

A 20-YEAR REFERENCE PERIOD FOR SSALTO/DUACS PRODUCTS

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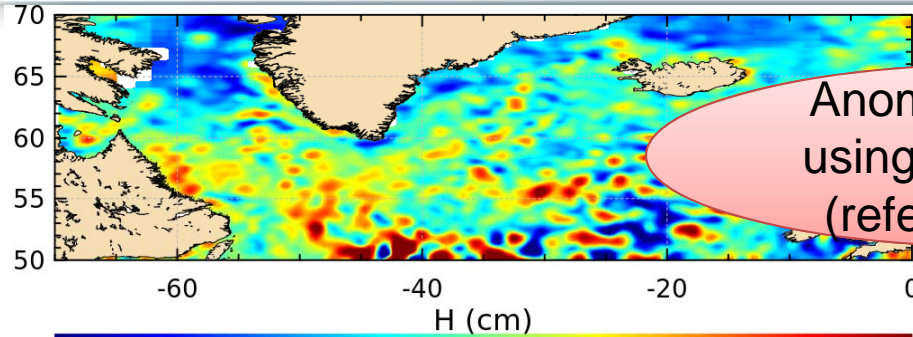


OSTST Boulder, October 2013

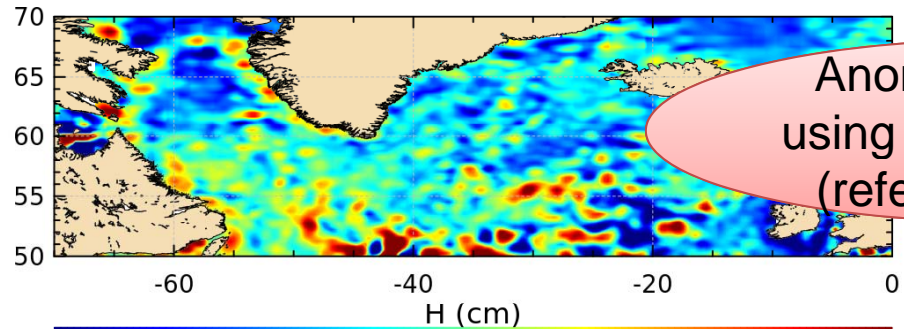
- What is a reference period
 - for SLA
 - for MSS
 - for MDT
- Changing to a 20yr reference – impact of the change
- Aviso product: Practical information on the change

What is the reference period ?

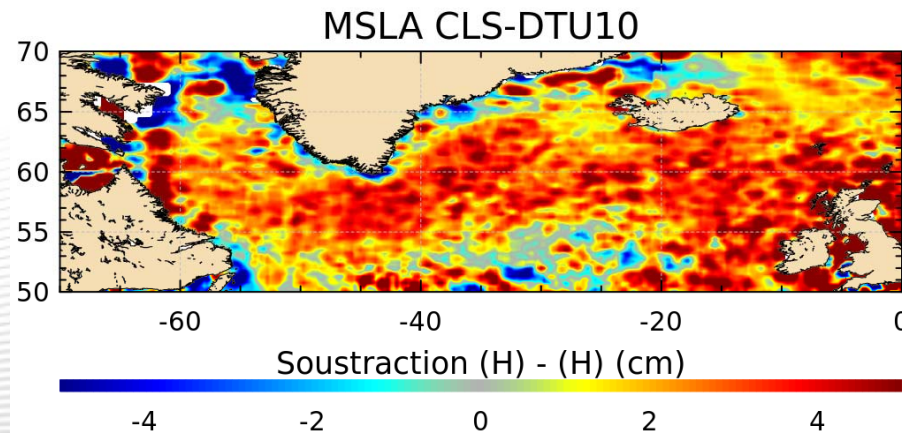
Gridded SLA Map
using MSS CLS11
on 26/09/2013



