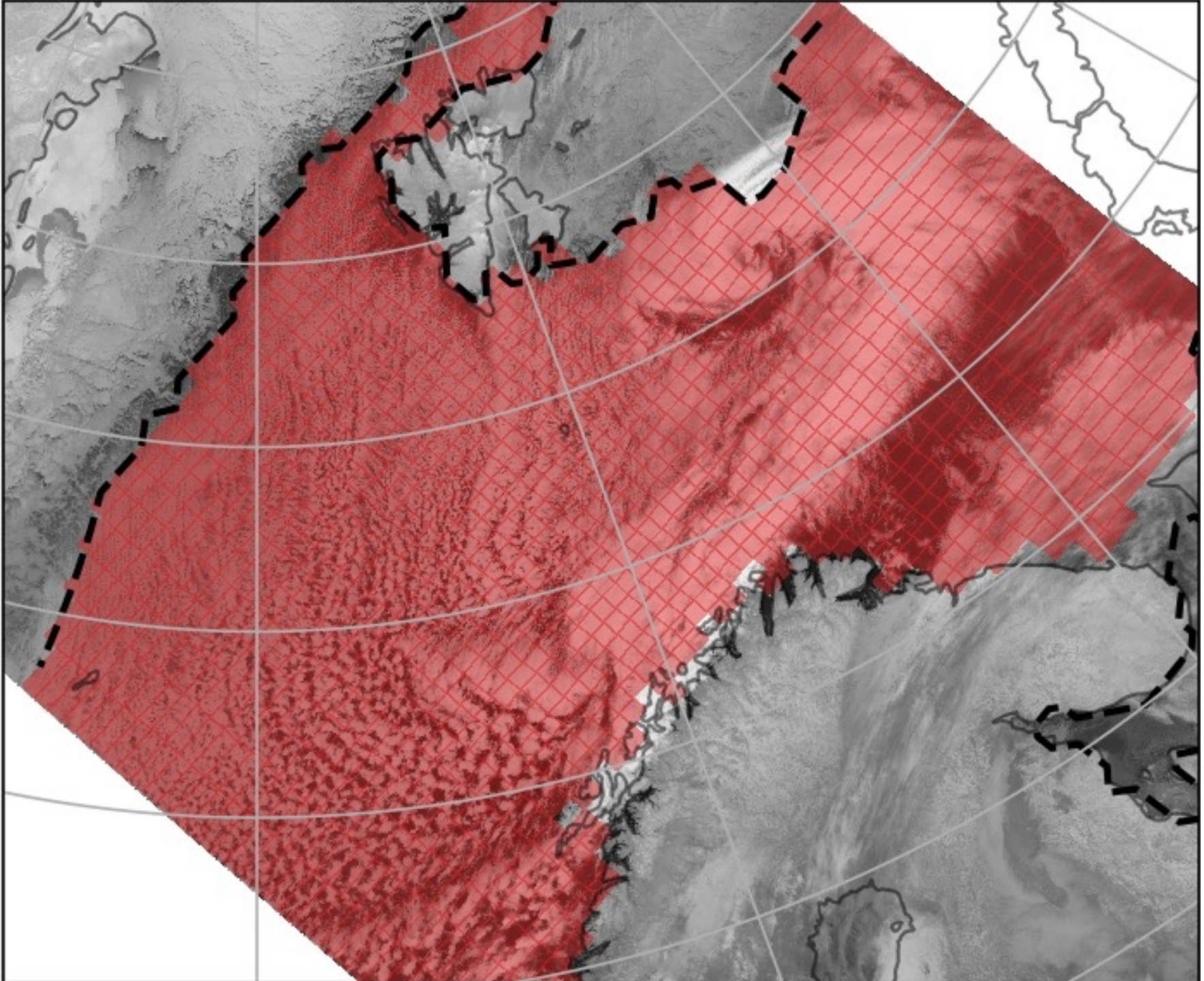
STEP CHANGE

UNIVERSITAS OSLOENSIS MDCCCXI

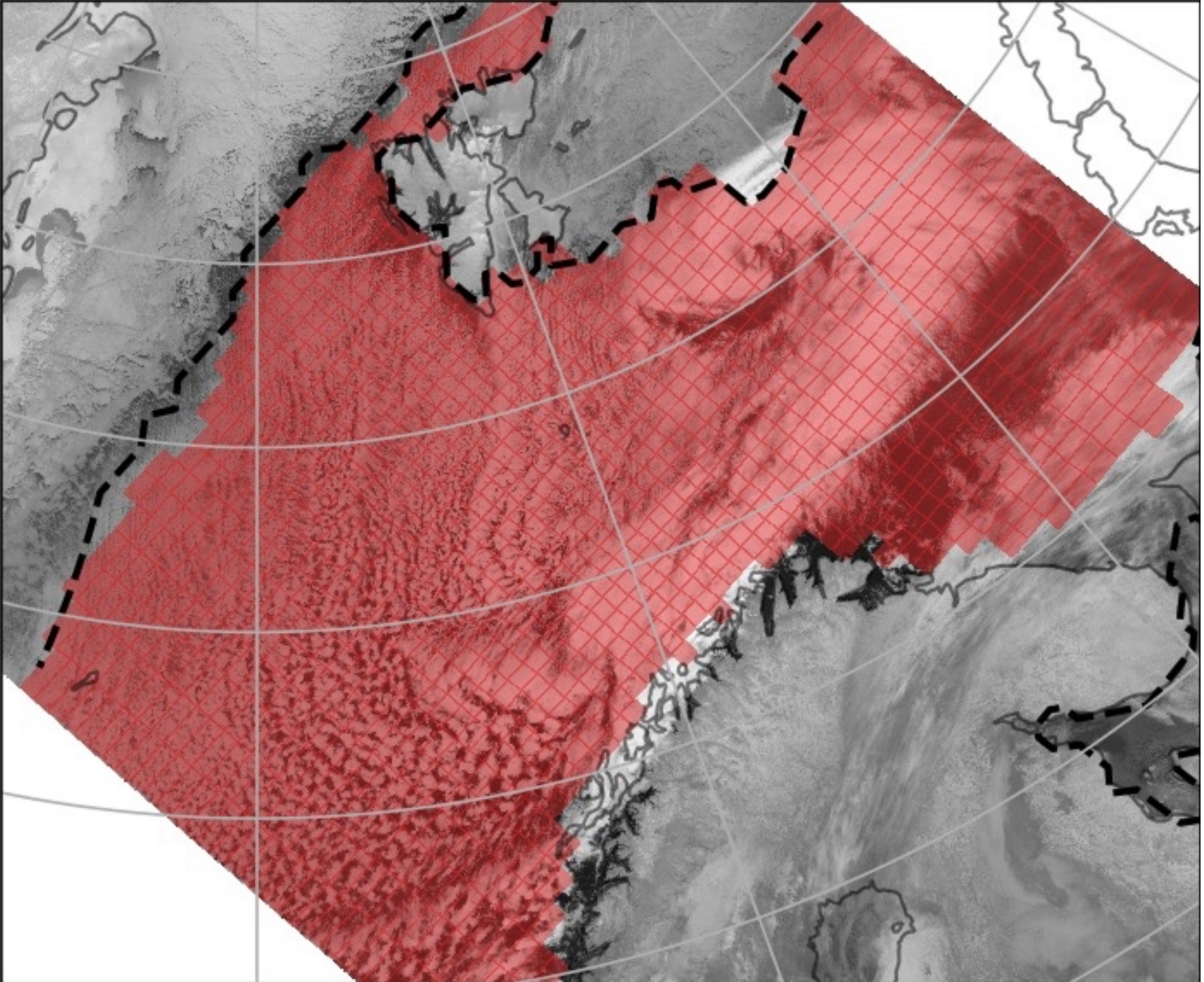


MODIS

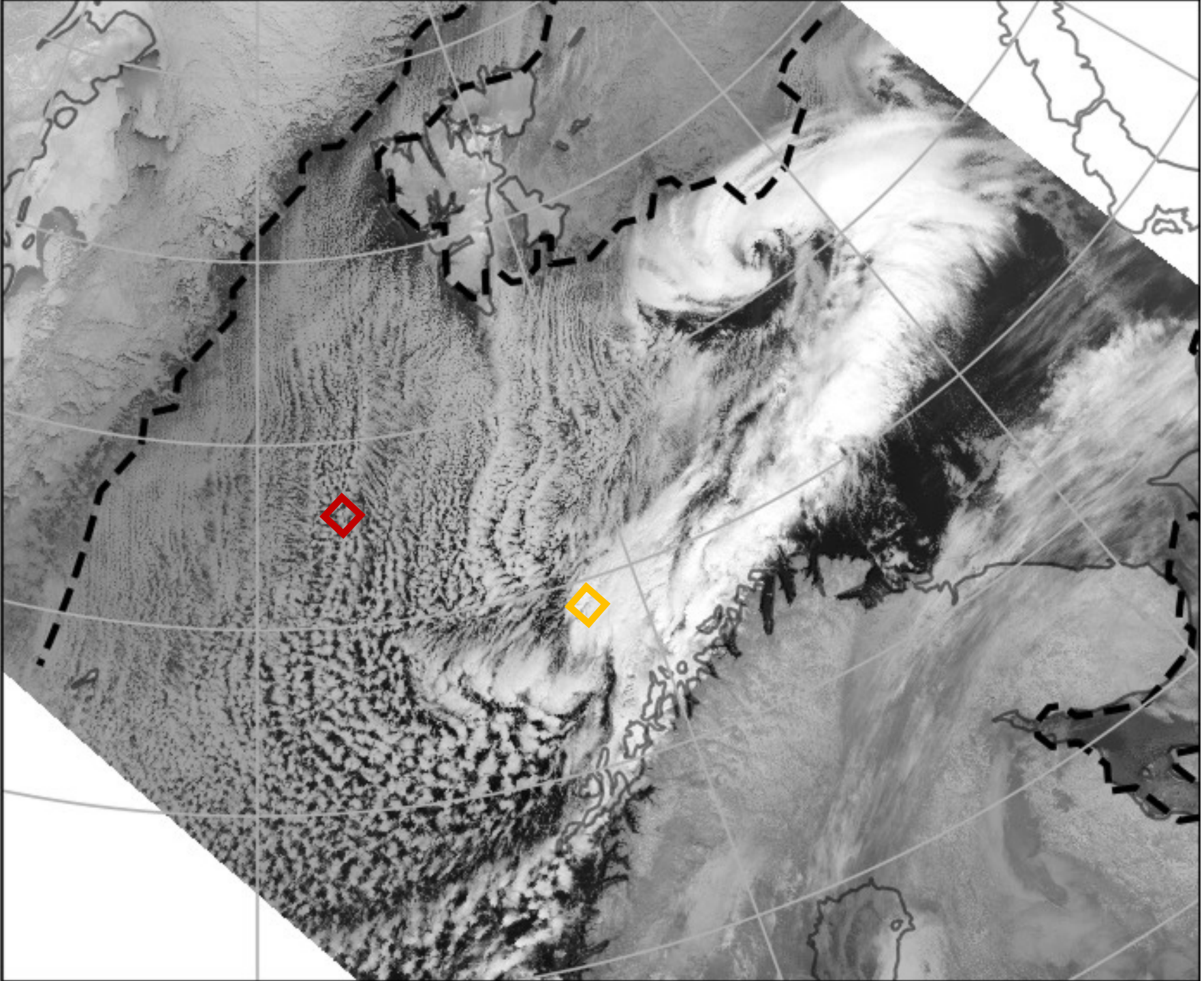
band 31 (10.780–11.280μm)

