

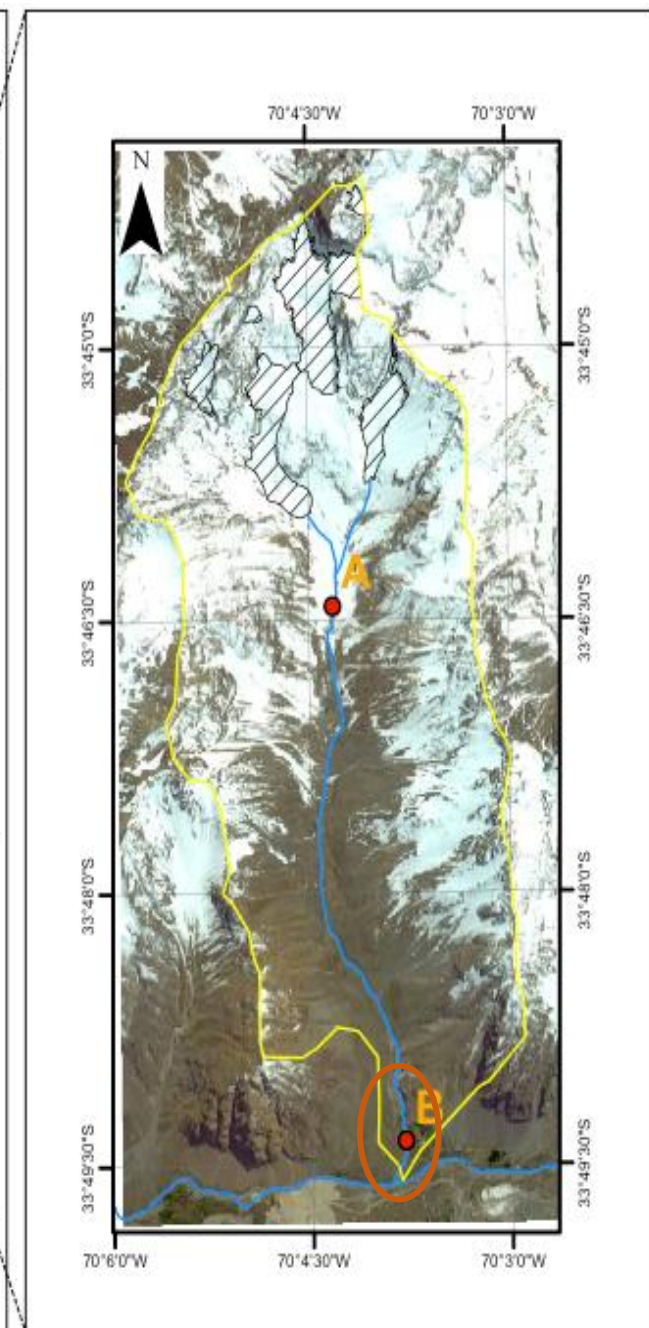
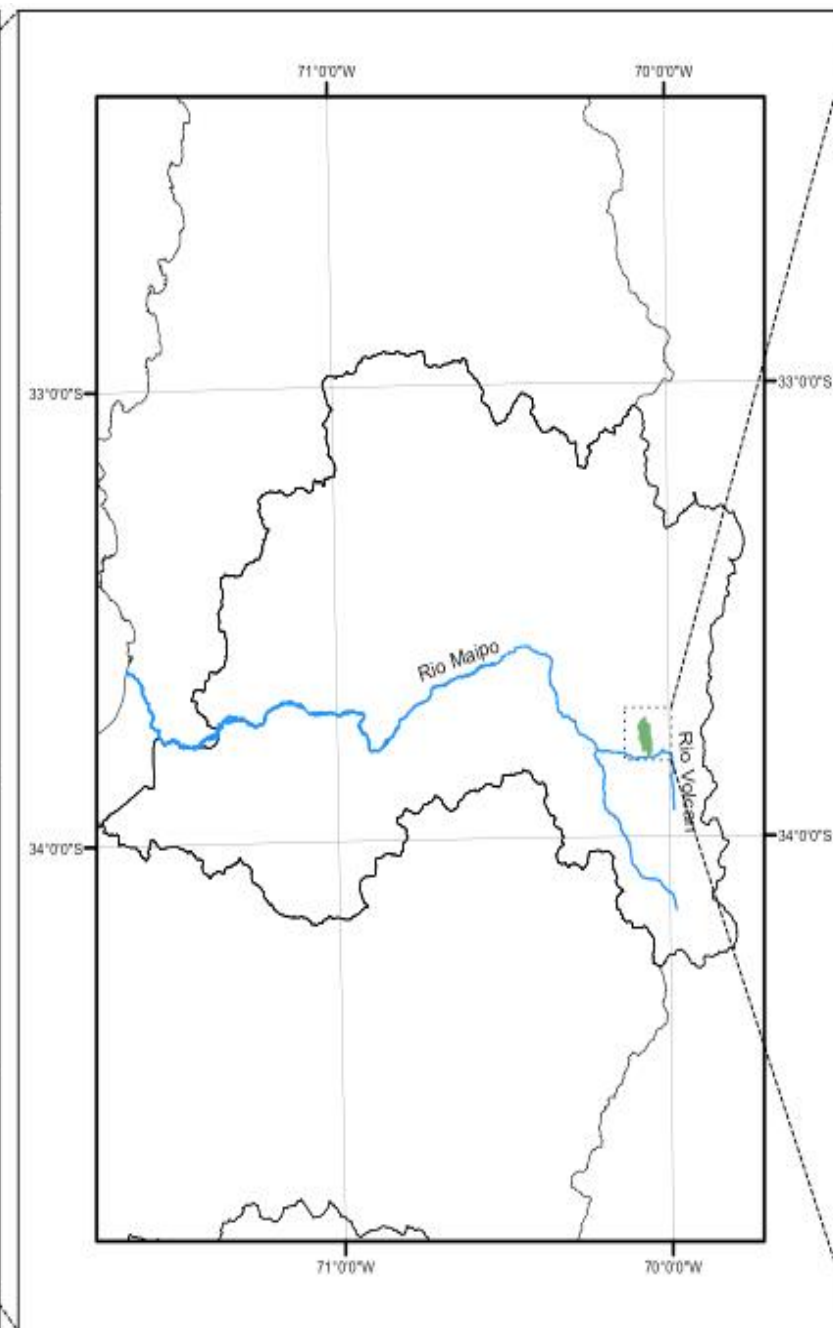
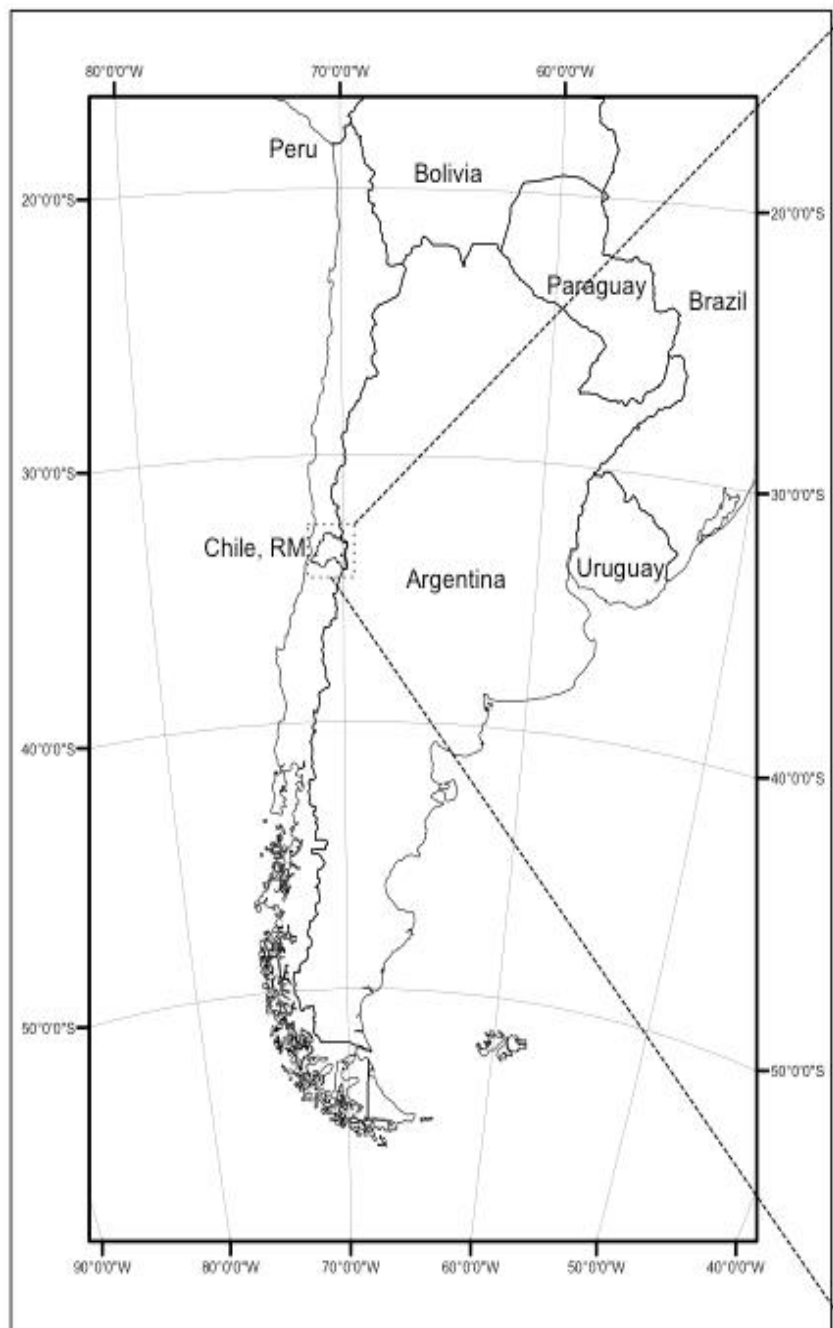
Linking erosion-deposition to geomorphic units changes in a high-gradient stream in the Central Chilean Andes: Estero Morales

