

A Quarter-Million Sandbar Photos: What Have We Learned?

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The USGS and NAU have been collecting repeat oblique photographic images of sandbars along the Colorado River in Grand Canyon since the late 1980s. In the late 2000s, the network of remote cameras was transitioned from film to digital. In addition, the photography was made fully automated, controlled by a datalogger. We have been maintaining and expanding this network of automated remote cameras ever since. This network currently provides five or more images every day at 46 sites. These cameras are high and hidden (to the best of our abilities), and are designed to provide an image of a whole sandbar without compromising camper privacy. Collections of some of these photos are available to the public on the GCMRC website. We're working on developing our website so we can serve more photos, organized by site and in time with a user-friendly interface.

Among the photographed sites are areas of geomorphic, recreational, and cultural significance. These photographs are used to study and document the condition of Grand Canyon sandbars as they are changed by daily river flows, controlled high flows, tributary flood events, recreational use, vegetation encroachment, and other factors. We'll be showing some interesting events that we've captured with these cameras, including a recent flood in National Canyon, and the effects of recent High Flow Experiments (HFEs) on sandbars.

We've learnt that each sandbar has its own personality and that its behavior is not necessarily representative of all sandbars in a given reach. Until now the use of the images has been qualitative (bigger, smaller, wider, taller), however we're working on techniques which use the images to obtain more quantitative estimates of how sandbars are changing in time, such as reliable estimates of sandbar areas, even volumes. This will help us survey more sandbars, more often, giving us a better understanding of their variation in time.