GCMRC's EXPERIMENTAL RESEARCH UPDATE "SEDIMENT"

Part I - Update on 2004 Sediment Test Findings
&
Part II - 2006 Status Of Sand Supplies In The Colorado Below Glen Canyon Dam

Presented to the Glen Canyon Dam Adaptive Management Workgroup

08:30 – 09:15

December 6, 2006

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PART I - Explaining the 2004 Test Results (Topping and others, 2006)

- Mixed Sand Bar Results - There was less sand system-wide in 2004 than in 1996, owing to sand export and sand bar erosion for 8 years under MLFF

- Robust Response in Upper Marble Canyon - Owing to new localized sand enrichment by Paria River, bars in Upper Marble Canyon increased in area and volume - results were mixed downstream where supply was depleted

- Mass Balance - The net mass balance for sand during the 2004 test was actually positive system-wide, despite depleted conditions below Marble Canyon (an encouraging sign tied to a shorter peak-flow duration)

- More Sand Needed – continued sand bar restoration likely requires additional high flows timed in combination with new sand from tributaries – more uniform distribution of new sand might result in more uniform response

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Overall sandbar growth was minimal or negative.

Not a sustainable plan.

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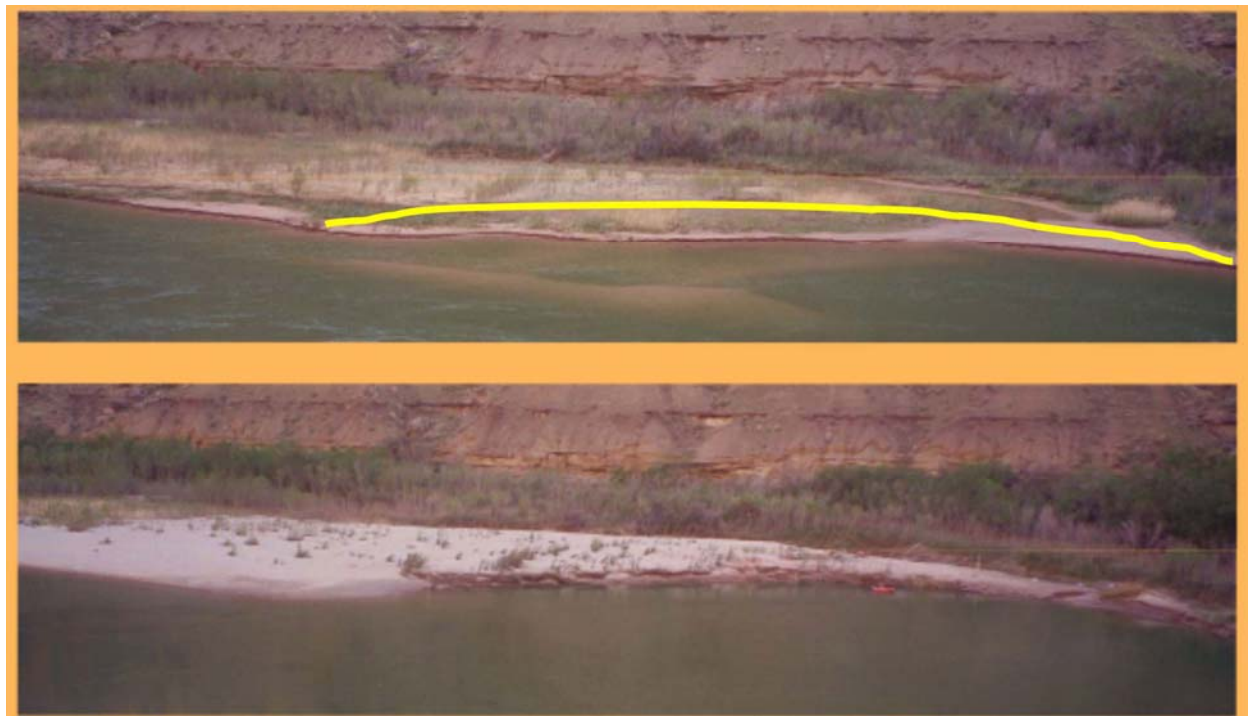
Overall sandbar growth was minimal or negative.

