

53rd JOINT ANNUAL MEETING
Arizona and New Mexico Chapters of
The Wildlife Society
&
Arizona/New Mexico Chapter of
The American Fisheries Society

January 30 – February 1, 2020
Prescott Resort and Conference Center
Prescott, Arizona



2020 Committee Chairpersons & Meeting Organizers

Arizona/New Mexico Chapter of the American Fisheries Society

President: David Stewart

President-Elect: Alton Livingston

Past-President: Kent Mosher

Treasurer: Brett Montgomery

Secretary: Tyler Wallin

Arrangements Coordinator: David Stewart

Program Coordinator: David Stewart, Kent Mosher, and Brett Montgomery

Program Layout and Printing: Kent Mosher and Brett Montgomery

Registration: Brett Montgomery

Workshops: David Stewart and James Dominguez

Plenary: David Stewart

Wildlife Presentations: Andrew Jones

Fisheries Presentations: Ryan Follmuth

Student Presentations: Pilar Wolters and Andrew Jones

AFS Student Posters: Pilar Wolters

TWS Student Poster: Tiffany Sprague and Andrew Jones

Student-Mentor Lunch: Kent Mosher

Photo Contest: Alton Livingston

Raffle: Tyler Wallin and David Stewart

Vendors: David Stewart

Quiz Bowl: Brett Montgomery, Audrey Owens, Tiffany Sprague, Scott Sprague,

Maddy Marsh, Kent Mosher, Ivana Mali

Spawning Run: Pilar Wolters

Schedule at a Glance

Thursday – January 30, 2020

Verde A

8:00 a.m. – 12:00 p.m.	Bird and Land Animals: Turning Sound into Discovery Using Wildlife Audio Recorders as a Valuable Research Tool
1:00 p.m. – 5:00 p.m.	Bat: Turning Sound into Discovery Using Wildlife Audio Recorders as a Valuable Research Tool

Cottonwood

8:00 a.m. – 12:00 p.m.	Distance Sampling for Abundance Estimation Workshop
1:00 p.m. – 5:00 p.m.	Automatic Identification of Animals in Camera Trap Images Using Machine Learning

Verde B

8:00 a.m. – 4:00 p.m.	Student Resume/Interview Workshop
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Clarkdale

8:30 a.m. – 4:00 p.m.	Piscicide Applications Workshop
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12:00 p.m. – 6:00 p.m.	Registration	<i>Prescott/Chino</i>
3:00 p.m. – 6:30 p.m.	Presentation Loading	<i>Jerome</i>
1:00 p.m. – 3:00 p.m.	Bat Working Group Meeting	<i>Sedona</i>
3:00 p.m. – 6:00 p.m.	Poster/Photo Set-up	<i>Granite Mountain</i>
4:00 p.m. – 6:00 p.m.	Vendors Set-up	<i>Foyer</i>
4:30 p.m. – 6:00 p.m.	AZ TWS Business Meeting	<i>Copper Basin</i>
4:30 p.m. – 6:00 p.m.	NM TWS Business Meeting	<i>Clarkdale</i>
4:30 p.m. – 6:00 p.m.	AZ/NM AFS Business Meeting	<i>Sedona</i>
6:30 p.m. – 9:00 p.m.	Welcome Social and Appetizers	<i>Granite Mountain</i>
7:00 p.m. – 9:00 p.m.	Student Quiz Bowl	<i>Cottonwood/Sedona</i>

Schedule at a Glance

Friday – January 31, 2020

7:00 a.m. – 2:00 p.m.	Registration	<i>Prescott/Chino</i>
7:00 a.m. – 5:30 p.m.	Presentation Loading	<i>Jerome</i>
10:00 a.m.	Deadline to Submit for Photo Contest	<i>Granite Mountain</i>
8:00 a.m. – 5:00 p.m.	Vendors	<i>Foyer</i>
8:00 a.m. – 11:35 a.m.	Plenary Session	<i>Goldwater</i>
10:00 a.m. – 10:15 a.m.	Coffee Break	<i>Foyer</i>
11:35 a.m. – 1:00 p.m.	Lunch	
11:35 a.m. – 1:00 p.m.	Student Mentor Social	<i>Granite Mountain</i>
12:00 p.m. – 5:00 p.m.	Photo Contest Voting Open	<i>Granite Mountain</i>
1:00 p.m. – 3:00 p.m.	Concurrent Technical Sessions	Clarkdale Cottonwood Sedona Verde A&B
3:00 p.m. – 3:20 p.m.	Afternoon Break	<i>Foyer</i>
3:20 p.m. – 5:20 p.m.	Concurrent Technical Sessions	Clarkdale Cottonwood Sedona Verde A&B
4:30 p.m. – 6:30 p.m.	Poster Session	<i>Granite Mountain</i>
6:30 p.m.	Cash Bar & Banquet Doors Open	<i>Goldwater</i>
7:00 p.m. – 9:30 p.m.	Banquet and Awards Ceremony	<i>Goldwater</i>

Schedule at a Glance

Saturday – February 1, 2020

7:00 a.m. – 9:00 a.m.	Spawning Run 5K	<i>Peavine Trailhead</i>
7:00 a.m. – 10:00 p.m.	Presentation Loading	<i>Jerome</i>
8:00 a.m. – 11:00 a.m.	Poster/Photo Contest Take Down	<i>Granite Mountain</i>
8:00 a.m. – 12:00 p.m.	Concurrent Technical Sessions	Clarkdale Cottonwood Sedona Verde A&B
12:00 p.m. – 1:00 p.m.	AFS/TWS Officers Meeting	<i>Eagle Crest</i>

Plenary Schedule

Friday, January 31, 2020 | 8am – 11:15am

Located in the Goldwater (Clarkdale, Cottonwood, Sedona, Verde) Meeting Room

- | | |
|---------------------------|---|
| 8:00 – 8:15 a.m. | Welcome and Opening Remarks
David Stewart
<i>President, AZ/NM Chapter of the American Fisheries Society</i> |
| 8:15 – 9:15 a.m. | Community Based Conservation: Creating a Shared Vision for Valle de Oro National Wildlife Refuge
Ariel Elliott and Jennifer Owen-White
<i>Valle de Oro National Wildlife Refuge, Albuquerque, NM</i> |
| 9:15 – 9:45 a.m. | Native Fish in the Classroom
Angela Palacios
<i>New Mexico Fish and Wildlife Conservation Office, Albuquerque, NM</i> |
| 9:45 – 10:00 a.m. | Breaking Down the Walls of the Ivory Tower: Engaging New Audiences with Stories of Science
Samantha Dwinnell
<i>Haub School of Environment and Natural Resources, University of Wyoming</i> |
| 10:00 – 10:15 a.m. | Break |
| 10:15 – 11:15 a.m. | Screening of <i>Deer 139</i> |
| 11:15 – 11:35 a.m. | Question and Answer Session |
| 11:35 – 1:00 p.m. | Lunch |

Fri Jan 31	Wildlife Session 1 Reptiles, Amphibians, and Urbanization Impacts	Wildlife Session 2 Student Session/Wildlife Health	Fisheries Session 1 Student Session	Fisheries Session 2
Moderator	Leland Pierce	Melissa Merrick	Kent Mosher	Ty Hardymon
Room	Cottonwood	Clarkdale	Verde A & B	Sedona
1:00	Effects of urbanization on an assemblage of Sonoran Desert snakes. Bosak**	Habitat selection by the Organ Mountains Colorado chipmunk. Schweiger†	Fish Abundance and Population Structure Pre- and Post- High Magnitude Flooding Event in an Arizona River. Jenney**	Environmental DNA and 16S rRNA metabarcoding detects fish and wildlife in the Verde River, Arizona Valente
1:20	The distribution of Jemez Mountains salamanders in relation to geology, topography, and other biogeographical factors. Giermakowski	Micro-habitat selection by the Peñasco least chipmunk McKibben†	Effects of estradiol-17 β on the survival, growth, and sex reversal of Red Shiner. Teal**	Environmental DNA sampling of desert fishes: performance relative to location, species, and traditional sampling Robinson
1:40	Conservation and management of flat-tailed horned lizards (<i>Phrynosoma mcallii</i>) in Arizona. Grimsley	Assessing geographic variation in song structure and plumage coloration in the willow flycatcher (<i>Empidonax traillii</i>) species complex. Mahoney†	Using native fish in Arizona high schools to teach Earth's carrying capacity and limiting factors. Freed**	Using Environmental DNA to Plan, Implement, and Evaluate Piscicide Treatments in Whitewater Creek Paggen
2:00	Effects of urbanization on three Sonoran Desert rattlesnake species. Huerta**	Mapping the spread and effect of chytrid in efforts to protect endangered species of amphibians across New Mexico. Nelson**	Microplastic Pollution in the Effluent-dependent Santa Cruz River. Hamdhani**	Status of an Iconic Gila Trout Population Five Years after the Whitewater Baldy Wildfire Wallin

