

GCMRC Science Update

June 11 TWG WebEx

Dave Lytle

Southwest Biological Science Center
Grand Canyon Monitoring and Research Center

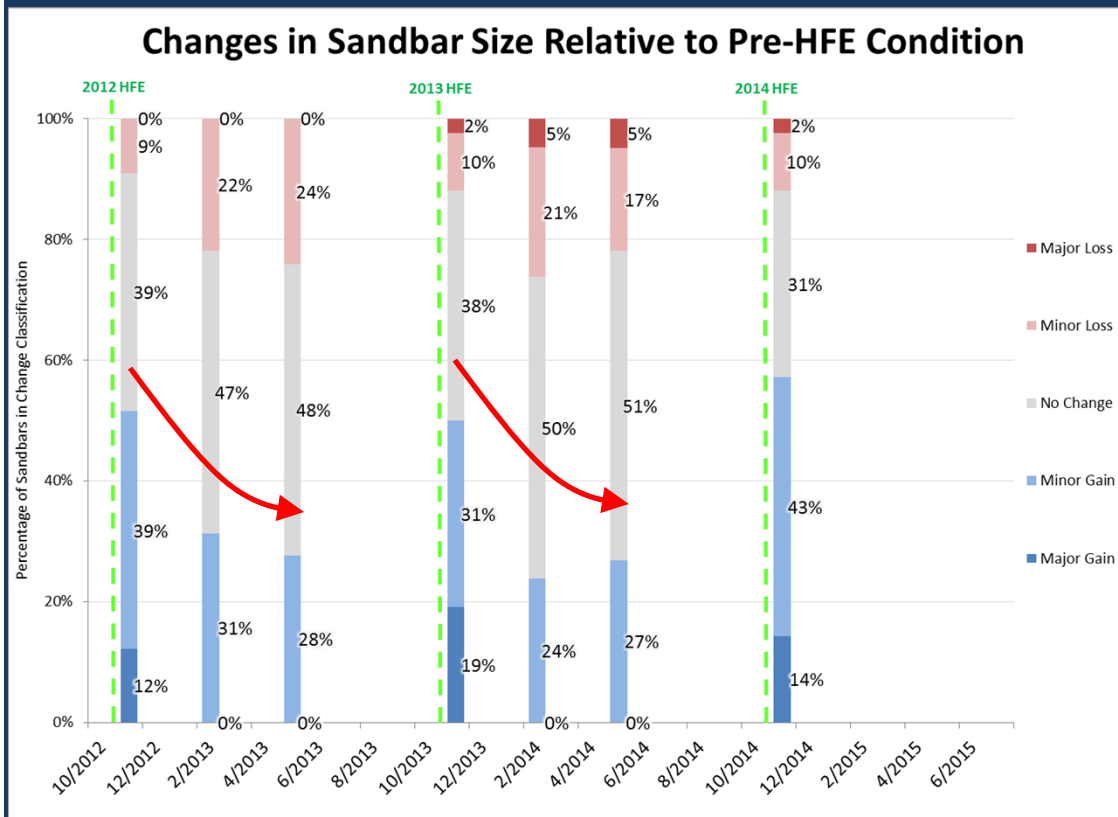


2014 HFE

- 24 sites (57%) larger
- 13 sites (31%) no change
- 5 sites (12%) smaller



Response to HFE Protocol



- Each of the HFEs in the past 3 years has resulted in sandbar deposition
 - They continue to erode in following 6 to 12 months

