

Clothing Fibers & Microplastic Pollution in the Outer Banks, North Carolina

*How Laundry Becomes One of the Largest Sources of
Microplastics in Outer Banks Waters*



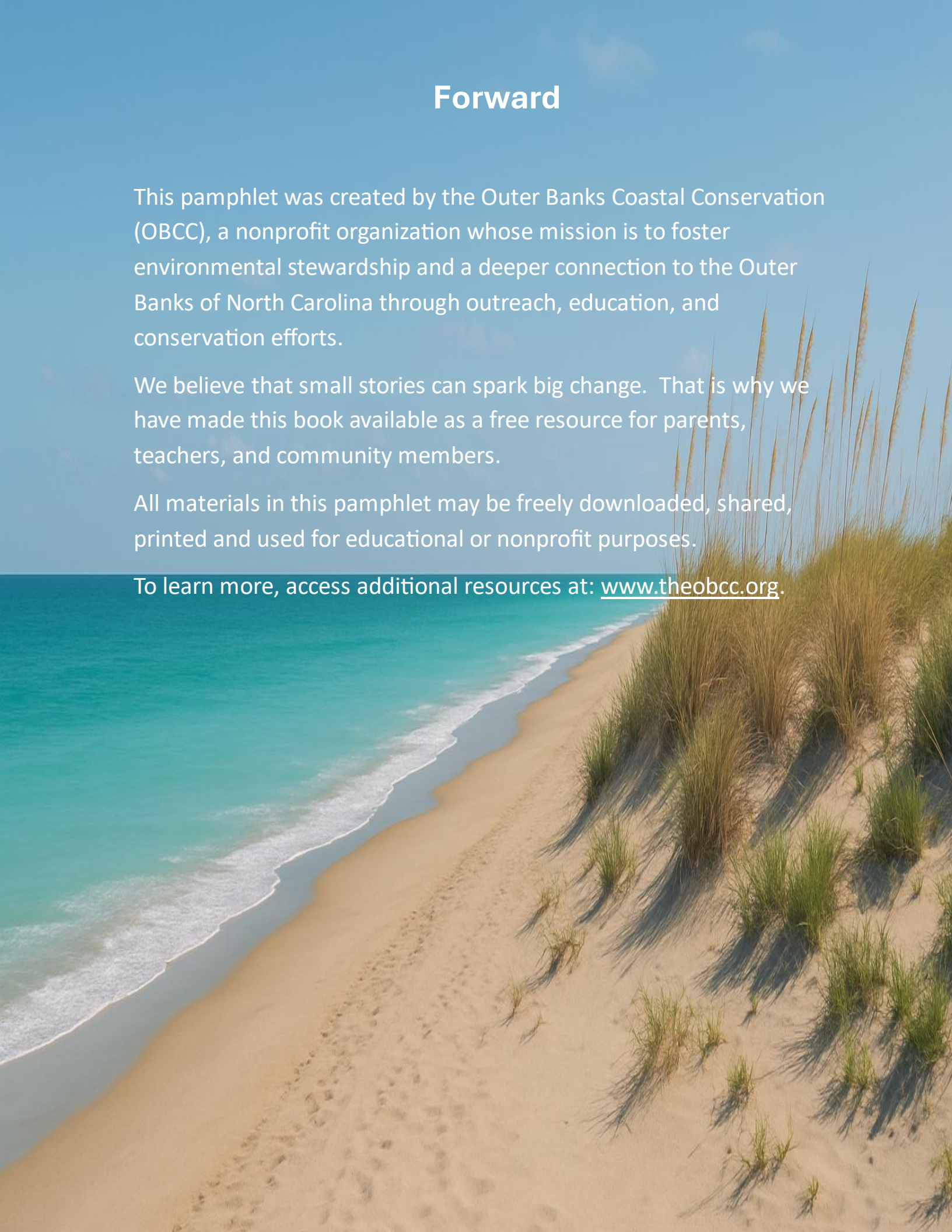
Forward

This pamphlet was created by the Outer Banks Coastal Conservation (OBCC), a nonprofit organization whose mission is to foster environmental stewardship and a deeper connection to the Outer Banks of North Carolina through outreach, education, and conservation efforts.

