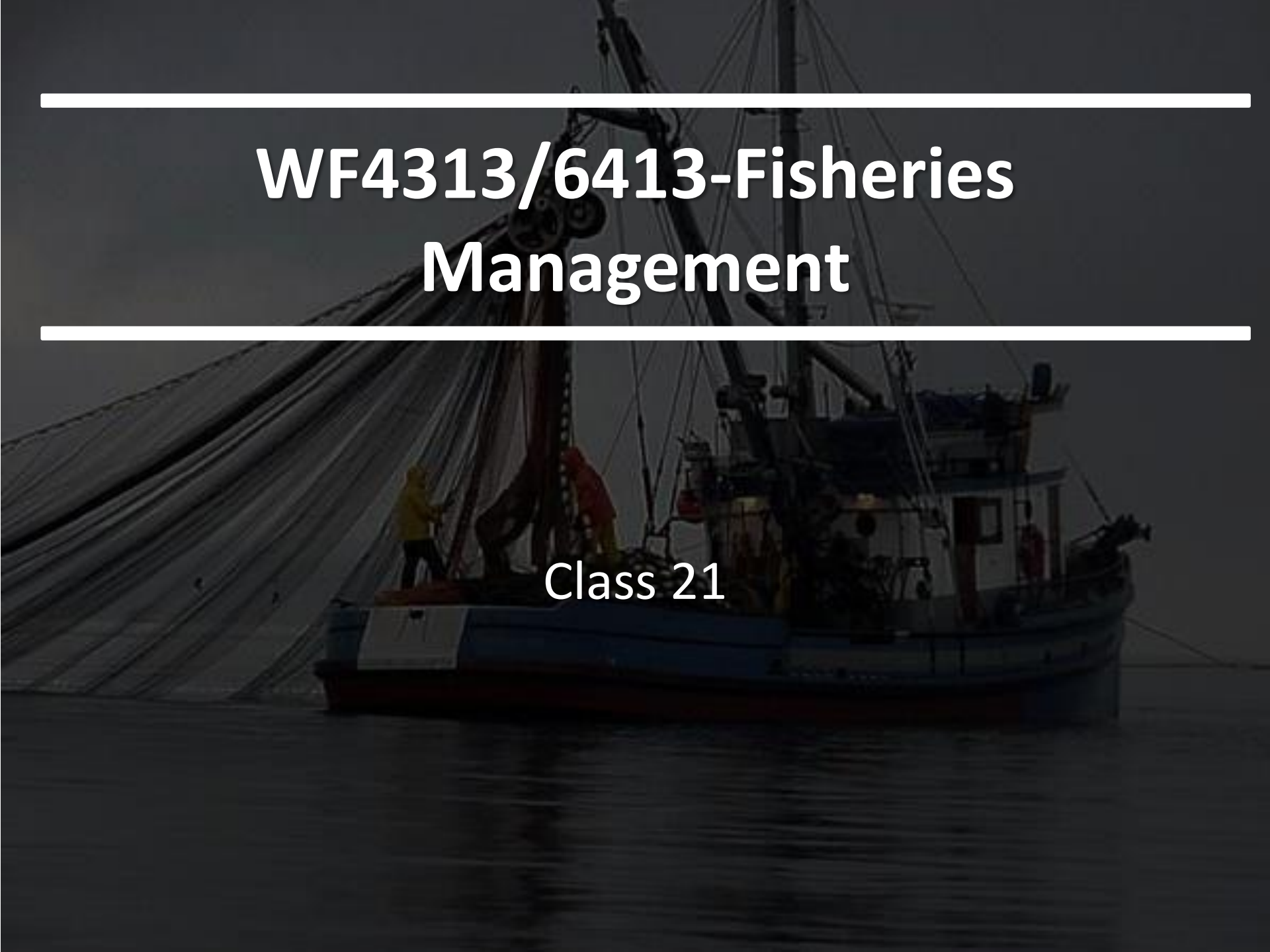
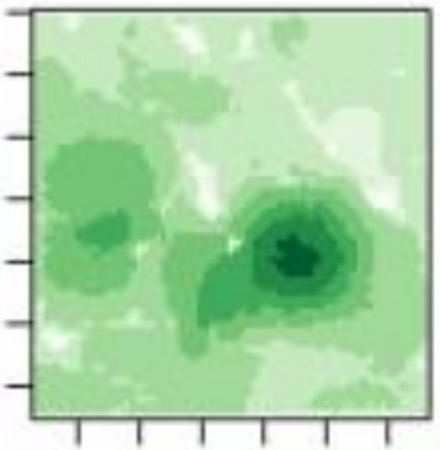


WF4313/6413-Fisheries Management

Class 21

Announcements






Scaling the Divide:

Animal Movement, Communities, and Population Processes

DANA MORIN

NOVEMBER 26, 2018

3:00PM, 100 - TULLY

SIUC COOPERATIVE WILDLIFE RESEARCH LAB

SIU Southern Illinois University

Revised Schedule**

- ~~October 30 = Group 1 @ Panther Creek~~
- ~~November 6th = Group 2 we'll do something~~
- ~~November 13th = NO LAB… ☹~~
- ~~Exam II = November 14th~~
- ~~November 20th = PIT Tag Telemetry~~
- ~~November 20th by 5pm – article to brief~~
- November 27th –No lab work on your briefs
- December 4th Brief presentations


WHERE WE LEFT OFF

18 play

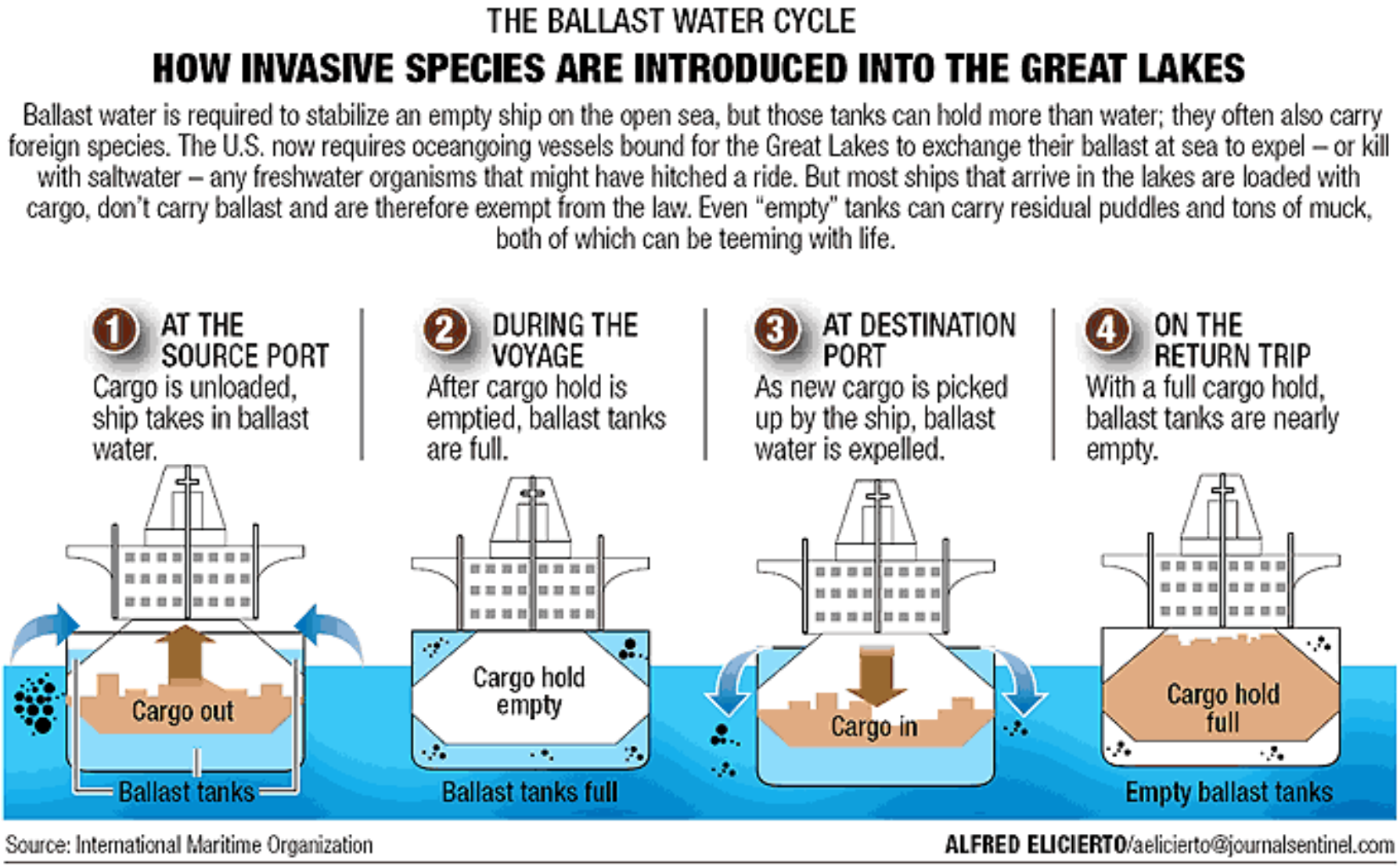
Note: Time series reflects NAS data and may not accurately reflect actual species spread.

Why is carp management important?

