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Data From: Microplastic Concentrations in Two Oregon Bivalve Species: Spatial, Temporal, and Species Variability

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Table 1. Description of the fields needed to describe the creation of your dataset.

Title of dataset	Microplastic Concentrations in Two Oregon Bivalve Species: Spatial, Temporal, and Species Variability
URL of dataset	Data is available in the Portland State University PDXScholar data repository at: https://doi.org/10.15760/esm-data.1
Abstract	Microplastics are an ecological stressor with implications for ecosystem and human health when present in seafood. We quantified microplastic types, concentrations, anatomical burdens, geographic distribution, and temporal differences in Pacific oysters (<i>Crassostrea gigas</i>) and Pacific razor clams (<i>Siliqua patula</i>) from 15 Oregon coast, U.S.A. sites. Organisms were chemically digested and visually analyzed for microplastics, and material type was determined using Fourier Transform Infrared Spectroscopy. Microplastics were present in organisms from all sites. On average, whole oysters and razor clams contained 10.95 ± 0.77 and 8.84 ± 0.45 microplastic pieces per individual, or 0.35 ± 0.04 and 0.16 ± 0.02 pieces g ⁻¹ tissue, respectively. Contamination was quantified but not subtracted. Over 99% of microplastics were fibers. Spring samples contained more microplastics than summer in oysters but not razor clams. This study provides a spatially extensive baseline of microplastics in Oregon bivalves and is the first to determine Pacific razor clam concentrations.
Keywords	Microfiber, microplastic, Pacific razor clam, Pacific oyster, <i>Crassostrea gigas</i> , <i>Siliqua patula</i>
Lead author for the dataset	Britta Baechler, Dr. Elise Granek
Title and position of lead author	Britta Baechler, PhD student; Dr. Elise Granek; Professor, Portland State University
Organization and address of lead author	Portland State University Environmental Science & Management PO Box 751 Portland, OR 97207
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¹ This document liberally borrows from a similar document provided by the Environmental Data Initiative
Metadata form for *L&O: Letters*

	¹ Portland State University, Portland, OR; ² Oregon Department of Fish and Wildlife, Astoria, OR; ³ United States Geological Survey, Tacoma, WA
Organization associated with the data	<i>n/a</i>
Funding	<i>PI: Dr. Elise Granek; Project title: Microplastics in our food? Providing a baseline for microplastic concentrations in the tissues of Oregon's commercially and recreationally important Pacific oysters and razor clams; Funding: Oregon Sea Grant # NA14OAR4170064</i>
License	This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License
Geographic location – verbal description	<i>15 sites along the Oregon coast, USA (9 razor clam sites, 6 oyster grower sites)</i>
Geographic coverage bounding coordinates	<i>46°11'42.15" N, 123°59'38.31 W, 42°27'15.78" N, 124°25'35.12" W</i>
Time frame - Begin date	<i>4/2017</i>
Time frame - End date	<i>3/2019</i>
General study design	Pacific oysters and razor clams were collected from 15 sites during low tide series in spring (April 27-28) and summer (July 21-31), 2017. Whole oysters were purchased from growers at six grower sites during both seasons. One oyster grower was selected from each of six Pacific oyster-producing bays. In this report, oyster grower names are withheld and are coded randomly as OY1–OY6. Razor clams were collected from nine sandy beach sites stretching from Clatsop in the north, to Gold beach. Of the nine clam sites, reported by name, four were sampled in both spring and summer, providing a temporal snapshot of microplastic frequencies. All samples were transported to the Applied Coastal Ecology laboratory at Portland State University (PSU) in Portland, Oregon.
Methods description	<p>All samples were transported on ice to the Applied Coastal Ecology laboratory at Portland State University (PSU) in Portland, Oregon, in clean 2 L glass Mason jars. Shell and tissue measurements were collected with a digital Mitutoyo caliper and Ohaus balance accurate to 0.01 mm and 0.01 g, respectively. Bivalve shells were rinsed with DI water to remove sand, mud, and debris, were shucked into clean 120 mL Mason jars and frozen at -20°C.</p> <p>Samples were thawed and digested for 24 h in a laminar flow fume hood using 10% potassium hydroxide (KOH). Digestion began with the first organism from each site and season, then proceeded to the second organism from each site, until all samples were processed. Samples were poured through a 7.6 cm diameter, 63 µm stainless</p>