We believe that small stories can spark big change. That is why we have made this book available as a free resource for parents, teachers, and community members.

All materials in this pamphlet may be freely downloaded, shared, printed and used for educational or nonprofit purposes.

To learn more, access additional resources at: www.theobcc.org.



Understanding Microfibers: The Hidden Microplastics

While most people think of microplastics as broken bottles or fragments of foam coolers, the majority found near Outer Banks inlets are tiny synthetic clothing fibers.

What They Are

Microfibers are thread-like pieces, often thinner than a human hair, shed from synthetic fabrics such as:

- Polyester
- Nylon
- Spandex
- Acrylic
- Polypropylene-blend athletic fabrics
- Fleece jackets and blankets

These fibers contain:

- Plastic polymers
- Chemical dyes
- UV stabilizers
- Antimicrobial coatings
- Flame retardants
- PFAS (associated with water-resistant clothing)

Why the Outer Banks Has a Microfiber Problem

The Outer Banks is uniquely vulnerable because it sits at the final receiving end of massive freshwater systems and human activity happening far inland.

“The Coastal Funnel Effect”

Rivers from hundreds of miles away empty into Pamlico and Albemarle Sounds. These waterways act like a funnel, concentrating microfibers that then push toward major inlets:

- Oregon Inlet
- Hatteras Inlet
- Ocracoke Inlet

From here, tides distribute them across beach surf zones, marsh edges, and seagrass meadows.

Septic Systems

Much of the Outer Banks uses septic systems, not centralized wastewater treatment. These allow:

- Laundry water
- Greywater
- Outdoor hose rinsing

...to seep into groundwater, which flows into canals and sounds.

Microfibers pass through septic drainfields easily because they're extremely small and buoyant.

Tourism Pressure

Millions of visitors bring:

- Fleece blankets
- Microfiber towels
- Fast-fashion swimwear
- Synthetic athletic clothing

When these are washed in rental homes, it creates a seasonal spike in microfiber pollution — especially during June–September.

How Microfibers Enter the Waterways

Inside the Home

Each wash cycle releases 100,000–700,000 fibers.

Sources include:

- Fleece jackets (worst offenders)
- Leggings and yoga pants
- Quick-dry shorts
- Swimsuits
- Bedding (microfiber sheets)
- Towels labeled “quick dry” or “microfiber”
- Carpets and blankets washed after a sandy beach day

These fibers:

- Slip through washing machine drains
- Pass through septic or municipal systems
- Travel to streams → rivers → sounds → ocean

Stormwater Transport

Strong Outer Banks winds blow fibers from:

- Drying racks
- Balcony laundry
- Outdoor beach towels
- Lint traps and trash cans

Storm drains send them straight to:

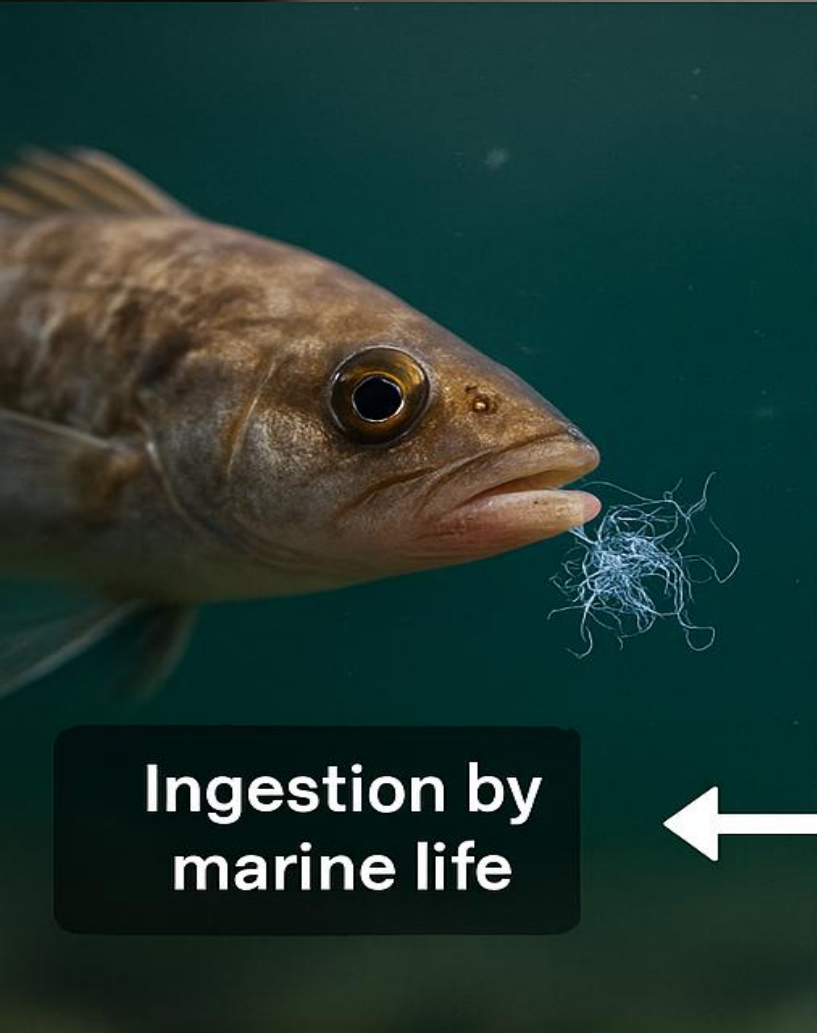
- Estuarine creeks
- Drainage ditches
- Soundside canals
- Saltmarsh edges



**Synthetic fibers
shed during washing**



**Fibers enter
wastewater**



**Ingestion by
marine life**



**Microplastic
pollution in the
Outer Banks**

Microfiber Impacts on Outer Banks Wildlife and Ecosystems

Oysters

Oysters filter up to 50 gallons of water a day, pulling in microfibers. Effects include:

- Reduced filtration efficiency
- Lower reproductive success
- Internal blockages
- Inflammation from chemical additives

Oyster reefs around Hatteras Island and Roanoke Sound already show elevated microfiber levels.

Fish & Juvenile Nursery Areas

Seagrass meadows in the Outer Banks are nurseries for:

- Spot
- Croaker
- Flounder
- Shrimp
- Blue crabs

Microfibers disrupt:

- Growth rates
- Gut function
- Food-finding behavior
- Oxygen uptake

Juvenile fish consume microfibers that look like tiny worms.



Dolphins and Marine Mammals

Outer Banks dolphins feed in:

- Oregon Inlet
- Roanoke Sound
- Hatteras Island nearshore waters

Microfibers enter through their prey. Risks include:

- Tissue inflammation
- Impaired nutrient absorption
- Increased exposure to toxins adhered to fibers

Shorebirds

Species such as:

- Sanderlings
- Piping plovers
- Pelicans

...mistake tiny synthetic fibers for strands of food or ingest them while probing the sand.

Marshes & Seagrasses

Microfibers accumulate in the roots of:

- *Spartina alterniflora*
- *Zostera marina* (eelgrass)
- *Halodule wrightii* (shoal grass)

This reduces:

- Sediment stability
- Oxygen flow
- Root health

...and threatens habitats critical to sea turtles and scallops.



Human Health & Tourism Implications

Seafood Consumption

Outer Banks fishing and seafood industries rely heavily on clean water. Microfibers have been found in:

- Shrimp
- Oysters
- Clams
- Blue crabs
- Small fish used as bait

This raises concerns about:

- Chemical exposure
- Inflammation
- Long-term health effects (ongoing research)

Beach Experience

Tourists increasingly report:

- “Bright threads in the surf”
- “Dust-like fibers catching on legs”

Microfibers degrade the natural beauty of Outer Banks waters.