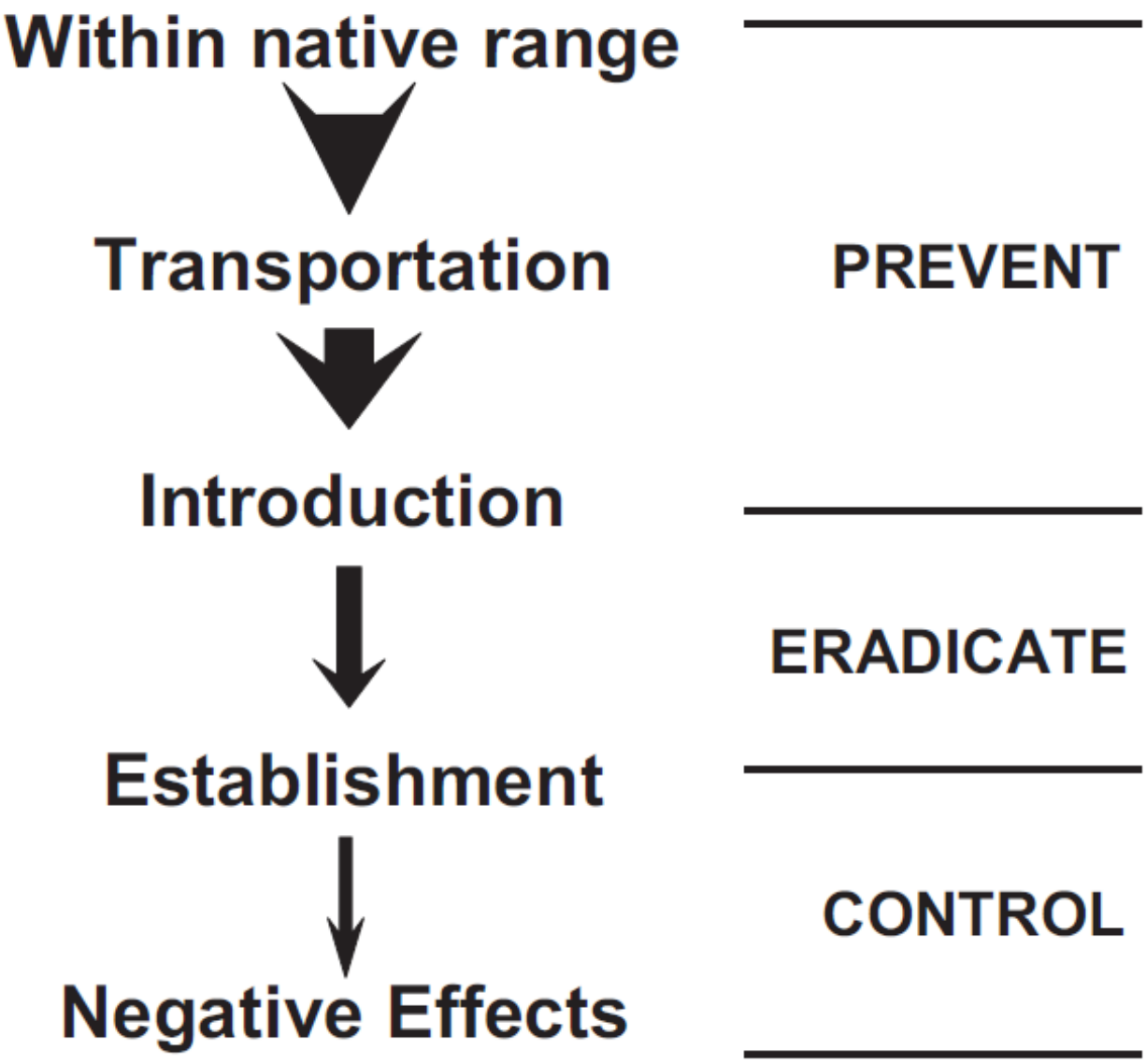
Management Objectives

- Refuge: Duck Use Days
- Carp have a negative effect on water quality and macrophytes
- Ducks do not use poor areas if they don’t have to
- Don’t meet management objectives…

Ballast water



Management strategies

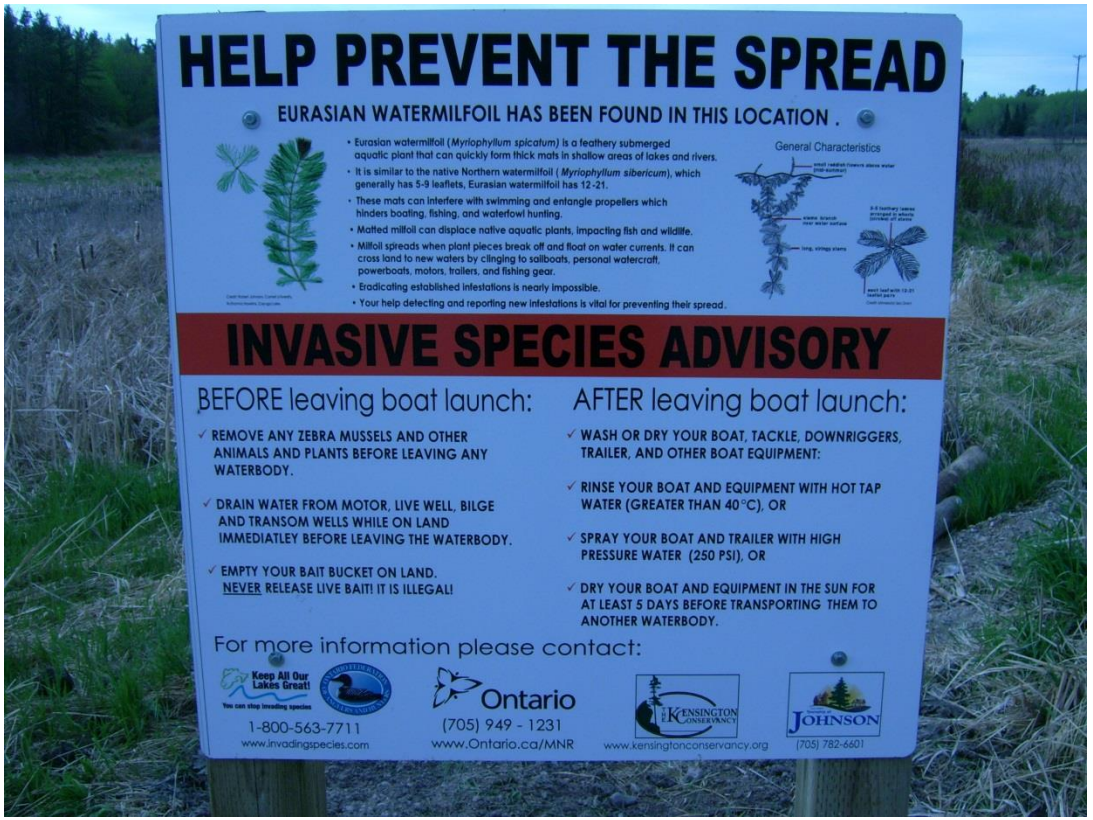


Prevent-Example

- Baitfish must be from watershed to be used
- No transport across state lines

Prevent-Example

- Eurasian water milfoil



Eradicate

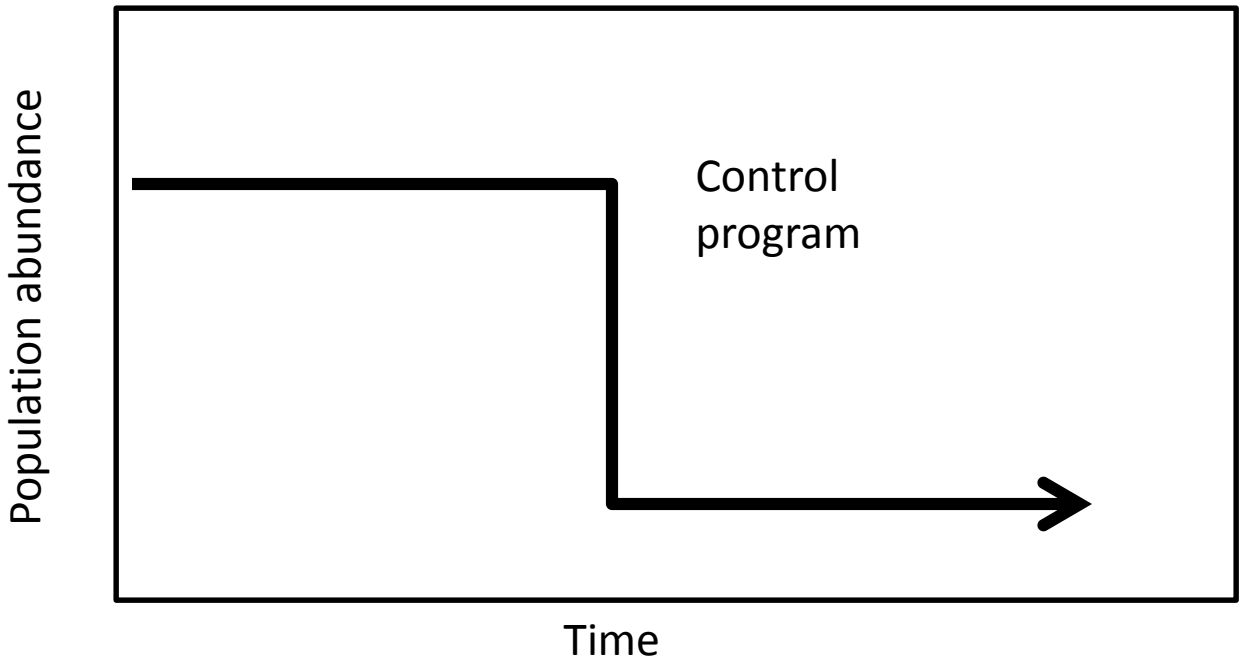
- Rarely effective
- Limited to small, easily-accessible, closed systems

Eradication is best attempted almost immediately upon discovery of the new invader population (Simberloff 2009)