Ricardo Carrillo and Luca Mao
Pupuya, Chile. May 2020



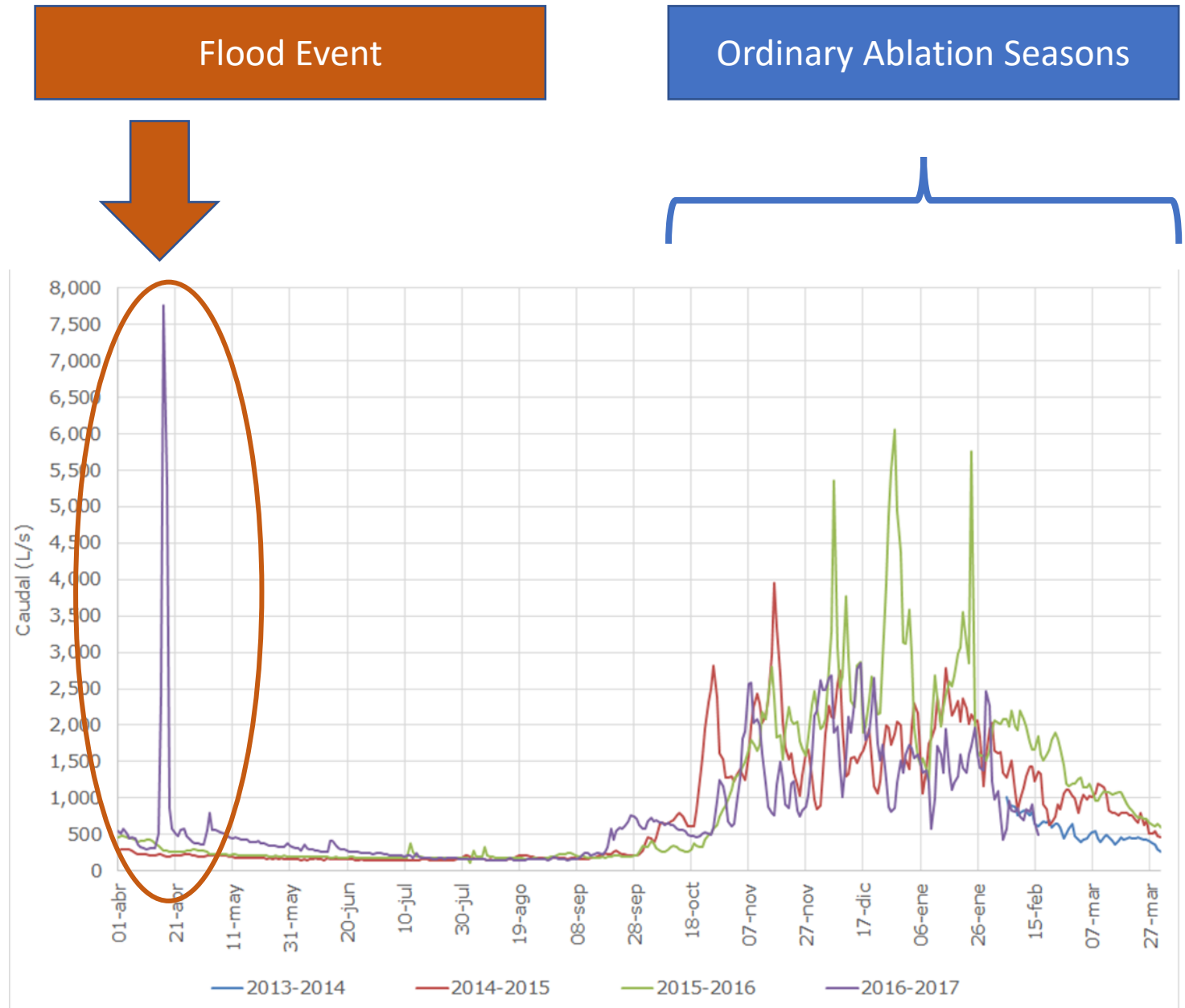
Work overview

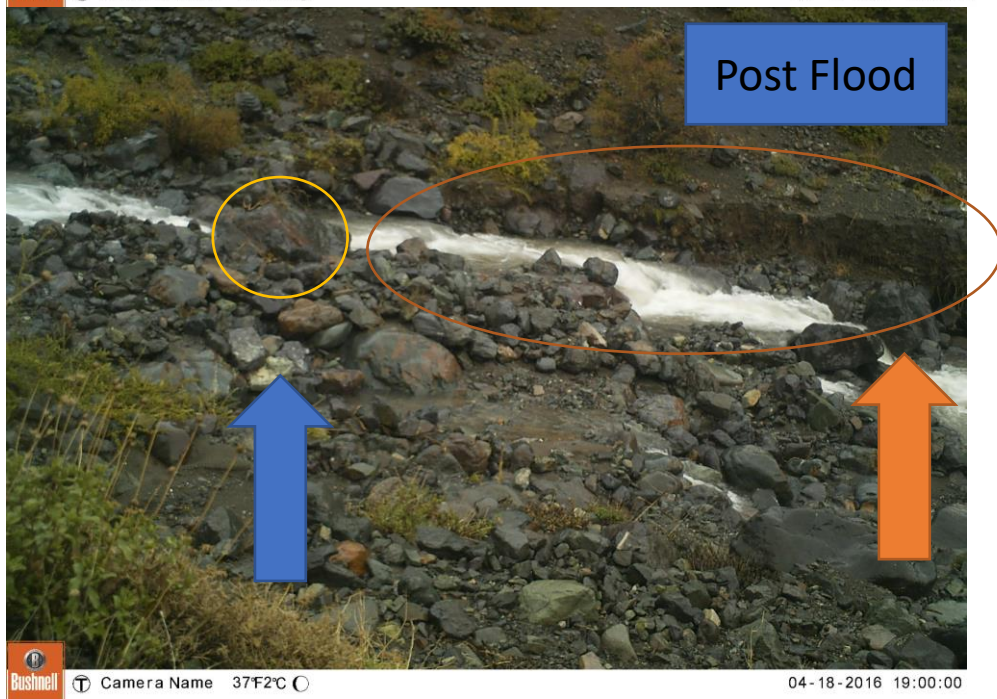
- This work investigates where geomorphic units are destroyed and formed and their relationship with erosion and deposition patterns.
- Erosion and deposition have been evaluated after an extraordinary flood event in Estero Morales, a small glacierized basin in the central Chilean Andes
- Surveys were used photogrammetric techniques using UAV, for pre and post-flood event.



