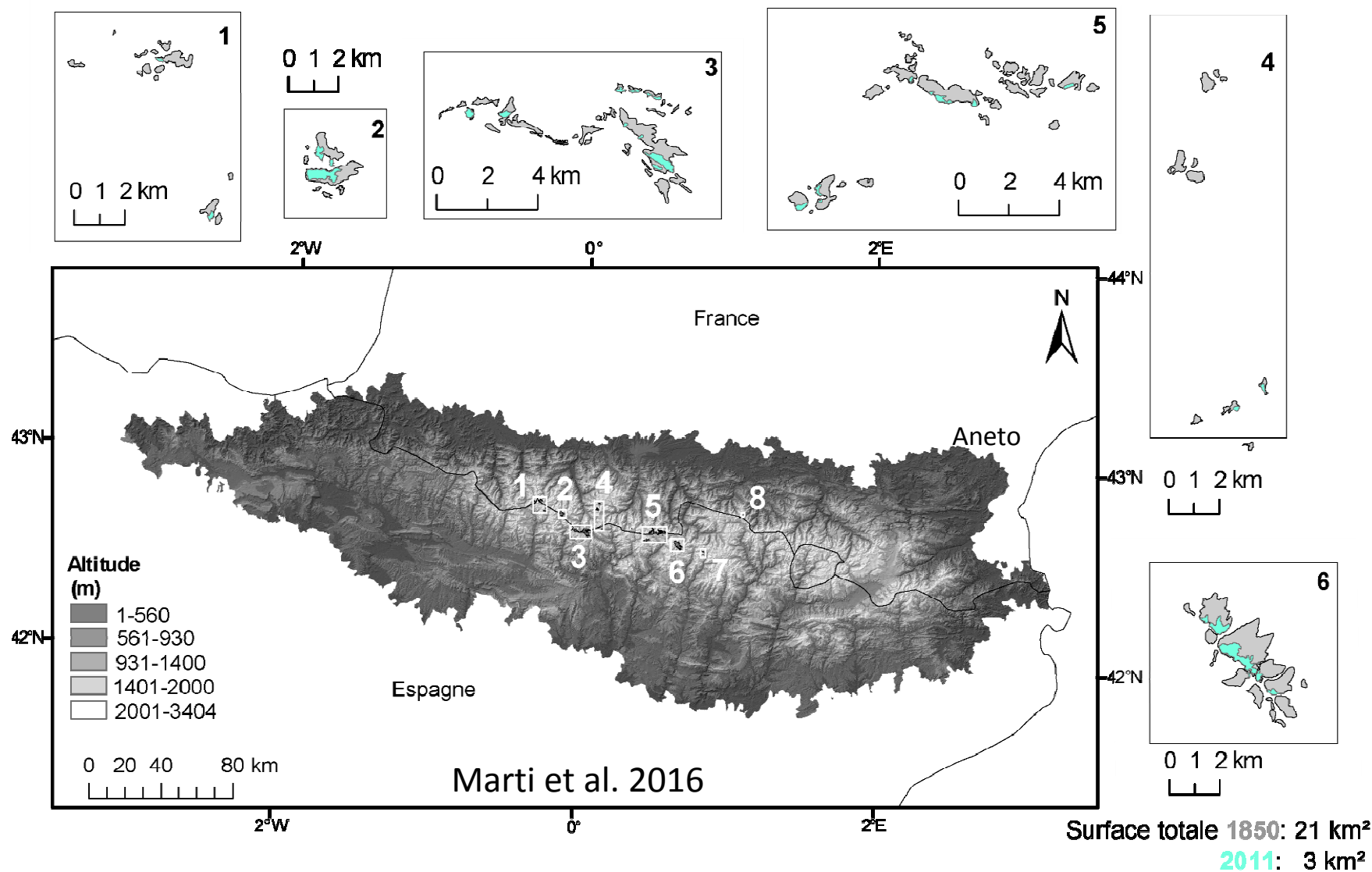
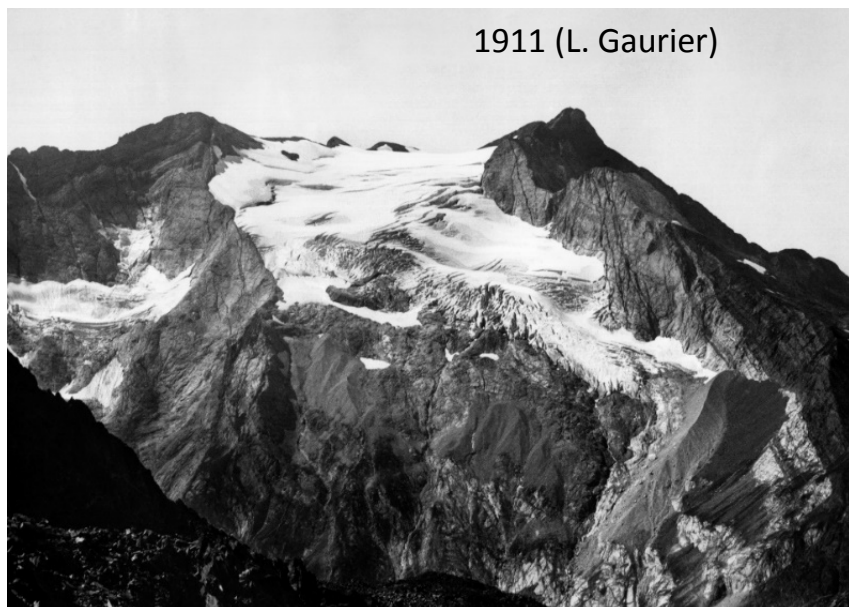


De 107 glaciers en 1850 (fin du petit âge glaciaire) à 31 glaciers en 2011

$\Delta S_{glacier}$ entre 1850 et 2011 : 85% de réduction



Glacier d'Ossoue



The Cryosphere, 9, 1773–1795, 2015
www.the-cryosphere.net/9/1773/2015/
doi:10.5194/tc-9-1773-2015

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Evolution of Ossoue Glacier (French Pyrenees) since the end of the Little Ice Age

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⁵Institut Polytechnique de Bordeaux (IPD), Pessac, France

