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PADDLE

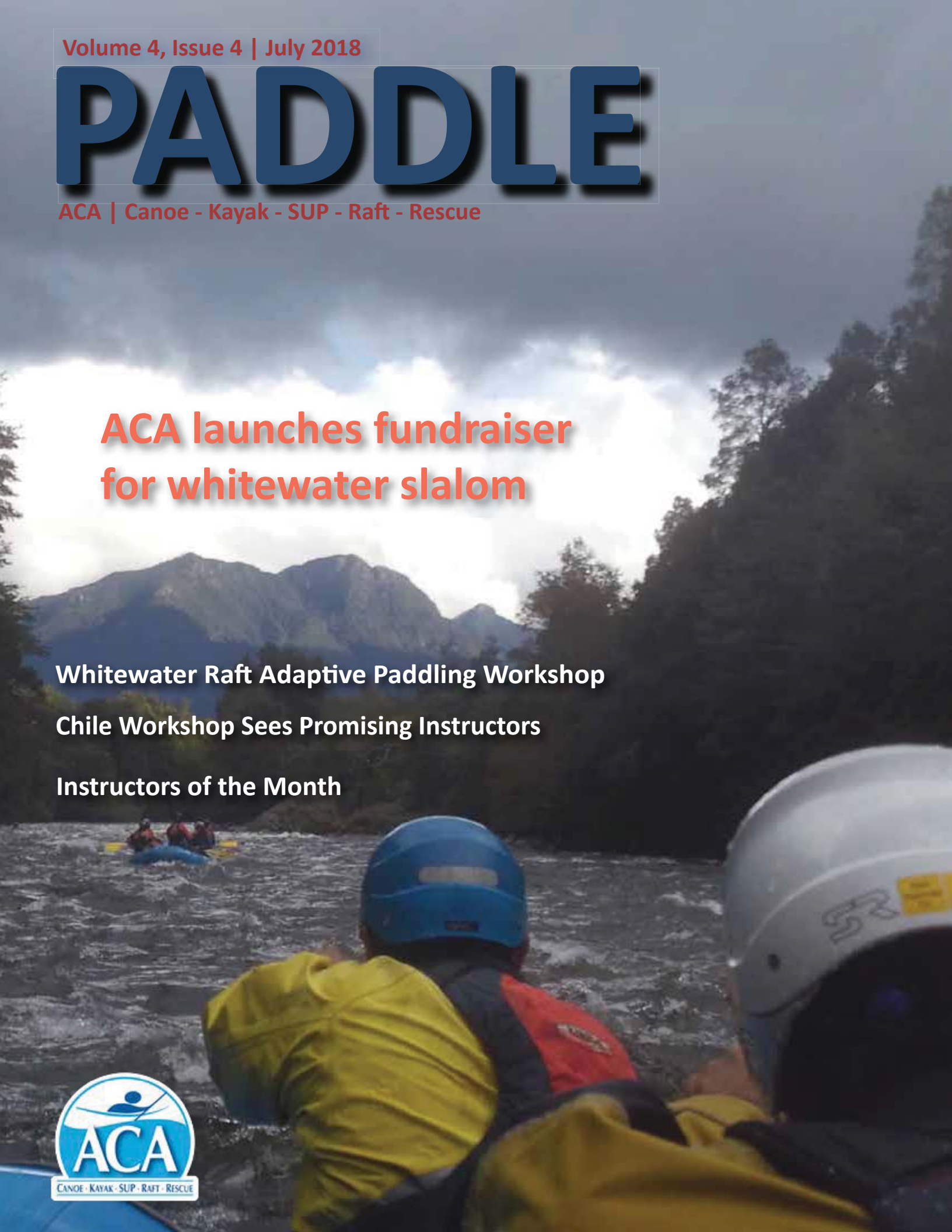
ACA | Canoe - Kayak - SUP - Raft - Rescue

ACA launches fundraiser for whitewater slalom

Whitewater Raft Adaptive Paddling Workshop

Chile Workshop Sees Promising Instructors

Instructors of the Month



Plastics vs. Waterways, Part 2

MICROFIBERS:

Another form of plastic pollution affecting waterways, oceans

By Cherie Northon, Ph.D., Executive Director, Anchorage Waterways Council

Recently, another pressing and insidious problem regarding the effects of plastic in freshwater and marine environments has been making the news: Microfibers. Pretty much invisible to the human eye, they have been found in fresh and marine ecosystems and some of the products that we consume, such as fish, shellfish, and sea salt.

Microfibers are a very fine synthetic yarn whose strands have a diameter of less than one denier (or ten micrometers), which is approximately 1/5 the diameter of a human hair. They are used to make certain products, including much of our favorite active wear—running shorts, yoga pants, and fleece jackets. The primary textiles that shed microfibers are nylon, polyester, rayon, acrylic and spandex, which are very popular due to being lightweight, resistant to wrinkling and pilling, breathable, comfortable, and having better thermal insulation.

Although microfibers have been around since the late 1950s, their use in clothing, furniture fabric, and in household items did not really take off until the 1990s. Polyester, spandex, and polar fleece are especially popular, and we have become greatly dependent on them. I love my 20-year-old bright yellow Eddie Bauer EBTEK

Microfibers photographed in an oyster from Apalachicola Bay, FL, 2015. Photo courtesy Robert Simmons, Ph.D. (microscopy@briarwillow.com)

The author in the Falkland Islands with Gentoo penguins attracted to her favorite yellow fleece, 2007. Photo courtesy Thom Eley, Ph.D.

pullover fleece, which has racked up tens of thousands of world travel miles with me (when I fly, it goes), yet, sadly, fleece is one of the worst offenders for releasing microfibers. And, it's been found that the older the garment—the more likely it is to shed microfibers.