Net mass balance of sand was negative

Not a sustainable plan.

pre-1996 flood

post-1996 flood



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- Bar growth was more substantial within enriched reach.
- Promising, but additional sand is needed. (Requires more frequent floods, exploiting bigger inputs, adding sediment, or constraining flows between floods.)

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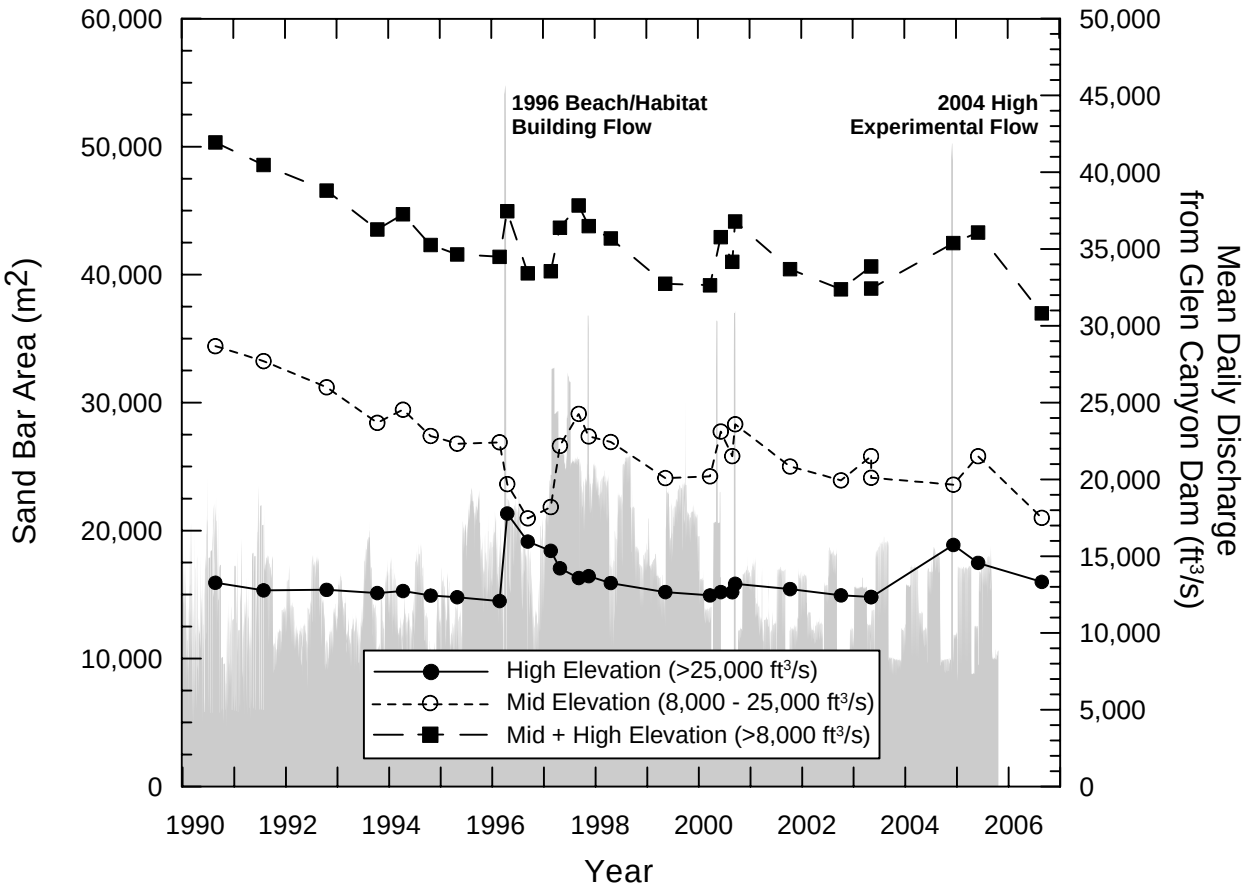
Total Sand Bar Area at 12 Sites in Marble Canyon



Source Data: Northern Arizona University – Preliminary, Subject to Review & Revision