INVASIVE & INTRODUCED SPECIES MANAGEMENT CONTINUED

Control

- Reduce population to level that minimizes impact



Methods of Eradication & Control

- Chemicals
  - Rotenone, Lampricide
- Physical
  - Traps, nets, explosives, water level, electrofishing, commercial fishing
- Biological
  - Predator & prey, pathogens, daughterless technologies, pheromones

Chemicals

Physical

- Fishing
  - Commercial
  - Recreational

North American Journal of Fisheries Management 32:1251–1264, 2012

ISSN: 0275-5947 print / 1548-8675 online
DOI: 10.1080/02755947.2012.728175

ARTICLE

Strategies to Control a Common Carp Population by Pulsed Commercial Harvest

Michael E. Colvin*
Department of Natural Resource Ecology and Management, Iowa State University, 339 Science II, Ames, Iowa 50011-3221, USA

Clay L. Pierce
U.S. Geological Survey, Iowa Cooperative Fish and Wildlife Research Unit, Iowa State University, 339 Science II, Ames, Iowa 50011-3221, USA

Timothy W. Stewart
Department of Natural Resource Ecology and Management, Iowa State University, 339 Science II, Ames, Iowa 50011-3221, USA

Scott E. Grummer
Iowa Department of Natural Resources, 1203 North Shore Drive, Clear Lake, Iowa 50428, USA

North American Journal of Fisheries Management 31:269–279, 2011

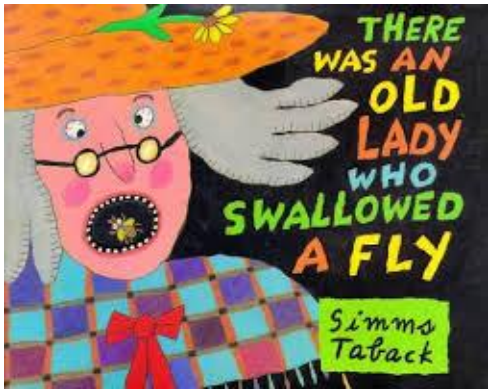
ISSN: 0275-5947 print / 1548-8675 online
DOI: 10.1080/02755947.2011.574923

ARTICLE

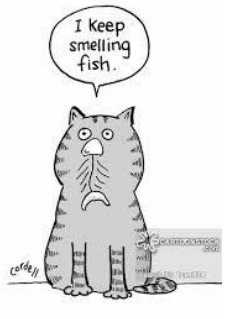
Simulated Population Responses of Common Carp to Commercial Exploitation

Michael J. Weber,* Matthew J. Hennen,[1] and Michael L. Brown
Department of Wildlife and Fisheries Sciences, South Dakota State University, Northern Plains Biostress Laboratory, North Campus Drive, Box 2140B, Brookings, South Dakota 57007, USA

Biological



- Predator prey
  Tiger musky & brook trout
- Pathogens
  Koi Herpes virus-carp
- Pheromones
  Lamprey, brook trout



But I really want to introduce a fish…

American Fisheries Society Position (taken from Policy Statement 15)

1. Rationale
2. Search
3. Preliminary assessment of the impact
4. Publicity and review
5. Experimental research
6. Evaluation or recommendation
7. Introduction

Rationale

Reasons for seeking an import should be clearly stated and demonstrated. It should be clearly noted what qualities are sought that would make the import more desirable than native forms.

Search

Within the qualifications set forth under rationale, a search of possible contenders should be made, with a list prepared of those that appear most likely to succeed, and the favorable and unfavorable aspects of each species noted.

Preliminary assessment of the impact

This should go beyond the area of rationale to consider impact on target aquatic ecosystems and general effect on game and food fishes or waterfowl, aquatic plants, and public health. The published information on the species should be reviewed, and the species should be studied in preliminary fashion in its biotope.

Publicity and review

The subject should be entirely open, and expert advice should be sought. It is at this point that thoroughness is in order. No importation is so urgent that it should not be subject to careful evaluation.

Experimental research

If a prospective import passes the first four steps, a research program should be initiated by an appropriate agency or organization to test the import in confined waters (e.g., experimental ponds).

Evaluation or recommendation

Publicity is in order and complete reports should be circulated amongst interested scientists and presented for publication in the Transactions of the American Fisheries Society.

Introduction

With favorable evaluation, the release should be effected and monitored, with results published or circulated.

North American Journal of Fisheries Management 35:885–894, 2015

ISSN: 0275-5947 print / 1548-8675 online
DOI: 10.1080/02755947.2015.1064835

MANAGEMENT BRIEF

Risk Screening of Arapaima, a New Species Proposed for Aquaculture in Florida

Jeffrey E. Hill* and Katelyn M. Lawson
Program in Fisheries and Aquatic Sciences, School of Forest Resources and Conservation, University of Florida, Tropical Aquaculture Laboratory, 1408 24th Street Southeast, Ruskin, Florida 33570, USA

Restoration & Introduced Species?

A critical first step in dealing with a potential introduction is positive identification of the species to confirm the species is nonnative (Fuller et al. 1999).

Best of intentions for species recovery?

Colorado Greenback Trout

U.S. Fish & Wildlife Service

Search ECOS

ECOS Environmental Conservation Online System

Conserving the Nature of America

ECOS / Species Profile for Greenback Cutthroat trout (Oncorhynchus clarki stomias)

Greenback Cutthroat trout (Oncorhynchus clarki stomias)

Federal Register | Recovery | Critical Habitat | Conservation Plans | Petitions | Life History

Taxonomy: View taxonomy in ITIS

Listing Status: Threatened

Where Listed: WHEREVER FOUND

General Information

Greenback cutthroat trout are coldwater fish belonging to the trout, salmon and whitefish family. They have dark, round spots on the sides and tail and two colorful blood-red stripes on each side of the throat under the jaw, hence the name "cutthroat." During the spring spawning season the entire belly may become crimson red.

- **States/US Territories** in which the Greenback Cutthroat trout, Entire is known to or is believed to occur: Colorado , Utah
- **US Counties** in which the Greenback Cutthroat trout, Entire is known to or is believed to occur: View All

Current Listing Status Summary

Status	Date Listed	Lead Region	Where Listed
Threatened	03/11/1967	Mountain-Prairie Region (Region 6)	Entire

Efforts To Save Greenback Cutthroat Trout Snagged: Wrong Fish Restocked For Decades

Date: September 11, 2007

Source: University of Colorado at Boulder

Summary: A new study indicates biologists trying to save Colorado's native greenback cutthroat trout from extinction over the past several decades through hatchery propagation and restocking efforts have, in most cases, inadvertently restored the wrong fish.

RELATED TOPICS

Plants & Animals

- Fish
- Wild Animals
- Ecology Research
- Nature
- New Species
- Extinction

RELATED TERMS

- Trout
- Fish farming
- Salmon
- Extinction event
- Amphibian
- Fish migration

FULL STORY

A new University of Colorado at Boulder study has shown biologists trying to spur the recovery of the threatened greenback cutthroat trout in Colorado, have in many cases been restocking the wrong subspecies of trout into small streams and lakes in the state.

