

Arctic Lightning in the hottest years on record

GLM meeting Nov 2023

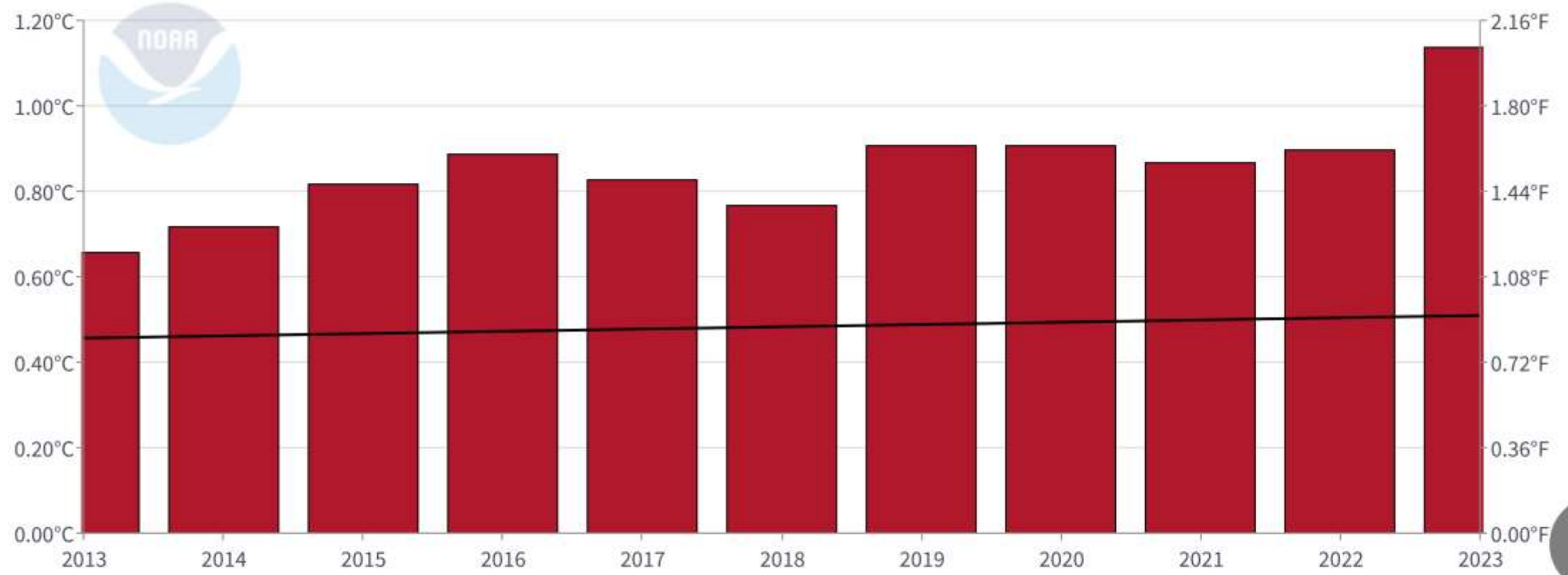
Robert Holzworth and the WWLLN team

Plot

GLOBAL Land and ocean Temperature anomaly for JJA

Global Land and Ocean
June-August Temperature Anomalies

1850-2023 Trend
(+0.53°C/Century)



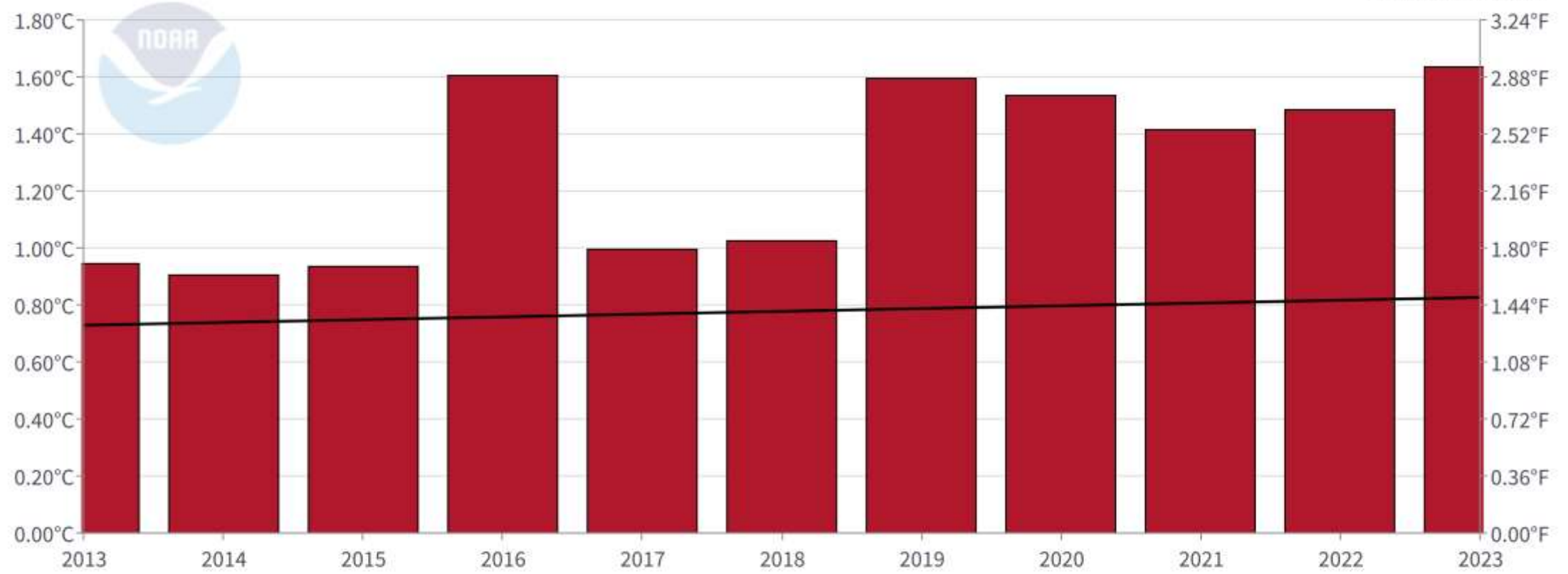
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Arctic

