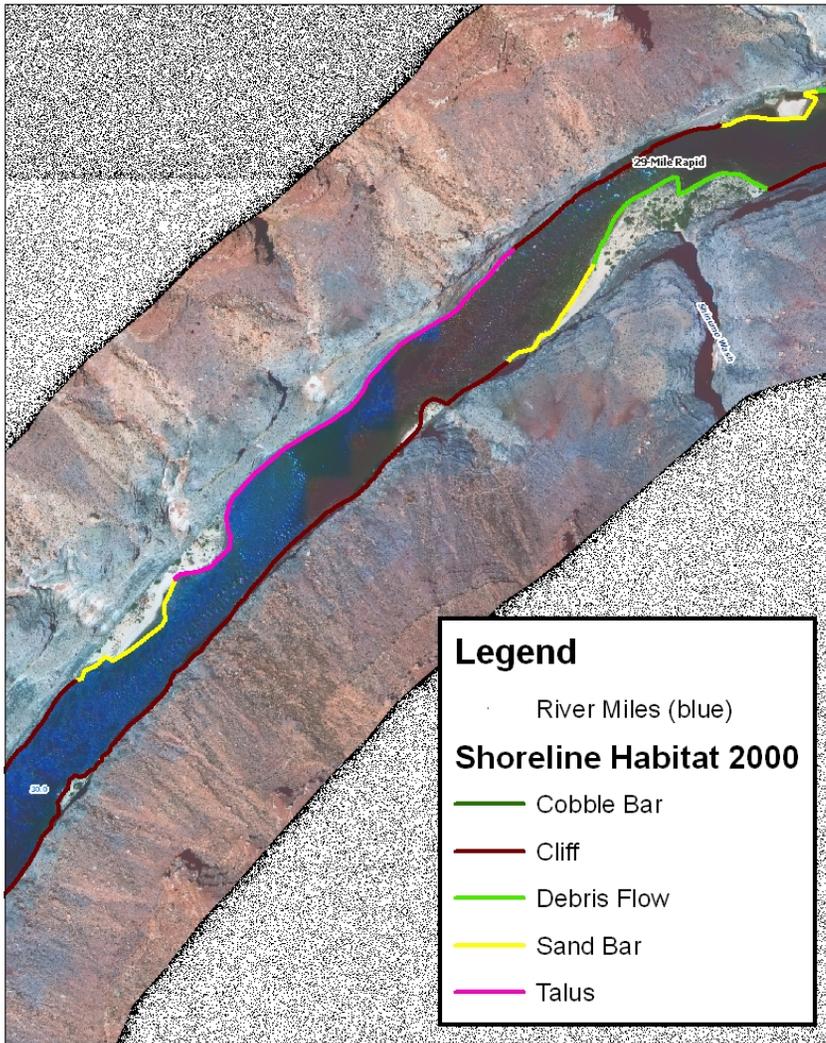


SHORELINE HABITAT

An Automated Approach to Classification and Monitoring

Mike Breedlove

The First Shoreline Habitat Classification: 2000



Stephanie Mietz

- 8,000 CFS Shoreline
- Geomorphic Classes
- 100-meter minimum mapping resolution

Automated Methodology

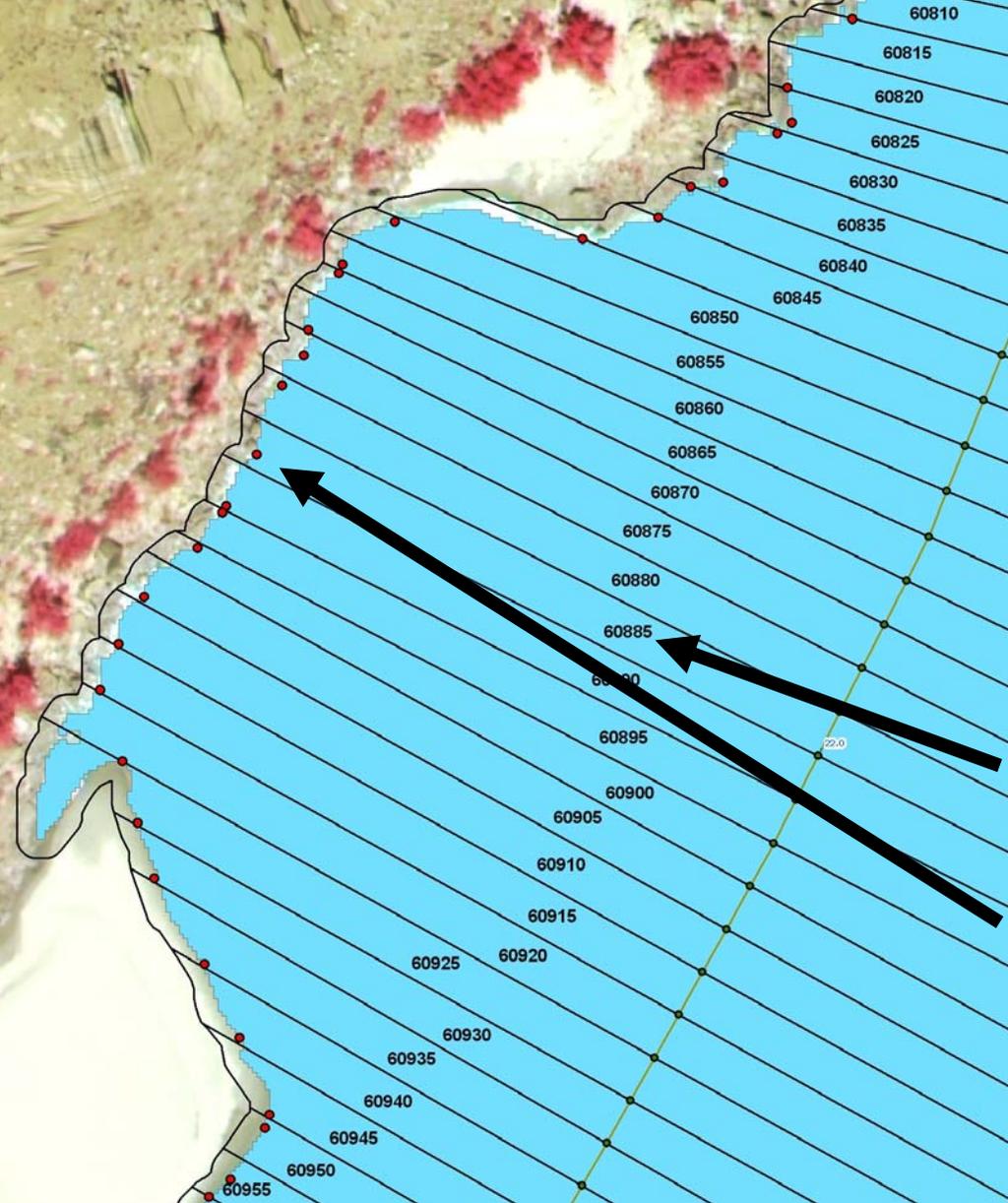
GOAL: Provide automated shoreline-habitat data across stage-discharge ranges for the entire Grand Canyon Ecosystem Corridor.

- **Classify whole surfaces by selected habitat characteristics such as: geomorphology, texture (roughness), vegetation, and ultimately, velocity and temperature from models.**
- **Develop automated techniques for extracting habitat data from these surfaces for individual stage lines or depth zones bracketing stage lines.**

Shoreline Habitat Polygons (RM22)