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JAM meeting Hamdhani

by Hamdhani Hamdhani

Submission date: 04-Nov-2021 11:30AM (UTC+0700)

Submission ID: 1692668386

File name: Presentation_Jam_2020_opt.pdf (2.62M)

Word count: 850

Character count: 4391

Microplastic Pollution in the Effluent-Dependent Santa Cruz River

Hamdhani, Drew Eppehiner, Kelsey Hollien, David Quanrud, Michael Bogan
School of Natural Resources and the Environment
University of Arizona



JAM 2020
Prescott, AZ

Acknowledgements

Charles Landa and Emma Froehlich's lab and field work

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WaterReuse Arizona



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The deepest ever ocean dive found plastic waste at the bottom of Mariana Trench

The deepest ever ocean dive discovered litter at the bottom of Mariana Trench, raising questions about the extent of plastic pollution.



The deepest ever ocean dive found plastic waste at

NATIONAL GEOGRAPHIC

ENVIRONMENT | PLANET OR PLASTIC?

Tiny pieces of plastic found in Arctic snow

The discovery suggests that microplastics are being carried around the planet in atmospheric winds, and that we're breathing them in.

BY CHERYL KATZ

4 MINUTE READ

f t e l

PUBLISHED AUGUST 12, 2019

Microplastics, those pervasive relics of modern times, have invaded seemingly every part of the planet today, including [rain over the Rocky Mountains](#) and the most remote reaches of the Arctic. Scientists have been puzzling over how this flood of pollution makes its way to such distant locations far from the urban centers where it's generated. A new study finds a [surprising route for the tiny particles](#)—they're ferried aloft to fall in the Arctic as snow.



The deepest ever ocean dive found plastic waste at

NATIONAL GEOGRAPHIC

ENVIRONMENT | PLANET OR PLASTIC?

New study finds microplastics in 12 types of American beer

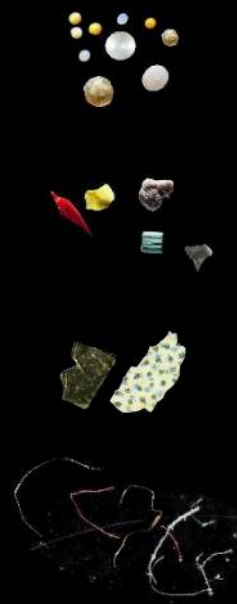
A study in the US has been eye-opening



BY KATIE AVIS-RIORDAN MAY 5, 2018



What are microplastics?



What are microplastics?

< 5mm in diameter

Primary

- designed/created to be micro
- ex: 1) beads

Secondary

- broken down from larger pieces
- ex: 2) fragments, 3) film, and 4) fibers

(Horton et al 2017)

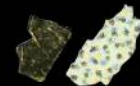
1)



2)



3)



4)



How do they get into the environment?



How do they get into the environment?

Point Source

Wastewater Treatment Plants

- Discharge into waterways

Nonpoint Source

Improper disposal of plastic, littering

- Transported by wind and runoff



(Horton et al 2017; Ziajahromi et al 2016)

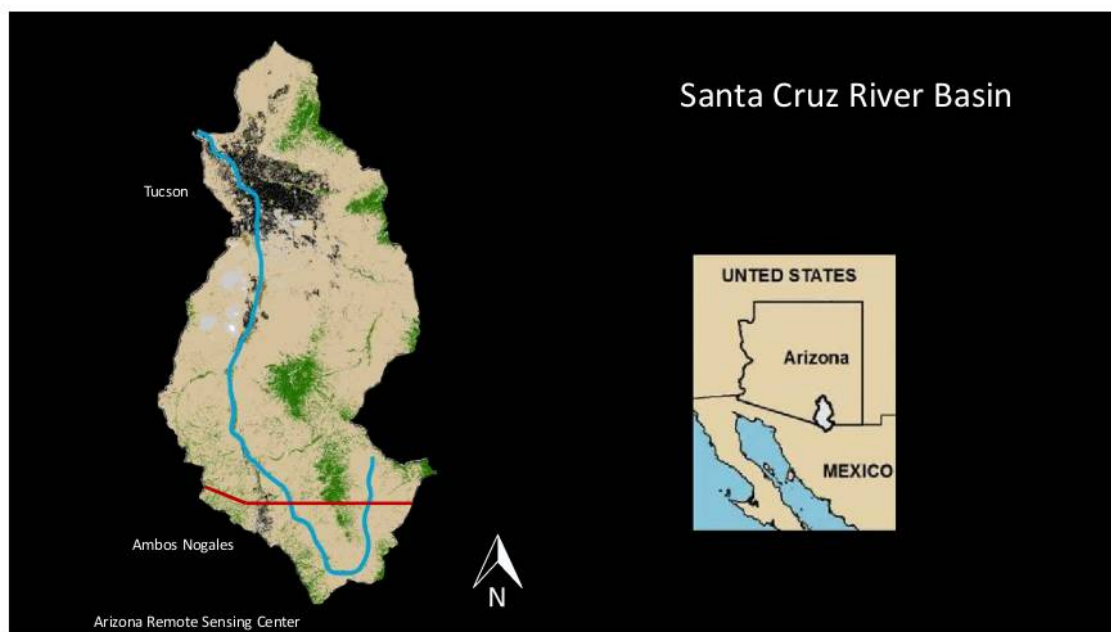
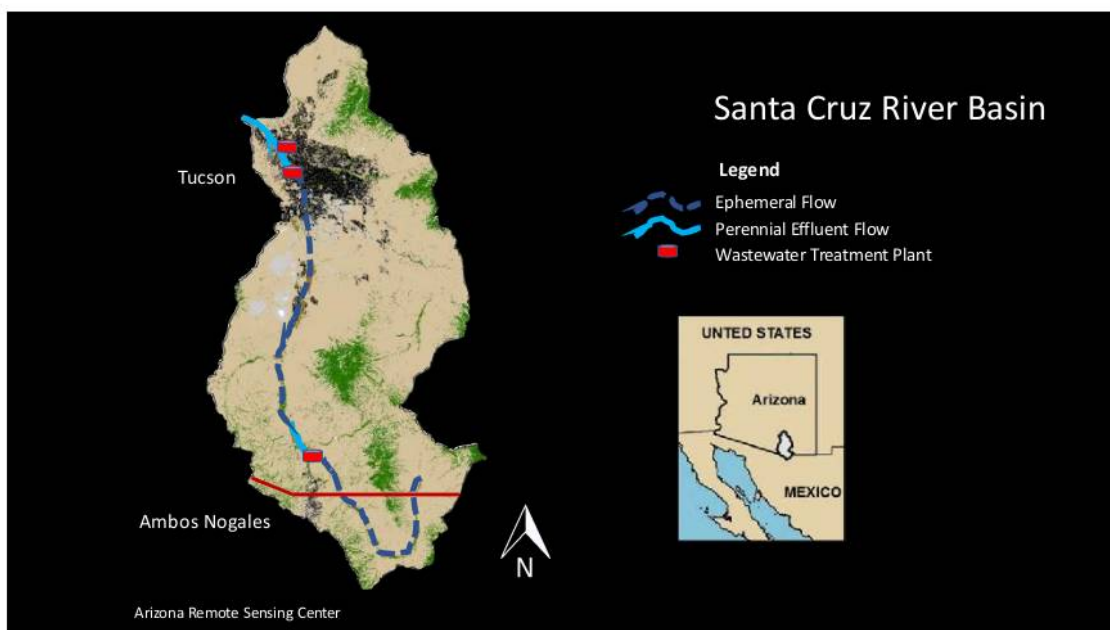