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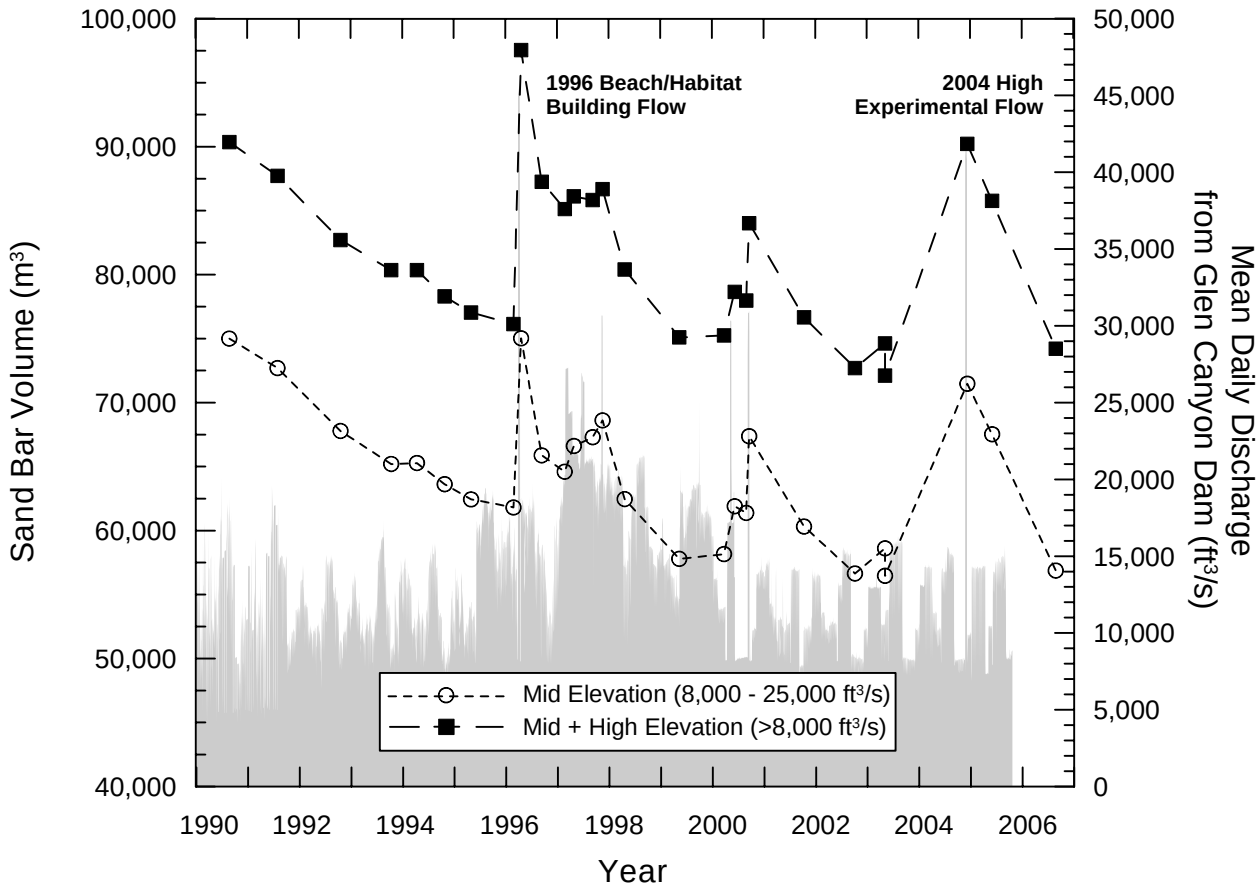
Total Sand Bar Volume at 12 Sites in Marble Canyon