June-August Temperature Anomalies

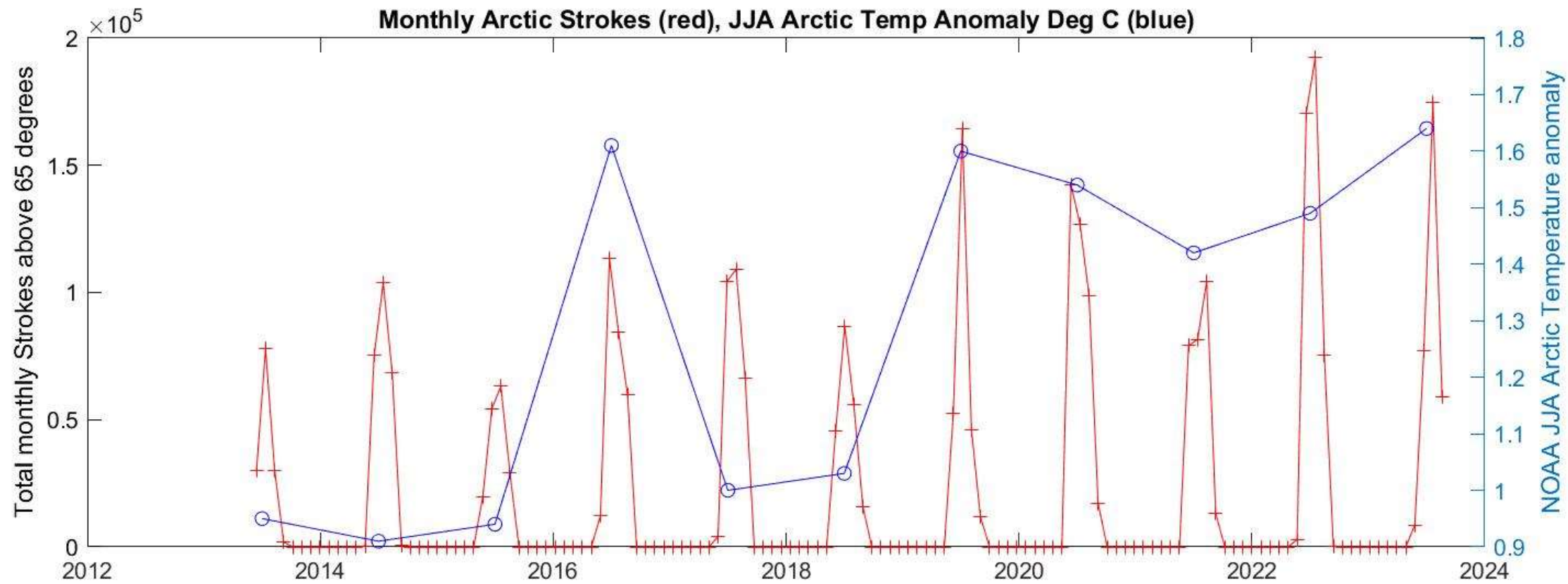
Arctic Temperature Anomaly for JJA

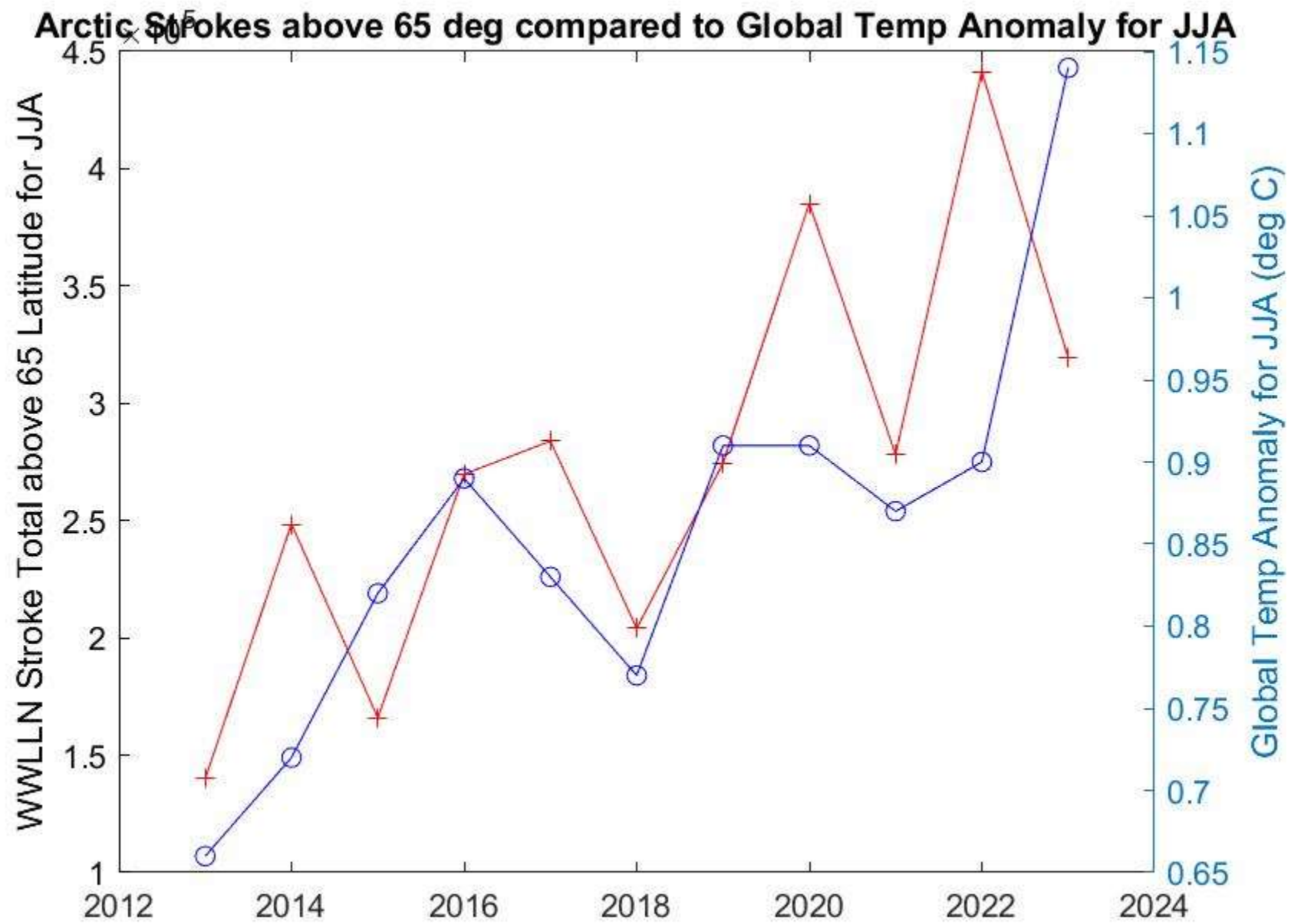
— 1850-2023 Trend (+0.97°C/Century)

