MSS for SWOT

DTU21MSS and Experimental MSS(t) for 2023

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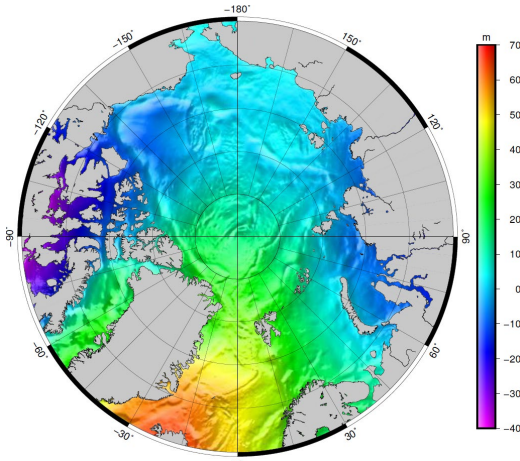
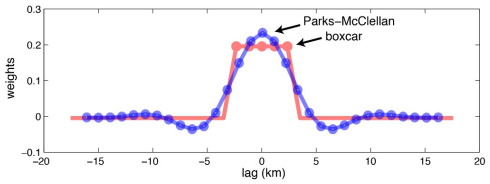
DTU21 Mean Sea Surface.

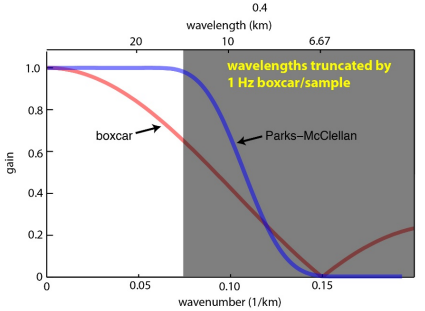


Update with respect to DTU15 and DTU18 MSS.
Ready to be delivered to SWOT for testing. Currently available on (S3A/S3B/S6)

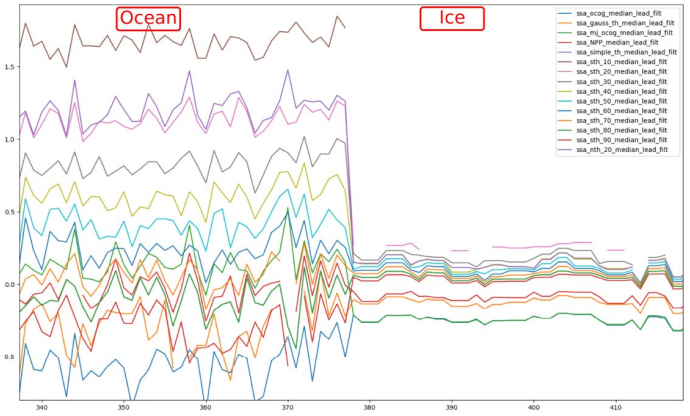
20 Year average (1993-2012) focused on 2003.01 (Similar to previous DTU MSS)
Truly global MSS focused on accuracy and compleness between 90S and 90N.

Shorter wavelength improved through:
Two-pass altimetry for all geodetic missions (C2+SA+JA1+JA2)
Parks McClellan filtered 2Hz Sea surface height data (Limiting spectral hump in LRM)