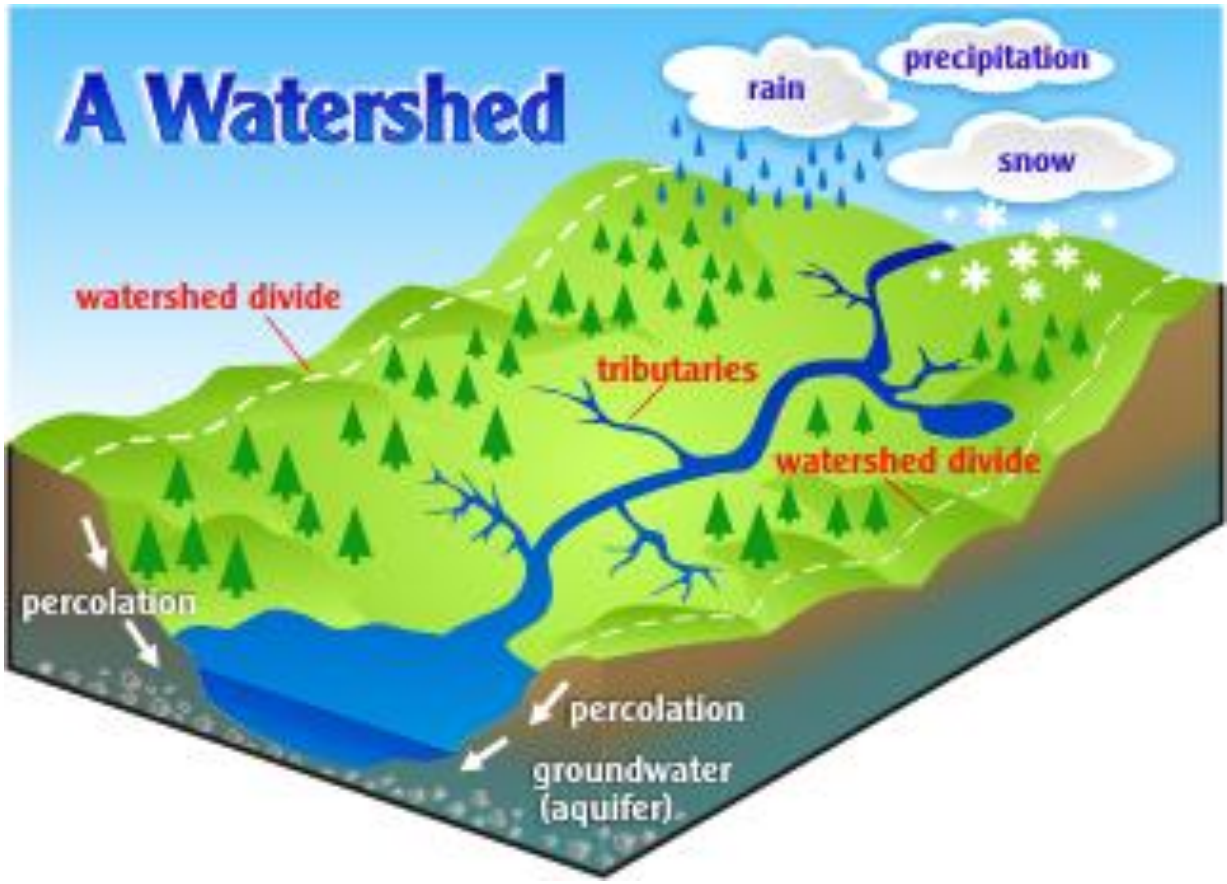
Credit: Colorado Division of Wildlife

Something we are wrestling with in fisheries

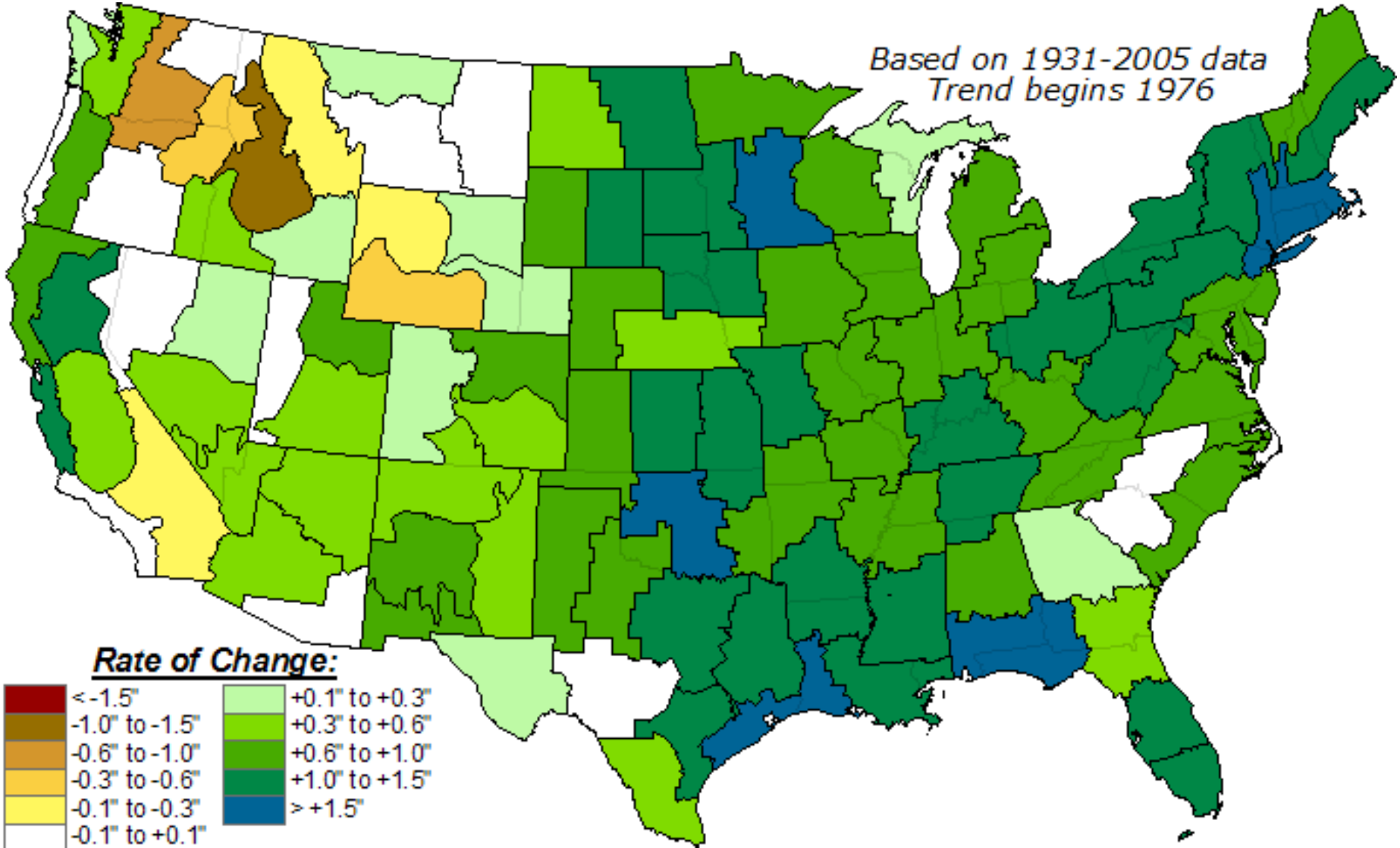
CLIMATE CHANGE & MANAGEMENT

Climate change & water

- Amount
- Temperature



Precipitation trends



Amount

- Frequency of droughts
- Duration of droughts
- Changes/variability in precipitation
- Changes in snowpack

Amount

Amount

Home » News

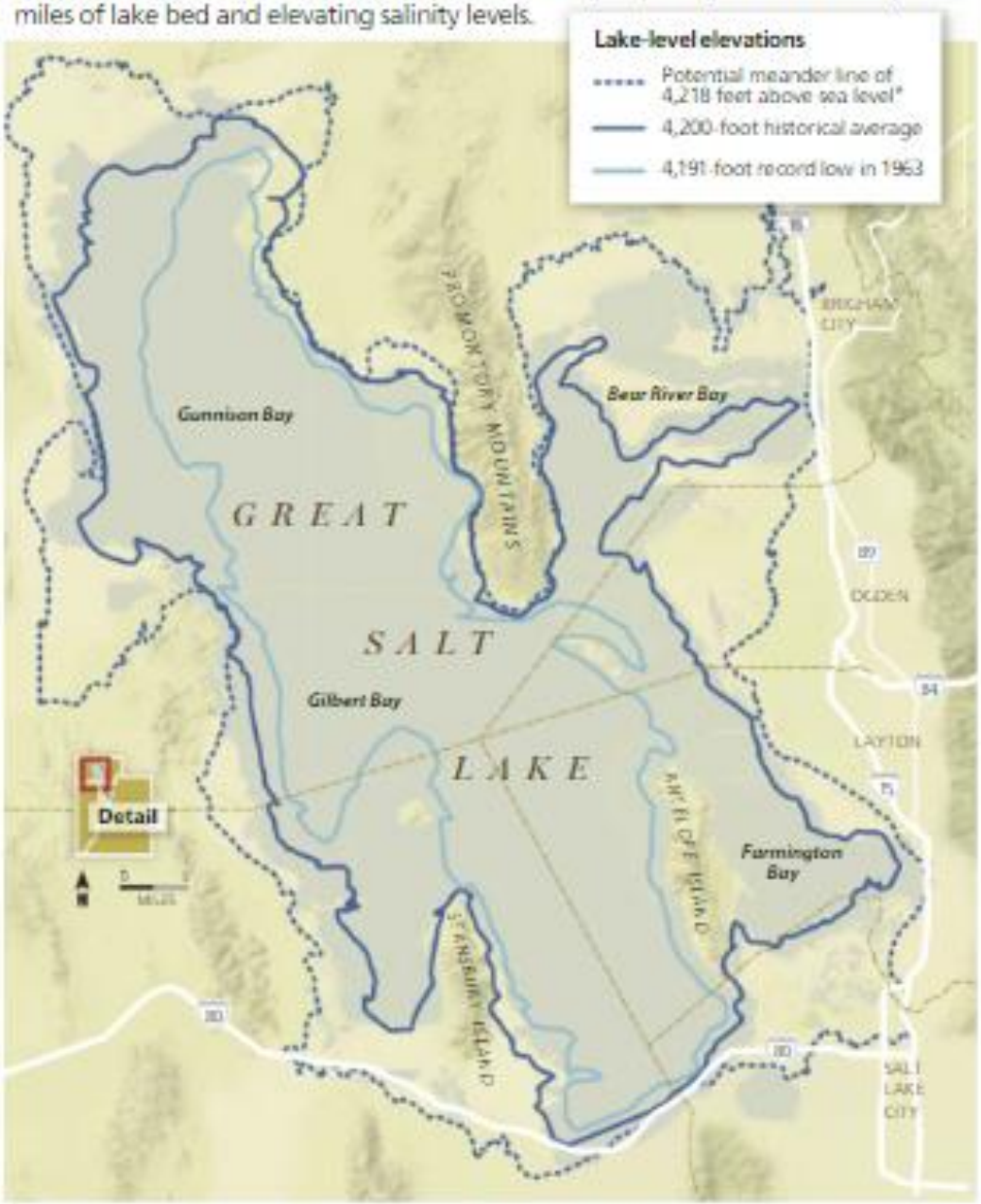
Salt Lake City 52 °
Traffic / Stories from last 36 ho

Great Salt

By BRIAN MAFFLY | The Sa
First Published Feb 01 2015 06:

Shrinking Great Salt Lake

The level of Great Salt Lake is dropping toward the historic low, set in 1963 at 4,191.3 feet in 1963. As a result the lake is shrinking, exposing hundreds of square miles of lake bed and elevating salinity levels.



