

## Effects of exotic forest plantations on functional and structural indicators of stream health in south-central Chile.

Peñas, Francisco J.<sup>1,2</sup>, Muñoz, Enrique<sup>1,2</sup>, Górski, Konrad<sup>2,3</sup>, Colin, Nicole<sup>2,3</sup>, Figueroa, Ricardo<sup>4</sup>

<sup>1</sup> Departamento de Ingeniería Civil, Facultad de Ingeniería, Universidad Católica de la Santísima Concepción

<sup>2</sup> Centro de Investigación en Biodiversidad y Ambientes Sustentables. "CIBAS", Universidad Católica de la Santísima Concepción

<sup>3</sup> Departamento de Ecología, Facultad de Ciencias, Universidad Católica de la Santísima Concepción

<sup>4</sup> Departamento de Sistemas Acuáticos, Facultad Ciencias Ambientales, Universidad de Concepción

Land-use changes often have significant effects on river flows and sediment yields from specified catchment. Thus, land-use changes have ecological implications not only for the health of terrestrial but also for aquatic ecosystems. Over the last decades, south-central Chile has suffered a drastic replacement of native forest by exotic forest plantations. This is expected to produce a significant decrease of the health of freshwater ecosystems and, consequently, it represents a first order issue that should be considered in water resource management. In this study, we assess the influence of replacement of native forest by exotic plantations on the flow regime and the structure and functioning of river ecosystems. Here, we present preliminary results from eighteen rivers of the Biobío and Araucanía regions of Chile, the area most strongly affected by exotic forest plantations in the country. Study sites were selected based on a control-impact design using a geospatial database of the river network created previously. Eight impacted sites were sampled with total cover of more than 60 % of forest plantations upstream of each of the sampling site. These were paired with ten control sites where native forest cover exceeds 50 % of the catchment. We analysed changes on macroinvertebrate and fish assemblages, physicochemical parameters (pH, conductivity, total dissolved solids, temperature), nutrients, benthic periphyton, granulometry and the effects on ecosystem metabolism based on continuous records (72 h) of dissolved oxygen concentration. Comparison of flow regimes recorded in gauge stations revealed effects of land-use changes on regular floods and low flow events. Furthermore, preliminary results revealed an effect of the land-use change on most of the functional and structural indicators used in this study.