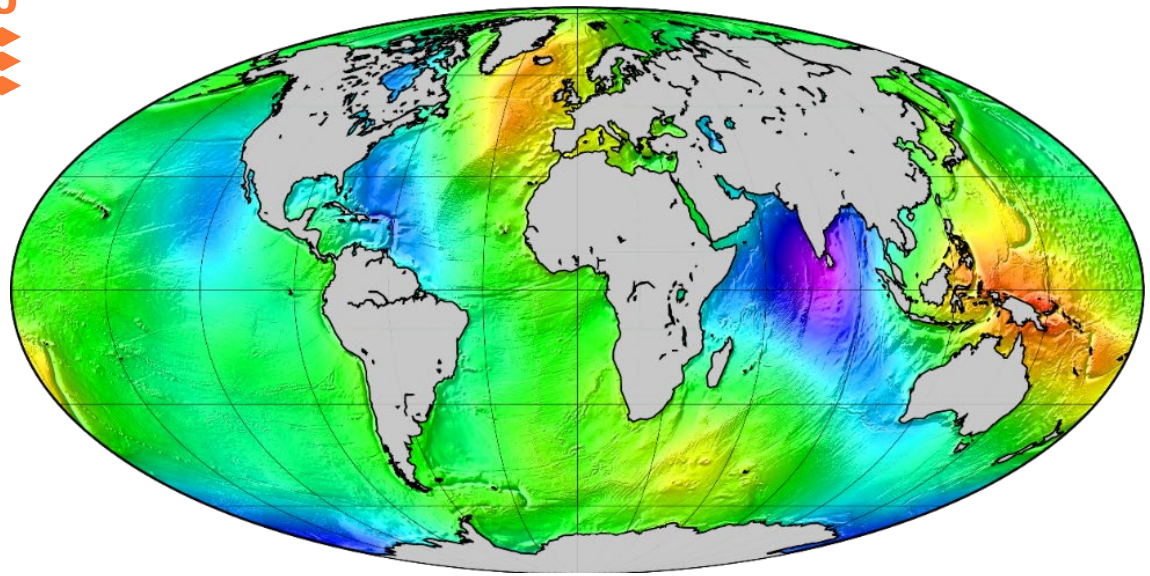




Longer wavelength improved through:
Physical retracking of high latitude regions (C2-SAMOSA+ data using ESA GPOD)
New Sea State Bias for high latitude applied resulting in no-offset
between LRM & SAR (even into Sea Ice)
Using linear SL adjustment to fit C2 data to Jasons at high latitude.



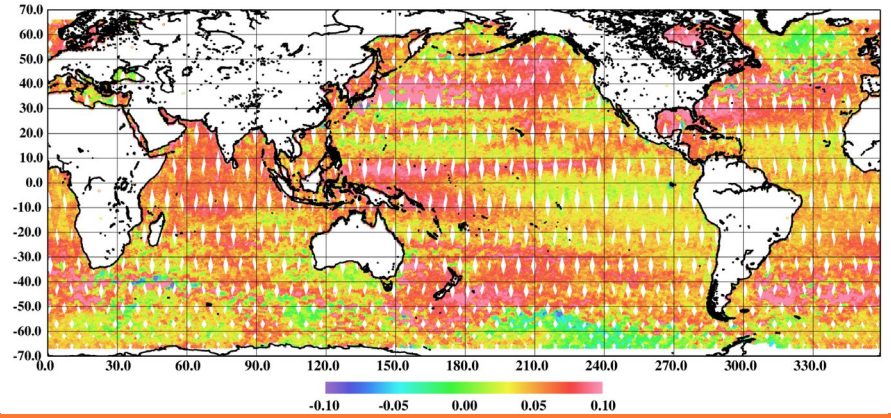
MSS is a fundamental reference for SWOT.



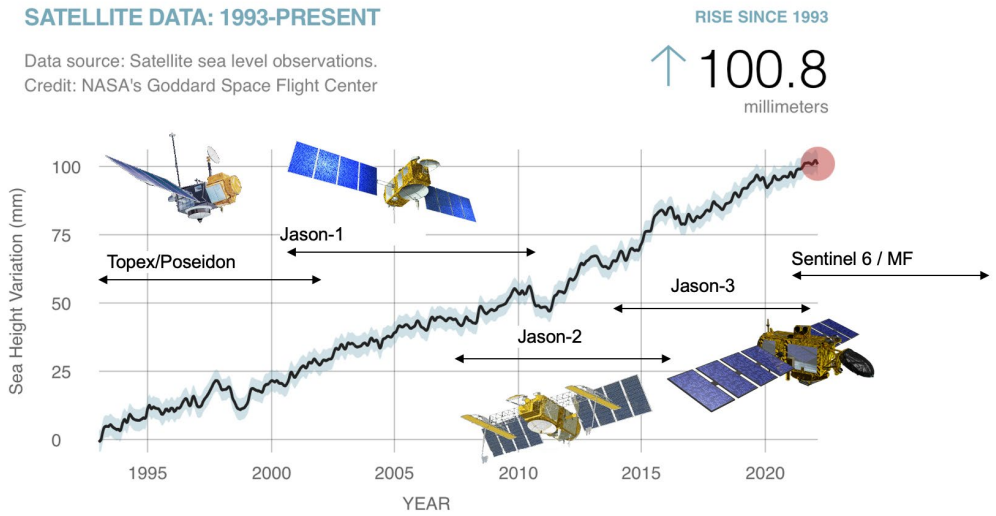
All MSS (DTU/CLS) are averaged over 20 years (1993-2012) so "center time" will be 2003.01.01