*Meander refers to potential water rise in a weather-related or geologic event

The Salt Lake Tribune

Politics and Social Issues

« View the Politics and Social Issues Index

« View Other Columns

California Fisheries in Crisis:

impact of drought and illegal marijuana grows

Upcoming forum focuses on historic drought and marijuana grows and their devastating impact to California watersheds - Hearing set for July 1 in Sacramento

Senator Mike McGuire (D-North Coast), chairman of the Joint Committee on Fisheries and Aquaculture, announced today that a hearing on the impacts of the drought and marijuana grows on fisheries will be held **Wednesday, July 1 at the State Capitol in Sacramento.**

"In our fourth year of this historic drought, we have to find ways to protect our fisheries from the impacts of the driest years on record, and the devestating impacts of rogue marijuana grows. The combination of the drought and rogue grows have resulted in unprecedented fish kills, have put endangered species on the brink in many

food for thought

California Drought Has Wild Salmon Competing With Almonds For Water

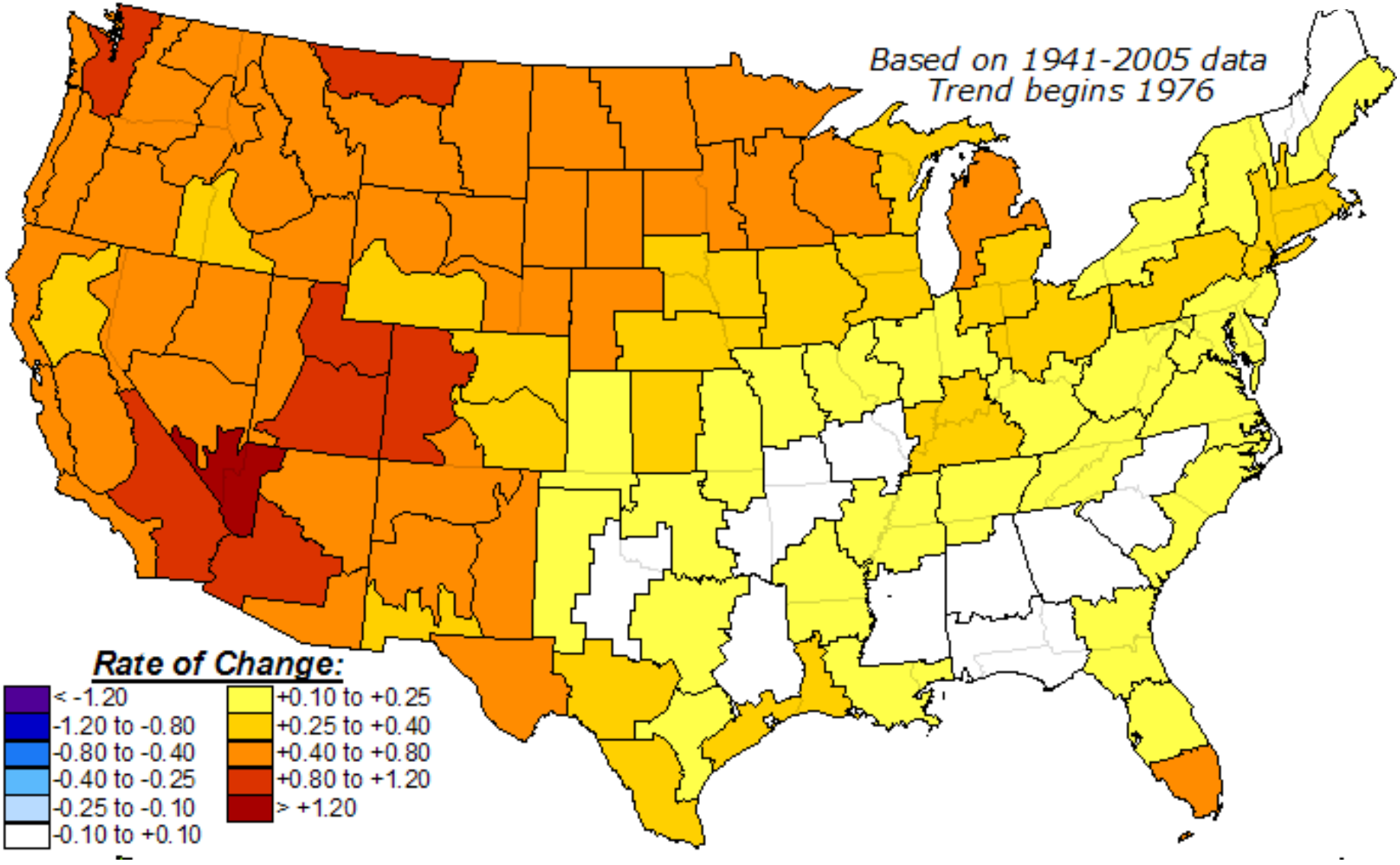
AUGUST 21, 2014 12:47 PM ET

ALASTAIR BLAND

A young Chinook salmon, called a smolt, near Vallejo, Calif., on April 24, 2014. North Coast tribes and environmentalists fear that the smolts and Chinooks may not survive this year's low river flows and warm water.

