Geophysical Research Abstracts
Vol. 17, EGU2015-2892, 2015
EGU General Assembly 2015

Hydrological response of afforestation in a Mediterranean mountain area: the Araguás Afforestation catchment

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The fraction of forest cover in the Mediterranean region is increasing due to afforestation programs conducted by national forest services and also due to natural revegetation processes. Literature review suggests that afforestation might threaten water resources because it (i) reduces the number of floods and many rainfall events produce no notable flow; (ii) decreases annual water yield and low flows; (iii) delays peak flows but increases the duration of floods; and (iv) increases rainfall interception, reducing the water reaching the soil. Also, afforestation typically reduces erosion risk and the volume of sediment reaching the streams, but not during the first years after plantation due to high geomorphic activity when invasive techniques are used. Although the great amount of literature on these topics, there is still considerable scientific uncertainty about the impact of afforestation on extreme events and groundwater dynamics.

The MED-AFFOREST project studies the effects of afforestation on the hydrological response of a small catchment (Araguás afforestation catchment) monitored in the Central Spanish Pyrenees. In this study, we present the first results , as an example of the likely effects of afforestation in Mediterranean mountain areas. The results show that the hydrological response in the afforestation area is variable and complex, because the discharge was generated by a combination of different runoff generation processes.

Acknowledgments
This research was supported by a Marie Curie Intra-European Fellowship in the project “MED-AFFOREST” (PIEF-GA-2013-624974).