

# Hydrology



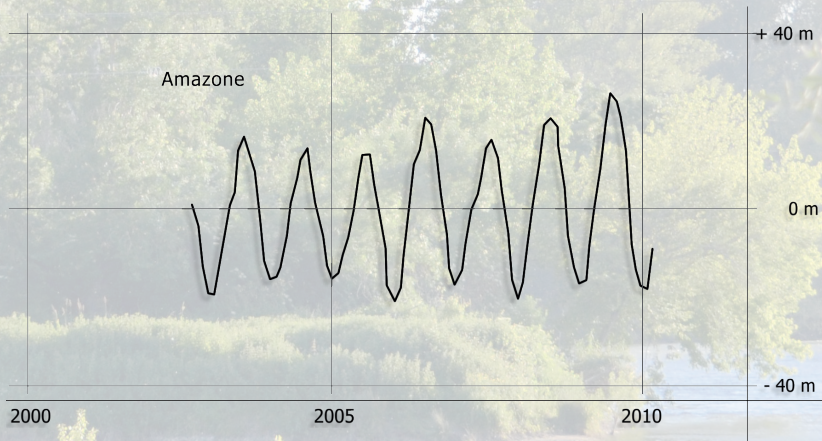
Pinnacles Lakes National Park. © Williams, Fotolia





Management of water resources is one of the greatest challenges facing the 21st century. As the planet warms, river discharges will decline and lakes and inland seas will shrink or possibly even swell as glaciers melt or precipitation increases. What has happened in the Aral Sea gives a taste of what we can expect in the future as the combined impacts of human activities and climate change make themselves felt. Hydrographic survey stations are often in a poor state of repair, and sometimes in remote areas. To monitor, provide early warning and understand the water cycle and status of resources, the big picture that altimetry satellites provide is now vital. Space hydrology is a discipline now able to keep track of hundreds of sites on inland seas, lakes and major rivers.

For example, in Central Asia measurements on Lake Issyk Kul will help to monitor glacier melting in the Tian Shan mountains. And in Brazil, satellites are gauging river levels in the farthest reaches of the Amazon.



*Level of the Amazon River measured by satellite altimetry*

The spatial resolution of current-generation satellites is not sufficient to monitor small drainage basins or medium-sized rivers like the Garonne. Sustainable stewardship of freshwater resources is a key priority. The French-U.S. SWOT satellite mission will use wide-swath radar interferometry to acquire 2D images of water surface height at a resolution enabling millions of lakes and all rivers wider than 100 metres to be monitored on all continents. SWOT will thus offer new insights into the global dynamics of surface water, and help to monitor and manage the planet's freshwater stocks.