

Bilan de 19 ans de mesures spatiales

des transferts de masse terrestres : missions **GRACE / GRACE-FO**

Séminaire missions spatiales sur l'hydrologie continentale (OMP)

1^{er} octobre 2021

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Gravimétrie satellitaire

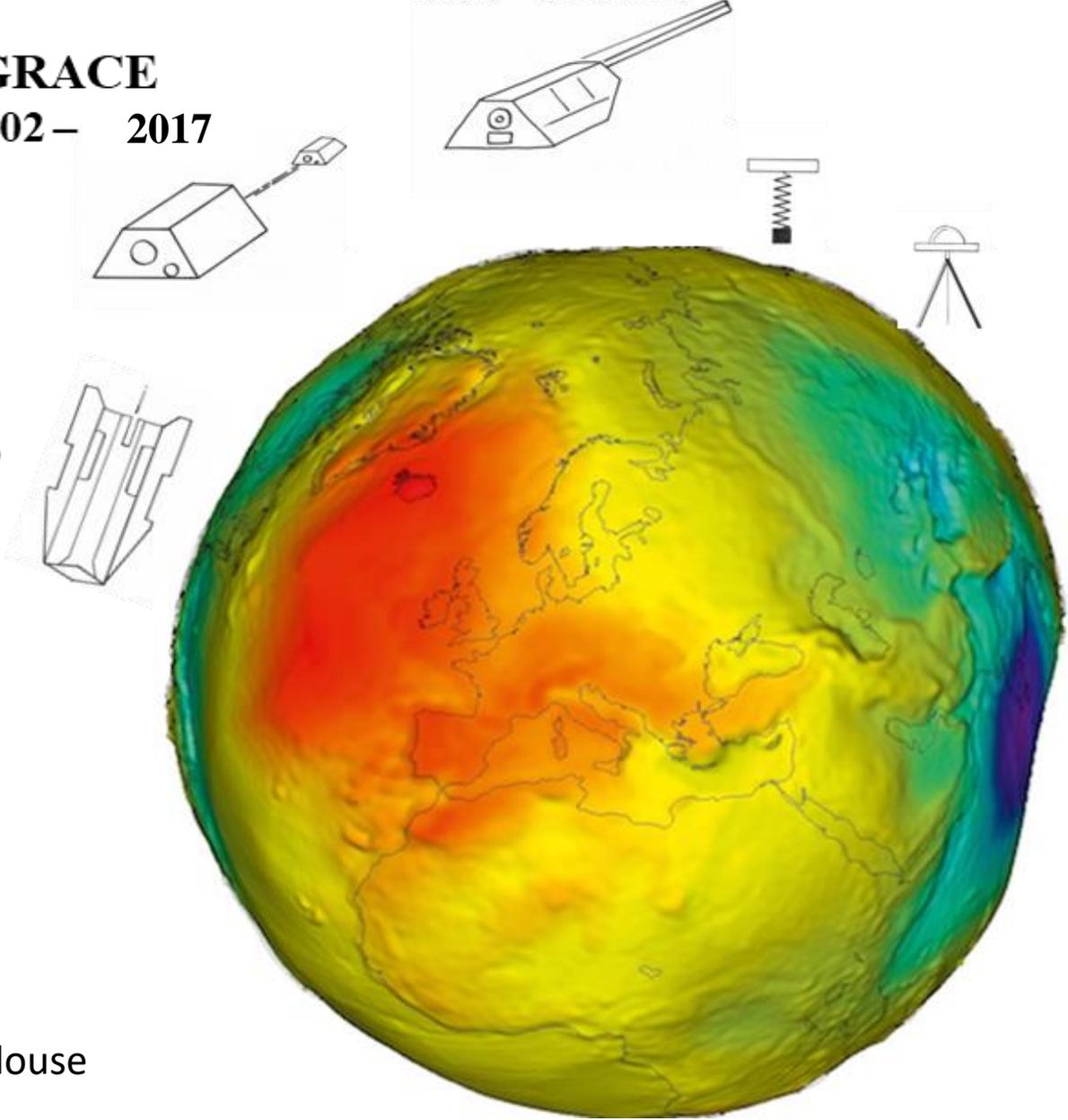
Principes

GRACE-FO
05/2018 - Present

GRACE
03/2002 – 2017

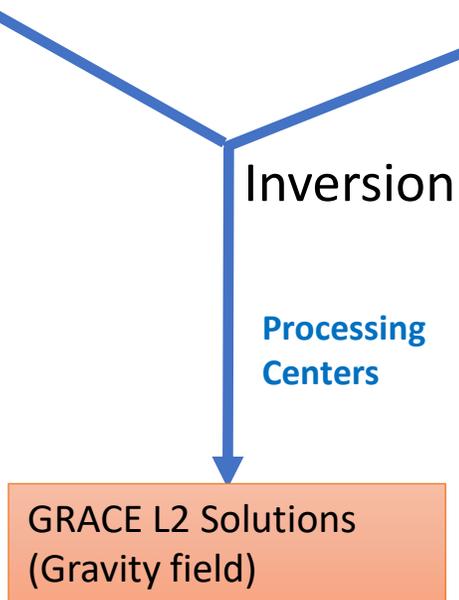
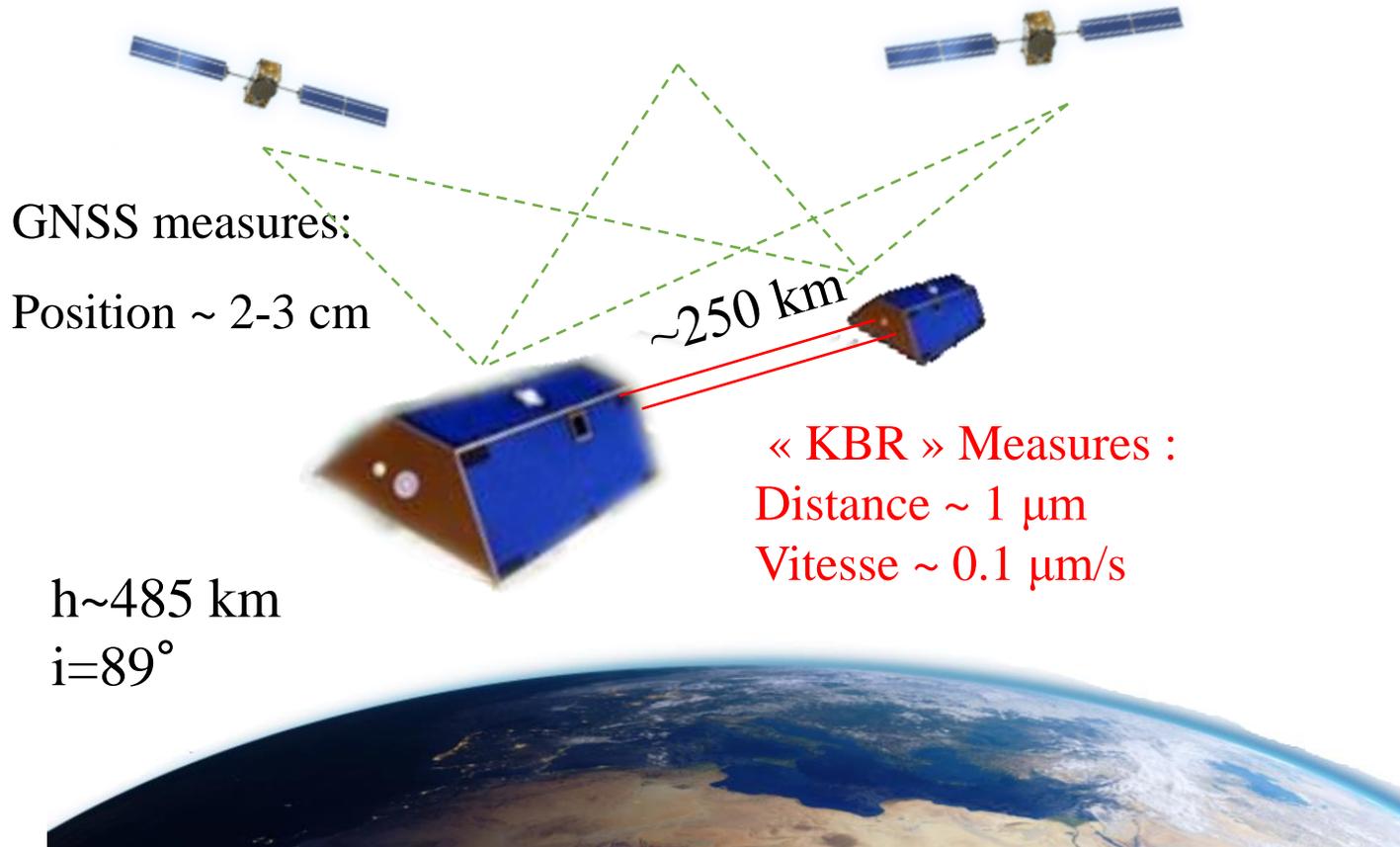
CHAMP
07/2000 – 09/2010

GOCE
03/2009 – 11/2013



Source: GGS, GET UMR5563, Toulouse

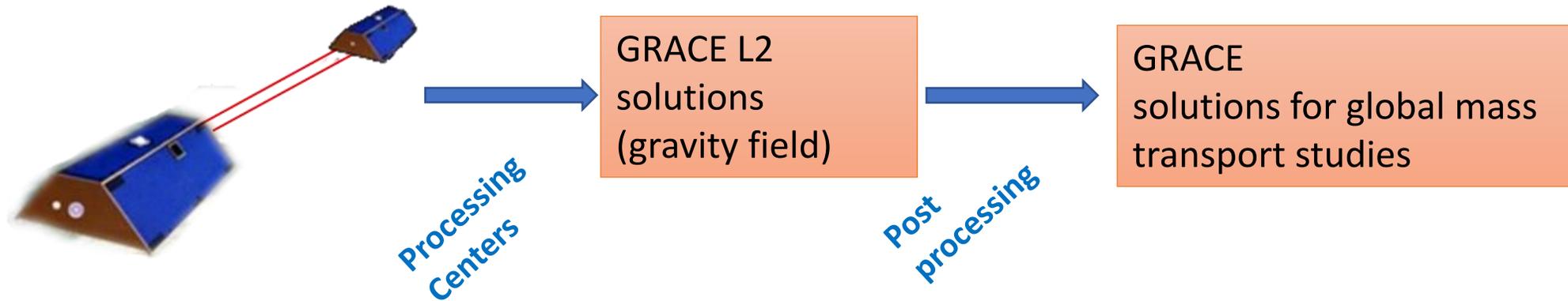
GRACE & GRACE FO missions



Max. degree : 60 – 90

Spatial resolution : 300 – 400 km

Post processing parameters



➤ L2 Limitations

- Geocenter motion
- Earth oblateness
- Anisotropic noise
- Leakage and Gibbs effect

➤ Solid-Earth Changes

- GIA correction
- Pole tide correction
- Earthquakes
- ...



Présentation

Le Groupe de Recherche de Géodésie Spatiale (GRGS) est un groupement scientifique qui fédère en France des équipes de recherche appartenant à 11 institutions nationales ayant des activités en géodésie spatiale :



Actualité

FAIT MARQUANT : STATION DE TÉLÉMÉTRIE LASER MÉO

Concernant la station de télémétrie laser MéO, les faits marquants pour 2018 sont : - Projet Européen EURAMET- S09 GeoMetre accepté, start date : 1 juin 2019 pour une durée de 36 mois.- télémétrie laser laser two-way sur la sonde lunaire LRO en collaboration avec la NASA-Goddard : 1e mondiale (bilan de liaison 10 fois [...])

Nov / 17 / 2020

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The *Marvellous* GRACE Plotter

