



Smith River Nuisance Algae Study

Chace Bell
Water Quality Division
2/23/2018

What prompted this project?

- Reports from the public
 - Algae growth is a nuisance/concern
 - Since 2015
 - Algae growth is occurring
 - More severe
 - Earlier
 - More often
- Determine Cause → Consider possible solutions

The algae growing in the Smith R. is almost certainly *Cladophora*.

Conditions known to promote *Cladophora* growth:

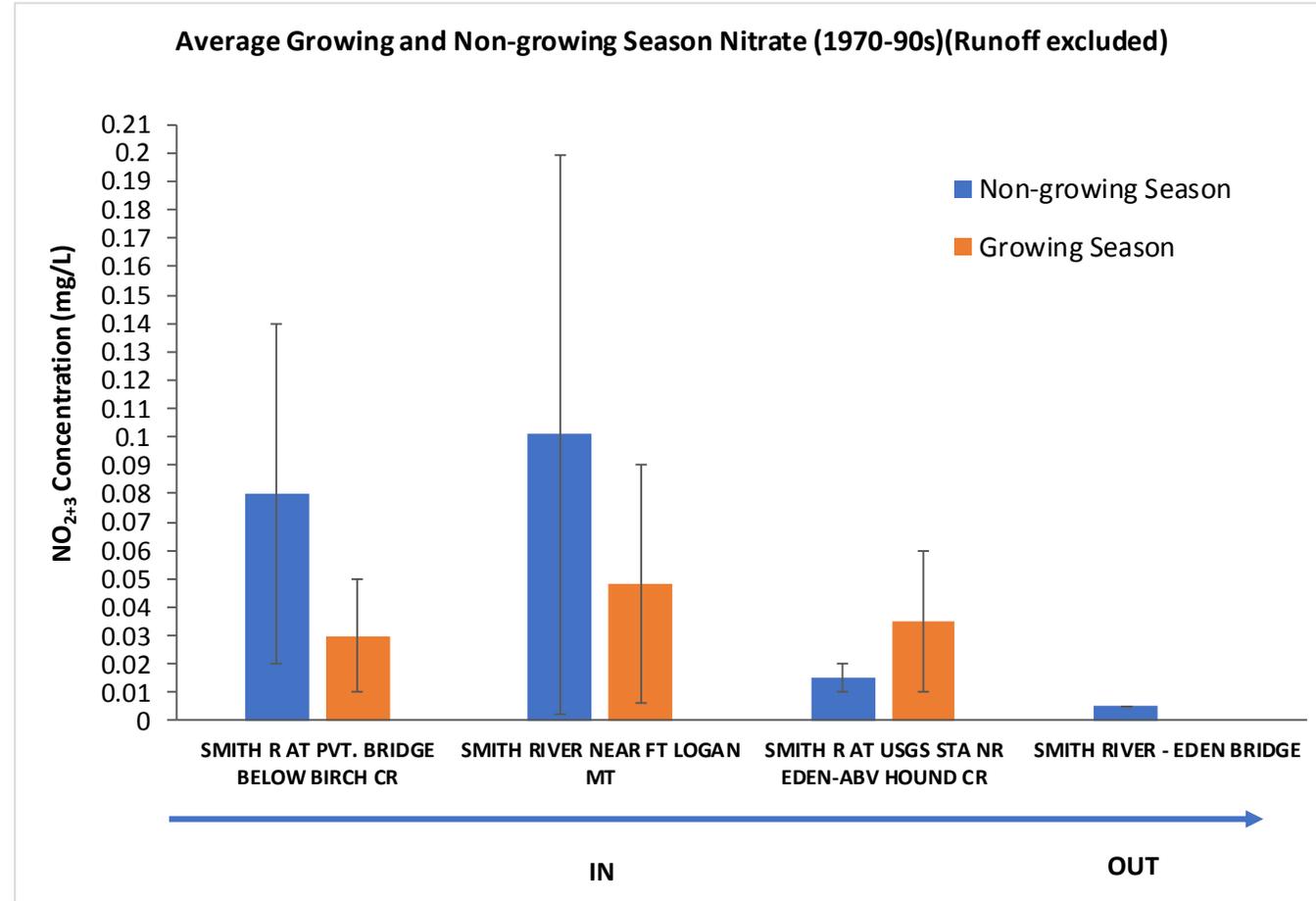
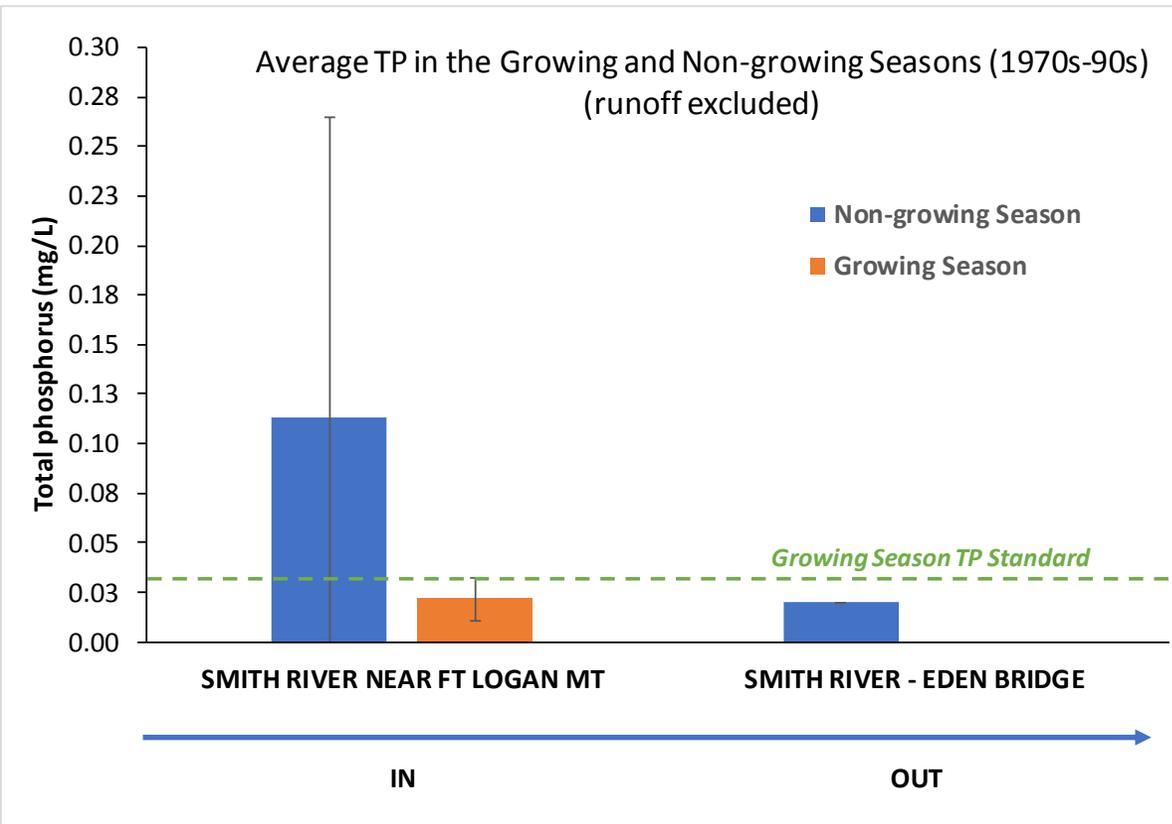
- Flowing waters and certain velocity ranges (0.4-0.7 m/sec)
- Increased nitrogen and phosphorus concentrations
- High light levels
- Increased water temperature (to a point)
- High pH (>7.0)
- Hard to very hard water (>121 mg/L CaCO₃)
- Other contributing factors