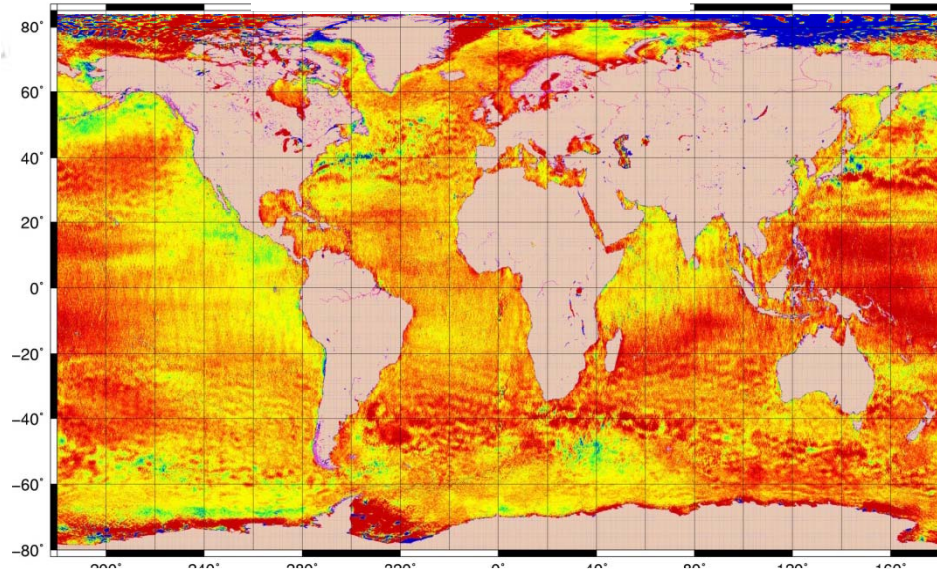
using MSS DTU10



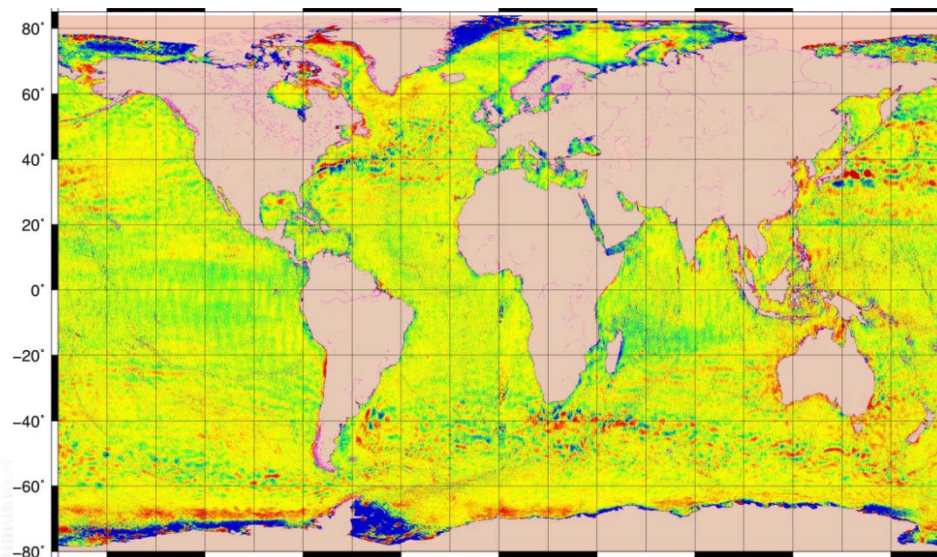
SLA CNES/CLS11
-
SLA DTU10



DTU10 – CNES_CLS11

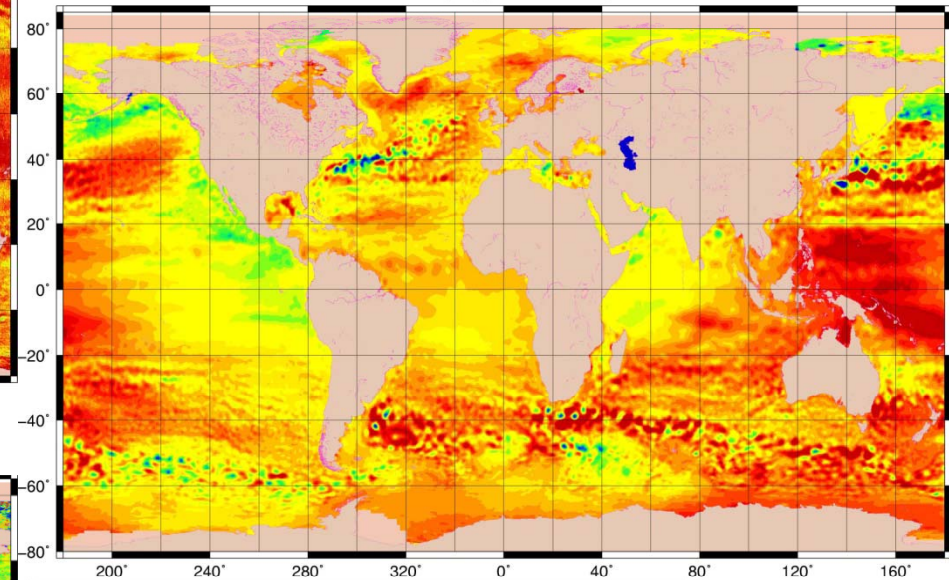


DTU10 corrected – CNES_CLS11

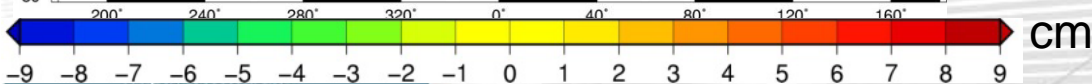


Map of SLA
17 yrs (DTU) vs. 7 yrs (CLS/CNES)

