Glen Canyon Dam Adaptive Management Work Group
Agenda Item Information
May 18, 2011

Agenda Item

Grand Canyon Monitoring and Research Center Updates

Action Requested

☑ This is an information item.

Presenters

Ted Melis, Acting Chief, Grand Canyon Monitoring and Research Center
Paul Grams, Physical Science Program Manager, Grand Canyon Monitoring and Research Center

Previous Action Taken

N/A

Relevant Science

☑ See below.

Background Information

2011 Knowledge Assessment II – Ted Melis

Knowledge Assessment is a two-fold process that entails identifying key questions that resource managers need to answer to achieve management goals, followed by an evaluation of the questions relative to available monitoring and research (including experimental results) information. The knowledge assessment typically includes updating status and trends of resources of interest as well as an attempt to document causal mechanisms associated with various flow and non flow policies as they are known to influence resources.

Attached are slides presented to TWG in March 2011 about the 2011 Knowledge Assessment II (the second KA of the program). At the time, they were intended only to summarize the conceptual proposed steps for conducting the second assessment in collaboration with TWG and cooperating scientists.

Since the March TWG meeting, two conference calls have been conducted with the TWG to discuss the upcoming steps (2-4) in the assessment. A meeting with Federal agency managers also occurred to get a clearer perspective about how the Knowledge Assessment II might best be conducted to meet the needs associated with achieving resource management goals.

Expert workshops intended to evaluate knowledge related to strategic science questions from the 2007-11 Monitoring and Research Plan and about causal mechanisms associated with flow and non-flow treatments and resource responses of interest are scheduled for early June through mid-July. Additional updated information on the process will be shared with TWG at the June meeting and with AMWG in August. A joint workshop with scientists and stakeholders is being planned for fall

2011 with the objectives of summarily reporting results of the expert workshops and allowing stakeholders to provide further input about the type of report that will best serve the needs of resource managers and the GCDAMP. The outcome of this second Knowledge Assessment will inform the next phase of planning for the 2012-16 Monitoring and Research Plan, and will also hopefully serve to inform the LTEMP EIS in 2012-13.

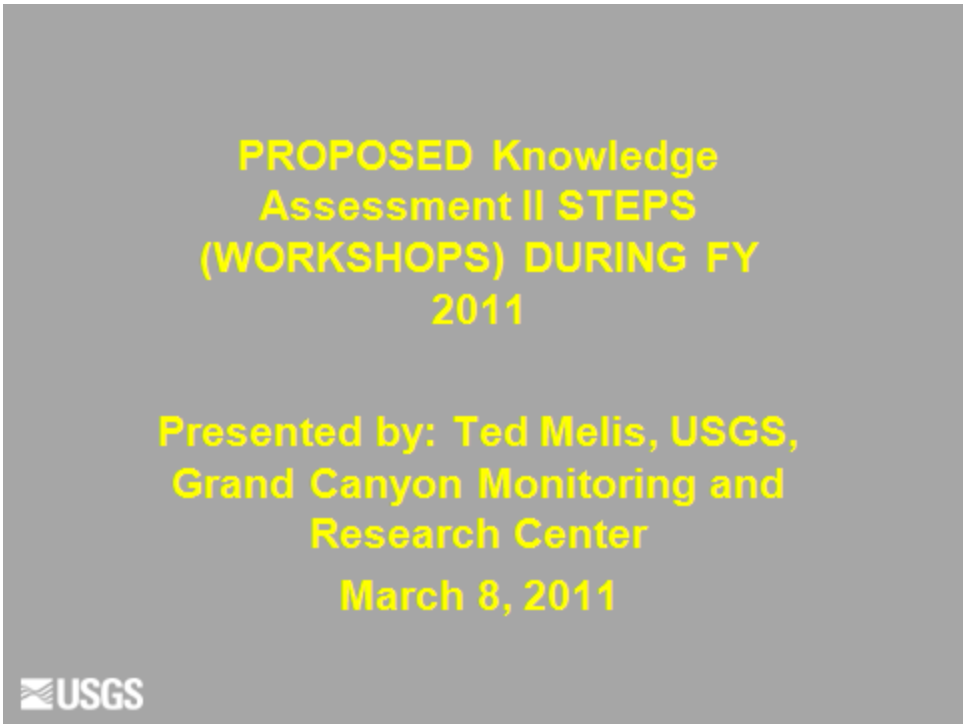
GCMRC contact: Ted Melis (tmelis@usgs.gov, 928-556-7282)