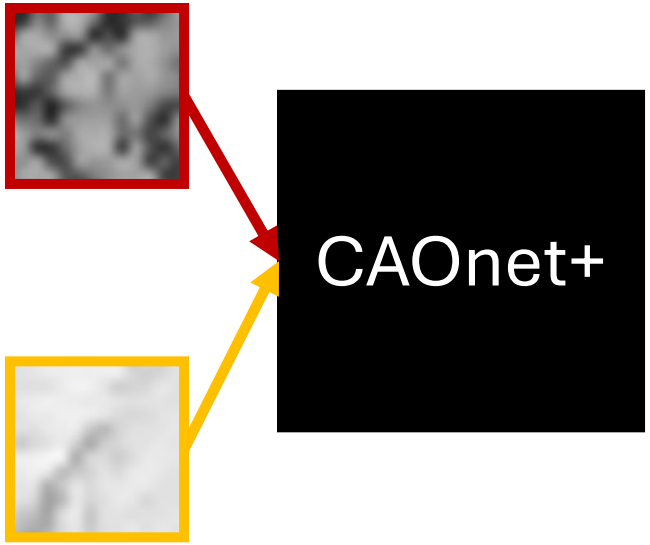


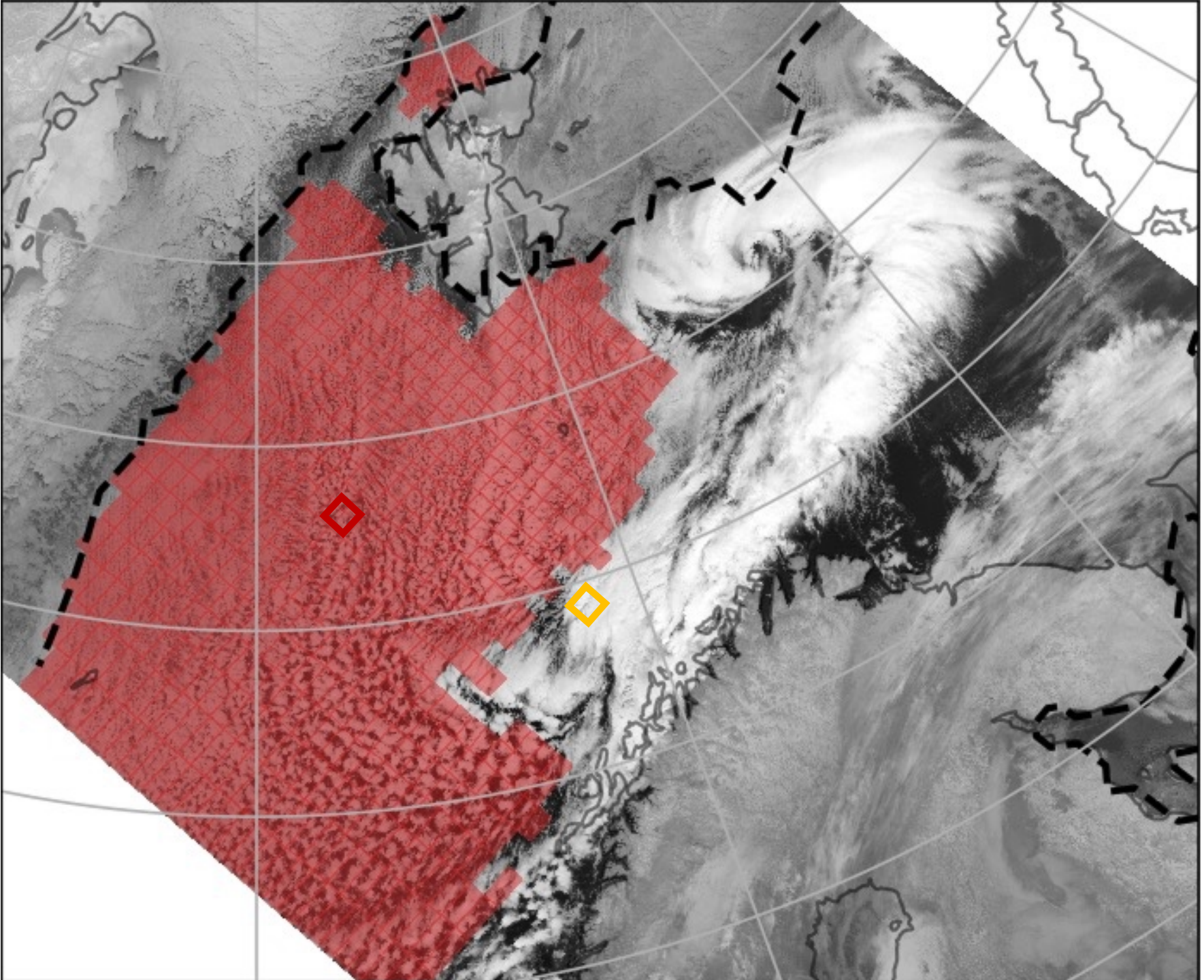
MERRA2
M > 0

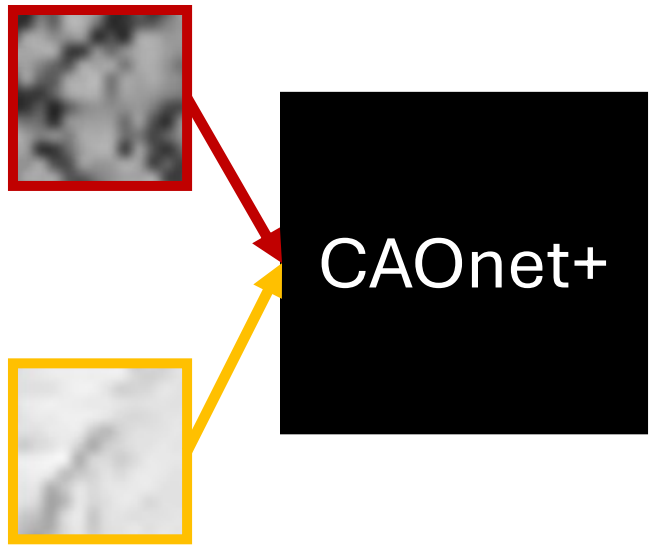


MERRA2
M > 3.75




CAOnet+

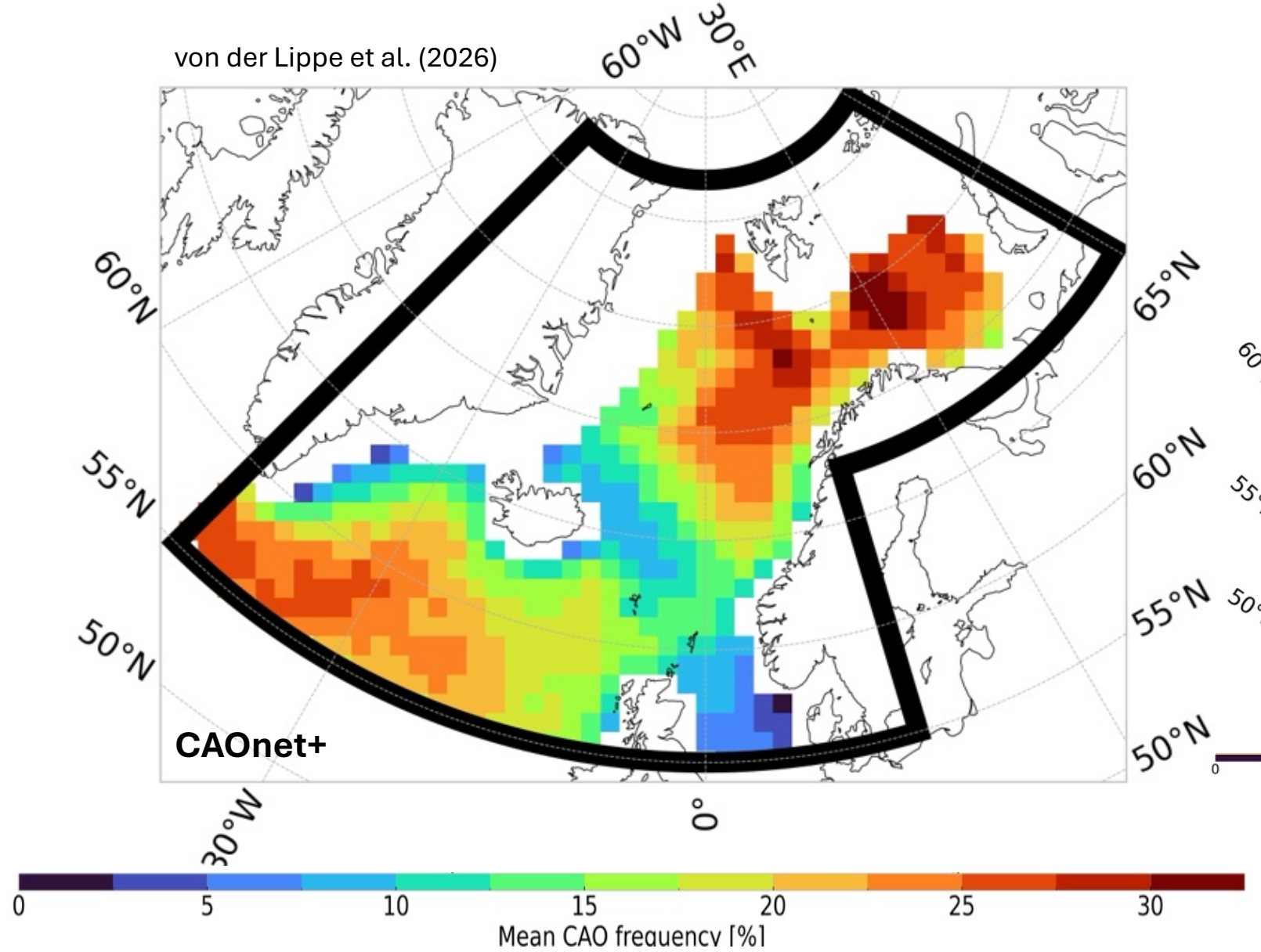


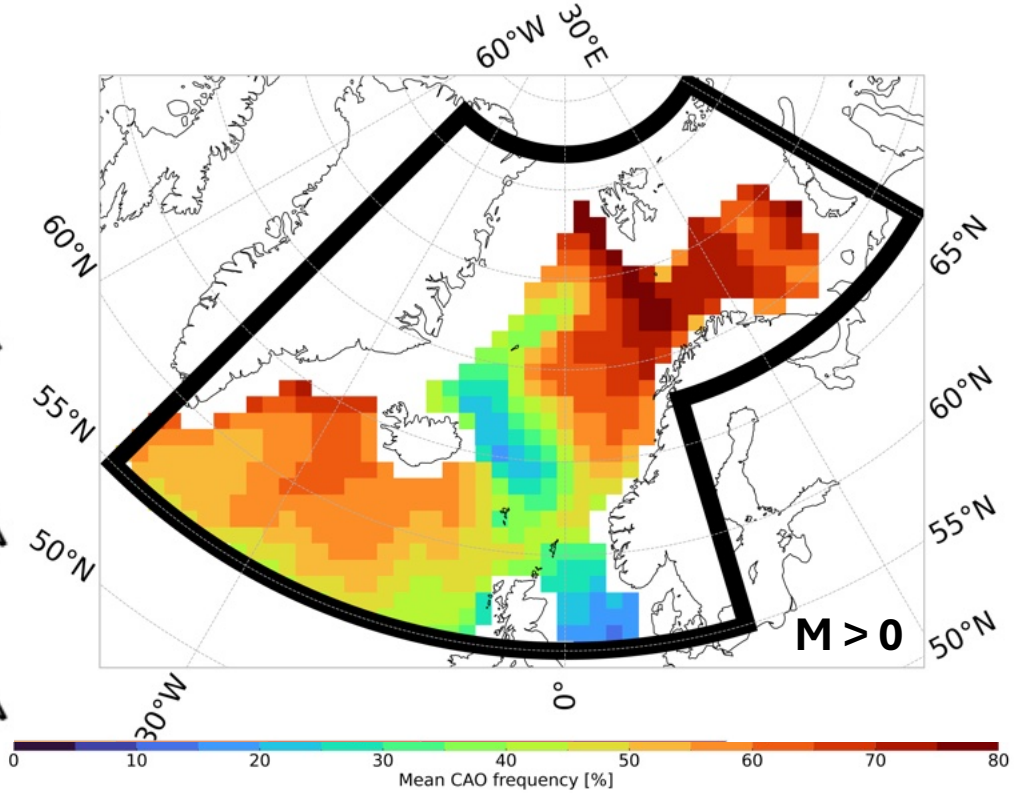


von der Lippe et al. (2026)

Where do CAO clouds occur?

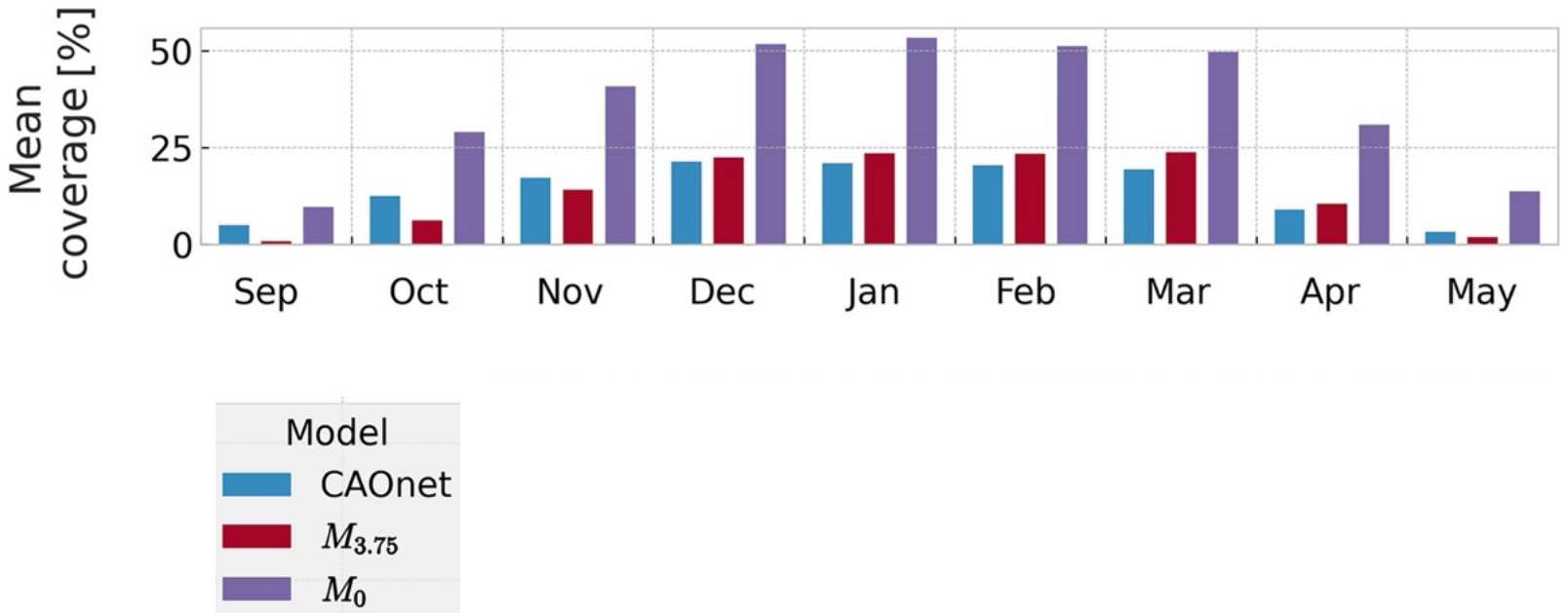
von der Lippe et al. (2026)