MSLA (cm) [1993 – Mi-2009]

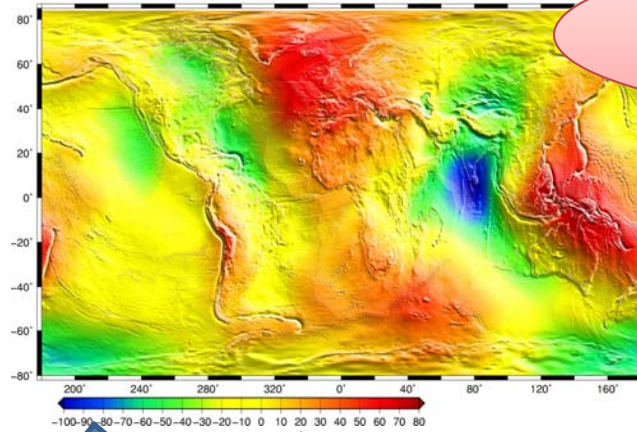
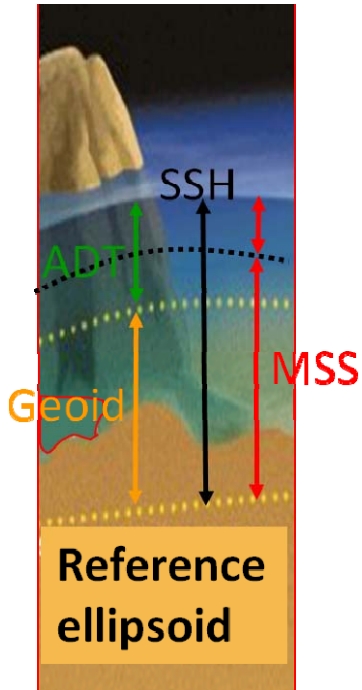


- The large scale signal visible in the difference of the two MSS are due to the difference of content
- When the files are referenced on the same period, these large scales signal disappear.



What is the reference period ?

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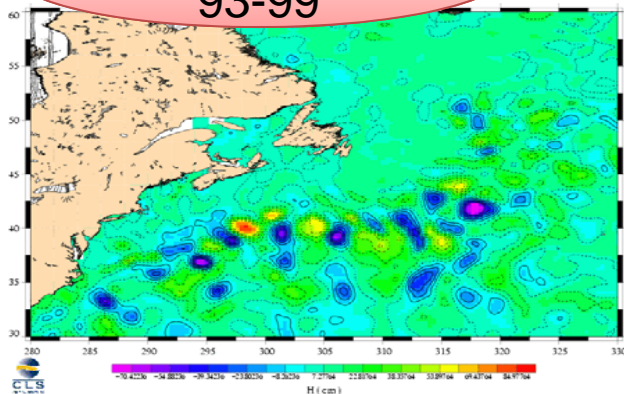


Contain geoid + mean of SL over 93-99

Mean Sea Surface (CLS01, CNES/CLS11)
Contain the mean of Sea Level between 93 and 99