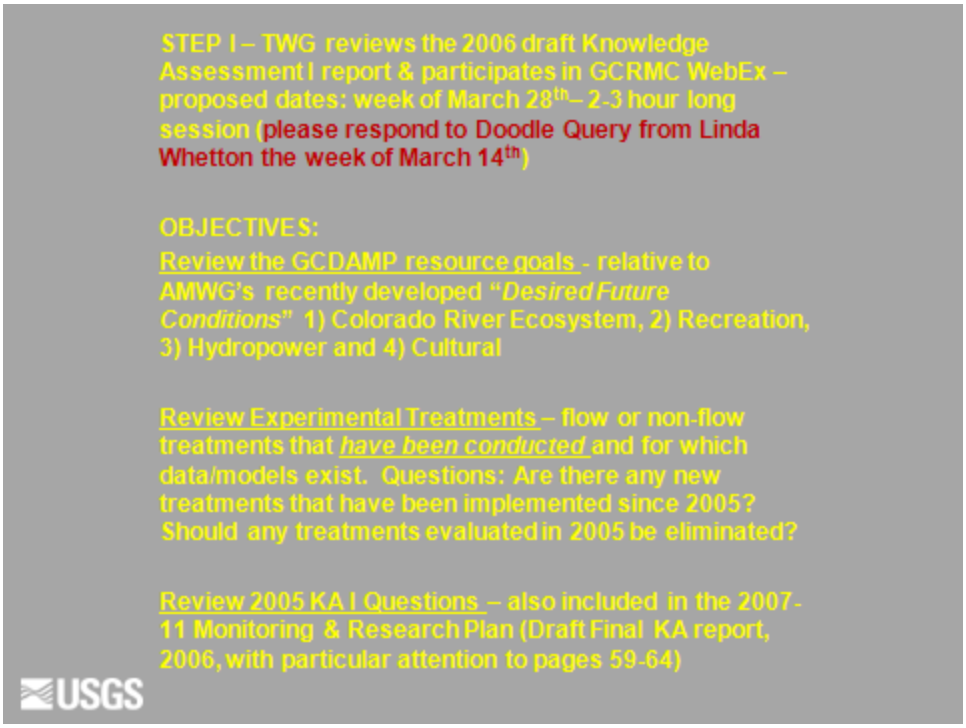
Sediment Update – Paul Grams

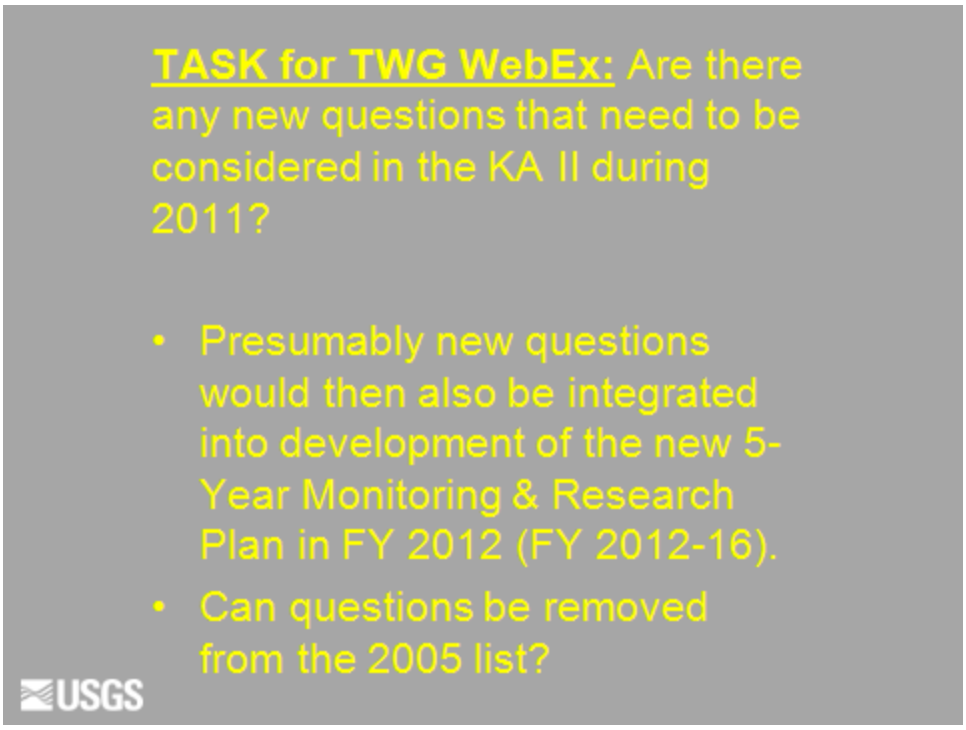
Following the March 2008 HFE, tributary sediment inputs were minimal until late summer and fall 2010. These inputs caused the sand budget in upper Marble Canyon (RM 0 to 30) to go from negative to positive relative to March 2008 (after the 2008 high flow). For the sand budgeting period from the end of the 2008 HFE to January 7, 2011, the sand budget was significantly positive in upper Marble Canyon (+1.0 to +1.8 million metric tons), slightly positive in central and western Grand Canyon (RM 87 to 225, 0.0 to +0.7 million metric tons), and slightly negative in lower Marble Canyon (RM 30 to 61, 0.0 to -0.2 million metric tons) and eastern Grand Canyon (RM 61 to 87, 0.0 to -0.7 million metric tons). The transition to greater release volumes that occurred on January 10 resulted in increased sand export rates in winter and spring 2011. Updated computations that show the status of the sand budget for Marble Canyon through April 2011 will be presented at the May 18 AMWG meeting.