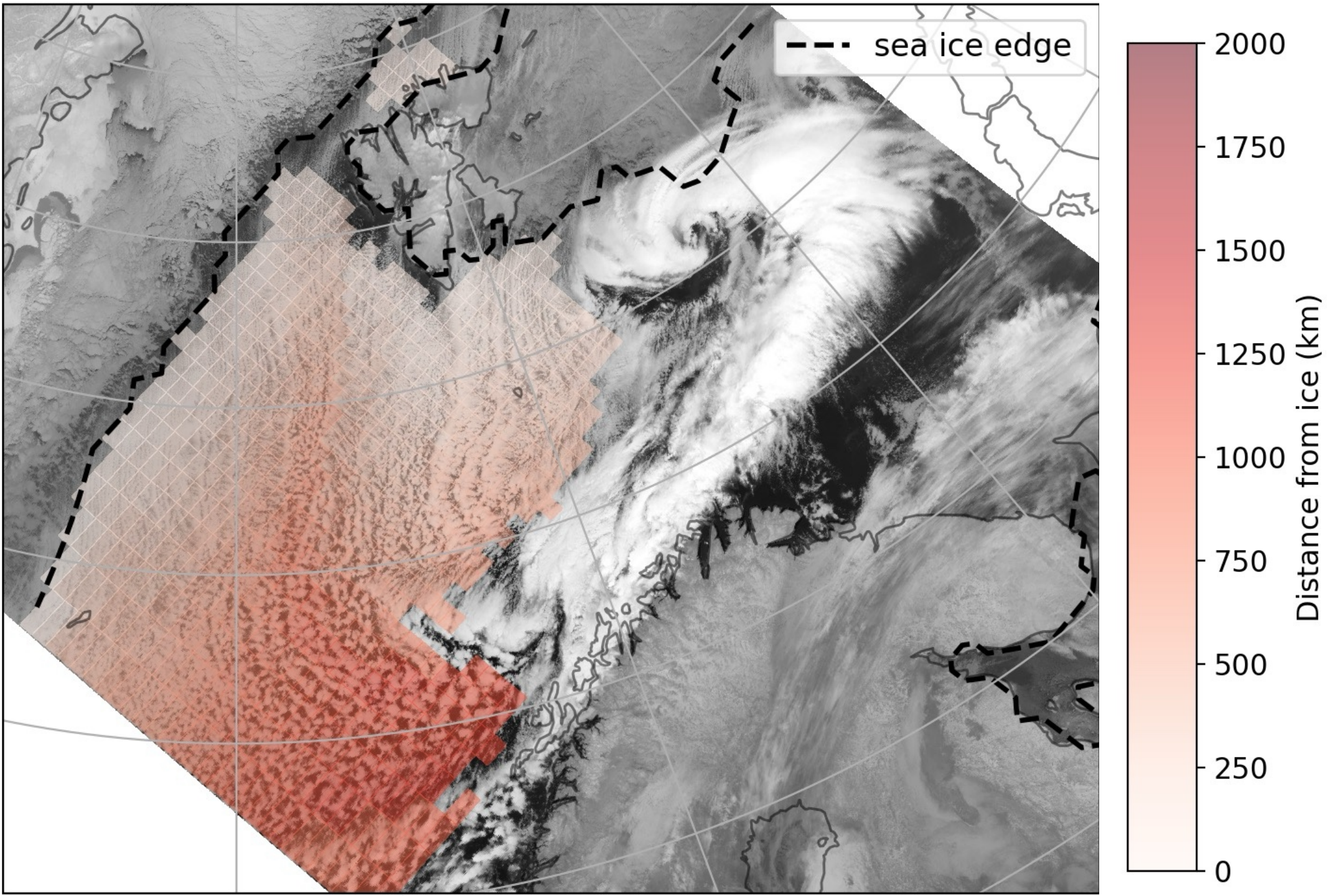


Adapted from Papritz and Spengler (2015)

Is CAO cloud occurence changing?



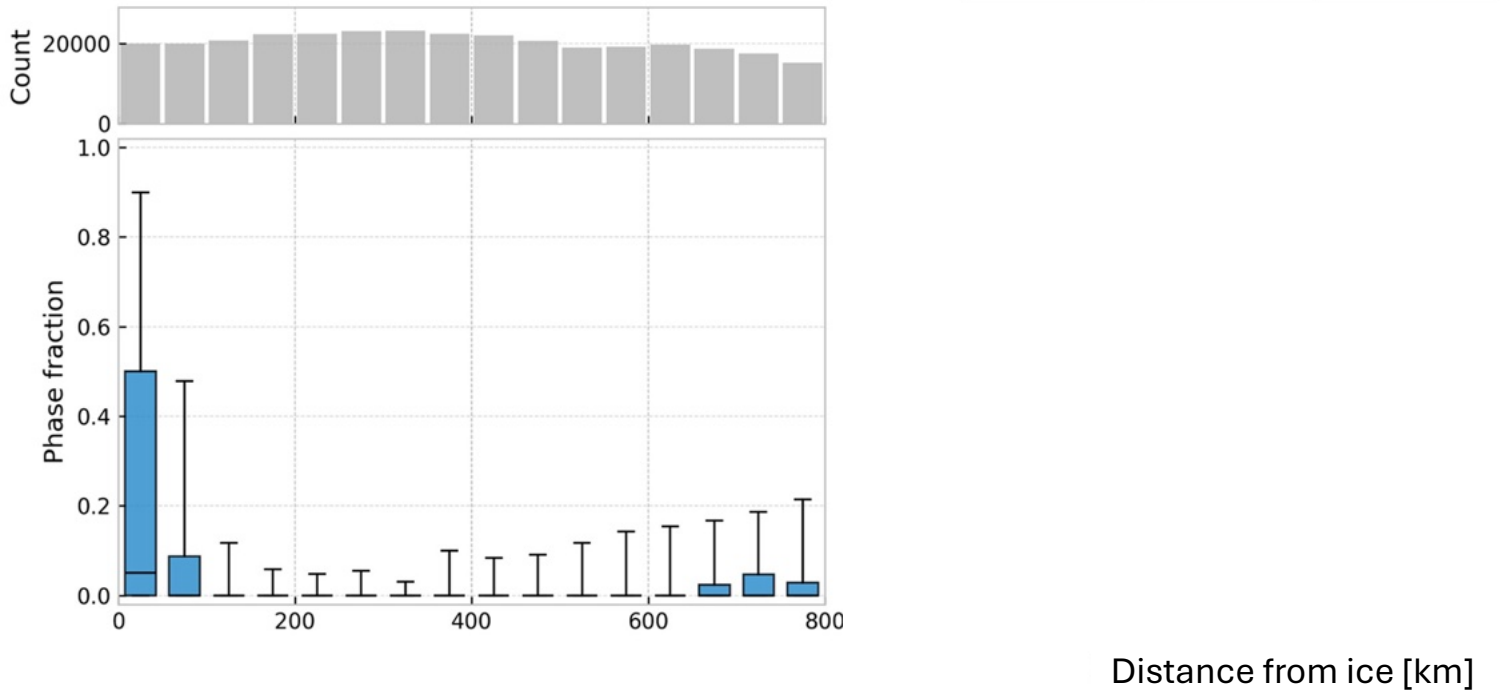
von der Lippe et al. (2026)


sea ice edge

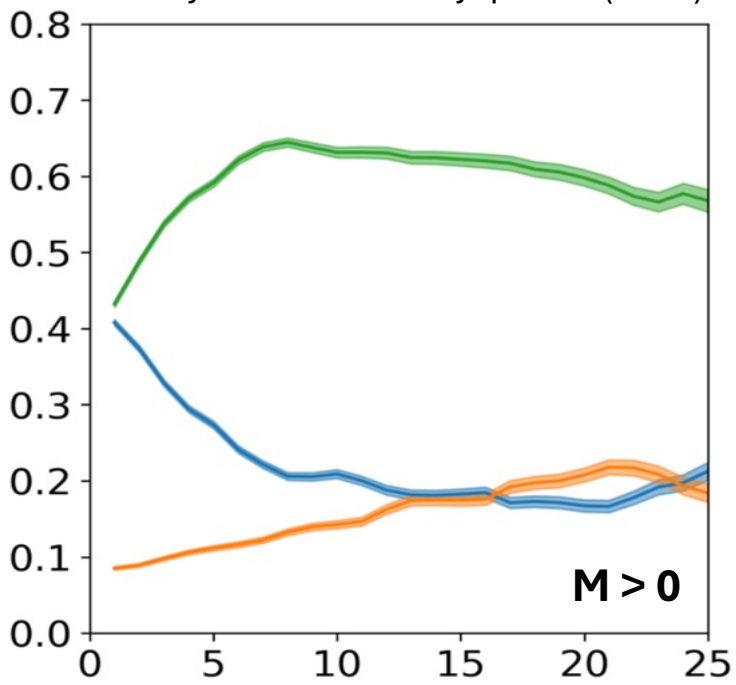
2000
1750
1500
1250
1000
750
500
250
0
Distance from ice (km)

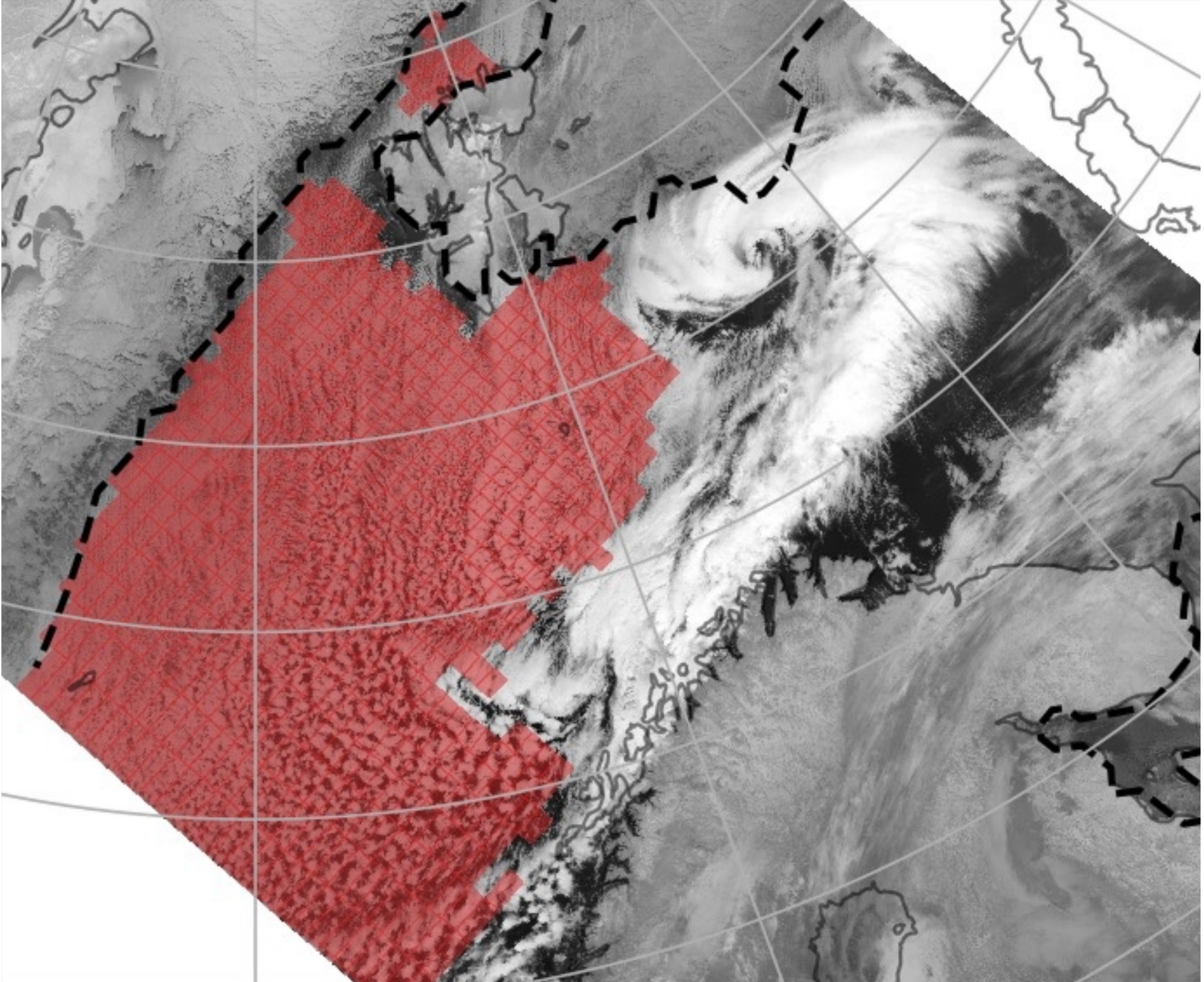
CAO cloud phase from ice edge:

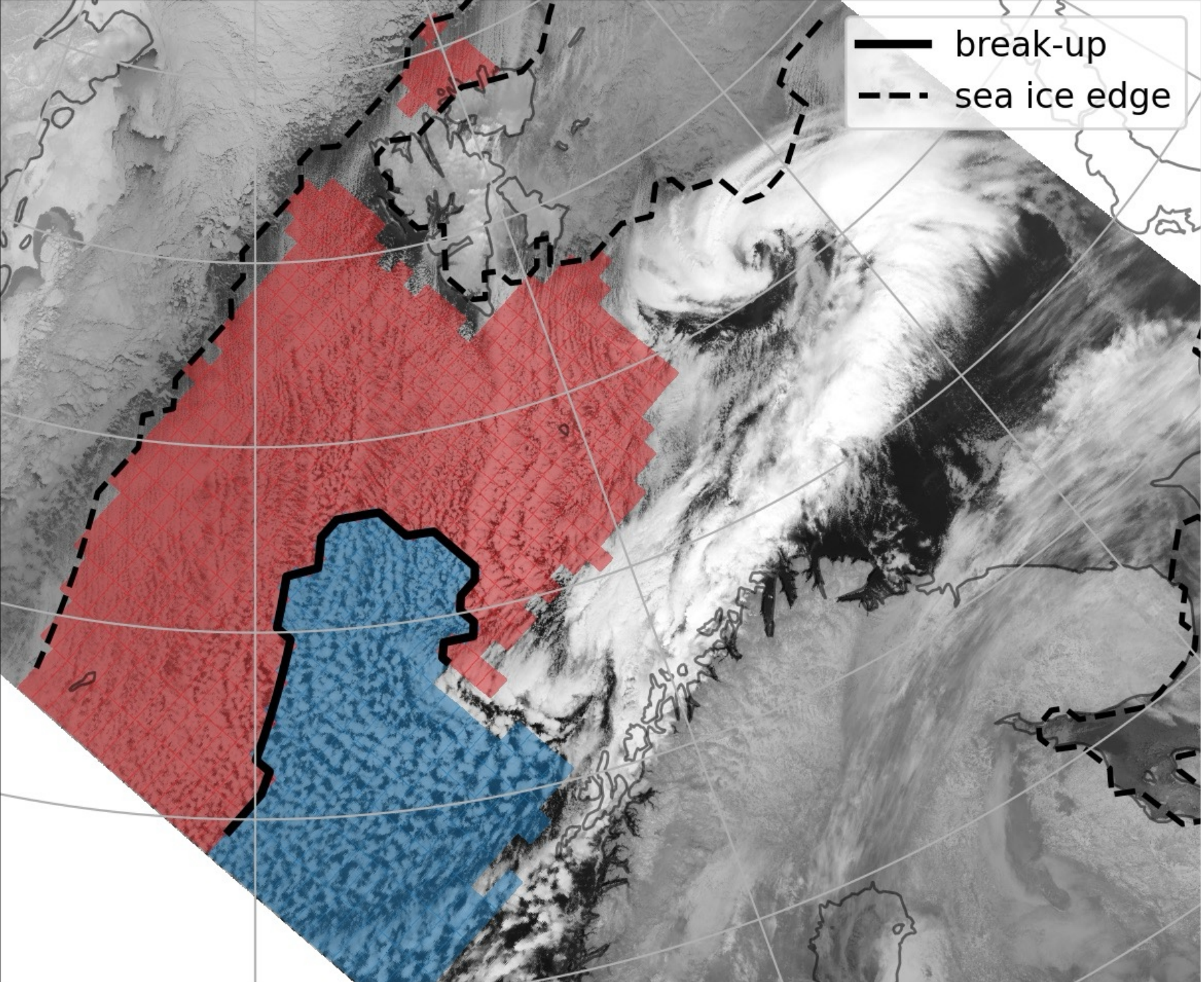
CloudSat and CALIPSO
- 2B-CLDCLASS-LIDAR

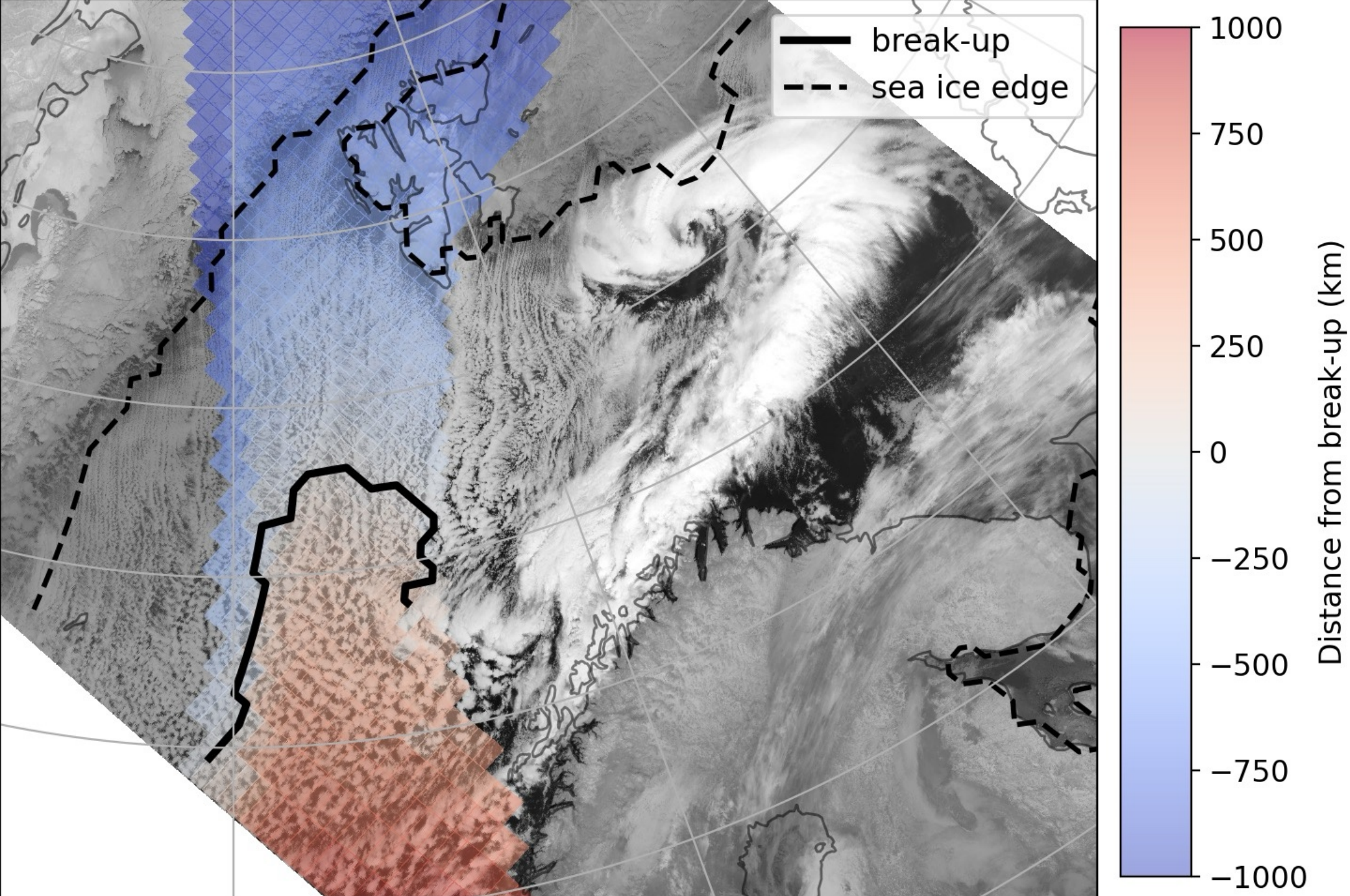


Murray-Watson and Gryspeerdt (2024)



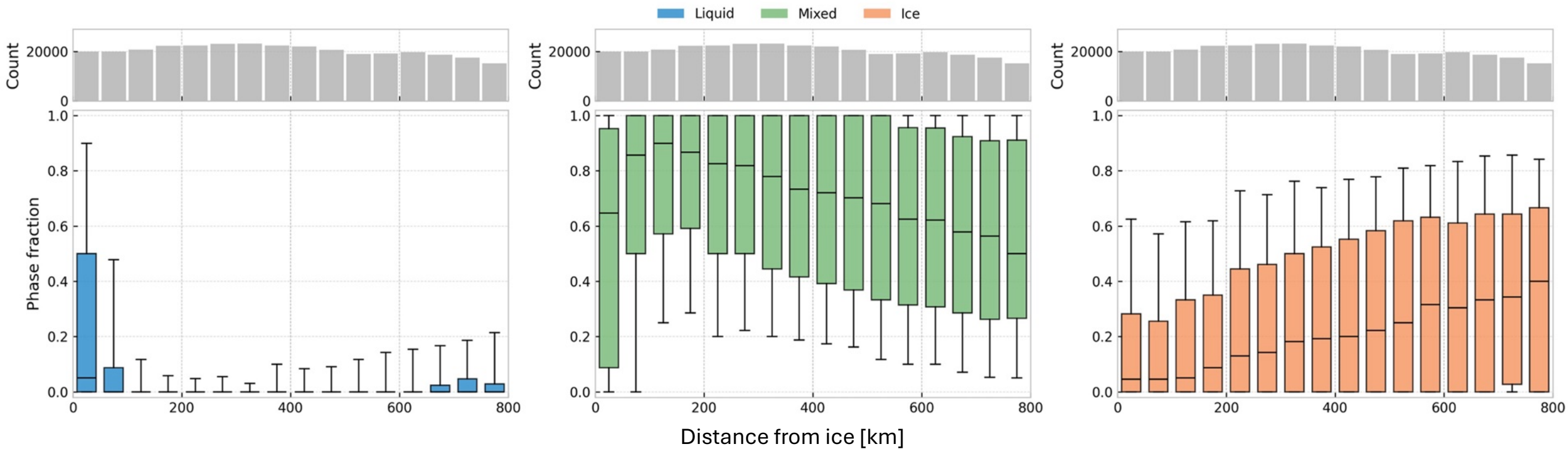



break-up
sea ice edge


break-up
sea ice edge

1000
750
500
250
0
−250
−500
−750
−1000
Distance from break-up (km)

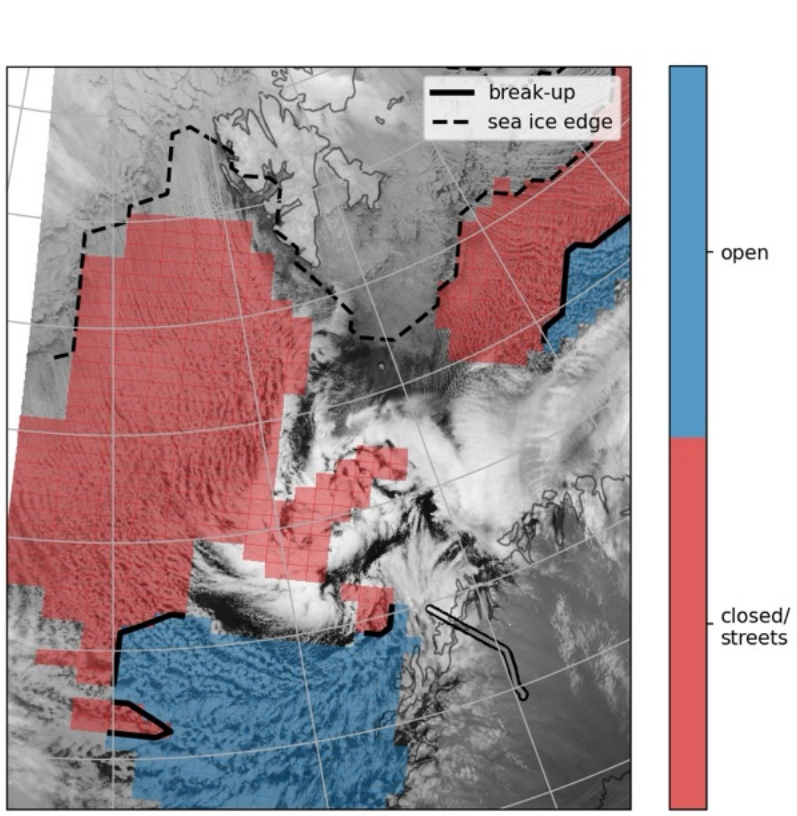
CAO cloud phase from break-up:



Cloud phase is changing near break-up but why?