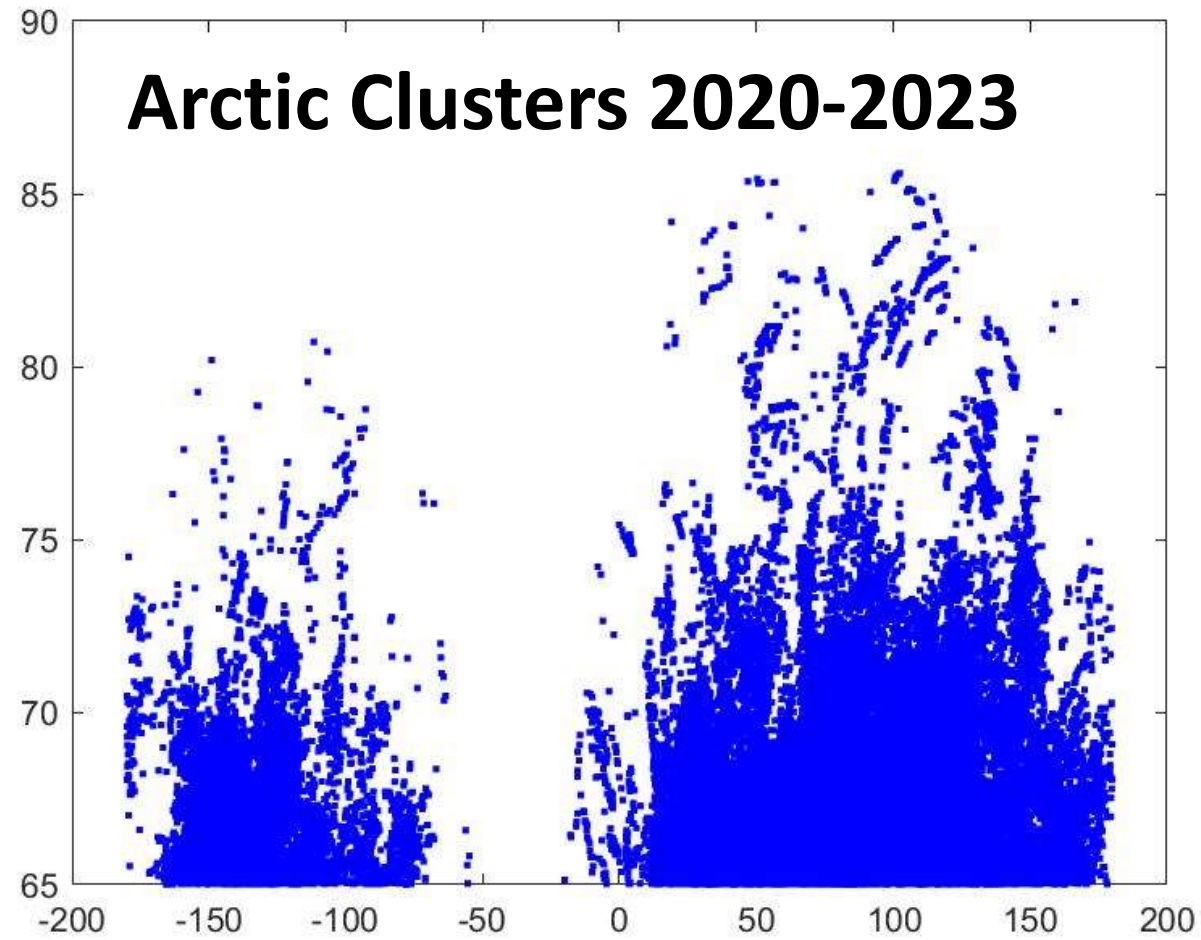
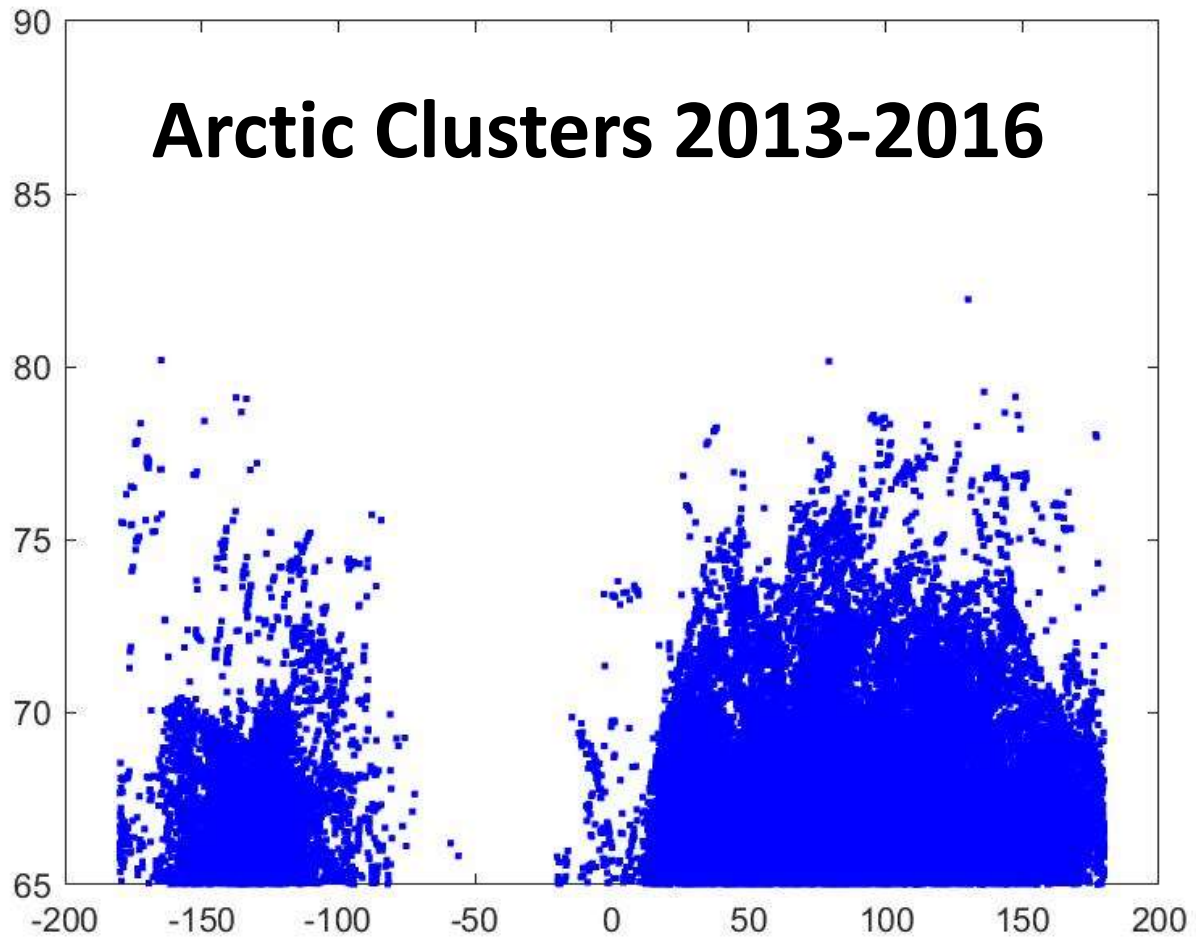


