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A blueprint for participatory environmental monitoring

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Environmental prediction needs both good models and good data. The advances in the development of hydrological models, calibration techniques, model space sampling and uncertainty estimations have improved drastically over recent years. Computing power is now sufficient to run very complex, distributed models. However, in many regions, there are not enough data to sustain the complexity of these environmental models. The discrepancies between data requirements and data availability results in ill-posed calibration problems, and complicates distinguishing between different model implementations and parameter sets. The predictive capacity of such model implementations is often very poor. These problems are particularly urgent in the tropics. For instance, hydrological monitoring stations are scarce, often not properly maintained and in an awkward state. In mountainous regions, most of the hydrometeorological monitoring networks are located in the lower parts of the valleys, where easier access is a big advantage. Last but not least, the maintenance of these stations is expensive, and typically can only be sustained by large organisations such as government bodies. This makes scientist and ecosystem managers highly dependent on often erratic political decisions. We will describe the experiences of implementing a participatory environmental monitoring scheme in the tropical Andes. Instead of focusing on a small number of highly technological and expensive hydrometeorological stations, the project opts for monitoring basic water balance fluxes in many small catchments, involving local communities. It is believed that such a participatory monitoring network will yield information with a scientific content that equals classical monitoring campaigns. Despite the lower accurracy of single implementations, the distributed nature of the network provides more information about the spatial variability of hy-

drometeorological processes, which is extremely high in the region. Furthermore, such a network is far more resilient to failures. Both the experiences of involving local communities in the decision making process and the practical implementation (sensor maintenance, data downloading, processing and distribution) will be explained.