Grand Canyon Monitoring and Research Center

Preliminary LSSF Observations

- TREAT AS PRELIMINARY AT BEST!!!

Preliminary Observations

Little Colorado River

- Size distribution of HBC indicates possibility of late winter (1999) spawn or fish over-wintering in the LCR.
- Not a big spawn, expect average recruitment.
- Spawning that did occur in 2000 was early spring.
- Sampled 718 HBC in hoop-nets.

Preliminary Observations

SPRING 31,000cfs spike

- The spring spike displaced ground-nesting birds in Lees Ferry and downstream. Spike may have been early enough so that a second hatch may have taken place.
- The spike redistributed sand to some extent. The staggered flows (17,000 - 31,000 -17,000 cfs) have created accessible camping beaches.
- Minor scouring of the aquatic foodbase in Lees Ferry.

Preliminary Observations

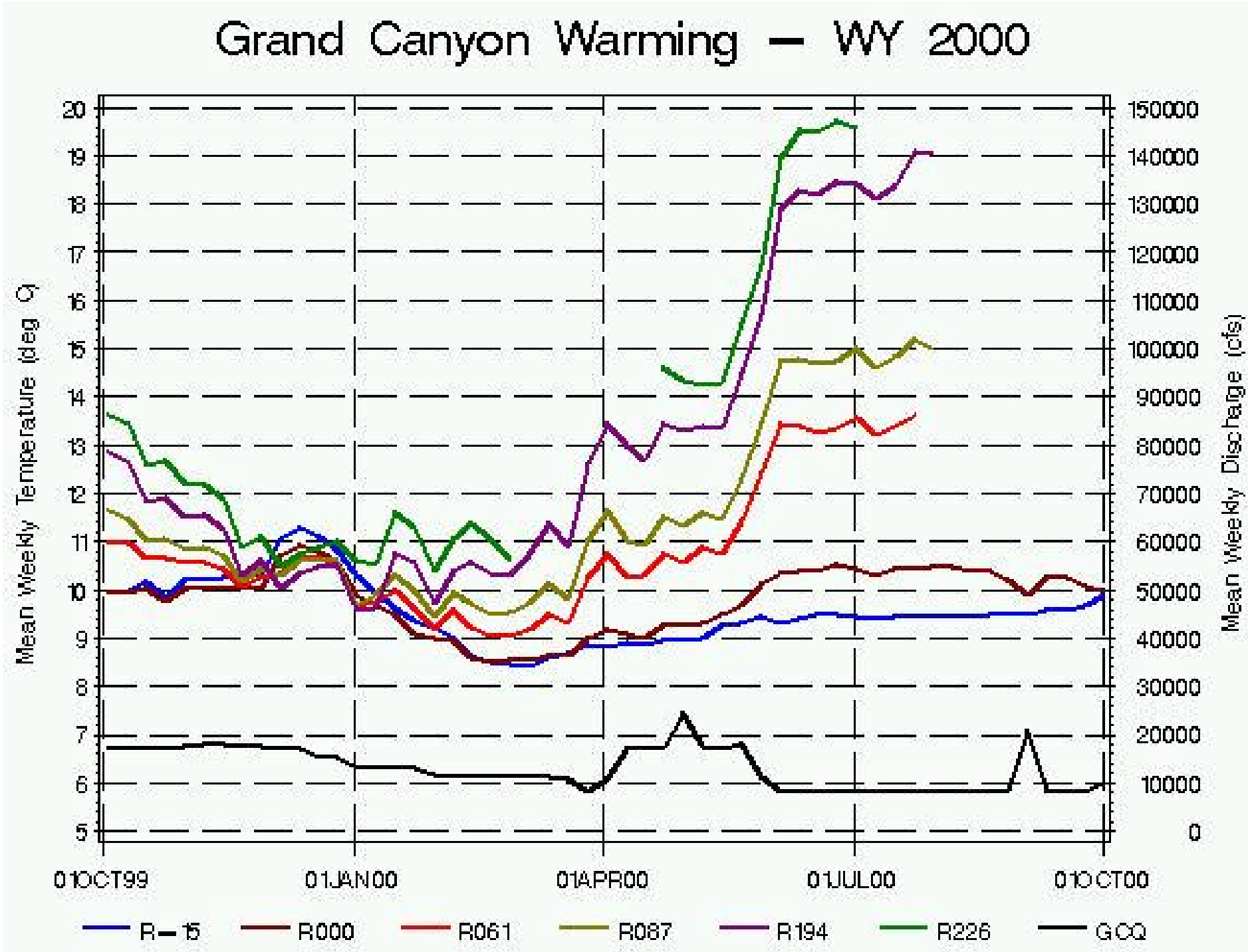
Steady 8,000cfs flows

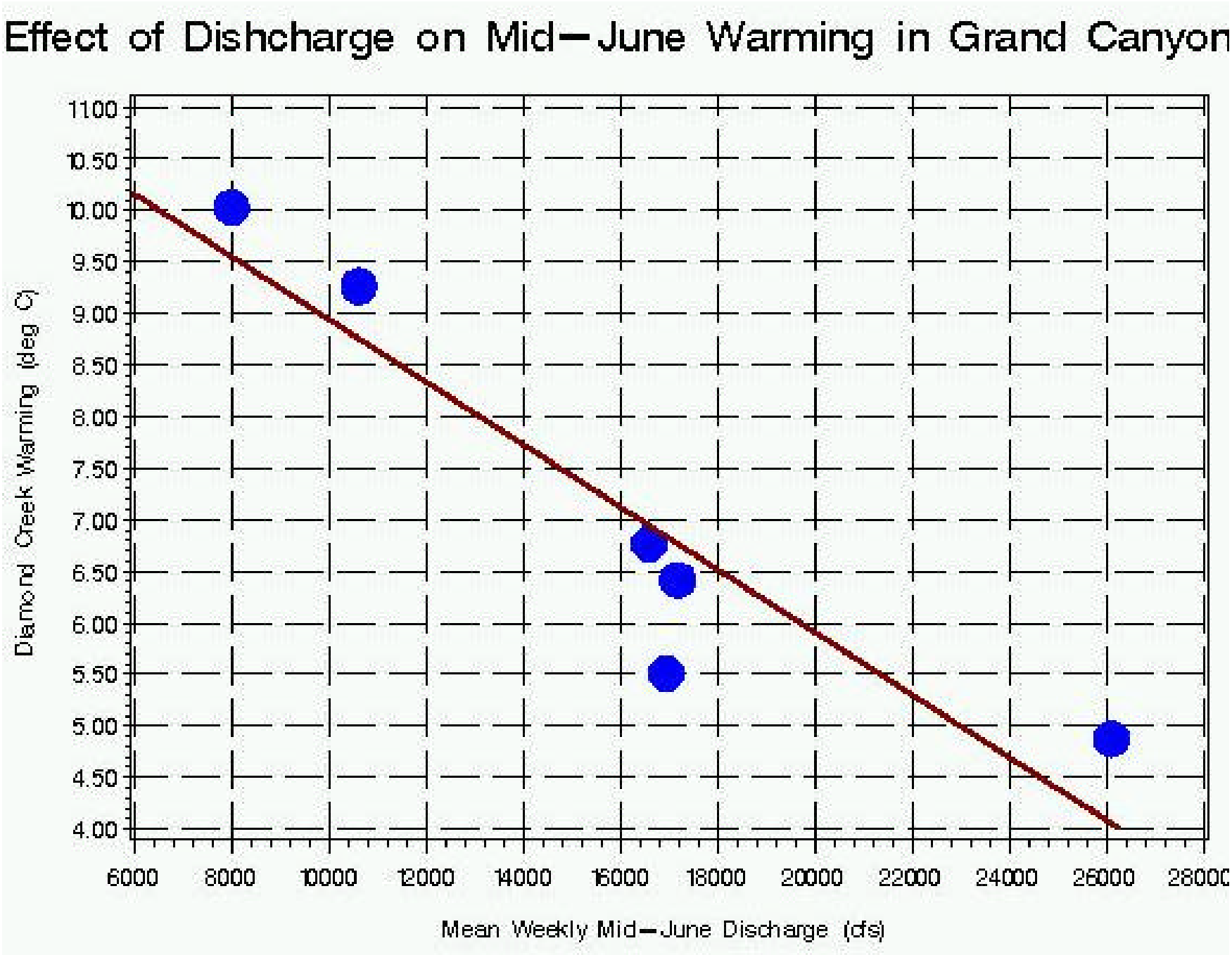
- Some stranding of fish (RBT & FMS) in Lees Ferry reach.
- Lower water resulted in larger available camping area.
- Steady flows reduced amount of suspended sediment in water resulting in greater water clarity.

