User Guide

For the Resilient Coasts for Salmon Interactive Map

Prepared by the Resilient Coasts for Salmon team
Last Revised: January 2026

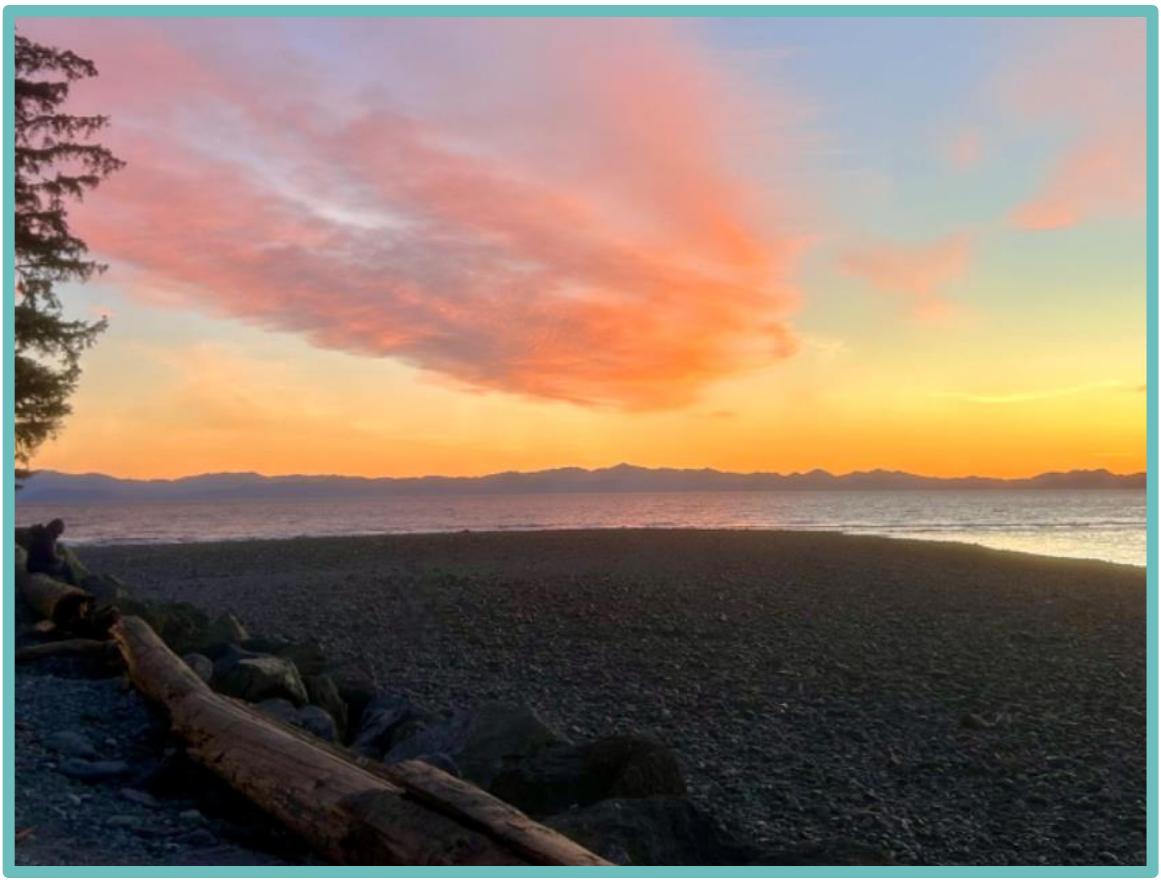

Photo Credit: Taylor Gardiner

This guide is designed to help you navigate the Resilient Coasts for Salmon Interactive Map with ease and optimize your interactive experience. Our goal for this map is to support the analysis of coastal environments, helping to better understand, protect, and restore these vital ecosystems.

If you have feedback or would like to contribute relevant datasets, we invite you to share your insights through our User Survey. To learn more about the map's features, explore the user guide below.