Flood Event

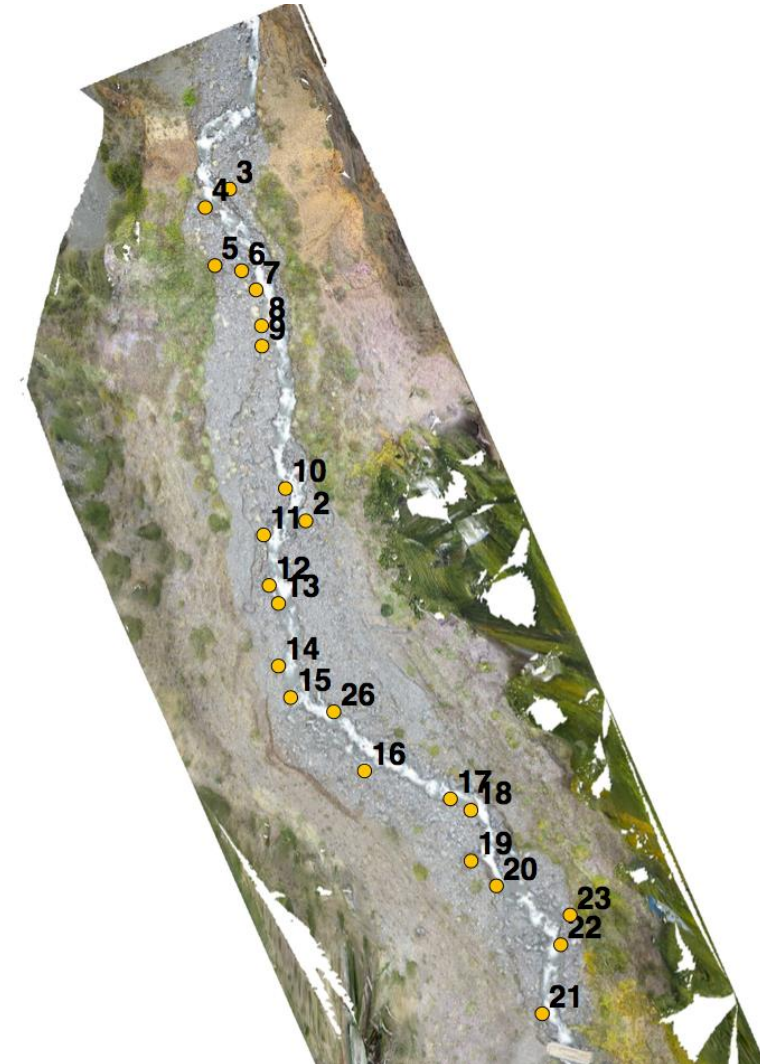
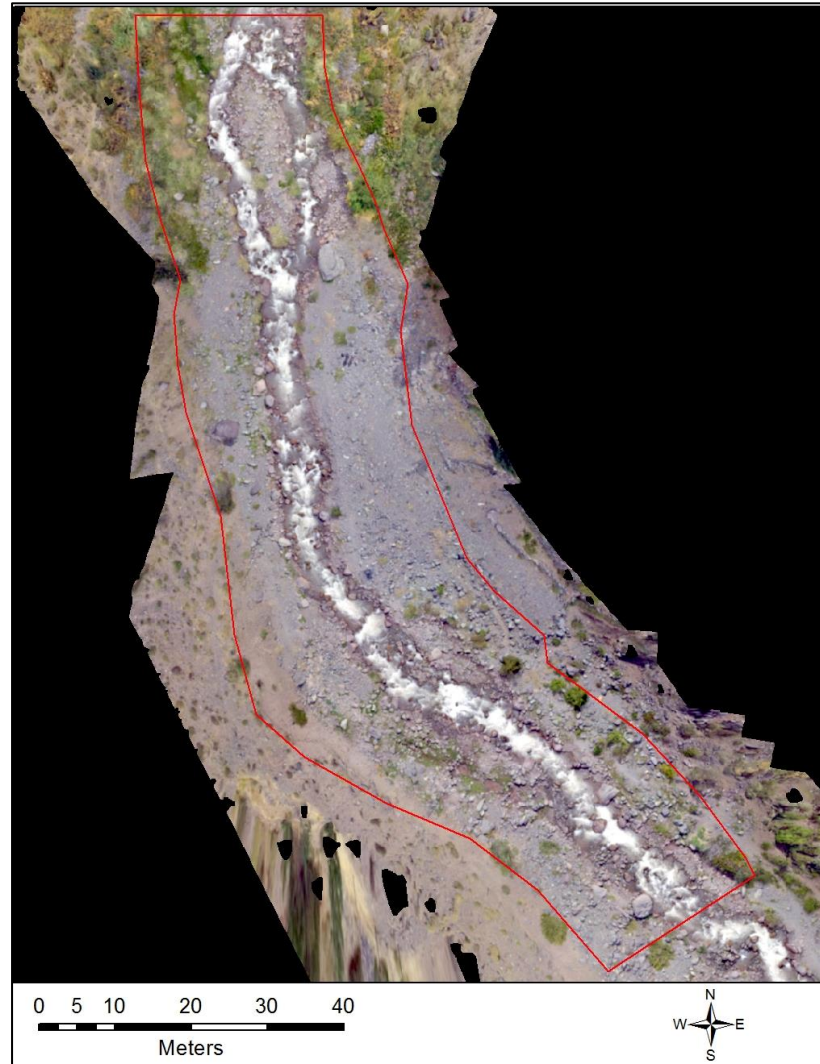
- April 13, 2016
- **ENSO** Event (El Niño South Oscillation)
- High zero **Isotherms**
- From **$0.5 \text{ m}^3\text{s}^{-1}$** to **$7.5 \text{ m}^3\text{s}^{-1}$**