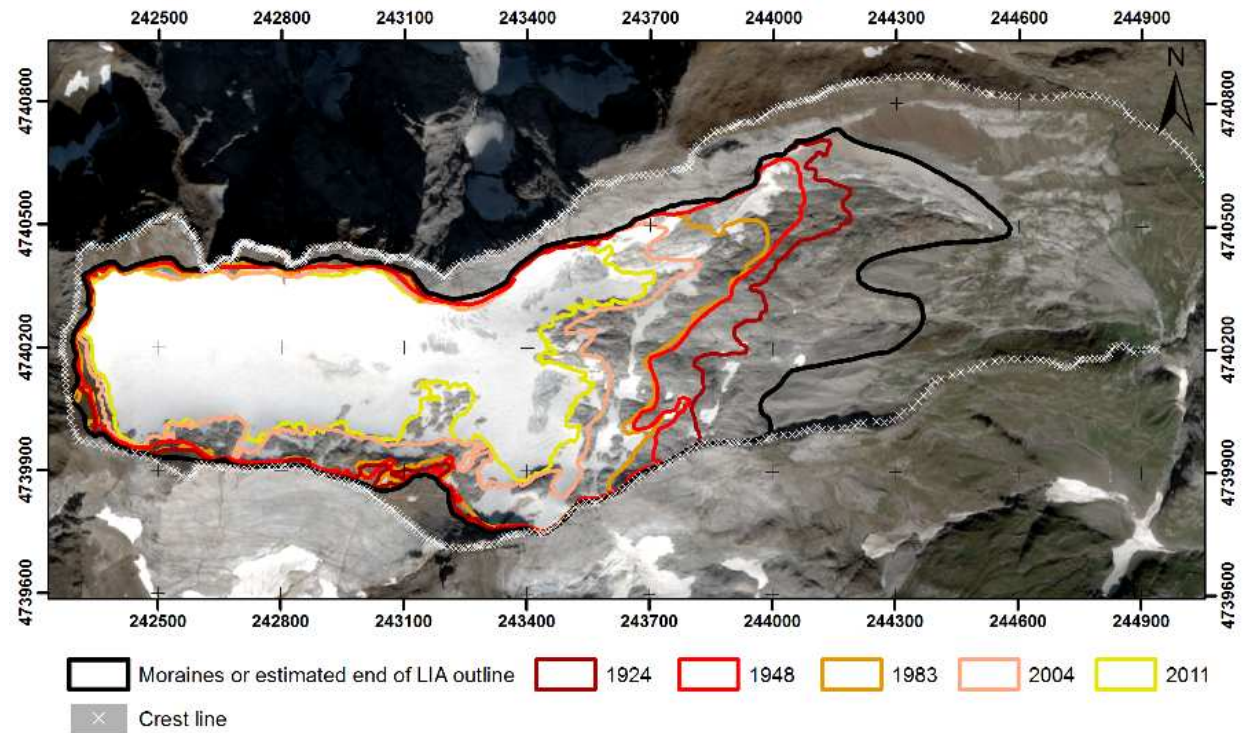
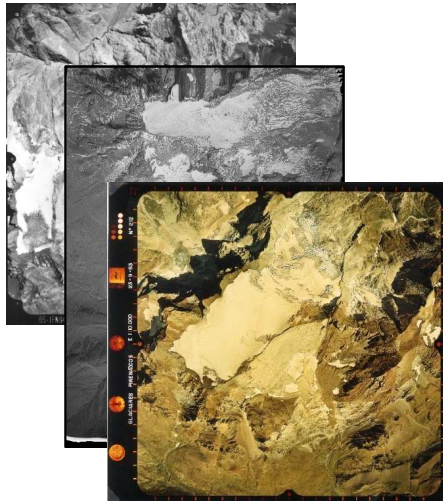
⁶Milieux Environnementaux, Transferts et Interactions dans les hydrosystèmes et les Sols (METIS), UPMC/CNRS/EPHE, Paris, France

⁷Université de Pau et des Pays de l'Adour (UPPA), Pau, France

⁸Météo France, Direction de la Climatologie (DCLIM), Toulouse, France

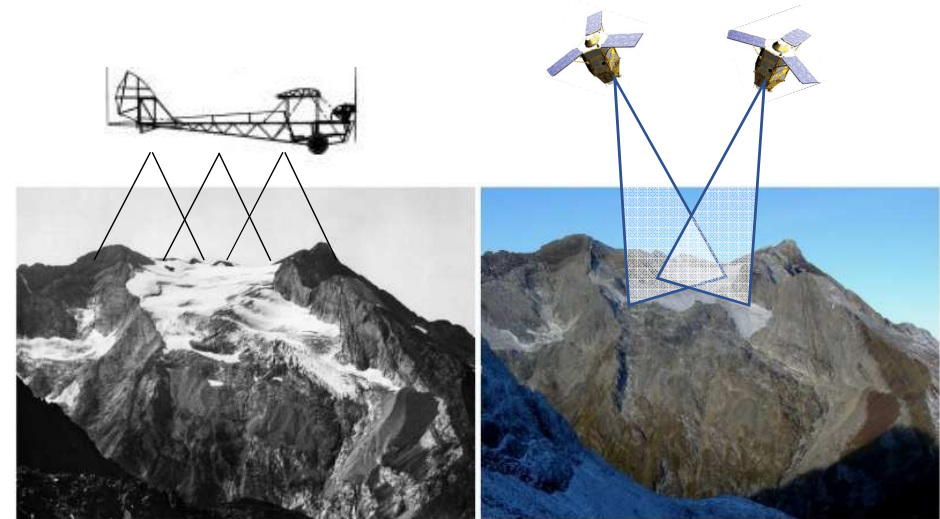
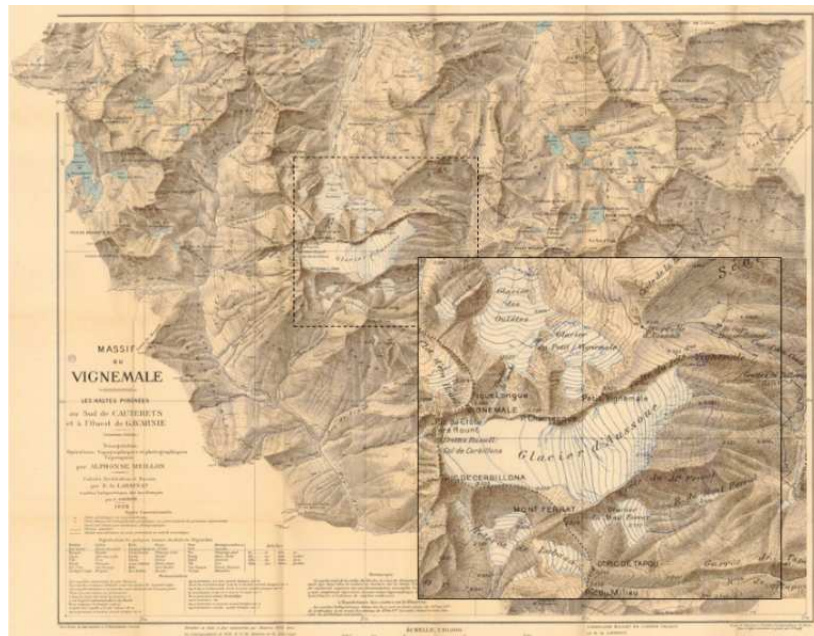
⁹Association Moraine, Luchon, France