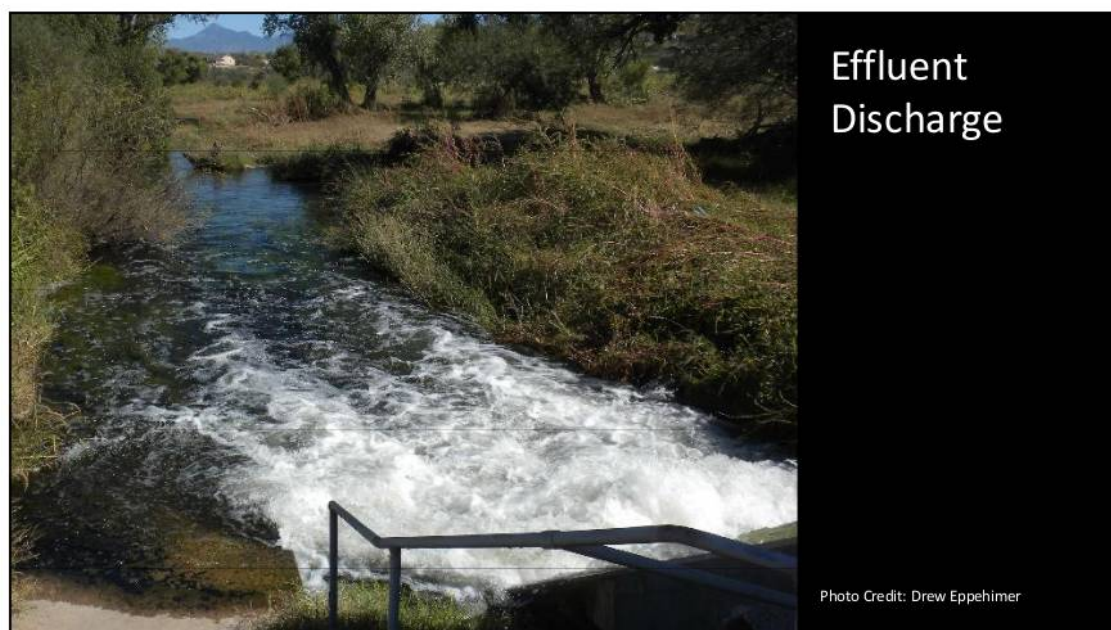
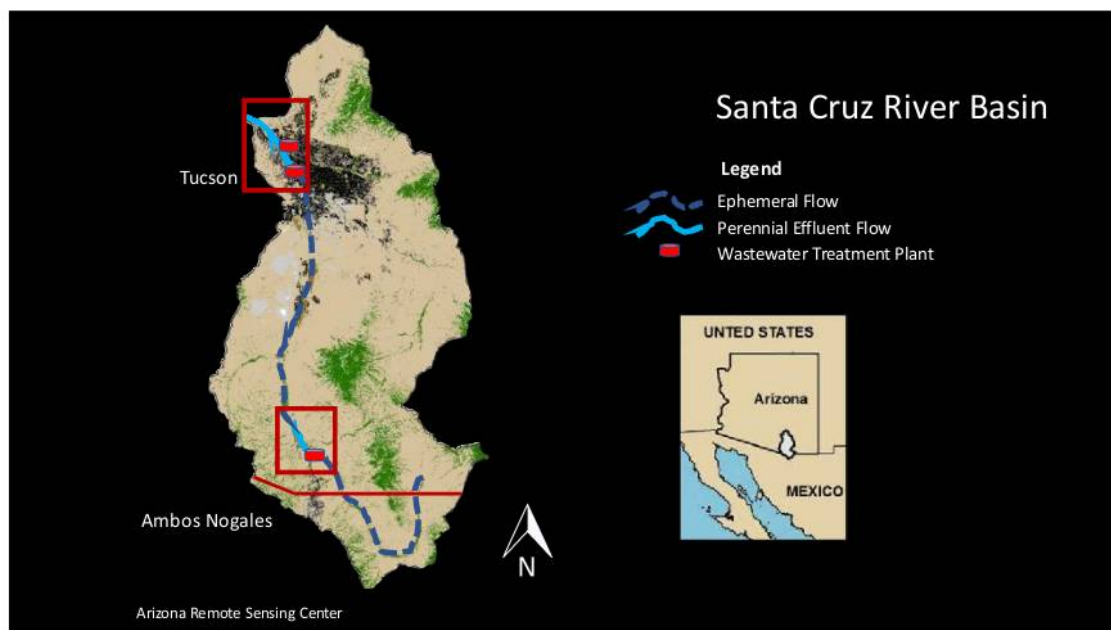


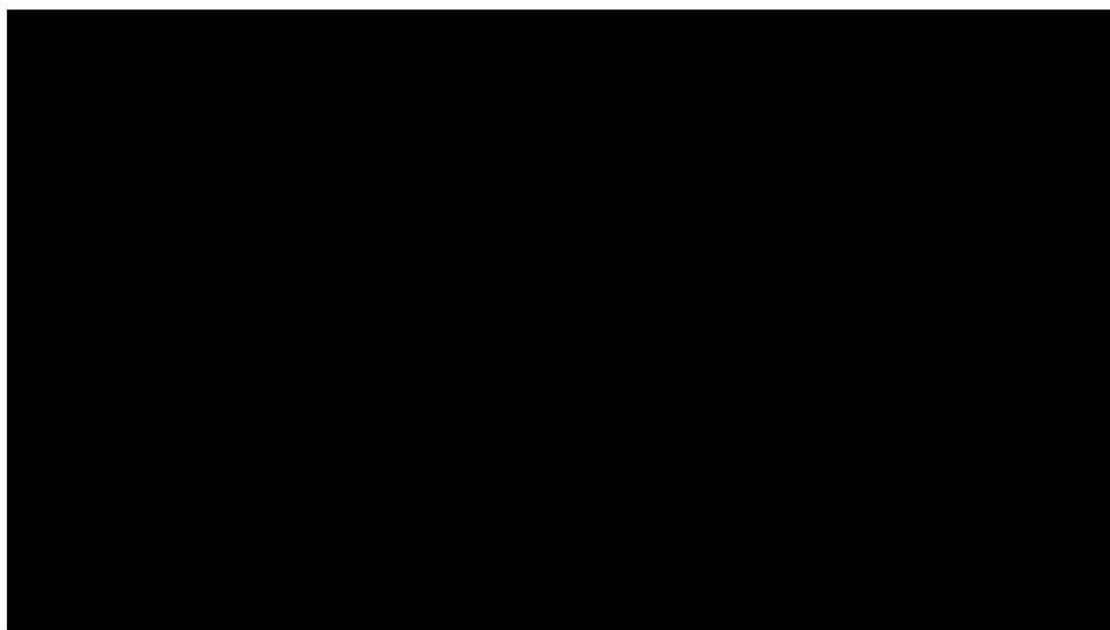
Photo Credit: Hamdhani



Photo Credit: Hamdhani







What is the extent of microplastic pollution in the effluent-dependent Santa Cruz River?

Are microplastics being consumed by aquatic biota?