Rich Pedroncelli/AP

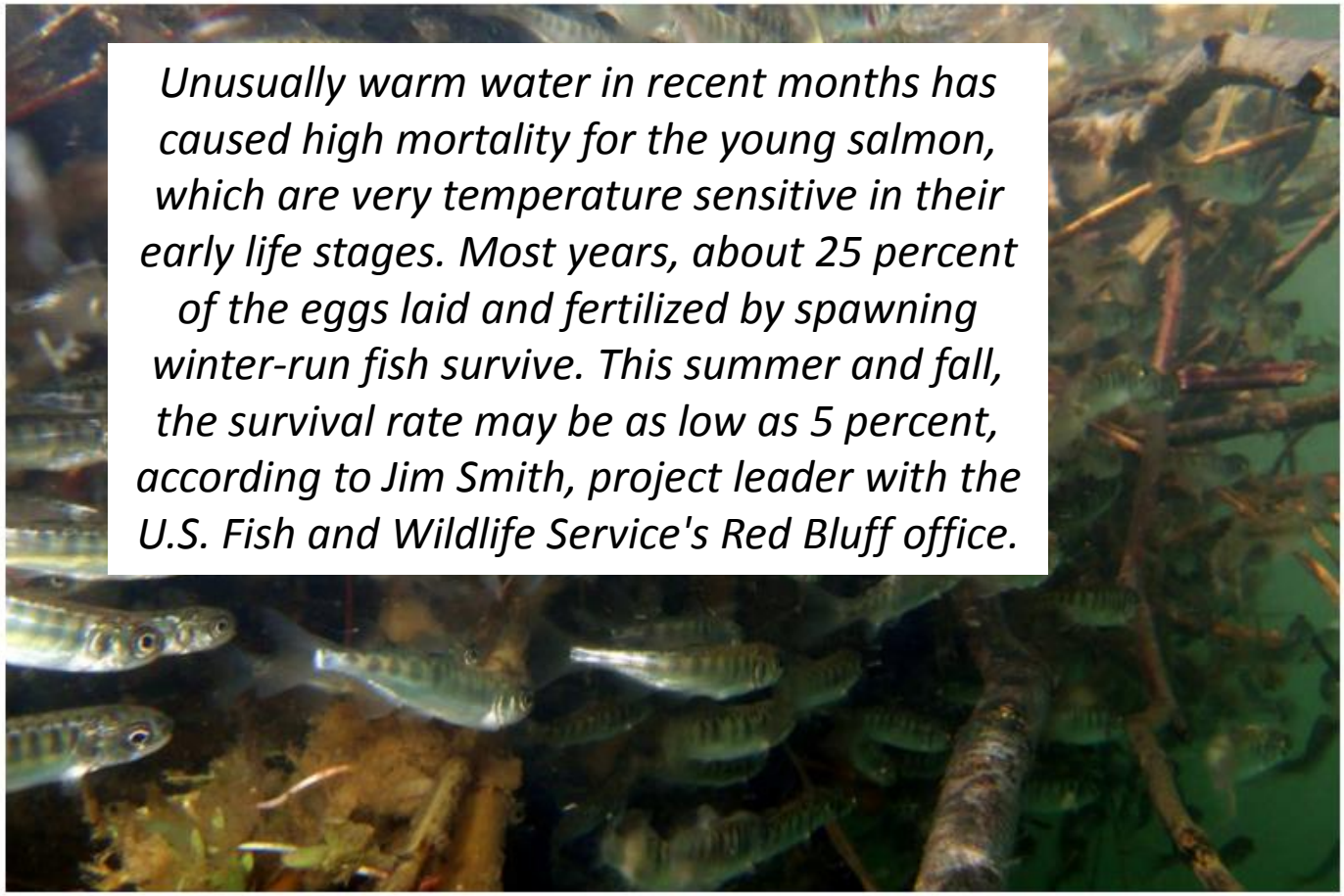
Temperature trends



Big Trouble Looms For California Salmon — And For Fishermen

NOVEMBER 06, 2015 1:28 PM ET

ALASTAIR BLAND

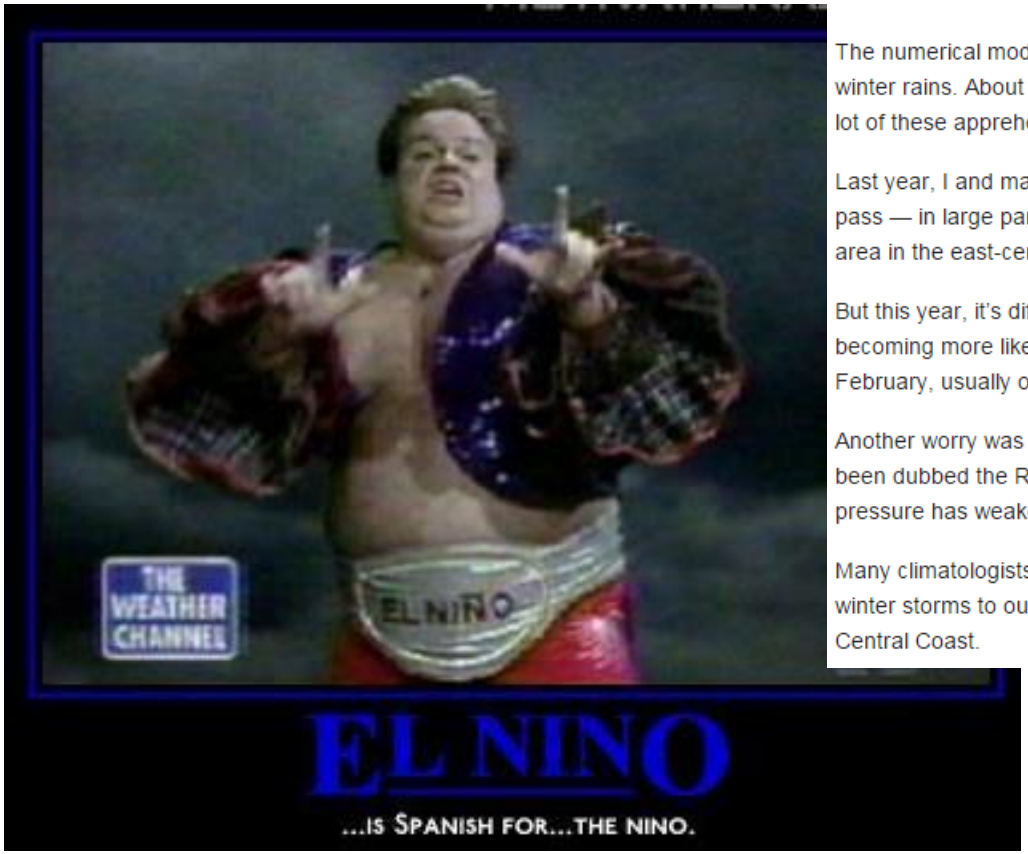


Unusually warm water in recent months has caused high mortality for the young salmon, which are very temperature sensitive in their early life stages. Most years, about 25 percent of the eggs laid and fertilized by spawning winter-run fish survive. This summer and fall, the survival rate may be as low as 5 percent, according to Jim Smith, project leader with the U.S. Fish and Wildlife Service's Red Bluff office.

Juvenile Chinook salmon swim in the American River in California. The state's salmon fishery, which revolves around fall-run Chinook, has been estimated to be worth $1.4 billion, with the fish finding their way into markets and restaurants.

Courtesy of John Hannon/USBR

Climate & us



El Nino shaping up nicely

12 hours ago (0) Comments

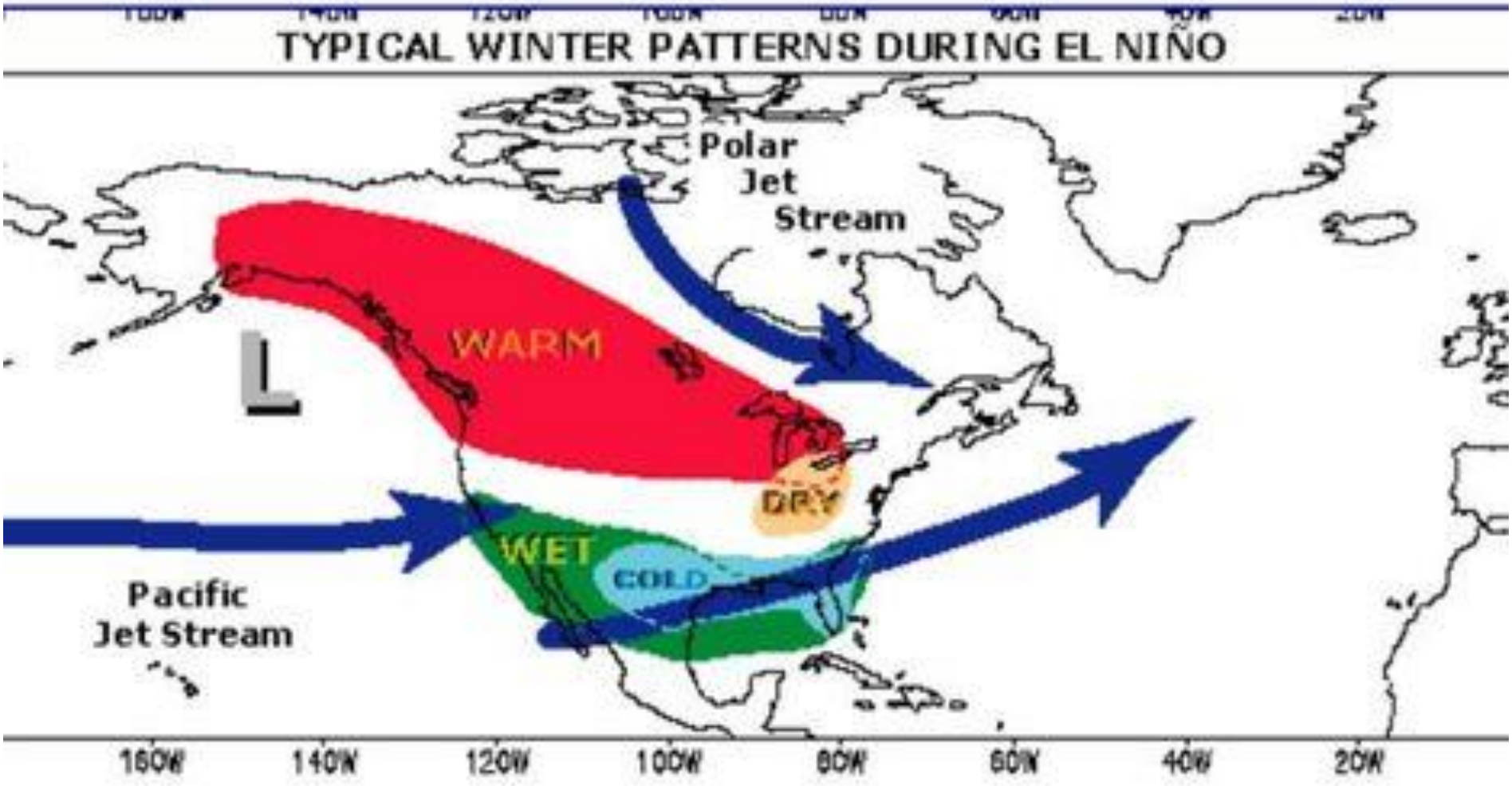
The numerical models continue to point to a strong El Nino event bringing the promise of heavy winter rains. About two month ago, I had some concerns that it may not bring abundant rainfall; a lot of these apprehensions have gone away, and here's why.

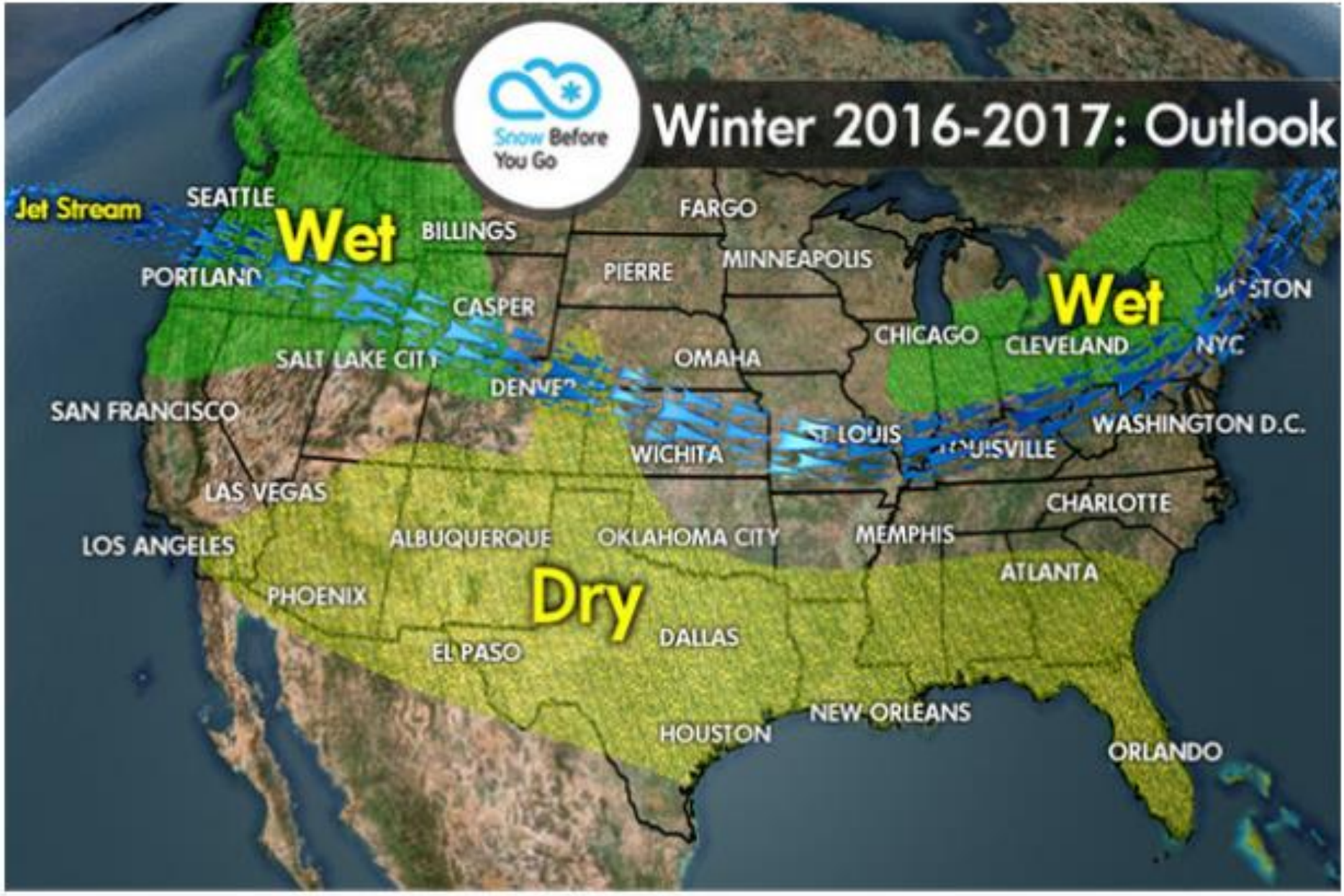
Last year, I and many others predicted abundant rainfall. Obviously, my prediction didn't come to pass — in large part because of decreasing seawater temperatures in the Nino 3.4 region (an area in the east-central equatorial Pacific) during the vital months of winter.

