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science for a changing world

Sea ice loss driven alterations of walrus behavioral ecology

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Rebecca Taylor
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U.S. Department of the Interior
U.S. Geological Survey

Photo: USGS / C. Jay

Photo: USGS / A.

Data collection methods

- telemetry
- imagery

Sea ice context

Walrus responses to sea ice

Resulting concerns

- change in energetic requirements
- disturbance
- vessel traffic

Future directions

USGS

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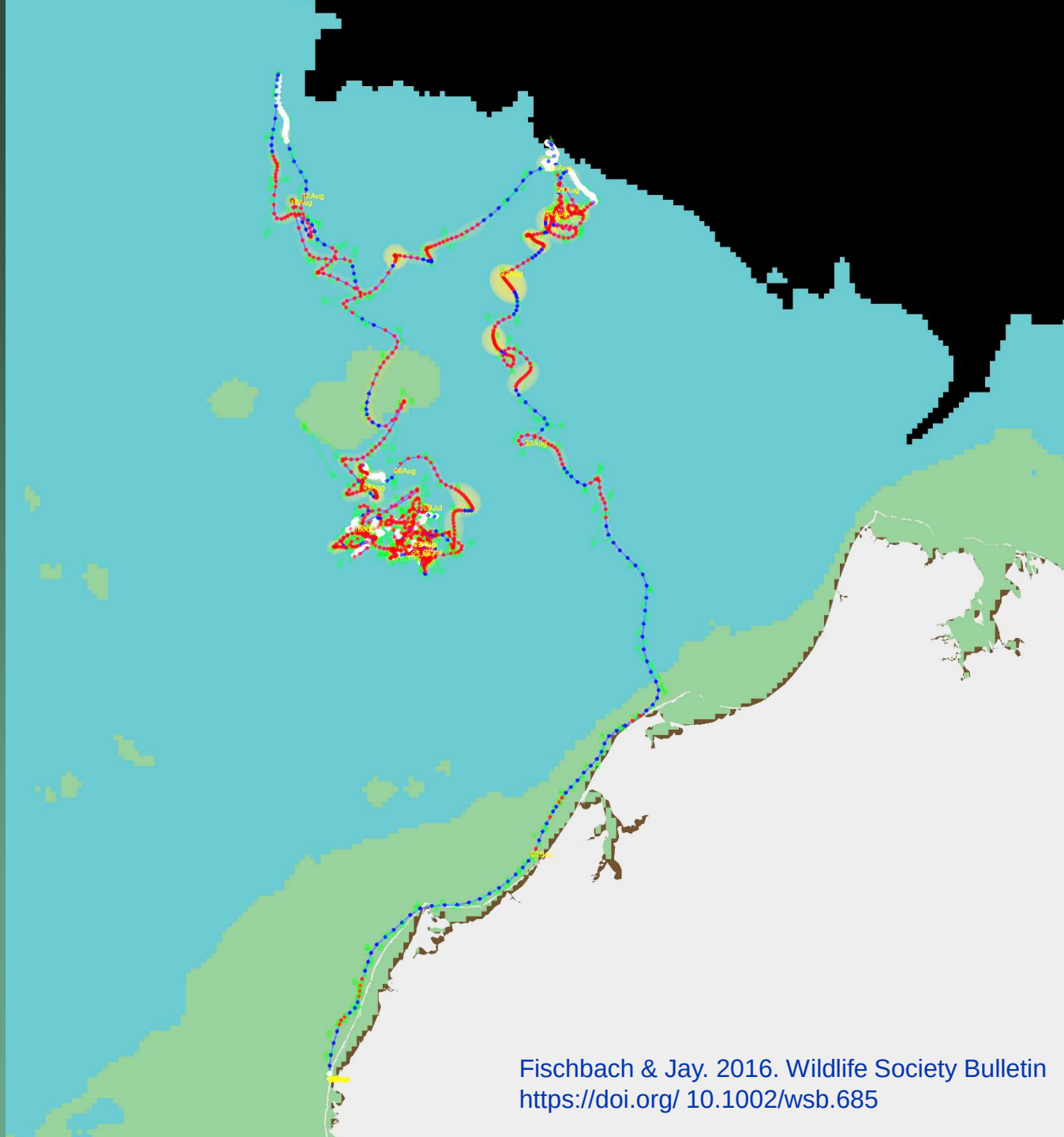
Telemetry

Jay et al. 2006. Marine Mammal Science

Jay et al. 2021. USGS
https://doi.org/10.5066/F7FQ9TP6

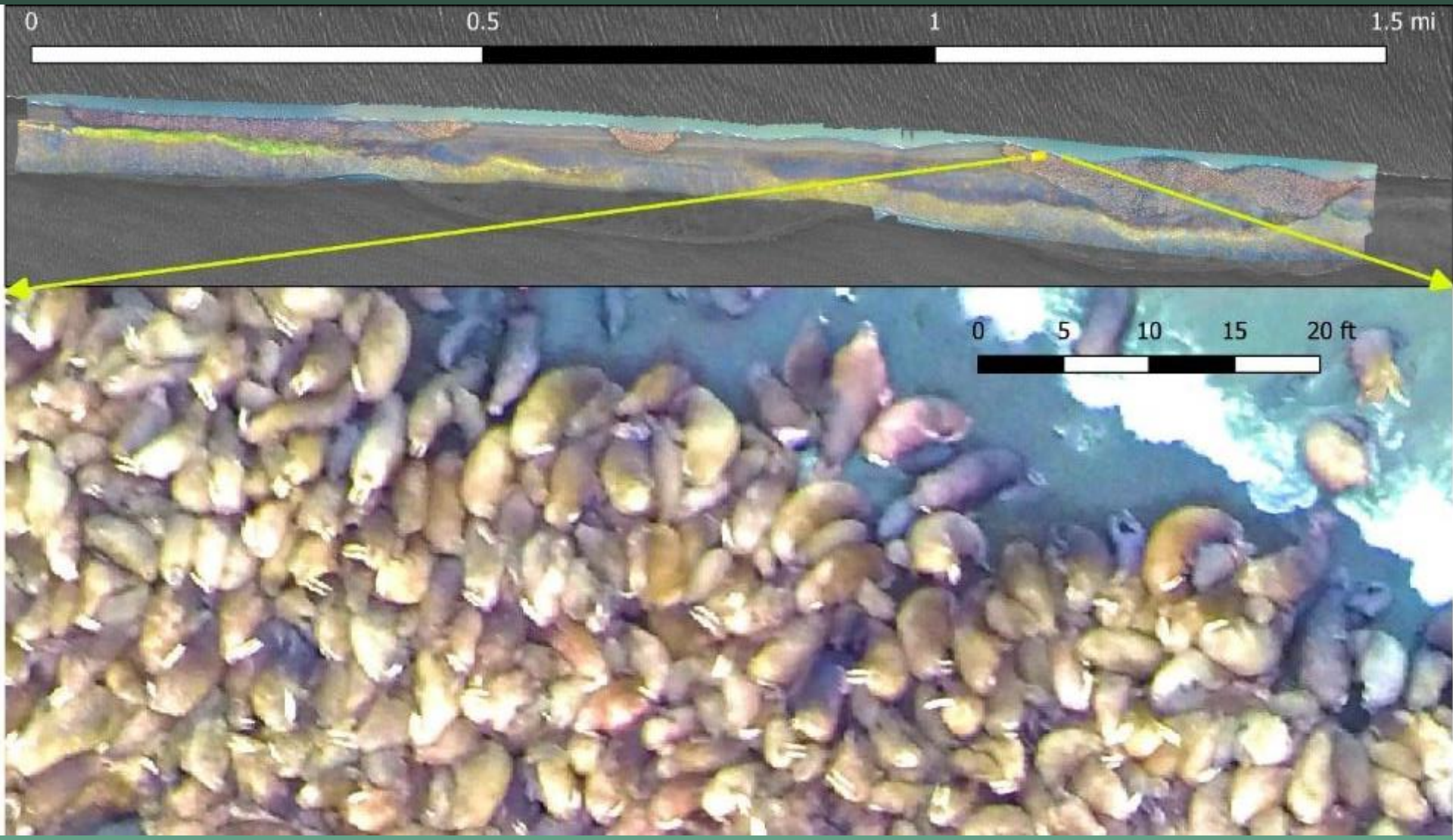
Telemetry

behavior and movement



Fischbach & Jay. 2016. Wildlife Society Bulletin
https://doi.org/ 10.1002/wsb.685