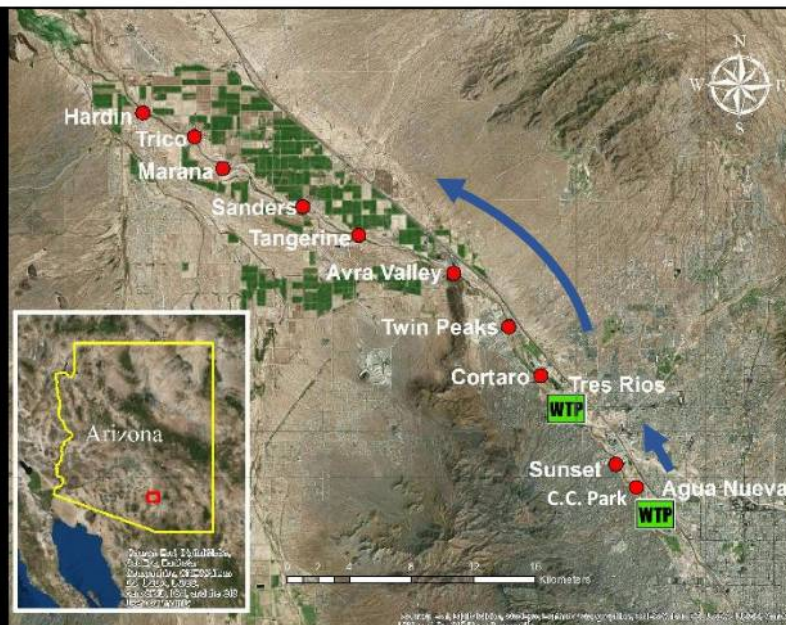
Sampling

Lower SCR

10 sites
~4km apart
2 WRFs

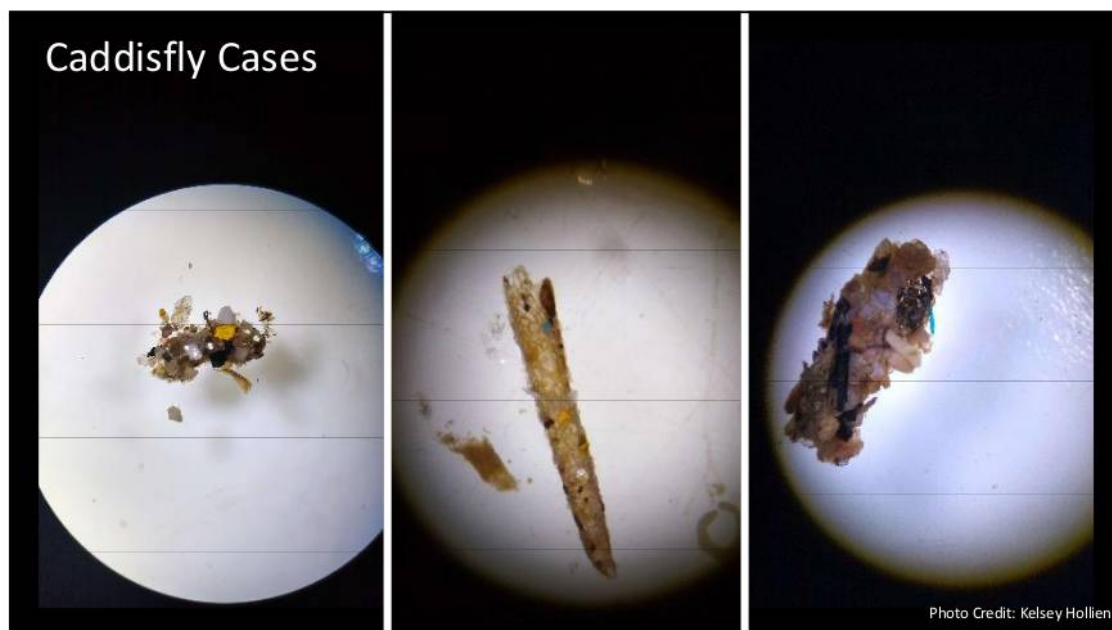
Pre-monsoon,
Monsoon 2018

Water grabs
Sediment cores
Mosquitofish



Results





So how much plastic?



So how much plastic?

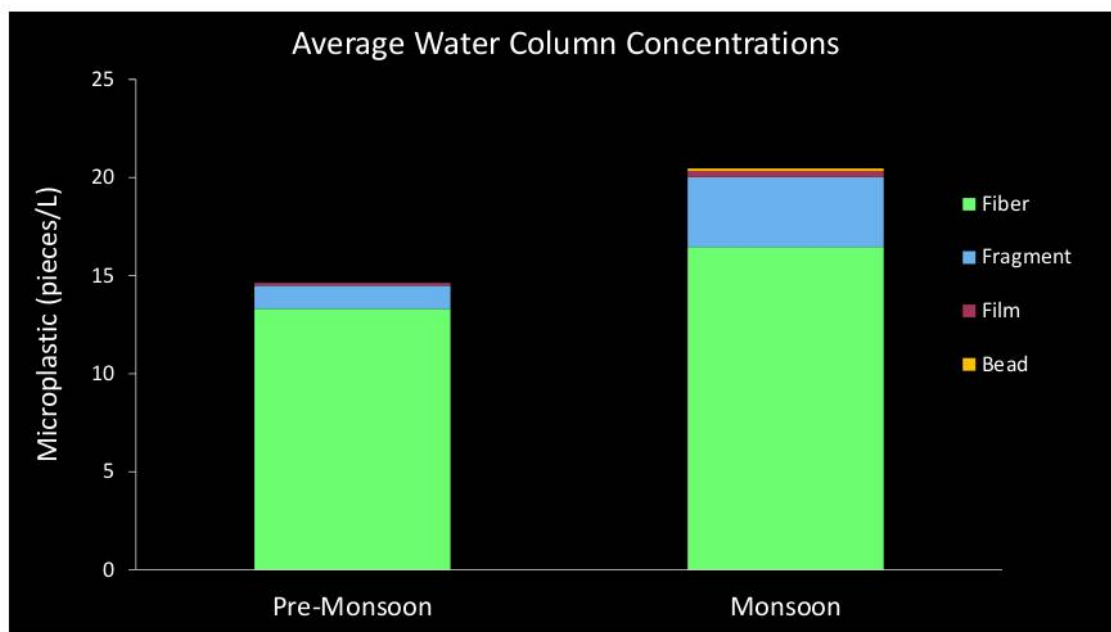
22.9 microplastic pieces / liter
(Effluent baseflow only)