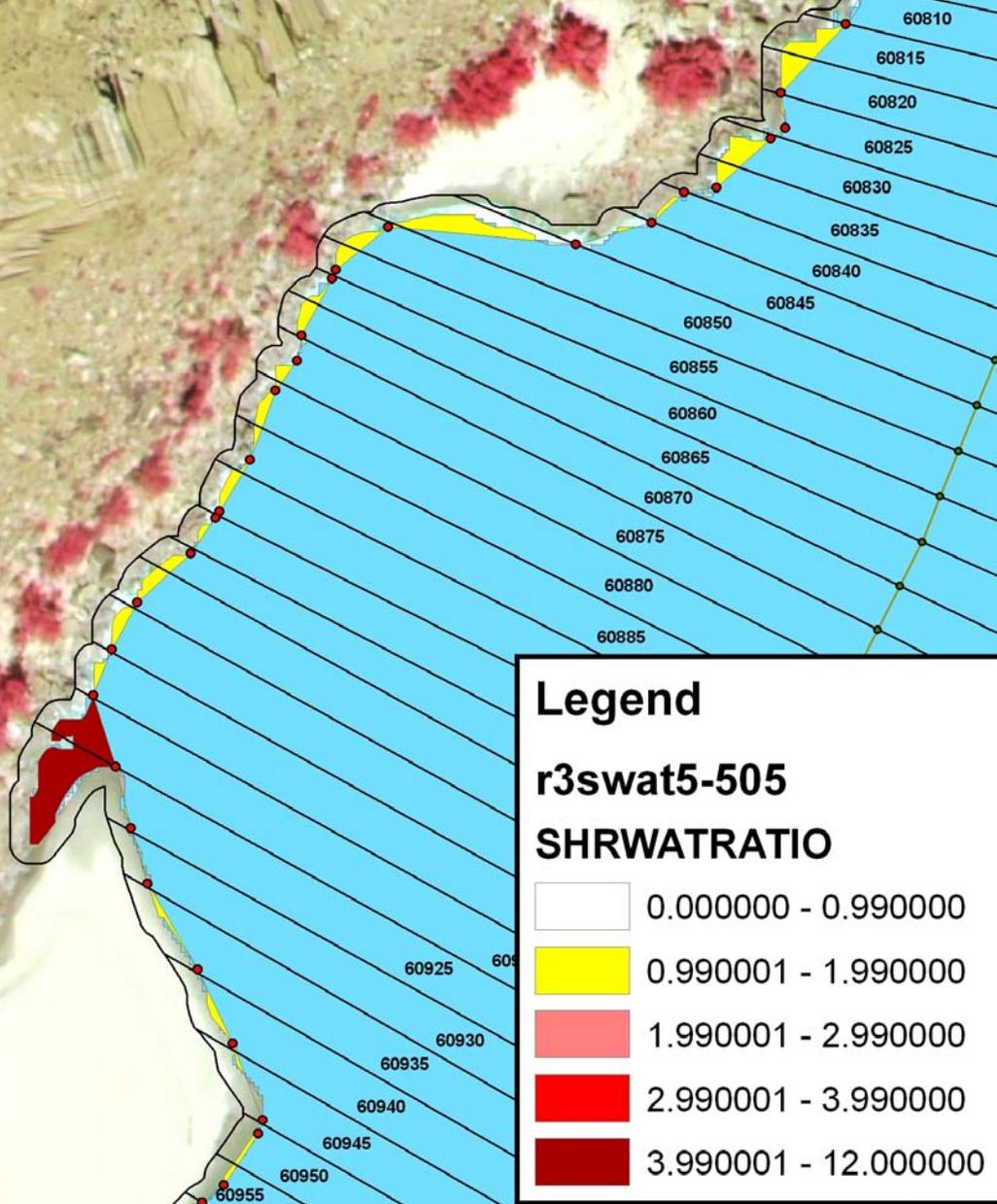
An automated procedure for delineating backwaters and other shoreline habitats from imagery and historical shorelines.

- For every 5 meters of downstream distance...
- Select the closest shoreline point (promontory).



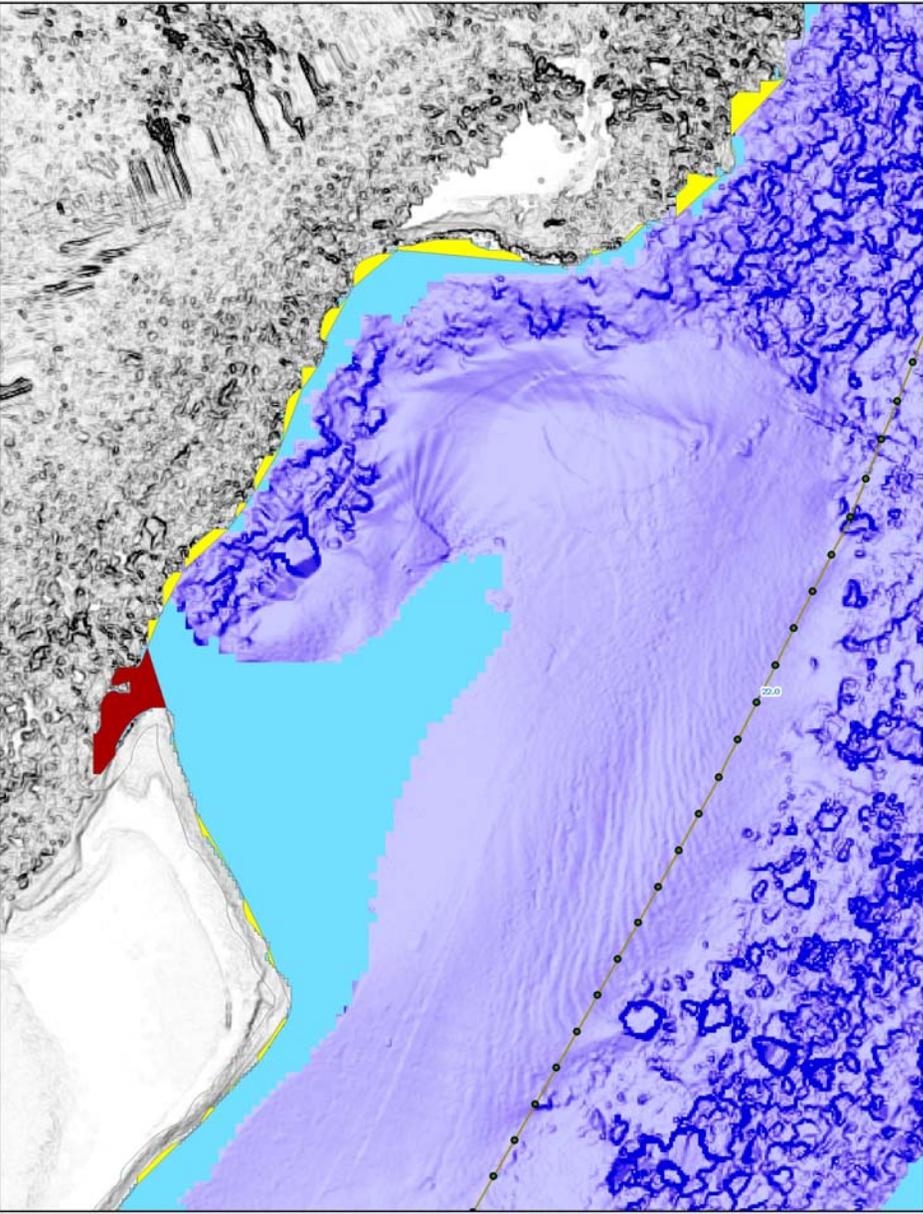
Shoreline Habitat Polygons (RM22)

- Connect each point and merge with the shoreline.
- Resulting polygons enclose embayments of various size, physical shoreline characteristics and thermal properties.
- Ratios of shoreline length to closure length are one measurement of complexity (rugosity).

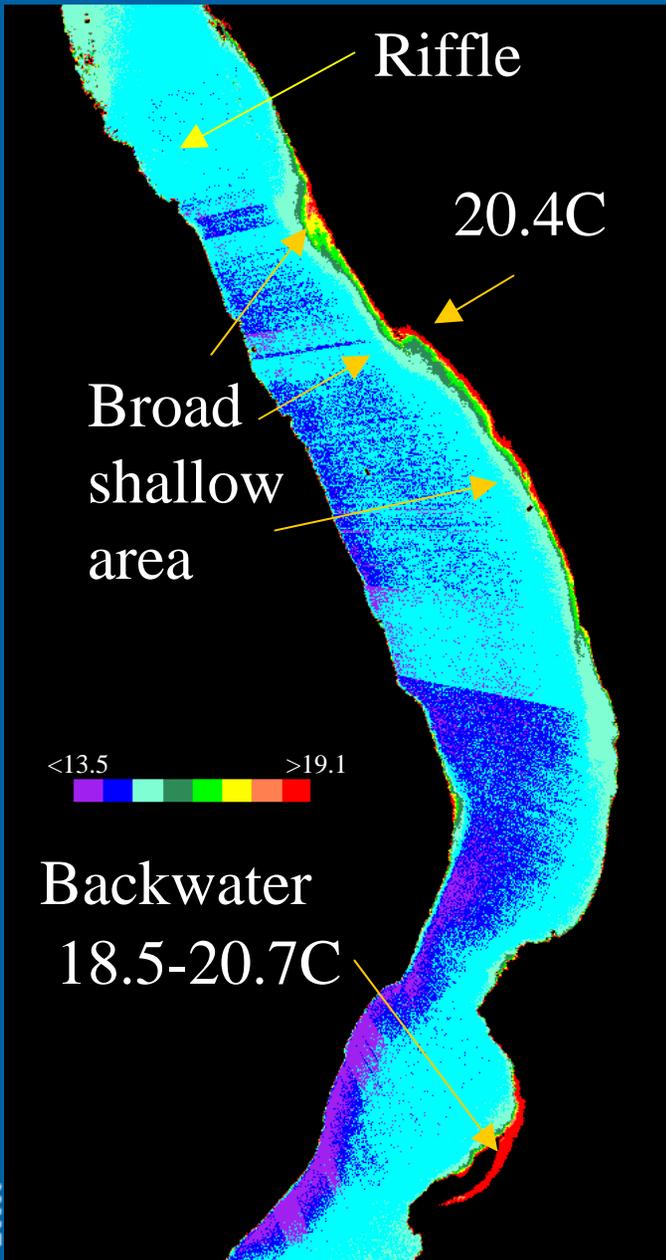


Shoreline Habitat Polygons (RM22)