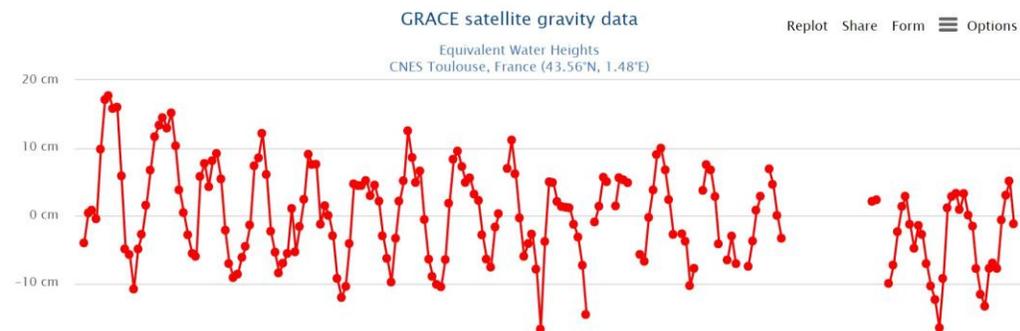
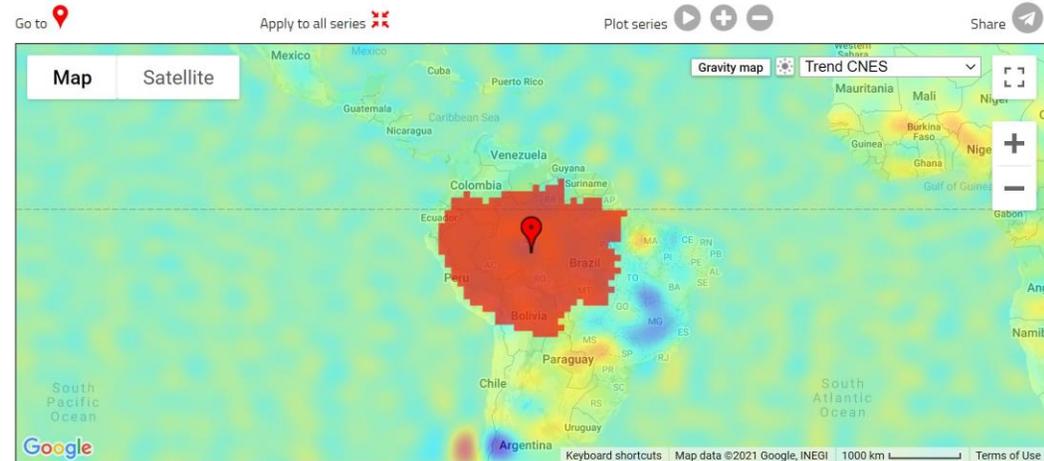
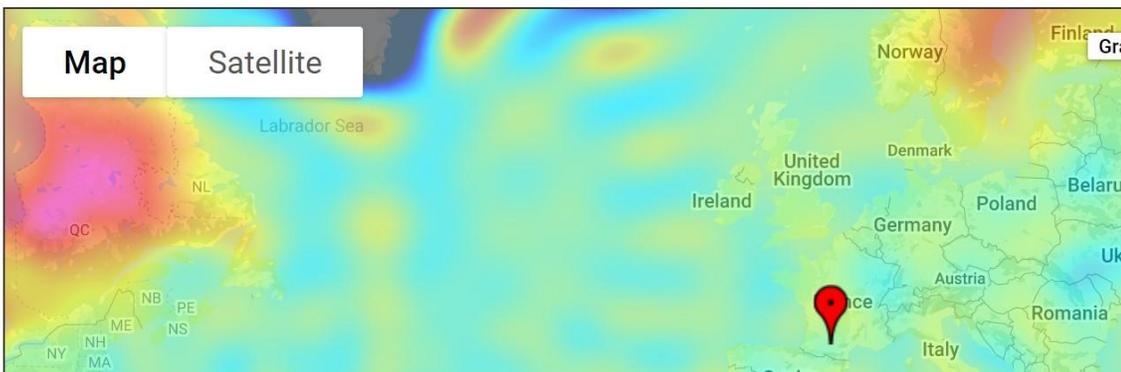
- 1 Select your gravity data
- 2 Choose your geographical area
- 3 Plot time-series
- 4 Export your graph

