Supplementary Materials

Analysis of Floodplain Dynamics in the Atrato River Colombia Using SAR Interferometry

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The Figure S1 in this document is a four years temporal composite of Landsat 7 and 8 (2014–2018) with RGB corresponding to NIR, SWIR1, and red. In the Figure we show a tributary of the Atrato river in the upper part of the basin, which is in a state of advanced degradation due to mining. The Figure illustrates the magnitude of the threats to the wetlands ecosystems in the area.

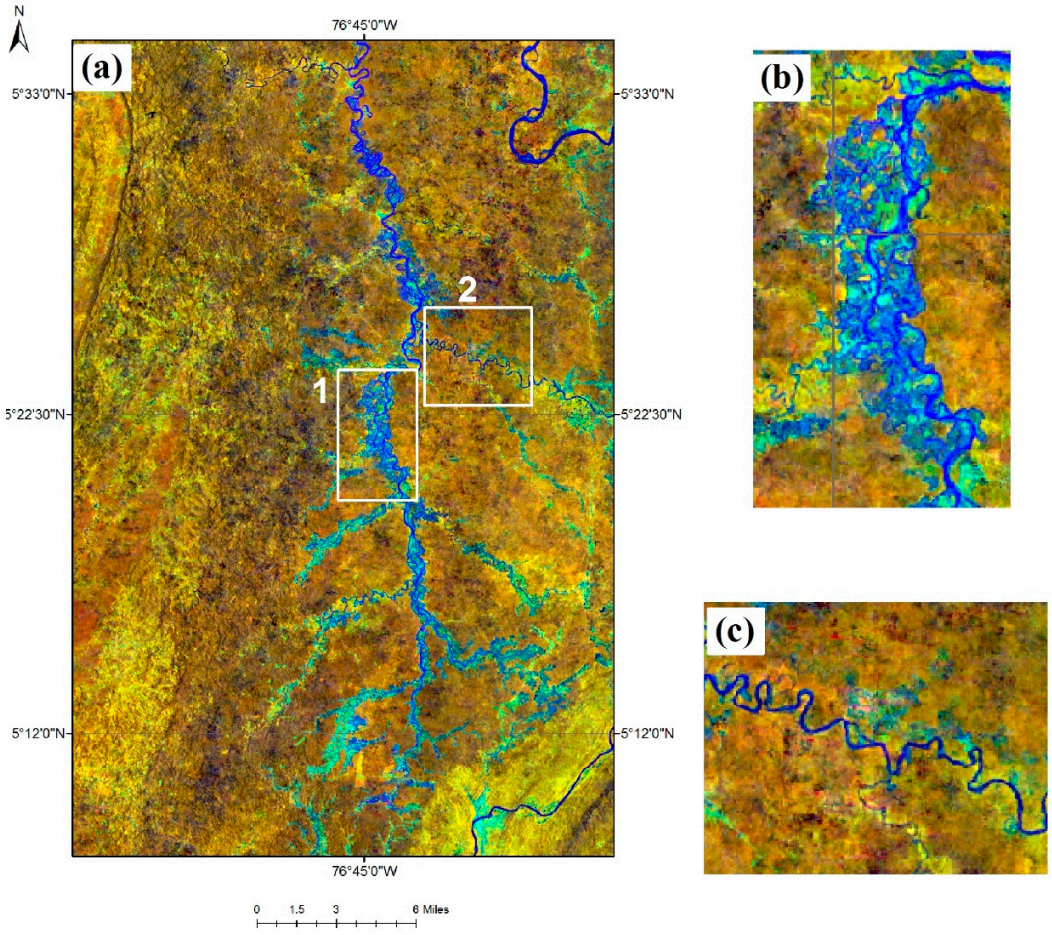

Figure S1. Ecosystem degradation by mining activities in the Quito River, a tributary of the Atrato River. (**a**) Quito River. (**b**) Zoom to the square number 1, where an area affected by in-stream mining is presented. (**c**) Zoom to the square number 2, where an non affected area is presented.

Comparison between two interferograms with and without ionospheric correction was performed (Figure S2). For the correction, the range-split spectrum method available in ISCE was used. The master-slave dates (yyyymmdd) of the images used to generate the interferogram comparison are 20100606–20100906. No distinct spatial patterns were found in the interferograms with and without ionospheric correction (see Figure S2). The impact of ionosphere on the signal was not significant, most likely dues to the night imaging (local time 23:00h).