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PART II

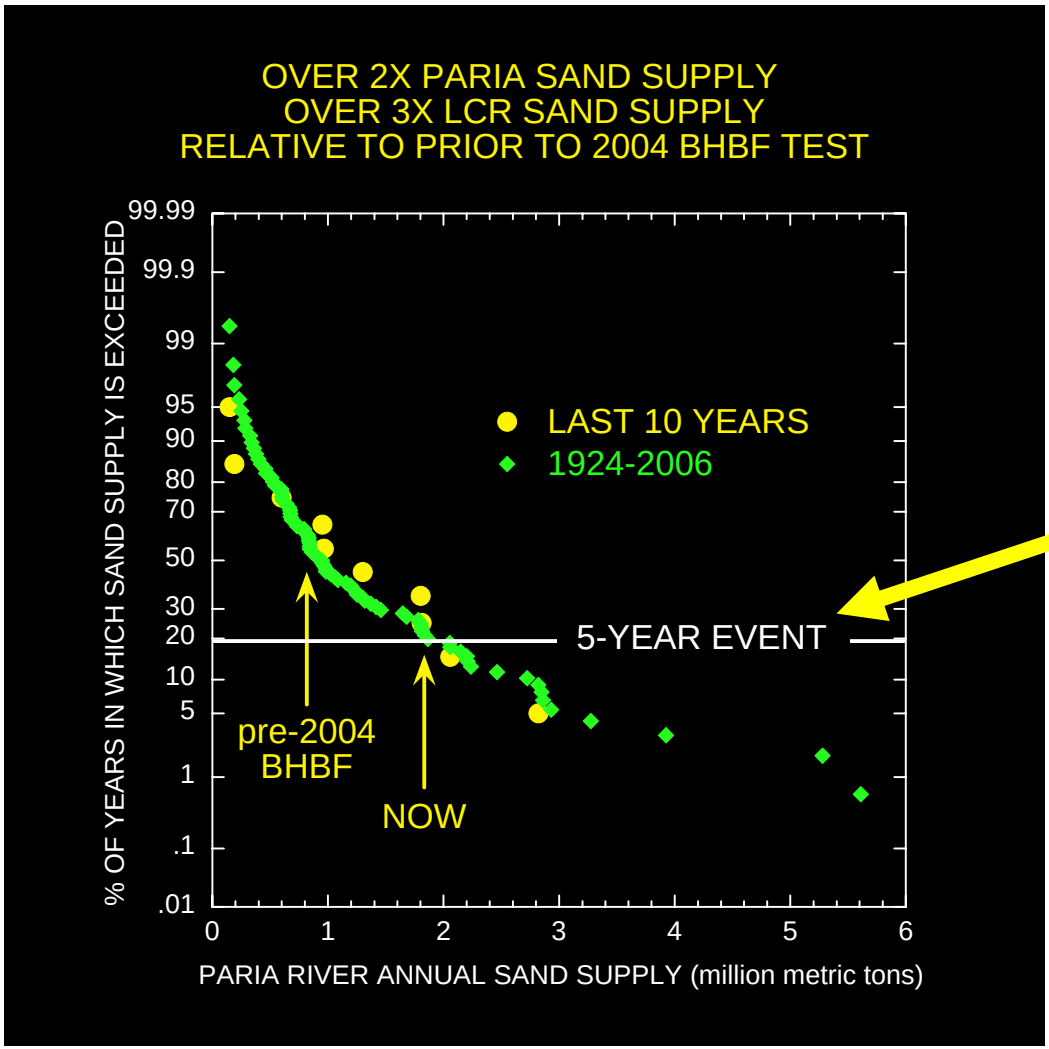
Where are We On Sand Supply in 2006 ?

- Channel is a factor of 2 to 3 times more sand-enriched than in 2004.

- Potential to increase bar size and suppress subsequent sand export, while testing flow-only treatment.

STATUS OF SAND SUPPLIES IN THE COLORADO BELOW GLEN CANYON DAM

Tributaries Have Delivered 1.7 – 2.6 Million Metric Tons of SAND



Experimental Research Opportunities to study beach habitat building flows under current sand enrichment are rare

