



A pristine, poorly gauged Catchment in the Chilean Andes: an integrated Approach to investigate its Runoff Generation Processes

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In this study we are investigating the runoff mechanisms in a small catchment in the foothills of the Chilean Andes. The interest in this catchment is twofold: on the one hand, young volcanic ash soils in combination with undisturbed old growth forest are of scientific interest (especially as the hydrology of these soils is little investigated). On the other hand, the fact that we are able to study a catchment in its original state, i.e. before human intervention, is of special interest within the context of land-use change, a major issue in this area of Chile. However, the rare opportunity of studying an undisturbed catchment comes with a number of drawbacks. Accessibility of the study area is very limited due to the dense vegetation and steep hillslopes. Neither roads nor paths exist. Prior data is also limited; soil maps and hydro-geological maps of this area are inexistent. In this case of a previously ungauged/poorly gauged catchment that we want to understand in its hydrological processes, we are not only dealing with data scarcity in space (as in most studies), but we also have to deal with data scarcity in time. Thus, long data records have to be replaced with results from a multitude of methods and experiments all carried out within a short timeframe. From short time series of data we need to extract as much knowledge and understanding as possible. The methods used in this study thus range from various short term measurements and experiments during field campaigns (e.g. tracer experiments and ERT measurements) to the measurement of high temporal resolution time series of rainfall, stream water level, groundwater level and soil moisture. After instrumentation and data acquisition we are faced with the challenge of integrating the results in order to obtain a coherent picture of runoff generation in this catchment. A physically

based hydrological model can facilitate this process. Focus of this presentation is the integrated approach, experimental methods and the synthesis of the results.