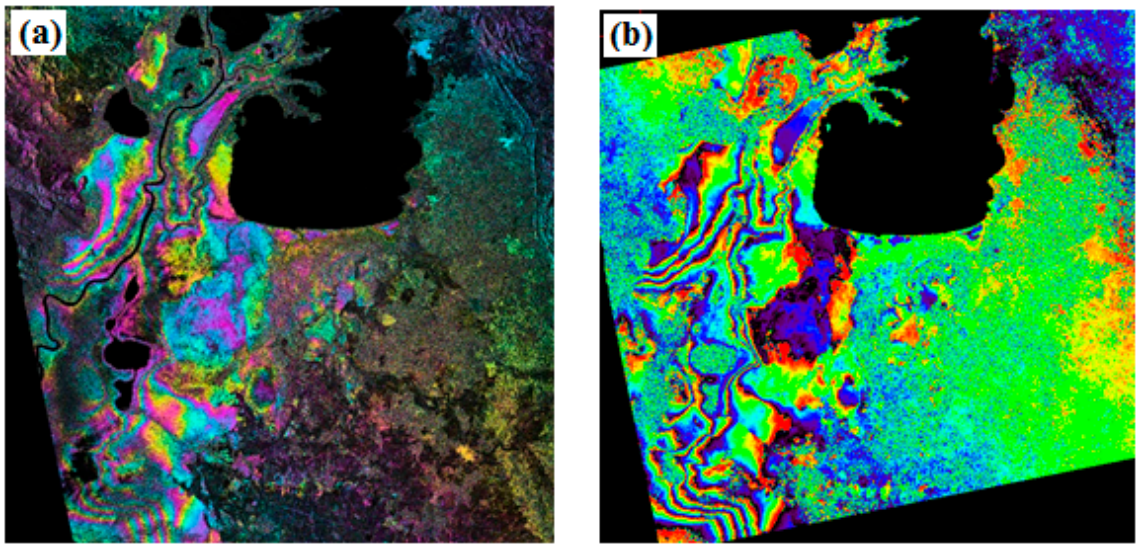

Figure S2. Ionospheric correction analysis for the study area. (**a**) Corrected interferogram using the range-split spectrum method (Fattahi et al., 2017) available in ISCE (Rosen et al., 2012). (**b**) Interferogram generated using SARscape/ENVI software 5.5.

In order to determine the possible contribution of the surface displacement to the fringe patterns observed, we compared the magnitude of the differences in water level between acquisitions obtained from the interferogram analysis, with the vertical surface displacement of the terrain. We used a time series from the GNSS station APTO from the SIRGAS-CON network available for the study area (Figure S3). A negative vertical displacement rate at APTO station of about 0.72 cm/year (~8cm /11 years) in the vertical time series was identified (red; last panel in Figure S3).

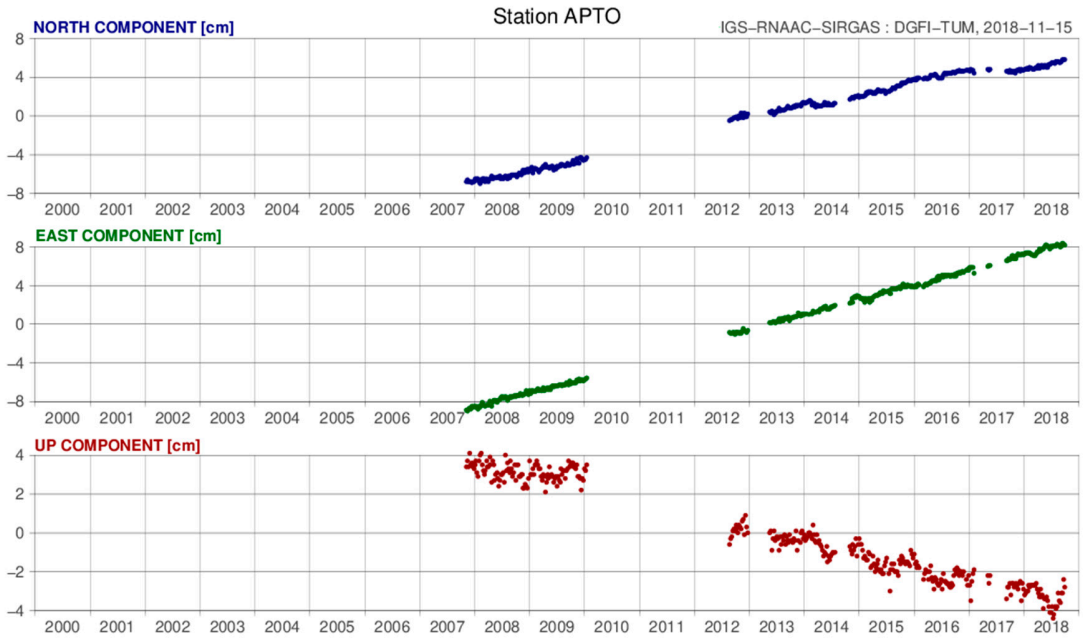

Figure S3. Time series of the APTO SIRGAS-CON network station. Information downloaded from http://www.sirgas.org/es/sirgas-con-network/stations/station-list/#.