Preliminary Observations

Mainstem Temperature

- Measured water temperatures of 9 - 10^{o} C at GCD with increases to 19 - 20^{o} C at Diamond Creek
- Doubling of warming at Diamond Creek compared to 1997
  - 4.8 degree C warming at 26000 cfs in 1997
  - 10.0 degree C warming at 8000 cfs in 2000
- Effect of discharge on historical mid-June warming


Grand Canyon Warming – WY 2000
Mean Weekly Temperature (deg C)
Mean Weekly Discharge (cfs)
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
150000
140000
130000
120000
110000
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
01OCT99
01JAN00
01APR00
01JUL00
01OCT00
R-15
R000
R061
R087
R194
R226
GCQ

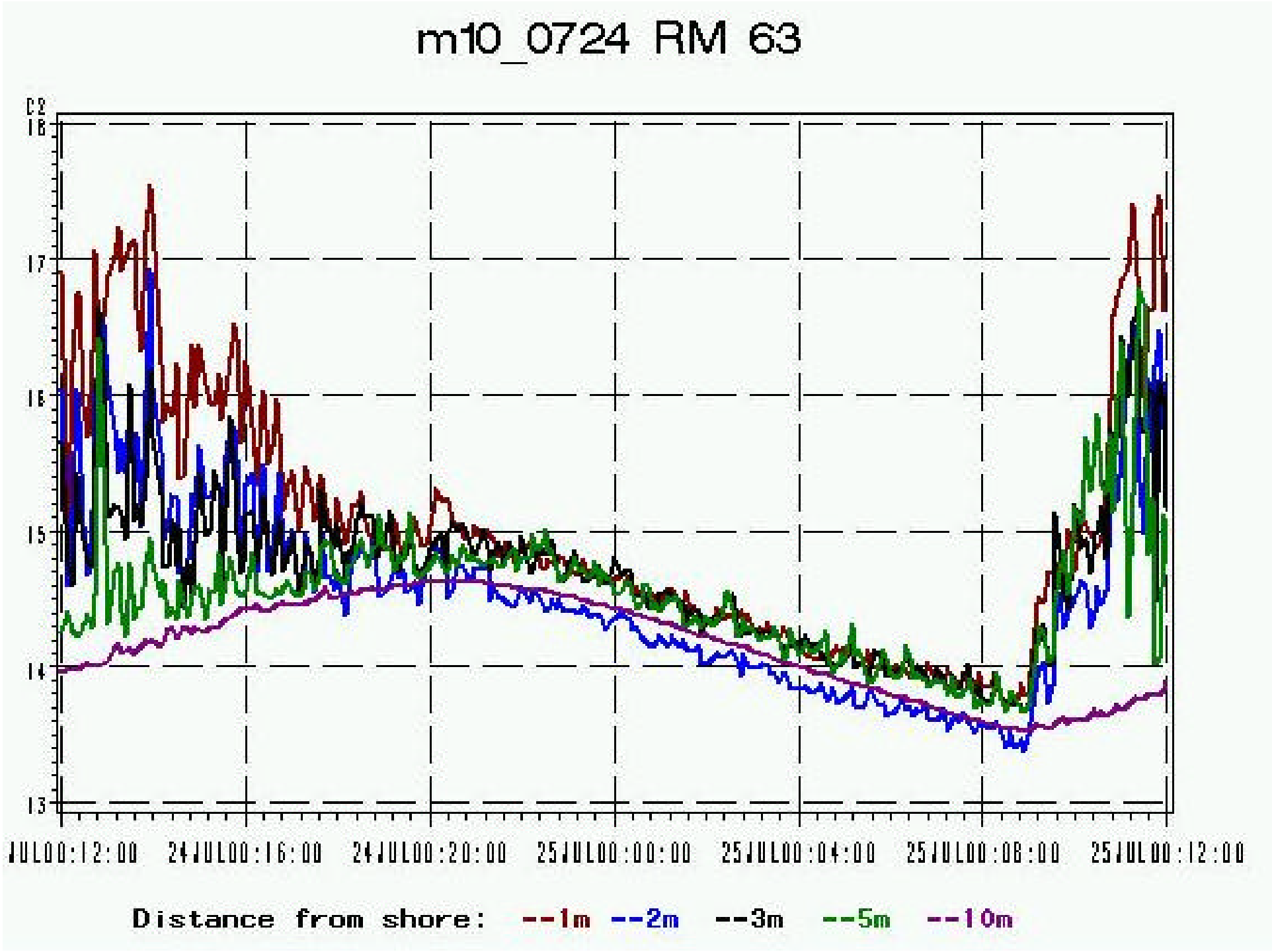

Effect of Dishcharge on Mid–June Warming in Grand Canyon
Diamond Creek Warming (deg C)
11.00
10.50
10.00
9.50
9.00
8.50
8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
6000
8000
10000
12000
14000
16000
18000
20000
22000
24000
26000
28000
Mean Weekly Mid–June Discharge (cfs)

Preliminary Observations

Near-Shore Temperature

- Water in near-shore environment shows increase in temperature over main channel during daytime
- Increased temperatures noted only in areas of low velocity
- Near shore temperature increases are exhibited in backwater as well as in open channel areas


7/24/2000 14:05


m10_0724 RM 63
DO
18
17
16
15
14
13
24JUL00:12:00
24JUL00:16:00
24JUL00:20:00
25JUL00:00:00
25JUL00:04:00
25JUL00:08:00
25JUL00:12:00
Distance from shore:
--1m
--2m
--3m
--5m
--10m

Preliminary Observations

VEGETATION

- Tamarisk seedlings that germinated during steady flows were decreased in number by flows in October more than the September spike.

AQUATIC FOODBASE

•Benthic and algal values were lower in Western GC when compared to previous years following monsoonal inputs.

Preliminary Observations

FISH

- Rainbow trout are distributed throughout the river corridor, their condition varies within the corridor with bigger fish in the western canyon. Stripers in western Grand Canyon, carp at bottom of rapids.