Imagery: survey drones



Fischbach et al. 2022. J. Wildl. Manag. https://doi.org/10.1002/jwmg.22256

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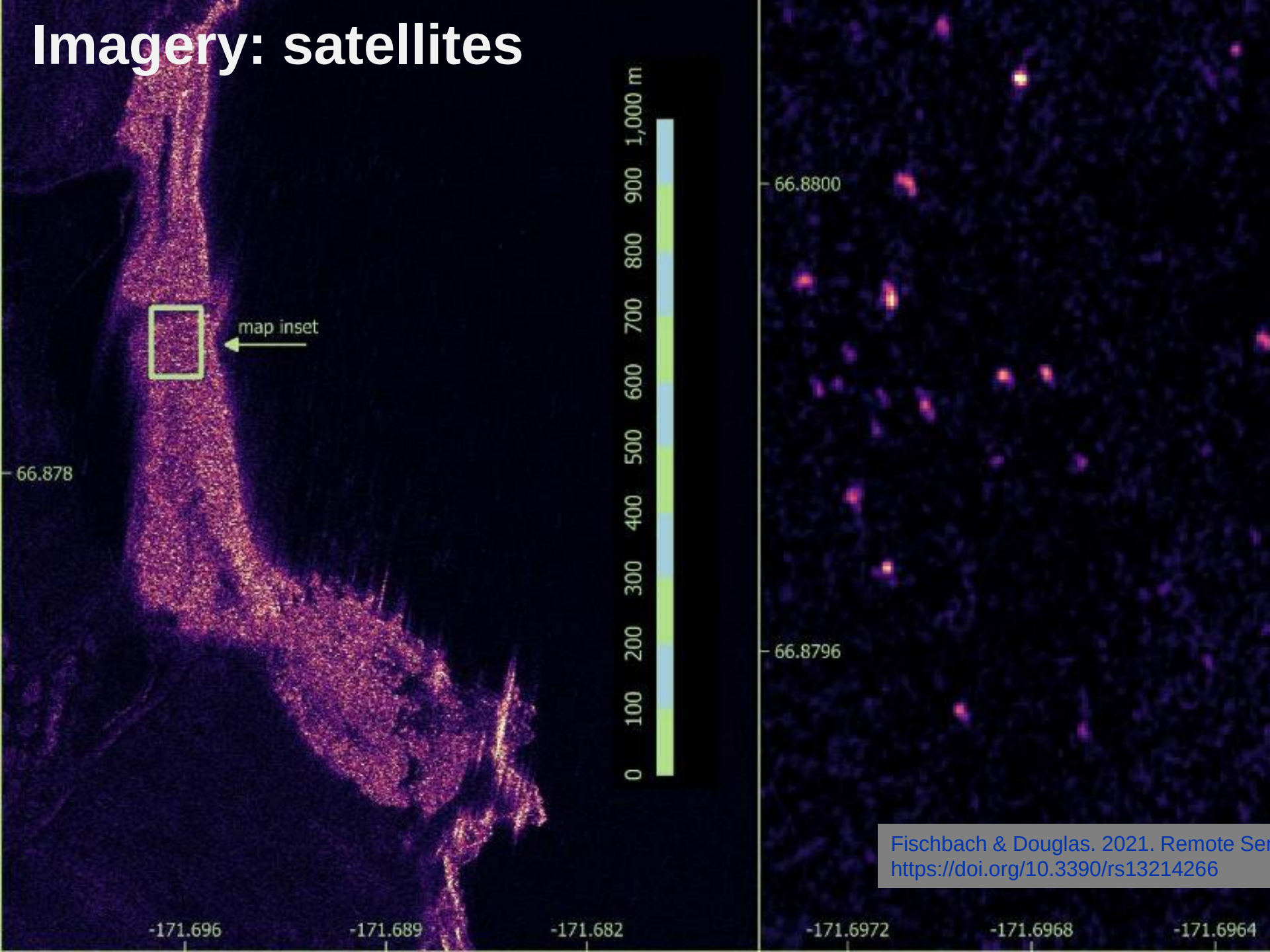
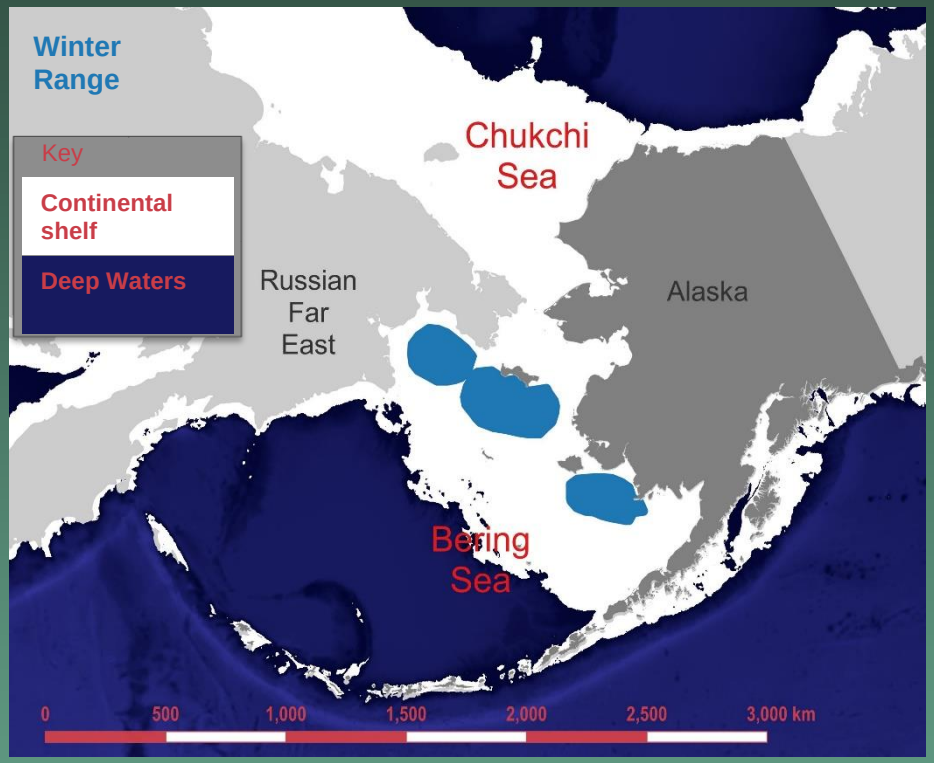
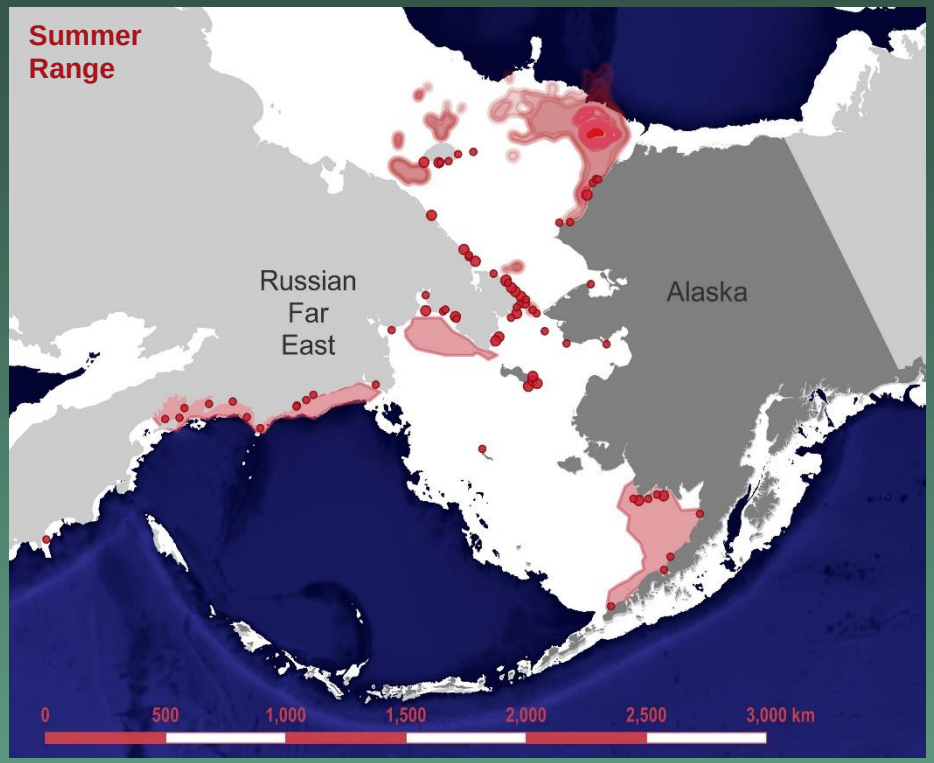
Imagery: satellites