Surface (1850—2011)

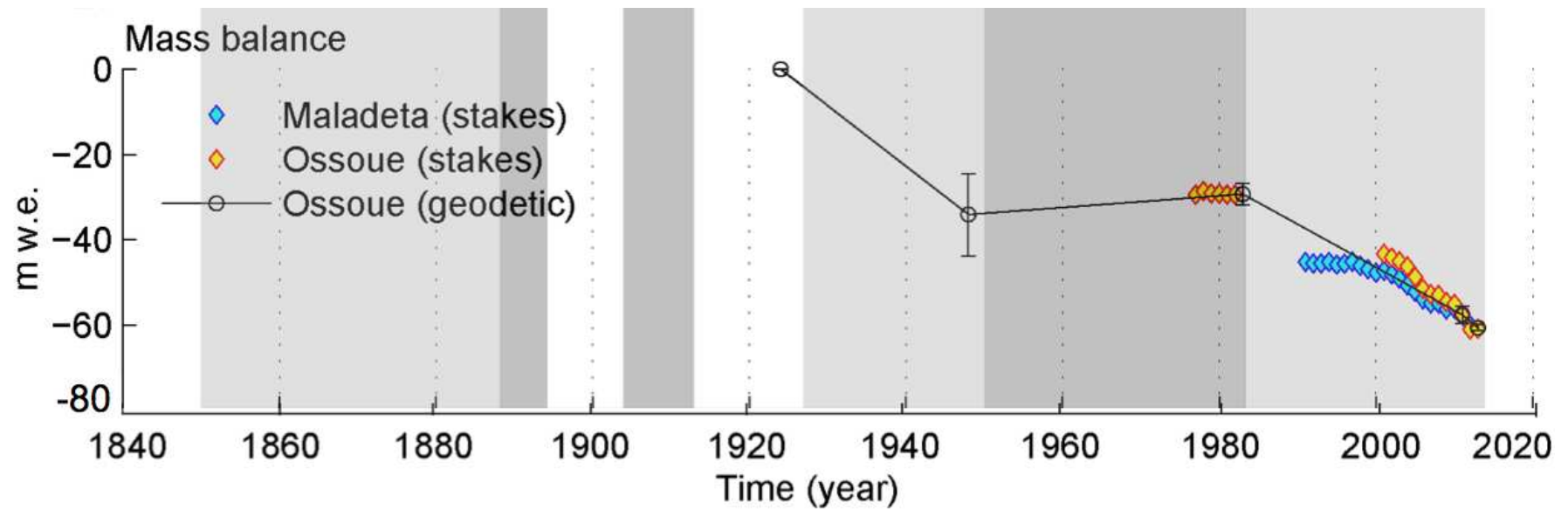


Bilan de masse cartographique

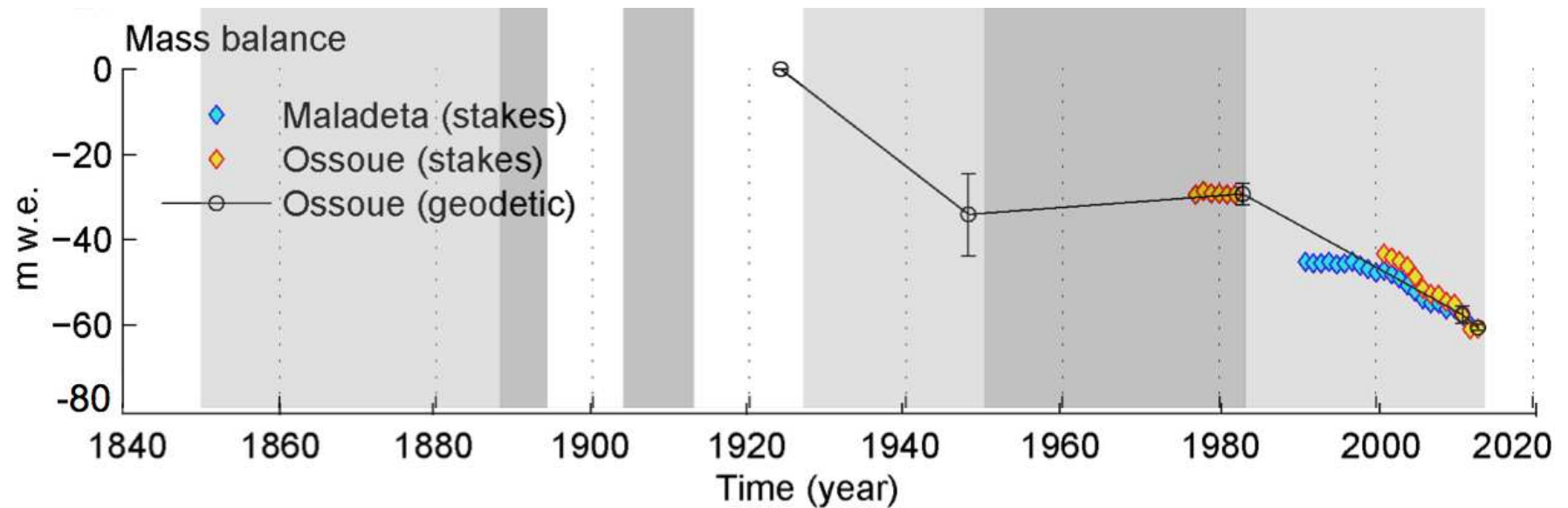
Cartes d'altitude de 1924, 1948, 1983, 2013



Evolution du bilan de masse de 1924 à 2013



Evolution du bilan de masse de 1924 à 2013



Et depuis 2013 ?