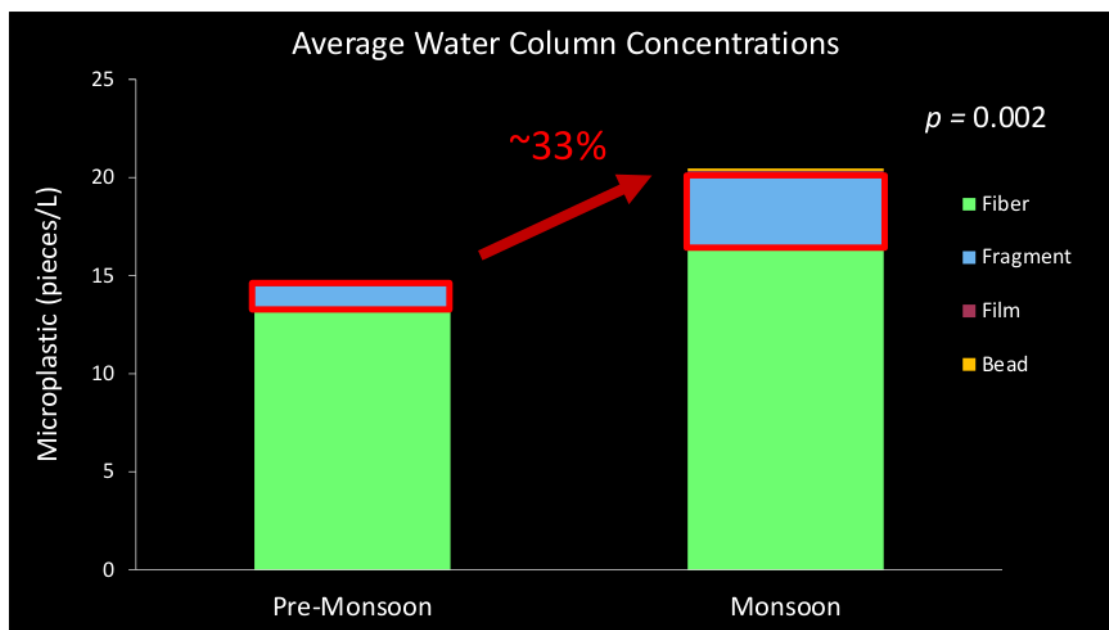
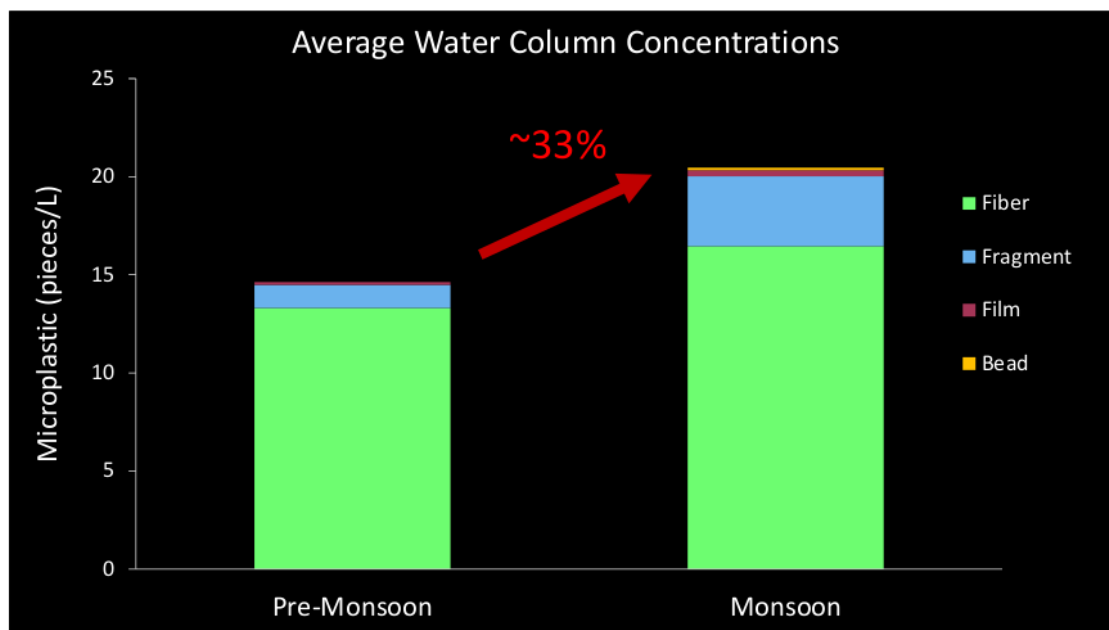


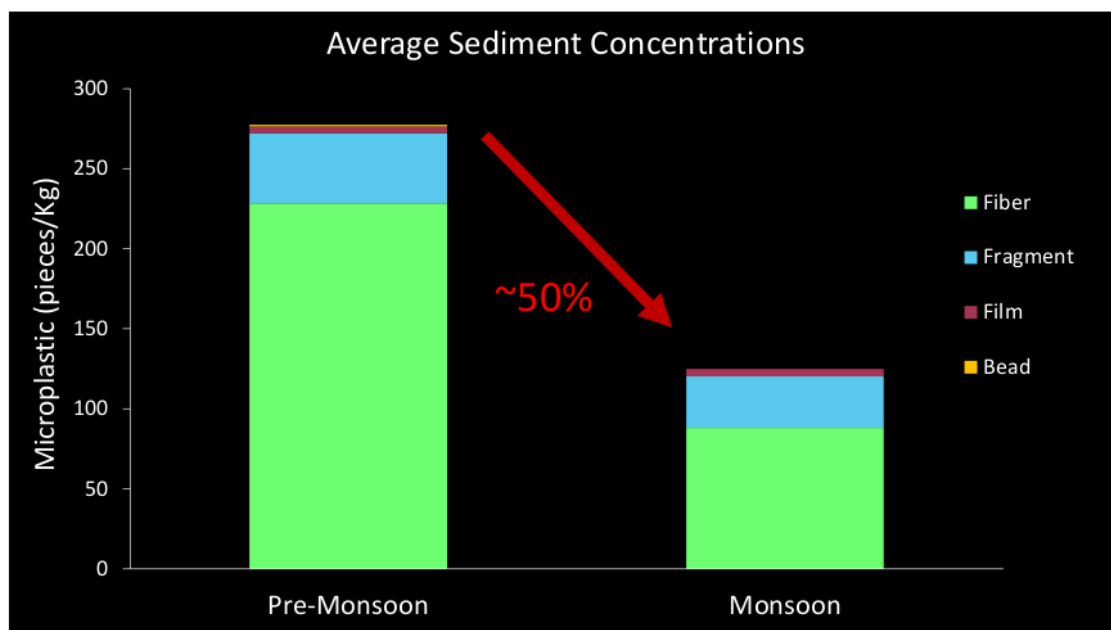
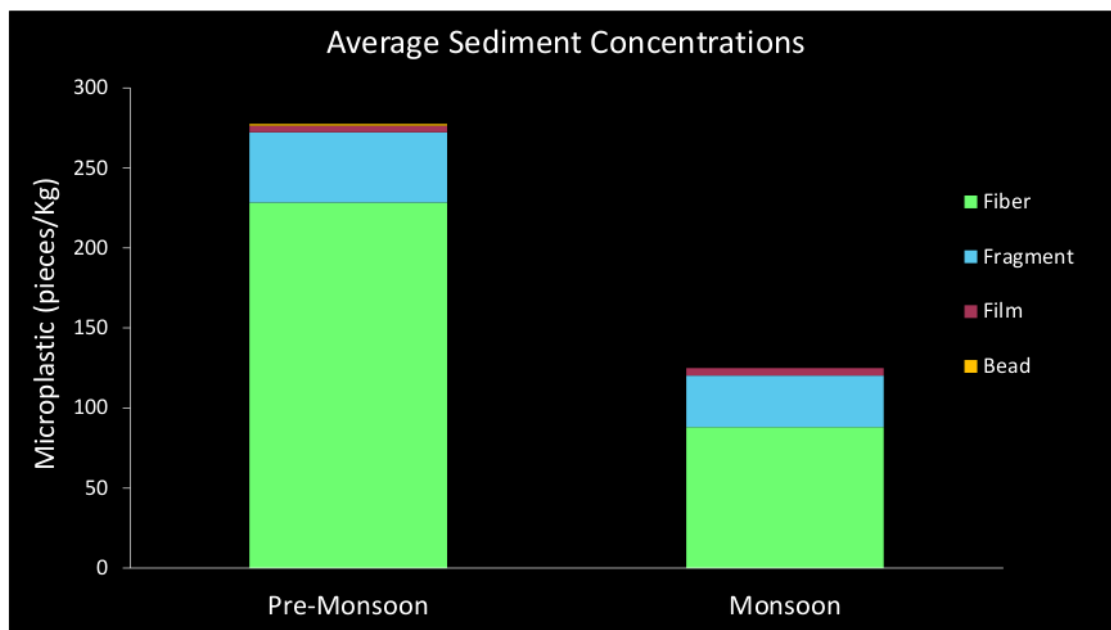
So how much plastic?