Fischbach & Douglas. 2021. Remote Se
https://doi.org/10.3390/rs13214266

Pacific walrus range





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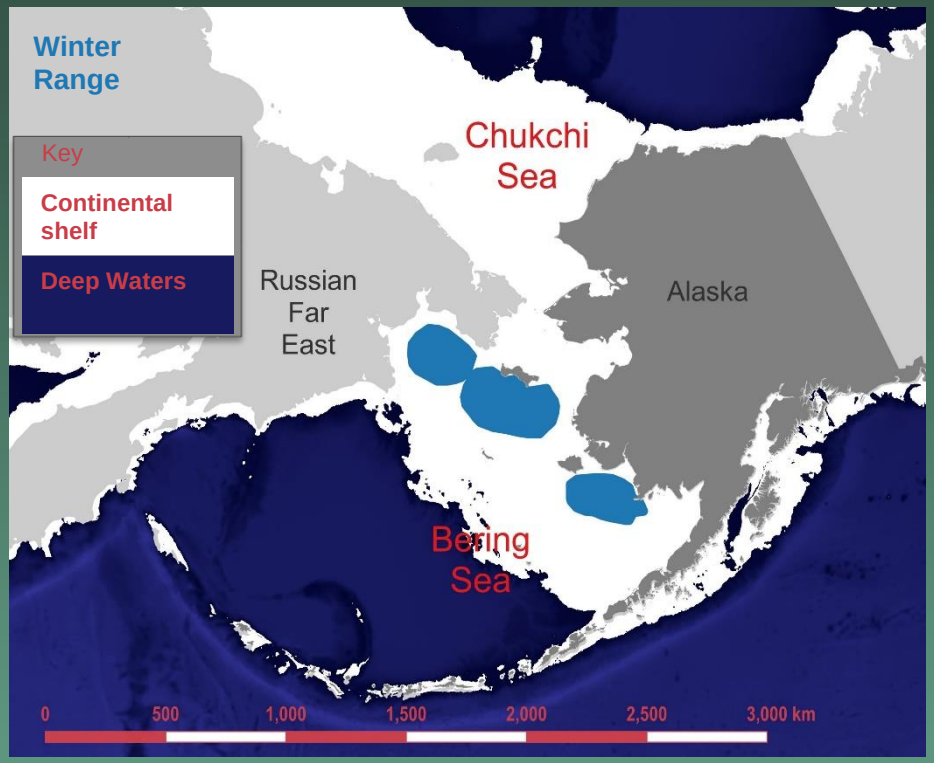
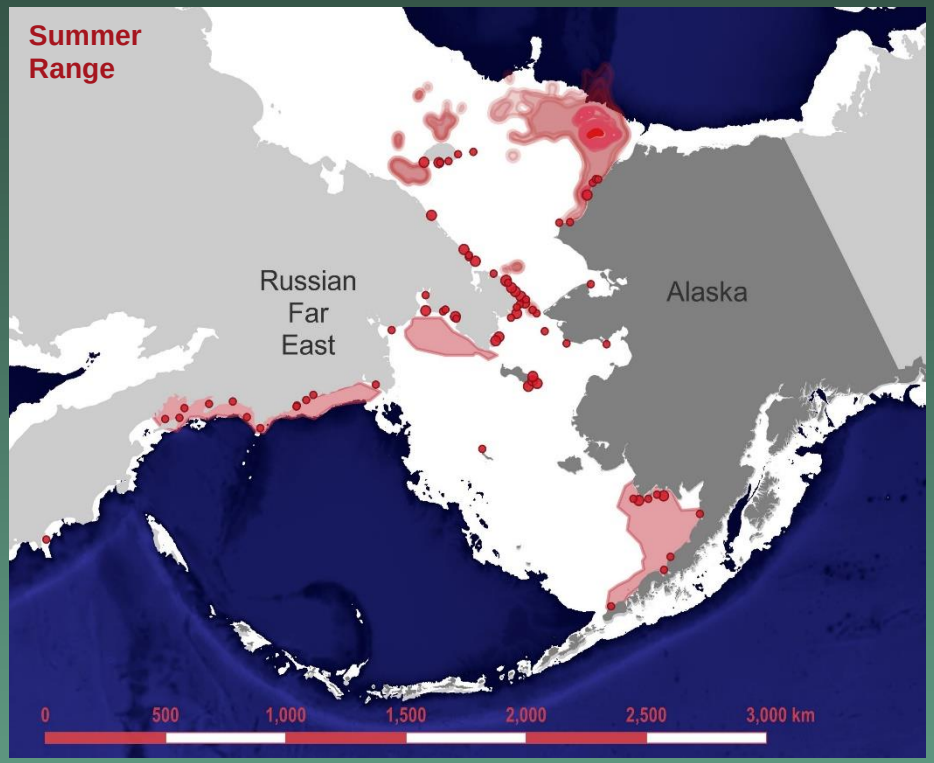
Pacific walrus range





Jay et al. 2014. PLoS One
https://doi.org/10.1371/journal.pone.0093035

Jay et al. 2010. Marine Ecology Progress Series
https://doi.org/10.3354/meps08575

Beatty et al. 2016. Biological Conservation
https://doi.org/10.1016/j.biocon.2016.08.035

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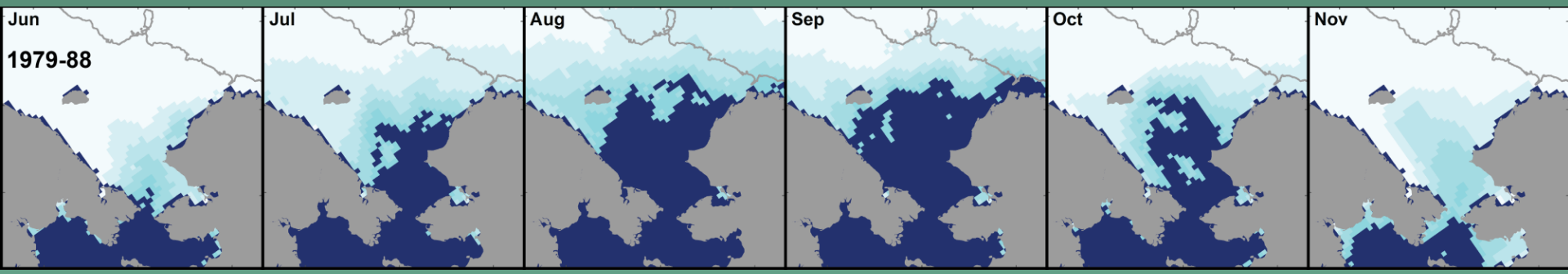
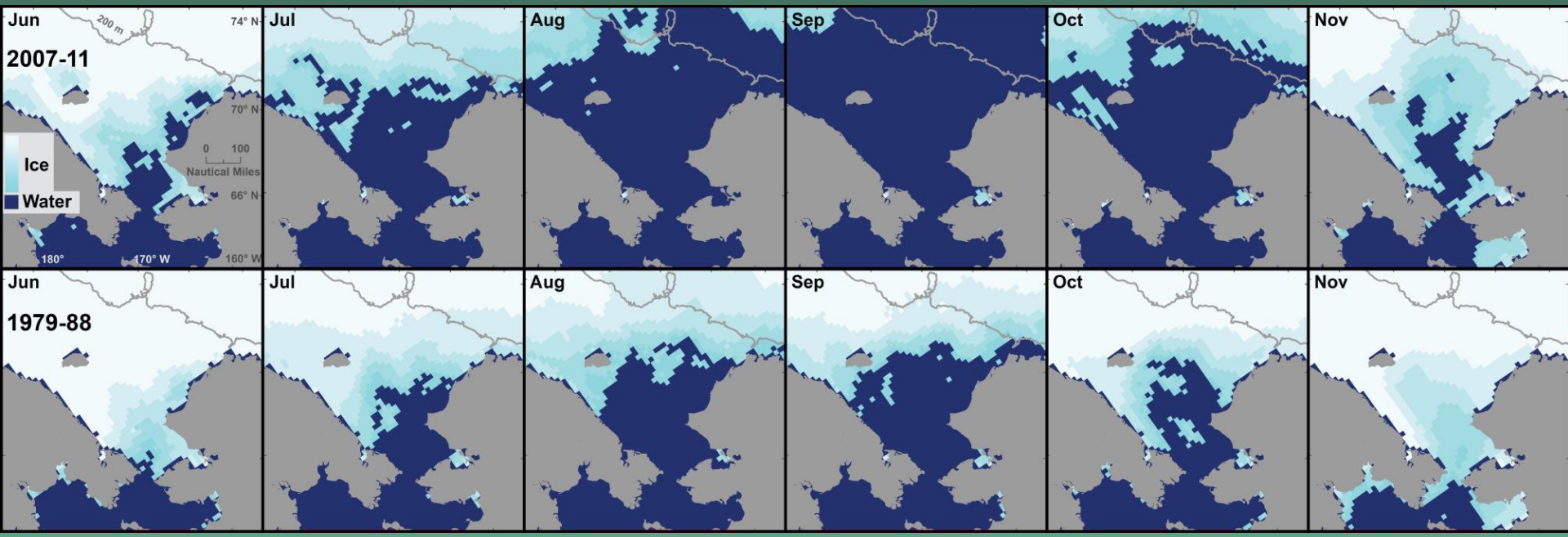