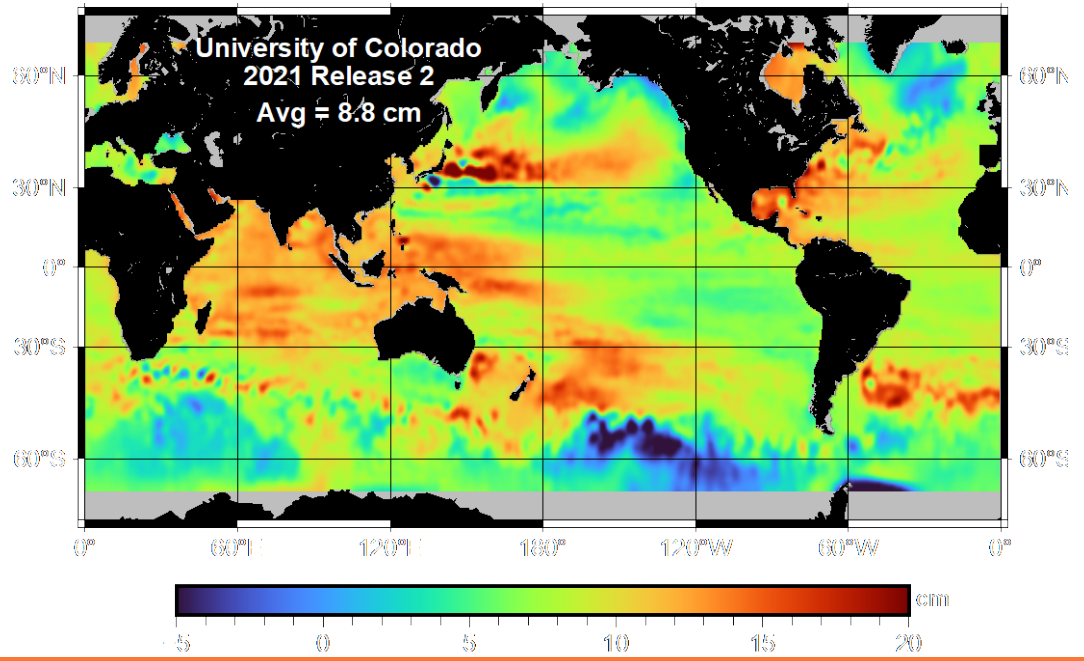
Due to GMSL trend ALL MSS becomes incresingly "**outdated**" with time.