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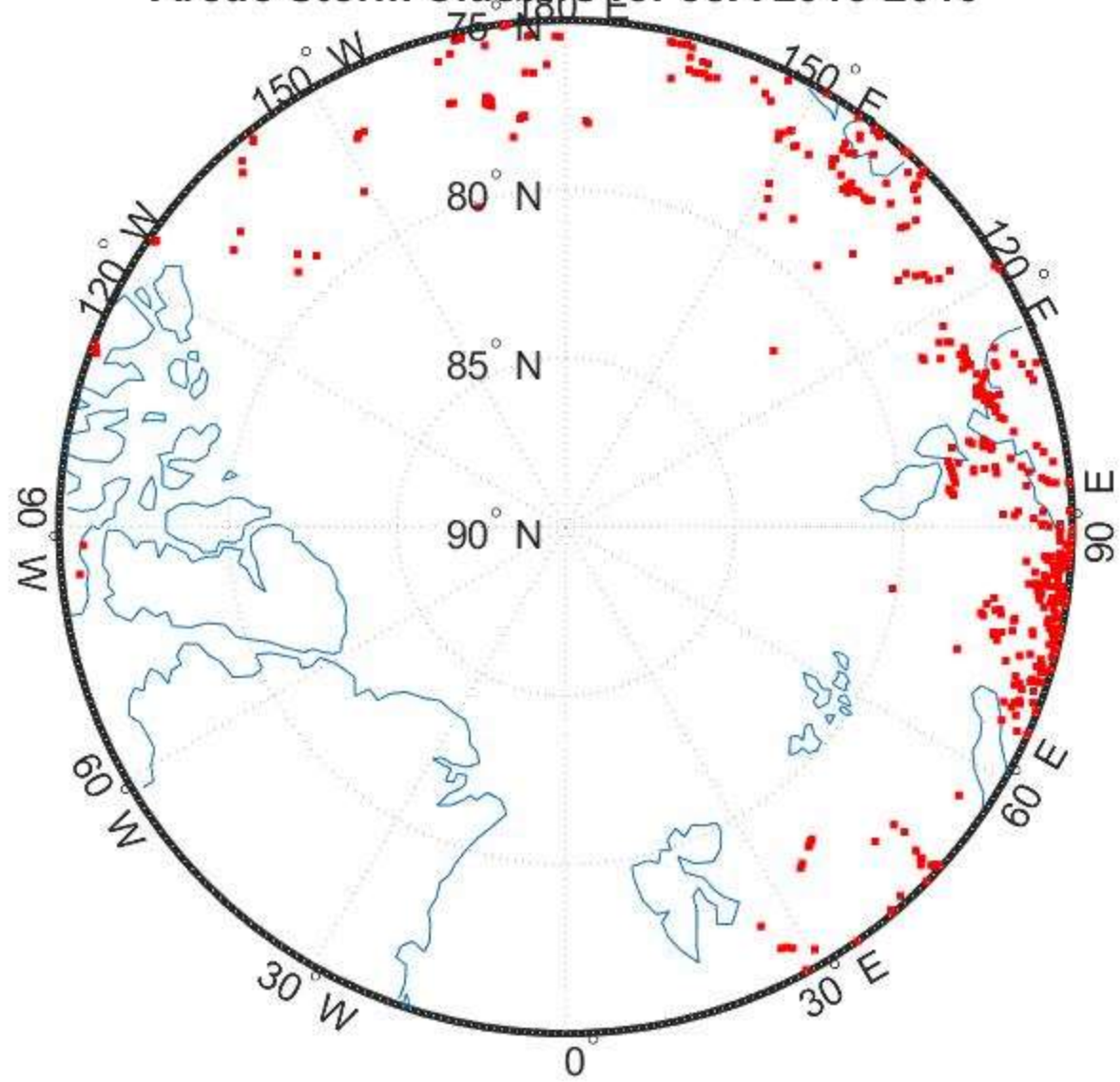
