

A global network of area-integrated water budget monitoring for climate change detection?

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Abstract Time series of ecosystem-scale water storage change should signal climatic change because storage amount reflects the integrated environment. Direct measurement of area-averaged land storage change is now possible through either gravity observations or geological weighing lysimeters (GWL). Gravity satellite systems such as GRACE monitor water storage changes over extensive regions at coarse time scales, while GWL stations monitor over hectares and in real time. The GWL approach comprises accurate measurements of deep static pore water pressures (derived, for example, from seismic monitoring) which respond to surface water load changes. Similarly, direct gravity monitoring to detect the local storage change signal of climate change might be achieved using existing deep underground physics laboratories. By the combined use of new and existing monitoring, it is suggested that a global network of ecosystem storage change be set up in localities likely to be most impacted by climate change effects.

Key words storage change; gravity monitoring; mass change; climate change