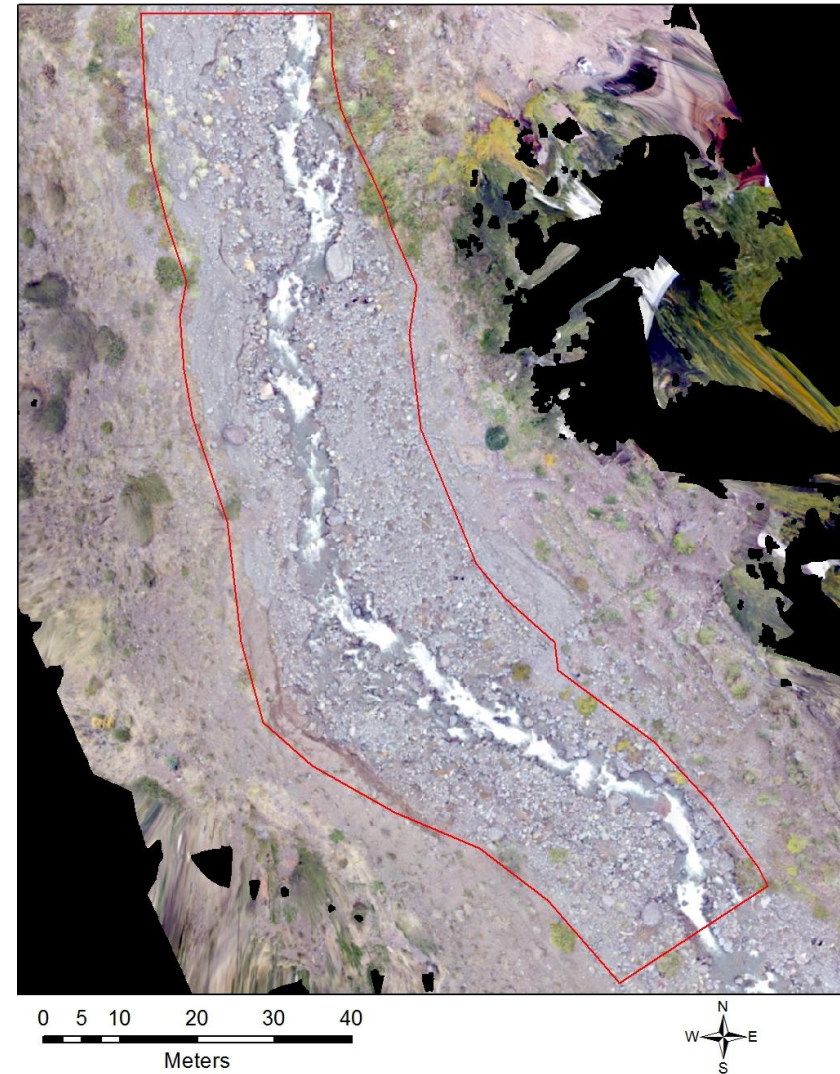
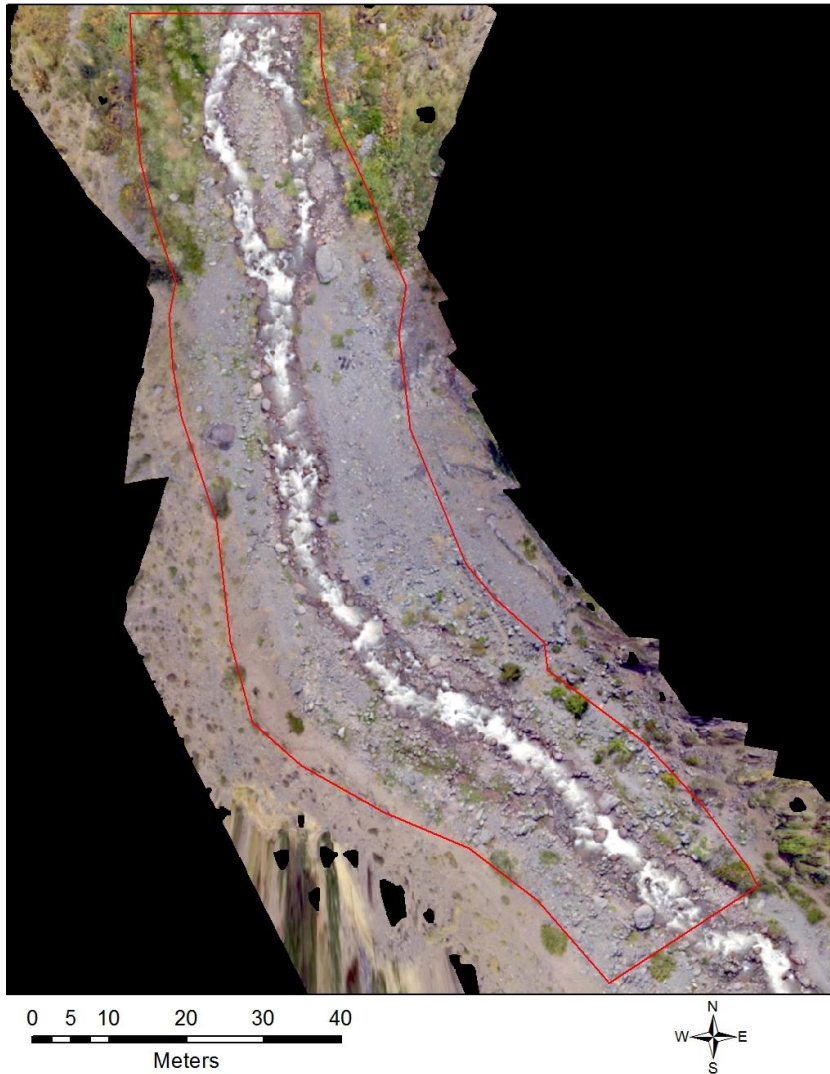


Methodology: Study Area and Surveys

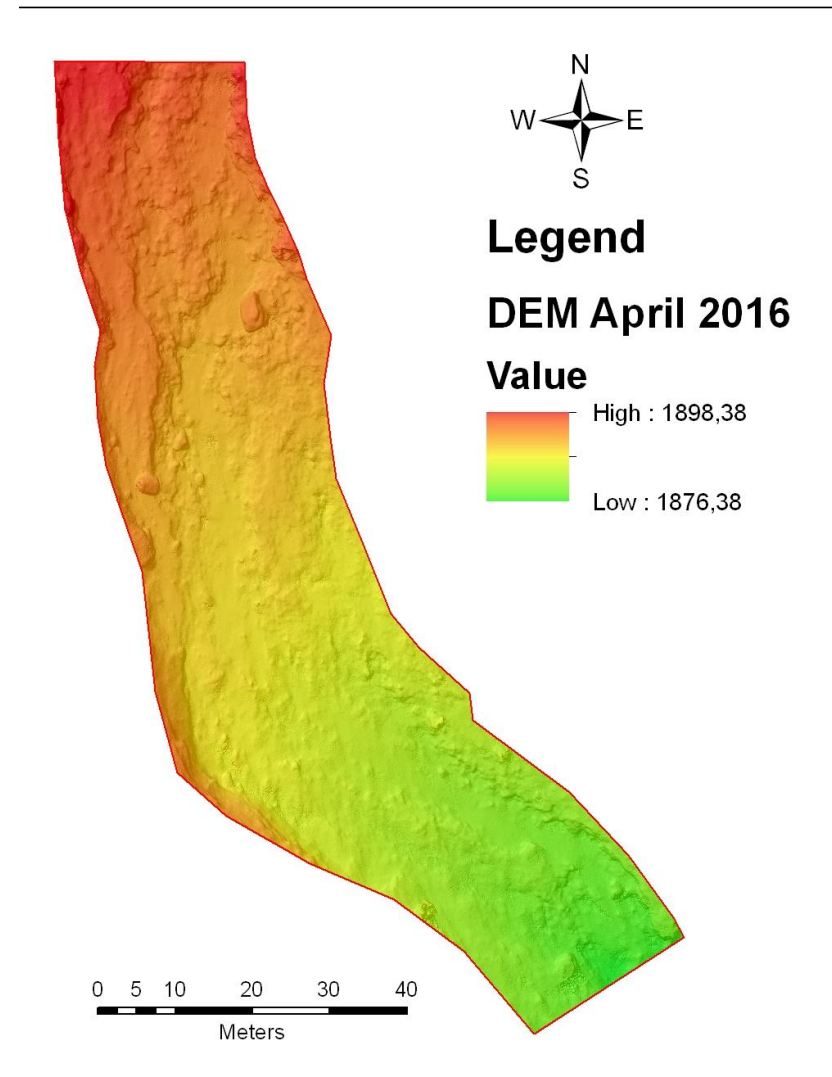