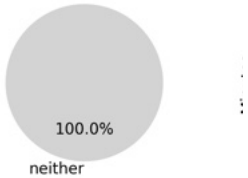
von der Lippe et al. (in prep)

Tagging recent airborne observations

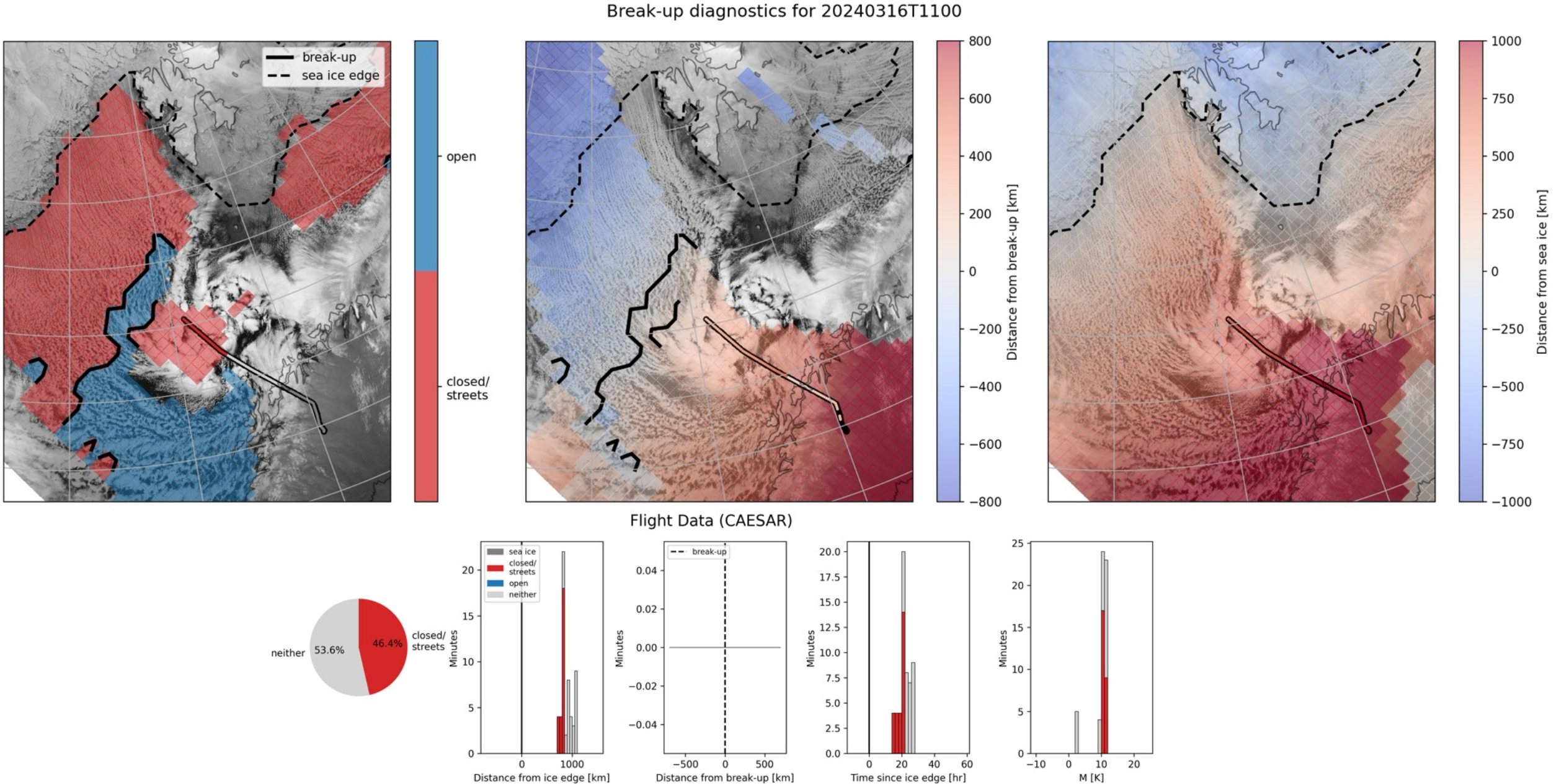


Break-up diagnostics for 20240316T1000

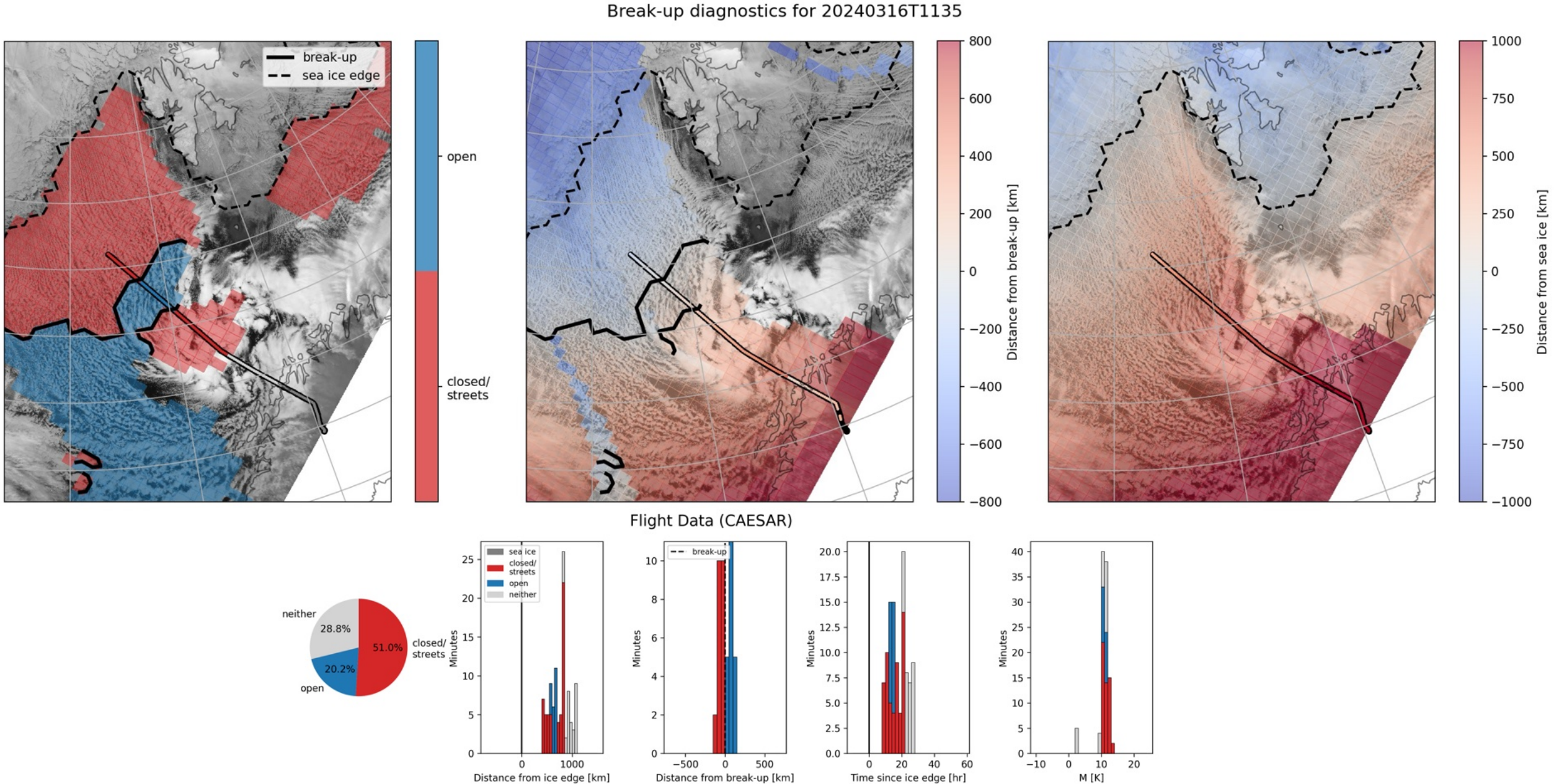
Flight Data (CAESAR)