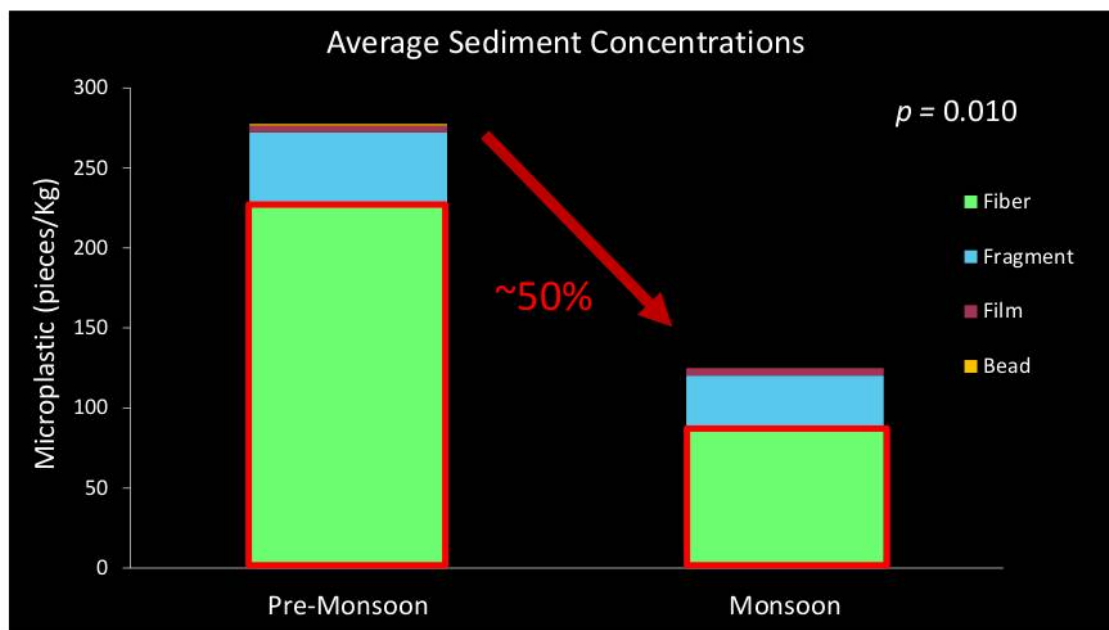
22.9 microplastic pieces / liter
(Effluent baseflow only)

29,640 microplastic pieces / second







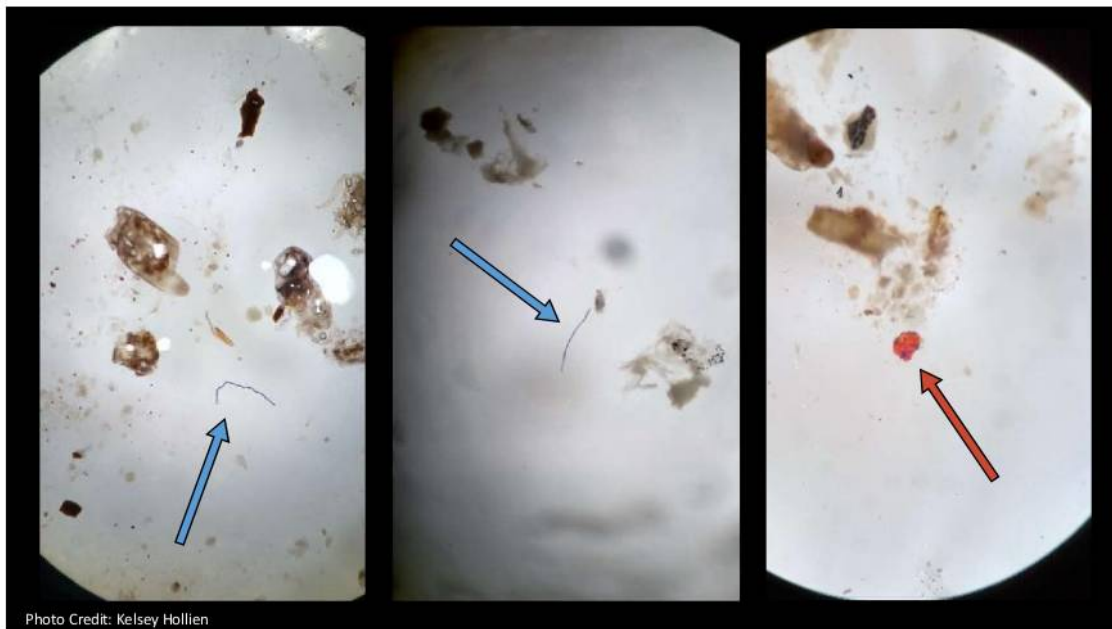
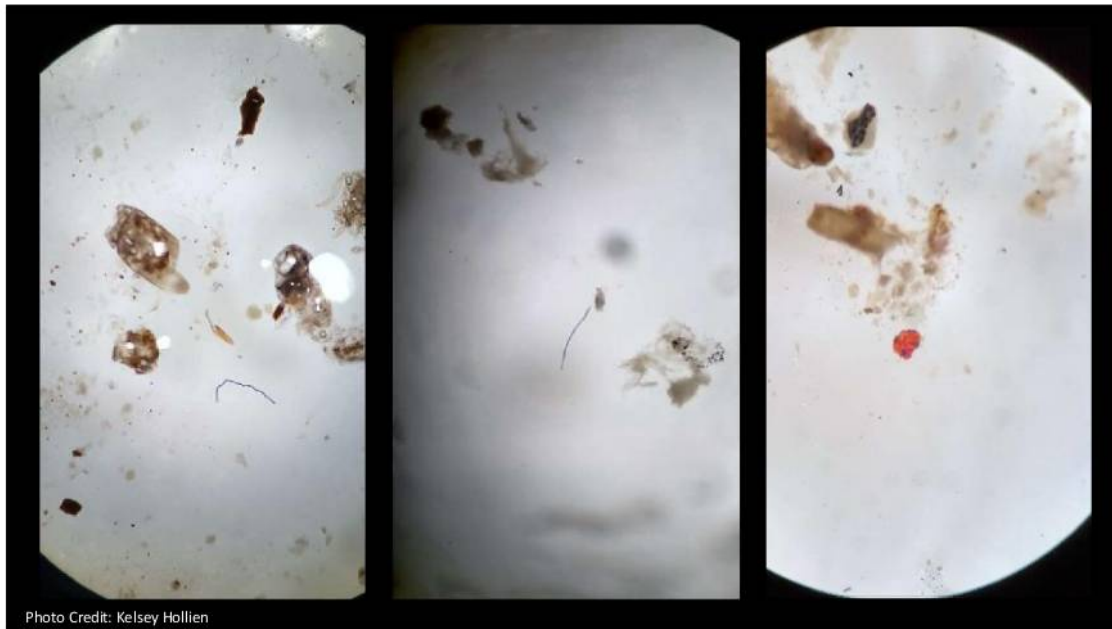