PACIFIC SALMON FOUNDATION

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Table of Contents

Icons

This map offers several tools to help you navigate the data. You can access them through the icons on the left-side toolbar. A detailed walkthrough of each tool is provided below.

Home

This is your starting point. The Home page in the left sidebar provides a quick overview of each icon tool.

Layers List

Click on this icon to navigate the layers and select which datasets to "activate" (display on the map).

The layers are categorized into three groups:

1. Resilient Coast for Salmon Layers
2. External Layers
3. Boundaries

If you are unable to see any of the layers, try viewing the interactive map in a different web browser (e.g., Google Chrome). If the issue persists, please contact us at marinedatacentre@psf.ca.

Click the › button on the left side of each layer group to expand the list of available layers. Only a few layers are activated by default. You can activate or deactivate layers simply by clicking the checkbox ☑ / ☐ next to their name. You can also activate/deactivate the entire layer group if you please.

Note: Some datasets may take time to load due to their size. If a layer does not appear within a minute, first confirm that the parent group is activated, then refresh your browser and try again.

Helpful Tips:

- If you're looking for a specific layer you can type the keyword into the **search bar** 🔍 on the top right corner of the Layers List.
- This map offers a handful of layers, and depending on your interests, you may want to **rearrange** them to better view overlapping features. To do this, click and drag the ⠿ button.

Click on the three dots • • • on the right side of the layers to display additional capabilities:

- **Zoom to** – Focus the map on the layer's full extent.
- **Transparency** – Adjust the transparency to better view overlapping data.
- **Set Filter** – Narrow down visible features by creating custom filters.
- **Add to Table** – Display the dataset in the attribute table.

For quick reference to the legend you can click the  button next to the layer title. However, you can also access the full map legend via the icon on the left toolbar. See more details directly below.

Legend

Click the Legend icon in the toolbar to display the symbology and descriptions for the layers you have selected from the Layers List. Please note: you will only see the legend for the layers that are currently activated.

Tip: You can also view the legend for individual layers directly in the Layers List by selecting 

For more information on how certain features within the Resilient Coasts for Salmon datasets were defined (e.g., the size range that distinguishes a small marina from a large marina), please refer to our Data Dictionary.

Feature Info

To view detailed information about a particular feature, click directly on its symbol on the map. The feature will be highlighted in blue, and its attribute fields will appear in a pop-up window.

For the best experience, use the Feature Info icon in the left toolbar to view this info in the side panel.

Important: The sidebar and pop-up window also include a link to their corresponding page on the Marine Data Portal. Here, you can explore additional information about each dataset (such as metadata, data dictionaries, and authorship) and download the data if needed. To access the link, scroll down within the pop-up and click the **Access Layer Data** button.

In the top right corner of the Feature Info pane, the four dots  display additional capabilities:

- Current (Selected Feature)
  - **Zoom to** – Centers and zooms the map to the selected feature.
  - **Pan to** – Moves the map to center on the feature without changing zoom.
  - **Show on map** – Highlights the selected feature on the map and zooms.
  - **View in table** – Displays the specific feature in the attribute table.
- All data (Entire Layer)
  - **Set Filter** – Narrows down visible features using custom filters.
  - **Zoom to** – Adjusts the map to show the full extent of all features in the dataset.
  - **Pan to** – Pans the map to the geographic center of the dataset.
  - **Add to Table** – Displays the dataset in the attribute table.

Shoreline Imagery

The Resilient Coasts for Salmon layers were built using a boat-based imagery dataset of over 60,000 photos. You can access this dataset by following the steps below:

1. Click the Shoreline Imagery icon in the left toolbar to open the navigation instructions.
2. Click the yellow button at the bottom of the sidebar. This will load a viewing screen on the map called Mapillary Explorer.
3. Once loading is complete, zoom in on the green track lines that follow the eastern coast of Vancouver Island. Your current zoom level (Z) is displayed in the top right corner of the viewing screen. Continue zooming until Z ≥ 16, or until the photo points change from green to brown.
4. Click on a brown photo point to load an image in the viewing screen.