USGS

Sea ice context



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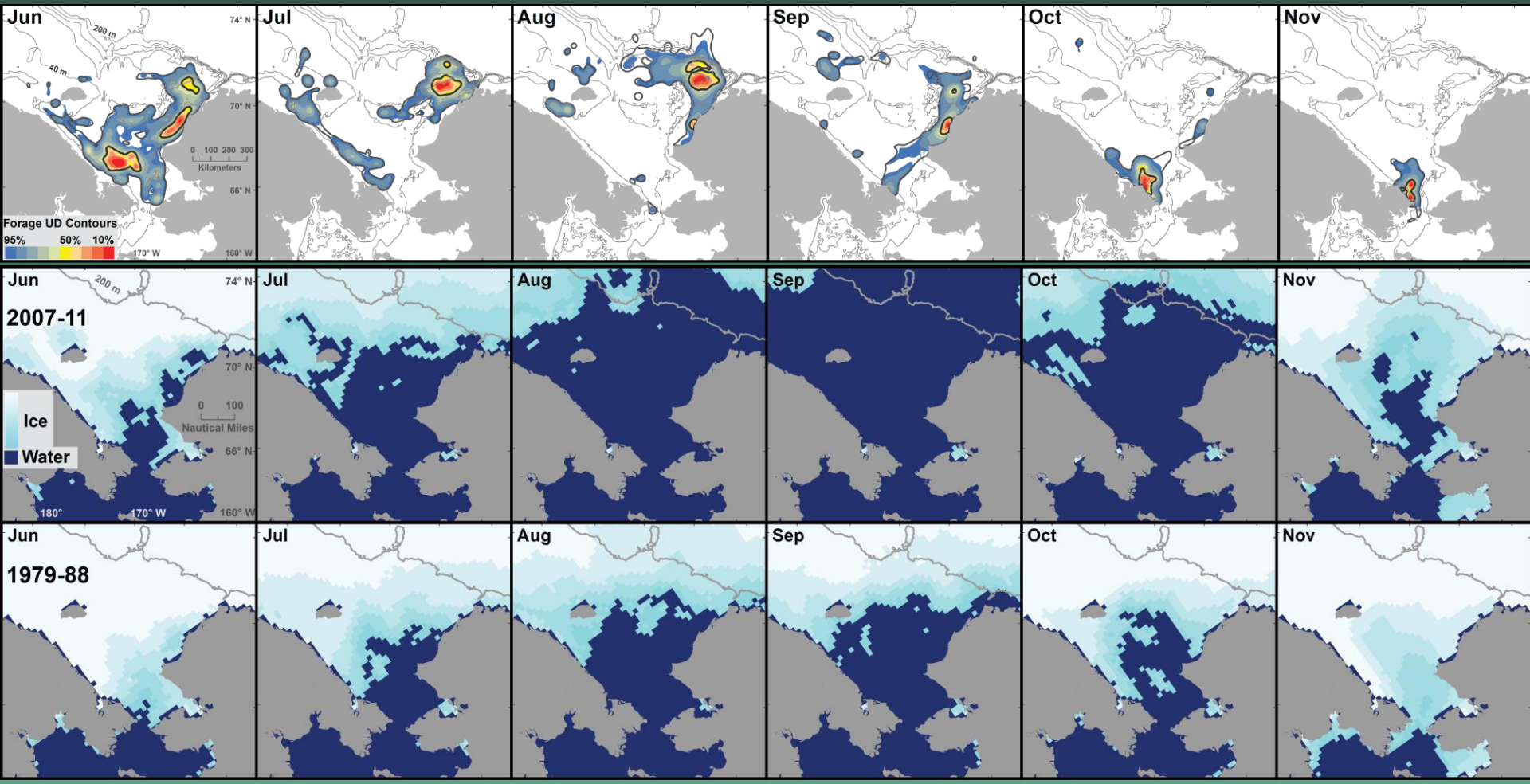

Jay et al. 2012. Marine Ecology Progress Series
https://doi.org/10.3354/meps10057

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Since 2007 sea ice has retreated from nearly all the Chukchi Sea in 15 of 17 years.

Photo: USGS / R. Kingsbury

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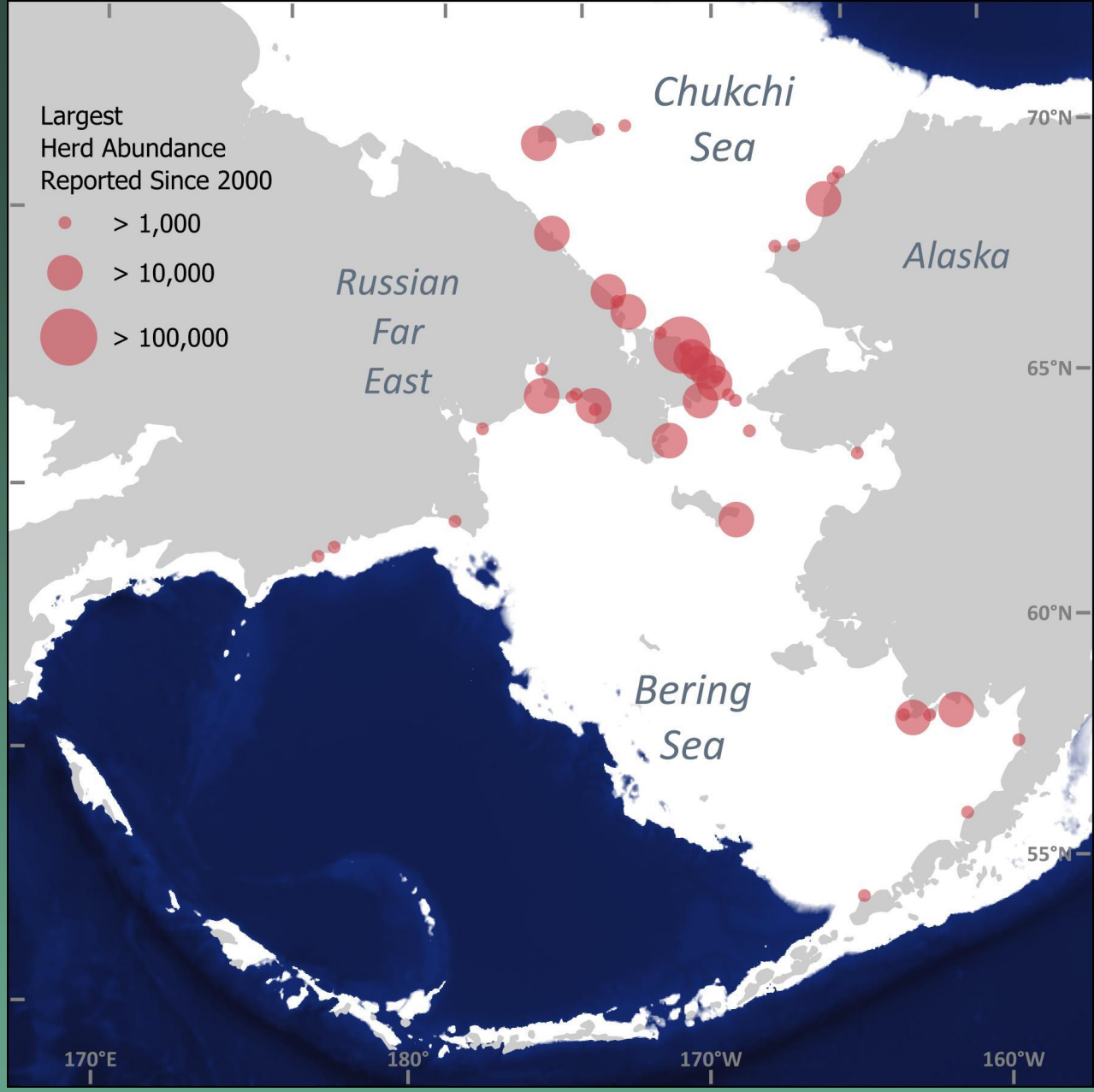
Most large coastal haulouts are in northern Chukotka



Fischbach et al. 2012. USGS
https://doi.org/10.3354/meps10057

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USGS

Change in energetic requirements

Ice-free season:

 **swimming**

 **resting**

Jay et al., 2017. Journal of Mammalogy
https://doi.org/10.1093/jmammal/gyw195

USGS

Change in energetic requirements

Ice-free season:

swimming

resting

Global climate models:

ice-free season

Udevitz, et al. 2017. Ecosphere
https://doi.org/10.1002/ecs2.2014

USGS

Change in energetic requirements

Ice-free season:

 **swimming**

 **resting**

Global climate models:

 **ice-free season**

Physiology models:

 **calories**

 **body condition**

Udevitz, et al. 2017. Ecosphere
https://doi.org/10.1002/ecs2.2014

USGS

Disturbances at coastal haulouts
- kill walruses and
- may cause population decline

Fischbach et al. 2009. USGS
https://pubs.usgs.gov/of/2009/1291/pdf/ofr20091291.pdf

Udevitz et al. 2013. Polar Biology
https://doi.org/10.1007/s00300-012-1259-3

Photo: USGS / A

vessel traffic

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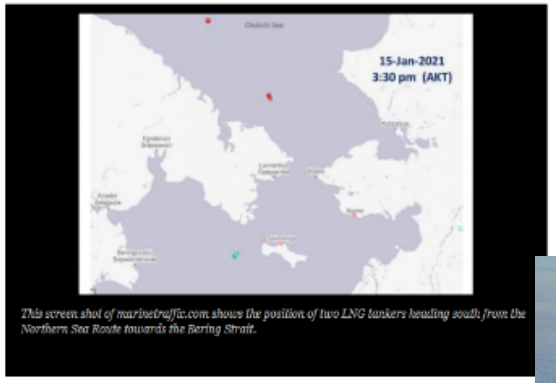
HOME / NEWS / RUSSIAN TANKER PASSES THROUGH BERING STRAIT IN THE MIDST OF WINTER



This screen shot of marinetraffic.com shows the position of two LNG tankers heading south from the Northern Sea Route towards the Bering Strait.