S6 is biased by > 6 cm globally during 2021



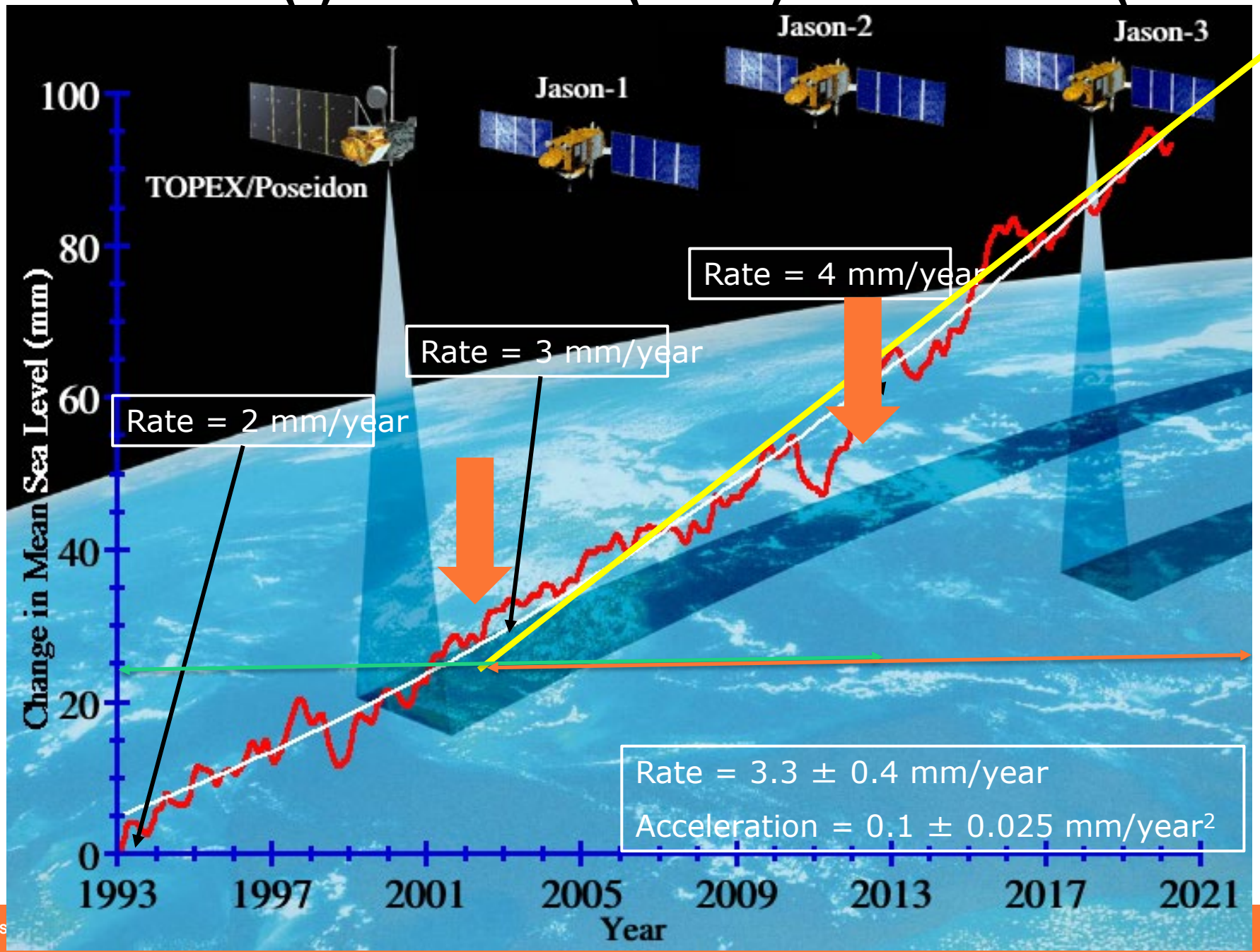
Is a mean a mean?