Once an image is open, you can:

- Drag the image to look around within the scene.
- Zoom in and out using the + and – buttons, or by using your mouse/trackpad.
- Use the arrows to move forward or backward along the shoreline.
- View the image in full screen by selecting the full screen icon ⛶ in the top left corner. Click it again to exit full screen.
- Press the play button to advance through a sequence of images. Select the | button to the right to open additional controls. Here you can adjust the playback speed using the rabbit icon or scroll through the images using the slider.
- Use the share button to copy a link to your current view, or download to save the image.

Note: This widget hosts Mapillary imagery and is currently filtered to display photos uploaded by Mitch Miller, our captain and photographer. If you would like to explore additional street-level imagery beyond this dataset, you can do so directly through Mapillary.

Basemap Gallery

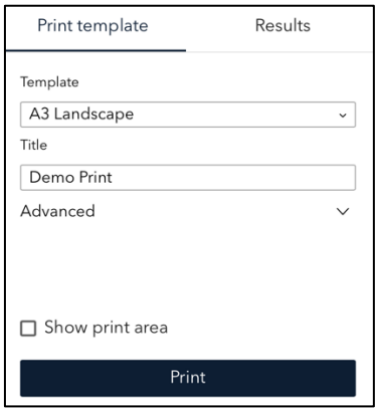
The Basemap Gallery, in the left toolbar, allows you to change the background of the map. You can switch between different basemaps (such as Imagery, Dark Gray Canvas, or Street Map) depending on which best highlights the data you are exploring. The default basemap is Topographic.

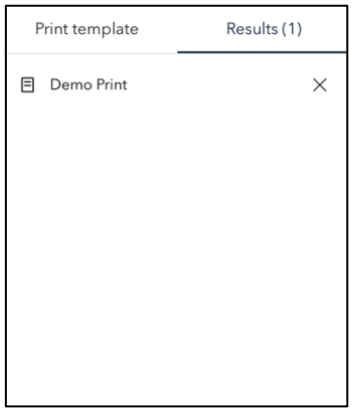
Share & Print

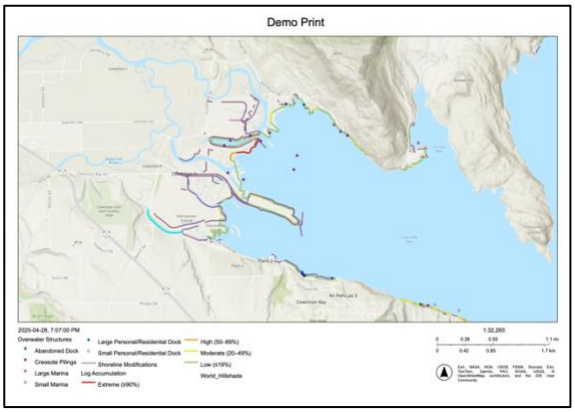
The Share & Print widget makes it easy to share the map with others directly via: Facebook, Twitter, LinkedIn, QR code, Email and/or a copyable link.

You can also create a printable version of the map by following these steps:

- Under the Print Template tab:
  - Select your preferred template (e.g., A3 Landscape, A4 Portrait).
  - Customize the “Title” and adjust the “Advanced” settings as needed.
  - Preview the print area and click “Print”.
- Under the Results tab:
  - Click on your result to open a new window with the PDF version of your map.
  - You can print or download the map from here.







Attribute Table

Each layer has an associated data table that you can view by clicking the Attribute Table button located in the top left corner of the map.

When you click the button, the bottom panel should automatically expand. If not, you can manually open it by clicking the “up arrow”  at the bottom of the map. To adjust the panel’s height, click and drag the top edge of the panel up or down.

By default, you will only see the attribute tables of the layers that are currently activated. To add a layer that is not activated, go to the Layers List, click the three dots ● ● ● next to the layer name, and select “Add to table”.