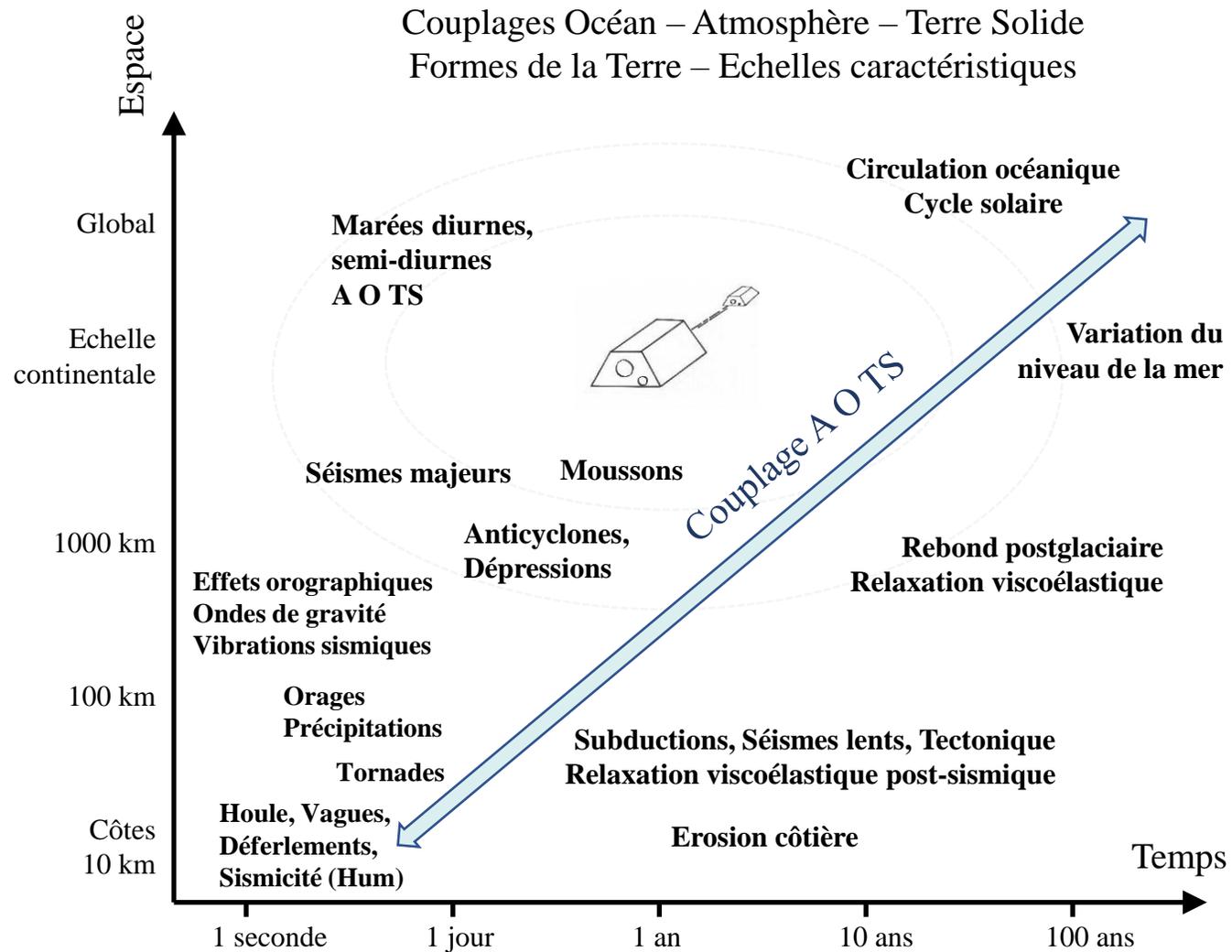
Statistics

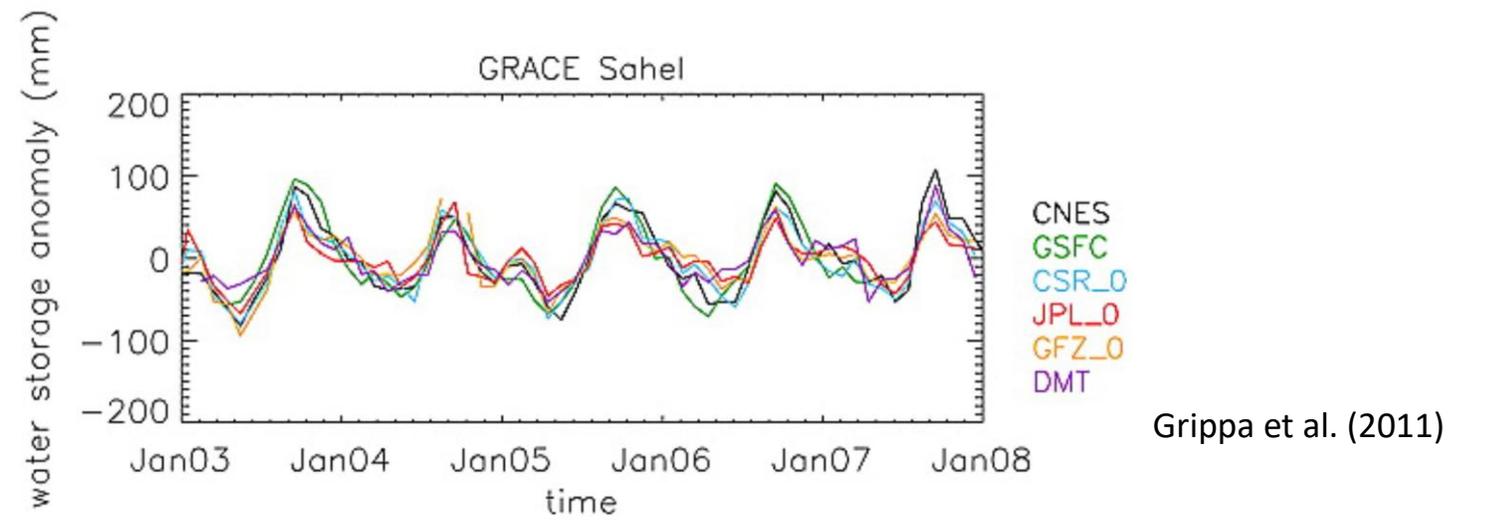