Anomaly to 93-99

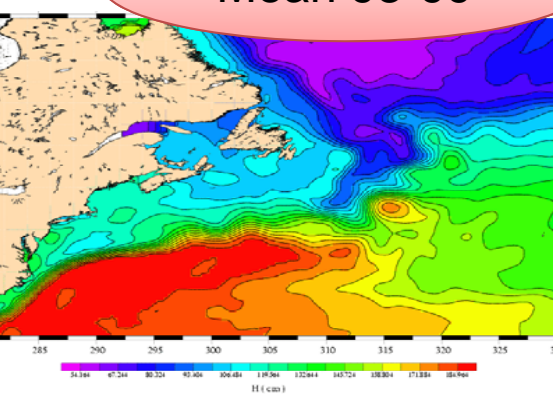
Mean 93-99



Altimeter Sea Level Anomalies

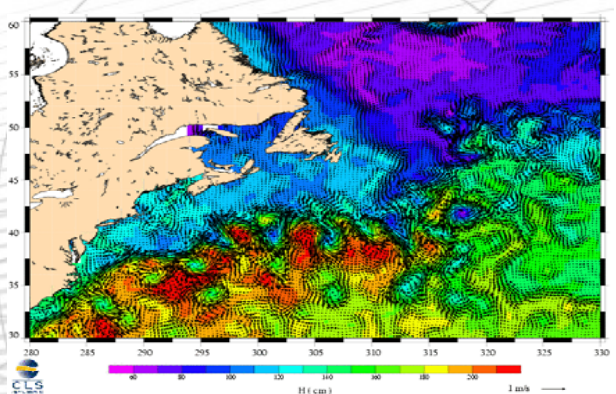
<http://www.cls.fr>

+



Mean Dynamic Topography

=



Absolute Dynamic Topography

Changing to a 20-year reference

6

=>Early version of Aviso products were computed using a 3-year mean

=>Then, a 7 year mean was computed has part as the computation of MSS CLS01, 12 years ago.. MSS CNES CLS 11 was computed from 17 years of altimetry but choice made to stay on the 7 year reference period to allow continuity and consistency of the product, notably to allow users to use the MDT distributed by Aviso. Since then, Ssalto/Duacs SL Anomalies products are referenced to the 7-year period [1993, 1999].

=>But With 20 years of altimetry time series it's time to change. As nearly 20 years of altimeter measurements are now available it is of high interest to change the reference period for a longer period which will lead to better interannual signals and true oceanic anomalies

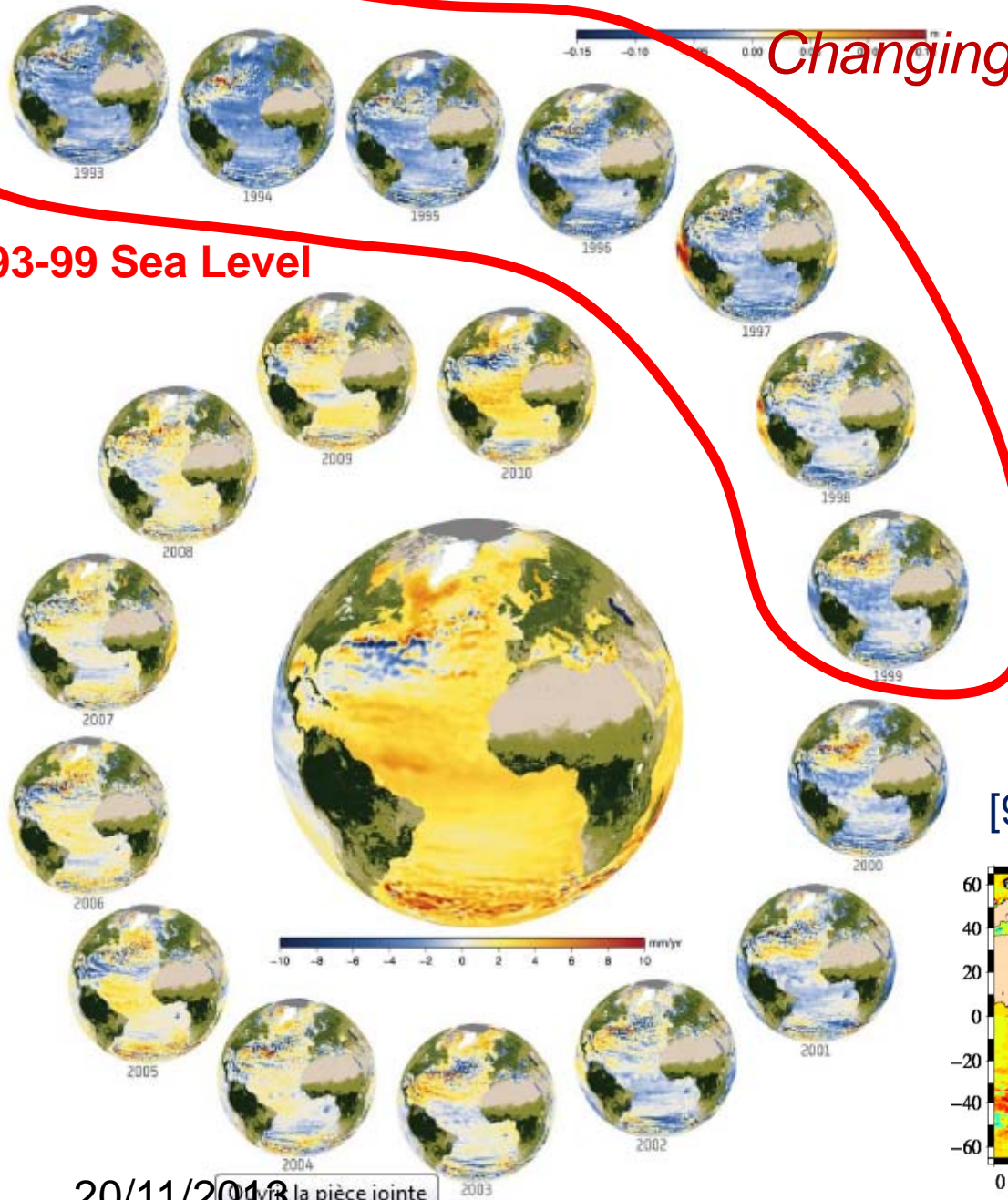
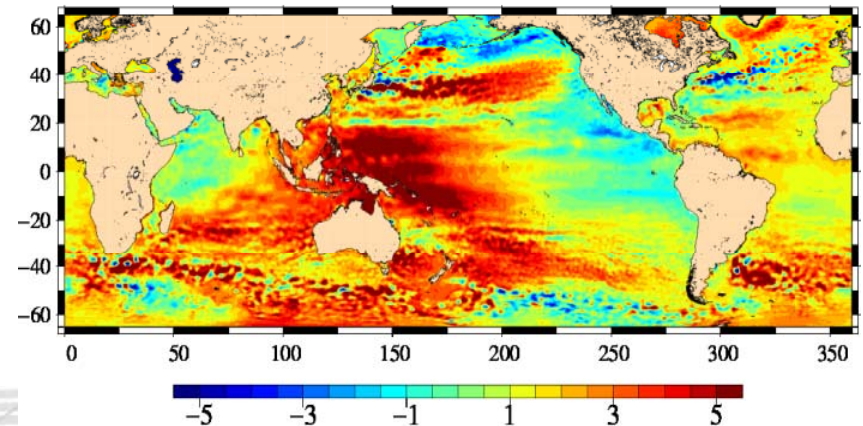
Changing to a 20-year reference