Within the attribute table, you can click on the heading of the column to order the data alphabetically/chronologically.

Some columns may have non-intuitive naming. If you would like to learn more about the abbreviations on each layer, click the **Access Layer Data** button at the bottom of a pop-up window for the specified layer. This will take you to the Marine Data Portal, that houses addition information and resources pertaining to the layer of interest.

Other Tools

Search Bar

Located in the top right corner of the map, the search bar allows you to find specific places by entering an address, location name, or geographic coordinate.

Compass

Clicking the compass icon in the bottom right corner of the map reorients the map to true north if it has been manually rotated.

Navigation

Use the + and – buttons in the bottom right corner of the map to zoom in or out. You can also zoom using your keypad or mouse.

Home

The home button, in the bottom right corner of the map, will bring you back to the default extent of the map, which displays the project scope on the East Coast of Vancouver Island.

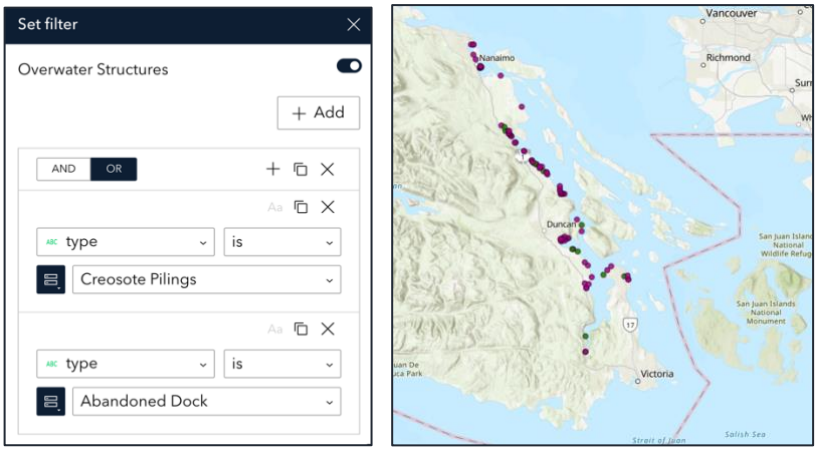
Set filter

Filtering data can be especially useful for researchers or other users looking to refine which features are displayed on the map based on specific attribute values in a layer. This option can be found within the Layers List or Feature Info Pane by clicking the • • • or ⁘ respectively.

How to set a filter:

1. **Click the "Add" Button** – Start by adding a new **clause** (a single filter) or a **clause set** (a group of conditions joined by AND/OR logic).
2. **Choose an Attribute** – Select a field from the layer (e.g., "Type" or "Date") that you want to filter by.
3. **Define a Condition** – Choose a logical operator for the attribute (e.g., is not, is between, is greater than).
4. **Select Source Type** – Choose how you will define the filter value:
    - **User Input** – Allows the map user to input a value dynamically.
    - **Field** – Compares one attribute to another within the dataset.
    - **Unique** – Selects from a list of existing, unique values in the dataset (e.g., names or categories).
5. **Enter a Value** – Type or select the value to filter by (e.g., "25" or "2022-11-08").
6. **Activate the Filter** – Use the toggle switch in the upper right corner to apply the filter. Only features that match your criteria will be displayed on the map and in the attribute table.

For example, here I am creating a **clause set** and selecting **Unique** as the source type to filter the Overwater Structures layer, showing only features where the "Type" is “Creosote Pilings” **OR** “Abandon Docks.” With the filter toggled on, the map displays only the overwater structures that match these criteria.



Accessing & Downloading Datasets

Click the button below to access the Resilient Coasts for Salmon datasets in the Marine Data Portal. Here, you can download our data layers in various formats for your use. You’ll also find our protocols, which explain how the data was digitized, as well as the complete data dictionaries that define key terminology.