09-Sep-2013



09-Sep-2014



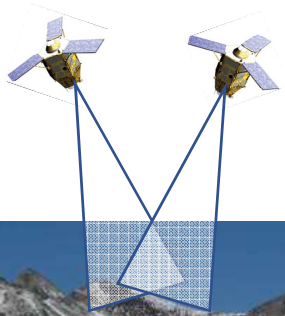
10-Oct-2015



06-Sep-2016



07-Oct-2017



09-Sep-2013



09-Sep-2014



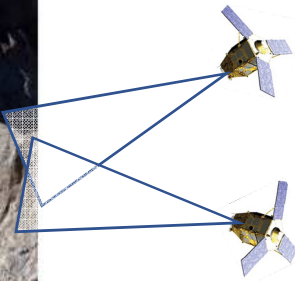
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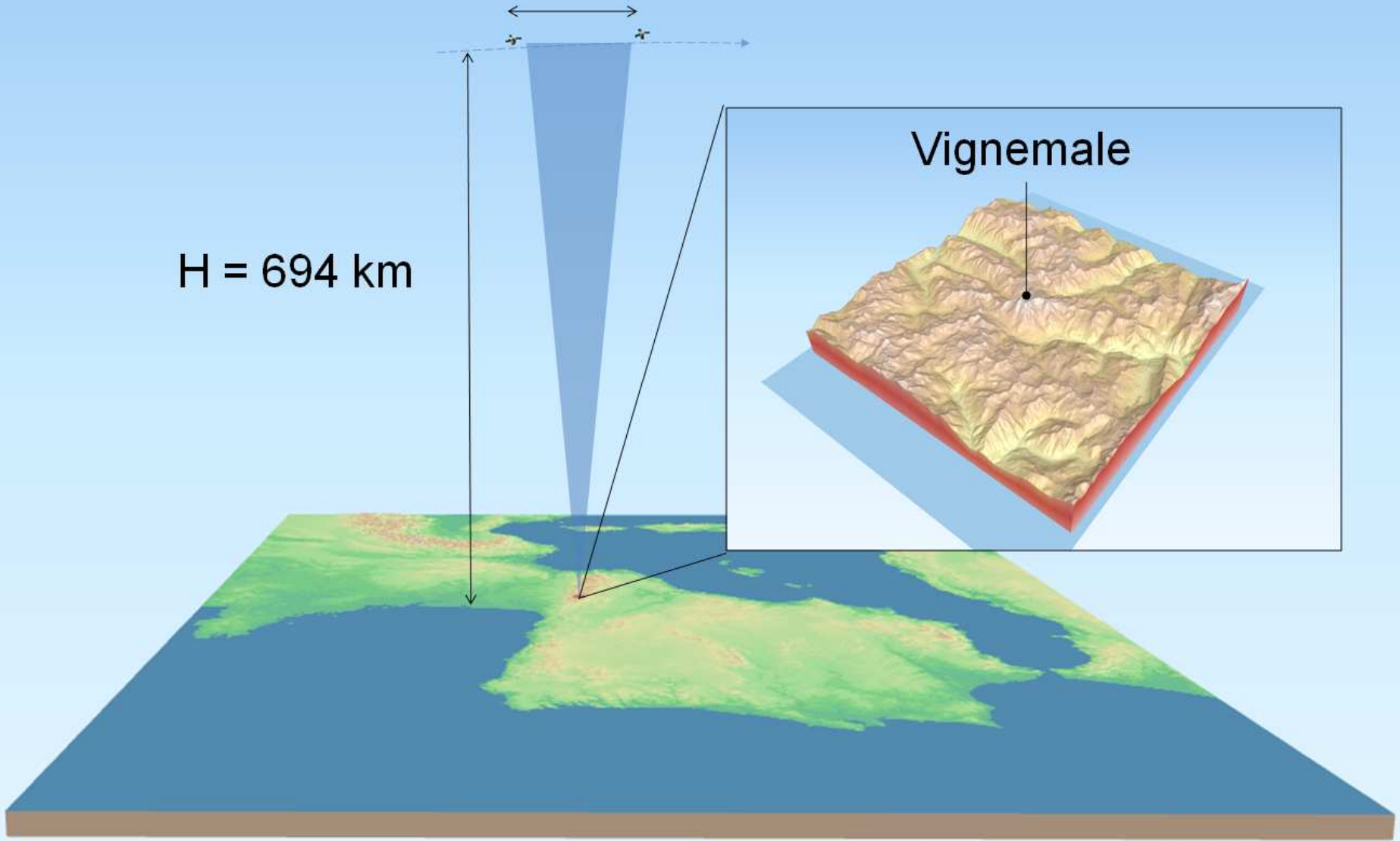
07-Oct-2017