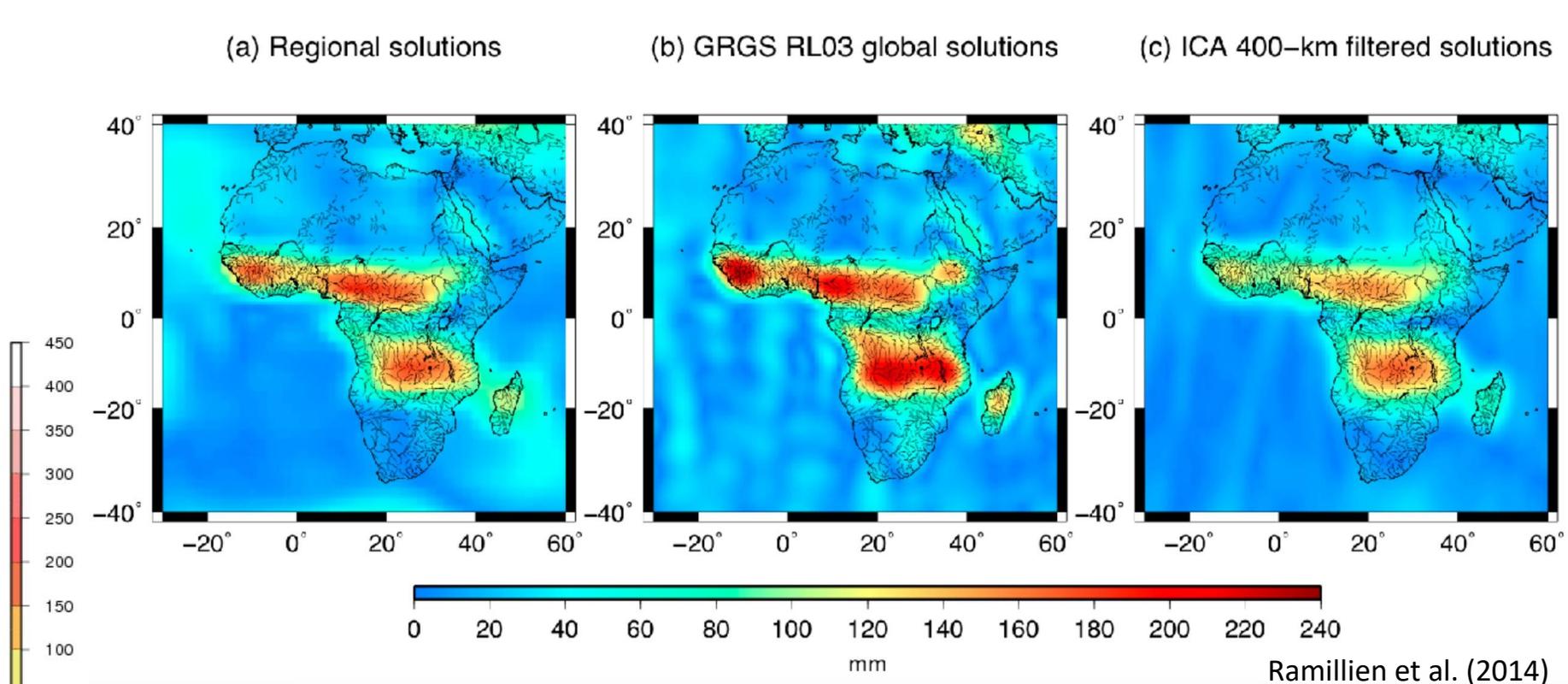
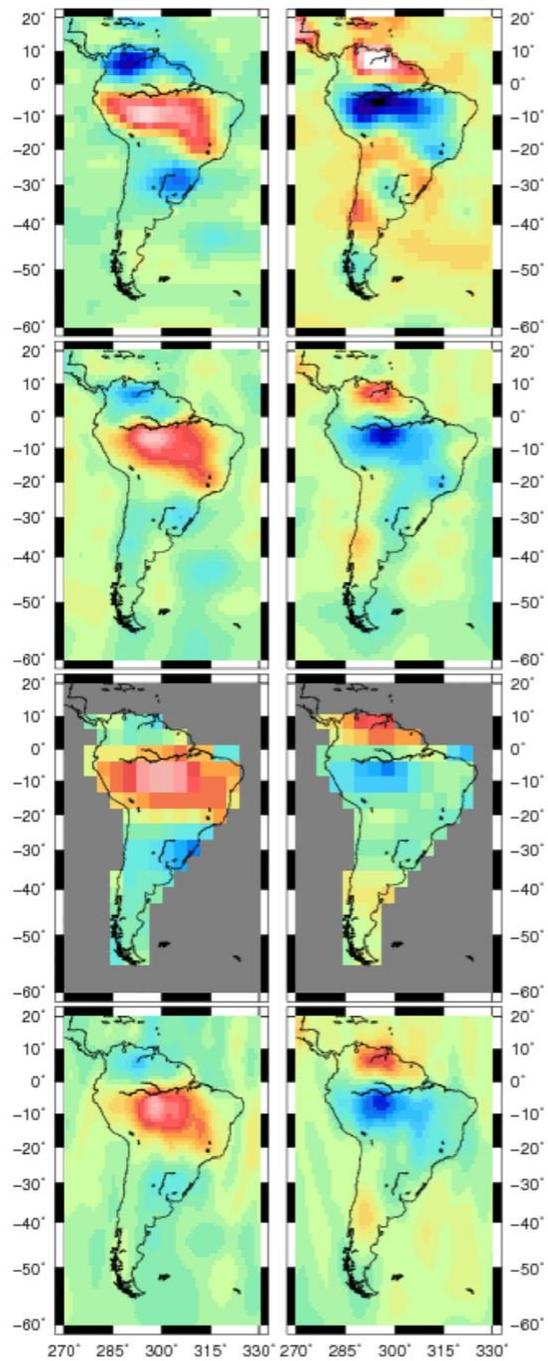
Plot GRACE time-series