Access Data Here

To access datasets from external sources, click on a data point within the desired layer on the interactive map. Then, scroll down in the pop-up window (or the Feature Info pane) to find the **Access Layer Data** button. This button should redirect you to layer’s page in the Marine Data Portal.

Data Dictionary

For more information about how these terms were applied in our methods, please refer to our Protocols document within the Resilient Coasts for Salmon Marine Data Portal.

abandoned dock: Dock that is no longer used, maintained, or in service. Abandoned docks can be recognized by the lack of maintenance: overgrown vegetation or accumulation of dirt and debris, deterioration (rotting/decaying wood), or structural instability (weakened/damaged support posts).

agricultural marshland: An area that was historically subject to tidal flooding and natural coastal processes, but was altered and converted, with dykes, ditches, drainage, roads, breakwaters, and other modifications, for agricultural purposes.

anchored (logs): Refers to the logs accumulated on beaches; logs that are secured in place, preventing them from drifting and moving. Can be secured by being trapped and lodged in sediment or held by a rope. Anchored logs are not easily moved by natural forces.

backshore/natural boundary: The zone of the shore lying above the high-water mark (indicated with a yellow arrow). In regards to log accumulation, the natural boundary usually represents the upper limit of where logs would be deposited during storm or king tide events. This zone is typically marked by terrestrial vegetation like shrubs and trees, and possibly a change in slope (e.g. coastal bluff).

basemap: The background map you select when in aerial view (e.g., ESRI Satellite).

beach access/path: A pathway/pedestrian access to the shoreline.

beach wrack: A line of dried seaweeds, kelp, seagrasses, and other debris that gets deposited at high tide.

berm/dike: For this project, berm is used interchangeably with the term dike and is defined as a human-made structure designed as a barrier to prevent flooding by the sea. Berms can take the form of raised mounds of fill, like compacted soil, ridges, walls, or embankment. Berms are typically built to protect industrial activities occurring on converted estuarine habitat, like agriculture and logging operations.

boat ramp: Ramps for boats, kayaks, and other vessels to access the ocean; usually made of poured concrete.

breakwater: A barrier that provides an area of reduced wave energy, commonly for harbors and marinas (ShoreZone). Can be oriented perpendicular or parallel to the shore.

coastal modification: Any human-made feature that can impact natural coastal processes or contribute to coastal squeeze. This includes walls that have been built to protect land along the coast from the sea (e.g., bulkhead/seawall/riprap), freestanding structures like homes built below the natural boundary, boat ramps, and modifications associated with piers and docks, etc. These structures can be made of a variety of materials including concrete, rocks, masonry, wood, etc. Includes hard armouring structures, and more. Used synonymously with shoreline modification.

coastal squeeze: The loss of habitat due to sea level rise where hard structures, like seawalls, prevent habitats from naturally migrating landward.

comments: Comments made by the recorder entering details and an explanation to what was found in the imagery. Use the comments box to record reasoning if low or moderate confidence is selected, or if there are any additional features present in the segment such as a driftwood fort structure.

concrete: A digitization attribute to indicate the material the shoreline modification is made from (e.g., seawall made of concrete).

confidence: Confidence ratings are assigned to indicate the degree of certainty of shoreline features entered in QGIS. Line Features for shoreline modifications will have a confidence rating of either Low, Moderate or High within the field attributes.

creosote (treated) wood: A digitization attribute to indicate that a log on the shoreline is treated with creosote and could have negative impacts to the shoreline ecosystem. Creosote is a coal tar preservative that prevents decay but is toxic and is commonly used in the marine environment.

data source: in the interactive map, the data source is listed in the pop up window to indicate who created and owns the data.

digitiz(e/ation/ing): the process of converting imagery (boat-based and satellite aerial imagery) or ground-truthed visual inspections, into data in QGIS, consisting of line and point feature data. The term classify is often used synonymously.

dike: See berm.

dock: An overwater structure typically used for recreation and to secure boats to. Often, but not always, accompanied by an overwater walkway that connects the dock to the shore. See overwater structures digitization protocol for distinctions of different dock types.