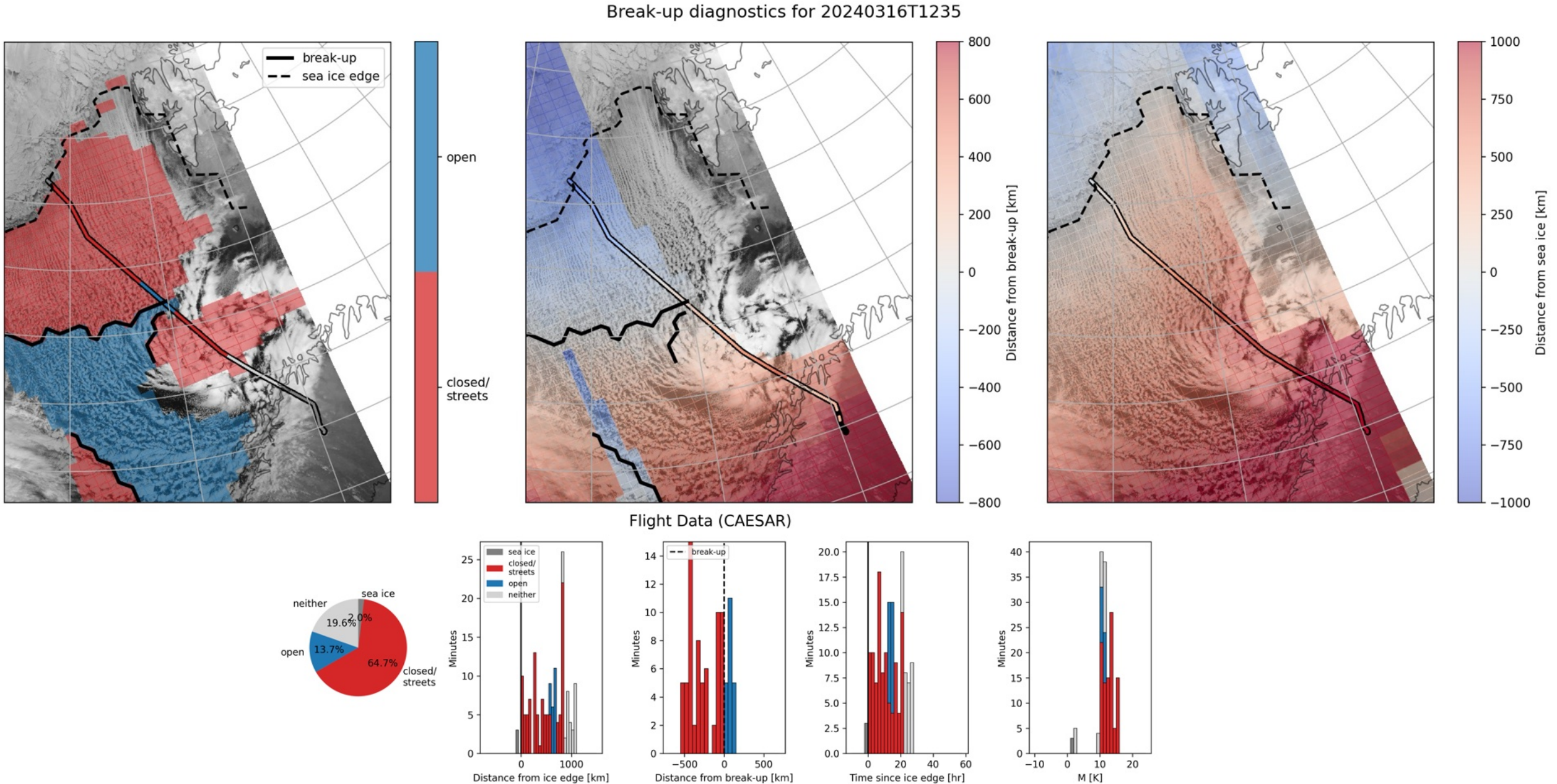
Tagging recent airborne observations



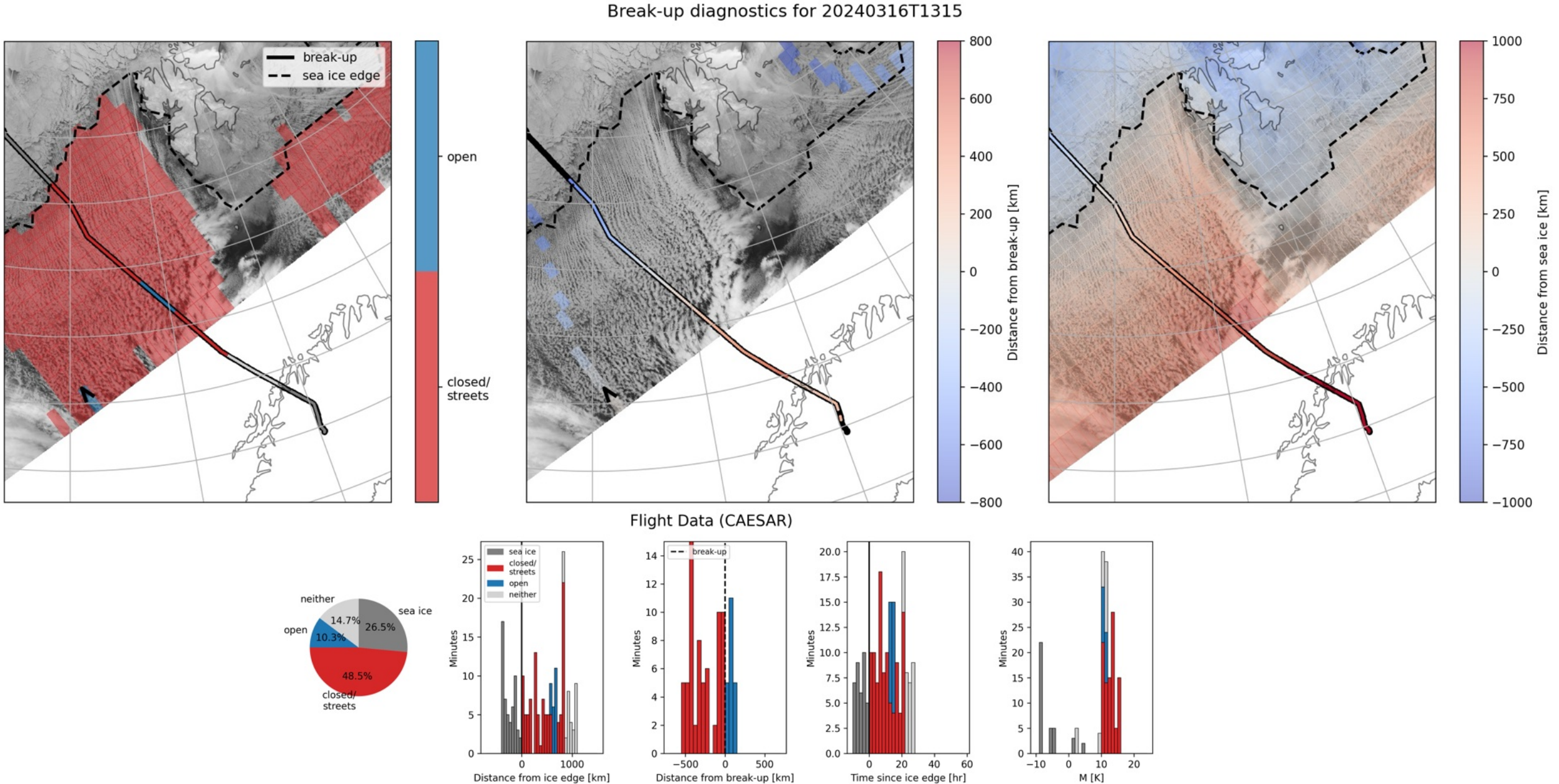
Tagging recent airborne observations



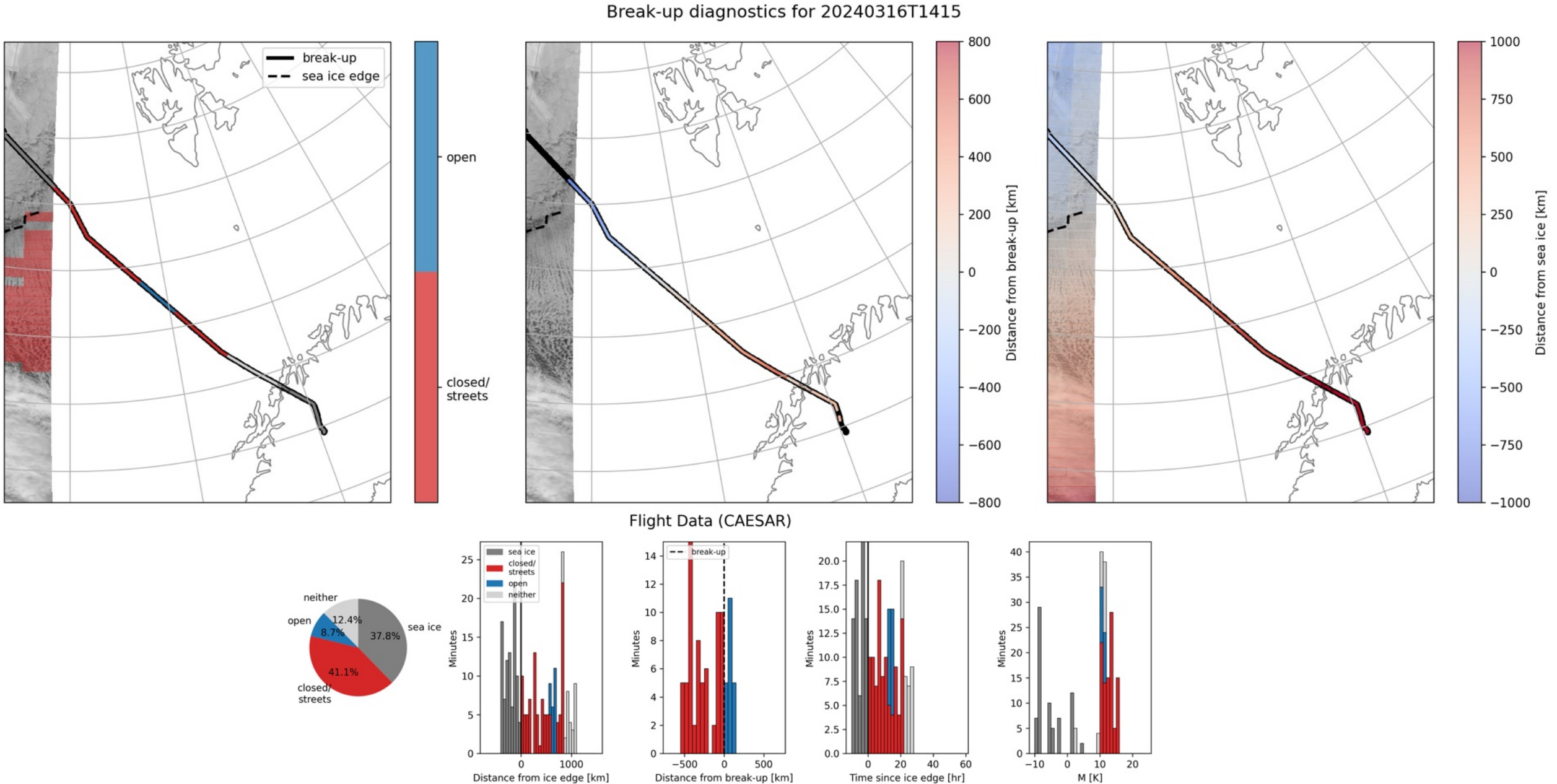
Tagging recent airborne observations



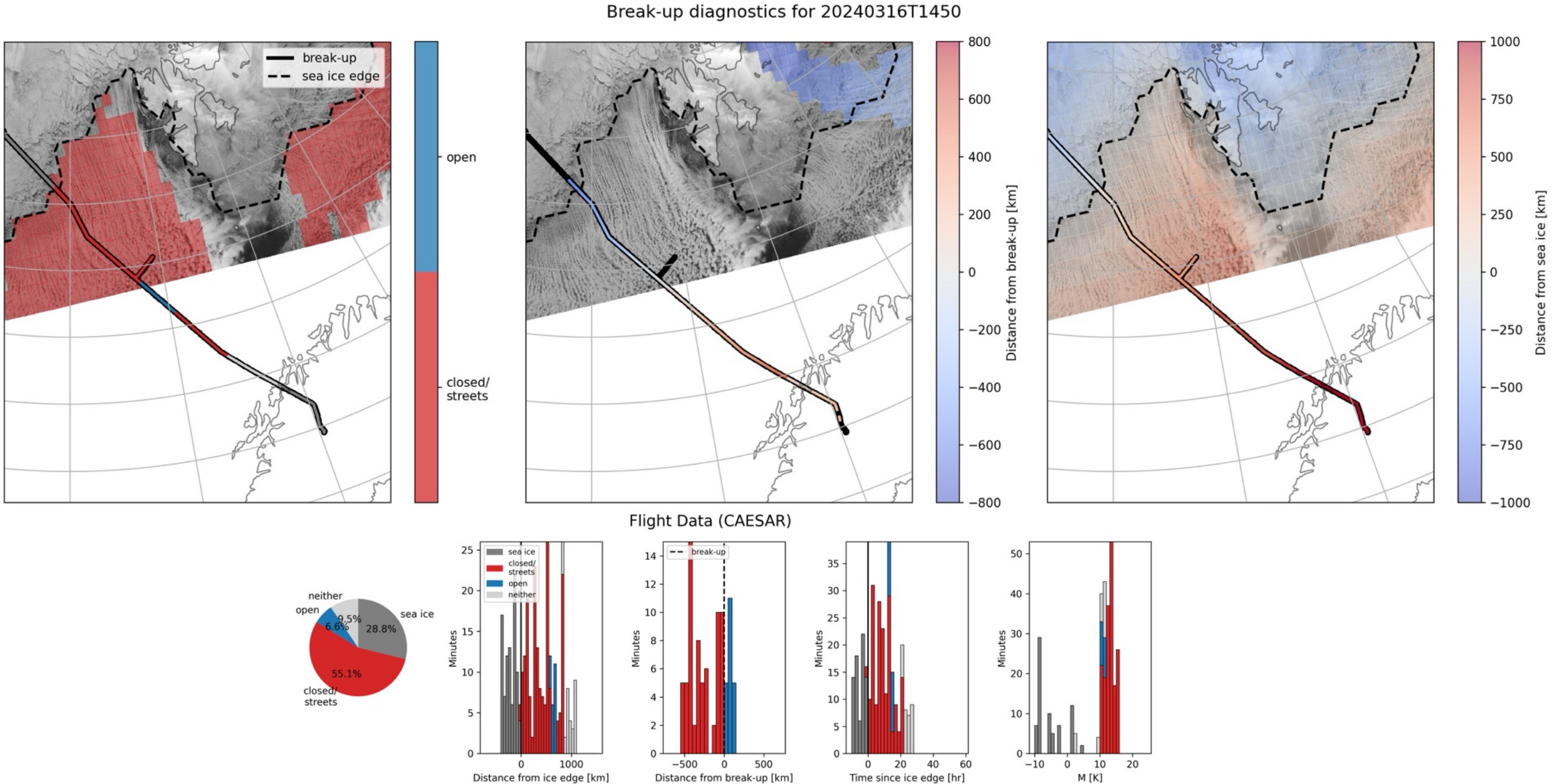
Tagging recent airborne observations



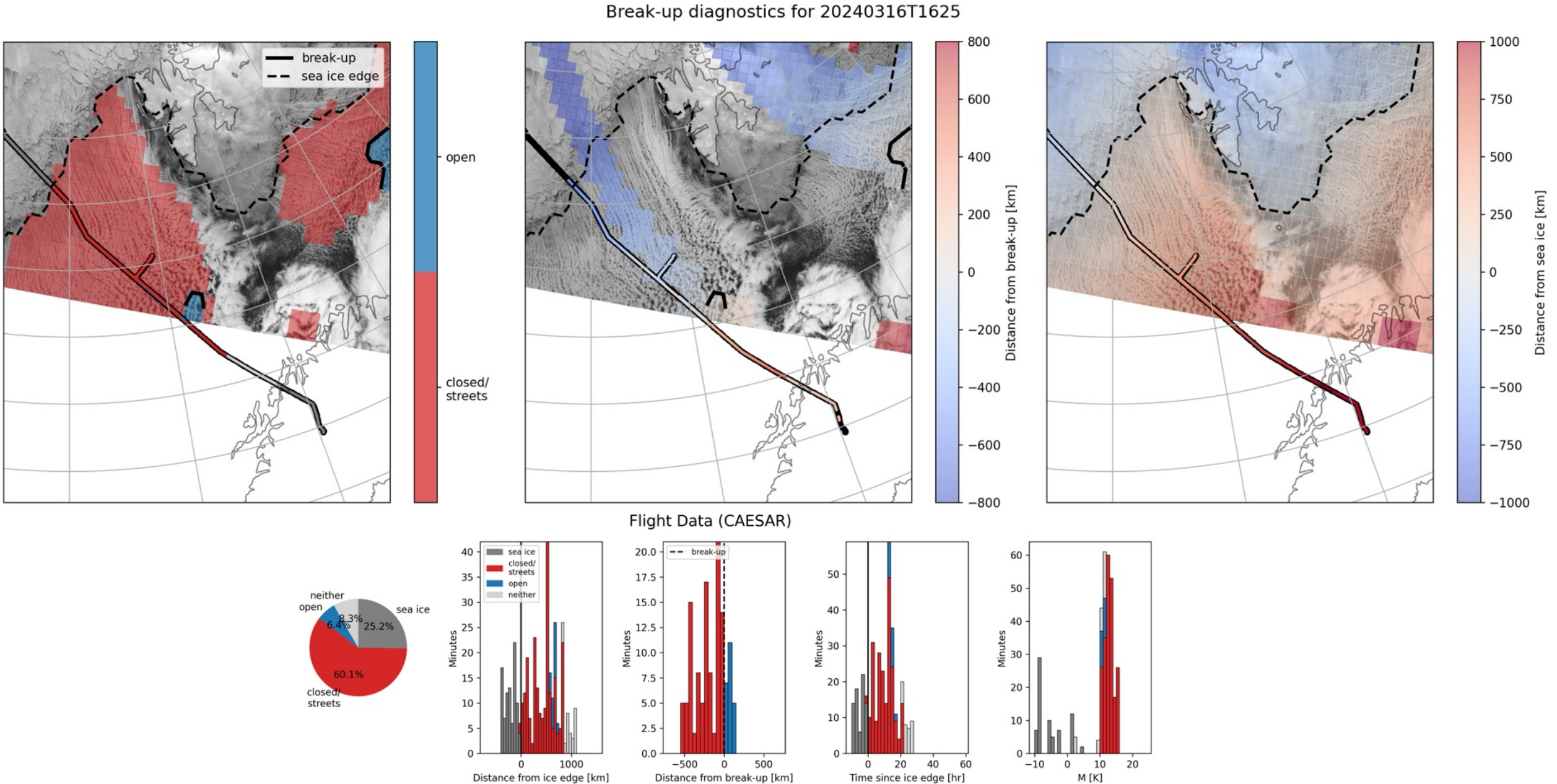
Tagging recent airborne observations



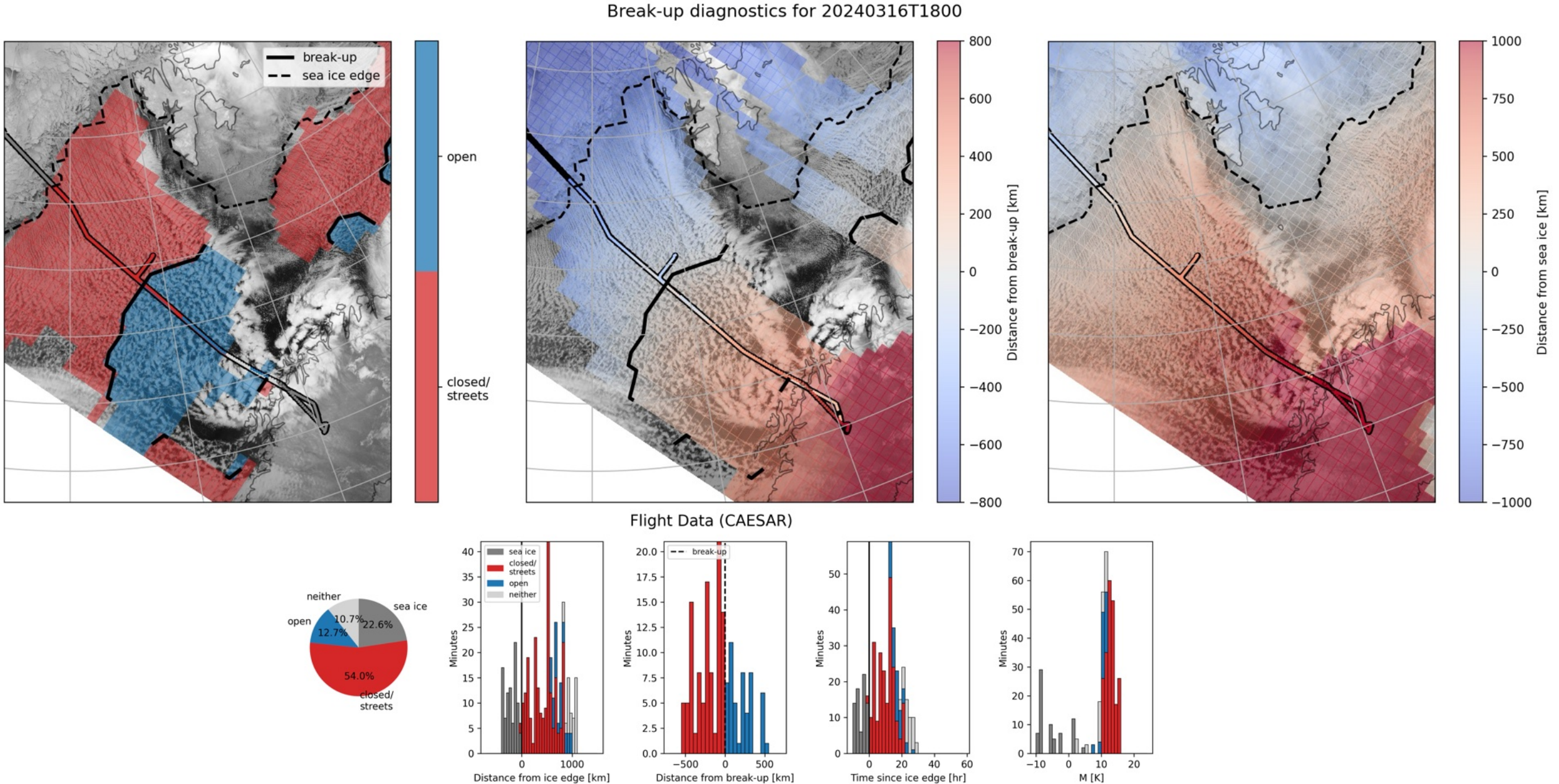
Tagging recent airborne observations



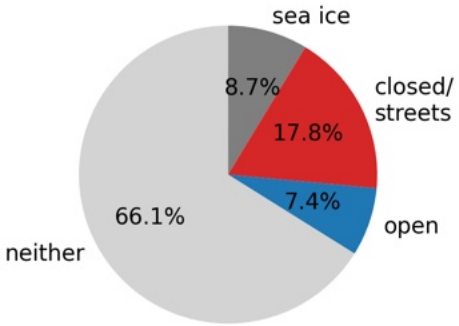