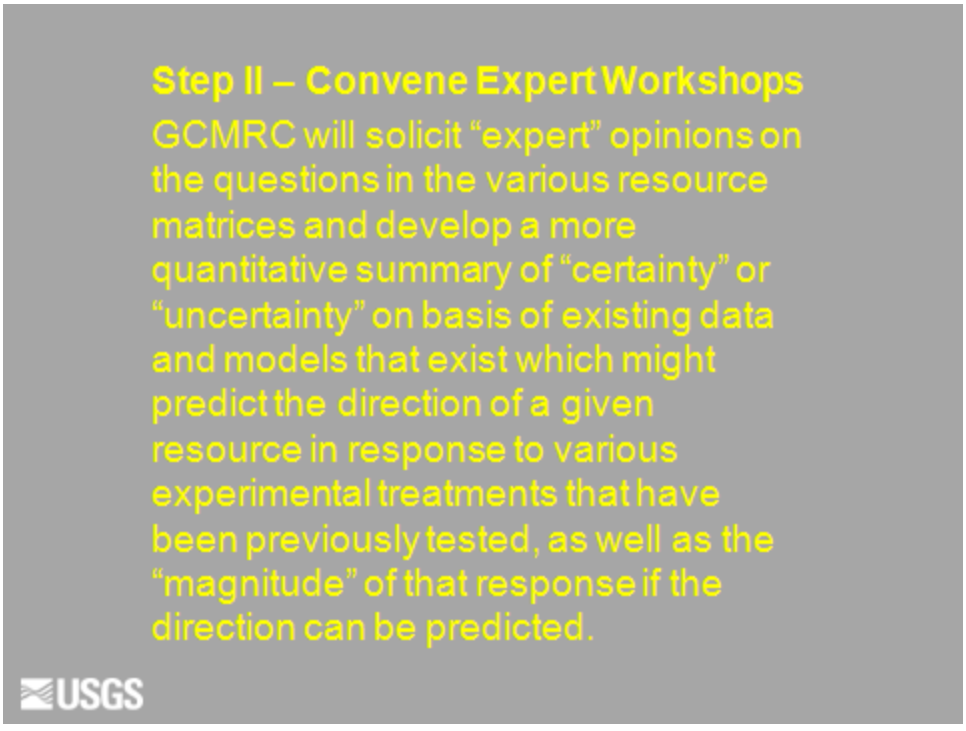
GCMRC contact: Paul Grams (pgrams@usgs.gov, 928-556-7092)