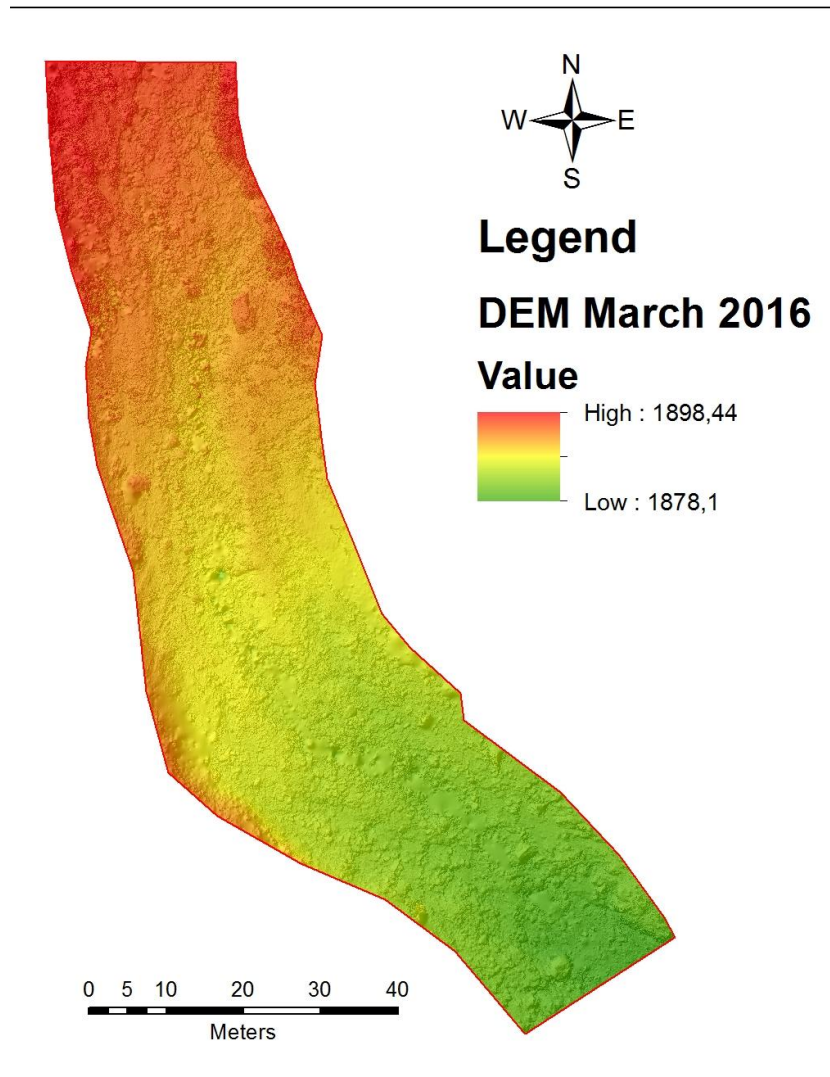
- 150 m long
- 1878 to 1894 m a.s.l.
- 0.108 m m^{-1}
- 3893 m^2
- Water level monitoring
- Ground Control Points