2012 HFE

2013 HFE

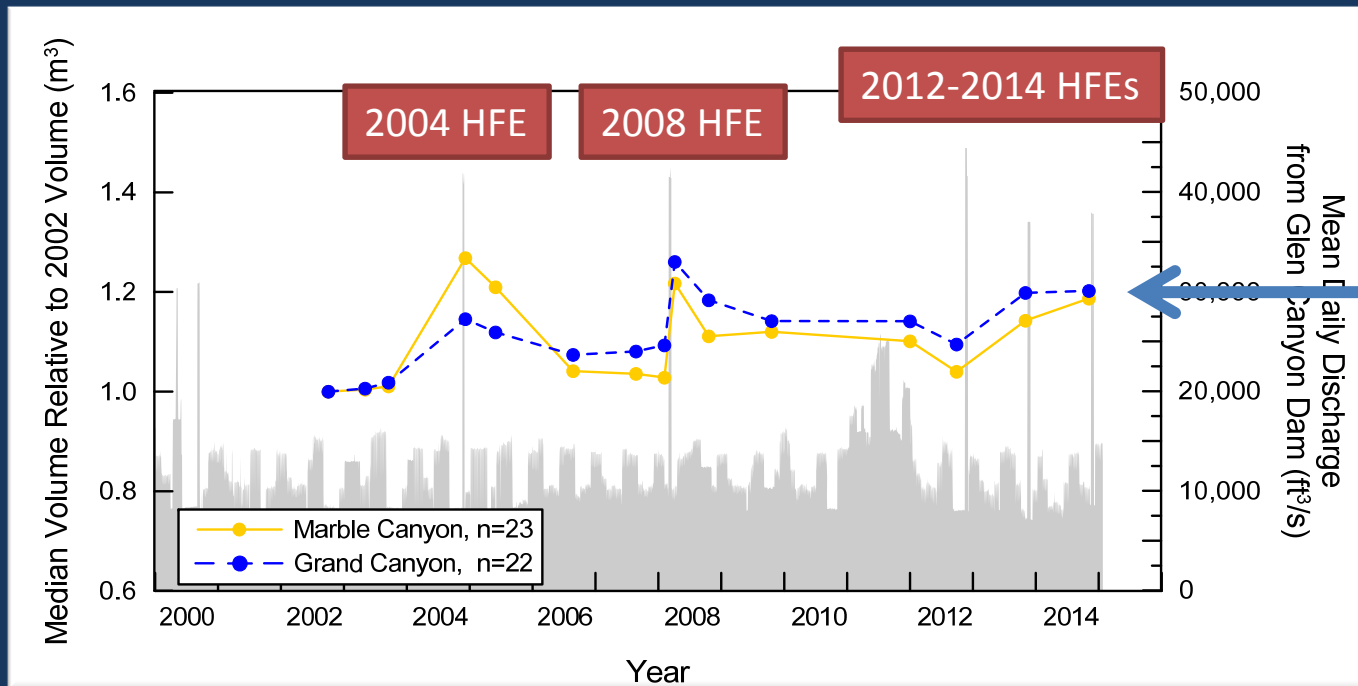
2014 HFE

Photos at www.gcmrc.gov/sandbar/

Preliminary results, subject to review and revision – do not cite



Sandbars: 2002-present



~10 months after HFEs, bars still larger than before start of protocol

- Increase in volume in both Marble Canyon and Grand Canyon at long-term monitoring sites
 - Deposition by HFEs
 - Bars erode following HFEs, but not quite to pre-flood size
- Frequent HFEs = consistently larger bars
- Cumulative effect? No evidence yet that bars will get progressively larger.
- 2013 and 2014 HFEs were smaller than 2012 and earlier.

• www.gcmrc.gov/sandbar/ Preliminary results, subject to review and revision – do not cite



Fwd: Proxy http://www.gcmrc.gov/sandbar/

www.gcmrc.gov/sandbar/

USGS Home Contact USGS Search USGS

Grand Canyon Monitoring and Research Center

Grand Canyon Sandbar Monitoring

Introduction

Since the completion of Glen Canyon Dam in 1963, the amount of sand supplied to Grand Canyon National Park has been reduced by more than 90 percent. The Paria River, a tributary to the Colorado River 15 miles downstream from the dam, is now the single most important supplier of sand to the Colorado River within the Park. This large reduction in sand supply has resulted in substantial decrease in the number and size of sandbars. Sandbars are important because they serve as campsites for river runner and hikers, provide important aquatic and riparian habitats, and are the source of sand that may help protect archaeological sites. The information collected by this project will be used to determine whether dam operations, including short-duration artificial floods, cause increases or decreases in sandbars and associated campsites in Grand Canyon National Park.

For Additional Information

For additional information, please contact


Project Chief
Paul Grams

- USGS Southwest Biological Science Center
- Grand Canyon Monitoring Research Center
- Contact pgrams@usgs.gov or (928)556-7385

Database Designer/Programmer
Kathryn Schoephoester

- USGS Center for Integrated Data Analytics

Website Design and Programming
USGS Center for Integrated Data Analytics




Terms of Use


The data presented in this website are collected and processed using standard USGS protocols and other established peer-reviewed methods, and subject to rigorous quality control. Nevertheless, minor errors of these data are possible.

The data are released on the condition that neither the USGS nor the U.S. Government may be held liable for any damages resulting from its authorized or unauthorized use.


The Sandbar Monitoring Data

Currently, topographic maps are made at a set of monitoring sites annually using conventional survey equipment. These surveys are used to calculate the size of each sandbar in terms of the area of exposed sand and the volume of sand contained in the bar. Both of these calculations are relative to an elevation of interest.





View Sandbar Monitoring Data



Sandbar Surveys

- Survey Data

Photos

- Photos showing results of 2012 high-flow
- Photos showing results of 2013 high-flow
- Photos showing results of 2014 high-flow

References

Methods

- Hazel, J.E., Jr., Grams, P.E., Schmidt, J.C., and Kapinski, M., 2010. Sandbar response in Marble and Grand Canyons, Arizona, following the 2009 high-flow experiment on the Colorado River. U.S. Geological Survey Scientific Investigations Report 2010-5015, 52 p. <http://pubs.usgs.gov/sir/2010/5015/>