Attachment: Knowledge Assessment Slides

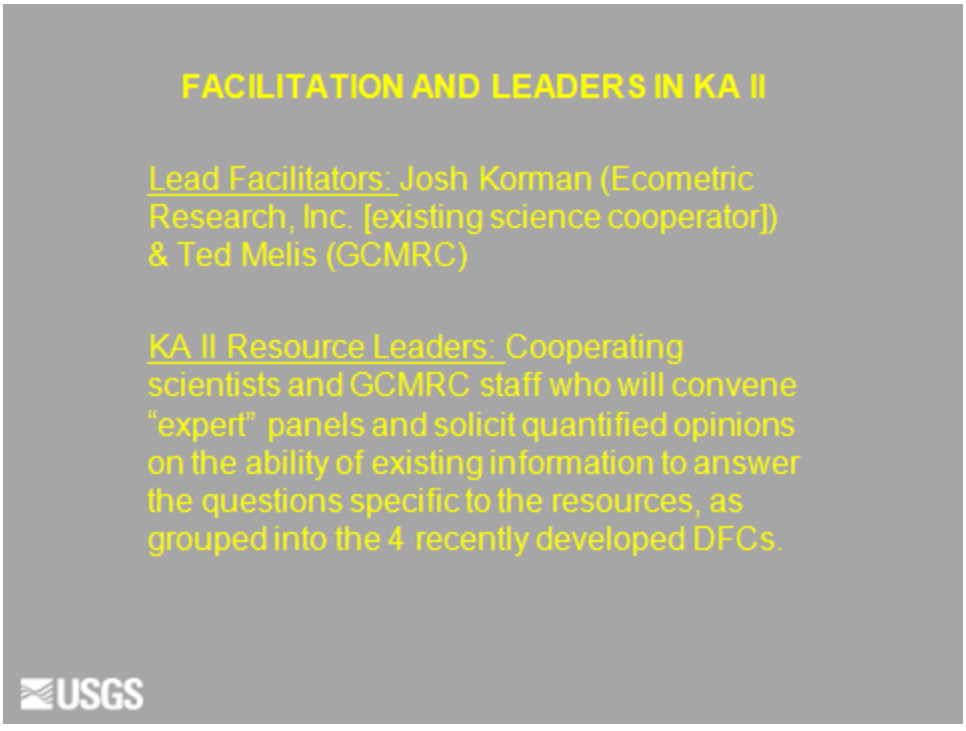


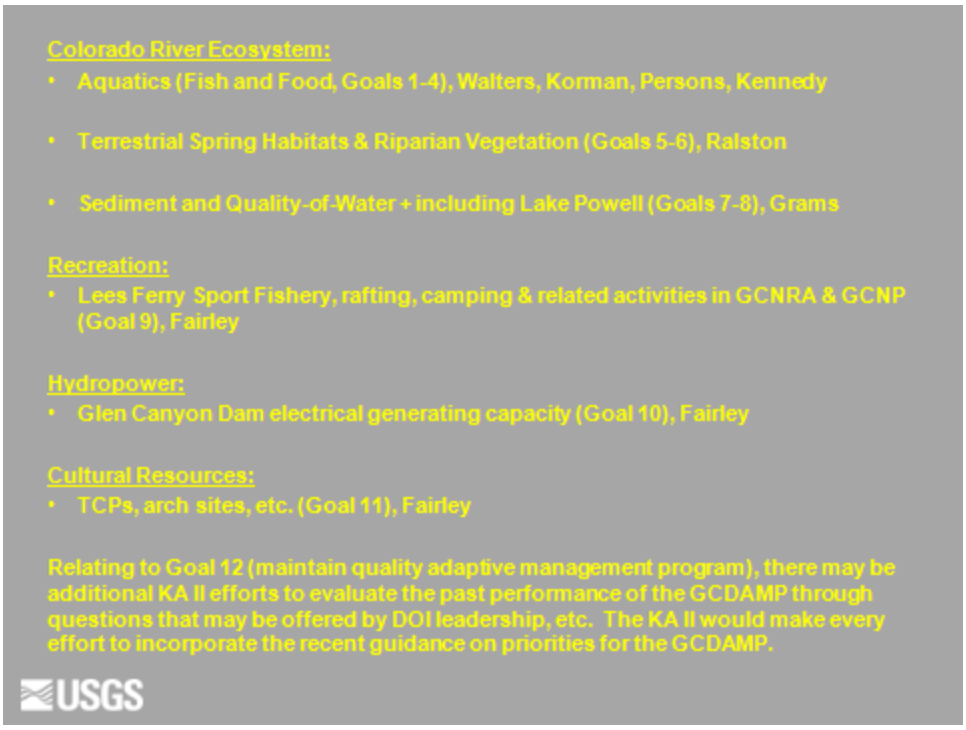



TASK for TWG WebEx: Are there any new questions that need to be considered in the KA II during 2011?
• Presumably new questions would then also be integrated into development of the new 5-Year Monitoring & Research Plan in FY 2012 (FY 2012-16).
• Can questions be removed from the 2005 list?
USGS


Step II – Convene Expert Workshops
GCMRC will solicit "expert" opinions on the questions in the various resource matrices and develop a more quantitative summary of "certainty" or "uncertainty" on basis of existing data and models that exist which might predict the direction of a given resource in response to various experimental treatments that have been previously tested, as well as the "magnitude" of that response if the direction can be predicted.
USGS


Step III – Convene Stakeholder Workshop
GCMRC proposes to convene a workshop with TWG in fall 2011 (early November) to review the "expert" input on the questions and discuss the next steps to reporting that update of the Knowledge Assessment and integrating the new information into the 5-Year MRP, 2012-16) and other efforts, such as the LTEMP EIS, etc. to support the GCDAMP program.
STEP IV – FY 2012, finalize report on KA II
GCMRC would complete and distribute final report to TWG and AMWG in late summer/fall 2012.
USGS


FACILITATION AND LEADERS IN KA II
Lead Facilitators: Josh Korman (Ecometric Research, Inc. [existing science cooperator]) & Ted Melis (GCMRC)
KA II Resource Leaders: Cooperating scientists and GCMRC staff who will convene "expert" panels and solicit quantified opinions on the ability of existing information to answer the questions specific to the resources, as grouped into the 4 recently developed DFCs.
USGS


Colorado River Ecosystem:
• Aquatics (Fish and Food, Goals 1-4), Walters, Korman, Persons, Kennedy
• Terrestrial Spring Habitats & Riparian Vegetation (Goals 5-6), Ralston
• Sediment and Quality-of-Water + including Lake Powell (Goals 7-8), Grams
Recreation:
• Lees Ferry Sport Fishery, rafting, camping & related activities in GCNRA & GCNP (Goal 9), Fairley
Hydropower:
• Glen Canyon Dam electrical generating capacity (Goal 10), Fairley
Cultural Resources:
• TCPs, arch sites, etc. (Goal 11), Fairley
Relating to Goal 12 (maintain quality adaptive management program), there may be additional KA II efforts to evaluate the past performance of the GCDAMP through questions that may be offered by DOI leadership, etc. The KA II would make every effort to incorporate the recent guidance on priorities for the GCDAMP.
USGS

Knowledge Assessment II
EXPERT WORKSHOP DATES
&
POSSIBLE PRODUCTS

Presented by: Ted Melis

Grand Canyon Monitoring and Research Center

AMWG - May 18, 2011

USGS

Knowledge Assessment II

EXPERT WORKSHOP

Facilitators: Korman, Kennedy & Persons

“AQUATICS (food web & fish)”

WHEN: June 1 – 3, 2011

WHERE: USGS Flagstaff Campus, Building #3 Conference Room

FORMAT: April 2007 Style

Knowledge Assessment II

EXPERT WORKSHOP

Facilitator: Paul Grams

“SEDIMENT & WATER QUALITY”

WHEN: July 11 – 12, 2011

WHERE: USGS Flagstaff Campus, Building #3 Conference Room

FORMAT: April 2007 Style

Knowledge Assessment II

EXPERT WORKSHOP

Facilitator: Fairley & Ralston

“CULTURAL, RECREATION, HYDROPOWER + OTHER TERRESTRIAL RESOURCES”

WHEN: To Be Announced

WHERE: USGS Flagstaff Campus, Building #3 Conference Room

FORMAT: April 2007 Style

Knowledge Assessment II
POSSIBLE PRODUCTS

Concepts for 2 types to meet managers' needs:

1) Combined Report (USGS on line or journal type publication) w/ Status & Trends + Information on Causal Mechanisms linking Flow & Non-Flow Treatments to Resource Responses

2) Advanced Interactive GCMRC Web Site that provides users access to updated information & data pertaining to those topics reported in #1 above + quarterly meetings to "assess" new information in a more ongoing way than currently occurs

USGS

FALL 2011 –Stakeholder Workshop

GCMRC proposes to convene a workshop with TWG in fall 2011 (last week October or first week November) to review the "expert" input on the questions and discuss the next steps to reporting that update of the Knowledge Assessment and integrating the new information into the 5-Year MRP, 2012-16) and other efforts, such as the LTEMP EIS, etc. to support the GCDAMP program.

LOOK FOR DOODLE QUERY SOON

FY2012-13 - report on KA II

GCMRC hopes to complete products in late 2012 to early 2013.