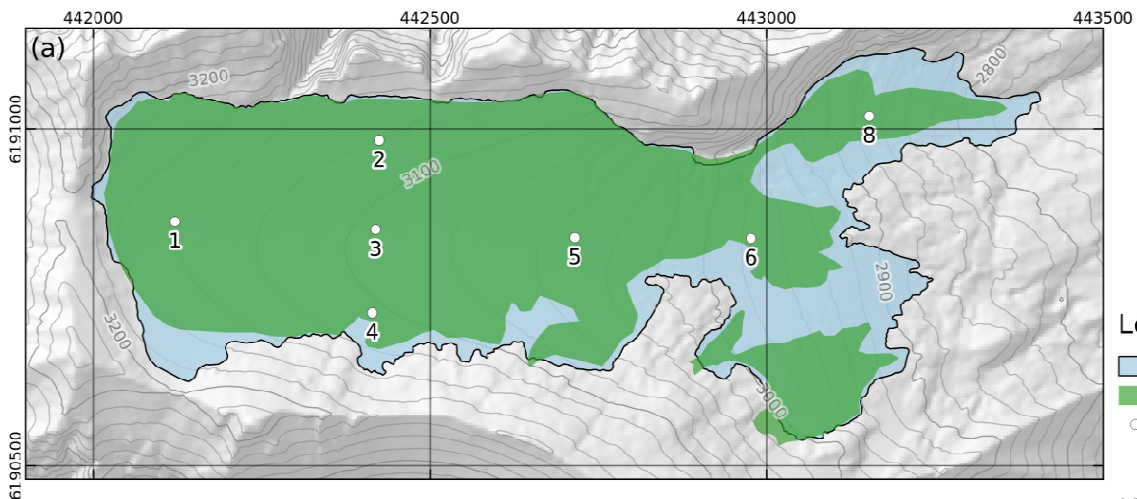


$B = 268 \text{ km}$

$H = 694 \text{ km}$

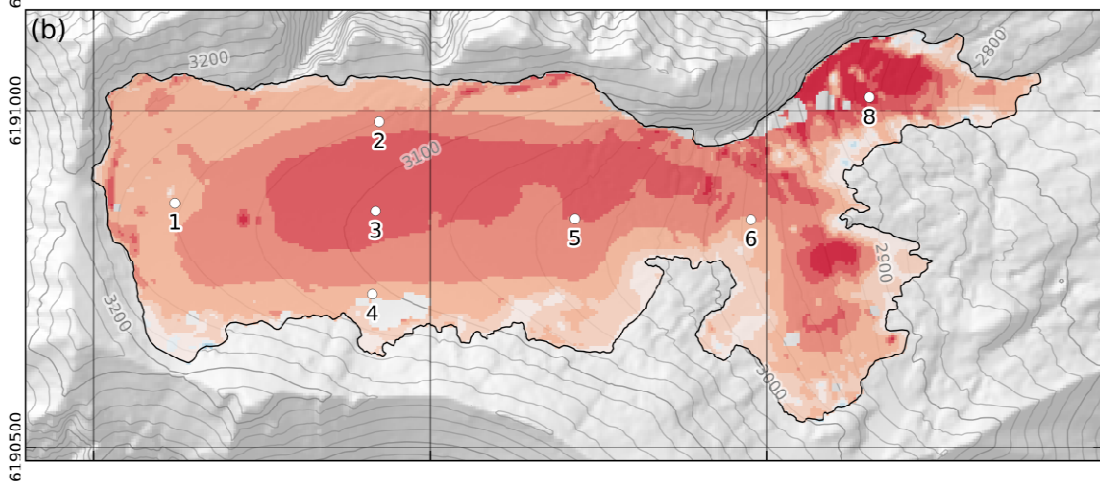
Vignemale





Légende

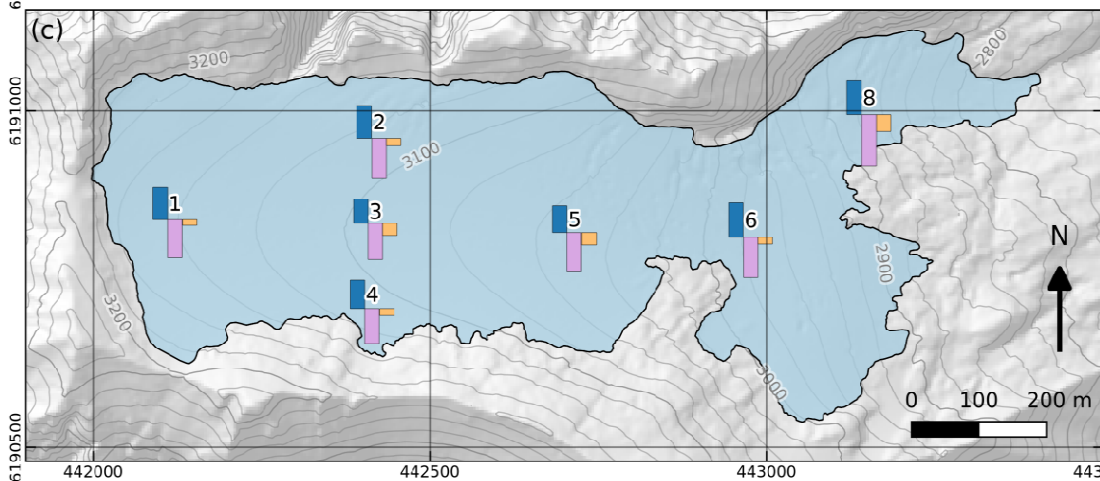
- Glacier (2012)
- Glacier (2017)
- Balises



Méthode géodésique

Variation de hauteur (m) 2013-2017

- <= -10
- -10 - -8
- -8 - -6
- -6 - -4
- -4 - -2
- -2 - 0
- 0 - 2
- 2 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- > 10

