Session Process

• **Background on PMEP and Data Tools**

• Hands on exercises to demonstrate use of data tools

• Discussion of data tools

• Demonstration of Map Viewer
Pacific Marine and Estuarine Fish Habitat Partnership

Launched in 2012
Part of the National Fish Habitat Partnership Program

- **Our vision** is for California, Oregon, and Washington to have functional, resilient estuarine and nearshore marine ecosystems that support healthy native fish populations.

- **Our mission** is to provide science, data, and funding to conserve and restore West Coast nearshore and estuarine fish habitat.
Partners

- NOAA
- PSMFC
- The Nature Conservancy
- US Fish & Wildlife Service
- US Forest Service
- Ducks Unlimited
- PFMC
- State of WA
- State of OR
- State of CA

- International Federation of Fly Fishers
- Yurok Tribal Fisheries Program
- National Estuarine Research Reserves
- National Estuary Program
- Institute for Applied Ecology
- Pacific Coast Joint Venture

[Map of the Pacific Northwest with regions highlighted, including the Salish Sea, Central California, and Southern California Bight.]
Strategic Focus

Focuses on estuaries, nearshore, and connectivity

Gathers expertise to synthesize best available information

Develops and compiles new datasets to fill high-priority data gaps in our understanding of fish habitats

Provides targeted funding for high-priority restoration and conservation projects
Conservation on the Ground

PMEP Projects

- **2018**
  - A - Managing European Green Crab in Makah Reservation Estuaries
  - B - Bear River Estuary Restoration - Phase 5
  - C - Yaquina Bay, Oregon Tidal Restoration
- **2017**
  - D - Eel River Estuary and Centerville Slough Enhancement Project
  - E - Elk River Coho Winter Rearing
  - F - Upper Newport Bay Living Shorelines Project
- **2016**
  - G - Columbia-Pacific Passage Habitat Restoration at Megler Creek
  - H - Eelgrass Mapping of the Coos Estuary
  - I - Poole Slough Acquisition, Assessment, and Planning
- **2015**
  - J - Southern Flow Corridor Project
  - K - Spatial and Temporal Analysis of Fish Assemblages in Tidal Estuarine Habitats
  - L - Sullivan Gulch Bottomland Restoration
- **2014**
  - M - Collier Boat Ramp and Jetty Removal
  - N - Restoration of Salt Marsh within the Dabob Bay Natural Area
  - O - Salt River Ecosystem Restoration Project
- **2013**
  - P - Bear River Estuary Project
  - Q - Grays Harbor Derelict Gear Project

PMEP Region

PMEP Scope

http://www.pacificfishhabitat.org/pmep-funded-projects/
Every year, the Pacific Marine and Estuarine Fish Habitat Partnership (PMEP) is able to help fund a handful of projects along the West Coast with support from the U.S. Fish and Wildlife Service and the National Fish Habitat Partnership. See below for project that have received funding since 2012.

**Upper Newport Bay Living Shorelines Project, CA (2017)**

PMEP funding will help to integrate native Olympia oyster habitat restoration into a larger multi-species restoration project in the bay. The project has added 240 square meters of oyster habitat and 1,280 square meters of eelgrass habitat. The overall goals of this project are to return these historically present but currently depleted species to the area, enhance habitat quality and connectivity for fish and wildlife, improve water quality, control erosion, and help adapt to sea level rise.

**Elk River Coho Winter Rearing, OR (2017)**

The Elk River was identified by NOAA Fisheries as important for coho salmon and that the population there is a “High Extinction Risk”. The proposed restoration project will improve juvenile access to Swamp and Cedar Creeks and rearing habitats in these areas, as well as improve the condition of these habitats.

**Eel River Estuary and Centerville Slough Enhancement Project, CA (2017)**

The project will restore aquatic habitat and tidal marsh on diked historic wetlands and coastal streams, improve drainage efficiency and manage sediment loads to enhance agricultural productivity, and reestablish tidal exchange by restoring Centerville Slough and Russ Creek connectivity.

