

FRÉDÉRIC SATGÉ – IRD / UMR ESPACE-DEV

Email : frederic.satge@ird.fr

I am currently researcher working for the French Institute of Research for the development (IRD) within the Espace-Dev research unit (Space for Development) based in Montpellier, France.

My research interest focus on the use of multiple remote sensing datasets to investigate the respective influence of climate variability and human pressure over the water resources. My approach includes preliminary steps consisting in the evaluation of the reliability of the datasets and calibration steps to insure as accurate as possible estimates before their use in modelling approach. More specifically, I have a strong expertise in satellite precipitation estimates and digital elevation model datasets.

Formations

Post-Doc for the French space national agency (CNES) within the HSM research unity (Hydro-sciences, Montpellier): Hydrological modelling combining remote sensing and in-situ datasets over the Lake Titicaca region (2018)

PhD at the University of Brasilia (UnB): Contribution of remote sensing datasets for the Andean Altiplano water resources study (2015-2017).

M2 at the University of Science of Metz: Water resources management (2010).

M1 at the University of Science of Montpellier: Inland water sciences (2009).

Licence at the Science University of Montpellier: Earth and environment sciences (2005-2008).

Publications

- [1] **Satgé, F.**, Hussain, Y., Xavier, A., Pillco, R., Salles, L., Timouk, F., Seyler, F., Garnier, J., Frappart, F., Bonnet, M-P. (2019): Unraveling the impacts of droughts and agricultural intensification on the Altiplano water resources. *Agricultural and Forest Meteorology* (under review).
- [2] **Satgé, F.**, Defrance, D., Sultan, B., Bonnet, M-P., Seyler, F., Rouché, N. Pierron, F., Paturel, J-E. (2019) : Evaluation of 22 gridded precipitation datasets across West Africa. *Journal of Hydrology* (under review)
- [3] **Satgé, F.**, Ruelland, D., Bonnet, M-P., Molina, J., Pillco, R. (2019): Consistency of satellite-based precipitation products in space and over time compared with gauge observations and snow-hydrological modelling in the Lake Titicaca region. *Hydrol. Earth Syst. Sci.*, 23, 595-619.
- [4] Pillco, R., Bengtsson, L., Berndtsson, R., Marti-Cardona, B., **Satgé, F.**, Timouk, F., Bonnet, M-P., Mollericon, L., Gamarra, C., Pasapera, J. (2019): Modelling Lake Titicaca's daily and monthly evaporation. *Hydrol. Earth Syst. Sci.*, 23, 657-668.
- [5] Salles, L., **Satgé, F.**, Roig, H., Almeida, T., Olivetti, D., Ferreira, W. (2019): Seasonal Effect on Spatial and Temporal Consistency of the new GPM-based IMERG-v5 and GSMaP-v7 satellite precipitation estimates in Brazil's central plateau region. *Water*, 11, 668.
- [6] **Satgé, F.**, Hussain, Y., Bonnet, M-P., Hussain, B M., Martinez-Carvajal, H., Akhter, G., Uagoda, Rogerio (2018): Benefits of the successive GPM based satellite precipitation estimates IMERG-v03, -v04, -v05 and GSMaP-v06, -v07 over diverse geomorphic and meteorological regions of Pakistan. *Remote Sensing*, 10,1373.
- [7] **Satgé, F.**, Espinoza, R., Pillco, R., Roig, H., Timouk, F., Molina, J., Garnier, J., Calmant, S., Seyler, F., Bonnet, M-P. (2017). Role of climate variability and human activity on Lake Poopó droughts between 1990 and 2015 assessed using remote sensing data. *Remote Sensing*, 9, 218.

- [8] **Satgé, F.**, Xavier, A., Pillco, R., Hussain, Y., Timouk, F., Garnier, J., Bonnet, M-P. (2017). Comparative assessments of the latest GPM mission's spatially enhanced satellite rainfall products over the main Bolivian watersheds. *Remote Sensing*, 9, 369.
- [9] Hussain, Y., Fida Ullah, S., Qyuum A., Akhter, G., Martínez, H.E., **Satgé, F.**, Ashraf, A., Iqbal, B., Cárdenas-Soto, M. (2017). Vulnerability assessment of an agro-stressed aquifer using a source-pathway-receptor model in GIS. *Modeling Earth Systems and Environment*, 3,2, 595-604.
- [10] Hussain, Y., **Satgé, F.**, Hussain M.B., Martinez-Carvajal, H., Bonnet, M-P., Cárdenas-Soto, M., Llacer Roig, H., Akhter, G. (2016). Performance of CMORPH, TMPA and PERSIANN rainfall datasets over plain, mountainous and glacial regions of Pakistan. *Theoretical and Applied Climatology*.
- [11] **Satgé, F.**, Denezine, M., Pillco, R., Timouk, F., Pinel, S., Molina, J., Garnier, J., Seyler, F., Bonnet, M-P. (2016). Absolute and relative height-pixel accuracy of SRTM-GL1 over the South American Andean Plateau. *ISPRS Journal of photogrammetry and remote sensing*, 121, 157-166.
- [12] Pinel, S., Bonnet, M.P., Santos Da Silva, J. Moreira, D., Calmant, S., **Satgé, F.**, Seyler, F. (2015). Correction of interferometric and vegetation biases in the SRTMGL1 spaceborne DEM with hydrological conditioning towards improved hydrodynamics modeling in the Amazon basin. *Remote sensing*.
- [13] **Satgé, F.**, Bonnet, M-P., Timouk, F., Calmant, S., Pillco, R., Molina, J., Lavado Camisiro, W., Arsen, A., Crétaux, J-F., Garnier, J. (2015a). Accuracy assessment of SRTM v4 and ASTER GDEM v2 over the Altiplano watershed using ICESat/GLAS data. *International journal of remote sensing*, Vol 36, 465-488.
- [14] **Satgé, F.**, Bonnet, M-P., Gosset, M., Molina, J., Hernan Yuque Lima, W., Pillco, R., Timouk, F., Garnier, J. (2015b). Assessment of satellite rainfall products over the Andean plateau. *Atmospheric research*, 167, 1-14.
- [15] Pfeffer, J., Seyler, F., Bonnet, M-P., Calmant, S., Frappart, F., Papa, F., Paiva, R.C.D., **Satgé, F.**, Santos Da Silva, J. (2014). First low-water maps of the groundwater table in the central Amazon by satellite altimetry. *Geophysical Research Letters*.
- [16] Molina J., **Satgé, F.**, Pilco R. (2013). Los recursos hídricos del sistema TDPS. Linea base de conocimientos sobre los recursos hidrológicos e hidrobiológicos en el sistema TDPS (IRD – IUCN, Quito, Ecuador. 307 pp.).

Contribution to the BONDS Project

In the framework of the BONDS project, my main contribution will be for the elaboration of a consistent satellite precipitation datasets based on the most reliable identified products and enhancement methods.

I will also participate to the calibration/correction effort towards the production of consistent Digital Elevation Model.