dock associated with boat ramp: A dock associated with a boat ramp. The dock is intended to assist boaters in launching into and out of the water. These are typically associated with public launch sites.

dock (personal/residential – small): Private overwater structures built along the shoreline, typically extending into the nearshore, and serve as a designated space for the access of personal watercrafts or for other uses (e.g., patios, boat sheds, cabins). Small personal/residential docks are privately owned and can hold one or two boats maximum. There are some examples of small docks that are owned by restaurants offering 1-2 spots for guests to visit their establishment. These are considered small personal docks.

dock (personal/residential – large): Private overwater structures built along the shoreline, typically extending into the nearshore, and serve as a designated space for the access of personal watercrafts or for other uses (e.g., patios, boat sheds, cabins). Large personal/residential docks are privately owned and can hold more than two boats.

feature: An object of interest that is being digitized; either a coastal modification structure, overwater structure, or other object. In the interactive map, the primary feature type is listed in the title of the feature pop up window. Often, there may be a secondary feature listed in the pop up window as well, to highlight a less dominant feature that is also present in the digitized line or point feature. e.g. a seawall may be the primary feature, but beach access may be a secondary feature if there are stairs included in that section of the seawall.

ferry terminal: A feature/ structure that provides services for passengers traveling by vessels. Other vessel terminals that are not for public passengers are also included.

floating – not attached to movable stairs: In the context of docks (see definition). Structures designated to float on the surface of the water. A floating structure can be moved locations or removed from the water at any time. These structures are not supported by pilings that are fixed into the sediment, however they may be tethered to the shore with chains, rope or structural arms, but not walkways or stairs. Floating docks can sometimes be found on the shoreline (outside of the water).

floating – attached to movable stairs: In the context of docks (see definition). Structures designated to float on the surface of the water, but are attached to the shore by a walkway/gangway. These structures are not supported by pilings that are fixed into the sediment, however the walkways that attach to them often are supported by pilings.

foreshore: The zone from the low water mark to the high-water mark (indicated with a red arrow).

form: A further descriptor of the feature type that tells you about the particular physical structure or its purpose.

gabion basket: A digitization attribute that indicates the material the shoreline modification is made from. A type of retaining wall. A wirework container structure filled with materials (e.g., rocks).

Google imagery data: Google imagery data utilized in the digitization process uses satellite imagery and aerial photography, including Google Map data from third party providers. E.g., Google Earth can be used to access satellite imagery and allows you to view the shoreline from multiple perspectives, offering a variety of angles and imagery from different years.

ground truth: A digitization attribute indicating whether the segment of shoreline (feature) has been visited and verified in-person.

groyne/groin: A human-made structure built perpendicular (or at an angle) to the shoreline that interrupts natural coastal processes.

halophylic vegetation: Salt-tolerant plants that encounter saline waters either through salt spray, their roots or occasional inundation and can thrive in sandy soils. They typically grow in buffers along estuaries and marine environments. Examples of halophytes include sea asparagus (Salicornia spp.) and sea plantain (Plantago maritima) (pictured), beach pea, dunegrass, and pink sand verbena.

hard armour(ing): A human-made feature that was built with the intention of shielding a property or structure from incoming waves. This includes walls that have been built to protect land along the coast from the sea (e.g. bulkhead/seawall/riprap). These structures can be made of a variety of materials including concrete, rocks, masonry, wood, etc.

herbaceous plants: Herbaceous plants are plants that have no persistent woody stem above ground. For example, grasses and other low-lying vegetation.

industrial overwater structure: An overwater structure that exists for the purpose of industrial activities such as logging, shipping, aquaculture etc. Can include large docks for shipping, shipping platforms for tanks/barges being filled with materials, piers and equipment, or docks associated with aquaculture

activities. In the interactive map, see the 'Comments' attribute to note what kind of structures are present.