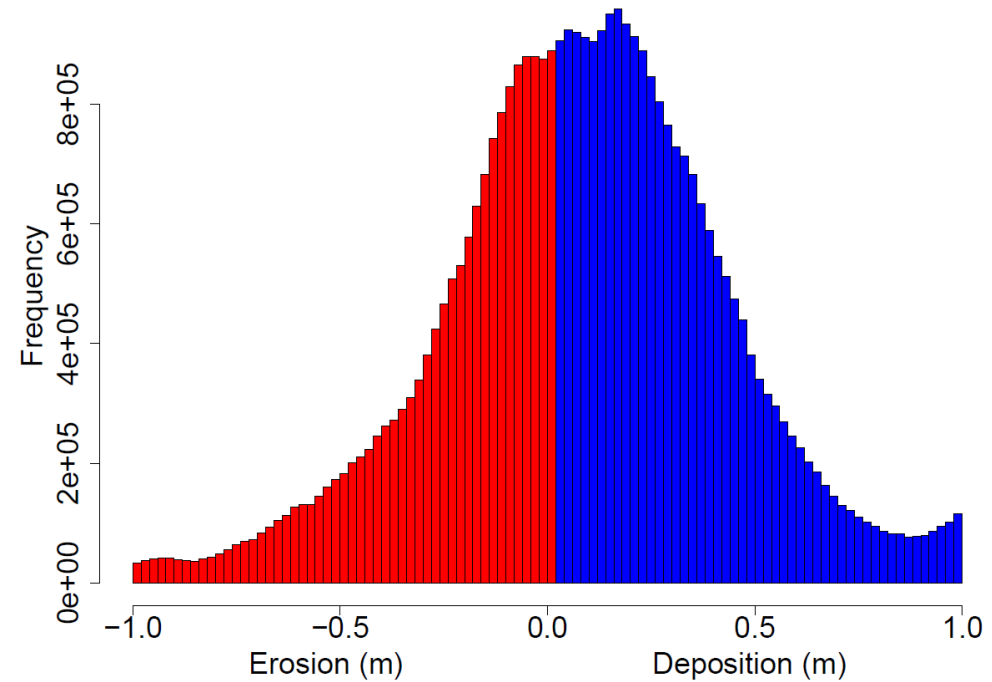
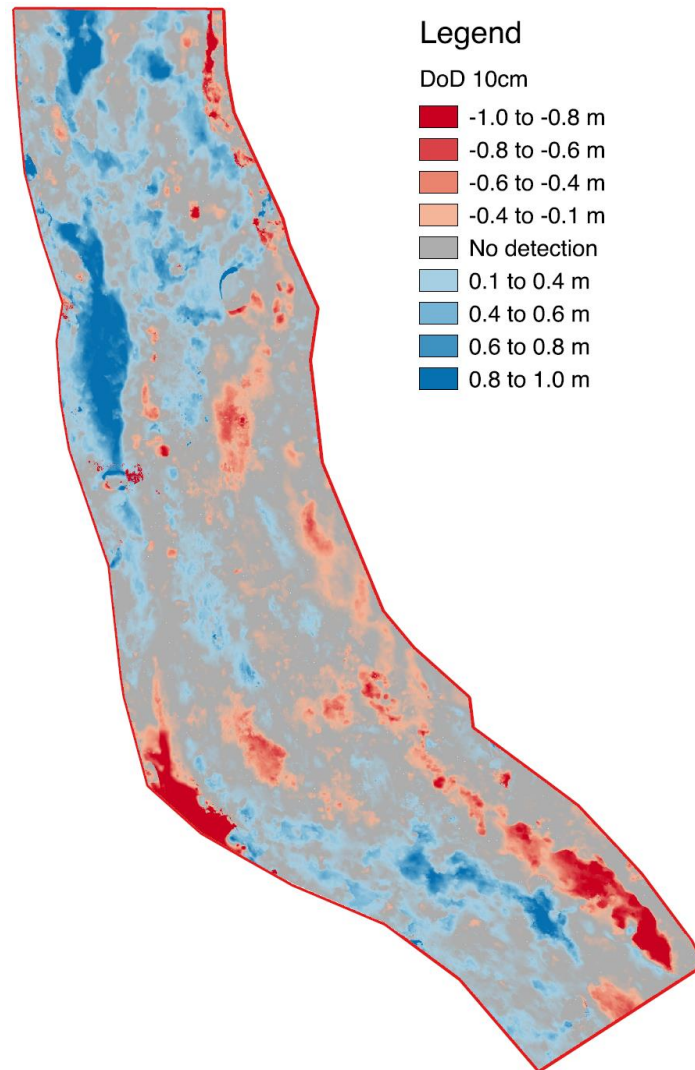
Results: Pre- and Post-flood aerial photos