Recent Publications

- Grams P. E., 2013. A sand budget for Marble Canyon, Arizona – implications for long-term monitoring of sand storage change. U.S. Geological Survey Fact Sheet 2013-3074, 4p. <http://pubs.usgs.gov/fsw/2013/3074>
- Grams P. E., D. J. Topping, J. C. Schmidt, J. E. Hazel Jr., and M. Kapinski, 2013. Linking morphodynamic response with sediment mass balance on the Colorado River in Marble Canyon: Issues of scale, geomorphic setting, and sampling design. J. Geophys. Res. Earth Surf., 118, 361–381. doi:10.1002/jgrf.20050. <http://onlinelibrary.wiley.com/doi/10.1002/jgrf.20050/full>

Full Publication List

- Full Publications

Cooperating Agencies and Academic Institutions

-  Bureau of Reclamation
-  National Park Service
-  Northern Arizona University

Rainbow Trout Abundance Estimates By Reach



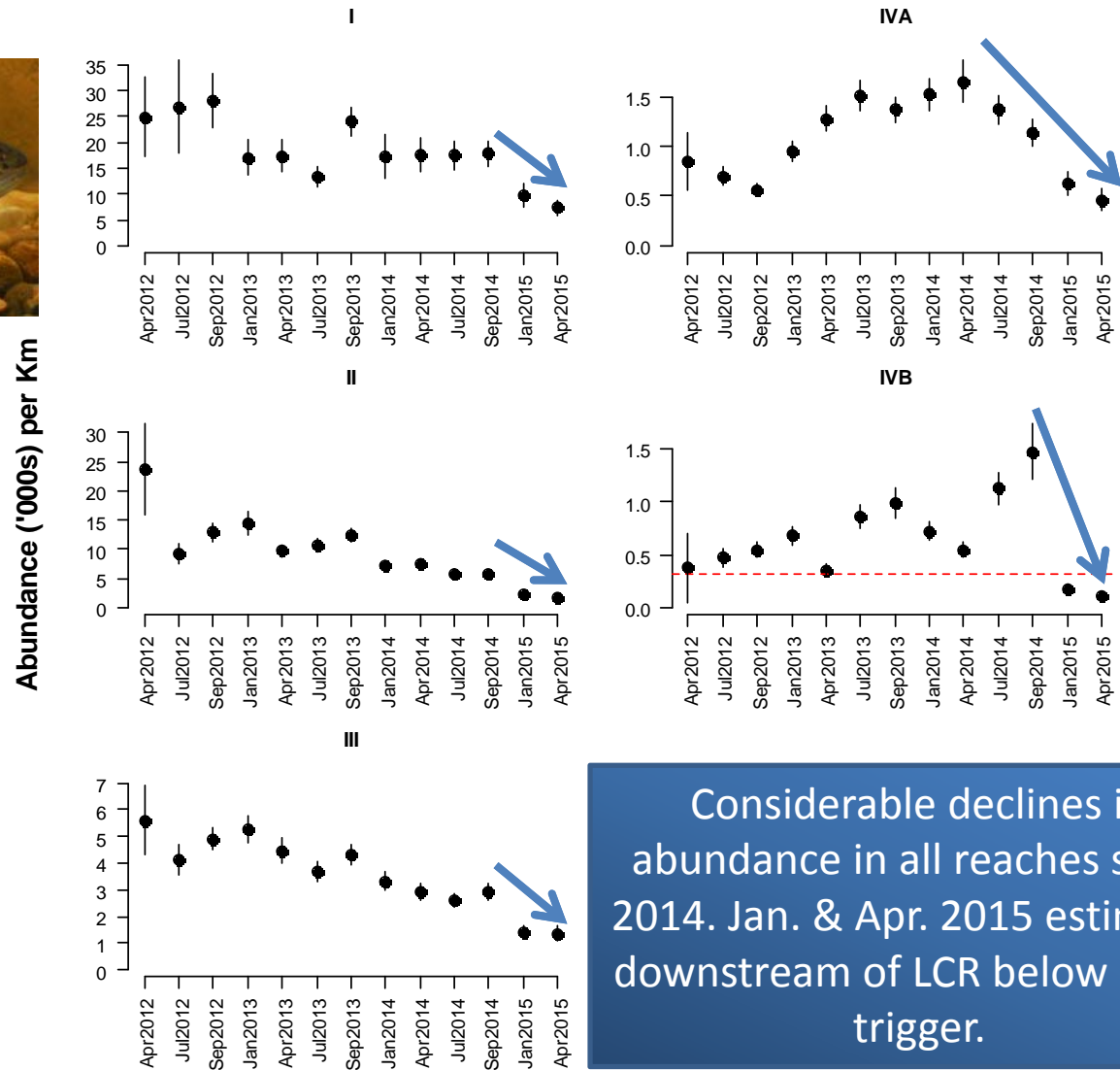
I – Glen Canyon/Lees Ferry

II – House Rock

III – Buck Farm

IVa – Upstream of LCR

IVb – Downstream of LCR



Considerable declines in abundance in all reaches since 2014. Jan. & Apr. 2015 estimates downstream of LCR below NNFC trigger.