93-99 Sea Level

The Change to a 20 year reference means to take into account the Sea level evolution during the 2000-2012

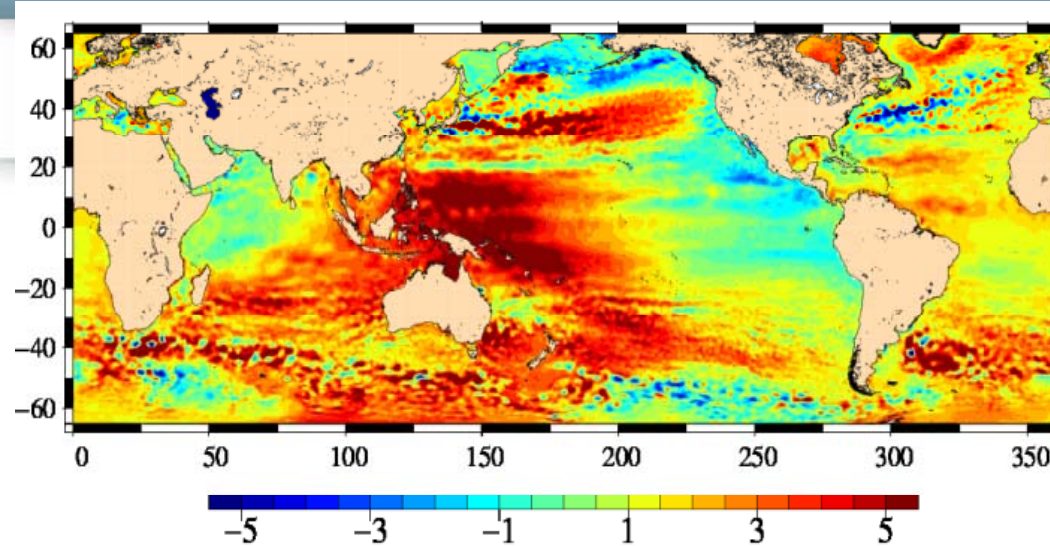


[93-99] to [93-2012] impact (cm)