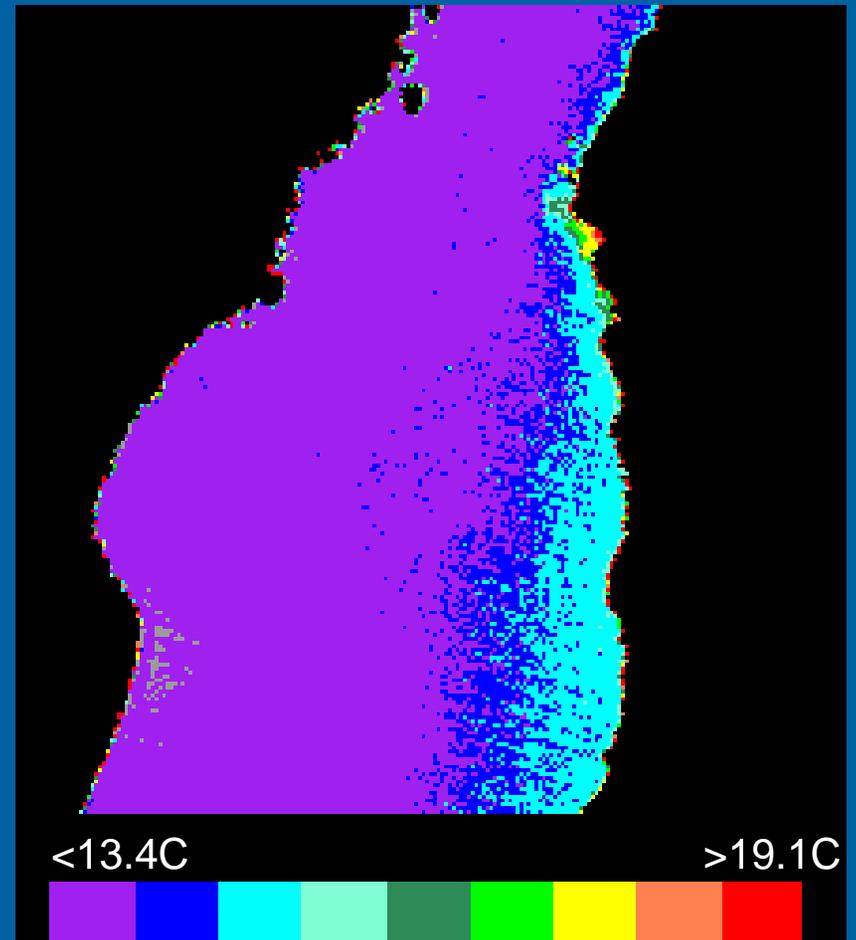
- Physical characteristics of shorelines
- Roughness above and below 8,000 CFS.



2000 Low Summer Steady Flow test: shoreline temperatures



RM 68 Thermal infrared image 7/25/00



RM 64.6L Thermal Infrared Imagery 7/25/00

Shoreline Habitat Polygons (RM22)

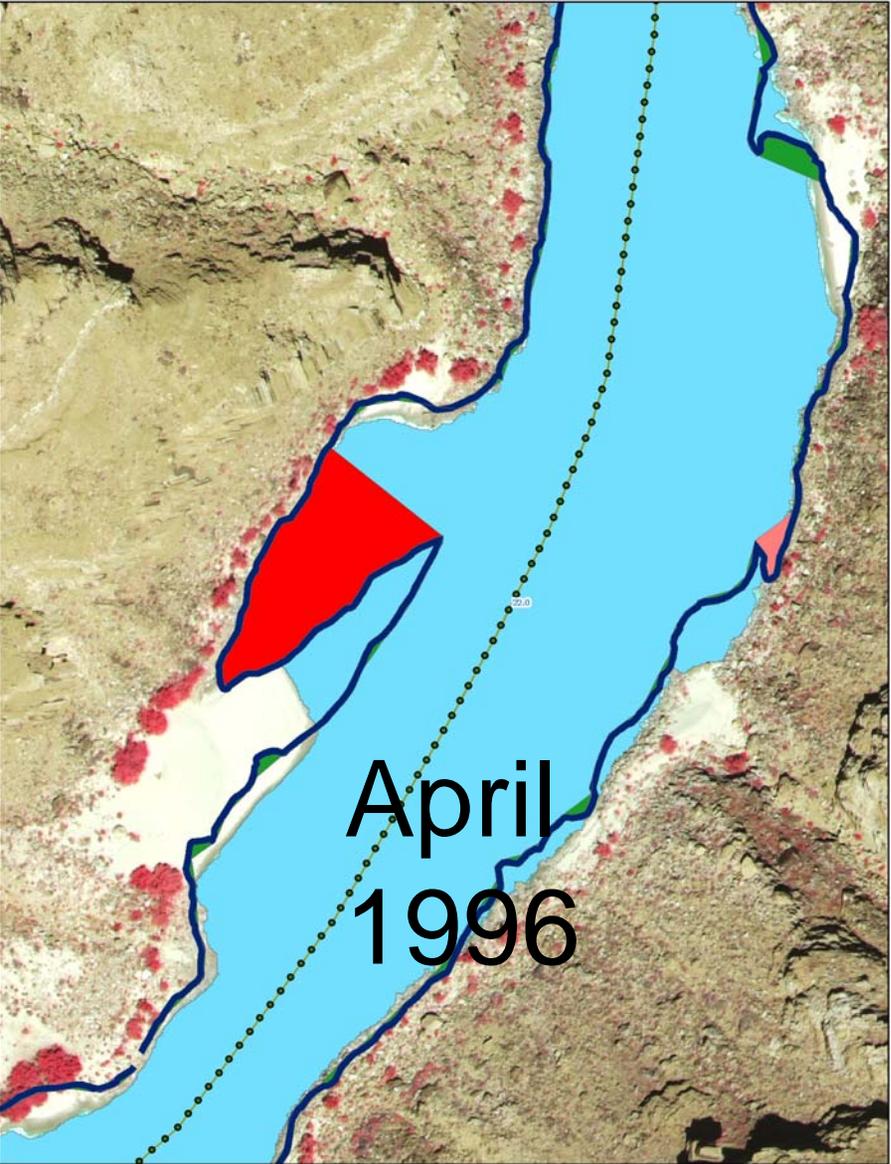
1984

March
1996

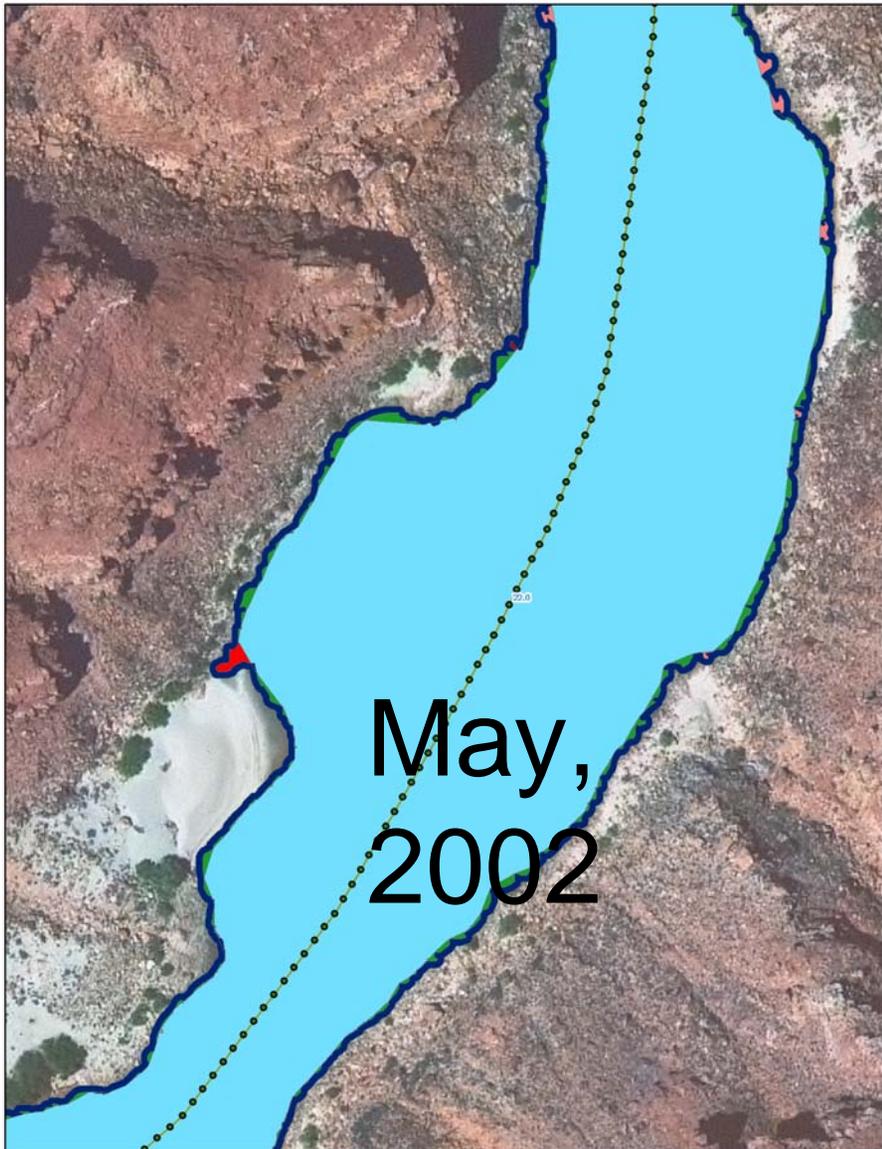


USU Shorelines
from Imagery

Shoreline Habitat Polygons (RM22)