DEQ's overarching question: Why are algae (*Cladophora*) reaching nuisance levels in the Smith R., and why now?

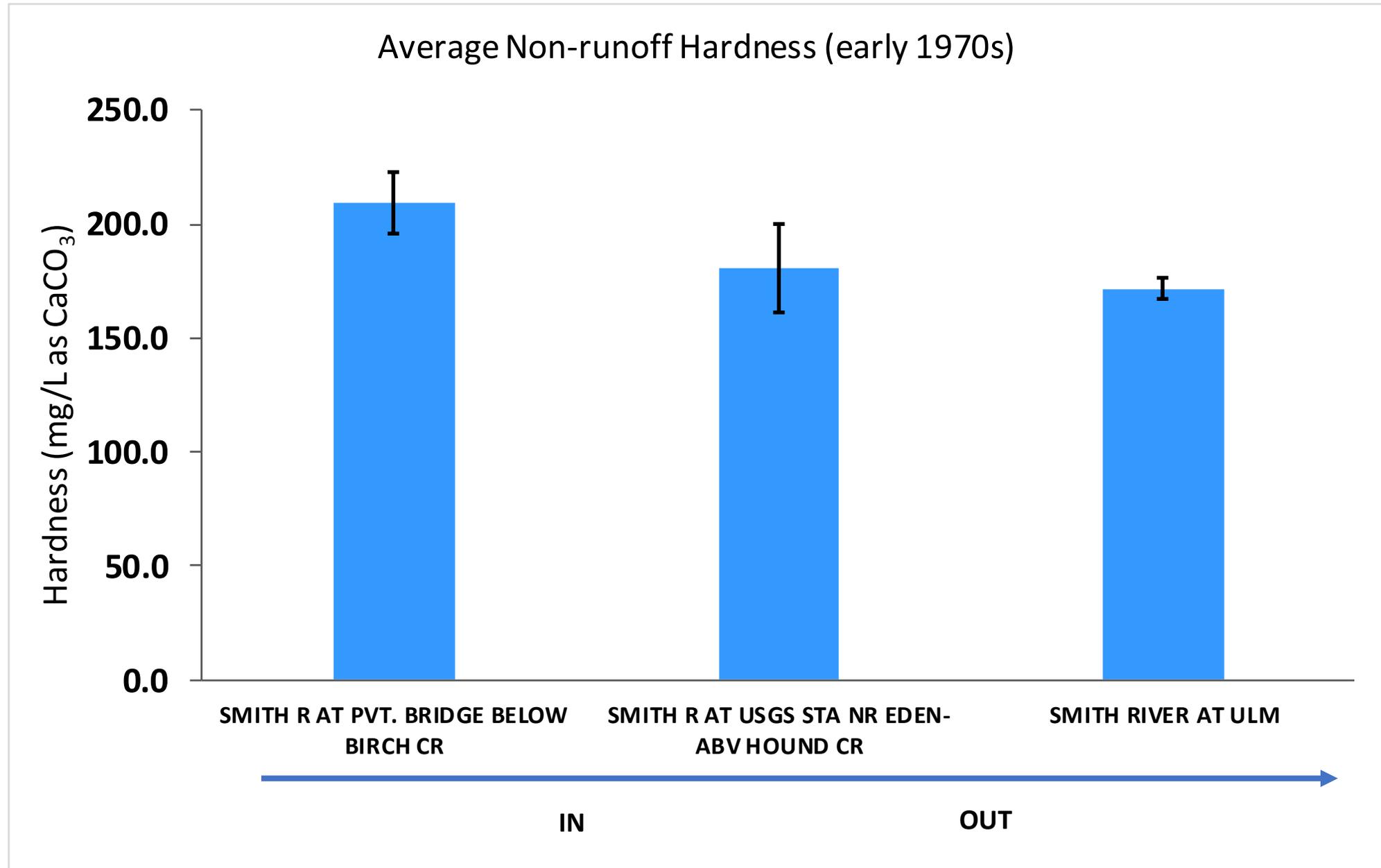
Some of DEQ's key focus questions at this point:

- Have nutrient concentrations during growing and non-growing seasons increased from the past?
- Has hardness and its constituents (Ca, Mg) during the growing season increased from the past?
- Has water temperature during the growing season changed to a more favorable range for *Cladophora*?
- Are peak flows and the longevity of those flows sufficient to move bedload and abrade the overwintering filaments?
- Does the entry of any major tributary result in observable changes in the *Cladophora* pattern?