Economic Impacts

If water quality declines:

- Charter fishing revenue drops
- Oyster harvests decline
- Tourism suffers
- Water sports (kayaking, kiteboarding) are impacted



What Outer Banks Residents, Visitors, and Businesses Can Do

For Residents

Upgrade laundry habits

- Use microfiber-catching laundry bags (Guppyfriend)
- Install in-line washing machine filters (Filtrol or PlanetCare)
- Choose cold water and gentle cycles
- Run fewer, fuller loads
- Avoid washing heavily sandy clothes

Choose fabrics wisely

- Select cotton, hemp, linen, bamboo, or wool when possible
- Avoid fast-fashion synthetics that shed quickly

Dispose properly

- Put dryer lint in the trash, not outside
- Never rinse cleaning rags outdoors

For Visitors

Hotels and rentals can leave a card reminding:

- Shake towels inside, not off balconies
- Use fiber-catching bags provided
- Reuse clothing rather than washing daily
- Avoid washing sandy swimsuits or beach blankets

A single rental home washed daily by multiple families can release millions of microfibers a week.

HELP KEEP
WATERS CLEAN
USE THE
FIBER FILTER

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For Vacation Rentals & Hotels

- Install commercial-grade microfiber filters
- Replace microfiber towels with cotton equivalents
- Provide eco-friendly laundry bags
- Add signage in laundry rooms:
“Help Keep OBX Waters Clean — Use the Fiber Filter Bag.”
- Keep outdoor laundry areas enclosed

For Watersports, Fishing, and Charter Businesses

- Provide microfiber awareness cards with rentals
- Stock cotton towels
- Offer durable, long-lasting branded apparel rather than fast-fashion synthetics

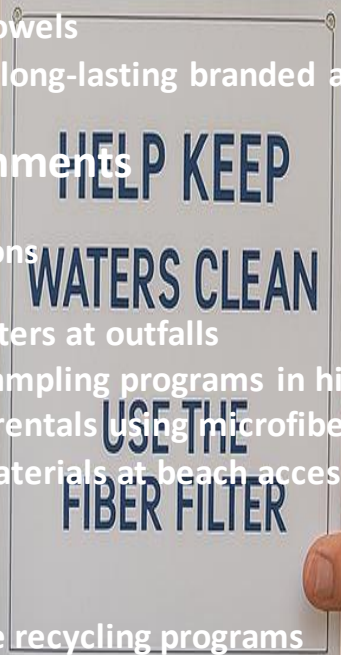
For Local Governments

Infrastructure solutions

- Stormwater filters at outfalls
- Microplastic sampling programs in high-tourism areas
- Incentives for rentals using microfiber filters
- Educational materials at beach access points

Policy options

- Support textile recycling programs
- Require filtration for new large rental homes





Long-Term Solutions for Outer Banks Clean Water

Promote Natural Fibers

As cotton, hemp, and linen clothing grows in popularity, microfiber shedding drops dramatically.

Invest in Community-Scale Filtration

Filters at storm drains and pump stations can capture fibers before they enter soundside ecosystems.

Restore Natural Filters

Salt marshes and oyster reefs naturally trap some microplastics — protecting and rebuilding them is crucial.

Public Education

Widespread awareness helps align:

- Households
- Visitors
- Rentals
- Businesses
- Local governments

...toward a shared goal of cleaner waters.



Did You Know?

- Microfibers are the #1 microplastic found on Outer Banks beaches.
- A single synthetic blanket shed enough fibers to stretch 30 miles end to end.
- Clothing marketed as “made from recycled bottles” can shed even more than regular polyester.
- Microfibers are now found in clouds, meaning the Outer Banks gets some from atmospheric fallout.
- Dye chemicals on microfiber threads have been linked to hormone disruption in wildlife.



Checklist for Reducing Microfiber Pollution

Laundry

- ☐ Use microfiber-catching laundry bag
- ☐ Install a washing machine microfiber filter
- ☐ Wash on cold & gentle
- ☐ Wash fewer, fuller loads
- ☐ Avoid washing sandy items
- ☐ Keep lint trap empty (and dispose indoors)

Clothing Choices

- ☐ Choose natural fibers
- ☐ Buy higher-quality garments
- ☐ Avoid cheap synthetics

Around the Home

- ☐ Line-dry when possible
- ☐ Avoid outdoor shaking of towels and blankets
- ☐ Keep outdoor drains clear

Visitors

- ☐ Shake beach towels indoors
- ☐ Use provided laundry bags
- ☐ Don't wash sandy clothes
- ☐ Reuse clothing during your stay

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