- Brown trout are more site specific–mostly in the gorge between Unkar (RM 72) and Phantom Ranch (RM 90).

- Many small sized fish used return current channel habitats.

Additional Fish Observations

- 4 HBC (15 -16 mm TL) captured at RM 197 in June
- 4 young HBC (34 - 45 mm TL) captured at RM 197 in August and Sept.
- High densities of larval and juvenile FMS and BHS during June, August, and September
- No young Fat-head miinows and Red Shiners observed
- Numbers of FHM increased longitudinally downstream of the LCR

Fish Observations

- 4 young (14-27 mm TL) largemouth bass in backwater at RM 213 and 3 adults captured in same area
- Densities of native and non-native fish decreased following Fall spike

- CAUTION: Regarding finding 4 HBC (15 -16 mm TL) at RM 197 in June, August and Sept. Don't know if this is due to: warming, stable habitat or increased sampling effort. Caution about making conclusions about finding HBC and the flows conducted this year.

Preliminary Observations

SOCIO-ECONOMIC RESOURCES

White Water Safety Study

- Data collection by NPS and Hualapai staff and volunteers at 8 rapids over about 70 days
- Most common incident was boats hitting submerged rocks
- Large motorized boasts seem most affected by LSSFs but boater trip reports being compiled for analysis and comparison to previous flow regimes
- Analysis of NPS Search and Rescue database ongoing
- GCMRC has experienced average damage to skegs and props. One motor lost due to extensive damage. Trips have been able to keep to planned schedules.

Preliminary Observations

SOCIO-ECONOMIC RESOURCES

Economic Impacts to Concessionaires & Anglers

Rafters:

- Number of trips not affected by LSSFs
- Due to flows, more time on river and less at camps and attraction sites
- Stranding incidents (N=3) resulted in premature trip termination and costly rescue efforts.
- Data analysis ongoing

Preliminary Observations

SOCIO-ECONOMIC RESOURCES

Economic Impacts to Concessionaires & Anglers

Anglers:

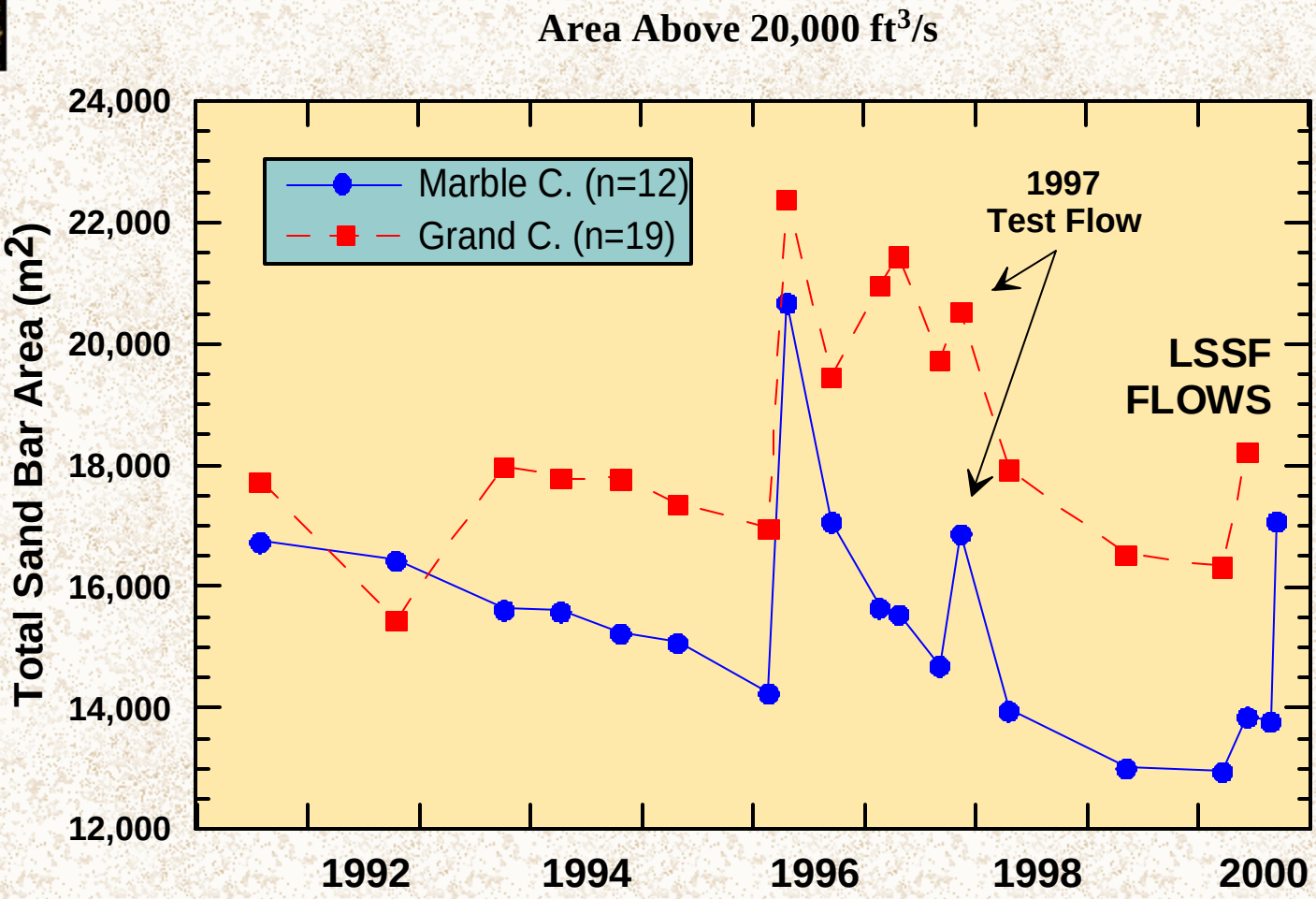
- Fishing slightly improved at Lees Ferry, particularly after spikes
- During spikes, high water and turbidity kept concessionaires from conducting trips.
- Estimated reported loss ranges from $ 5,000 to $10,000 for each spike, but overall increase due to increased fishing.
- Data processing and analysis are ongoing

Long-term fish monitoring development

- Defining sampling universe for fish – developing sampling strategy for mainstem, LCR and other tributaries.
- AGFD with Carl Walters (UBC) using sampling effort to determine population estimates for rainbow and brown trout.
- SWCA, USFWS and AGFD with Carl Walters (UBC) using sampling effort to calibrate gear-types to get at abundance estimates for fish. Methods include:
  - **Depletion efforts in defined areas of river**
  - **Mark/recapture.**
- Increasing sampling throughout river
  - **150 electroshocking samples/trip**
  - **50 net sets/trip.**

Grand Canyon Monitoring and Research Center

Monitoring Sand Bars During the FY2000 LSSF Experimental Flows
By Northern Arizona University



Grand Canyon Monitoring and Research Center

Monitoring Sand Bars During the FY2000 LSSF Experimental Flows
By Northern Arizona University