April
1996

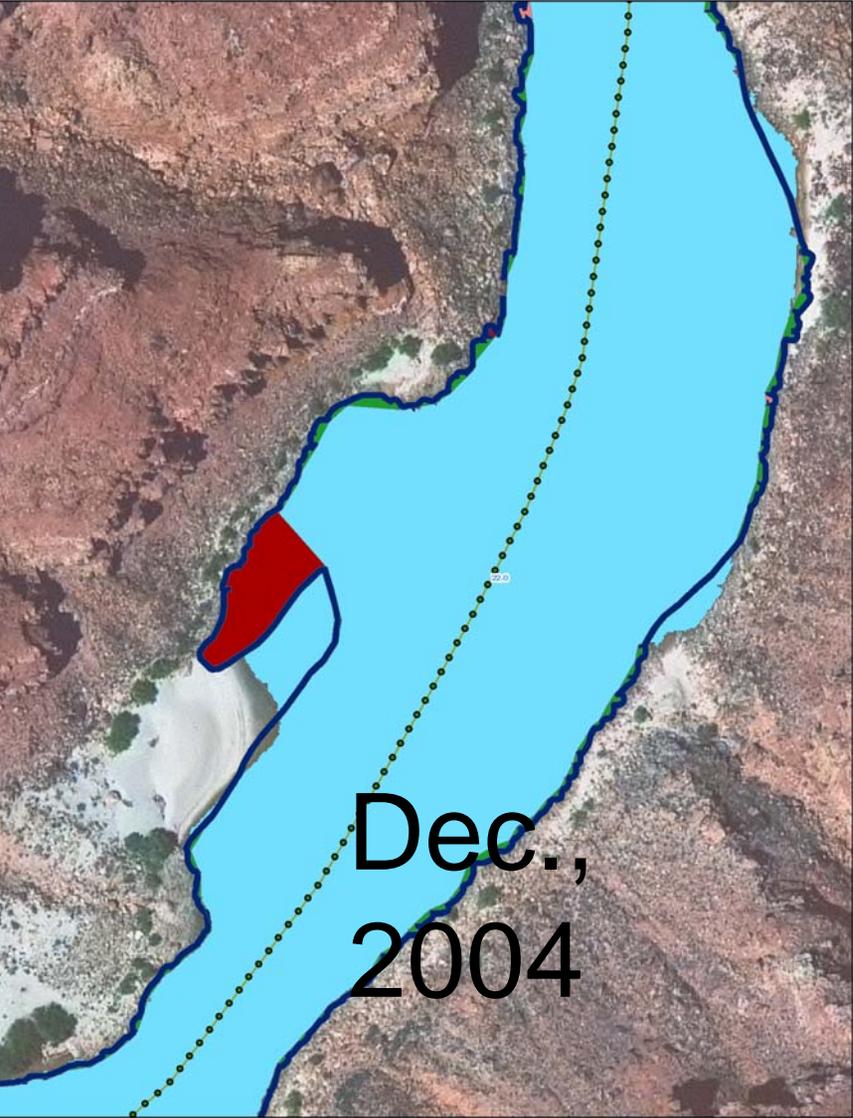


May,
2002

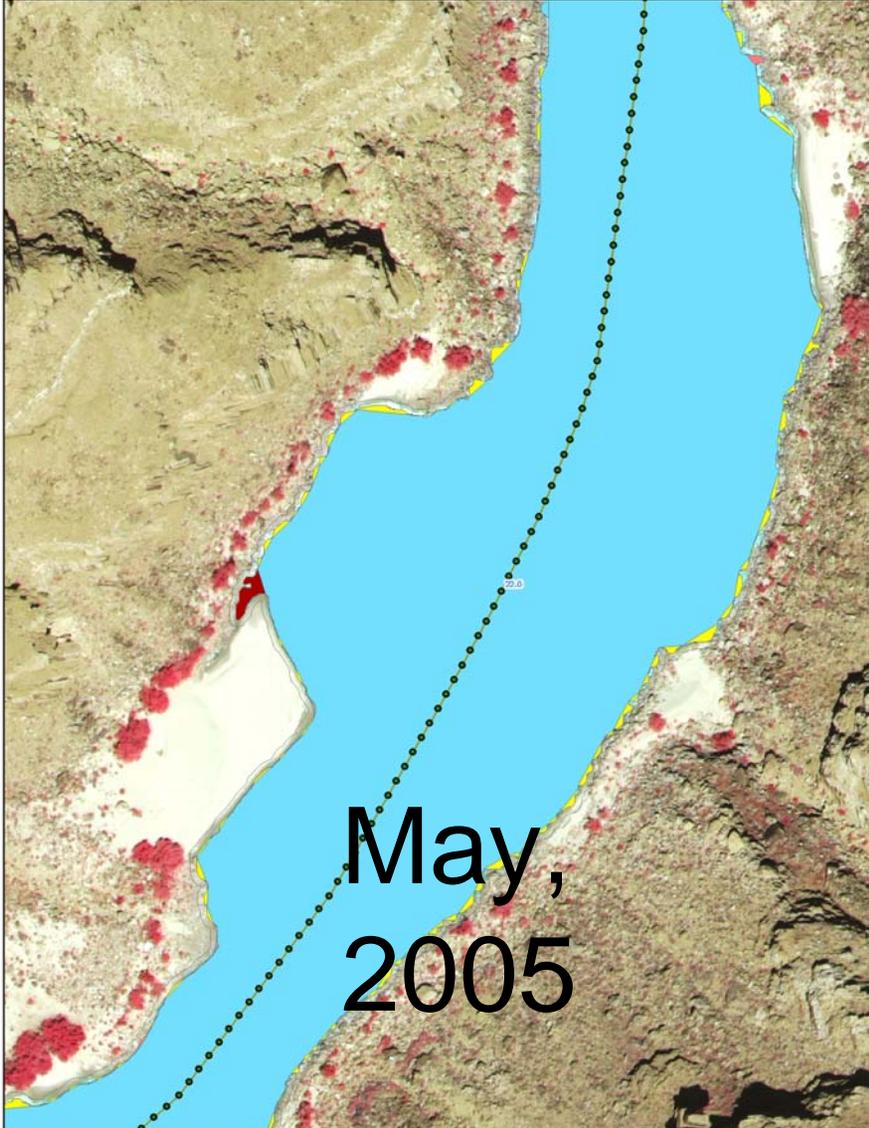


USU Shorelines
from Imagery

Shoreline Habitat Polygons (RM22)