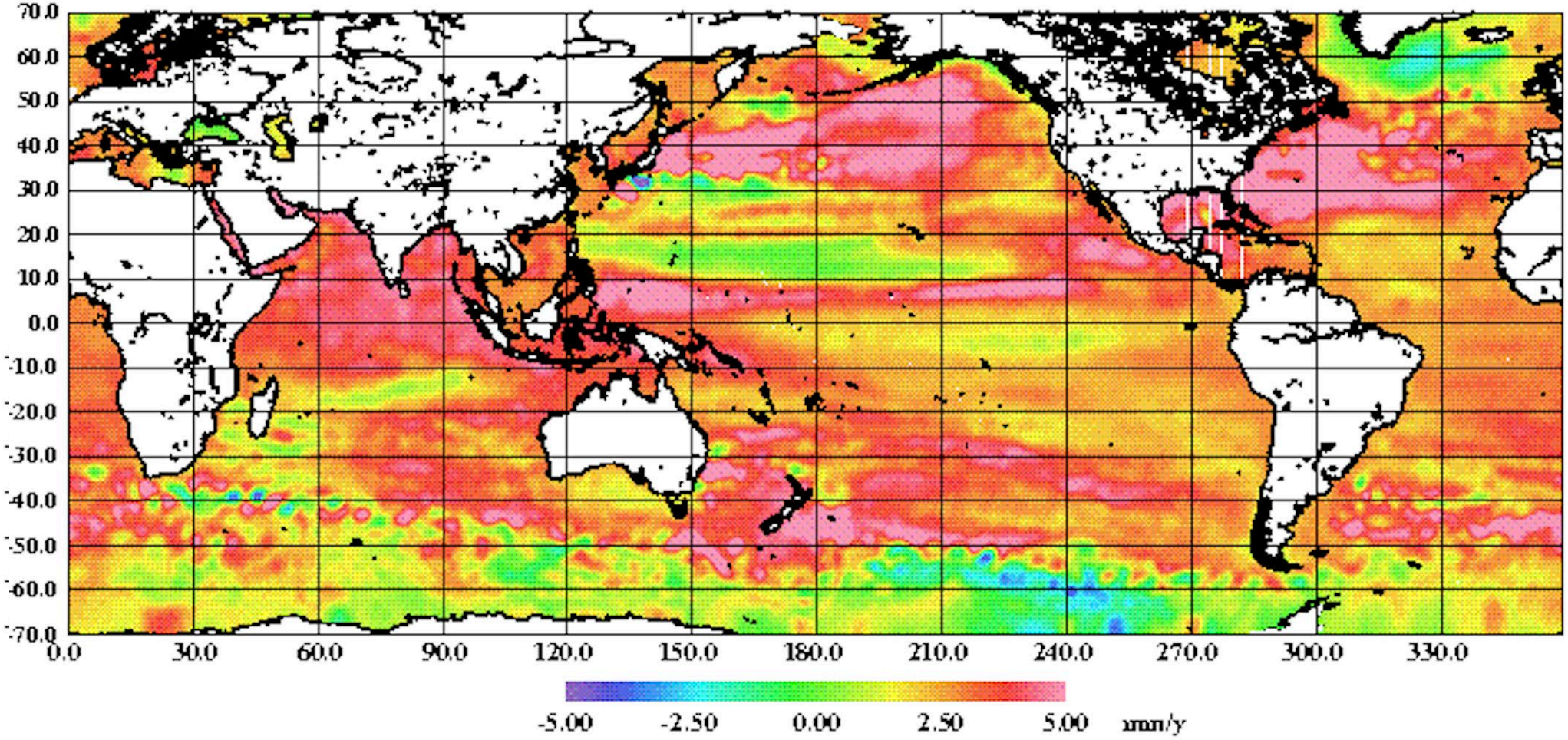
Sea Level Change Jan 1993 - Aug 2021

MSS23EX(t) = MSS23E(2012)+linear SL * (t-2012)