Russian Tanker Passes Through Bering Strait In The Midst Of Winter

FRI, 01/15/2021 - 7:51PM admin

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BY: RB SMITH

Photo: DSME
https://www.ship-technology.com/

Yamal LNG's 15-Vessel Fleet of Icebreaking LNG Tankers Now Operational

Mike Schuler
Total Views: 813
December 11, 2019

ЧУКОТКА
ИНФОРМАЦИОННОЕ АГЕНТСТВО
12+

НОВОСТИ ДАЛЬНИЙ ВОСТОК СЕВЕРНЫЙ ЗАВОЗ -2021 ВЭФ ФОТО ВИДЕО СТАТЬИ

ТРАНСПОРТ 06.11.2021 17:10

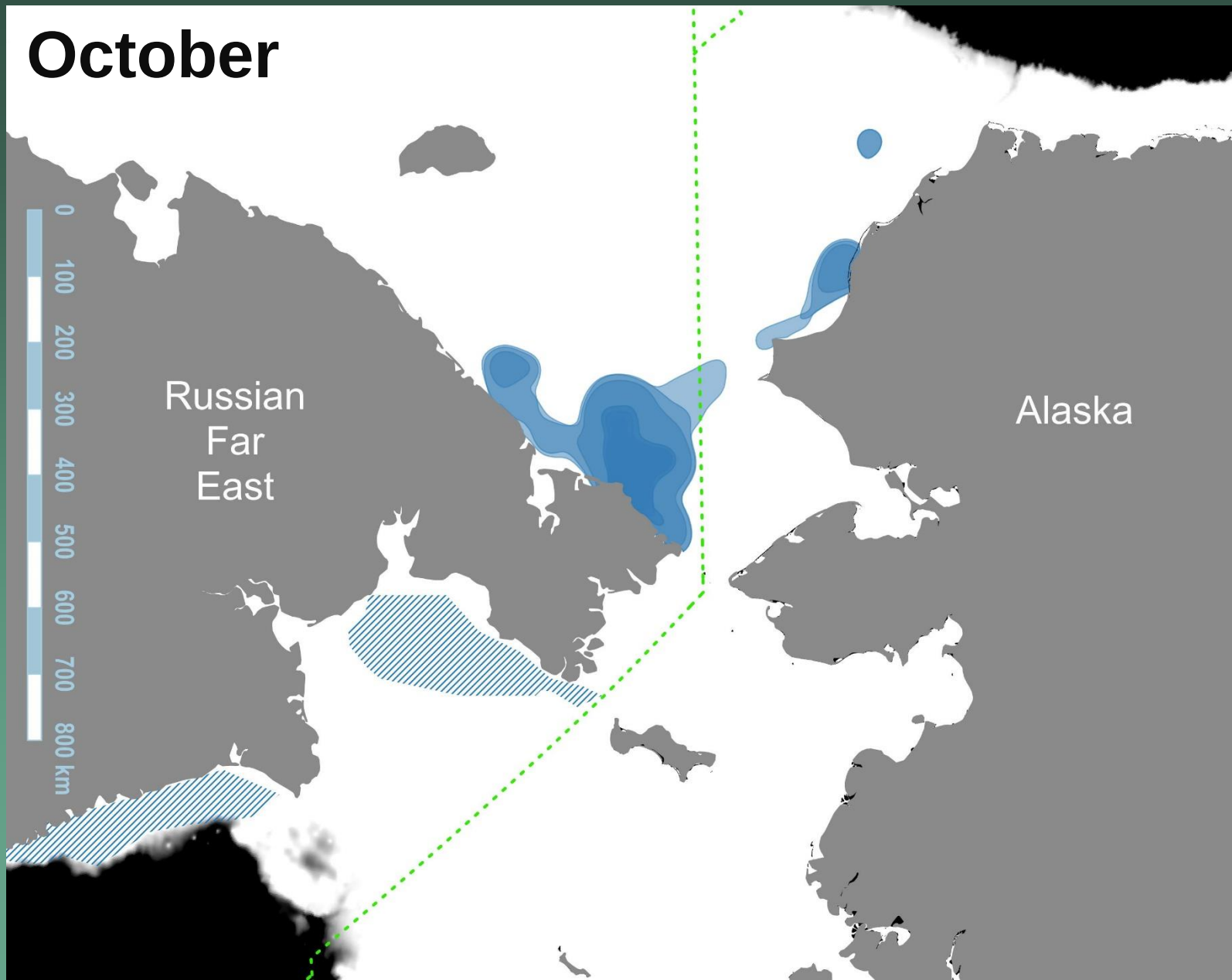
Ледокольный флот обеспечит проводку судов на Чукотку

Для обеспечения северного завоза по Севморпути на Чукотку привлечены ледоколы и судно-спасатель. Подход судов к Певеку уже обеспечивает ~~атомный ледокол "Ямал"~~(по уточнённым данным) атомный ледокол "Вайгач", с 15 ноября к нему присоединится дизель-электрический ледокол "Новороссийск". В акватории Анадырского залива будет работать судно ледового класса "Спасатель Заборщиков", сообщает ИА "Чукотка".