Dec.,
2004



May,
2005



USU Shorelines
from Imagery

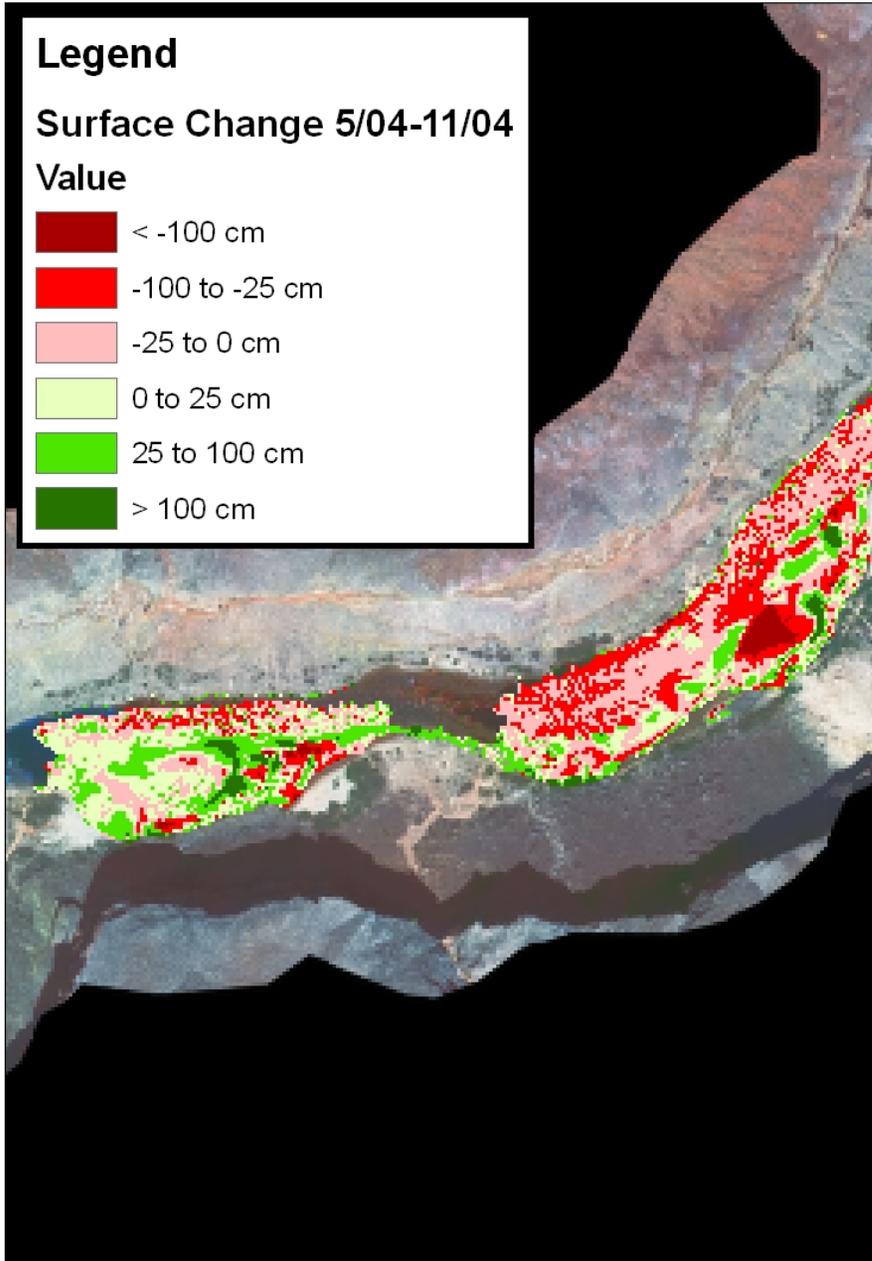
FIST Approaches to Measuring Change

Surface Change

Legend

Surface Change 5/04-11/04

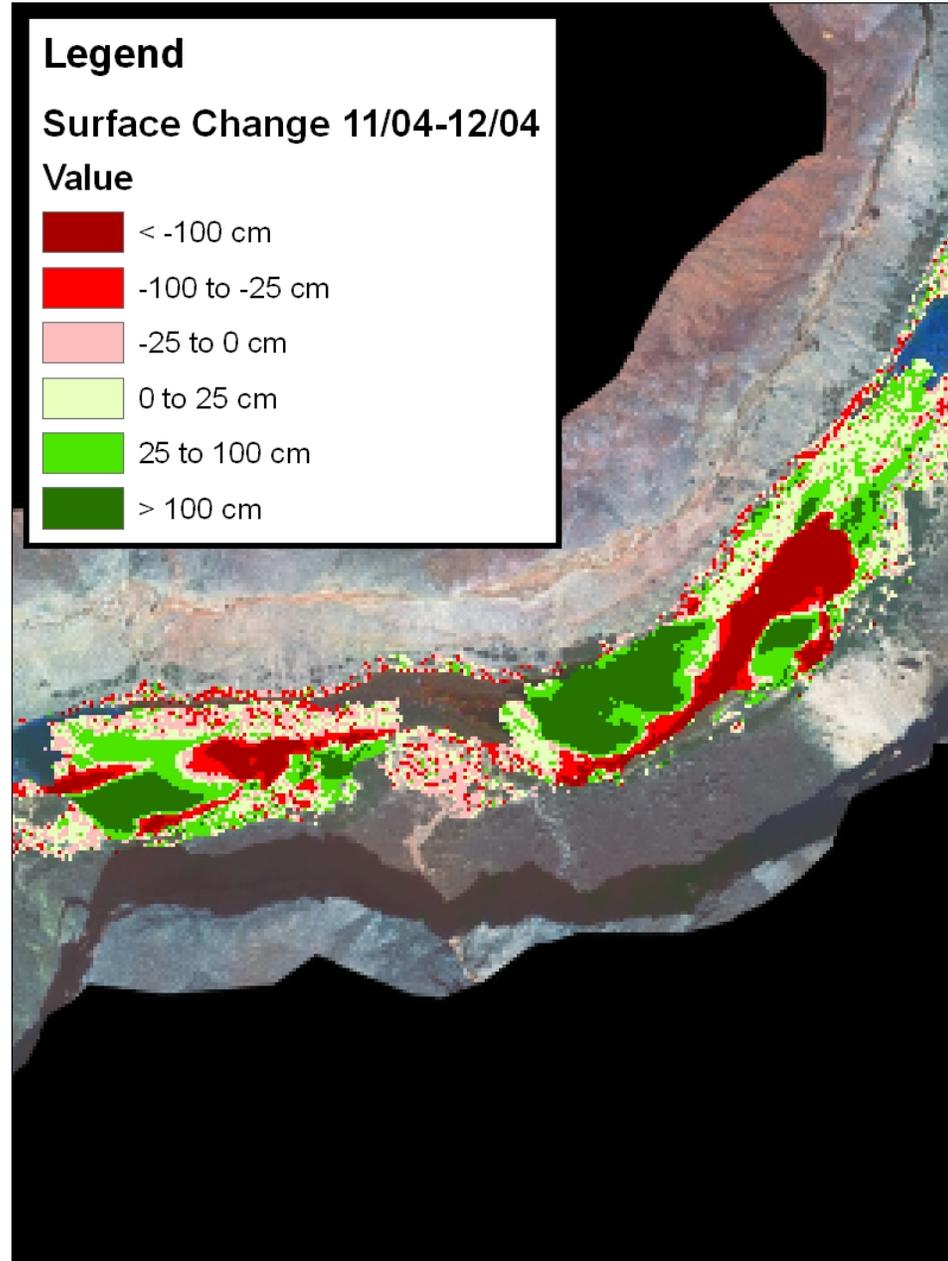
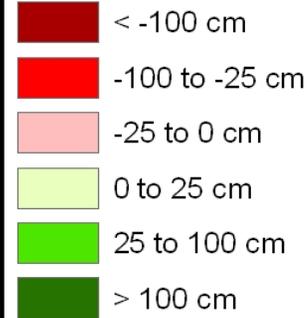
Value



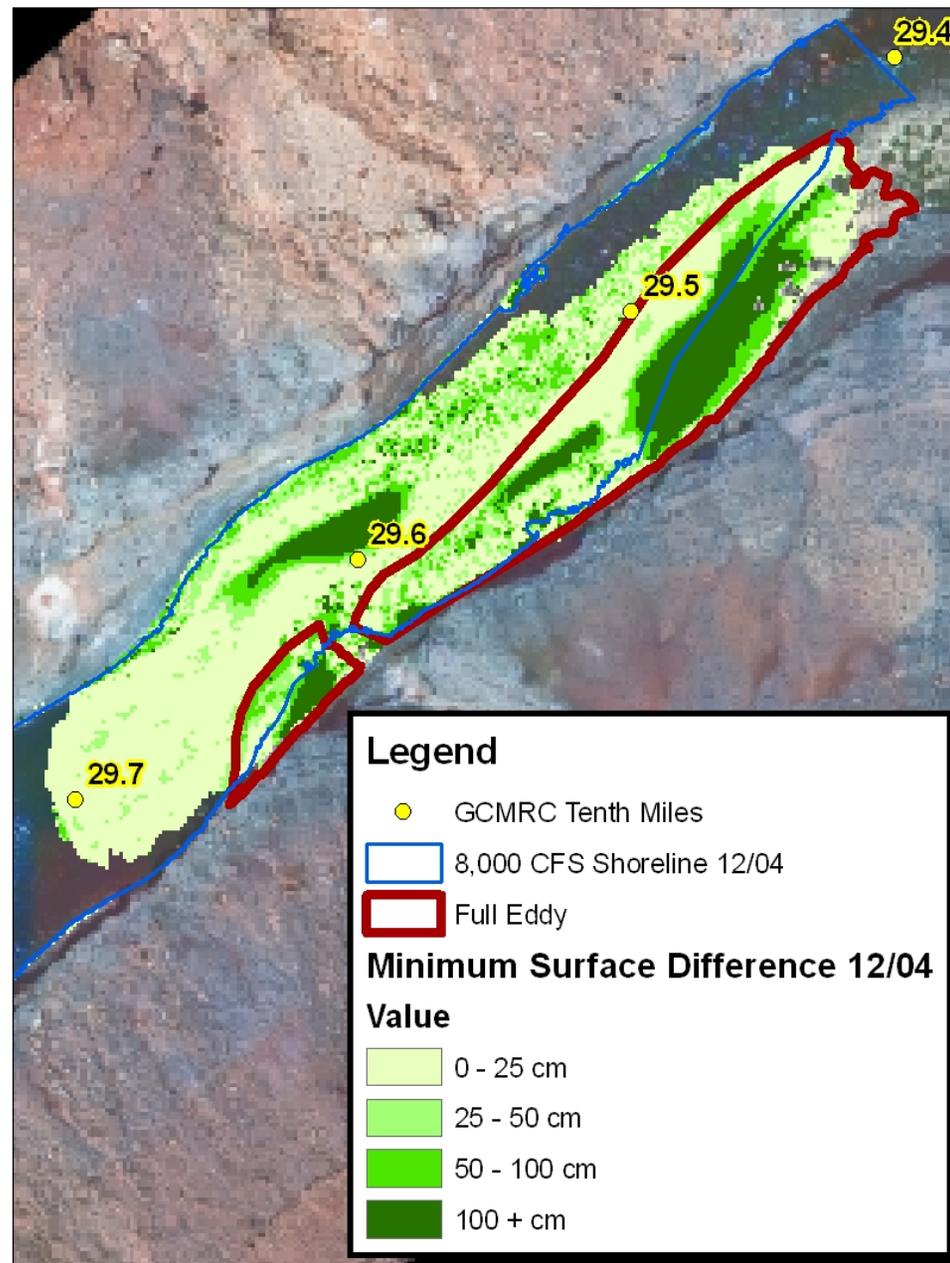
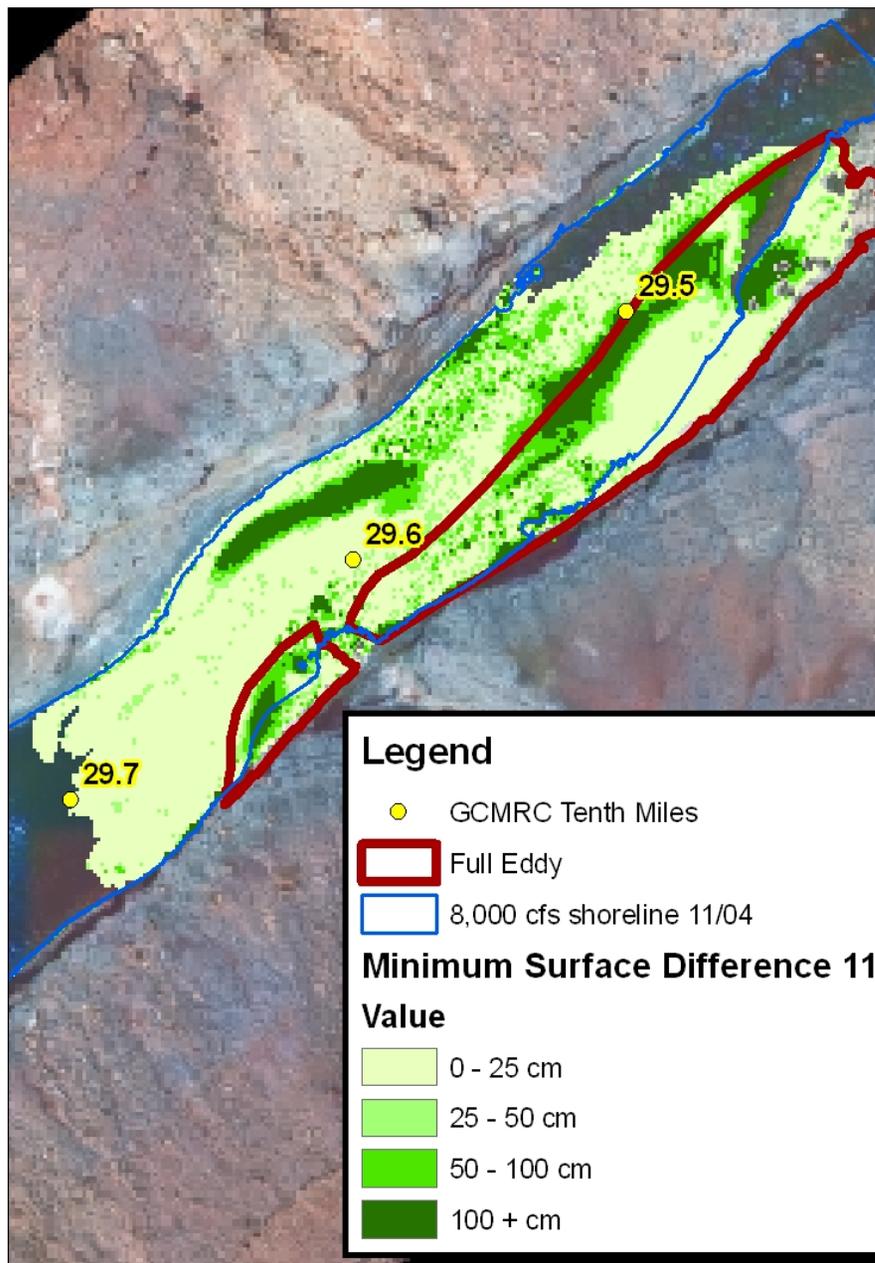
Legend