Tagging recent airborne observations



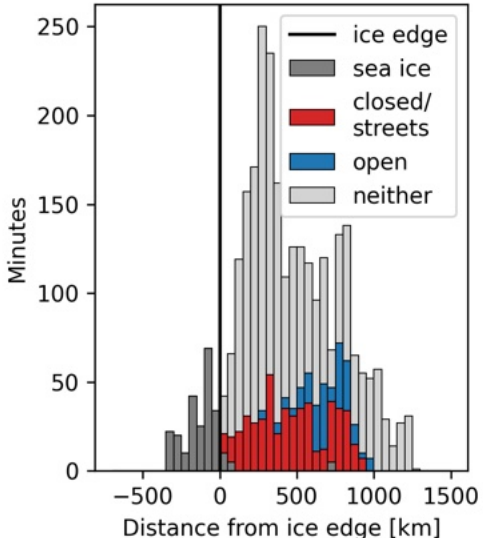
Tagging recent airborne observations

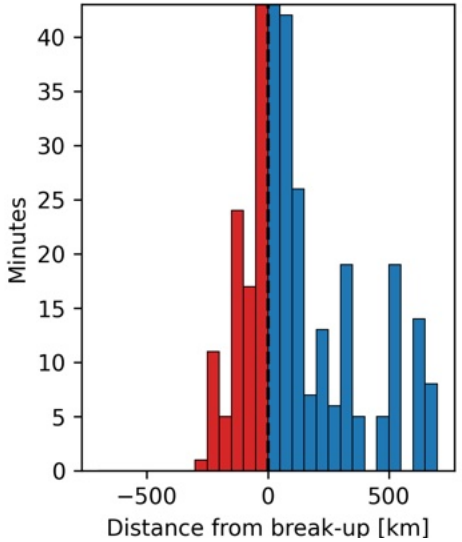


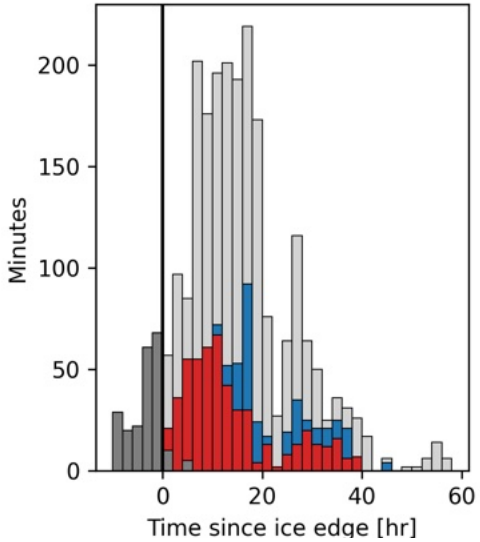
Tagging recent airborne observations

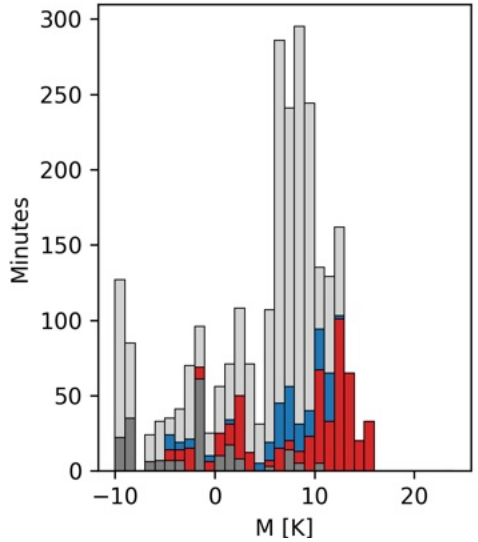


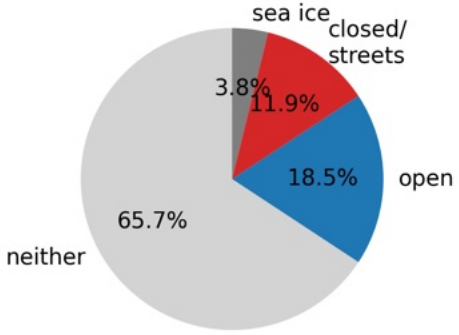
Flight Data (CAESAR)



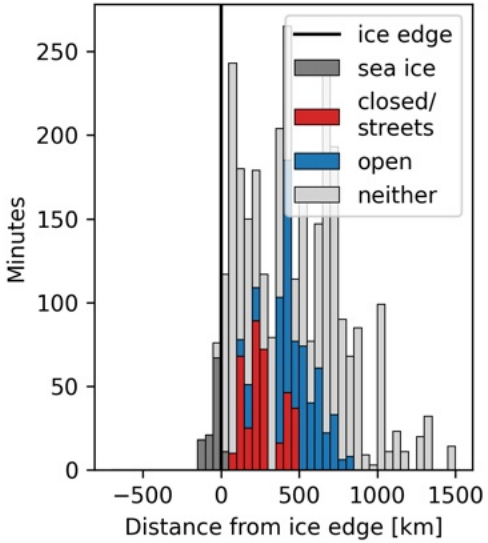


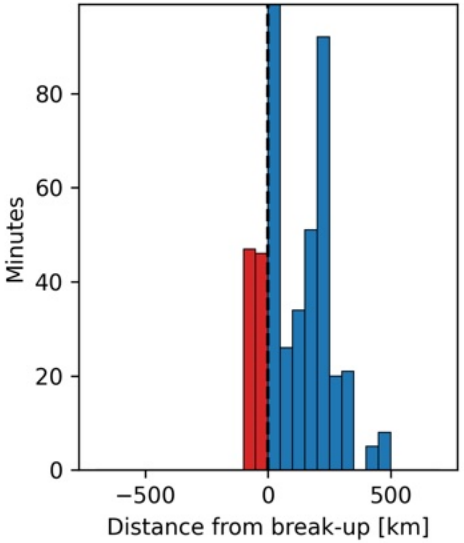


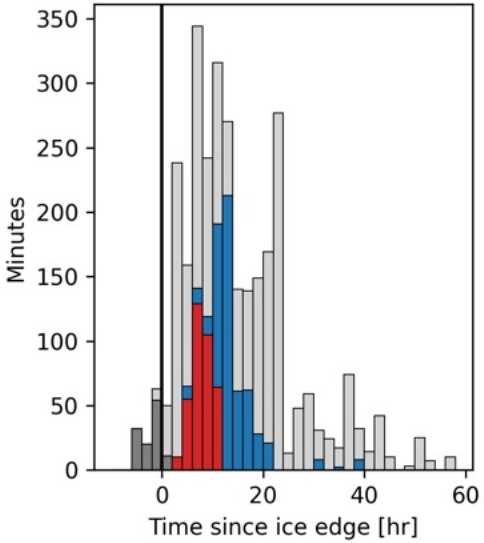


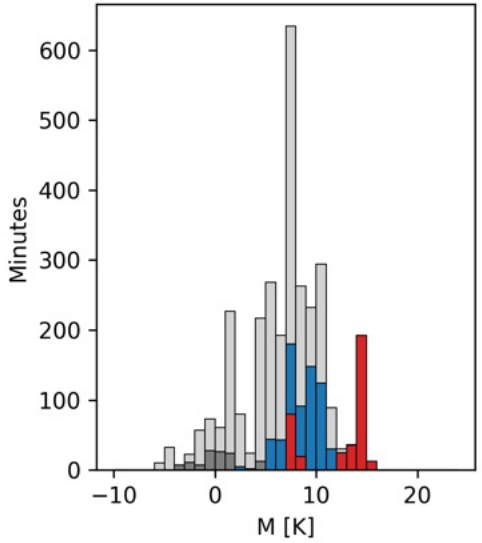


Flight Data (ISLAS)