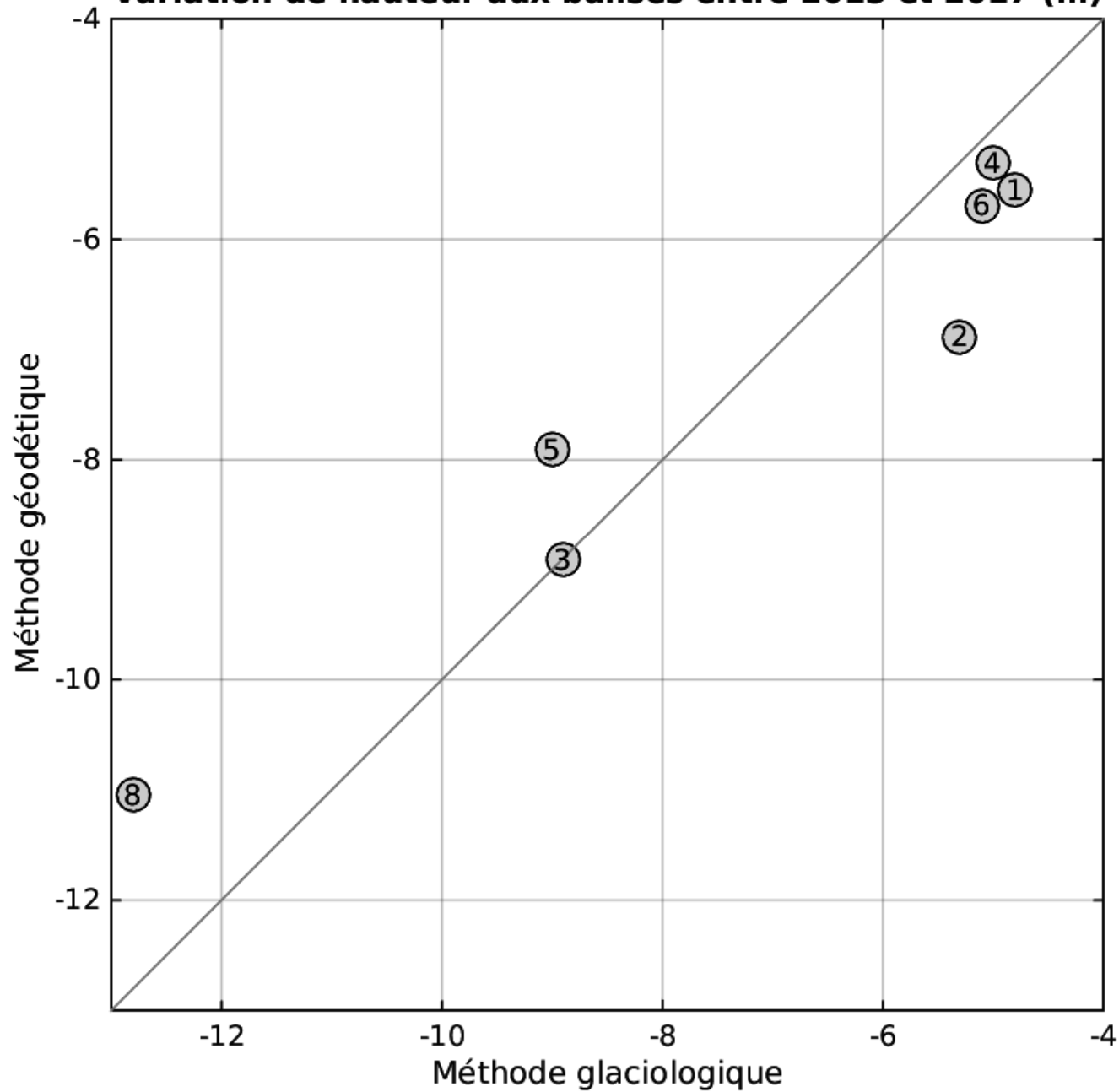


Méthode glaciologique

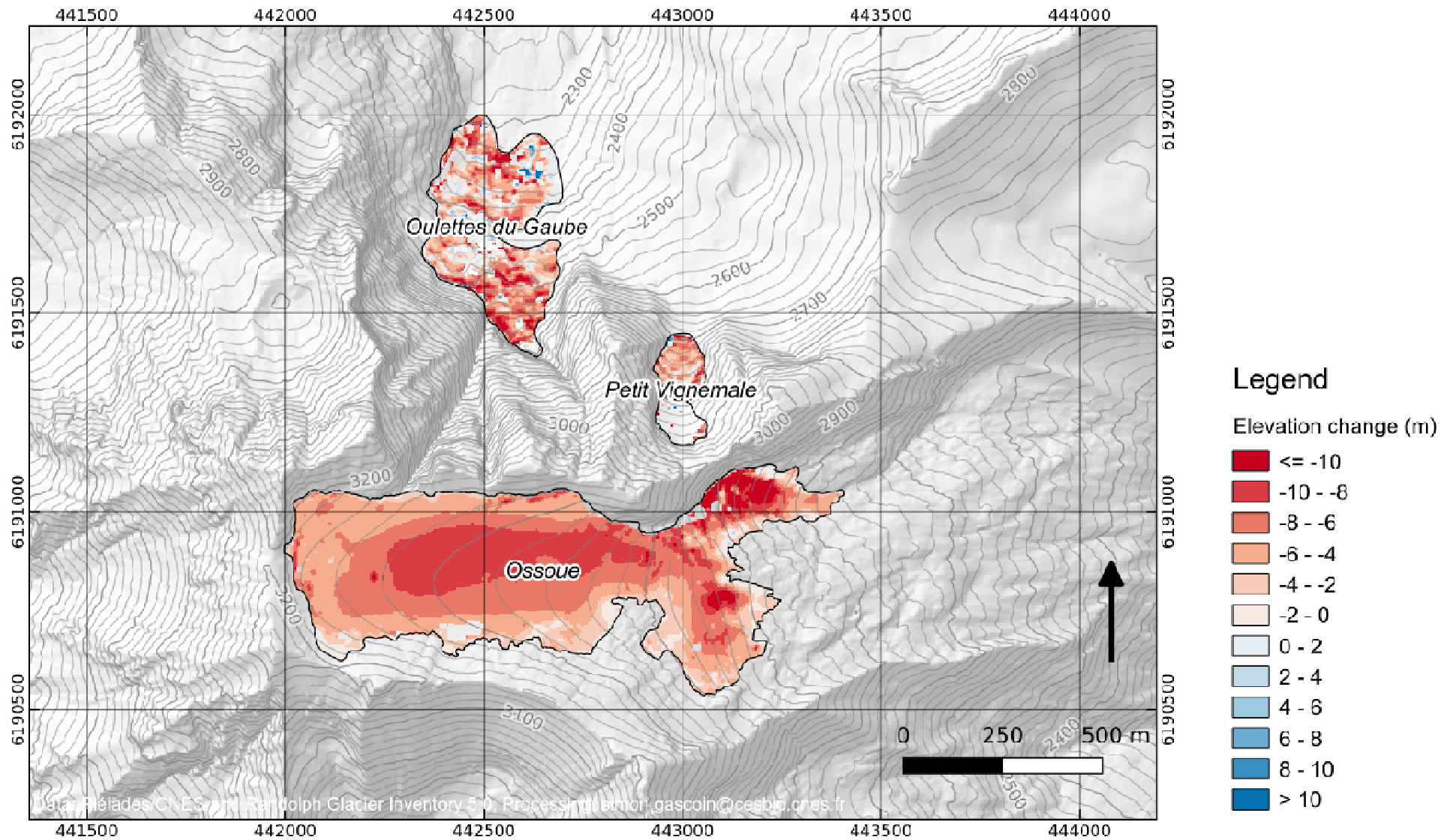
Variation de hauteur (m) 2013-2017

- Bilan hivernal
- Bilan estival
- Bilan net

Variation de hauteur aux balises entre 2013 et 2017 (m)

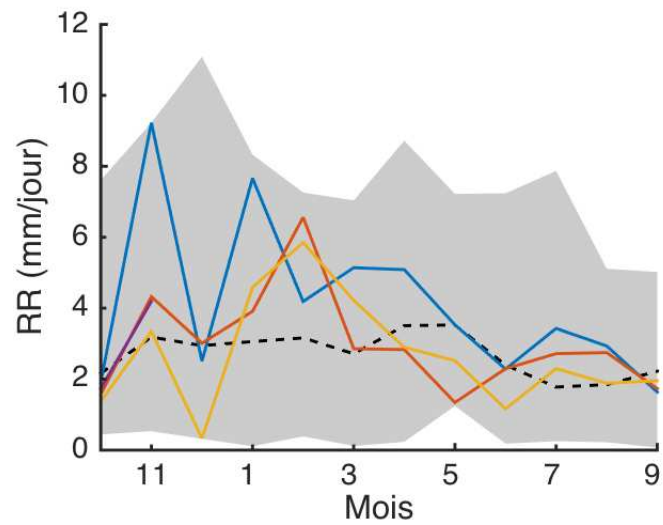
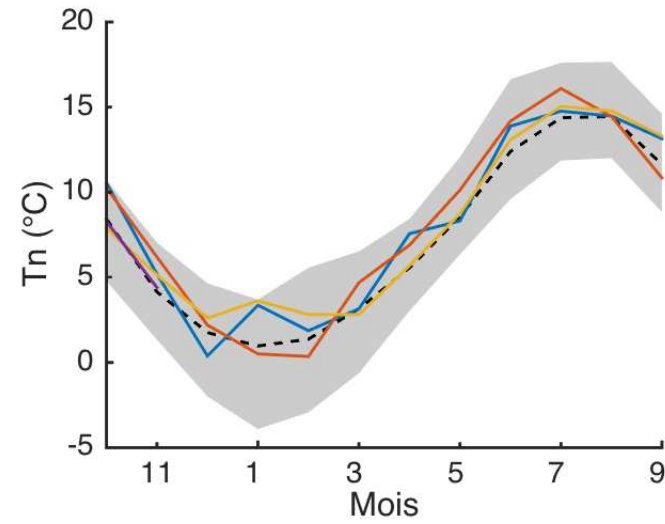
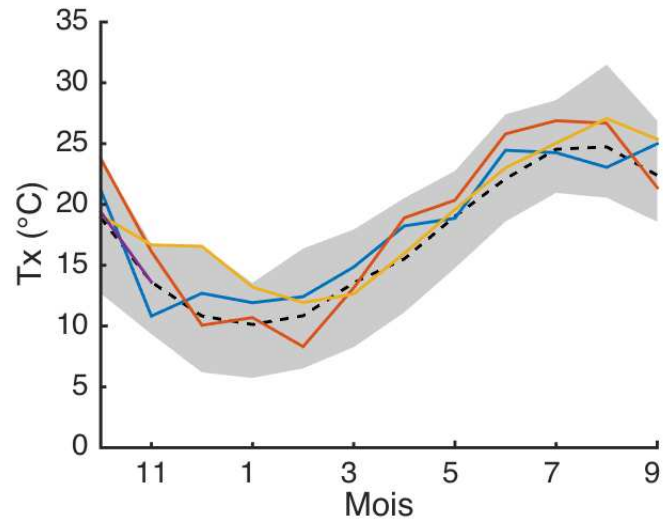