Series title	Gravity functional	Data center and version	Area	Latitude	Longitude
Series 1	Water heights	CNES RL05 monthly	Point	43.561845	1.481594

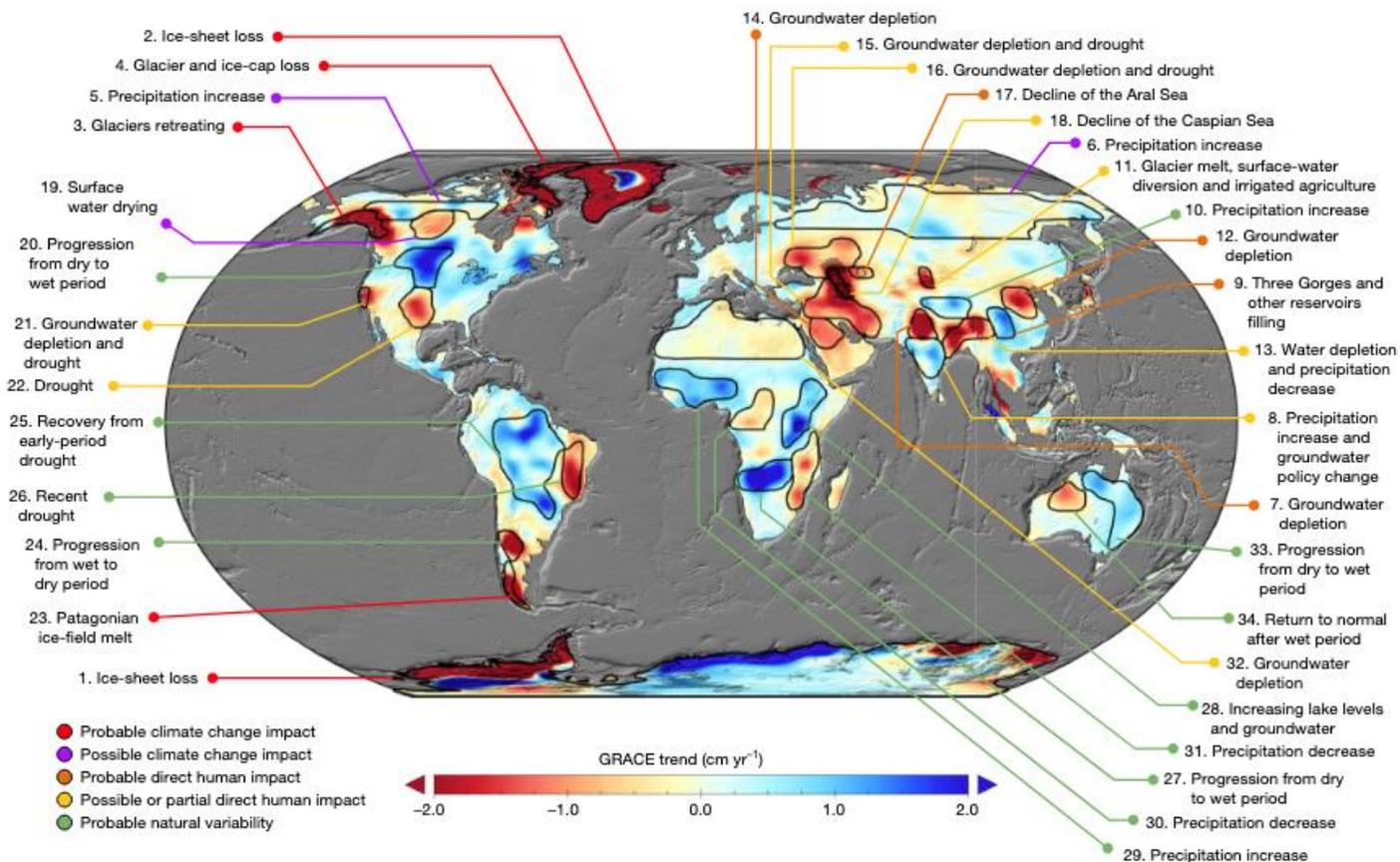
Go to Apply to all series Plot series





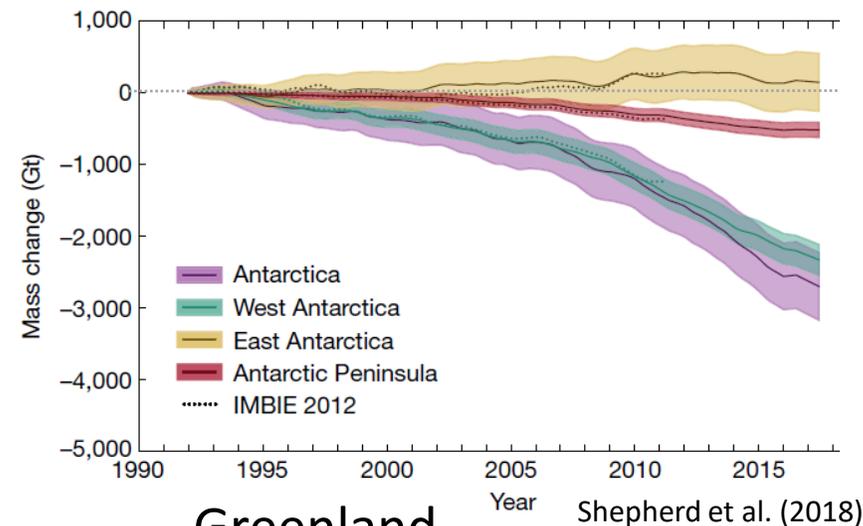


GRACE-based water mass changes



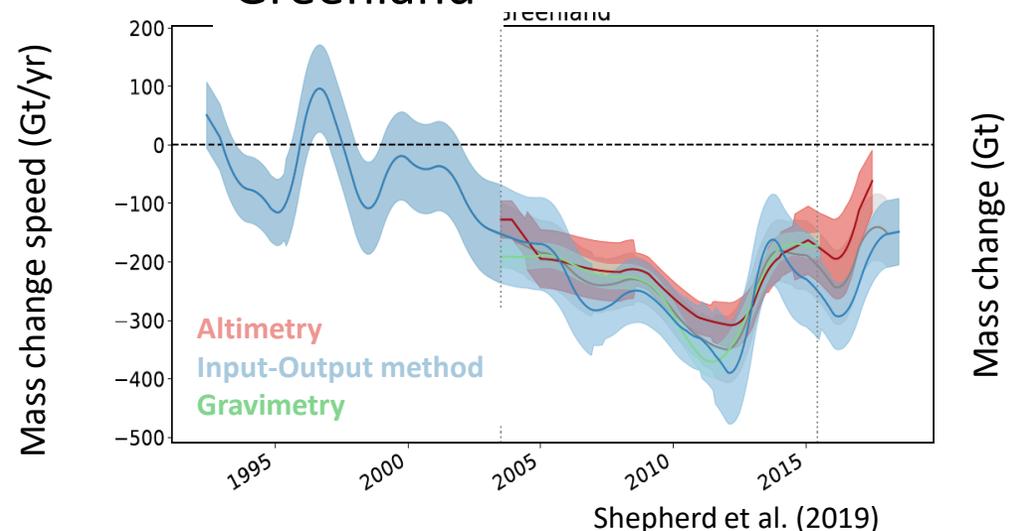
Rodell et al. 2018

Antarctica



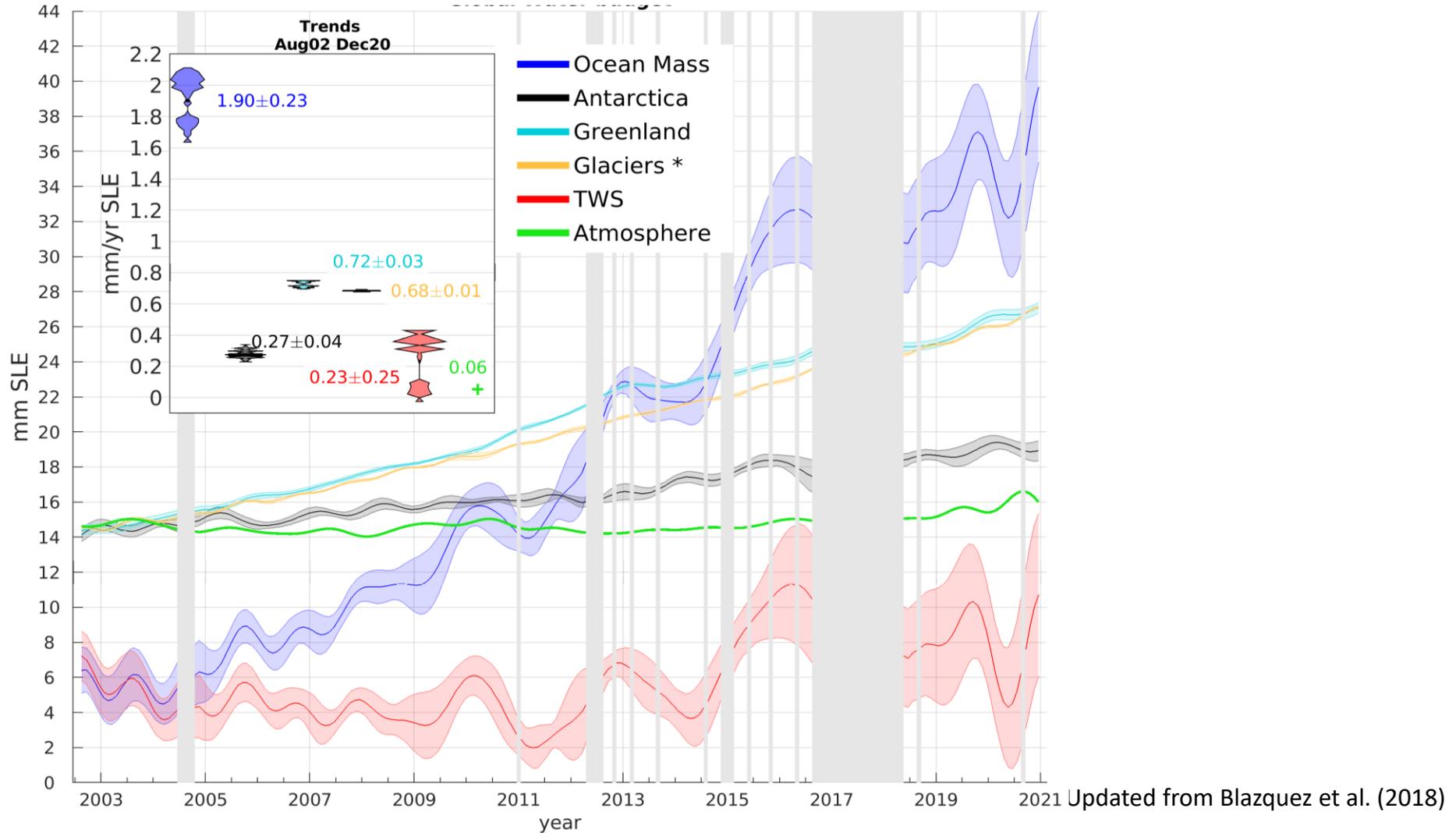
Shepherd et al. (2018)