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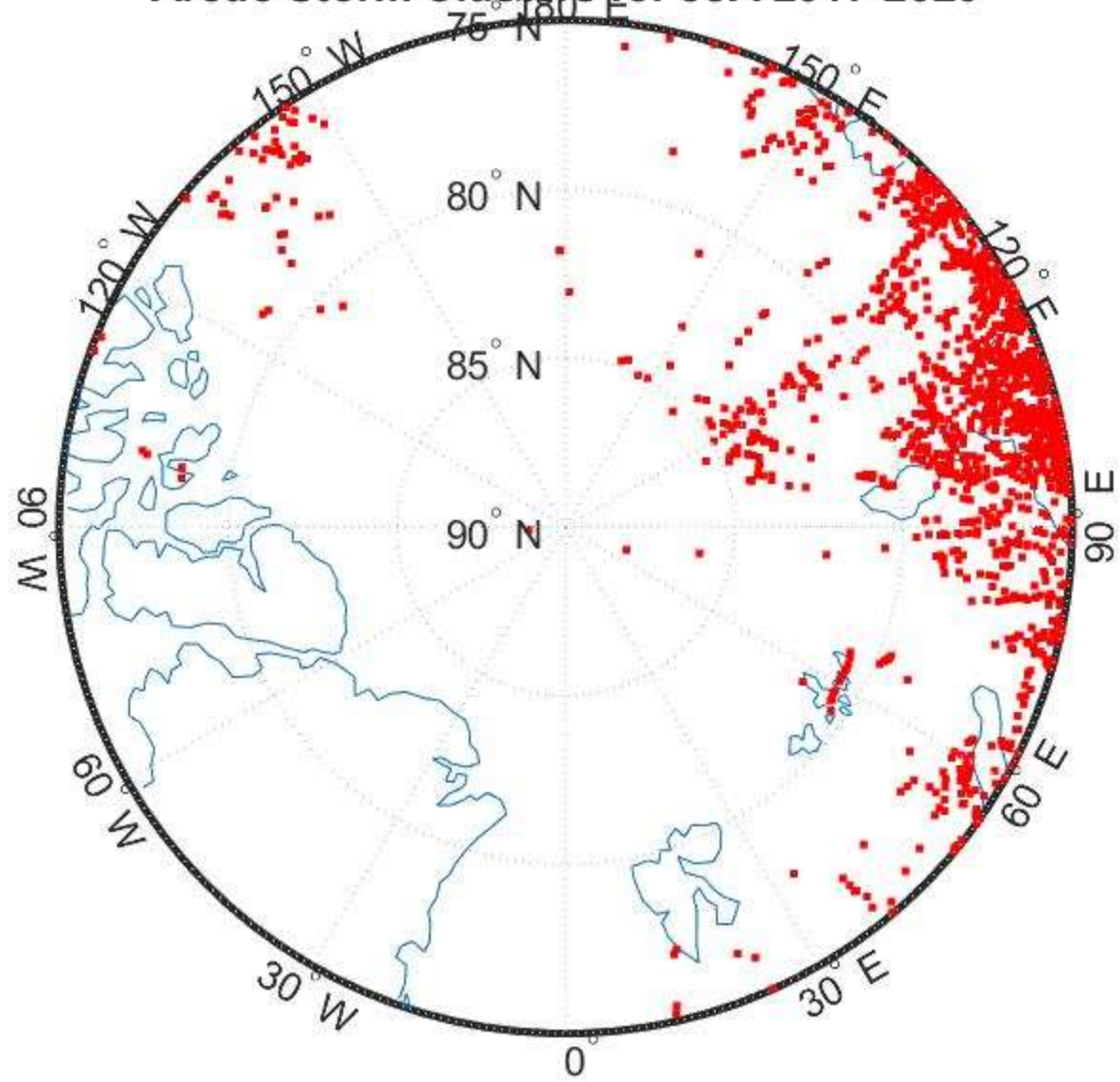