intertidal: The area of shoreline between where the water reaches at the lowest low tide and highest high tide during a regular tidal cycle. This area is regularly exposed then submerged during a 24 hour period due to the tidal cycle. Logs are typically deposited on the shoreline at the high tide mark.

jetty: A pier or structure projecting perpendicular from the shore with the purpose of stabilizing a channel, inlet, or harbour (ShoreZone definition). It is also often built to function as a pier for human enjoyment and can exist both perpendicular and parallel to the shoreline. The term is used synonymously with pier and wharf.

landscaping feature: A feature, like this low rock wall (right), that is well above the high-water mark.

line: A code indicating the type of linear feature that is being classified. In the interactive map, Resilient Coasts coastal modification and log accumulation data are shown as line features.

linestring: A geometry type in QGIS for line features.

log accumulation: Areas of the shoreline where logs accumulate – specifically, logs that have escaped industry log booms (that contain cut ends) and naturally sourced logs that have fallen and drifted through natural processes. The log accumulations are measured by the amount of beach that is covered with logs between the high tide line and the backshore/natural boundary. In estuaries, log accumulation is digitized across marsh habitats as well.

Areas of log accumulation are categorized as low (≤19%), moderate (20-49%), high (50-89%), and extreme (≥90%). *Note: log accumulation also represents areas with zero logs present, which would be classified as "low".

logging infrastructure: Any infrastructure constructed for forestry operations that exist along the shoreline and sometimes extend into the nearshore. Includes log sorts and areas of land/water used for sorting, processing, and transporting logs in forestry operations.

managed retreat: the approach to property management in response to sea level rise where infrastructure is physically moved (relocated or reconstructed) further inland in order to prevent risk of damage to those structures by waves, flooding and storms, and/or to reduce the impacts of coastal squeeze on shoreline habitat.

Mapillary: A platform that makes street-level, and ocean-level, images and map data available to scale and helps automate mapping.

marina: A facility built along the shoreline to service and hold multiple boats and watercrafts. In our definitions, small marinas can accommodate up to 50 vessels, and large marinas can accommodate over 50 vessels.

marine riparian vegetation: Vegetation on the backshore that is adjacent to the marine environment. This may include species of grasses, sedges, shrubs, and trees found at or near HHWLT (Higher High Water, Large Tide) water elevation level.

masonry: A digitization attribute that indicates the material the shoreline modification is made from. Masonry typically involves building a structure with materials (e.g., stones, bricks), plastered and bound together.

material: A digitization attribute to indicate the materials that a feature is made with. The recorded notes the most dominant material used.

metal: A digitization attribute to indicate the material the shoreline modification is made from (e.g., metal sheet piles are used to create seawalls/bulkheads). Typical metals used in marine and coastal features include steel, aluminum, and more.

mobile (logs): Logs that are free to move or be transported by people or by natural forces such as currents, tides, or wind.

modified / modified on rocky outcrop: Any human-made feature that can impact natural coastal processes, with distinction made of what type of sediment type the structure is built upon – see 'type' attribute in the coastal modifications layer in the interactive map. If the structure was built on unconsolidated materials, that feature is just called 'modified', whereas if it was built upon a solid rock platform, the distinction was made that the feature was 'modified on rocky outcrop.'

natural (logs): Logs found on the shoreline that originated from forests as fallen trees, often retaining natural characteristics such as root wads and branches. Natural logs are not derived from forestry operations (not processed for market).

nearshore: The zone waterward of where the lowest tide hits the shore, extending out several hundred meters from shore where the majority of wave-breaking and sediment transport occur. Often, logging infrastructure in the nearshore can contribute to log accumulation on the shoreline.