	<p>steel sieve. Material retained on the sieve was rinsed into clean, labeled glass petri dishes. Petri dishes with Petristickers® affixed to the bases were placed in a drying oven at 40° C for 24 h and stored in sealed tubs prior to microscope processing. Due to high levels of organic material and sand granules remaining in clam samples after initial digestion, a second 10% KOH digestion combined with hypersaline density separation (330g/L Fisher Chemical Certified ACS Crystalline NaCl) was utilized. Samples were analyzed under a Leica M165C stereomicroscope (10-120x magnification) connected via a Leica IC80 HD camera to a computer running Leica Application Suite X imaging software.</p>
Laboratory, field, or other analytical methods	<p><i>NAME: Each individual specimen was assigned a label for identification after being brought from the field to the PSU lab (Naming convention: SITE-SEASON-SPECIES-SAMPLE NUMBER-SAMPLE TYPE)</i></p> <p><i>SPECIES: Species (Pacific razor clam or Pacific oyster) was determined based on existing knowledge</i></p> <p><i>SAMTYPE: Type of sample was recorded and coded for each individual specimen [C=control, CW= whole razor clam, CT= razor clam tissue only, CG= razor clam gut only, OW= whole Pacific oyster, OT= oyster tissue only, OG= oyster gut only, PB=procedural blank, SA= saline density separation step (razor clams only)]</i></p> <p><i>Sample: Type of sample was recorded (in full text) for each individual specimen [Control= Control; Whole= whole sample (gut & tissue), GUT= gut only sample, TISSUE= tissue only sample, Proced. Blank= procedural blank, Saline= saline density separation step (razor clams only)]</i></p> <p><i>SITE: Sample location was recorded at the date and time of collection. Site names were written for razor clam sites but were coded as OY1-OY6 for Pacific oysters for grower privacy. (OY1-OY6: Oyster site (randomized). CLA= Clatsop Beach; CAN= Cannon Beach; MEA= Cape Meares; AGA= Agate Beach; NEW= Newport South Beach; COO= Bayside North Spit, Coos Bay; BDF= Bastendorff Beach; WHS= Whiskey Creek; GDB= Gold Beach.)</i></p> <p><i>SEASON: Season sample was harvested or purchased in during 2017 was recorded at time of harvest or purchase. (SP= Spring; SUM= Summer)</i></p> <p><i>SH_LEN: Shell length was measured with a digital Mitutoyo caliper and accurate to 0.01mm</i></p>

	<p><i>SH_WID</i>: Shell width was measured with a digital Mitutoyo caliper and accurate to 0.01mm</p> <p><i>FULL_WT</i>: Combined weight of shell and tissue, measured with a digital Ohaus balance accurate to 0.01g.</p> <p><i>SH_WT</i>: Shell-only weight was recorded post-organism shucking in a PSU lab with a digital Ohaus balance accurate to 0.01g.</p> <p><i>BODY_WT</i>: Wet tissue weight was recorded post-organism shucking, measured with a digital Ohaus balance accurate to 0.01g.</p> <p><i>MPNUM</i>: Count of total suspected microplastics found in each sample.</p> <p><i>AVGMPLN</i>: Average length of all suspected microplastics found in each sample. Fibers were measured using a Leica M165C stereomicroscope (10-120x magnification) connected via a Leica IC80 HD camera to a computer running Leica Application Suite X imaging software.</p> <p><i>MINMPLN</i>: Shortest (smallest) maximum length of all suspected microplastics found in each sample. Fibers were measured using a Leica M165C stereomicroscope (10-120x magnification) connected via a Leica IC80 HD camera to a computer running Leica Application Suite X imaging software.</p> <p><i>MAXMPLN</i>: Longest maximum length of all suspected microplastics found in each sample. Fibers were measured using a Leica M165C stereomicroscope (10-120x magnification) connected via a Leica IC80 HD camera to a computer running Leica Application Suite X imaging software.</p> <p><i>MPGT</i>: Calculation dividing total body weight by number of microplastics found in whole organism. Calculation is done for whole-organisms only (as weight was not taken separately for gut-tissue and non-gut tissue samples). Calculation: $MPNUM/BODY_WT$</p>
Taxonomic species or groups	<i>Pacific razor clam (Siliqua patula)</i> , <i>Pacific oyster (Crassostrea gigas)</i>
Quality control	One hundred percent cotton clothing, cotton lab coats, and nitrile gloves were worn at all times during sample processing, digestion, and analysis procedures. All shucking implements and glassware were rinsed three times with deionized (DI) water filtered to 0.22 µm. To quantify procedural contamination, 11 replicates of 50 mL