Arctic Storm Clusters for JJA 2013-2016

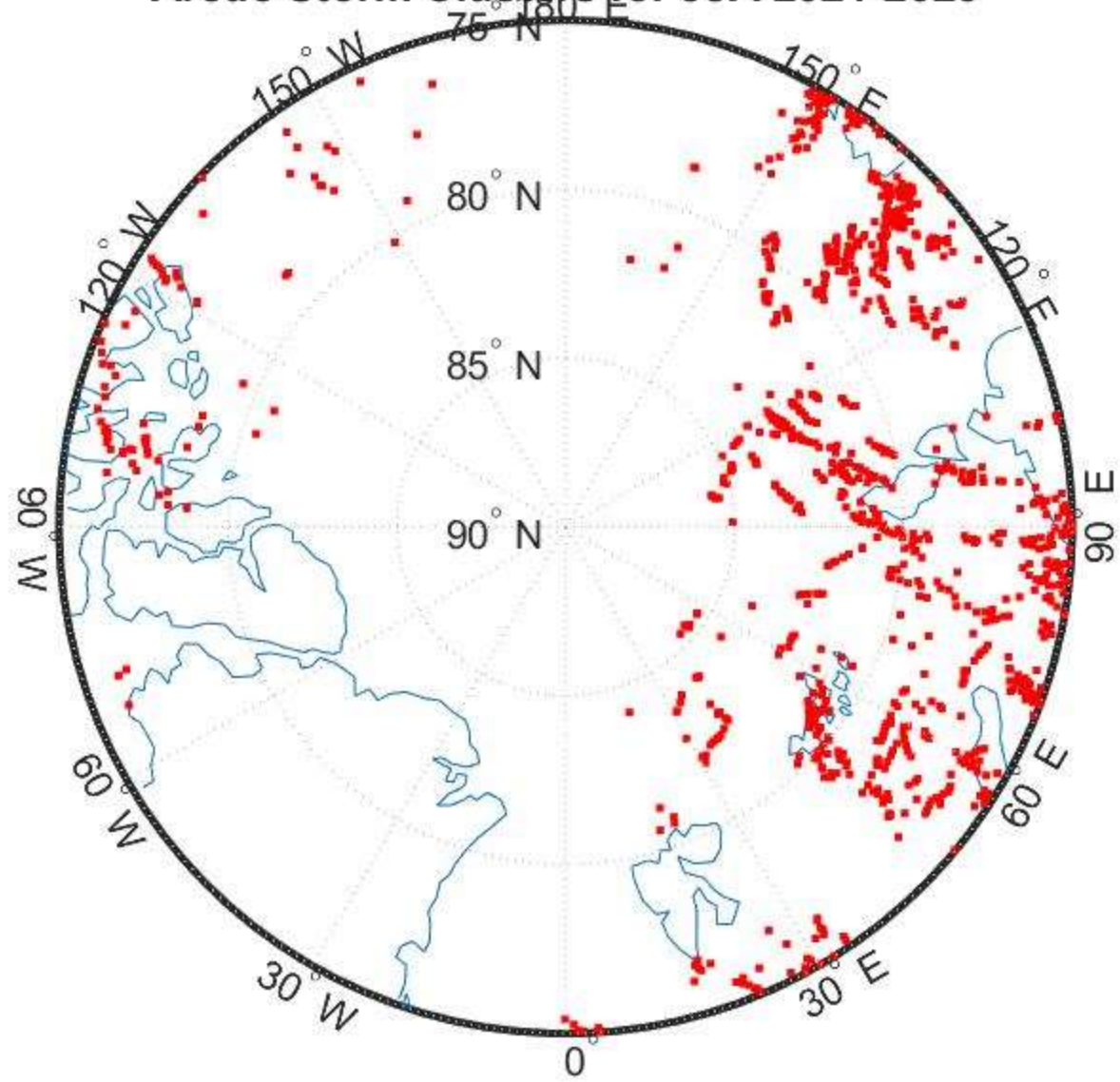


Note: These are clusters of strokes, representing thunderstorms, NOT total strokes