Surface Change 11/04-12/04

Value



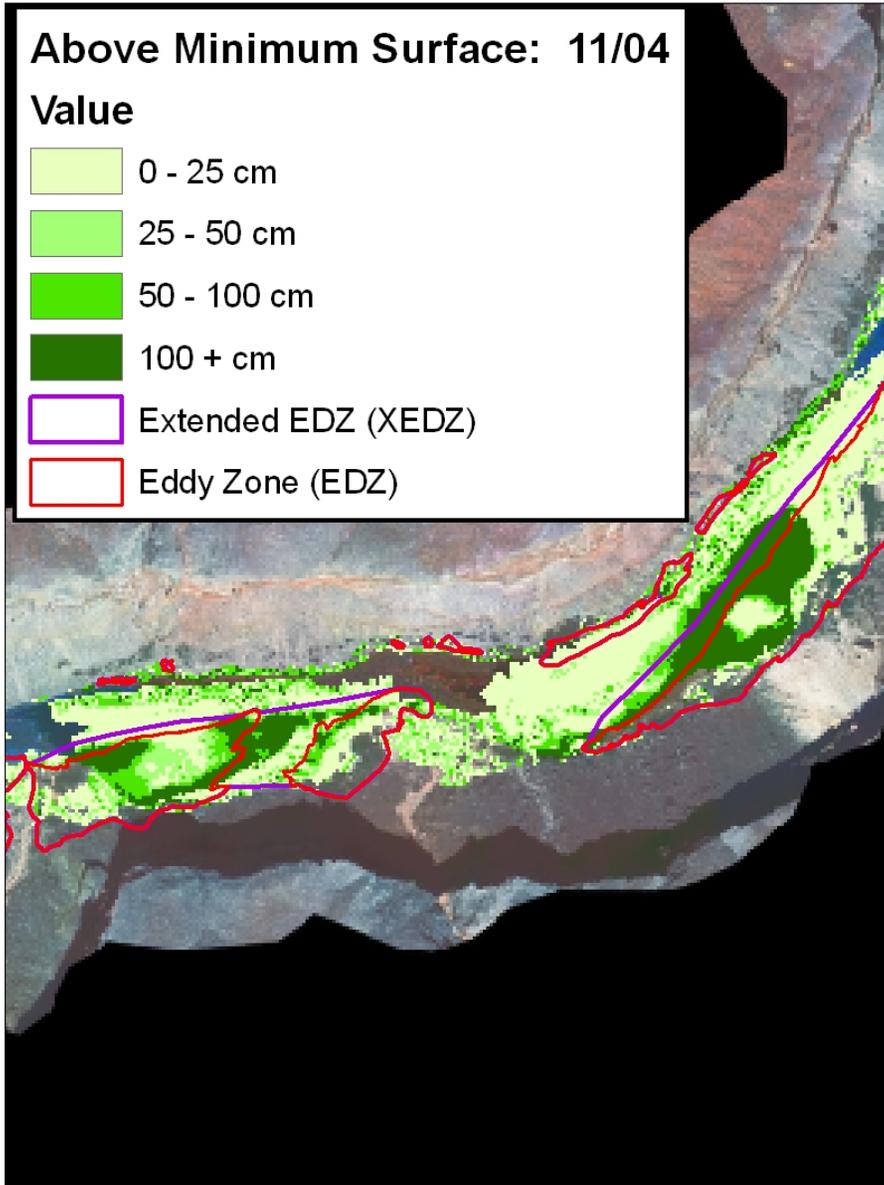
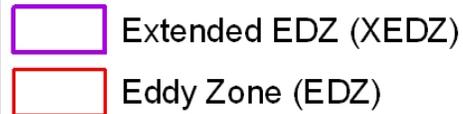
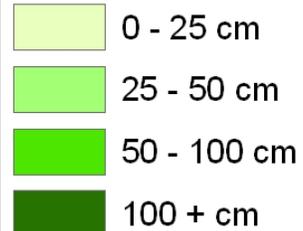
Variance From Minimum Surface: 11/04 & 12/04