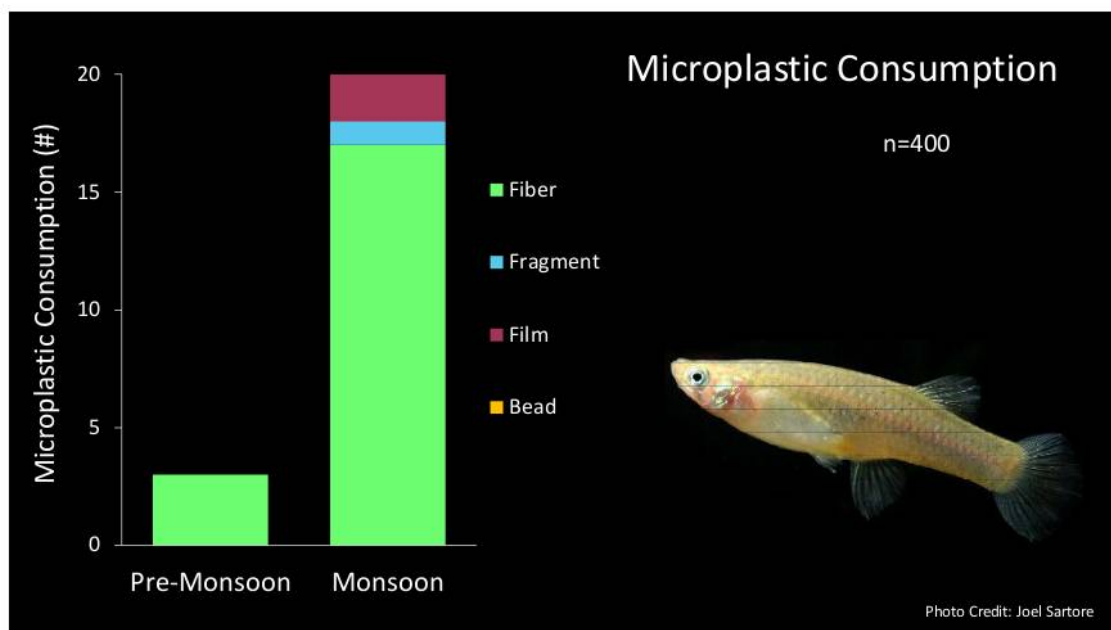
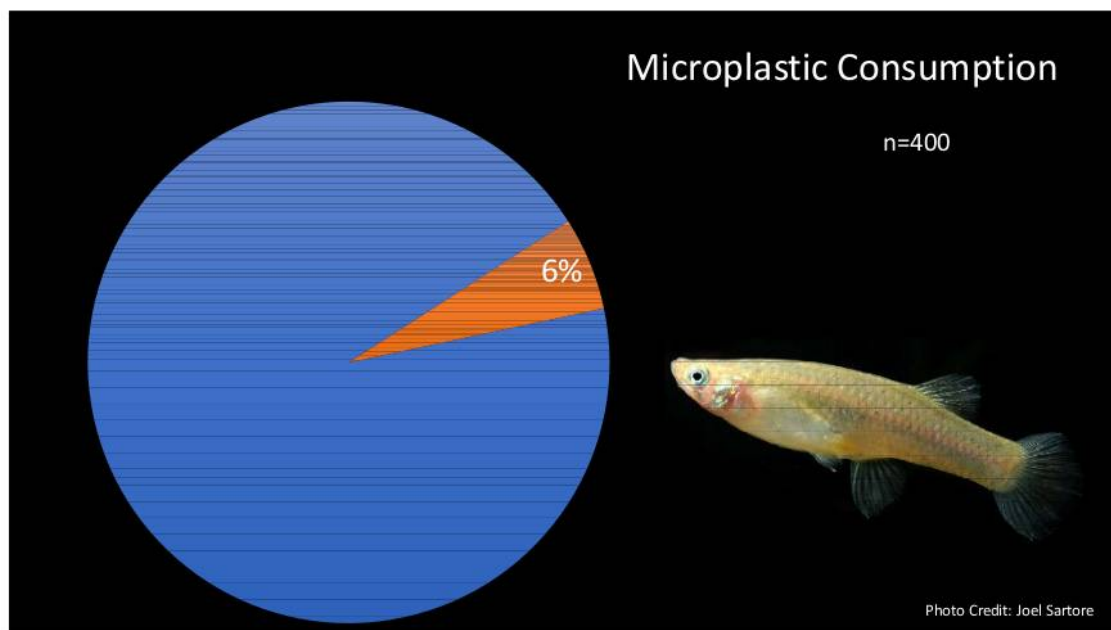
Are microplastics being consumed by aquatic biota?

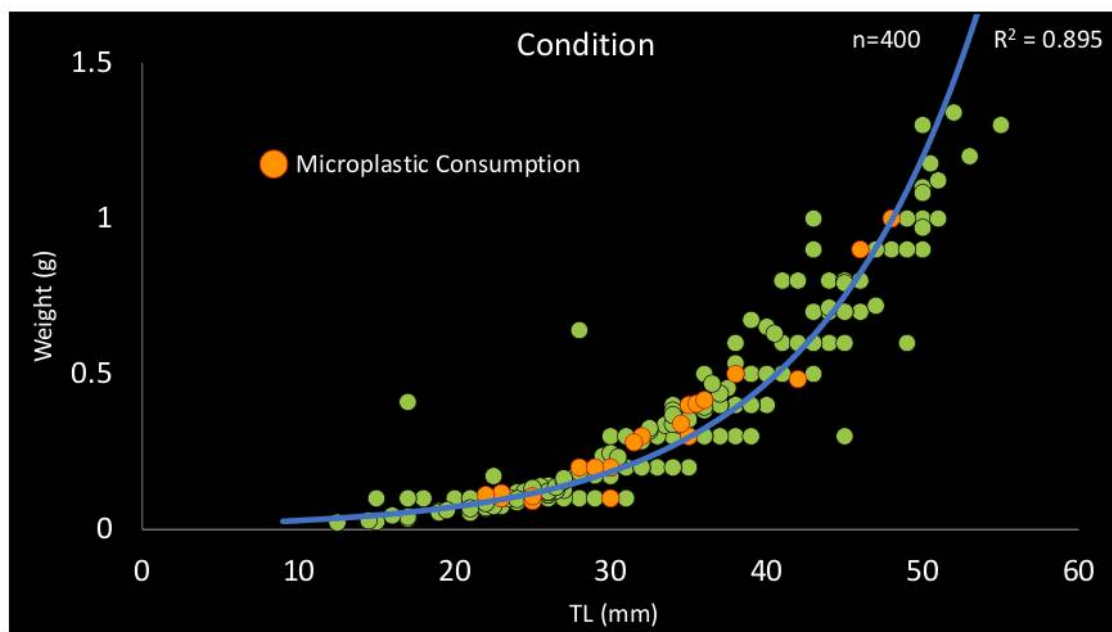
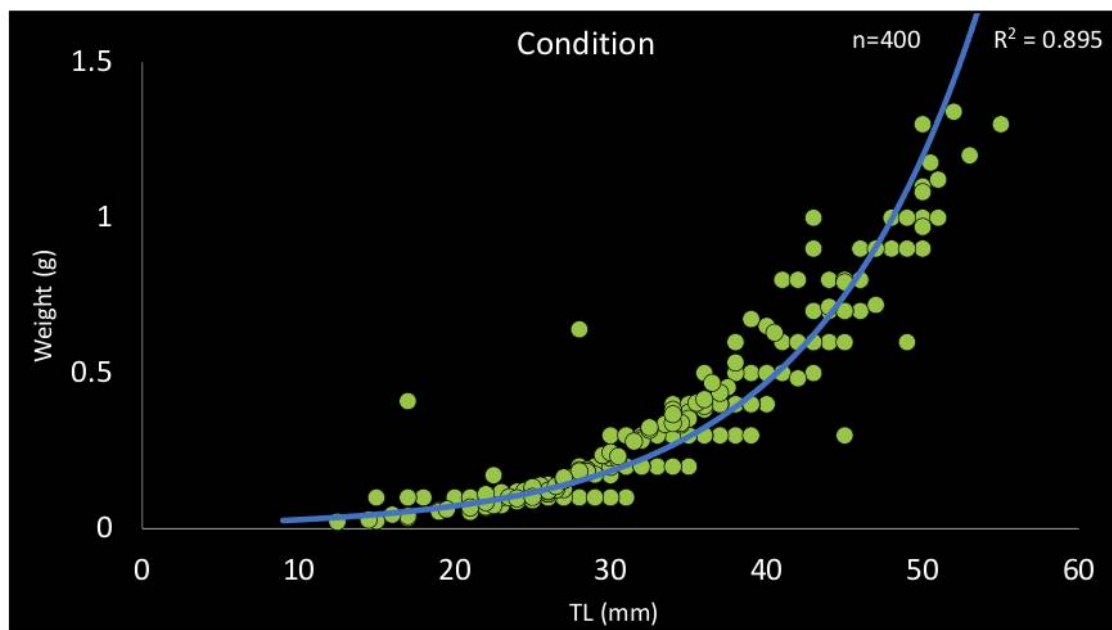