USGS

USGS
science for a changing world

Update on Sand Mass Balance

GCDAMP AMWG Meeting
May 18, 2011

Paul Grams, David Topping, and Tom Sabol

U.S. Department of the Interior
U.S. Geological Survey

Flux monitoring for managing sediment and sandbars

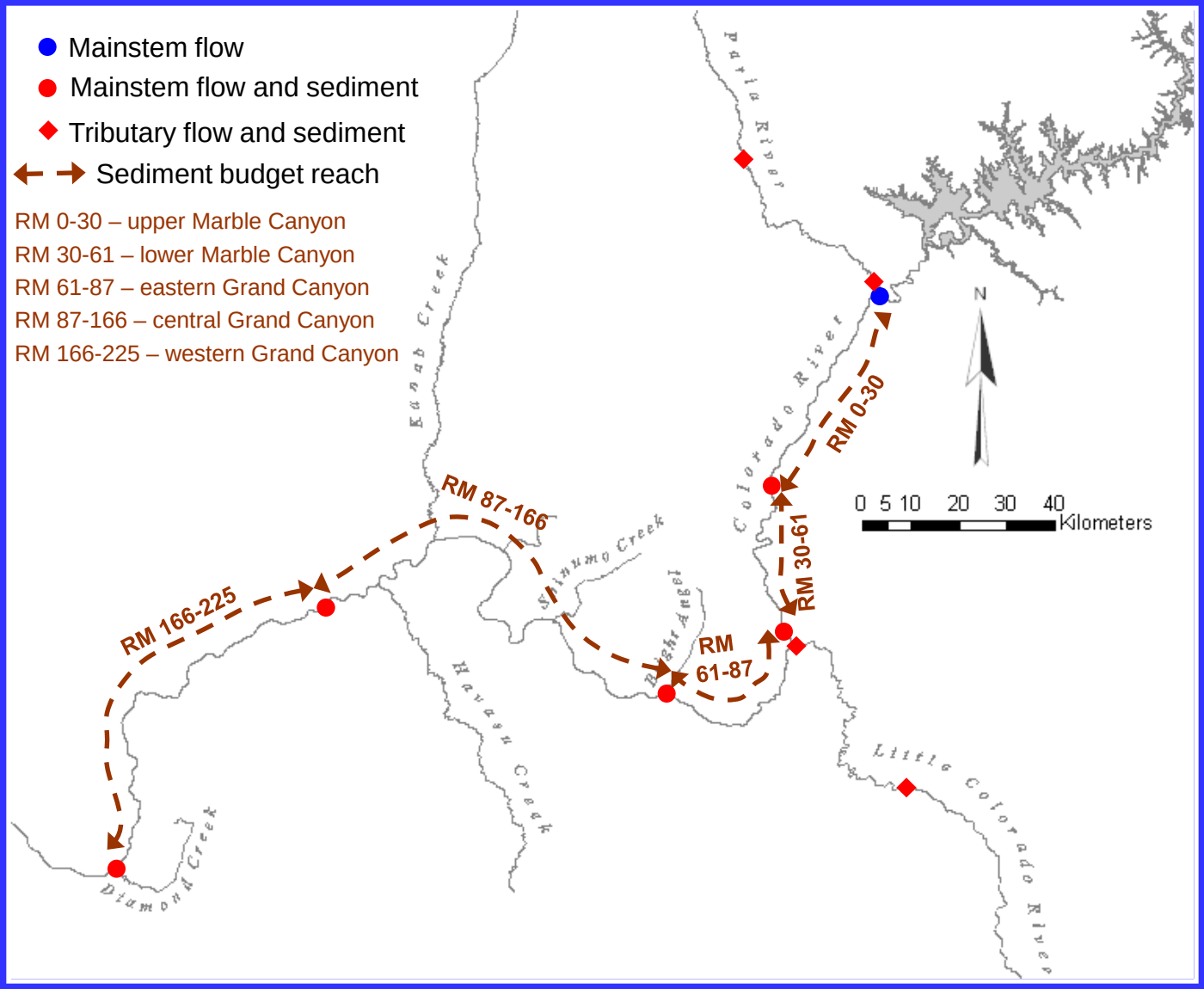
- **Flux monitoring:**
  - **Tracks tributary sediment inputs and mainstem transport at five locations to track status of the sediment “bank account.”**
  - **Provides the information needed to time high flows for building sandbars to follow periods of sand accumulation.**