Фото: снимок с видео YouTube

USGS

vessel traffic



USGS

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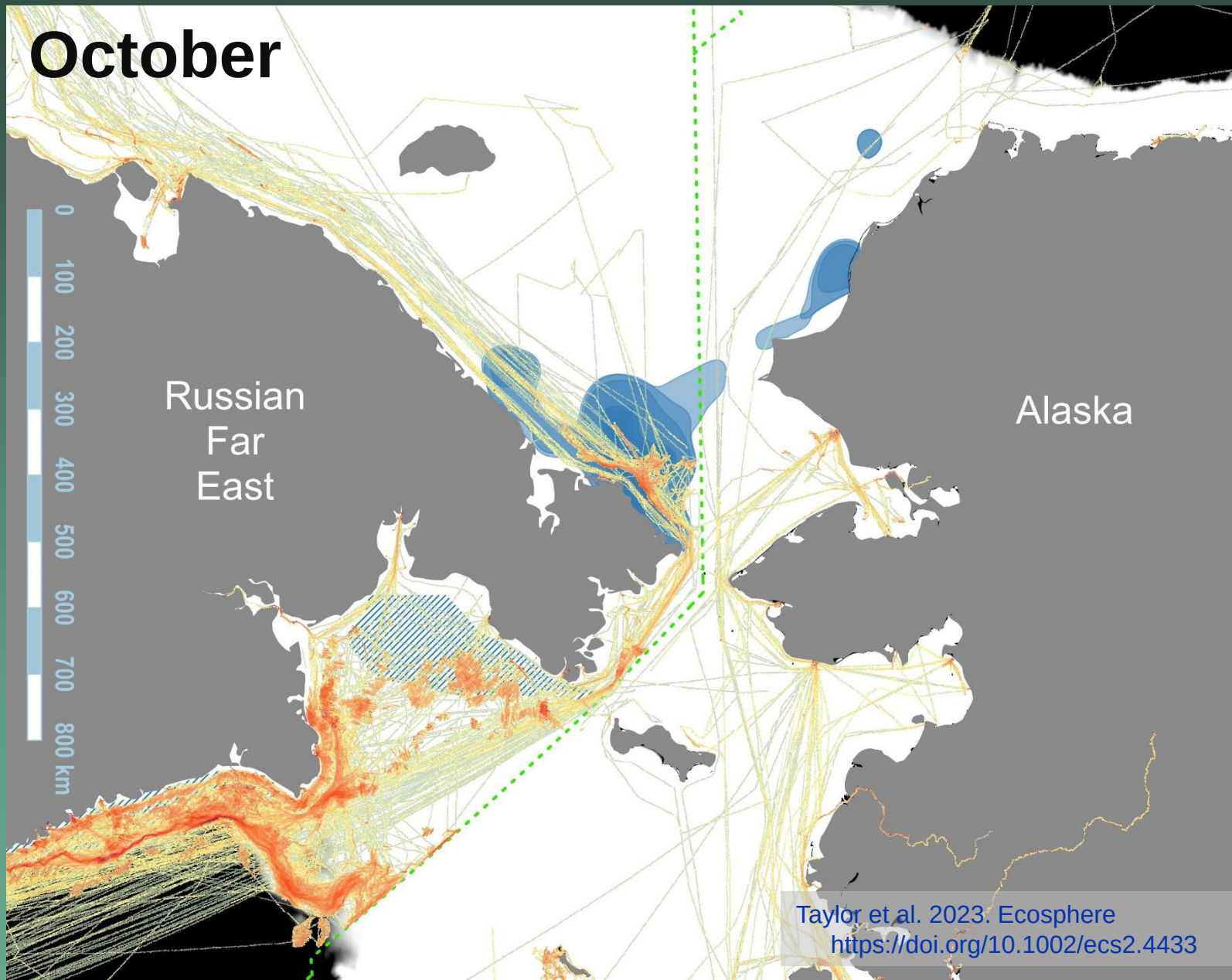
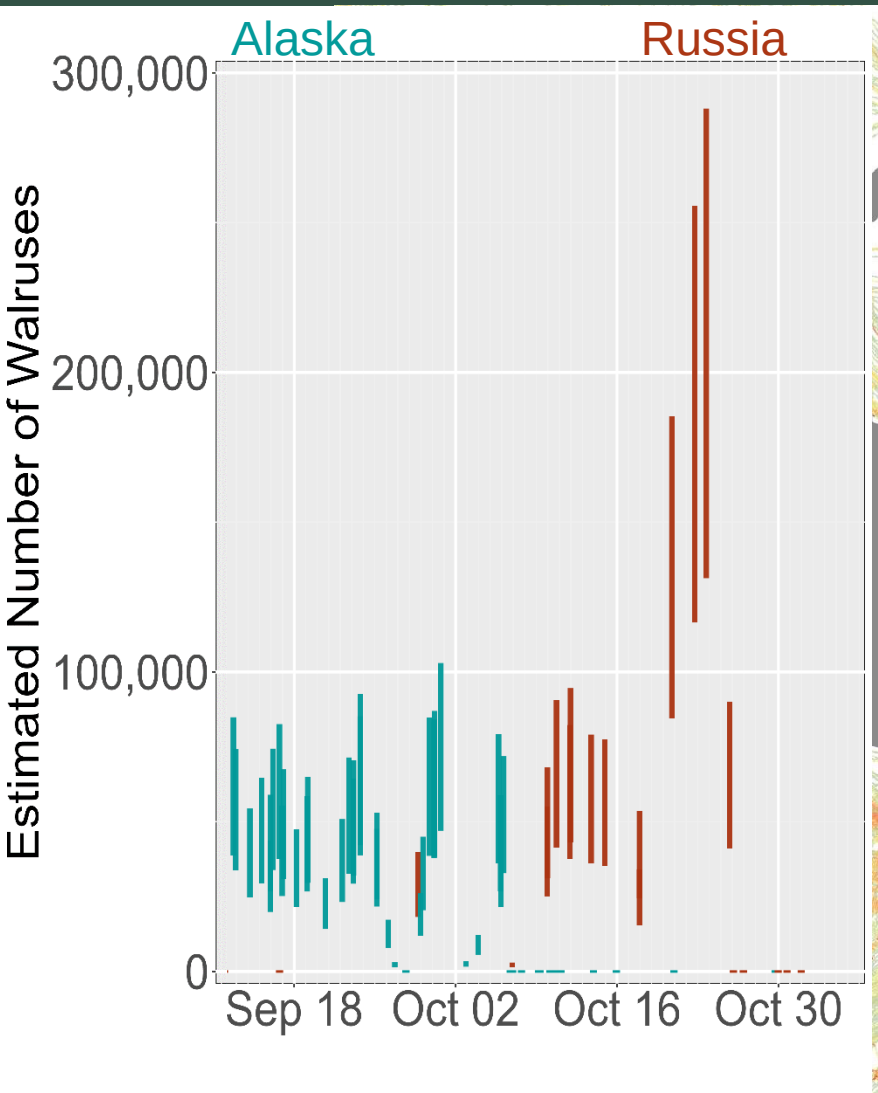
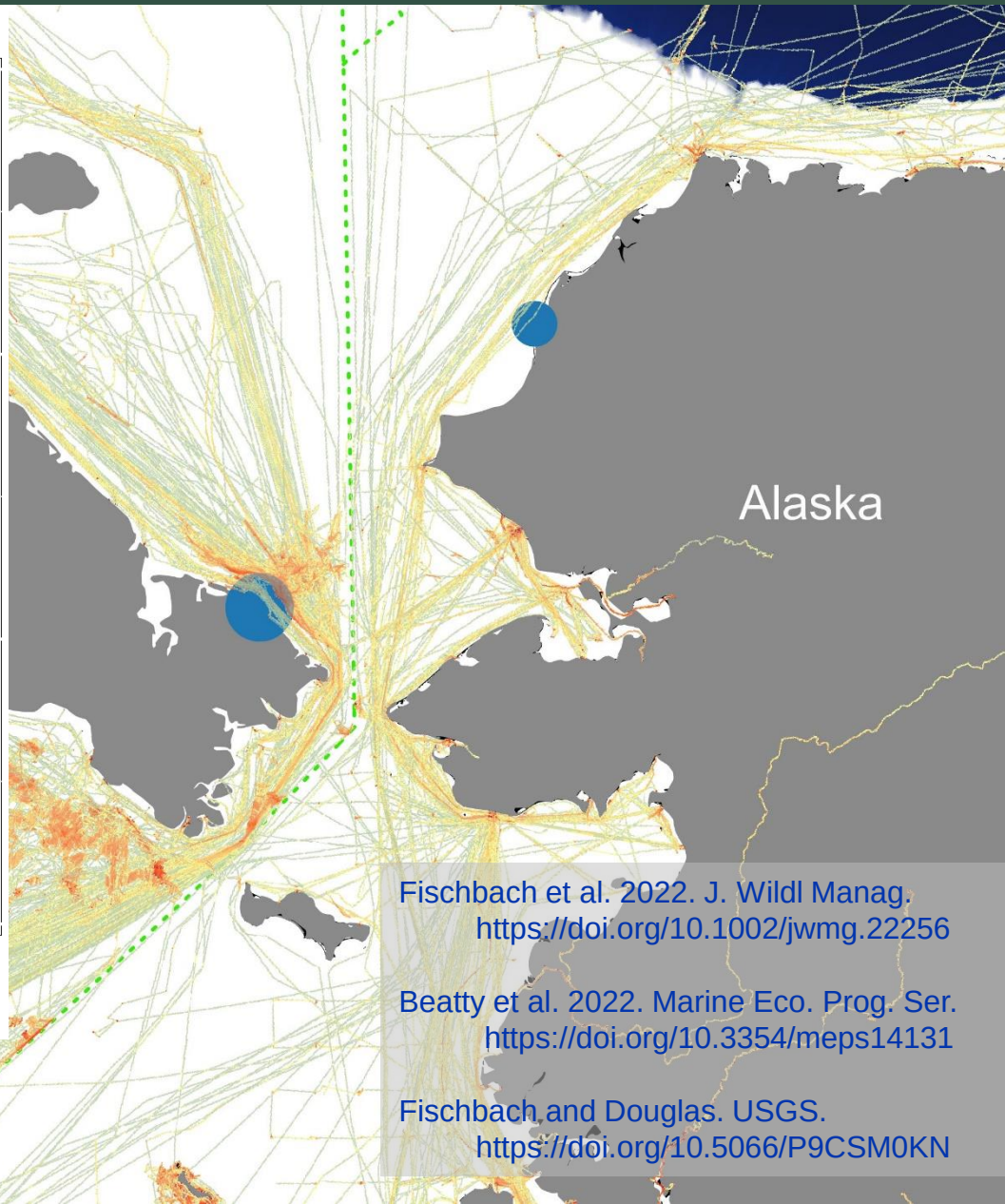


USGS

Taylor et al. 2023. Ecosphere
https://doi.org/10.1002/ecs2.4433

vessel traffic





Fischbach et al. 2022. J. Wildl Manag. https://doi.org/10.1002/jwmg.22256

