

RESEARCH

Project 2.4

Project 2.5

**PROJECT 2.2****Water regulation as an ecosystem service****Project Leader: Dr David McJannet (CSIRO)**

The quality, allocation and management of water resources for industry, community and environment are critical issues in the Wet Tropics of north Queensland. There are increasing pressures to dam, divert and harvest water for urban and agricultural uses that need to be balanced against requirements to maintain environmental flows and rates of aquifer recharge.

Most catchments in the Wet Tropics are complex mosaics of different land uses and vegetation, with rainforests frequently comprising a significant proportion of the vegetation cover especially in the upper parts of the catchment. However, there is little quantitative information on the hydrology of different forest types, or on their hydrological characteristics compared to similar areas under agricultural and other land uses. Although broad relationships between rainfall and stream flows are known for some of the major catchments in the region, the effects of changes in vegetation type and cover on catchment response, water quality and water yield from these humid tropical landscapes are poorly understood and subject to much community speculation and controversy.

A predictive understanding of the effects of changes in land cover and climate on regional hydrology is vital for planning for sustainable use of water resources in the Wet Tropics bioregion. Similarly, an understanding of the impacts of land use and climate change on local hydrology and its possible implications for the long-term survival of different forest types (and their associated biota) is essential for conservation planning.

By improving our knowledge of the role of rainforests in regulating water flows from catchments in the region, and by understanding the dependence of these forests on local hydrological regimes, this project will make a major contribution towards:

- (1) documenting the 'water services' provided by the region's rainforests;
- (2) evaluating the consequences of land use & climate change on catchment water yields; and,
- (3) identifying possible implications of changes in regional and local hydrology on the long-term survival and conservation prospects for threatened forest types (e.g. cloud forests, lowland palm forests).

A specific component of the project will also contribute towards understanding the possible role

of floodplain forests of the coastal lowland in filtering and regulating water quality.