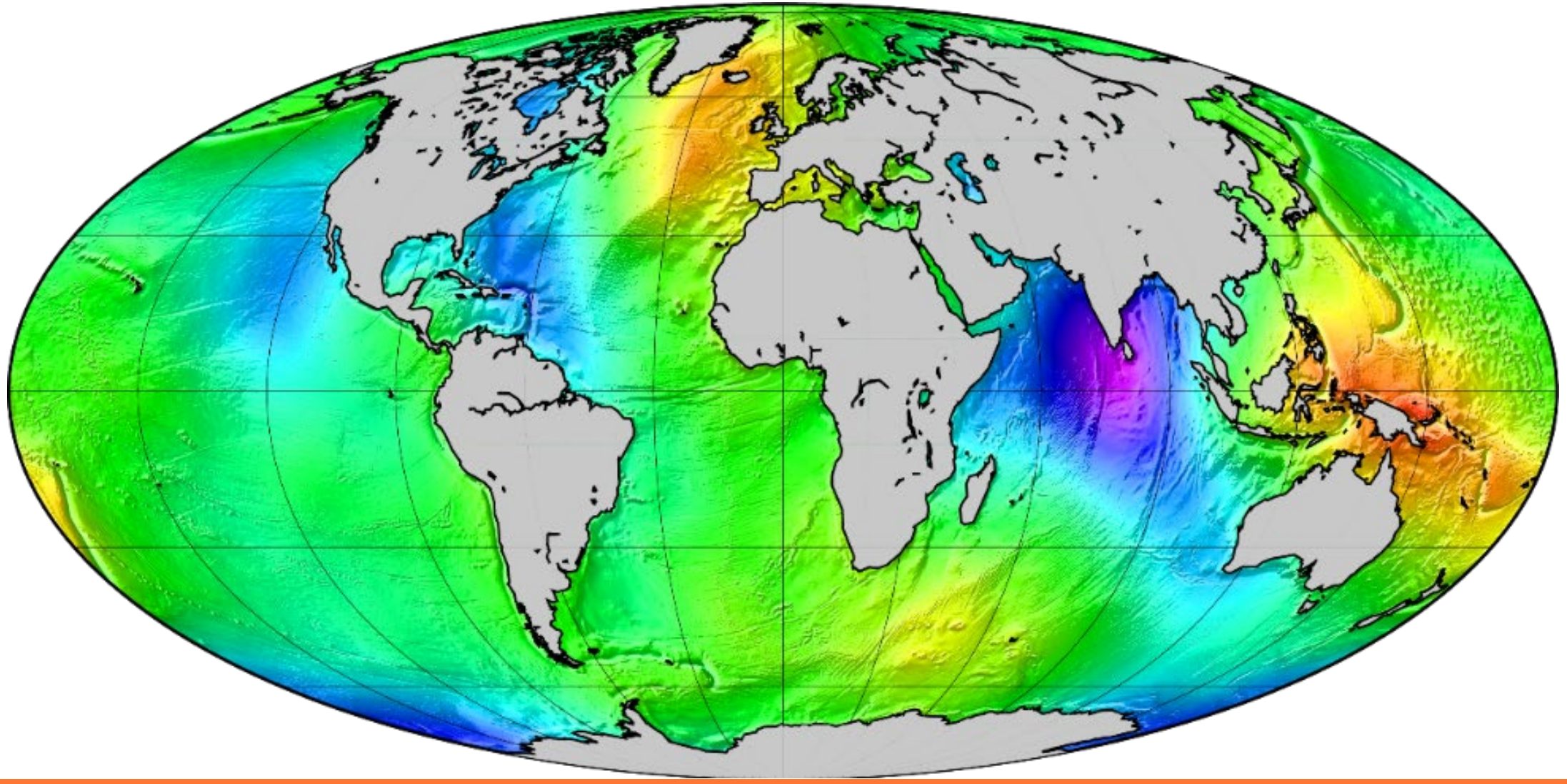
2023

DTU23E: New MSS from 20 years of Jasons (2002-2021) center time will be 2012.01.01



Difference etween DTU23E with DTU21

DTU23EX is now propagated to year 2023.