Beatty et al. 2022. Marine Eco. Prog. Ser. https://doi.org/10.3354/meps14131

Fischbach and Douglas. USGS. https://doi.org/10.5066/P9CSM0KN

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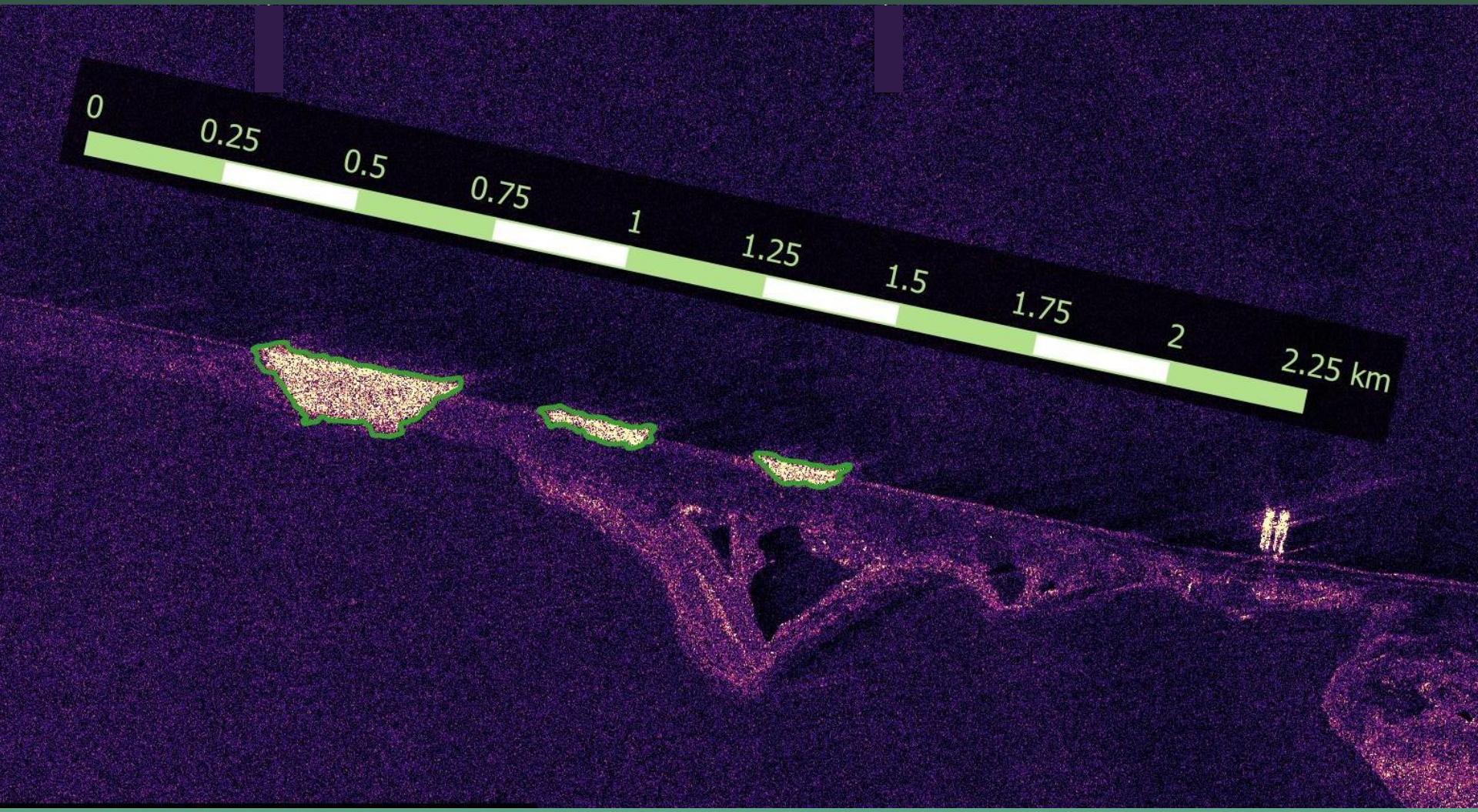
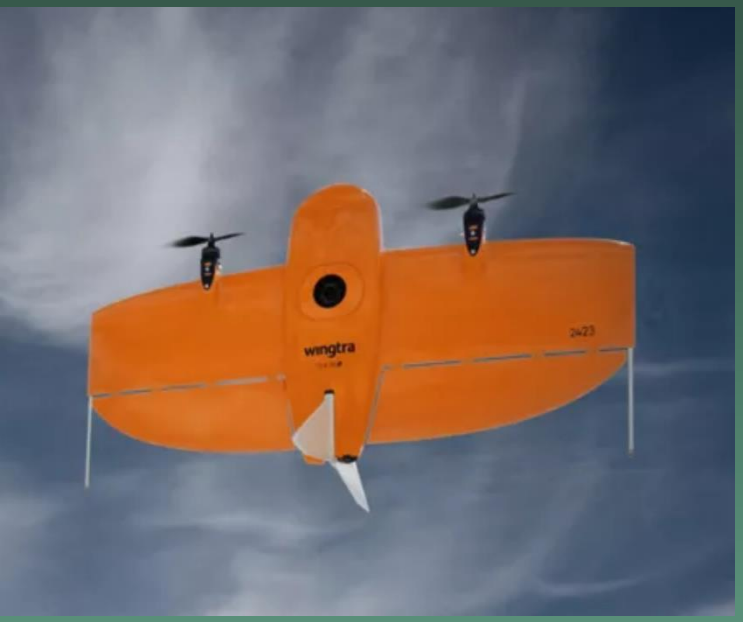
rapid dissemination of haulout use observations to managers