USGS

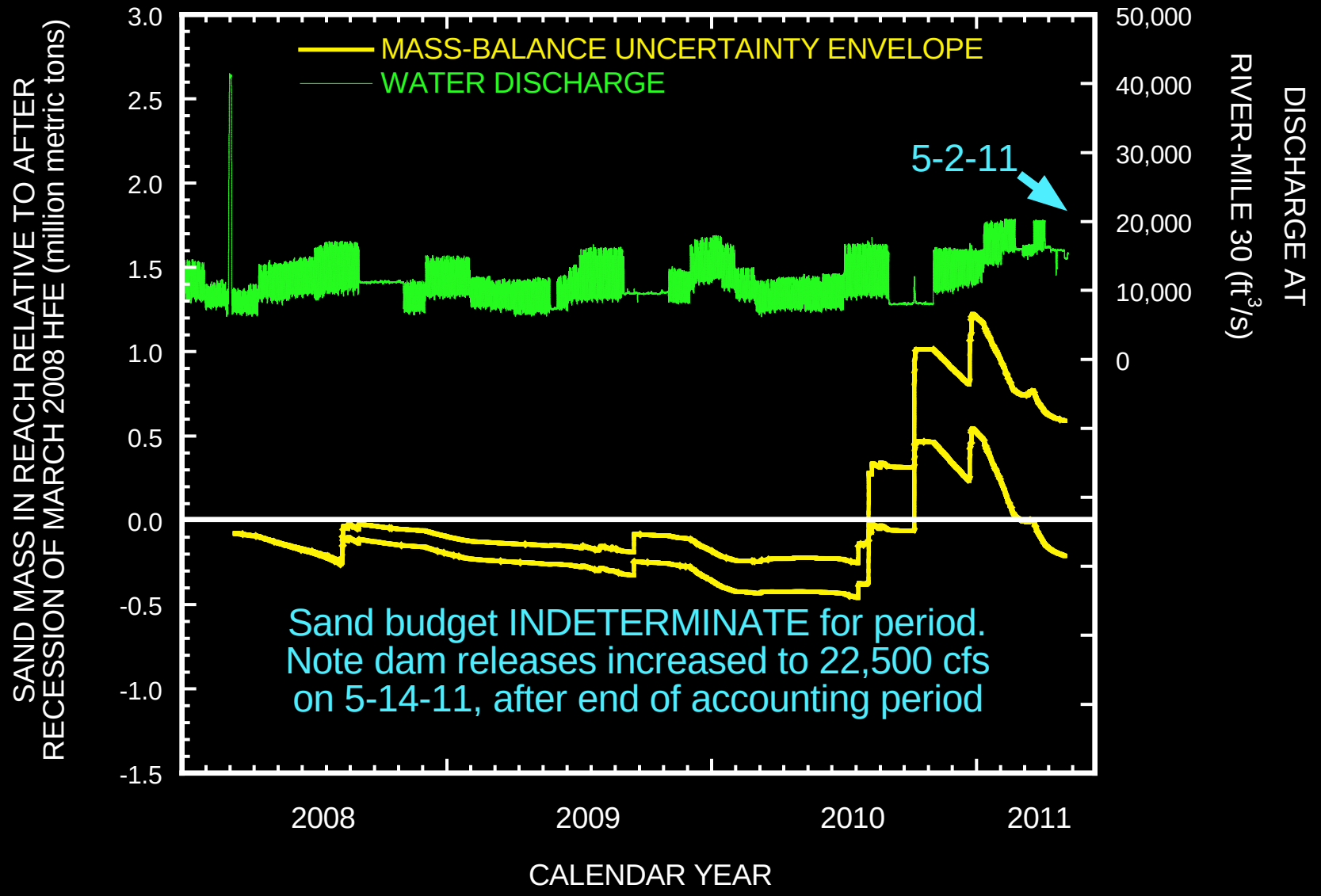
USGS Sediment Flux Monitoring Program in Grand Canyon