Elevation changes between 23 Sep 2013 and 08 Oct 2017



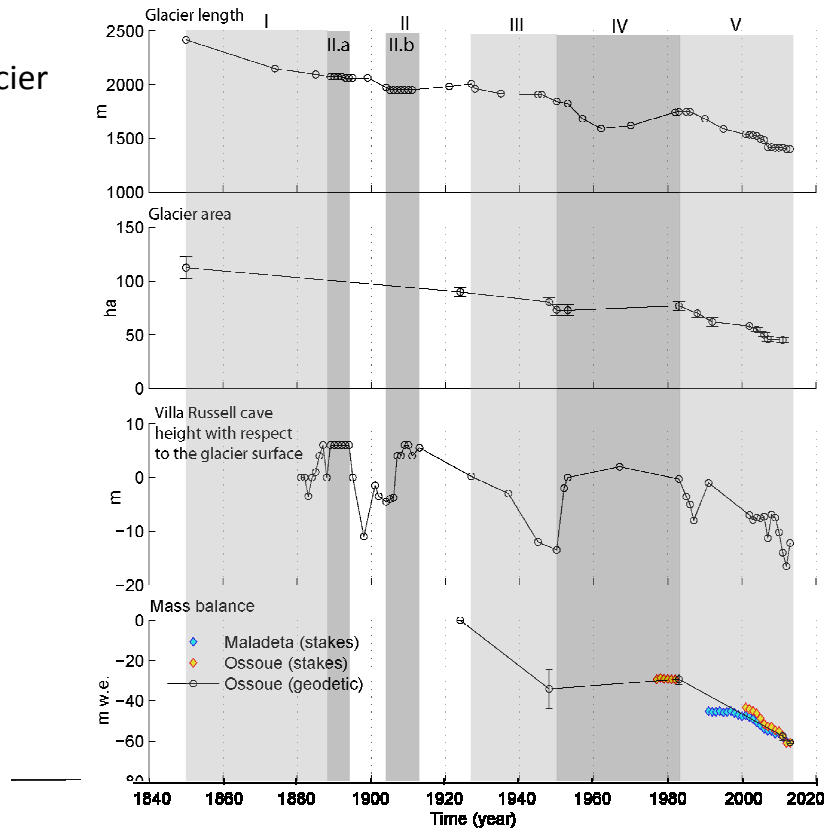
Coordinates system: Lambert-93 (axes labels in meters). Elevation are orthometric heights to Alicante tide gauge

Climatologie (Tarbes)

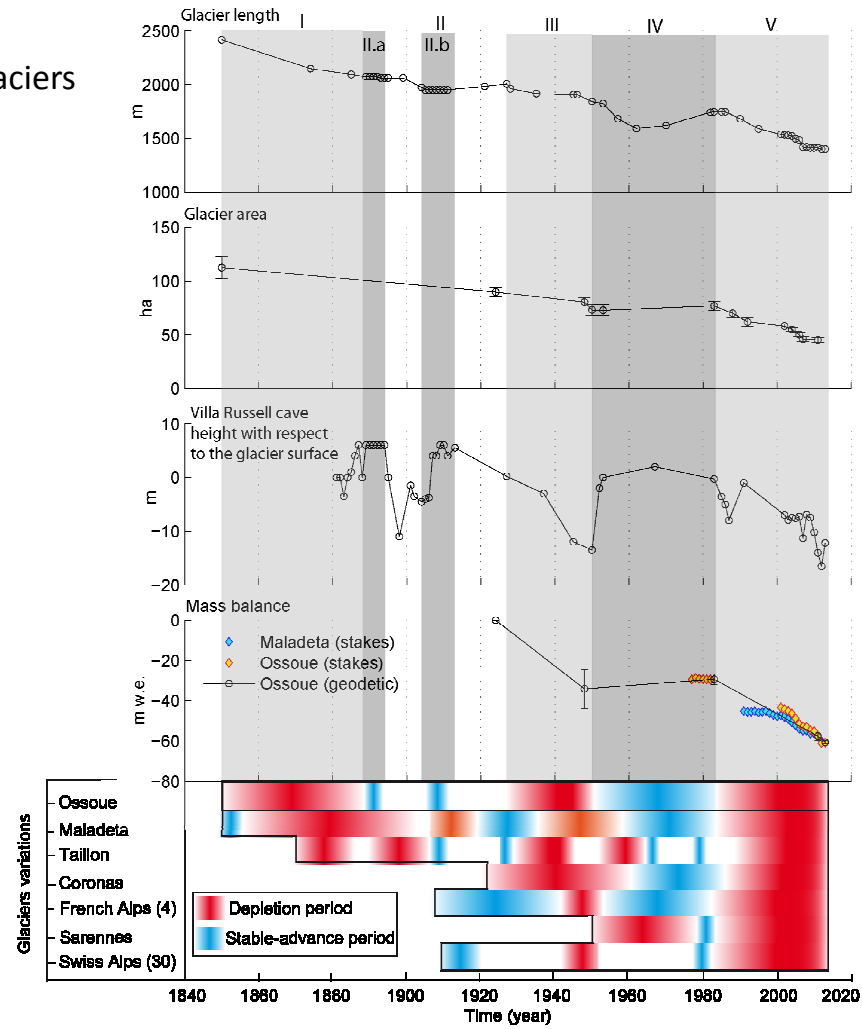


- min-max 1960-2016
- médiane 1960-2016
- 2013-2014
- 2014-2015
- 2014-2015
- 2015-2016