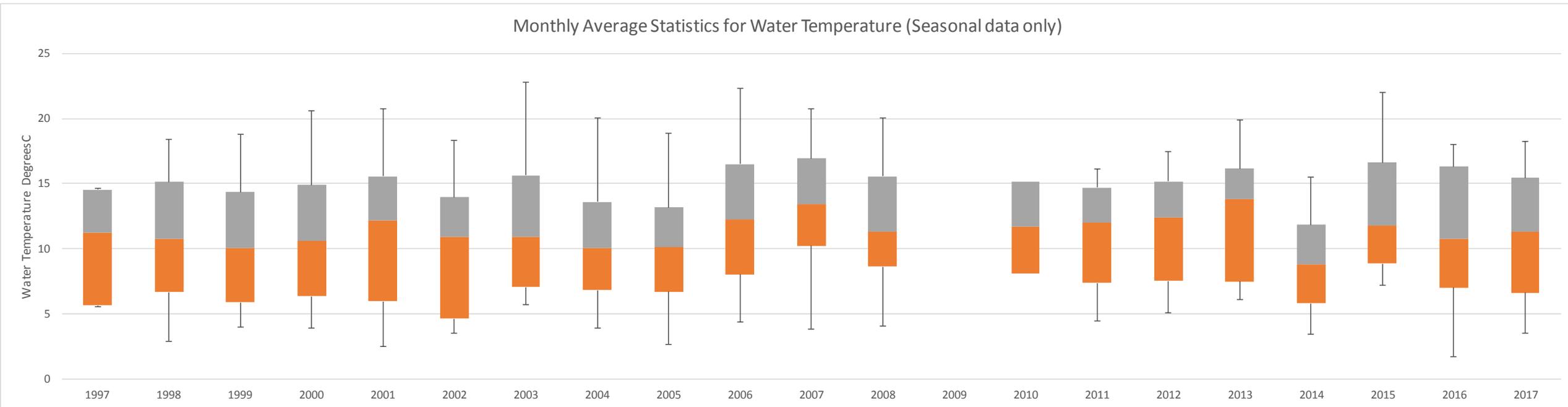
Historic Conditions - Nutrients



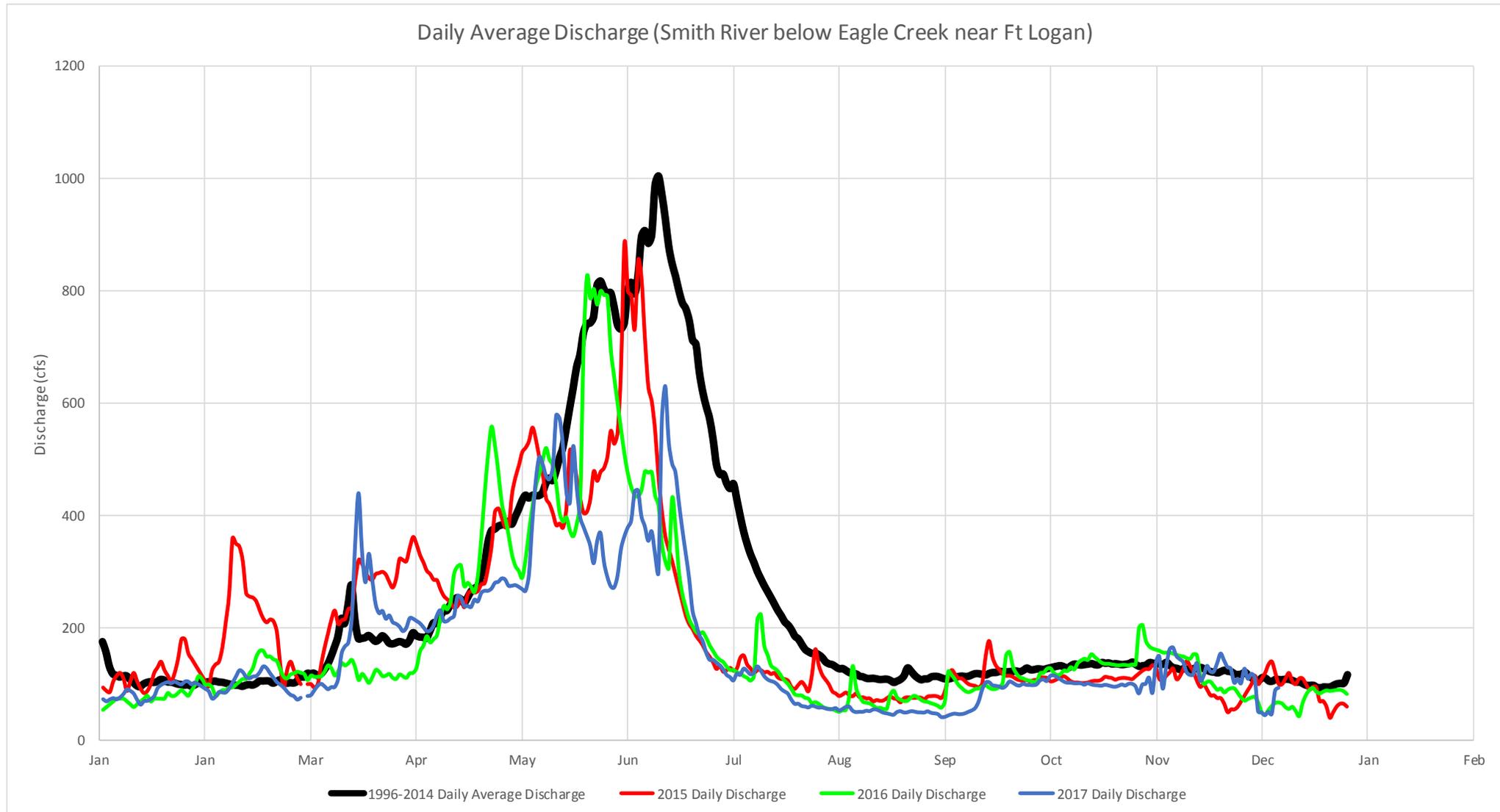
Historic Conditions - Hardness



Historic Conditions – Water Temperature



Historic Conditions - Flow

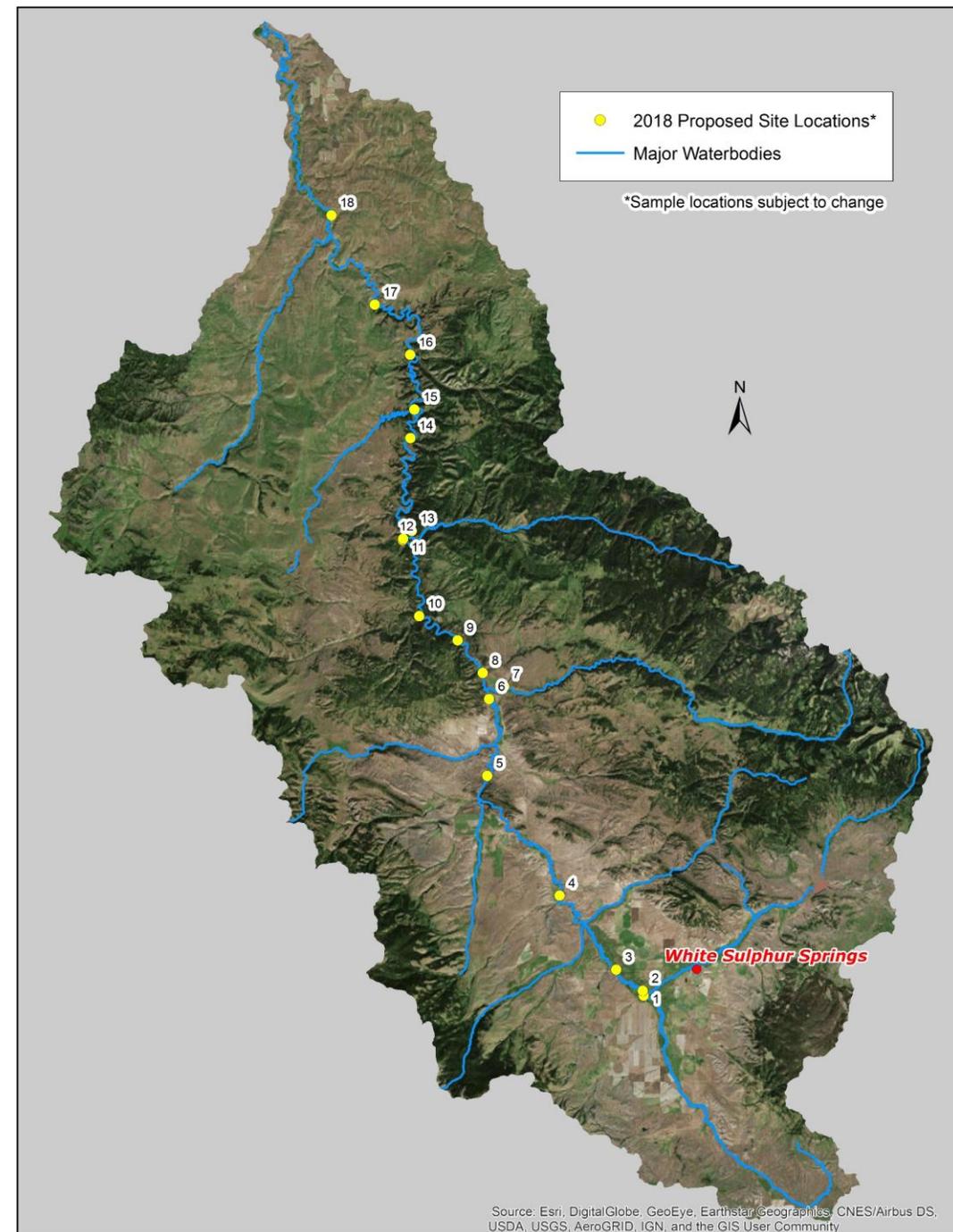


Monitoring and sampling strategy

Characterize current conditions

- Upstream to downstream
- Timing: growing season versus non-growing season?
- Flows: scouring flows, low flows?
- Are tributaries influencing algae factors?
- Can we identify source areas?
- Natural influence versus human influence?

Compare new data to historic data



Next Steps:

Public Engagement

- Monitoring is contingent on river access
- Local knowledge on area land changes
- Is there something we are missing in our understanding of nuisance algae growth in the Smith River?