Results: Pre- and Post-flood DEM



Results: Difference of DEM



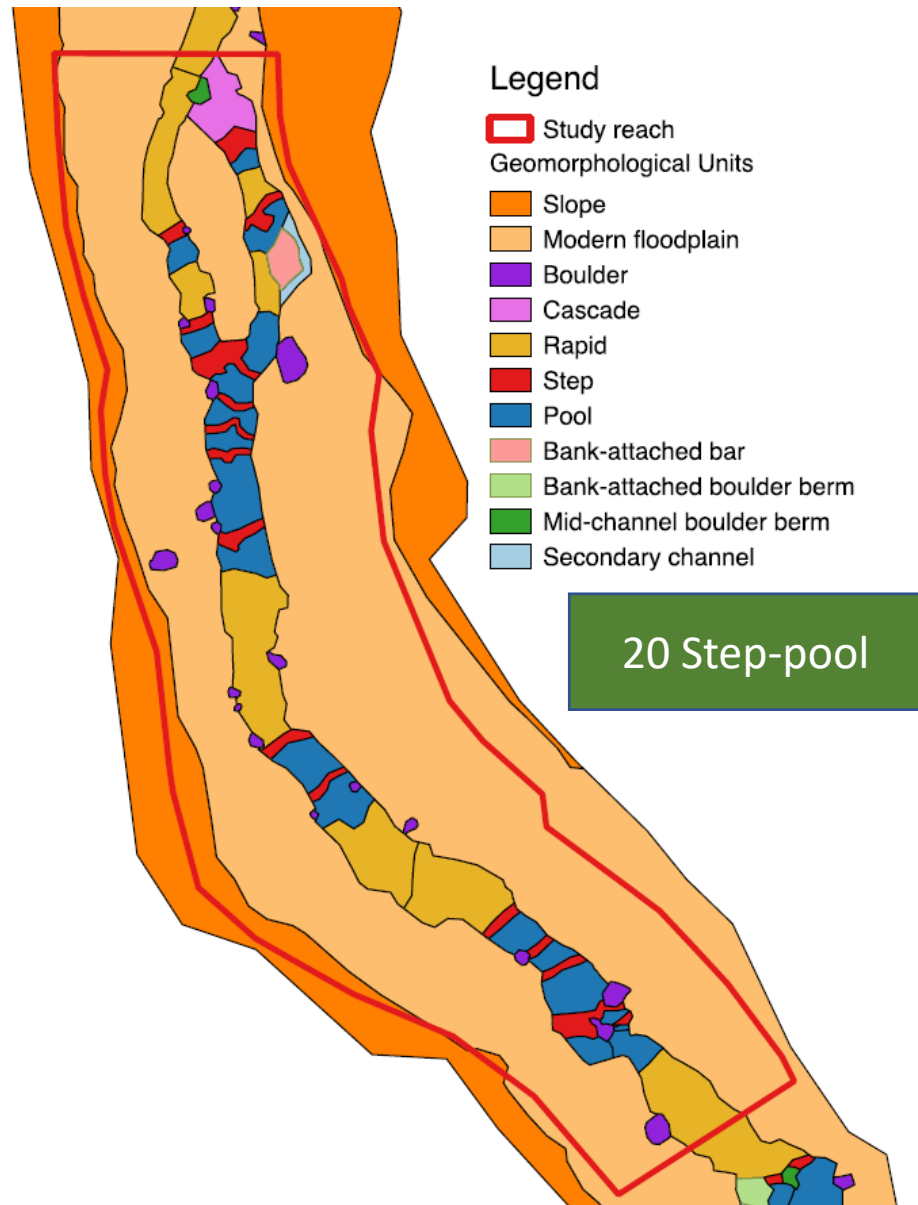
Erosion: 359 m³

Deposition: 680 m³

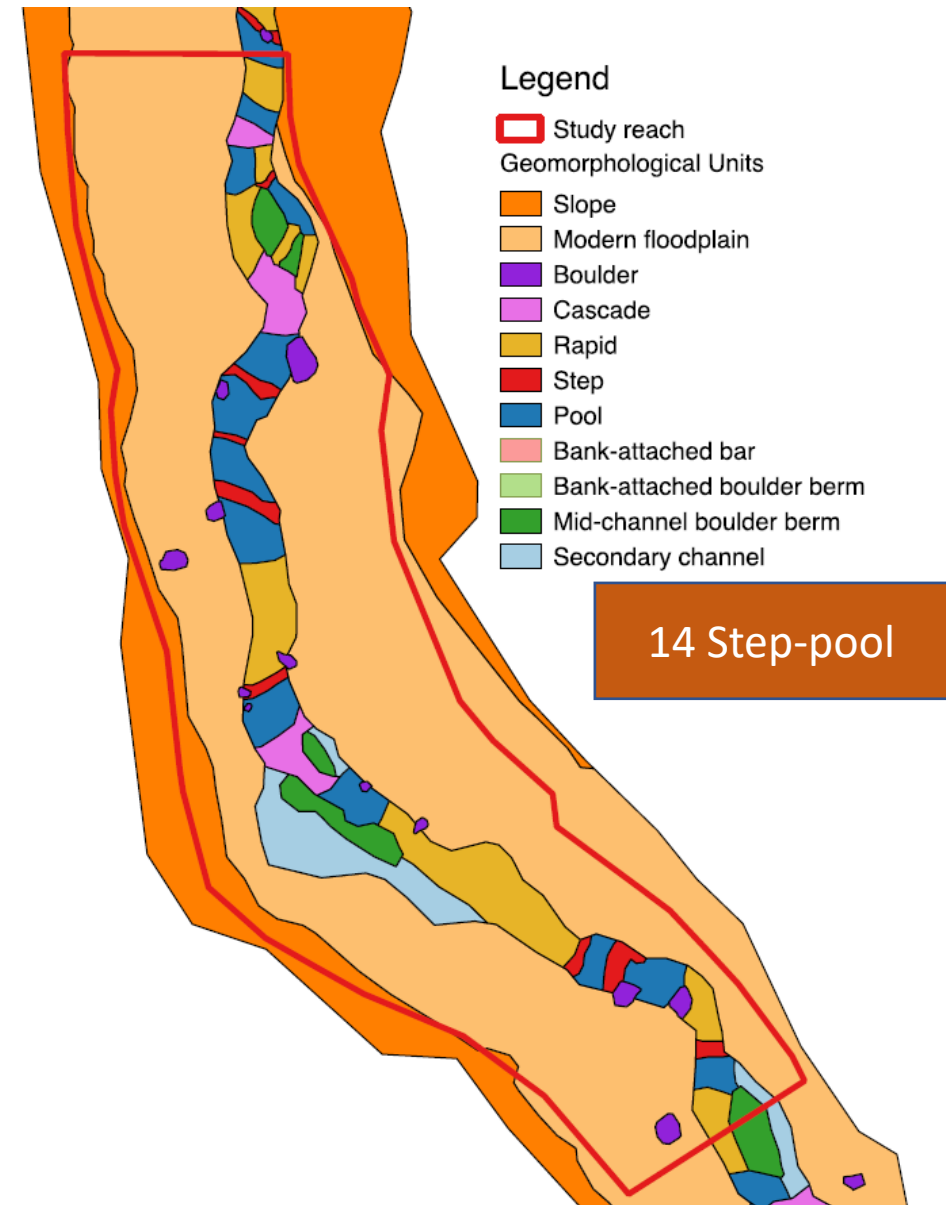
Net Volumetric