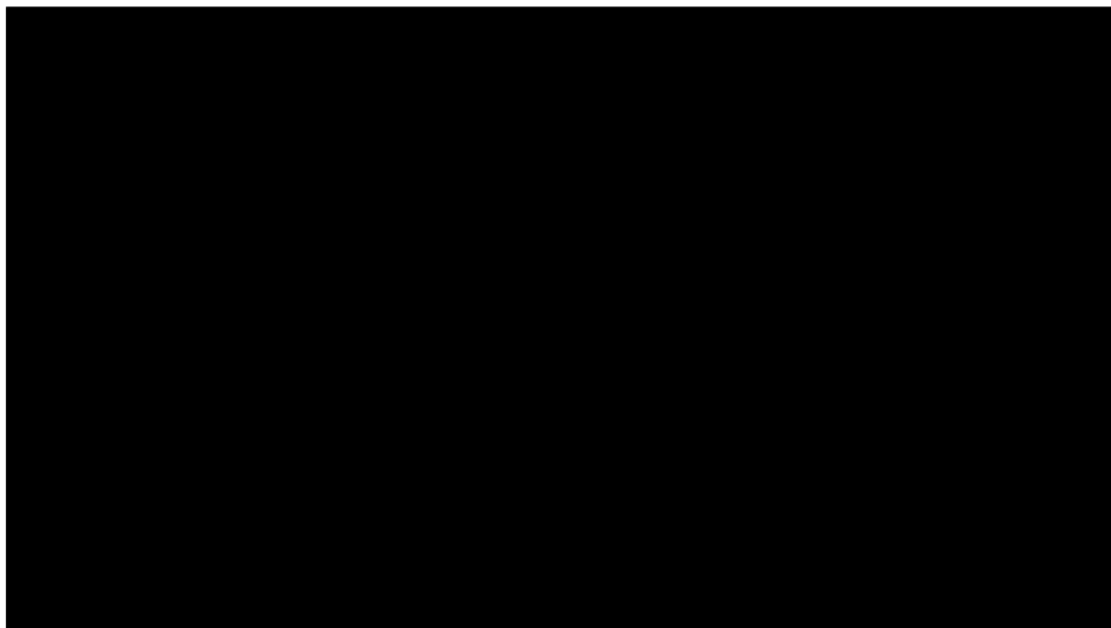
Gambusia affinis

Photo Credit: Joel Sartore

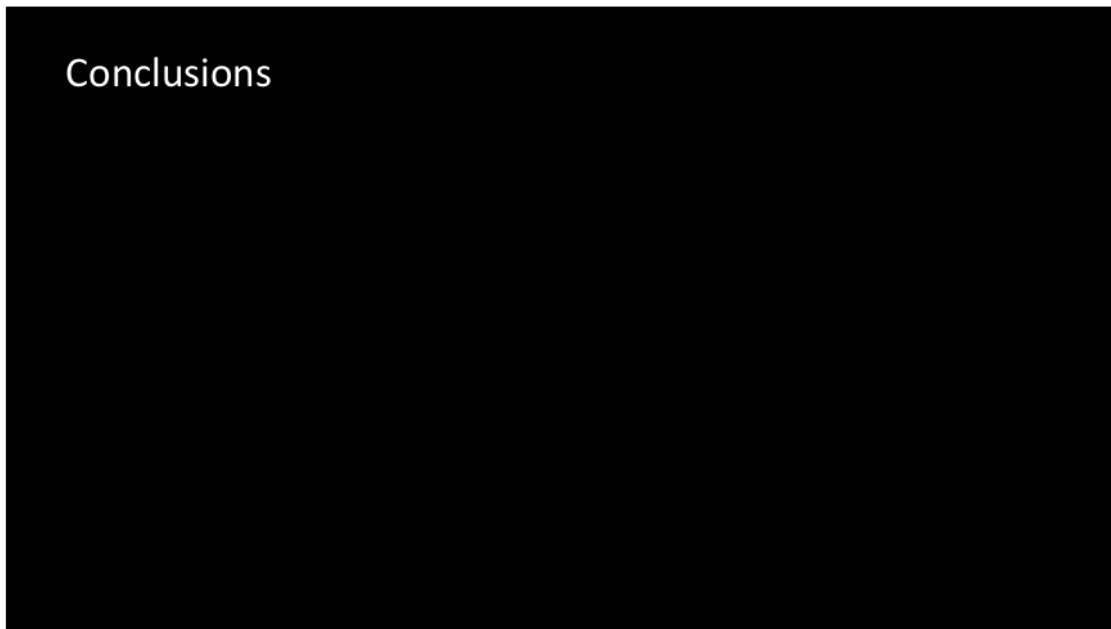








Conclusions



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Microplastics are common in the lower Santa Cruz River

- water column and sediment
- concentrations have seasonal dynamics

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Microplastic concentrations are within the range of other effluent studies (0-400 pieces/L) Carr et al 2016; Sun et al 2018

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Microplastic concentrations are within the range of other effluent studies (0-400 pieces/L) Carr et al 2016; Sun et al 2018

Mosquitofish are more likely to ingest microplastics during the monsoon season

Future Work

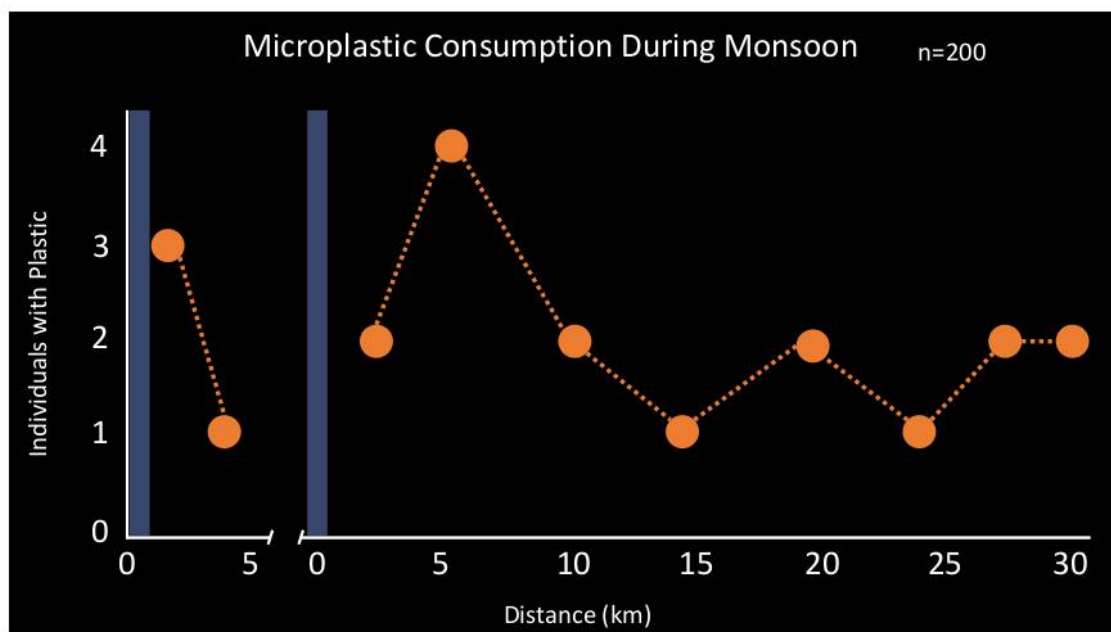
Drift net processing and analysis

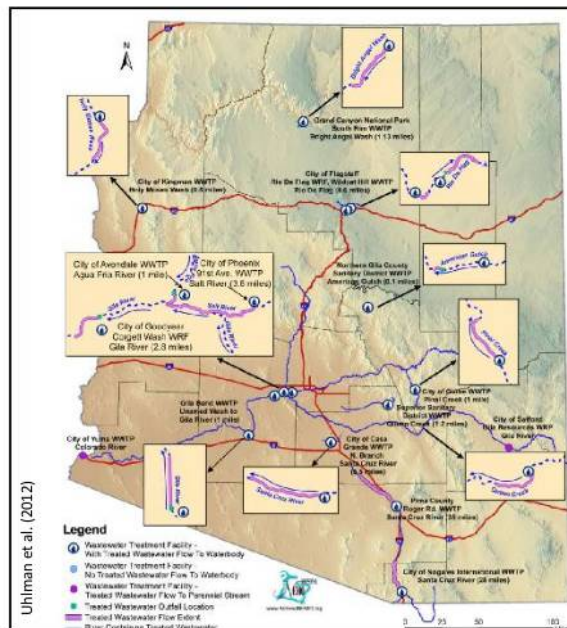
- quantify larger, rarer forms of microplastic (ex: beads)

Future studies should assess long-term impacts of microplastic on the health of aquatic biota in effluent-dependent rivers



Photo Credit: Margarethe Brummermann





The Santa Cruz River is one of many effluent dominated systems in AZ.

~100 miles of effluent dominated flow in AZ

Uhlman et al. (2012)

JAM meeting Hamdhani

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