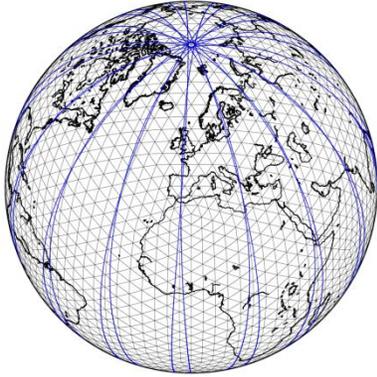
Greenland



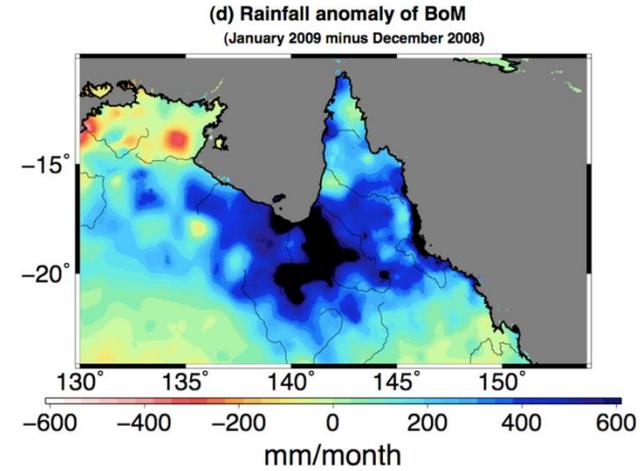
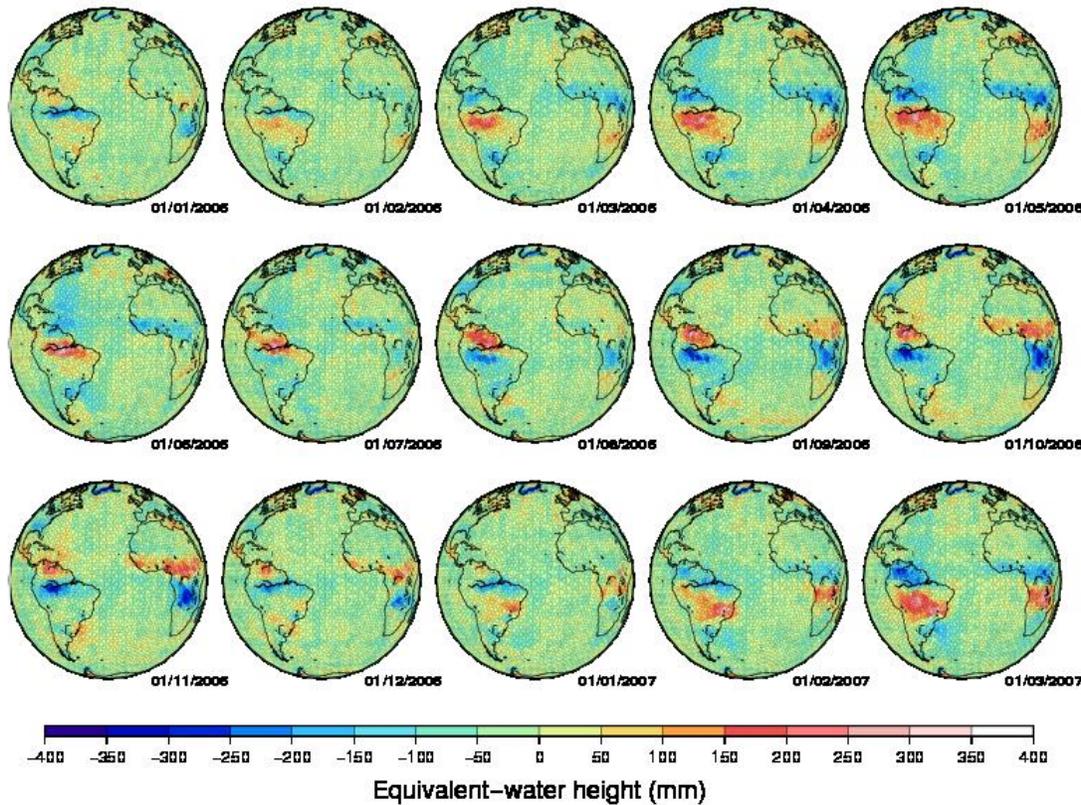
Shepherd et al. (2019)

GRACE-based global water budget



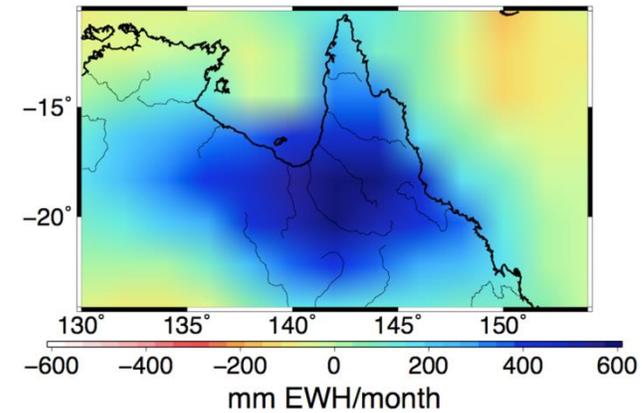


Détermination des variations journalières du stock d'eau continental à partir des données de la mission GRACE