20/11/2013 la pièce jointe

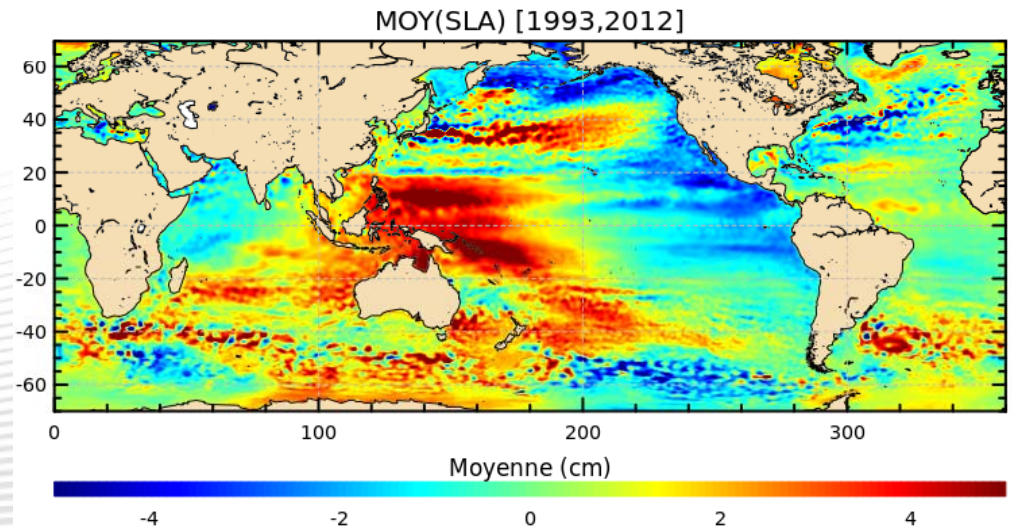
[93-99] to
[93-2012]
impact (cm)