Once we better understand what's causing nuisance algae growth, we can strategize what do about it...

What management options are available to address human influences?

Next Steps

- Two public meetings – Helena 2/28/18, White Sulphur Springs 3/1/18
- Finalize key questions and associated study designs
- Scheduling

For more information about the Smith River

Nuisance Algae Study contact:

Chace Bell

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Email: cbell2@mt.gov



Montana Smith River Algae App

Katie Makarowski
Montana DEQ
Water Quality Division

Water Pollution
Control Advisory
Council Meeting
2/23/18



People are interested in Smith River algae

- Public comments
- Volunteer monitoring

Questions remain about the algae

- Where? When?
- How much? Affecting recreation?

Challenge

- Not a lot of data
- Access is limited (physical and float permit requirement)

Opportunity

- EPA funding opportunity – creative approach involving crowdsourcing
- Agency partnership to create mobile app to enlist volunteers to collect data

SMITH RIVER
STATE PARK



Experience a multi-day float trip on the Smith River if you are lucky enough to draw a permit in the annual lottery. Noted for its spectacular scenery and renowned trout fishing, the Smith River is unique with only one public put-in and take-out site for the entire 59 miles.



Montana Smith River Algae App

1. Download app



Available on the
App Store



Get it on
Google play

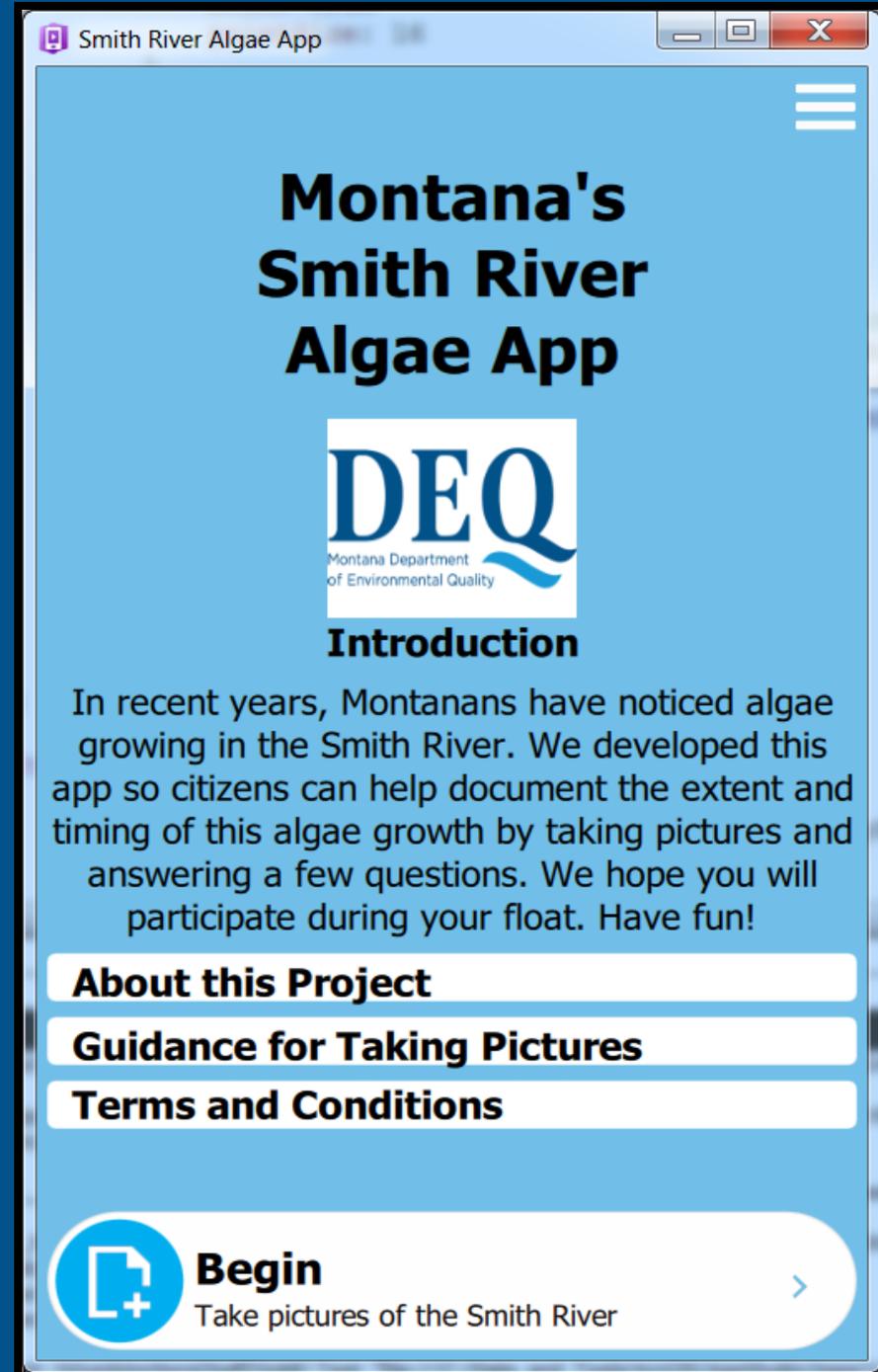
2. Click app icon
to open on
mobile device