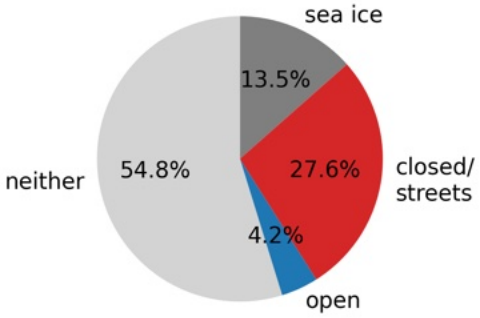


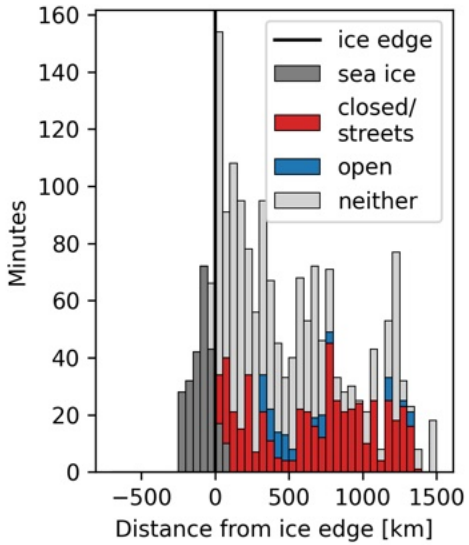


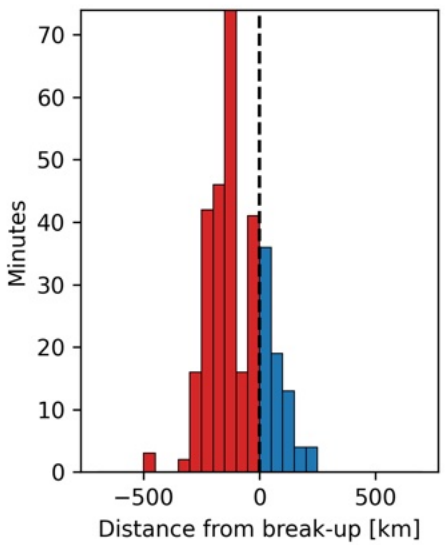


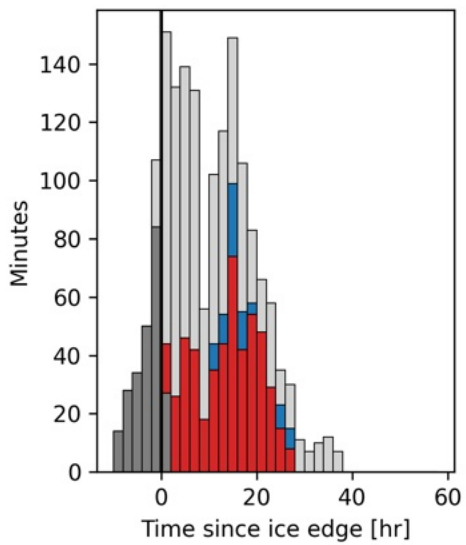
Tagging recent airborne observations

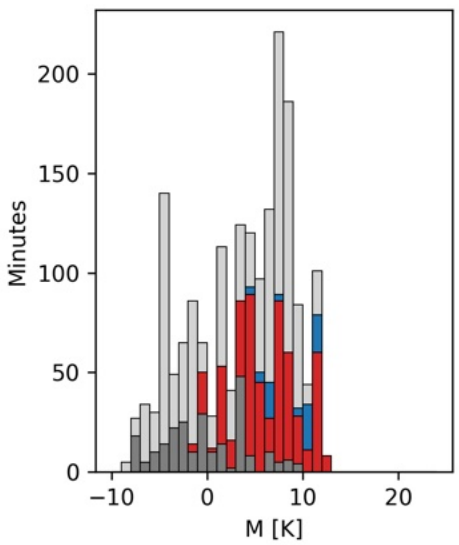
Flight Data (ACAO)



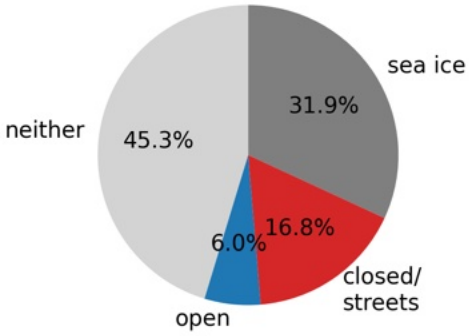


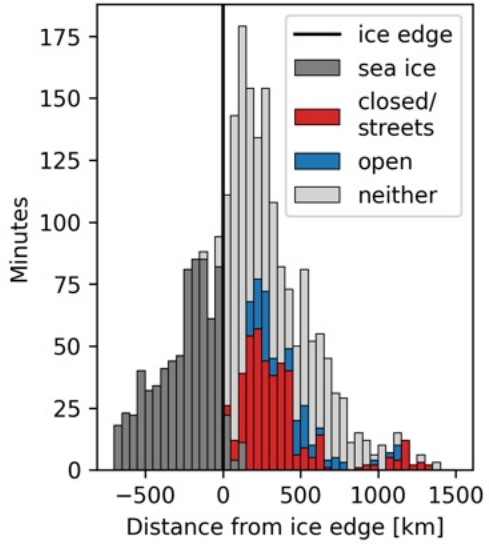


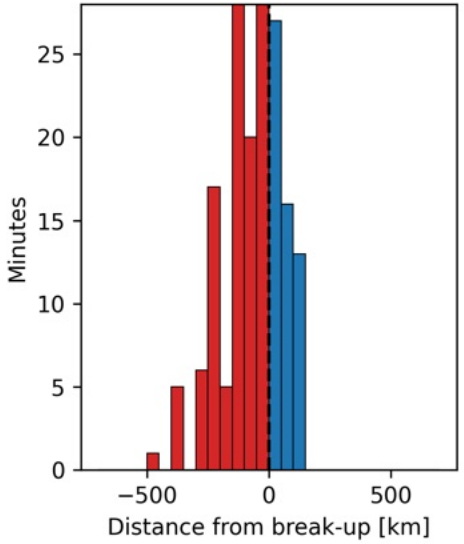


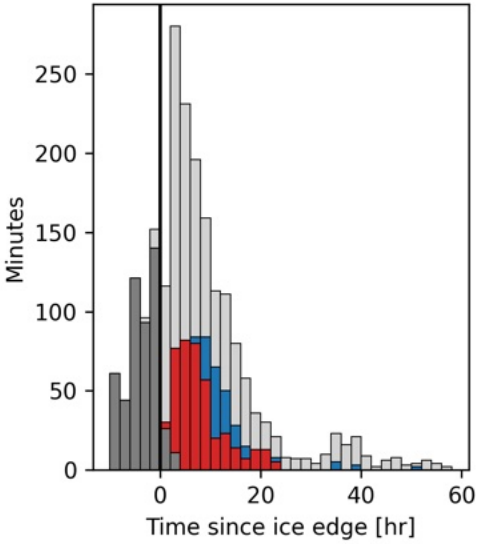


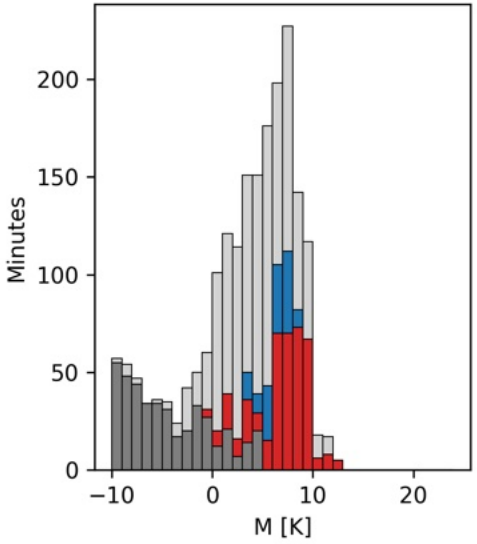
Flight Data (HALO-AC3)



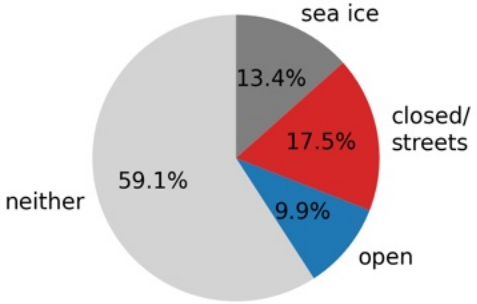




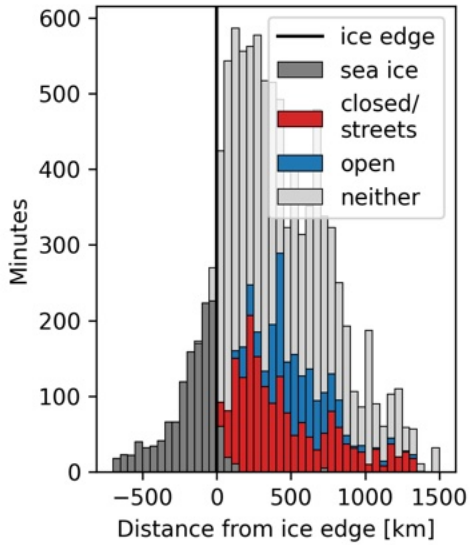


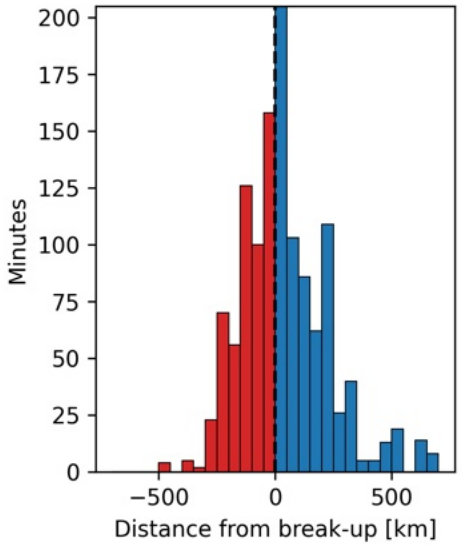


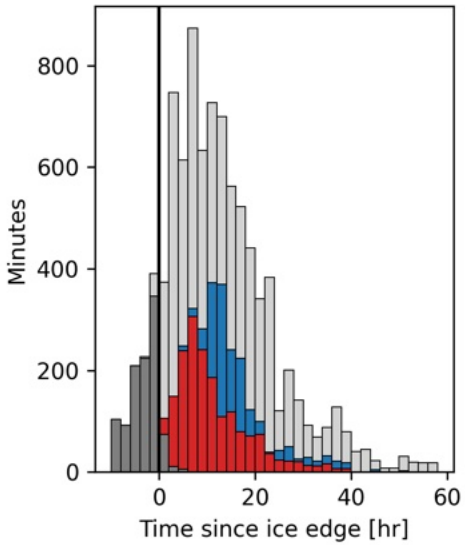
Tagging recent airborne observations

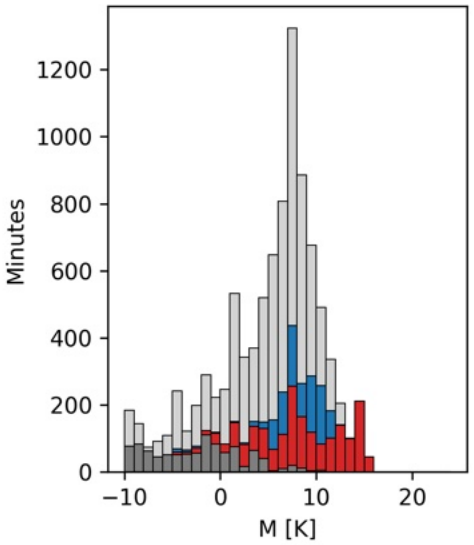


Flight Data (all flights)

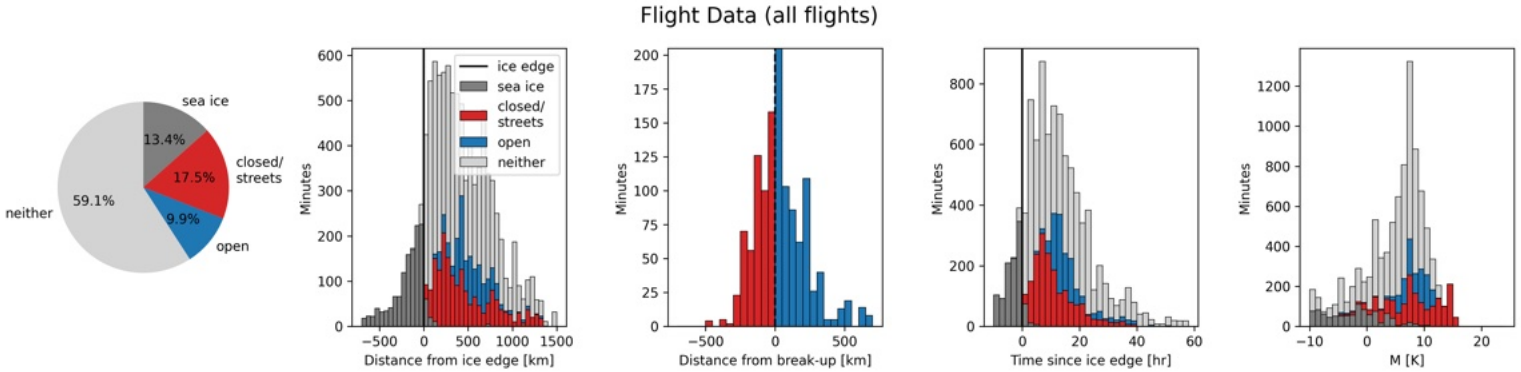








Tagging recent airborne observations



So what's next?

- Composite in-situ measurements e.g. see Tim's talk?
- Aggregate dropsondes e.g. do better than reanalysis?
- Use airborne remote sensing e.g. improve blind zone?
- Tag simulated OLR to improve/understand break-up?