Contains a Global component

Contains a Regional component

+ 2.5cm global bias

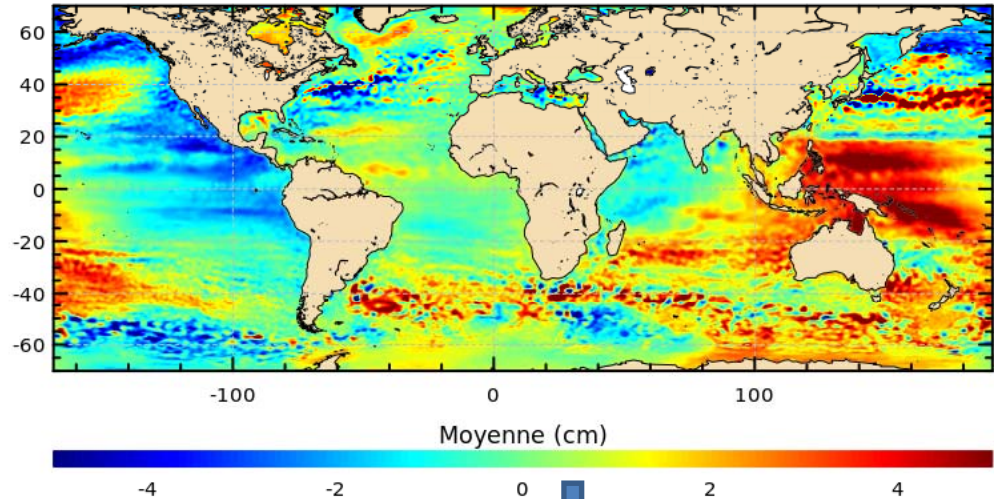


+ 2.5 cm global bias

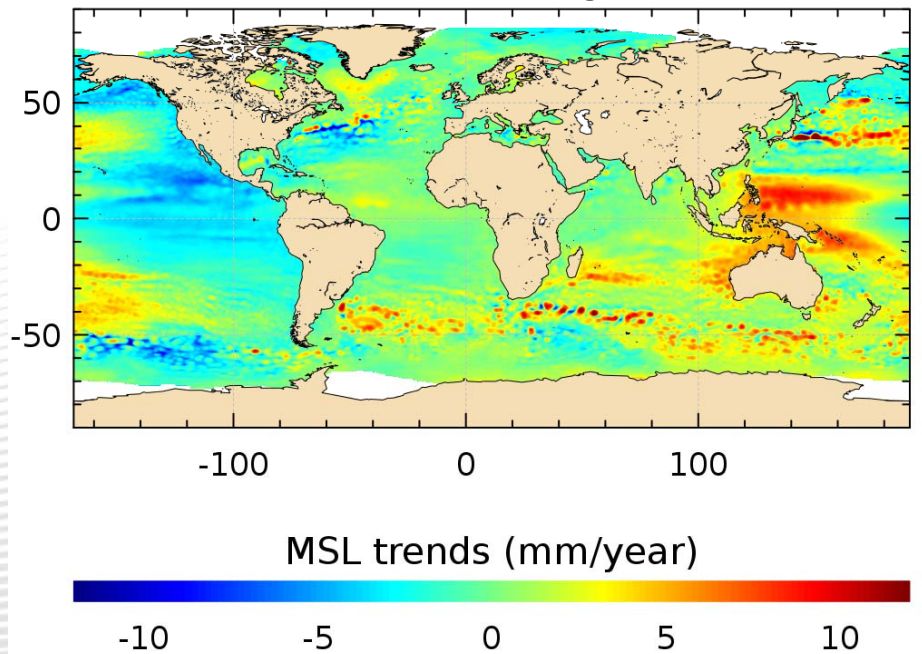
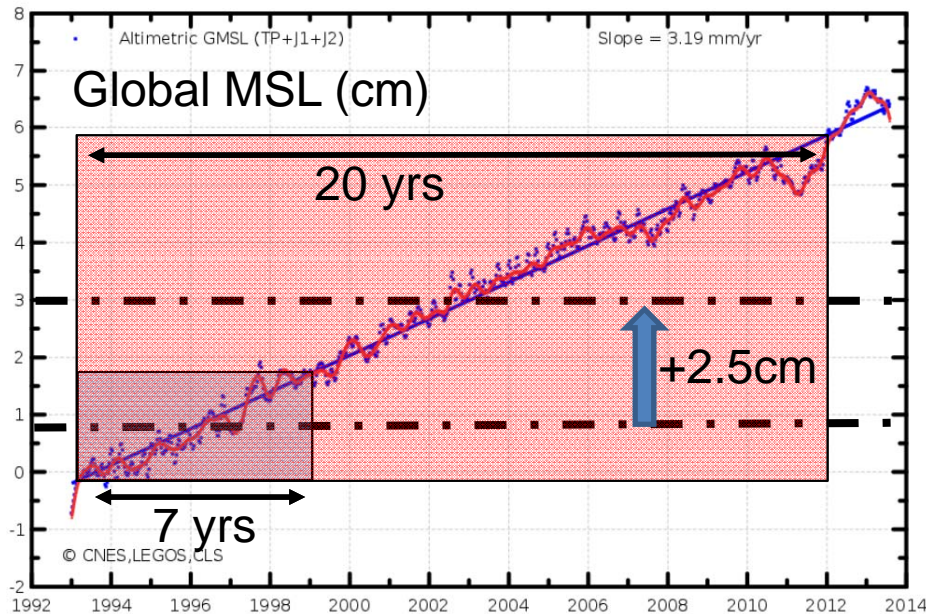


Due to Global MSL Rise

MOY(SLA) [1993,2012]



Due to Regional variability of the MSL evolution (regional trend and interannual signals)