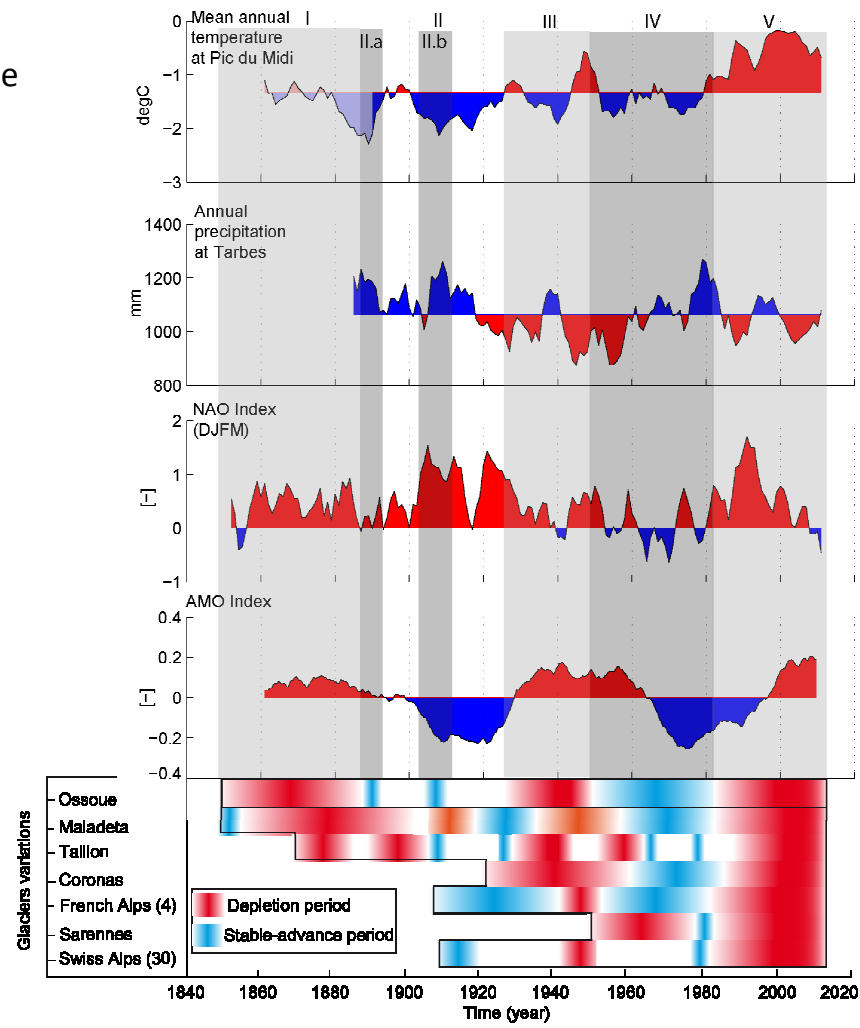
Evolution des indicateurs du glacier

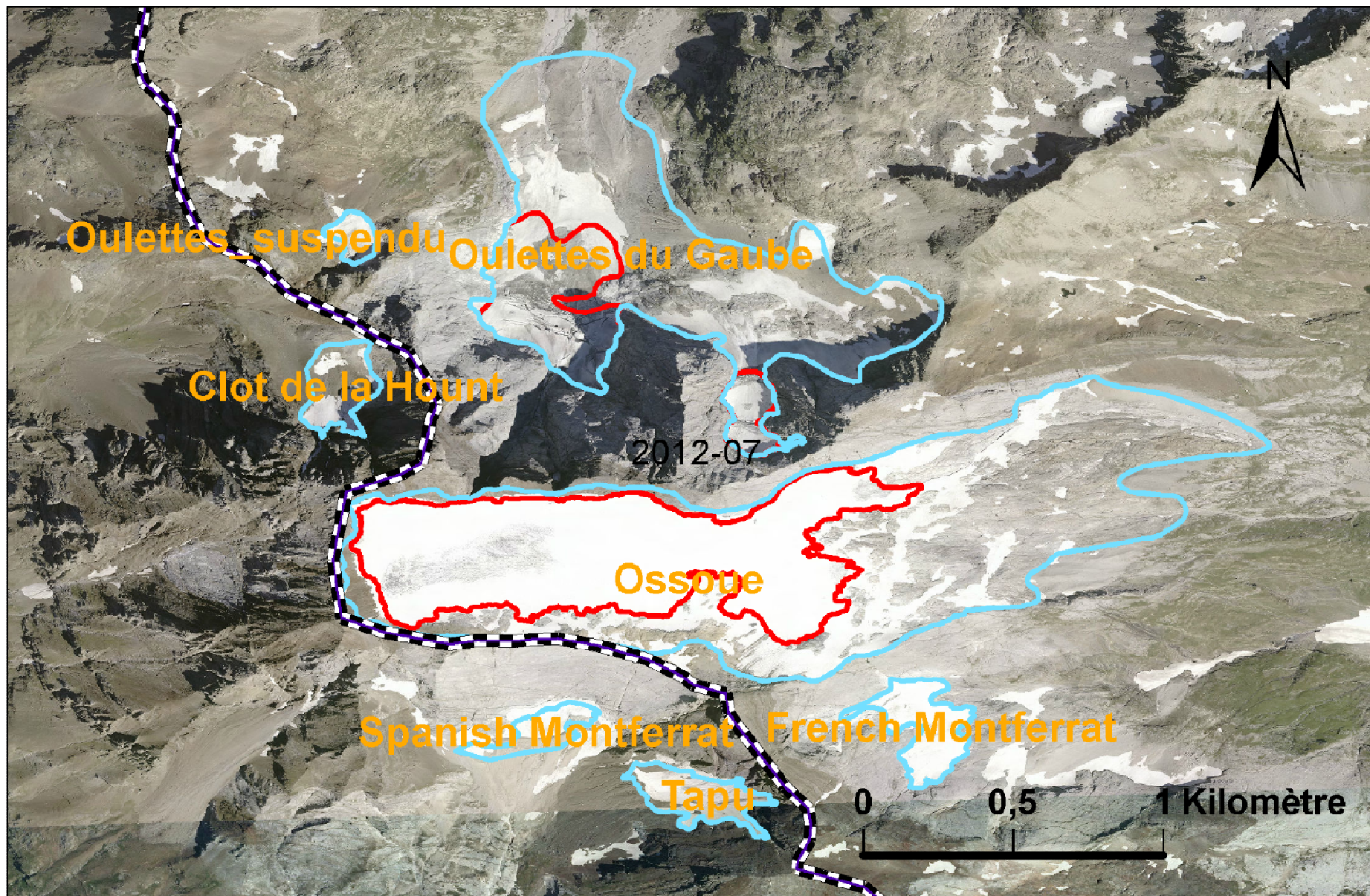


Comparaison avec d'autres glaciers



Mise en perspective climatique





--- Frontière □ Glaciers en 1850 □ Glaciers en 2011