monitor walrus body condition



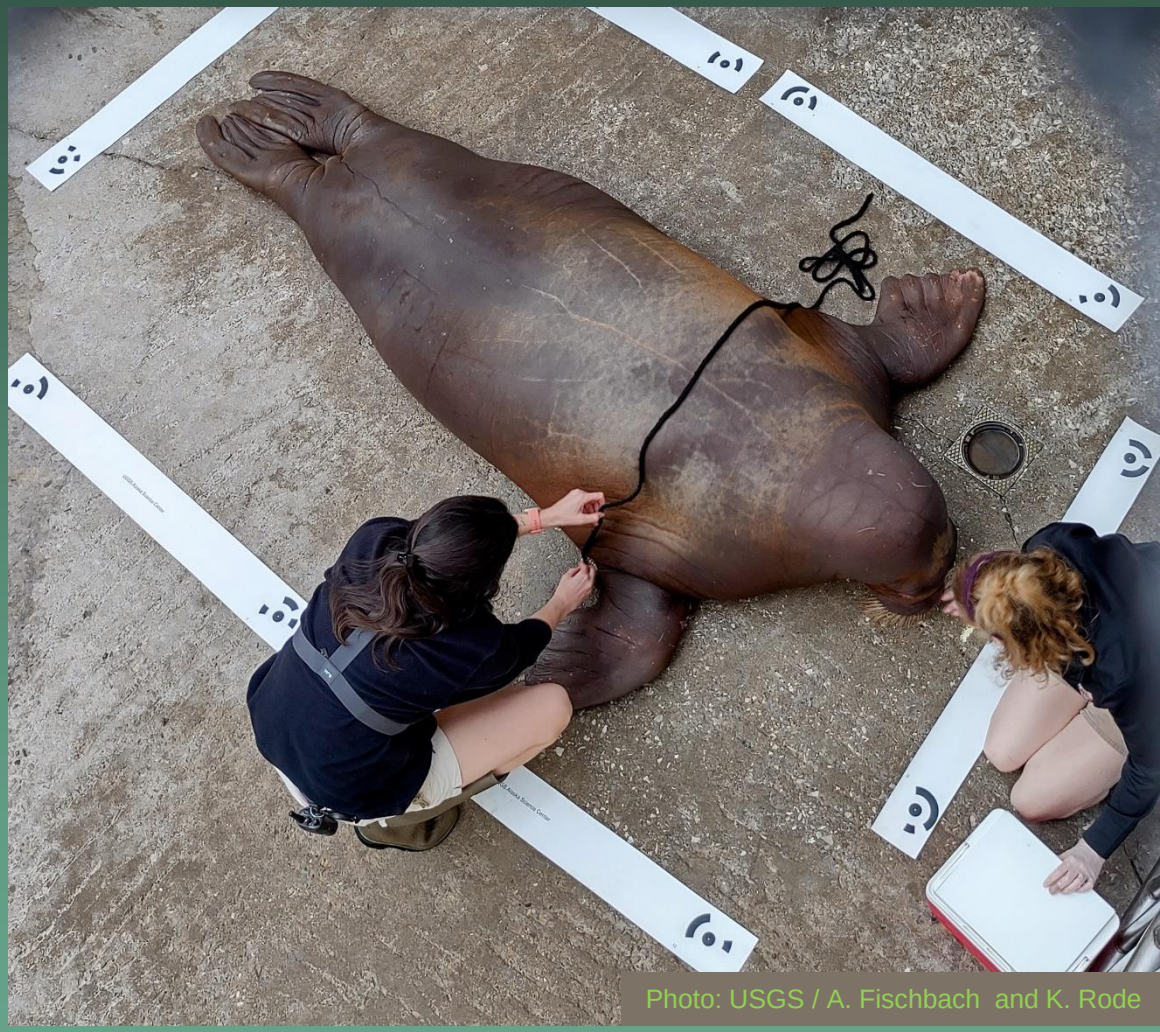


Photo: USGS / A. Fischbach and K. Rode

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Thank you

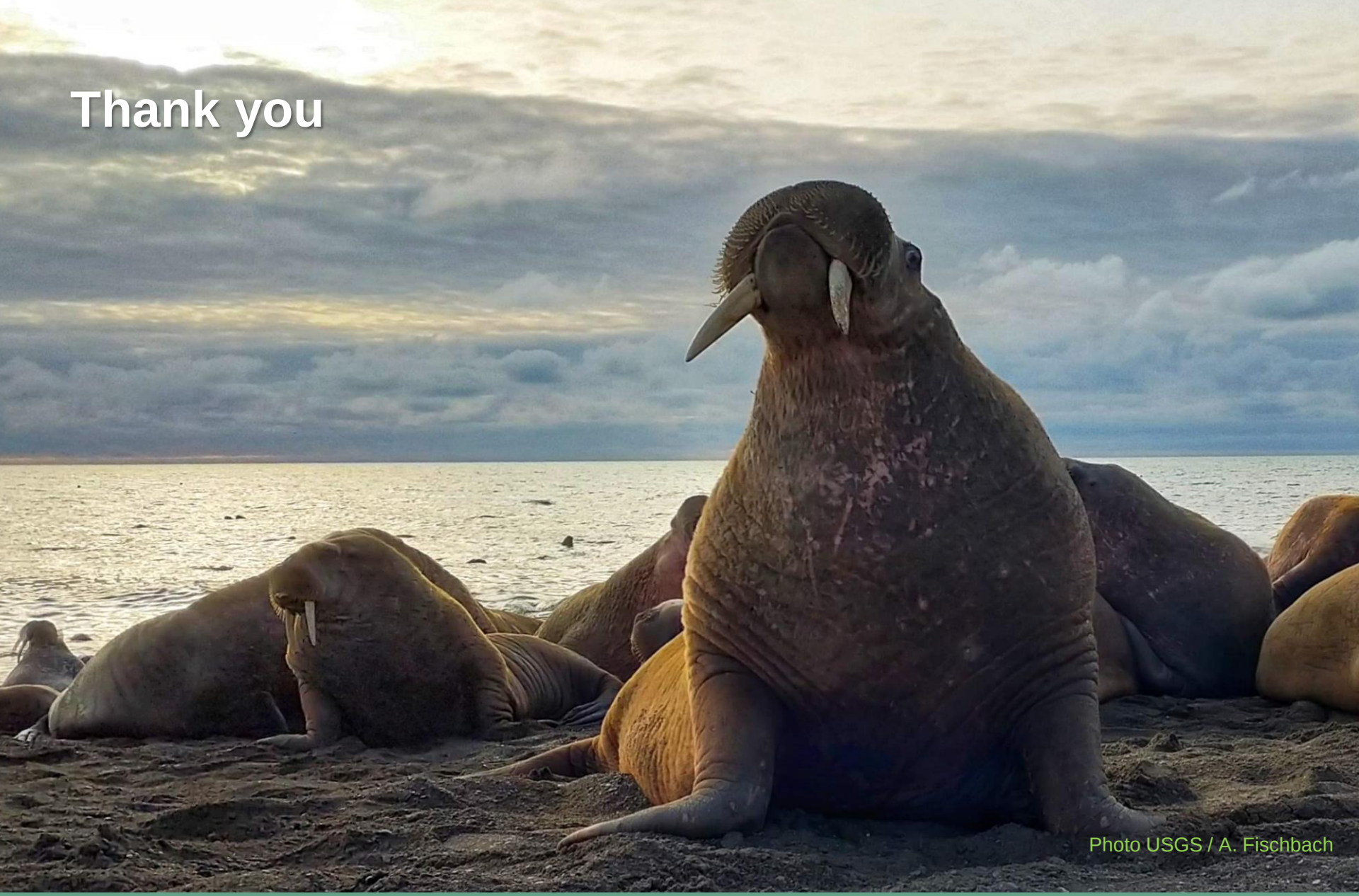
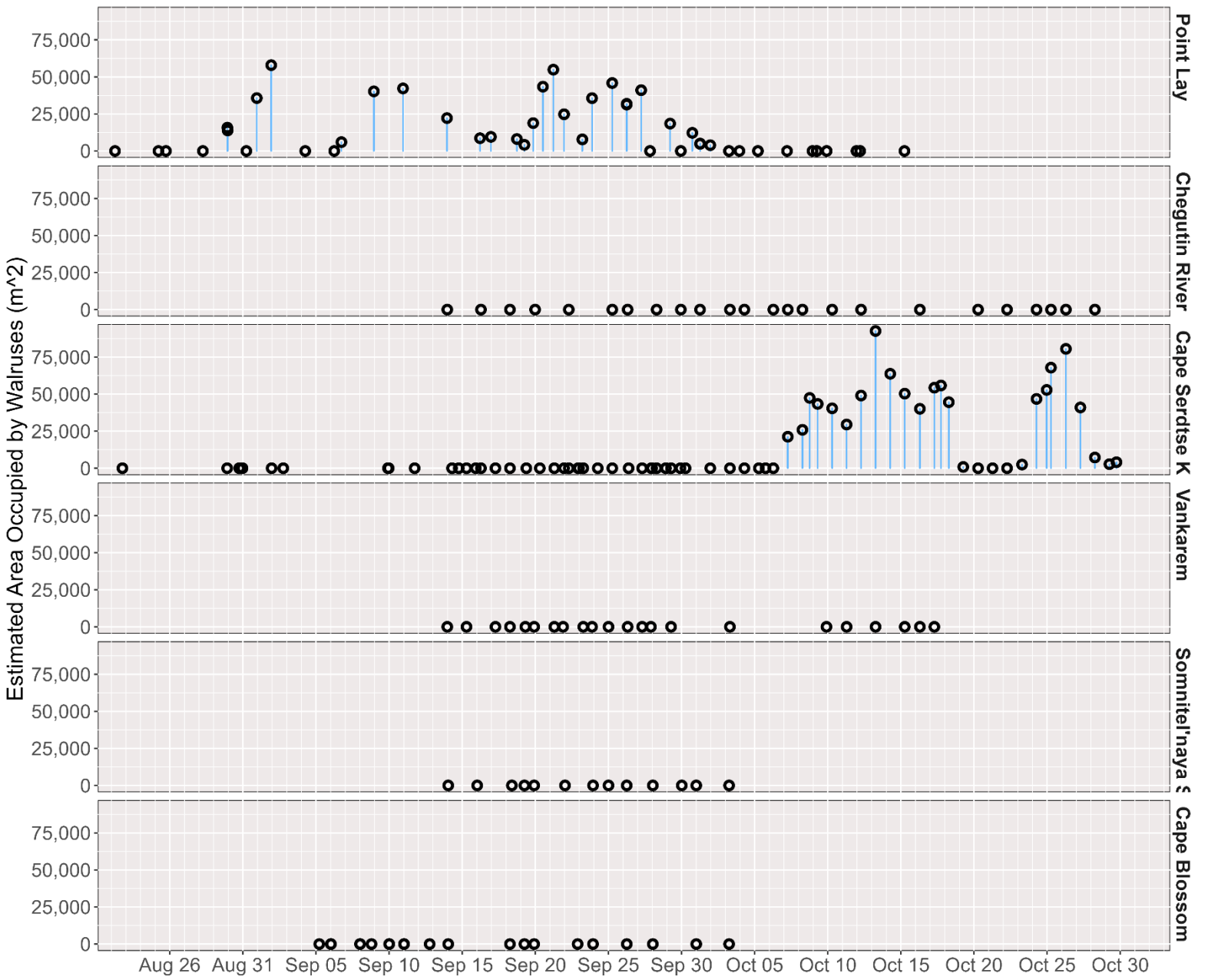


Photo USGS / A. Fischbach

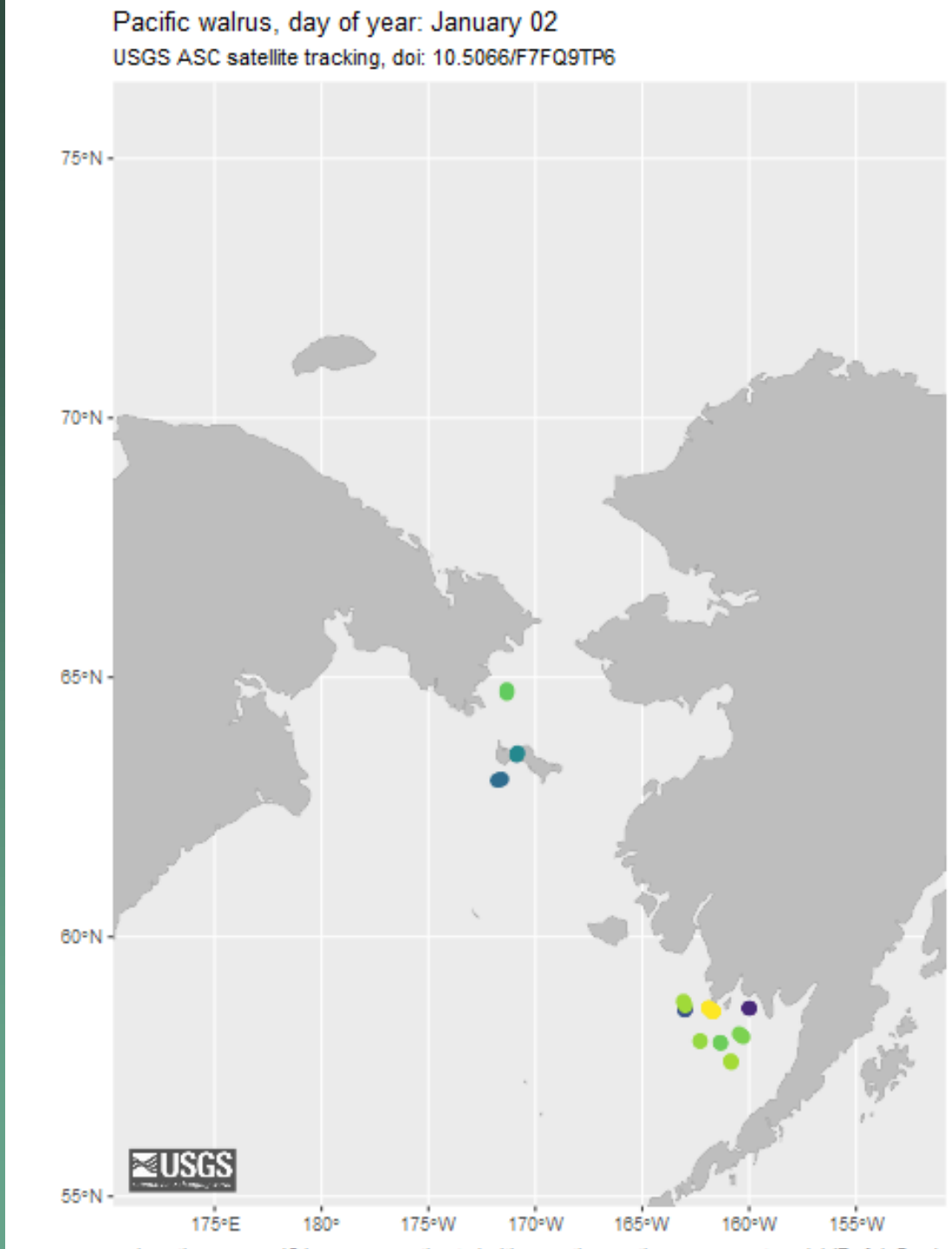
Blank slide

northern Chukotka

Photo: A.A. Kochnev


Estimated Area Occupied by Walruses (m^2)
Point Lay
Chegutin River
Cape Serdtse K
Vankarem
Somnitel'naya S
Cape Blossom
75,000
50,000
25,000
0
Aug 26
Aug 31
Sep 05
Sep 10
Sep 15
Sep 20
Sep 25
Sep 30
Oct 05
Oct 10
Oct 15
Oct 20
Oct 25
Oct 30

Methods


Pacific walrus, day of year: January 02
USGS ASC satellite tracking, doi: 10.5066/F7FQ9TP6
75°N
70°N
65°N
60°N
55°N
175°E
180°
175°W
170°W
165°W
160°W
155°W
USGS