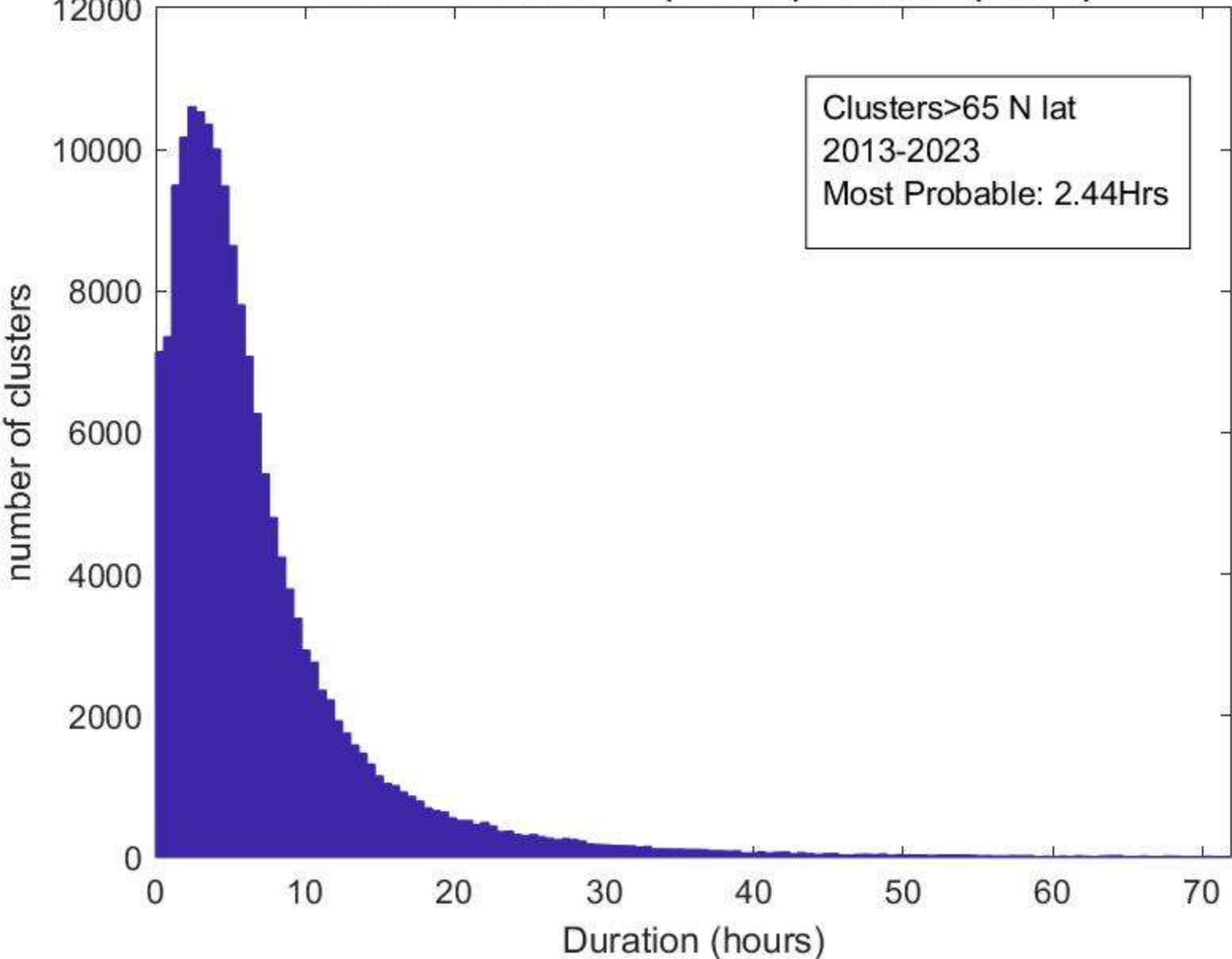
Arctic Storm Clusters for JJA 2017-2020



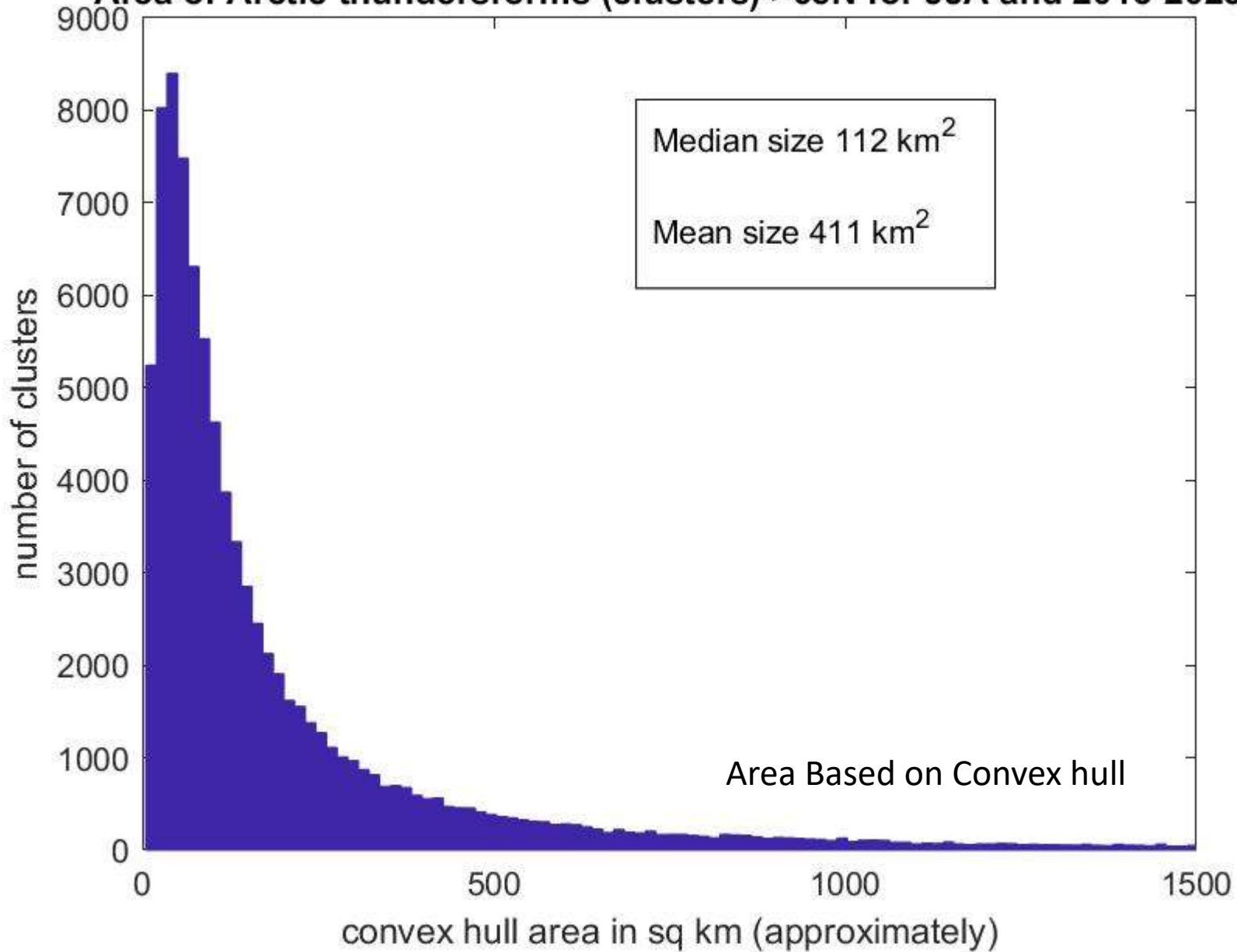
Arctic Storm Clusters for JJA 2021-2023



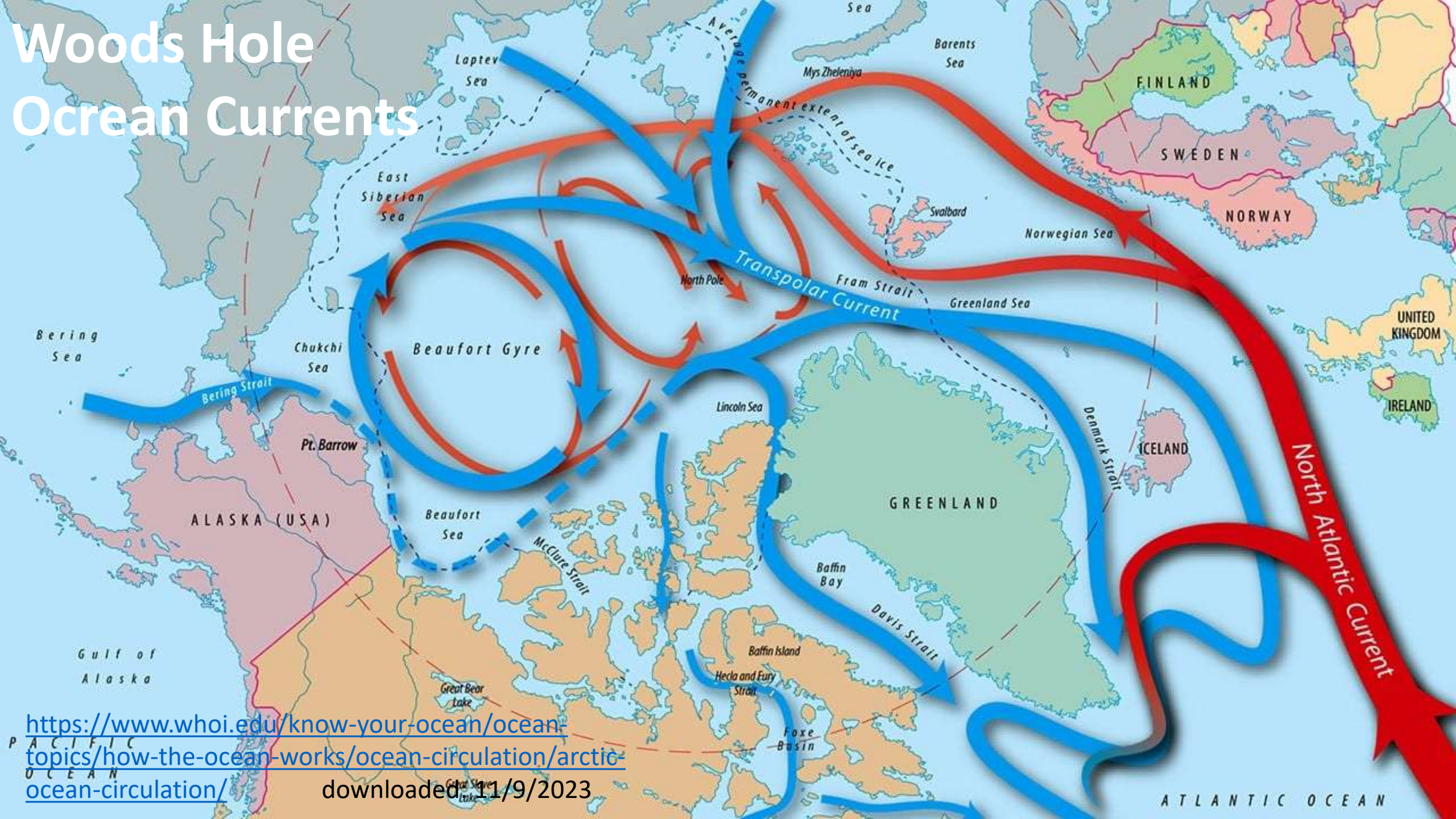
Arctic Thunderstorm (cluster) duration (hours)



Area of Arctic thundersorms (clusters) >65N for JJA and 2013-2023



Woods Hole Ocean Currents



<https://www.whoi.edu/know-your-ocean/ocean-topics/how-the-ocean-works/ocean-circulation/arctic-ocean-circulation/>
downloaded 11/9/2023

ATLANTIC OCEAN

Conclusions

1. Thunderstorms continue to increase in Arctic
2. Thunderstorm number (clusters) increase roughly parallels global temperature anomaly
3. East-West difference in occurrence is prominent
4. Average duration: 2.4 Hrs
5. Median, Mean Size : 112 km², 411 km² (respectively)
6. Arctic ocean Currents likely explains East West asymmetry in thunderstorms