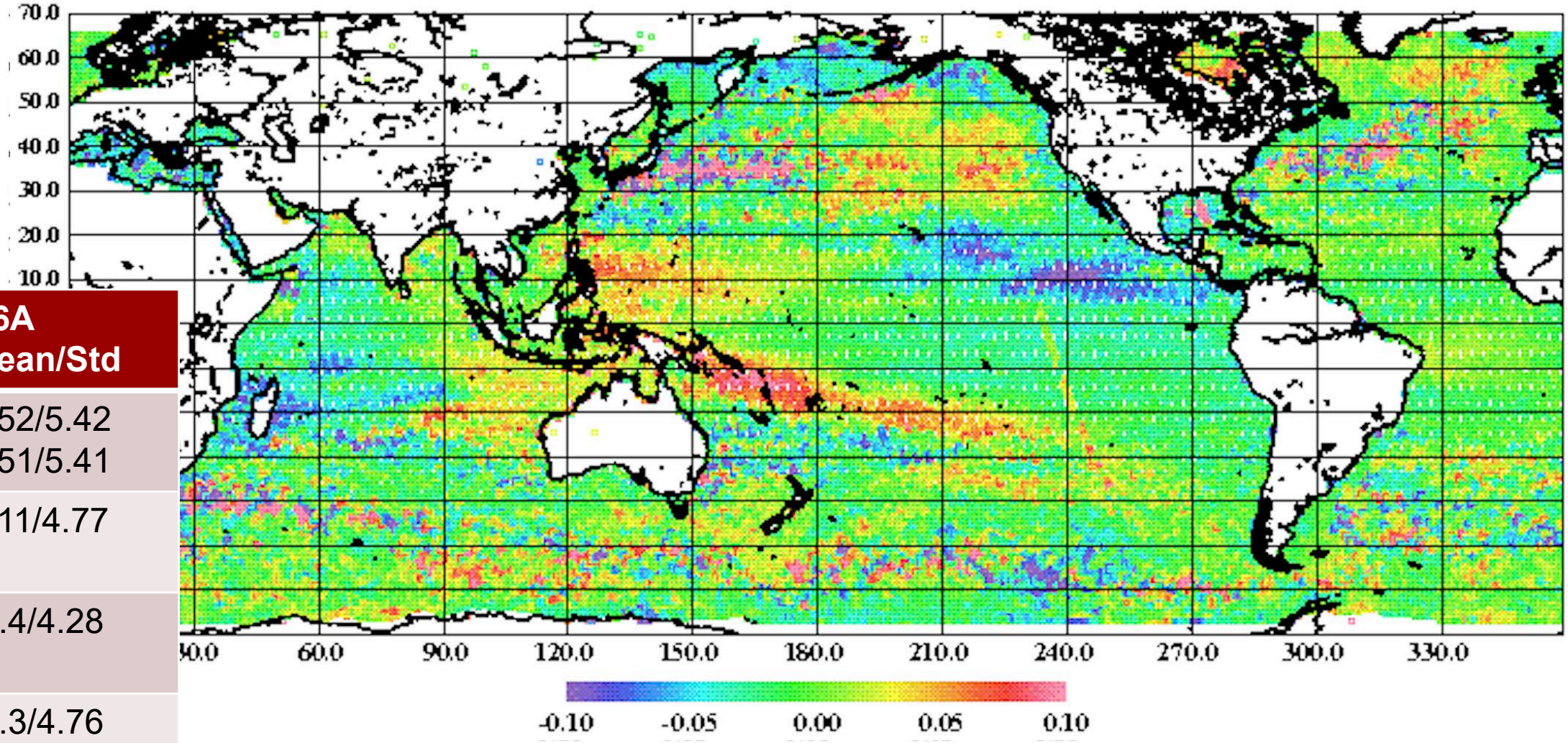


Sentinel-6 – First year average (2021.06->2022.05)

DTU21

DTU23E

DTU23EX



Values in cm	S6A Mean/Std
DTU21 CLS15	4.52/5.42 4.51/5.41
DTU23E (2012)	2.11/4.77
DTU23EX (2021)	-0.4/4.28
DTU21 LinQuad	-0.3/4.76

MSS for SWOT

- Discussion:
  - How important is adding MSS(t)?
  - Would a mean sea surface slope model be useful (along- and cross-track slope)?
  - Does one the MSS need to be embedded in the SWOT product?
  - Will SWOT measure the nadir SSH or the closest reflection SSH?