Variance From Minimum Surface

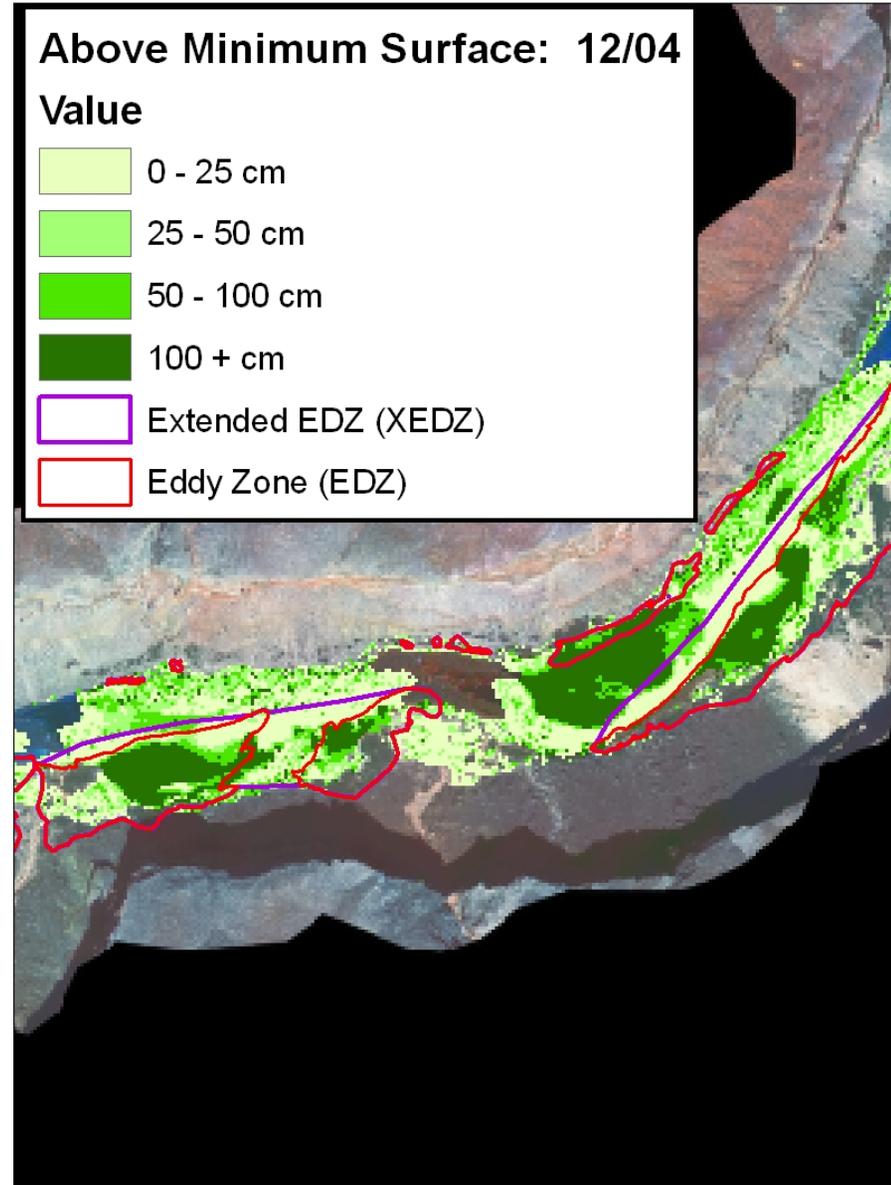
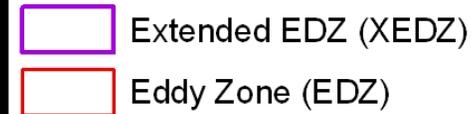
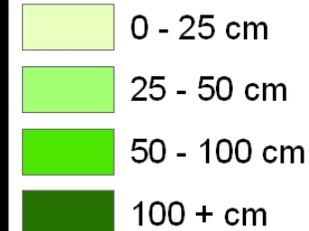
Above Minimum Surface: 11/04