**Poole Slough Acquisition, Assessment, and Planning, Yaquina estuary, OR (2016)**

The project resulted in permanent conservation of 130 acres in the lower Yaquina estuary, containing estuarine, riparian and upslope forest habitats. Now 80% of the McCaffrey and Poole Sloughs are in conservation in perpetuity benefiting a variety of PMEP focal species.
Assessments and Reports

☑ Estuary Nursery Function Data Assessment
☑ Estuary Nursery Function State of the Knowledge Report
Spatial Database – 444 estuaries

- Inventory
- Classification
- Estuary Extent
- CMECS Habitat Types
- Wetland loss rapid assessment
- Wetland loss by habitat type (OR pilot)
PMEP’S DATA TOOLS AND SPATIAL DATA PRODUCTS

Kate Sherman¹, Van Hare¹, Brett Holycross¹
Laura Brophy², Hiroo Imaki³

¹ Pacific States Marine Fisheries Commission
² Estuary Technical Group, Institute for Applied Ecology
³ NOAA Fisheries, NW Fisheries Science Center

Restore America’s Estuaries Conference
December 10, 2018
PMEP’s Scope

Links to estuary level attributes from prior related efforts

444 Estuaries Mapped

PMEP Estuaries by Type
- Lagoonal: 17
- Embayment/Bay: 127
- Riverine: 125
- Major River Delta: 175

PMEP Estuaries by Region
- Salish Sea: 61
- Washington, Oregon, Northern California Coast: 166
- Central California: 110
- Southern California Bight: 104
West Coast Current and Historical Estuary Extent*

*Available in Estuary Explorer & Viewer Tools

- Mapped current and historical extent of estuaries using models of extreme water levels and high resolution elevation data
- Guiding documents helped promote consistency of methods and terminology coast-wide
- Important foundational layer for PMEP’s Spatial Data System
- Extent mapped for each of PMEP’s 444 Estuaries

*Available in Estuary Explorer & Viewer Tools

**PMEP Estuary Viewer**

Spatial data products from the Pacific Marine & Estuarine Fish Habitat Partnership

**PMEP Website**

- Single-click access to national estuarine data
- Announces new data and projects

**CORE COHESIVE PROCESSING METHODS**

**OREGON ESTUARY PROJECT OF SPECIAL MERIT**

- Oregon Coastal Estuarine Research Reserve Inventory Tracking
- Benefits of estuarine estuarine research
- Understanding the complex nature of estuaries
- Importance of estuaries for biodiversity and ecosystem services

**5/15/2014**

**PMEP**
West Coast USA Estuarine Biotic Habitat*

*Available in Estuary Explorer & Viewer Tools

CMECS Biotic Component

- Following methods forged by Oregon, created compatible dataset for Washington and California.
- Guiding documents and help from partners helped us use consistent methods and terminology coast-wide.
- A standardized coast-wide dataset for comparing and contrasting biotic habitat elements.

Santa Ynez River Estuary, CA
National Assessment of Stressors to Estuarine Fish Habitats*

- Conditions of estuaries were analyzed using existing data.
- Indicators of disturbance to habitat health were combined into four categories:
  - River Discharge
  - Pollution
  - Eutrophication
  - Land Cover
- Completed in 2010 and 2015

*Available in Estuary Explorer & Viewer Tools
• Provides an indirect estimate of emergent, scrub-shrub and forested tidal wetland losses for 55 non-lagoonal estuaries spanning the United States West Coast.
• Losses are defined as those areas that were tidal wetlands prior to European settlement, but are no longer tidal wetlands today.
• Areas not identified as current tidal wetlands in the National Wetlands Inventory (NWI) are considered “lost” in this analysis.
West Coast Eelgrass Habitat**

**Available in Estuary Viewer Tool

- Dataset displays eelgrass extent survey data and represents the maximum observed extent of eelgrass.
- Companion dataset summarized eelgrass presence and available data for all 444 estuaries in PMEP’s spatial framework.
- State of the Knowledge report summarizes literature and data availability by PMEP Ecoregion and identifies data gaps.
PMEP Spatial Data Tools

Data Products

Applications

This map viewer highlights spatial data products developed by PMEP to characterize habitats and synthesize information in support of habitat conservation and restoration goal setting. Most of the data presented in this viewer are available for download below.

App Estuary Viewer

PMEP West Coast Estuary Viewer

App Estuaries Explorer

PMEP Estuaries Explorer

This application is useful for quickly comparing estuaries to each other along the coastlines of Washington, Oregon, and California. Using dynamic filters and an interactive map you can find estuaries that meet specific criteria; or estuaries that provide habitat for focal species of interest to you.

www.pacificfishhabitat.org/data
Session Process

• Background on PMEP and Data Tools

• **Hands on exercises to demonstrate use of data tools**

• Discussion of data tools

• Demonstration of Map Viewer
Use case question #1

Which embayment/bay type estuaries on the west coast have a very low / low risk of habitat degradation?
Use case question #1

• Conservation planning
• Restoration project identification
• Review of proposed projects
• Targeting activities to support or fund
• Place your proposed project into a coastwide context
Use case question #2

