

## **Estimating pond storage capacity using remote sensing and GIS: a case study in Zhanghe irrigation scheme, southern China**

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**Abstract** There are numerous ponds in southern China and it is very difficult to evaluate their contribution to local water users because of their small size and wide variance. This paper presents two methods for estimating pond storage capacity using RS/GIS. One is to estimate pond storage capacity as a function of the topographic factors. An indicator, PV, pond storage capacity per unit rice area of 86 villages, is calculated, and then the correlation between PV, slope, altitude and drainage density is calculated to estimate the pond storage capacity of the whole study area. The other method is to extrapolate estimated results from a high resolution image of small scale to a low resolution image of large scale area. With field information and an IKONOS image (1 m), the pond storage of a small scale area is estimated using a pond surface area–volume function, and then the value is extrapolated to large scale area with reference to a Landsat ETM image (14.25 m). The two methods are applied to Zhanghe irrigation district, and the application results show that the results are acceptable.

**Key words** GIS; pond storage; remote sensing; topographic factor

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