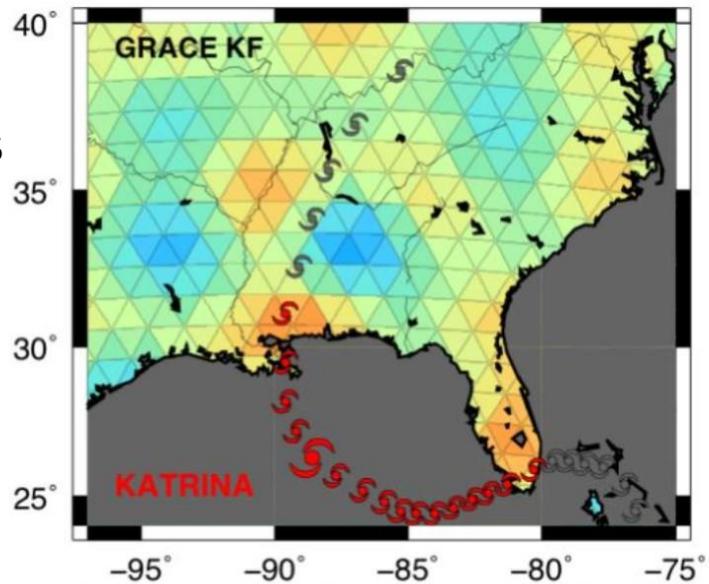


11-12 / 01 / 2009

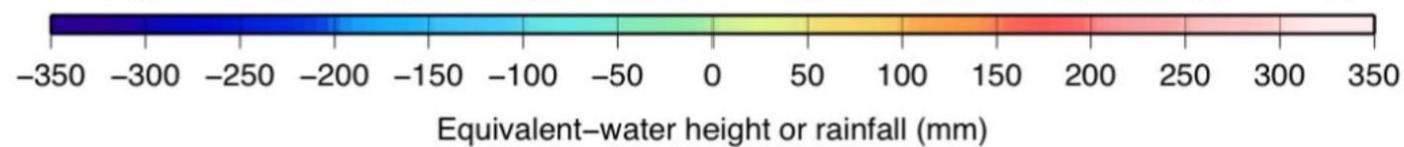
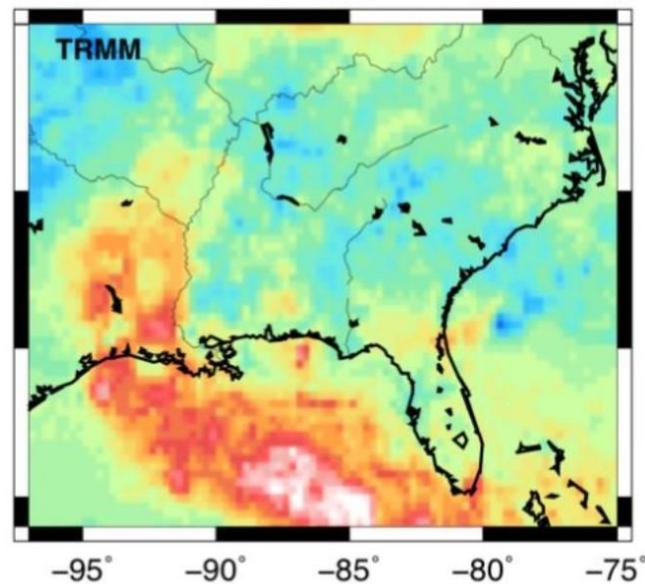
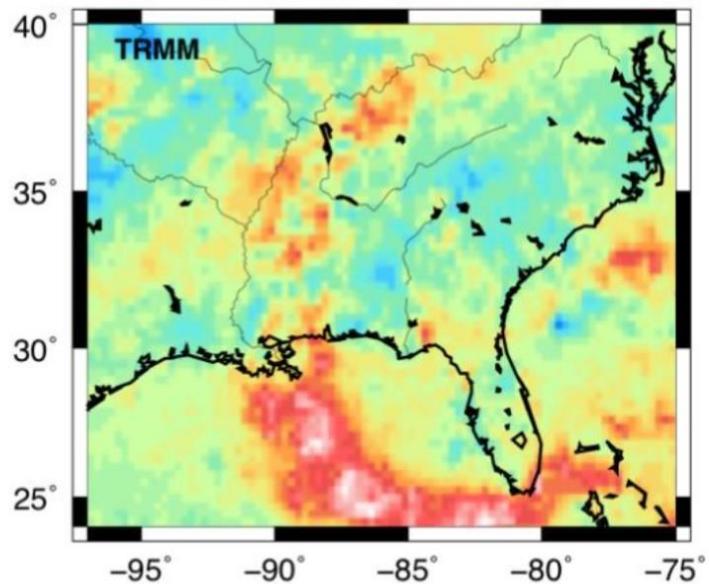
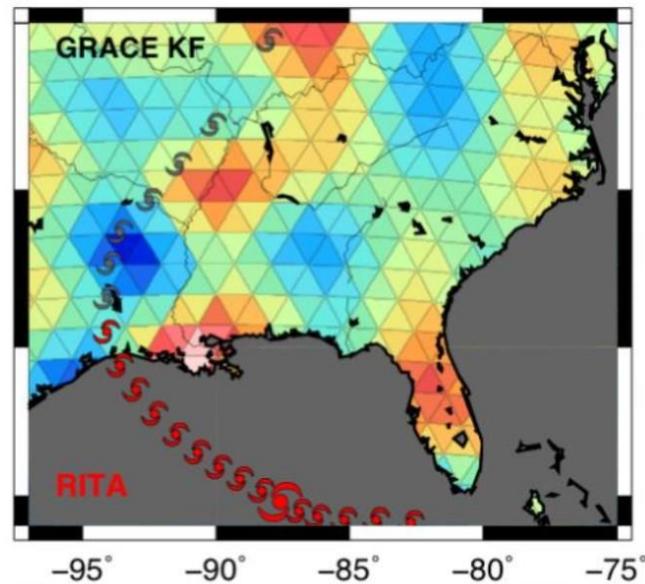
(a) Delta TWS from regional approach estimated as :
TWS (24-12-08 / 02-01-09) minus TWS (03-01-09 / 12-01-09)

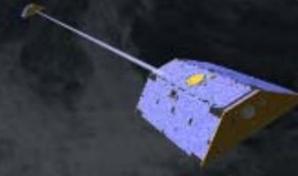


31 / 08 / 2005



18 / 09 / 2005





Measuring Earth's Surface Mass and Water Changes

Satellites Show How Earth's Water Cycle Is Ramping Up as Climate Warms

NASA scientists have studied 17 years of gravity observations of our planet to understand how the global water cycle is changing.

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