But this year, it's different — with each month's oceanographic observations and predictions, it is becoming more likely that seawater temperatures will peak during December, January and February, usually our wettest months.

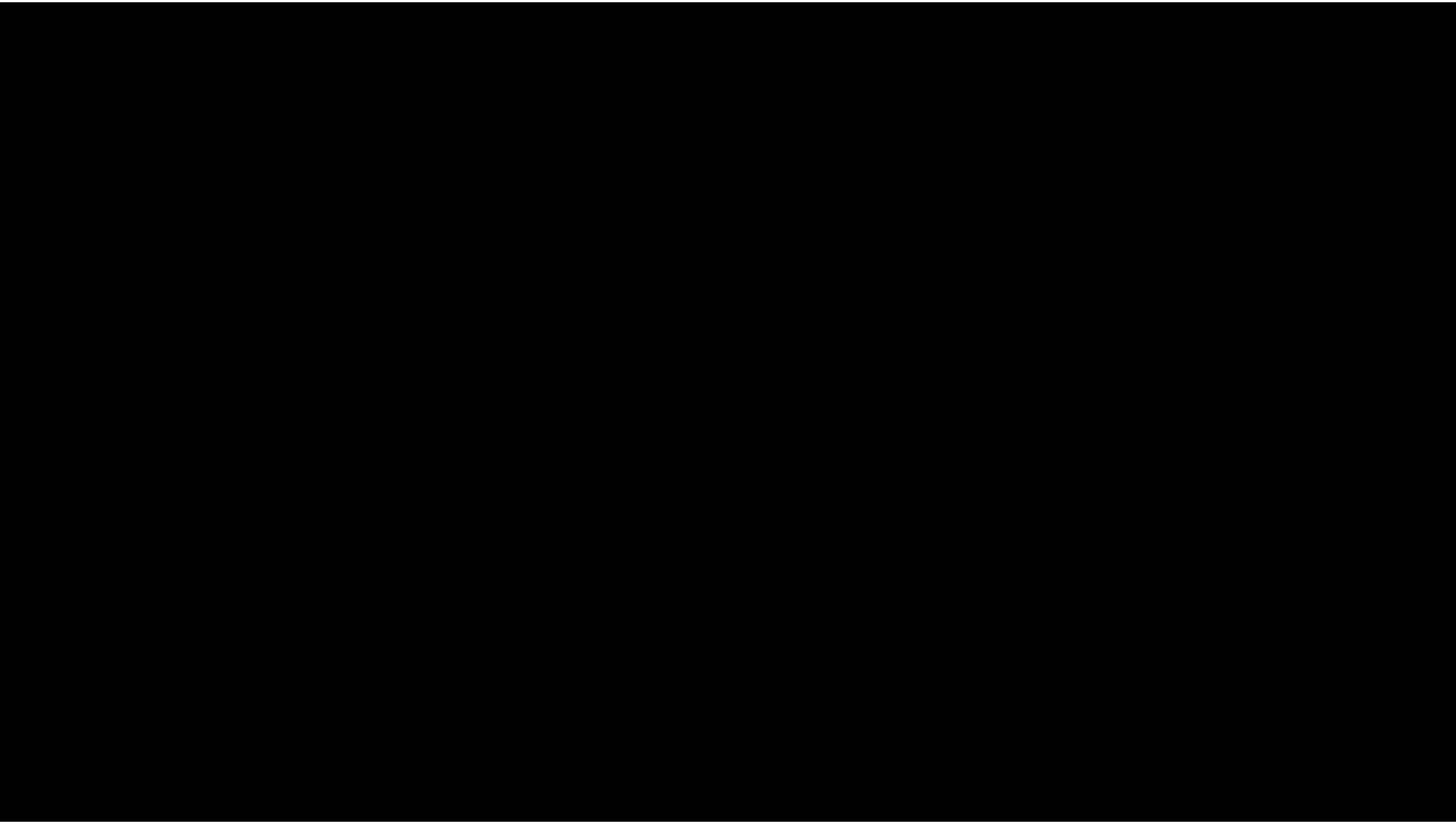
Another worry was the "blob" of abnormally warm seawater off the Pacific Northwest and what has been dubbed the Ridiculously Resilient Ridge of high pressure there. But that area of high pressure has weakened considerably. Consequently, the blob is just about gone.

Many climatologists thought the southern branch of the polar jet stream that traditionally brings winter storms to our area would be driven north by the blob, keeping storms to the north of the Central Coast.

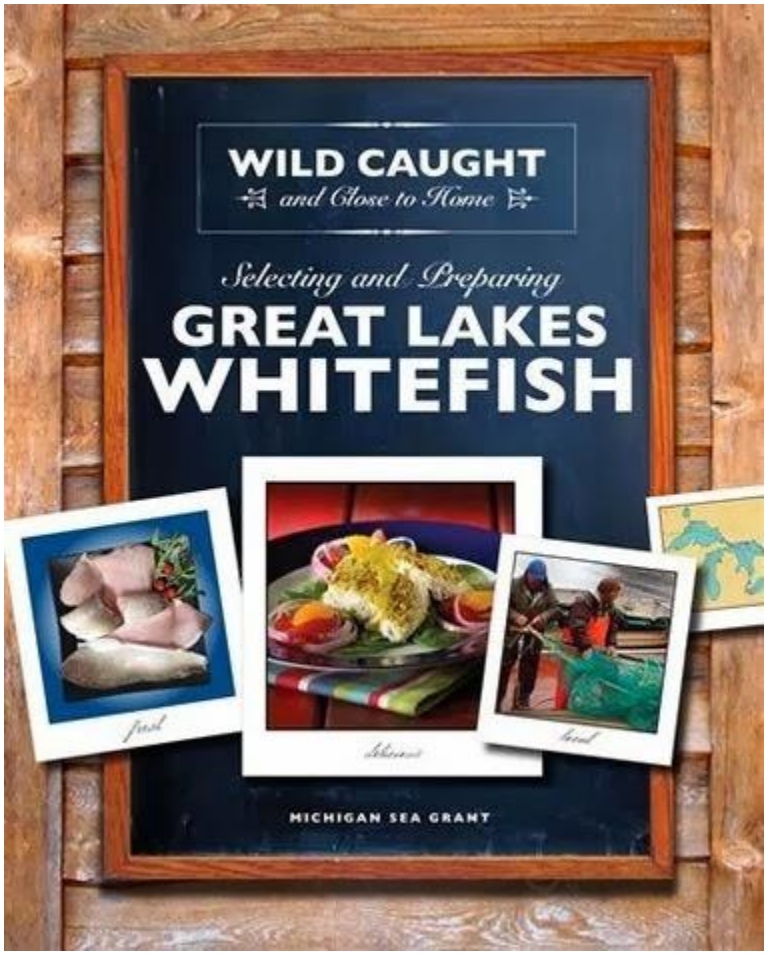

TYPICAL WINTER PATTERNS DURING EL NIÑO
Polar
Jet
Stream
WARM
L
DRY
WET
COLD
Pacific
Jet Stream
160W
140W
120W
100W
80W
60W
40W
20W


Snow Before You Go
Winter 2016-2017: Outlook
Jet Stream
SEATTLE
Wet
BILLINGS
FARGO
PORTLAND
PIERRE
MINNEAPOLIS
CASPER
Wet
CHICAGO
CLEVELAND
NYC
SALT LAKE CITY
OMAHA
SAN FRANCISCO
WASHINGTON D.C.
ST LOUIS
WICHITA
LOUISVILLE
LAS VEGAS
CHARLOTTE
LOS ANGELES
ALBUQUERQUE
OKLAHOMA CITY
MEMPHIS
ATLANTA
PHOENIX
Dry
DALLAS
EL PASO
NEW ORLEANS
HOUSTON
ORLANDO

PNW - Wet



Example-Lake Whitefish



Lake Whitefish

- Spawn in fall
- Hatch in spring

“Research has observed positive relationship between recruitment and spring temperatures and ice cover and a negative relationship between recruitment and fall temperatures and fall wind speed.”

The other foot

“However, warmer fall temperatures, more wind, and less ice cover may inhibit egg survival and, consequently, Lake Whitefish production.”

Climate drives recruitment?