Change:

+321 m³

Pre-flood Event

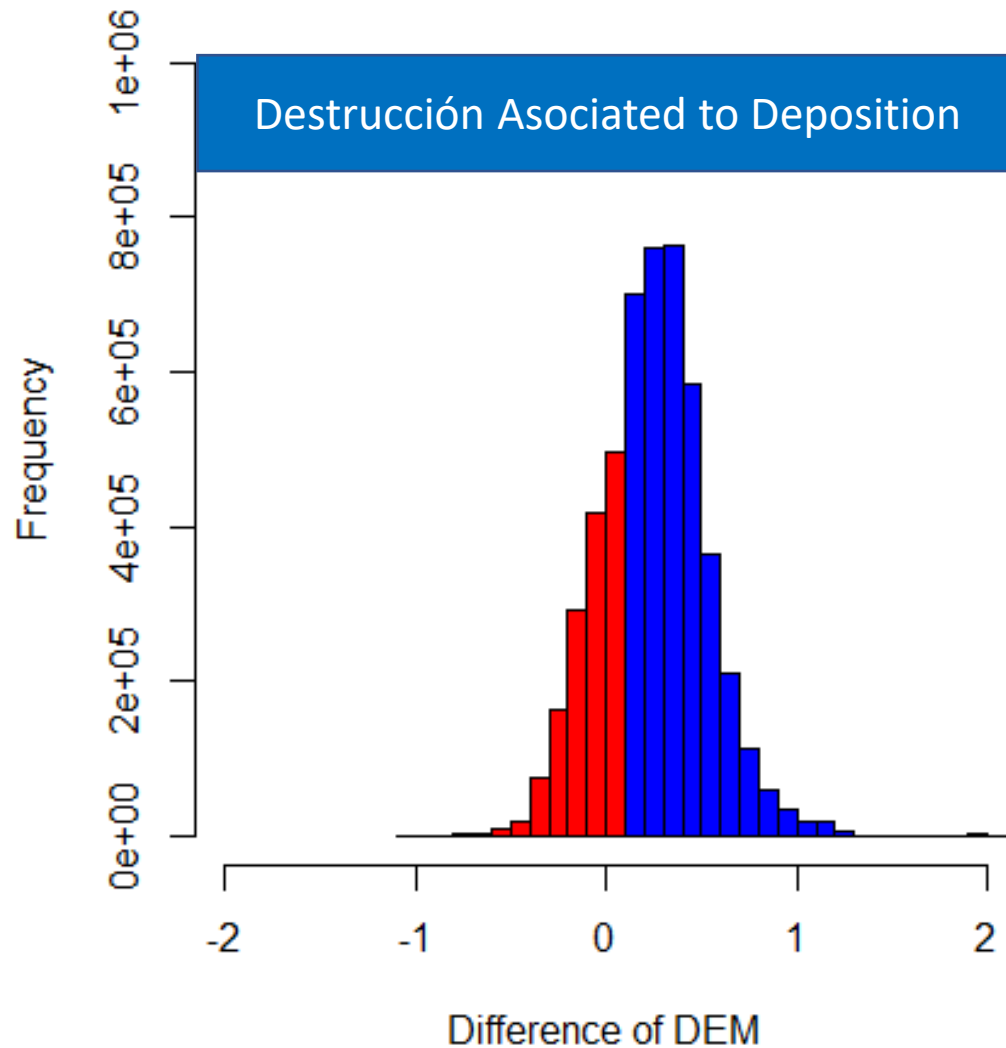


Post-flood Event



Link between Step-pool Dynamic with erosión and deposition

Step-pool destruction



Step-pool formation