David Topping
Ronald Griffiths
Thomas Sabol
Nicholas Voichick
Karen Vanaman

USGS



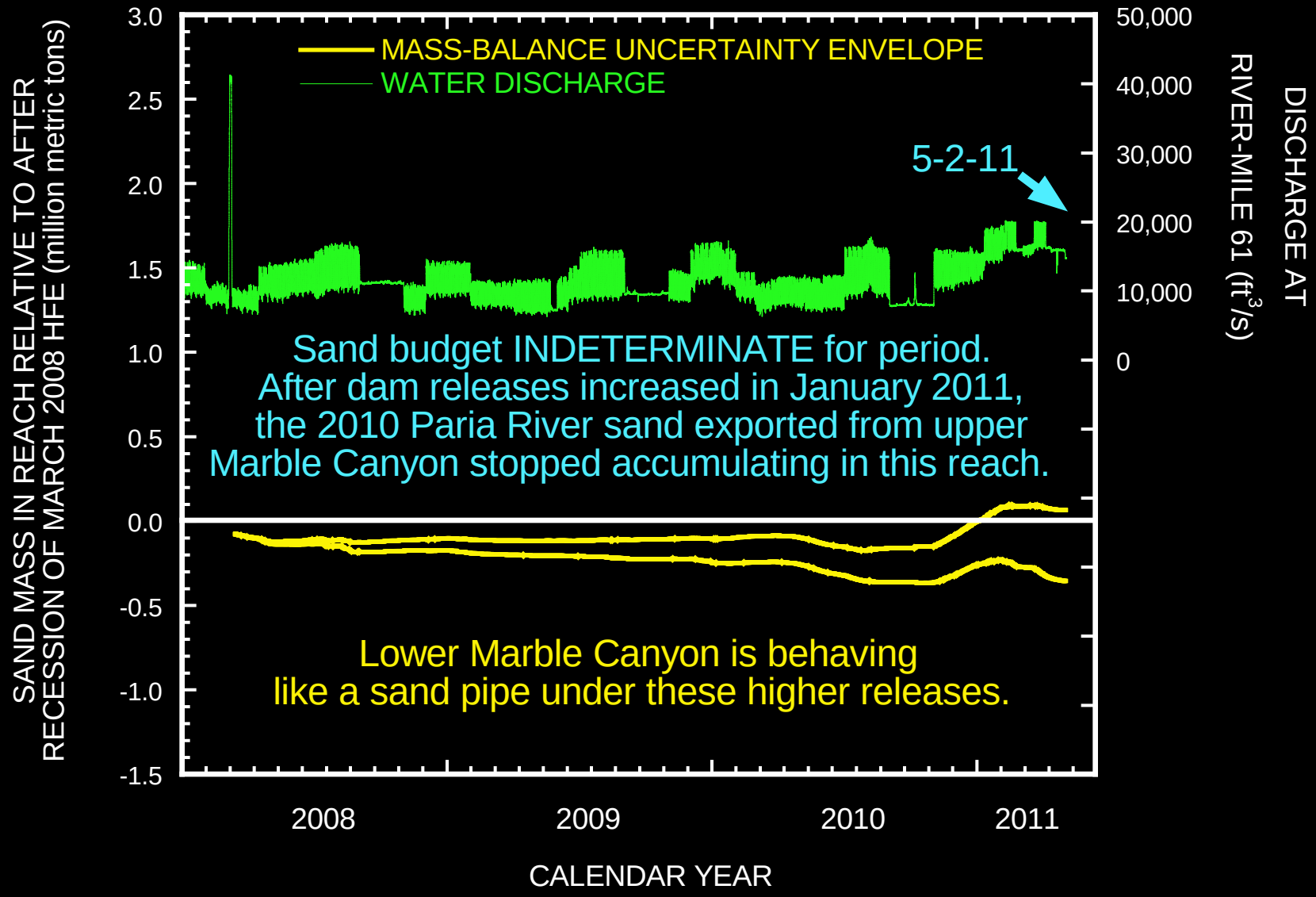
POST-2008 HFE MASS-BALANCE SAND BUDGET BETWEEN RIVER-MILES 0 AND 30



USGS

Preliminary results – subject to review and revision

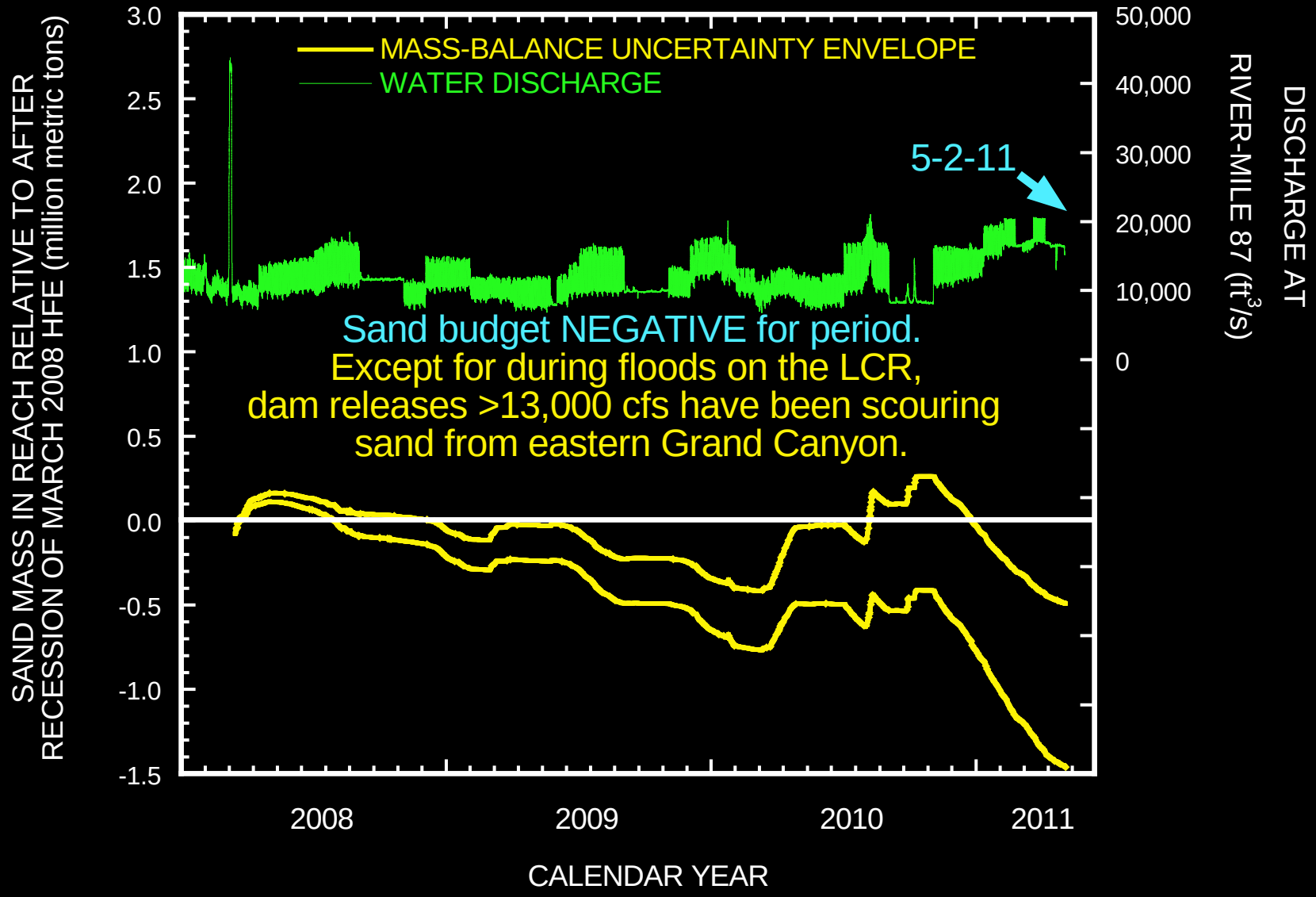
POST-2008 HFE MASS-BALANCE SAND BUDGET BETWEEN RIVER-MILES 30 AND 61



USGS

Preliminary results – subject to review and revision

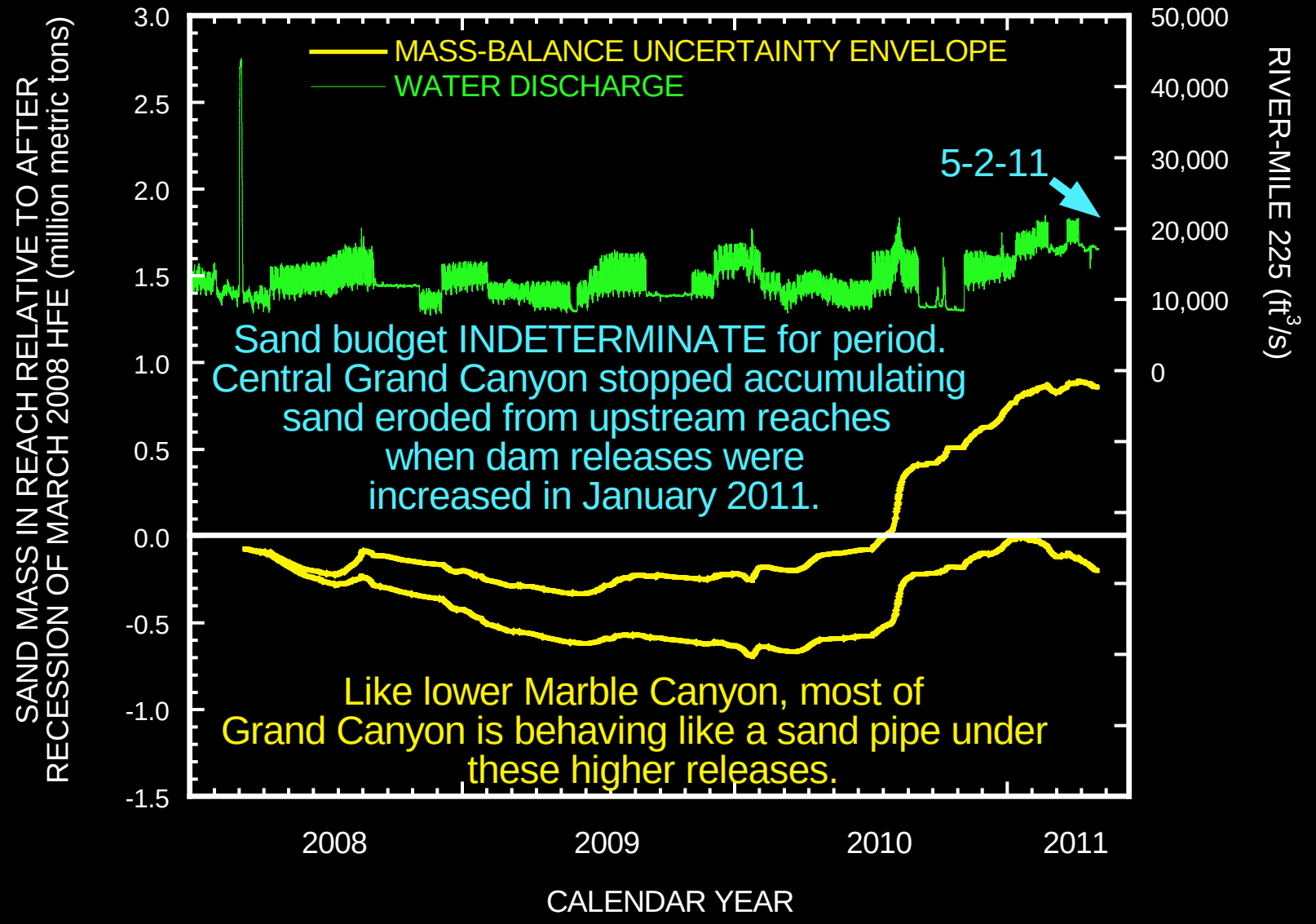
POST-2008 HFE MASS-BALANCE SAND BUDGET BETWEEN RIVER-MILES 61 AND 87



USGS

Preliminary results – subject to review and revision

POST-2008 HFE MASS-BALANCE SAND BUDGET BETWEEN RIVER-MILES 87 AND 225



USGS

Preliminary results – subject to review and revision

Comparison of May 2011 status with status leading up to 2004 and 2008 high flows

Reach	July 1, 2004 to start of 2004 HFE	End of 2004 HFE to start of 2008 HFE	End of 2008 HFE to Jan. 7, 2011	End of 2008 HFE to May 2, 2011
RM 0 to 30	0.4 ± 0.1	1.2 ± 0.6	1.4 ± 0.4	+0.25 ± 0.35
RM 30 to 61	0.1 ± 0.05	0.5 ± 0.3	-0.05 ± 0.15	-0.10 ± 0.10
RM 61 to 87	0.0 ± 0.05	0.8 ± 0.7	-0.35 ± 0.35	-0.90 ± 0.50
RM 87 to 225	0.2 ± 0.1	0.9 ± 0.4	0.35 ± 0.35	+0.40 ± 0.50

Green = definitely positive
Orange = indeterminate, maybe positive
Yellow = indeterminate, maybe negative
Red = definitely negative

All values in million metric tons.

USGS

Preliminary results – subject to review and revision

Summary

- There were above average sand inputs in July through October 2010.
  - As of January 7, 2011, most of those inputs were still in upper Marble Canyon (above RM 30)
- The period from January 1, 2011 to present (May 2, 2011) has been a period of net sand export
  - ~0.7 million tons loss from upper Marble Canyon (RM 0 to 30)
  - ~0.15 million tons loss from lower Marble Canyon (RM 30 to 61)
  - ~1.05 million tons loss from eastern Grand Canyon (RM 61 to 87)
  - ~0.2 million tons loss from central and western Grand Canyon (RM 87 to 225)
- The relatively high volume dam releases of winter-spring 2011 (~ 17,000 cfs average) do not permit sand retention
- Sand is moving out of upper Marble Canyon by deflation (the pile of sand is shrinking and transported through the downstream reaches in suspension, not moving downstream as a “wave” on the bed)

USGS

Preliminary results – subject to review and revision