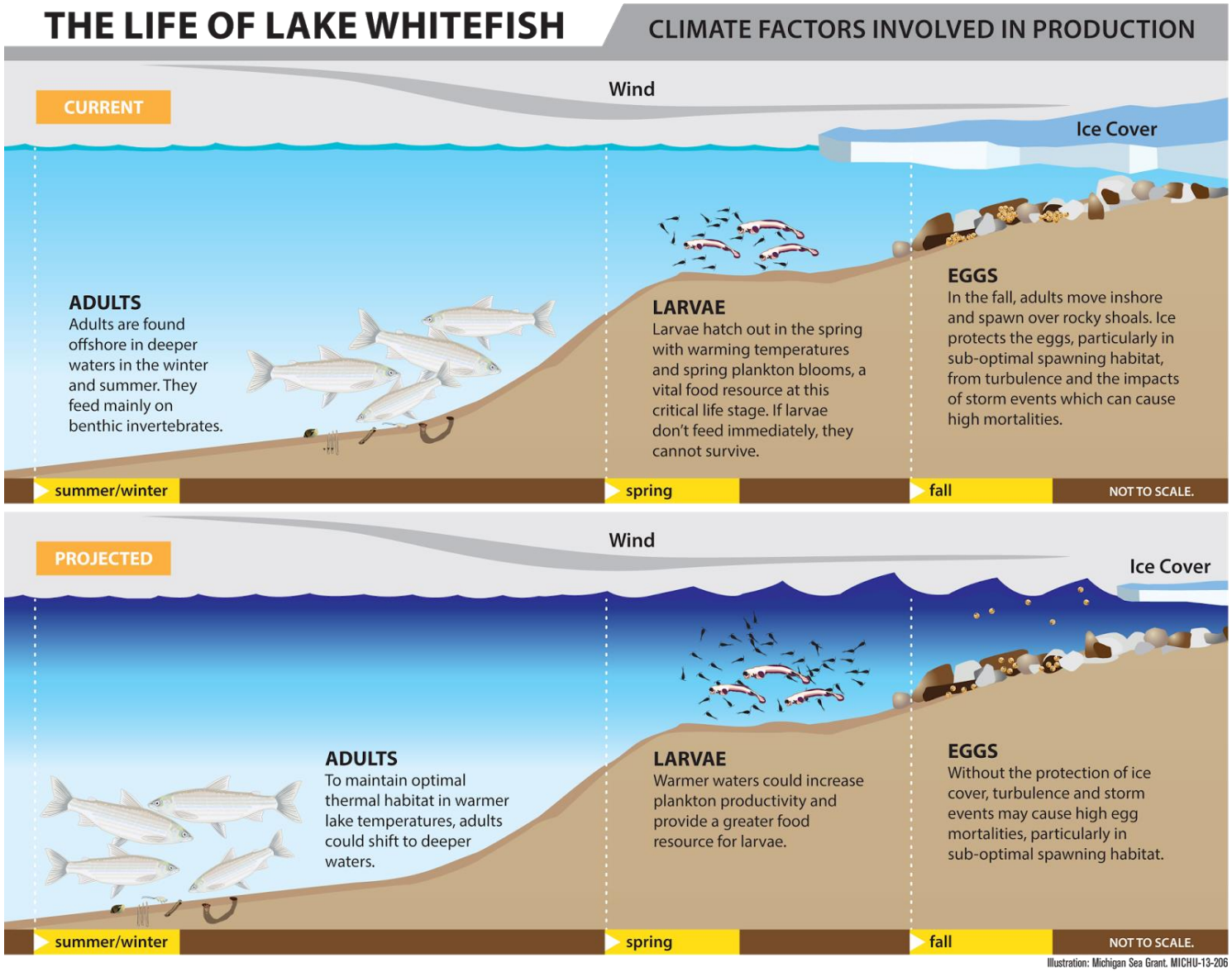
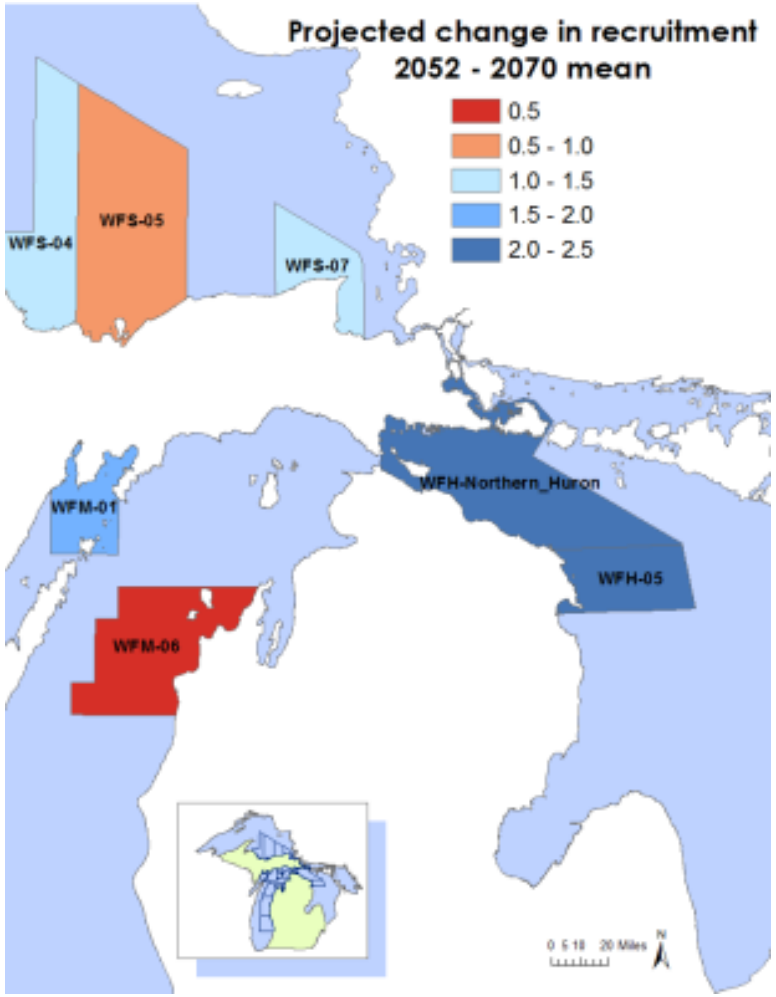


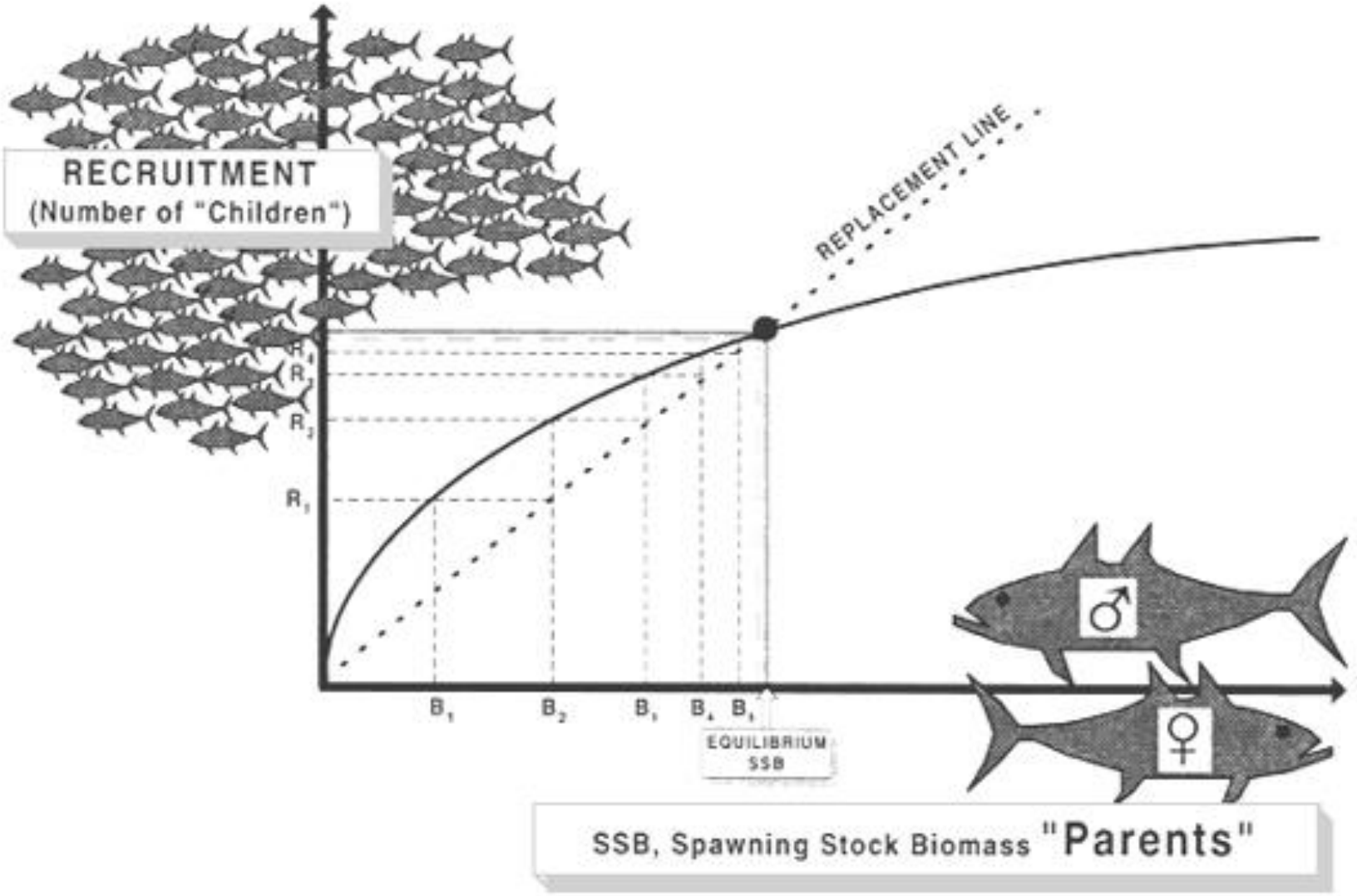
Illustration: Michigan Sea Grant. MICHU-13-206

Results

"Potential for increased Lake Whitefish recruitment in the Great Lakes with climate change and some shift in the distribution of the fishery."



Spawners drive recruitment?



Disentangle climate and fishing?

- Tough to determine
- *“Temperature increased by 2 degrees and survival will decrease 5%”*
- Long time scales…

Pacific decadal oscillation