Which estuaries on the northern Oregon coast (just south of the Columbia) have the most tidal forested wetlands, and where are they located?
Use case question #2

• Conservation and restoration planning
• Searching for sites that contain habitat types in need of protection and or where restoration opportunities exist
• Gaining an understanding of what the predominant biotic habitat types are within a focused area of interest.
Use case question #3

In Central and Southern California, where would tidal wetland restoration most benefit managed fisheries?
Use case question #3

• Habitat conservation targeted to benefit managed fisheries and recovery planning efforts
• Consultations related to minimizing impacts on Essential Fish Habitat
Session Process

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- **Discussion of data tools**
- Demonstration of Map Viewer
Session Process

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• **Demonstration of Map Viewer**
Estuary Viewer application

A mapping application that compliments the Estuary Explorer by providing direct access to PMEP’s west coast wide wide datasets.

- Estuary points
- Current and Historical Estuary Extent
- Estuarine Biotic Habitat
- Indirect Assessment of Tidal Wetland Loss
- Eelgrass presence and maximum observed extent
QUESTIONS?
Data Products

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PMEP Estuaries Explorer

www.pacificfishhabitat.org/data
Nestucca Bay

**PMEP ID:** 2042

**CMECS Physiographic Setting:** Riverine Estuary

**PMEP Region:** Washington, Oregon, Northern California Coast

**Extent Data Source:** OCMP

**Estuary Size:** 1,119.4 hectares

*includes current and historical estuary extent*

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES...
Indirect Assessment of Tidal Wetland Loss
We value feedback and are happy to help partners leverage our data to further habitat conservation and restoration planning goals.

Our GIS team will generally respond to specific questions and requests for help within two business days. Suggestions for how to improve our products and opportunities to collaborate will be brought to our Science & Data Committee to guide and prioritize future work. Thank you for contacting us by email at info@pacificfishhabitat.org or via the feedback form on our website.

Indirect Estimate of Tidal Wetlands Loss Assessment: This map viewer highlights a recent PMEP data product that is in its final review stages. The Tidal Wetland Loss layer provides an indirect estimate of emergent, scrub-shrub and forested tidal wetland losses for 55 non-lagoonal estuaries spanning the contiguous United States West Coast. Losses are defined as those areas that were tidal wetlands prior to European settlement, but are no longer tidal wetlands today. Losses were estimated by comparing the National Wetland Inventory’s mapping of current tidal wetlands to the Pacific Marine and Estuarine Fish Habitat Partnership (PMEP)’s West Coast Estuary Extent mapping. The estuary extent layer represents the likely historical extent of tidal wetlands, so areas not identified as current tidal wetlands in the National Wetlands Inventory (NWI) are considered “lost” in this analysis.

Important limitations to be aware of when interpreting the results of this assessment:
**Tidal Wetland Loss Summary:**

- Retained = 20.4% (134.7 ha)
- Lost = 79.6% (525.6 ha)

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES...
Estuarine Biotic Habitat nested within Current and Historical Estuary Extent
<table>
<thead>
<tr>
<th>Estuary Name</th>
<th>EstuaryID</th>
<th>Data Source</th>
<th>CMECS BC Code</th>
<th>CMECS BC Name</th>
<th>CMECS Level</th>
<th>CMECS BC Setting</th>
<th>CMECS BC Class</th>
<th>CMECS BC Subclass</th>
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</thead>
<tbody>
<tr>
<td>Yaquina Bay</td>
<td>2050</td>
<td>OCMP</td>
<td>2.6.1</td>
<td>Emergent Tidal Marsh</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

480 features 0 selected
Eelgrass Maximum Observed Extent
PMEP West Coast USA Eelgrass Maximum Observed Extent: Yaquina Bay

- Estuary Name: Yaquina Bay
- Current Year: 1978
- Dataset Count: 1
- CMECS Code: 82.5.2.1
- Area Type: Estuary
- Acres: 378.4
- Year1: 0
- Year2: 0
- Year3: 1978
- Year4: 0
- Year5: 0
- Year6: 0
- Zoom to:
PMEP West Coast USA Eelgrass Maximum Observed Extent: Yaquina Bay

- Estuary Name: Yaquina Bay
- Current Year: 1978
- Dataset Count: 1
- CMECS Code: B2.5.2.1
- Area Type: Estuary
- Acres: 378.4
- Year 1: 0
- Year 2: 0
- Year 3: 1978
- Year 4: 0
- Year 5: 0
- Year 6: 0
- Zoom to