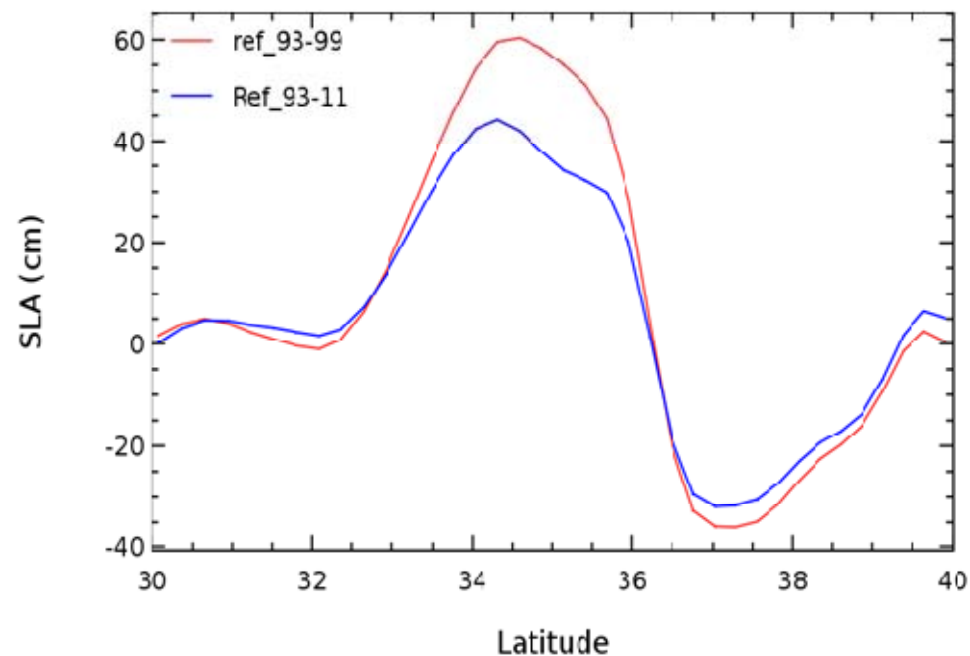


Changing to a 20-year reference

=> What impact on DUACS/Aviso users

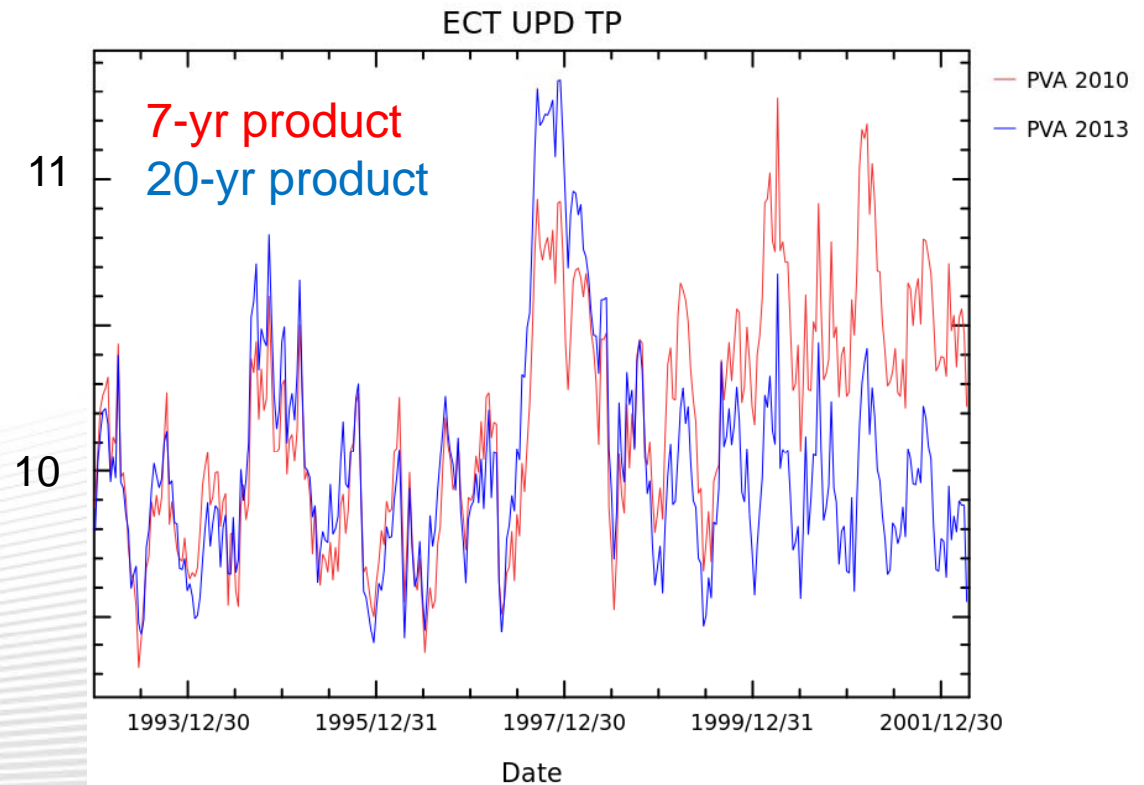
- ✓ Impact on Global bias? **No**, because the Aviso convention is to have the average of Sea Level over 1993 equal 0. => the 2.5cm global impact will be removed in this operation.
- ✓ Spatial impact on the mean for all SLA along track and gridded products: up to 5cm regional biases and more in region of high variability

J1 pass crossing the Kuroshio in December 2011



- ✓ Evolution of the spatial variability of the SLA is changed :
 - With a [1993-1999] reference period, the variability increase after 1999
 - With a [1993,2012] reference, no increase after 1999; the signature of ENSO 97-98 is higher

Standard deviation of Sea Level Anomaly from along track T/P data (cm)



- ✓ Evolution of the spatial variability of the SLA is changed :
 - With a [1993-1999] reference period, the variability increase after 1999
 - With a [1993,2012] reference, no increase after 1999; the signature of ENSO 97-98 is higher

But :

- ✓ No impact on MSL Trends
- ✓ No impact on ADT

- In March 2014 Ssalto/DUACS will deliver 20-year referenced products:
 - ⇒ On real time SLA/MSLA. The referenced products will be delivered in new directory while the old products will continue during a limited period
 - ⇒ On Delayed time SLA/MSLA, associated with a complete reprocessing of the 20 years of the altimetry time series
- A correction for changing 20-year → 7-year reference will be provided in order to allow you stay on the current reference and keep on using your current MDT

$$\text{ADT}_{\text{alti}} = \text{SLA}_{20\text{-y}} + \text{MDT}_{20\text{-y}}$$



You must use the MDT referenced on the 20-year

~~$$\text{ADT}_{\text{alti}} = \text{SLA}_{20\text{-y}} + \text{MDT}_{7\text{-y}}$$~~

You must not use the same MDT as the current one (i.e. 7-year reference)

T/P/ JA1/JA2

TP/JA1 inter

ERS-1/2/EN

GFO

ERS-1 Geo

EN Geo

JA1 Geo

Cr2