The Paria River Inputs are Now Equal to Five-Year Recurrence Interval

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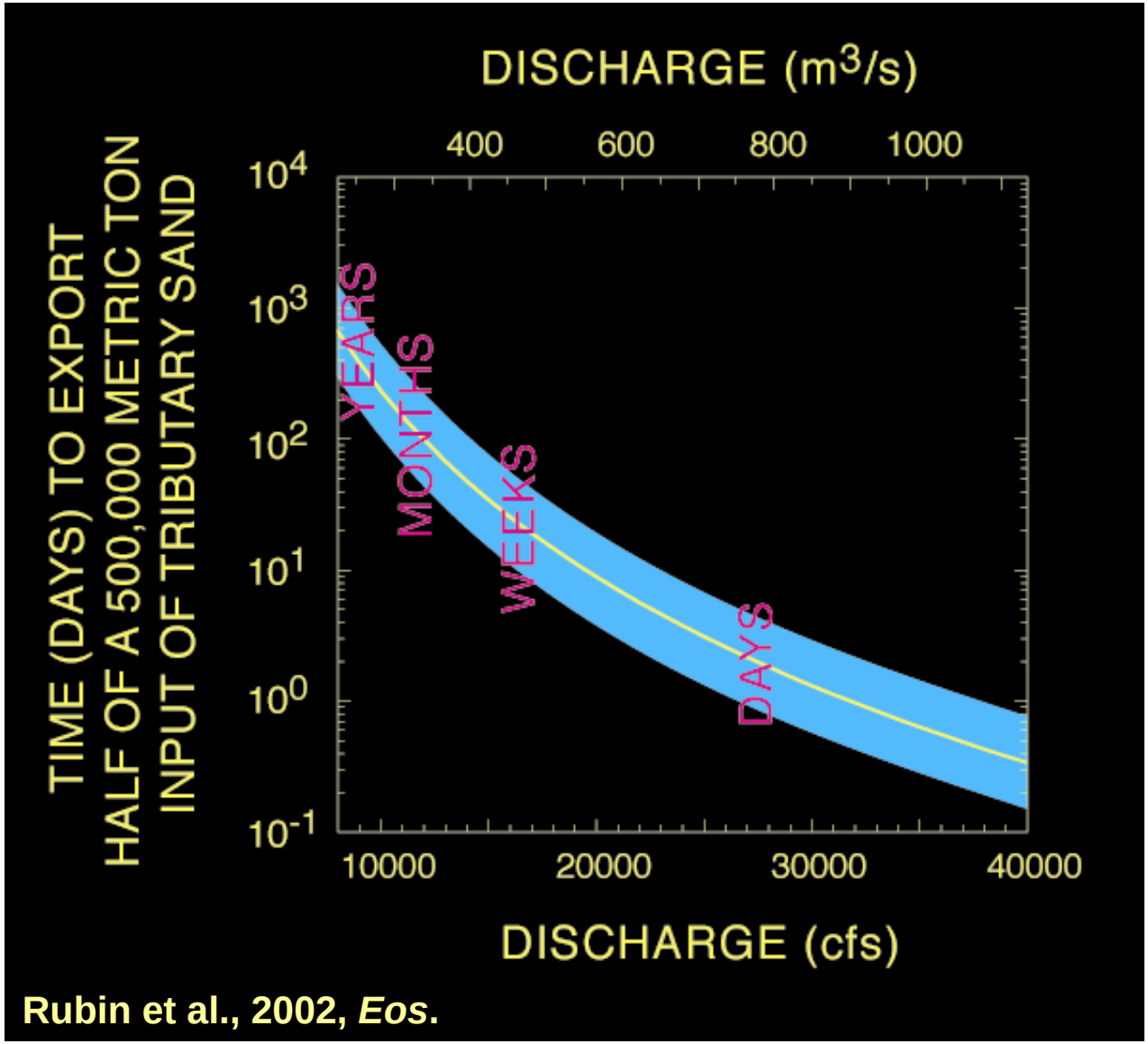
Estimating Fate of Recent Paria River Sand Inputs?



Rubin et al., 2002, *Eos*.

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Potential for Equalization Releases in WY 2007

- October Inflow Has Increased Probability That WY 2007 Annual Release May Include Equalization Flows From Glen Canyon Dam

- New Sand Supplies Will Be Exported Faster Under Higher Peak Flows Associated With Larger Summer Volumes

- Probability of Equalization Releases in WY 2007 is currently 50 %

  - 50 % Exceedance [A-J ~ 91 %] Avg Summer Releases ~ 13,000 cfs
  - 40 % Exceedance [A-J ~ 101%] Avg Summer Releases ~ 16,000 cfs
  - 30 % Exceedance [A-J ~ 114 %] Avg Summer Releases ~ 20,000 cfs
  - 20 % Exceedance [A-J ~ 131 %] Avg Summer Releases ~ 22,000 cfs
  - 10 % Exceedance [A-J ~ 155 %] Avg Summer Releases ~ 24,000 cfs*

* may not be achievable due to maintenance

RECLAMATION
Managing Water in the West

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