Open Street Map: An open-data map whereby people around the world can contribute and maintain a variety of data.

overwater feature: The data layer described in this document, which includes: docks, piers/wharfs, marinas, ferry terminals, industrial features and free-standing creosote pilings in the nearshore and intertidal zone. The term 'overwater structure' is often used interchangeably.

permanent: In the context of overwater features, permanent is an option of the 'form' attribute to describe structures built along the shoreline to withstand long term use and remain in place indefinitely. Permanent overwater features are commonly anchored with pilings or concrete footings.

phyident: A unique code to identify each shore unit following the format: Region/Area/Phy Unit/Subunit (Physical ident) developed by ShoreZone.

pier/wharf: A long structure often perpendicular to a shoreline (built on the shore and projecting out to the sea, harbour, etc.), where people can walk and/or boats can be tied/moored. Sometimes with structures on it. Terms used synonymously with jetty.

pilings: Logs inserted vertically into the sediment that are either free-standing (often used in forestry operations) or used to support structures (e.g., docks, piers). Can be made of materials like creosote wood, concrete, metal or vinyl/plastic. Pilings are not digitized in this layer – any wood piling on the shoreline

should not be considered part of log accumulation as it did not arrive at that location through natural processes (i.e. it was installed).

point: Vector data used to demark overwater structures.

project regions: Predetermined areas along the east coast of Vancouver Island for the Resilient Coasts for Salmon project, often referred to as Region# or R#.

- Region 1 (R1): Southern Vancouver Island from Victoria to Nanaimo: 2021 and 2022
- R2: Qualicum Beach to Comox: 2023
- R3: Campbell River to Port McNeill 2024
- R4: Small rural areas in between the aforementioned areas: 2025

recorder: The individual that enters the data - either digitizing imagery or visiting the features in person. Observer is used interchangeably.

rock: A digitization attribute that indicates the material the shoreline modification is made from. Rock is often used as riprap.

rocky outcrop/platform: Visible exposure of bedrock, exposed boulders or deposits/geologic formations on the lands surface. Includes natural rocky platforms.

seawall/bulkhead: A retaining structure, often built to protect a property from ocean processes. Often made of reinforced concrete, rock, or wood. Fencing, walls, patios or other barriers can function similarly to a bulkhead (e.g., prevent movement of natural materials on the shoreline), and have been digitized as seawall/bulkheads. The terms seawall, bulkhead and retaining wall are used synonymously.

shore type: Defined by ShoreZone, shore types - also referred to as coastal class - are the dominant structuring process, slope, morphology, substrate, and width character for a shore unit (segment of shoreline) of the intertidal zone (Cook et al. 2017).

shore unit: A shore unit delineates the shoreline into homogeneous stretches. They are separated when there is a large change in a section of shoreline, which can include change in exposure or wave energy, or a change from a beach to a rocky platform. Terminology was created by ShoreZone and the Province of British Columbia.

toe elevation: Where the bottom of structure intersects the beach at the most waterward point.

type: The type of the shoreline modification feature, either Anthropogenic Modified, or Anthropogenic Modified on Rocky Outcrop. See shoreline modification/ shoreline modification on rocky outcrop/platform definition.

uncertain: Used when the observer is unable to confidently say whether there is a presence or lack of creosote treated logs or natural logs in a segment. When there is a lack of clarity in either of these attributes (natural logs and creosote logs) due to the angle or quality of the imagery, the observer will select ‘uncertain.’

value: A code/description entered in the attribute table in QGIS. E.g., Value = C, Description = Continuous.

vertex: Used to define unique segments of a feature, e.g., a multi-line would be composed of different segments with vertexes at each end. Segments can be edited by moving/deleting or creating new vertexes.

wood: A digitization attribute to indicate the material the shoreline modification is made from (e.g., often in the form of cut logs and log debris/driftwood).

Resilient Coasts for Salmon is a collaborative initiative led by the Pacific Salmon Foundation with many valued partners including the Stewardship Centre for British Columbia, World Wildlife Fund - Canada, Peninsula Streams and Shorelines, and others. Resilient Coasts for Salmon is funded in part by the Government of Canada.

RESILIENT COASTS FOR SALMON

GREEN SHORES

STEWARDSHIP CENTRE FOR BRITISH COLUMBIA

PACIFIC SALMON FOUNDATION