3. Agree to
terms and
conditions

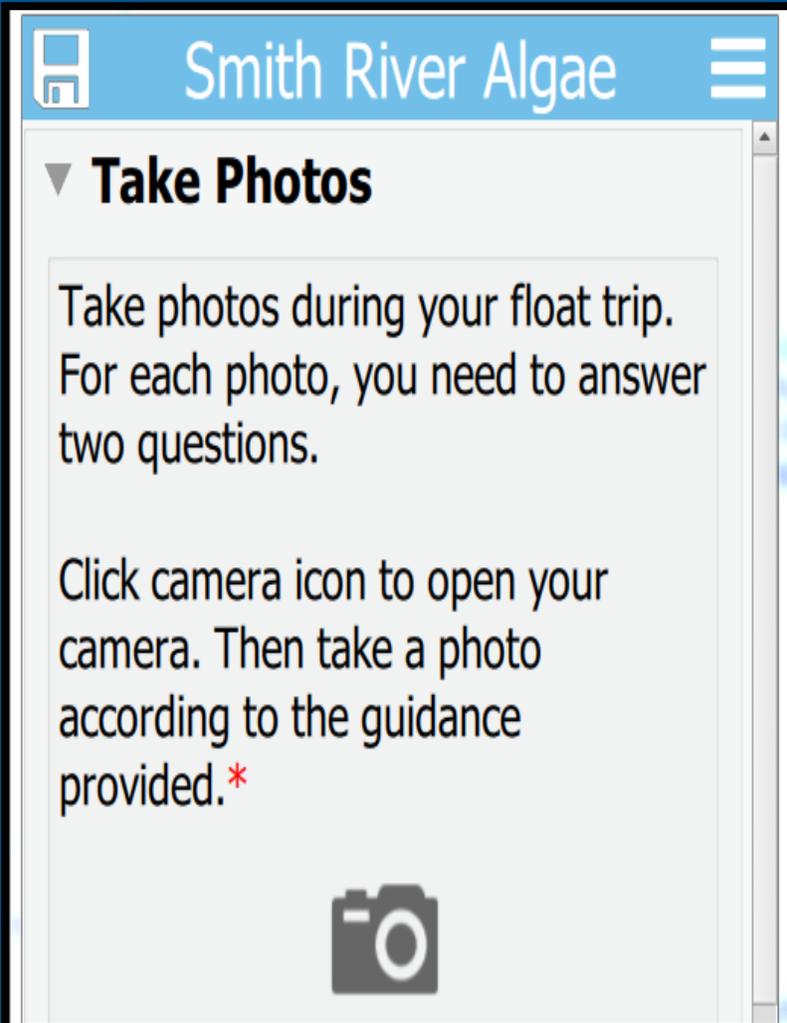
Read more
information

Get started



Montana Smith River Algae App

4. Take photo



Smith River Algae

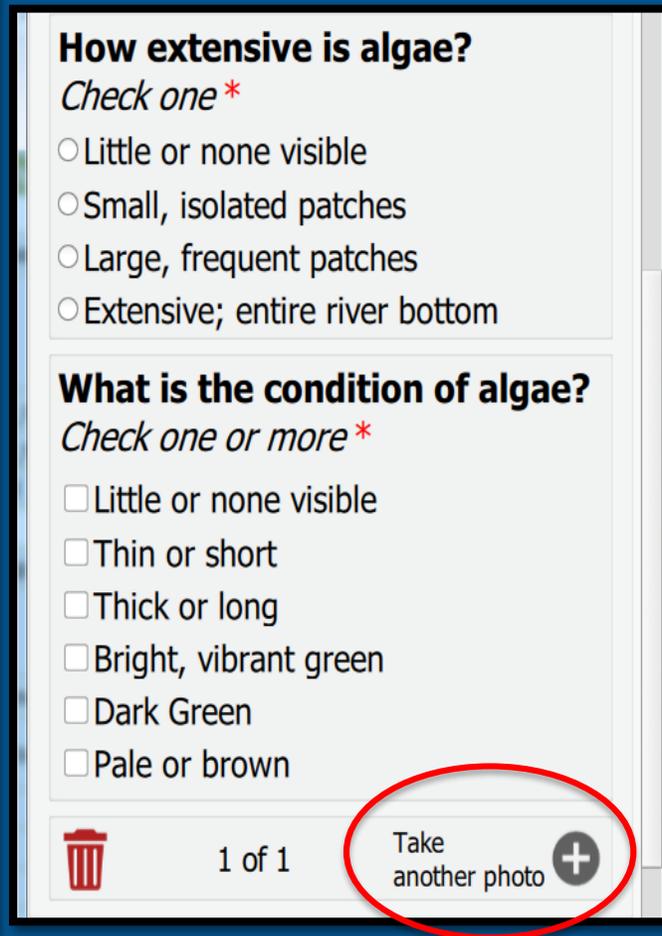
▼ **Take Photos**

Take photos during your float trip. For each photo, you need to answer two questions.

Click camera icon to open your camera. Then take a photo according to the guidance provided.*



5. Answer two algae questions



How extensive is algae?
*Check one**

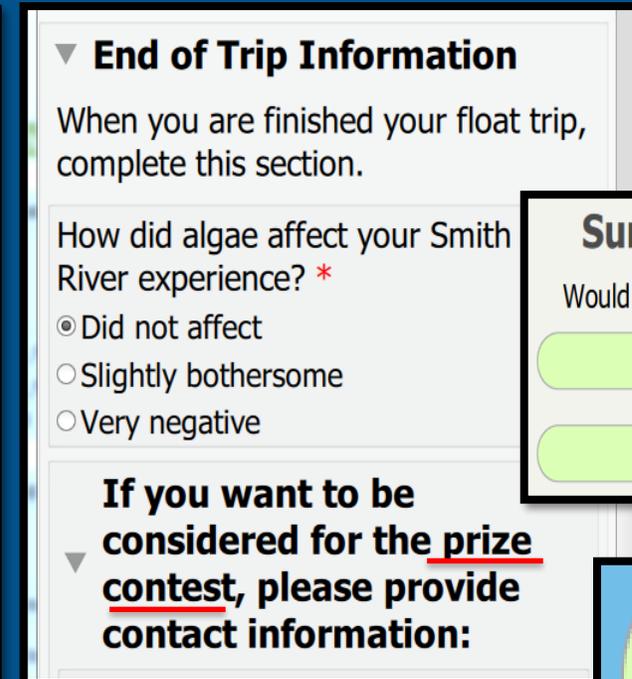
- Little or none visible
- Small, isolated patches
- Large, frequent patches
- Extensive; entire river bottom

What is the condition of algae?
*Check one or more**

- Little or none visible
- Thin or short
- Thick or long
- Bright, vibrant green
- Dark Green
- Pale or brown

 1 of 1 **Take another photo** 

6. Take more photos -or- Finalize and submit



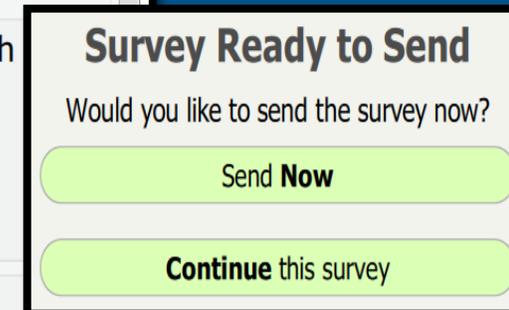
▼ **End of Trip Information**

When you are finished your float trip, complete this section.

How did algae affect your Smith River experience? *

- Did not affect
- Slightly bothersome
- Very negative

If you want to be considered for the prize contest, please provide contact information:



Survey Ready to Send

Would you like to send the survey now?

Send Now

Continue this survey



Montana Smith River Algae App

What we'll do with the information...

- Quality control (location, clarity, appropriateness, etc.)
- Mapping (latitude/longitude for each photo to display visually)
- May assist in understanding where and when nuisance algae grows

For information about app, contact:

Katie Makarowski, kmkarowski@mt.gov, 406-444-3507

Darrin Kron, dkron@mt.gov, 406-444-4765

FAQs on Smith River State
Park webpage soon:

SMITH RIVER STATE PARK
Frequently Asked Questions

Reminders for the 2018 float season