How does my fleece pullover impact marine and freshwater habitats? Whenever items containing microfibers go through the washing machine, they release thousands of microscopic plastic fibers, known as microfibers. From the laundry they travel into septic systems or wastewater treatment plants. Though it is estimated that wastewater treatment plants can capture 62-92% of the microfibers, an enormous number are finding their way into fresh and saltwater ecosystems in the discharged effluent and on land from wastewater sludge that is often used as a fertilizer.

Aside from abandoning some of our favorite clothes and items, what can we do?

Two global fixes to the microfiber problem that have been proposed are major and very costly. One is to upgrade wastewater treatment plants to trap and better retain microfibers, and the other is for a change in the textile and clothing industry to move away from microfiber fabrics. If instituted, these changes will take time, money, an attitude shift, and a huge buy-in by producers and consumers. In the meantime, here are some things each of us can do:

- Wash synthetic clothes less frequently and for a shorter cycle.

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A new Guppy Friend bag. (guppyfriend.com)

Microfibers collected in the Guppy Friend bag. Photo courtesy Beth Terry (myplasticfreelife.com)

- Fill up your washing machine. Washing a full load results in less friction between the clothes and fewer fibers are released.

- If you use powdered detergent, consider switching to a liquid laundry soap**.** Laundry powder causes more scrubbing, which loosens more microfibers.

- Use a colder wash setting. Higher temperatures can damage clothes and release more fibers.

- Spin dry clothes at low revolutions. Higher revolutions increase the friction between the clothes.

- When you clean out your washer and dryer filters, place lint in the trash instead of washing it down the drain (which would defeat the whole purpose).

- If you are in the market for a new washer, consider a front loading model. Studies have shown that front loading washers cause significantly less microfiber shedding than top loading washers.

- You can purchase a special microfiber filter for your washer. Although they require more of an investment, there are several models on the Internet with prices around $150, and they are also helpful for reducing septic system/drainfield failures and clogged drains.

- Consider buying a Guppy Friend **wash bag.** During testing, the bag captured 99 percent of fibers released in the washing process. The bags are available for purchase at Patagonia for around $30. They measure about 20" x 30" and are perfect for a few items. Beth Terry, a plastic pollution activist, reviewed the Guppy Friend bag and recovered a small amount of fiber lint left in the bag after a washing cycle. Remember, these are microfibers, so don't expect a huge ball of fuzz.

- What about larger item such as sheets, blankets, or pet beds? Another product on the market might fill that gap—the Cora Ball, whose design is based on how coral filters water. All you need to do is toss one into your washing machine with a load of clothes.

According to their inventors, "Cora swooshes around in the laundry and just like coral, allows water to flow, while picking up those little pieces of microfiber and catching them in her stalks". And, of course, remove the Cora after

washing and clean it when there's an accumulation of lint (not necessarily after every wash). Again, remember to put the lint in the trash, not down the drain.

- Think more carefully about what you own (and wash) that is made of synthetics. As an example, fleece typically brings to mind jackets or pullovers. Around my house I found socks, slippers, caps, vests, pants, blankets, throws, and pet beds. Microfiber bed sheets now fill store shelves, and are getting rave reviews including recent publicity from NBC's *Today Show*. Who wouldn't be swayed by the fact that they are soft, cool, wrinkle-free, and run about $30 a set? Too bad the review didn't mention the downside of microfiber products.

- Consider switching to products that are made from natural fibers, such as cotton, linen (flax), and wool. There is a different set of environmental concerns, which means tradeoffs. Both linen and cotton (especially) require large inputs of water and chemicals (fertilizers and pesticides), although linen tends to be less demanding. And, of course, while sheep's wool is a renewable resource, there are environmental downsides to raising large animal herds. Hemp and bamboo, also made into bed sheets, are gaining more recognition and acceptance, which would be good, natural alternatives. However, currently they cannot compete with the low cost of microfiber sheets.

To an improved future…

It is my hope that the information in this and my earlier article, *Plastics vs. Waterways* (March 2018) will acquaint readers with the less well-known impacts of plastic on the aquatic environment. Our entire relationship with plastic is complex; some aspects have fairly simple remedies while others are not easily resolved. The products we purchase, the lifestyles we lead, and the regard we have for minimizing the very negative environmental effects of plastics are all important. Certainly there is much room for improvement to try and minimize many of the consequences. We can only do better by being informed about human-made environmental disasters, such as plastic pollution in freshwater and the oceans, and by taking steps to help mitigate our personal impact.

Tossing the Cora Ball into the washer.
Photos courtesy Cora Ball (Coraball.com)

About the Author

Cherie Northon has a master's and a doctorate in Geography from the University of California Berkeley, where she taught for 19 years. She is also a cartographer – working in GIS, remote sensing, and GPS-acquired data. Her areas of interest are habitat protection and improvement of the natural environment (flora and fauna), student outreach (K-12), and generating public participation in environmental issues. She has been the executive director of Anchorage Waterways Council since 2010.