Value



Above Minimum Surface: 12/04

Value

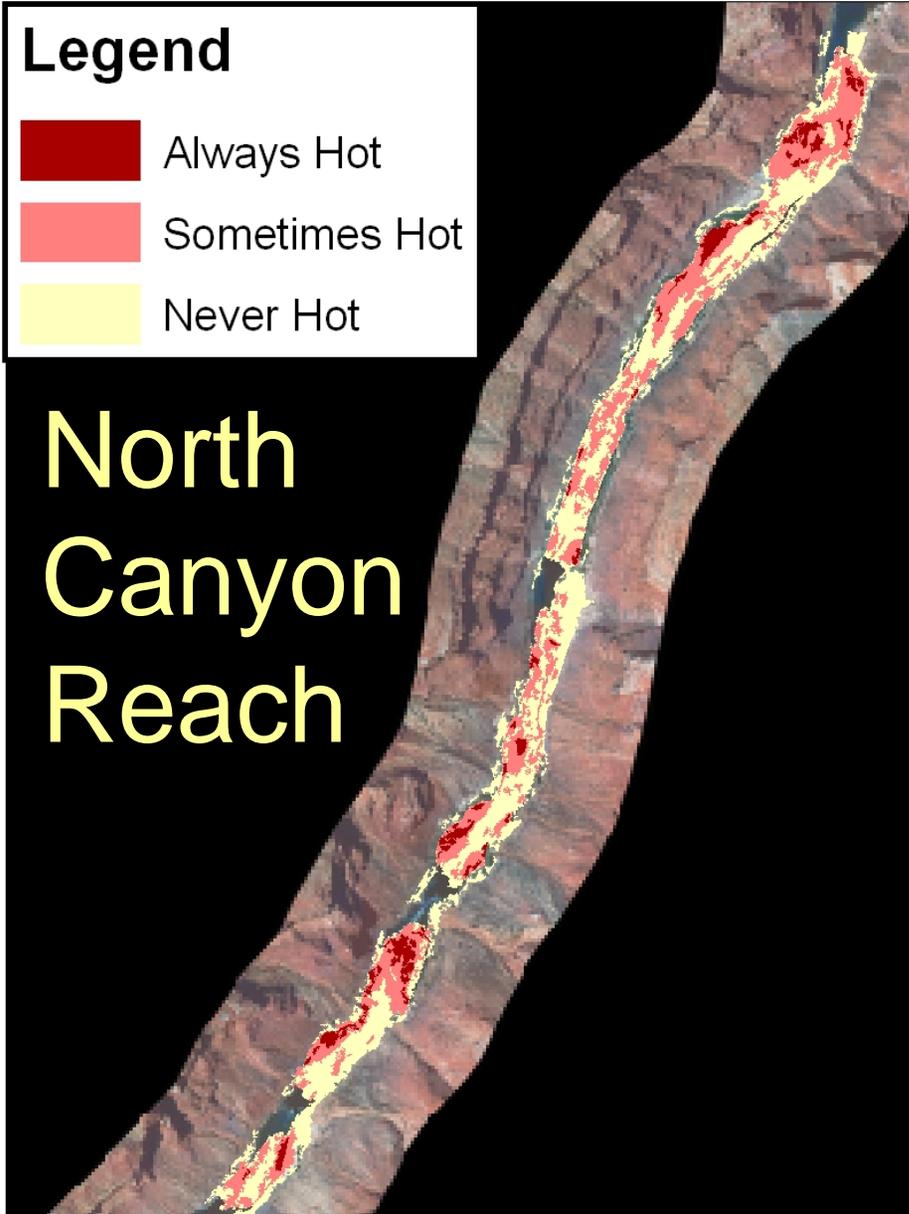


Hot Spots

Legend



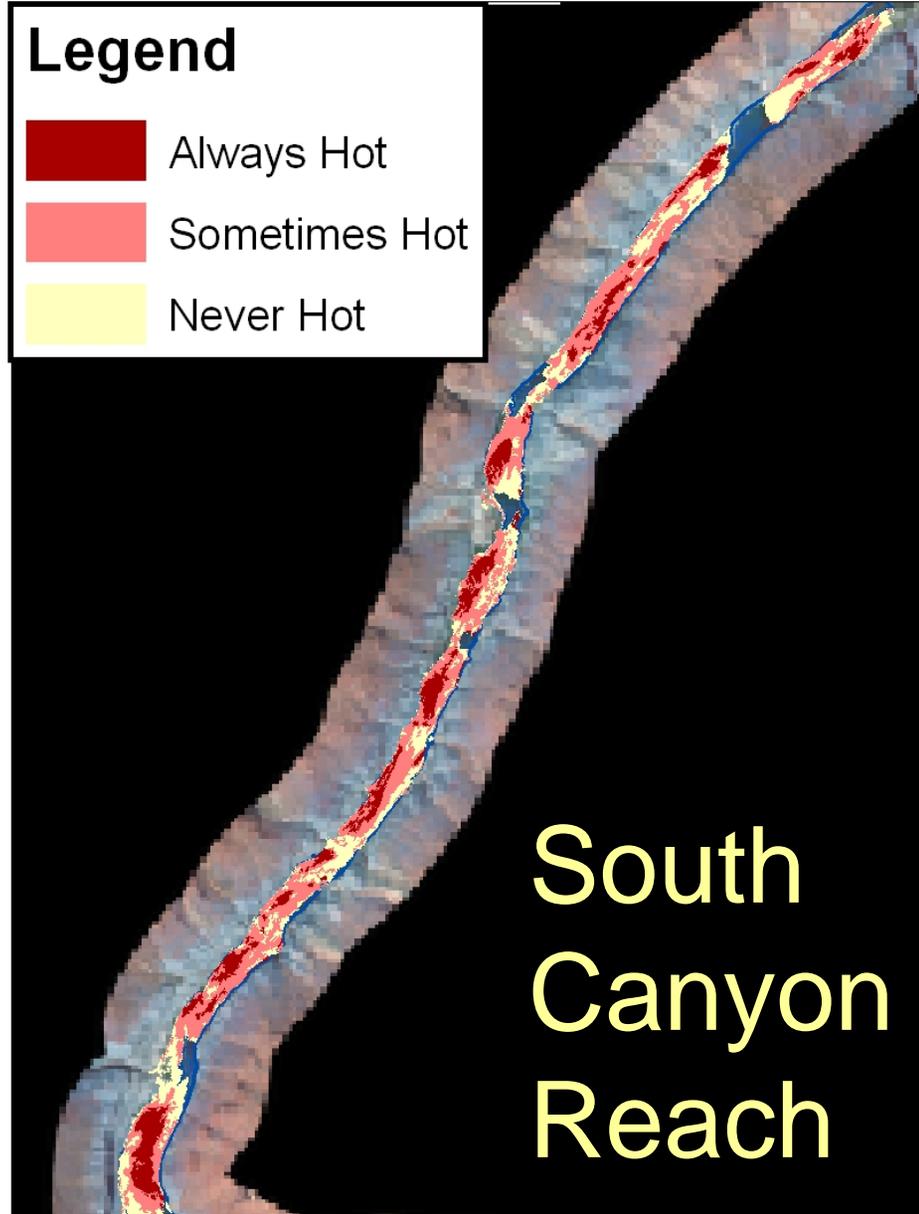
North
Canyon
Reach



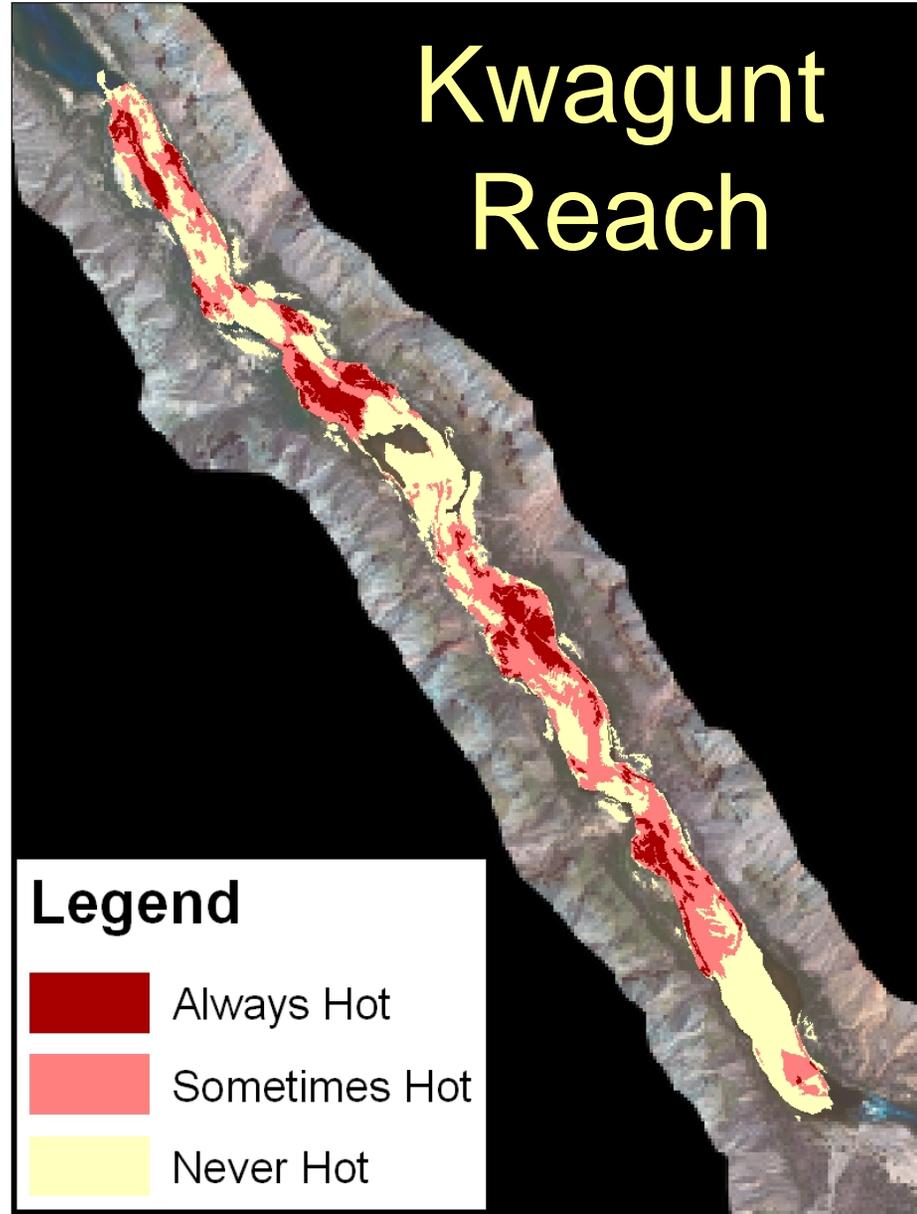
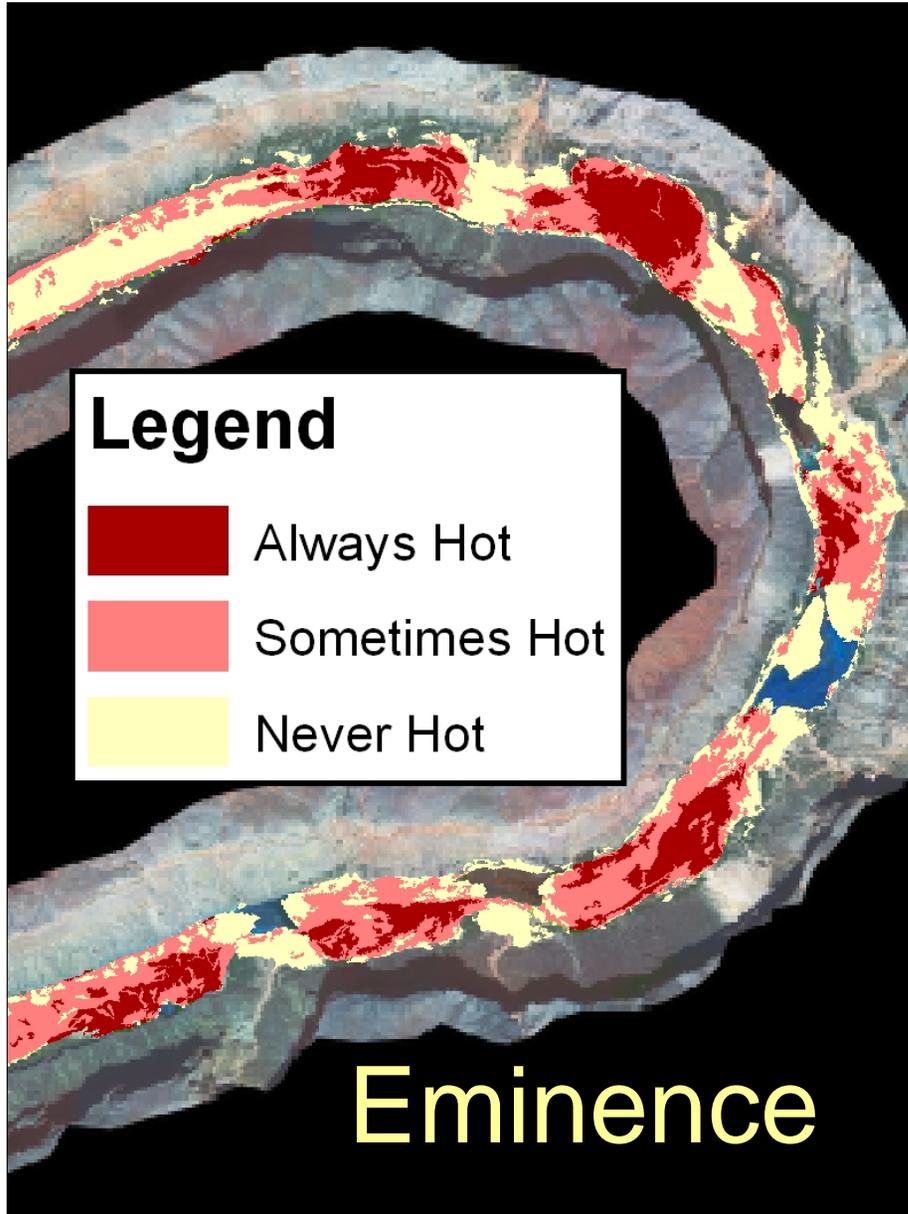
Legend



South
Canyon
Reach



Hot Spots

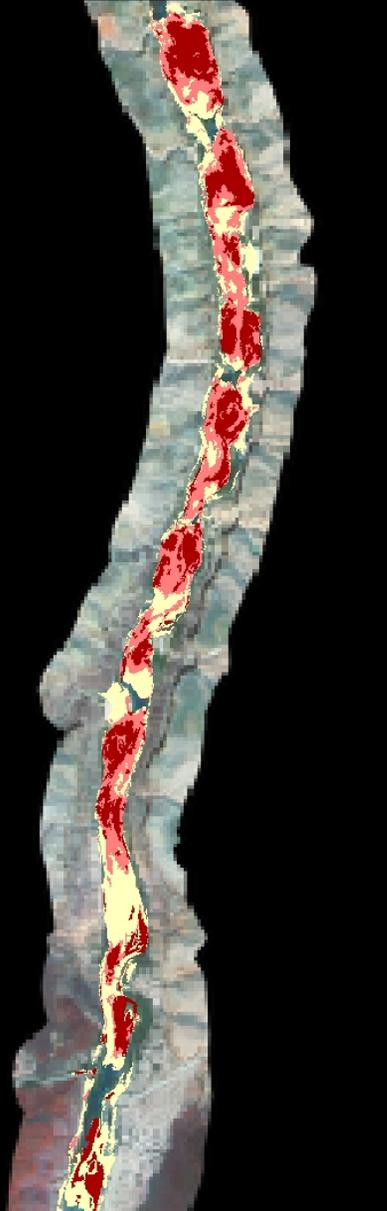


Hot Spots

Legend



LCR
Tapeats
Gorge
Reach



Legend



Paria
Reach