	<p>filtered DI water were frozen in 4 oz jars and underwent the same digestion and analysis process as organism samples. One procedural blank per week was chemically digested alongside field samples on a randomly generated day. Additionally, three procedural blanks were collected to quantify contamination introduced by the secondary digestion and hypersaline density separation of razor clam samples. During microscope analysis, a petri dish containing filtered DI water was placed adjacent to each sample on the microscope base and left open to the air to quantify airborne contaminants. After sample analysis, the control petri dish was analyzed for microplastics; any particles detected were assumed to be contamination and were measured and categorized.</p> <p>Aside from microplastic contamination prevention quality control, data were reviewed for accuracy.</p>
Additional information	<i>n/a</i>

Table 2. Data dictionary: description of the variables (i.e., columns) in EACH dataset. You must provide sufficient detail for another user to understand and use the data. If there are 10 variables (i.e., columns) in the dataset, then there should be 10 rows in this table that describe each column. Be sure to include all relevant information for your dataset, including the unique identifiers for your dataset or system, dates, replicate numbers, latitude and longitude of sampling locations, etc.

Dataset filename: *MP_Data_Baechler et al_2019.xls*

Dataset description: *For each sample organism: Collection location and season, sample type, species, Biological measurements, number of microplastics, average microplastic length, smallest and largest microplastic detected.*

Column name	Description	Units	Code explanation	Data format	Missing data code
NAME	Organism sample number	n/a	Naming convention: SITE SEASON-SPECIES-SAMPLE NUMBER-SAMPLE TYPE	[Site: OY1-OY6: Oyster site (randomized). CLA= Clatsop Beach; CAN= Cannon Beach; MEA= Cape Meares; AGA= Agate Beach; NEW= Newport South Beach; COO= Bayside North Spit, Coos Bay; BDF= Bastendorff Beach; WHS= Whiskey Creek; GDB= Gold Beach.][Season: SP= Spring; SUM= Summer][Species: R= razor clam; OY= oyster][Sample number: Organism number for site][Sample type: Whole=blank; Gut= -G; Tissue= -T, Procedural blank= PB]	blank cell
SPECIES	Species of sample	n/a	C= control; Clam= Pacific razor clam; Oyster= Pacific oyster; PB= procedural blank, SA= saline density separation step (razor clams only)	[see code explanation]	blank cell
SAMTYPE	Type of sample: Species-specific	n/a	C=control, CW= whole razor clam, CT= razor clam tissue only, CG= razor clam gut only, OW= whole Pacific oyster, OT= oyster tissue only, OG= oyster gut only, PB=procedural blank, SA= saline density separation step (razor clams only)	[see code explanation]	blank cell
Sample	Type of sample: Not species-specific	n/a	Control= Control; Whole= whole sample (gut & tissue), GUT= gut only sample, TISSUE= tissue only sample, Proced. Blank= procedural blank, Saline= saline density separation step (razor clams only)	[see code explanation]	blank cell
SITE	Site sample was collected from	n/a	OY1-OY6: Oyster site (randomized). CLA= Clatsop Beach; CAN= Cannon Beach; MEA= Cape Meares; AGA= Agate Beach; NEW= Newport South Beach; COO= Bayside North Spit, Coos Bay; BDF= Bastendorff Beach; WHS= Whiskey Creek; GDB= Gold Beach.	[see code explanation]	blank cell
SEASON	Season sample was collected in	n/a	SP= Spring; SUM= Summer	[see code explanation]	blank cell
SH_LEN	Shell length	mm	n/a	number	blank cell
SH_WID	Shell width	mm	n/a	number	blank cell
FULL_WT	Full weight of shell and body (wet weight)	g	n/a	number	blank cell
SH_WT	Weight of shells only	g	n/a	number	blank cell
BODY_WT	Weight of body tissue only (wet weight)	g	n/a	number	blank cell
MPNUM	Number of microplastics in sample	n/a	n/a	count	blank cell
AVGMPLEN	Average microplastic length for sample	mm	n/a	average number	blank cell
MINMPLEN	Smallest microplastic found in sample	mm	n/a	number	blank cell
MAXMPLEN	Largest microplastic found in sample	mm	n/a	number	blank cell
MPGT	Number of microplastics per gram of organism tissue	n/a	Calculation of MPNUM/BODY_WT. Will be left blank if no body weight was collected.	number	blank cell

Table 3. Data provenance

If you used data derived from other sources, provide the information here so future users know where the data came from. **N/A**

Notes and Comments: **N/A**