The webinar will begin in a few minutes...

1:00pm – Welcome and opening remarks
1:10pm – TIME project overview
1:40pm – TIME project deliverables and scaling up
2:15pm – WRP Regional Strategy Update
2:55pm – Next steps and closing remarks
3:00pm – Adjourn
Welcome

Kristen Goodrich
Tijuana River National Estuarine Research Reserve
Coastal Training Program Coordinator
Moderator

Dr. Dorian Fougeres
California State University, Sacramento
Center for Collaborative Policy
Southern California Office Director
Webinar functionality

• You are automatically muted in the webinar.

• If you have a question/comment, please **type the comment/question** in the webinar control.

• We will answer questions during transitions in the webinar.
Introductions to the team

*Project Coordinator:* Kristen Goodrich  
*Collaboration Lead:* Dr. Dorian Fougeres  
*Applied Science Investigator:* Dr. Jeff Crooks

*Collaborators:*
Dr. Eric Stein & Dr. Steve Steinberg (SCCWRP)  
Greg Gauthier (California Coastal Conservancy)  
Robin Grossinger & Erin Beller (San Francisco Estuary Institute)
NERRS Science Collaborative
Involving intended users throughout the research process from problem definition to results will increase the likelihood that science will be applied.
Next presenter

Dr. Jeff Crooks
Tijuana River National Estuarine Research Reserve
Research Coordinator
Lessons learned

“How to use temporal information to steer wetland recovery”

Issues Assessment
(characterization of issues associated with wetland recovery in the region)

Wetland Case Studies
(use of temporal information and ecosystem service concepts in 6 southern California systems)

Regional:
Southern California

Local:
Tijuana River Valley

Ecosystem Services:
Typology, Tradeoffs, & Visualization

Past
Research & Mapping

Future

Historical Ecology

Tijuana River Valley Recovery Team

TRV Recovery Strategy & Tijuana Estuary Tidal Restoration Program

Other Wetlands & WRP Regional Strategy Update
Historical Ecology

Past

Compilation

Synthesis

Analysis

Reporting

Project trajectory

Collection: completed

Compilation: completed

Synthesis: completed draft

Analysis: beginning stages

Reporting: beginning stages
Current maps and models

Current conditions

Habitat
- Beach and Sand Dunes
- Disturbed
- Fresh Brackish Marsh
- Mesas
- Riparian
- Salt Flat
- Salt Marsh
- Tidal Channel / Mud Flat
- Upland
- Wetland - Upland Transition Zone
- Tijuana River and channels
Climate Understanding & Resilience in the River Valley

- Conduct Vulnerability Assessment
- Develop Climate Adaptation Strategy
- Focus on Sea Level Rise & Riverine Flooding
- Considers Both Built and Natural Environments

Climate Change Future

Coastal and Ocean Climate Applications
Scenario Planning

- Scenario planning embraces **uncertainty**

- Interaction of multiple, **complex** variables

- Scenarios should link the past and present with hypothetical futures. To be **plausible**, each scenario should have the future emerging from the past and present in a **seamless** way

- Scenarios should expand and **challenge** thinking, and convert alternatives into dynamic stories by adding a **credible** series of driving forces and responses
Scenario Development

- Identify Axes
- SLR in all scenarios
- Workshops on physical drivers and habitat responses
Physical Drivers

- River-Ocean Connection
- Sediment Dynamics
- Flooding and Inundation
- Water Residence Time
- Surface- and Ground-Water Salinity

![Diagram showing the effects of tidal flow on the mouth of a river.](image)

- Mostly closed mouth
  - Severe river flooding
- Open lagoon mouth
  - River & coastal flooding
- Closed mouth
  - River flooding
- Mostly open mouth
  - Coastal flooding

- Increased Extreme Flow Events
- Increased Tidal Prism
- Decreased Extreme Flow Events
- Decreased Tidal Prism
Habitat Responses
Modeling for Scenario D

Parameters
166 cm sea-level rise by 2110
20 mg/l suspended sediment concentration
Next presenter

Dr. Julio Lorda
Tijuana River National Estuarine Research Reserve
Post-doctoral Researcher
Ecosystem Services

Those components and processes which are used, required, or demanded from ecological systems for human benefit.

or

The benefits people obtain from ecosystems, including products, functions, and attributes.
Ecosystem Services - Methodology

- Ecosystem services Advisory Group
- Literature review
- Web-survey to researchers and experts
- Web-survey to WRP task forces
Ecosystem Services

- Ecosystem services list (Typology)
  - Habitat-level

- Tradeoffs

- Visualization
Ecosystem Services - Habitats

- Beach and Dunes
- Shallow subtidal
- Eelgrass bed
- Oyster Bed
- Tidal mudflat and channel
- Cordgrass marsh
- Saltflat
- Fresh/brackish marsh
- Ditch grass bed
- River bed and riparian
- Wetland-upland transition zone
- Pickleweed marsh
<table>
<thead>
<tr>
<th>Ecosystem services</th>
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</thead>
<tbody>
<tr>
<td><strong>Nutrient cycling, water purification, and waste treatment</strong></td>
</tr>
<tr>
<td>Breakdown and sequestration of anthropogenic nutrients</td>
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<tr>
<td>Water purification or contaminant dilution</td>
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<tr>
<td><strong>Climate regulation</strong></td>
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<tr>
<td>Local effects on temperature, wind, rainfall, etc...</td>
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<td>Air quality improvement</td>
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<td>Carbon storage/sequestration</td>
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(based on MEA 2005 and McInnes 2013)
<table>
<thead>
<tr>
<th>Ecosystem services</th>
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<tbody>
<tr>
<td>Water regulation</td>
<td>Groundwater recharge</td>
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<td></td>
<td>Direct water supply for livestock and agriculture</td>
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<td>Storm and erosion and control</td>
<td>Shoreline, tidal creek, or river bank stabilization</td>
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<td>Amelioration of flooding</td>
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<td>Soil and sediment retention (e.g., potential offset to sea-level rise)</td>
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*(based on MEA 2005 and McInnes 2013)*
<table>
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<th>Ecosystem services</th>
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<tbody>
<tr>
<td>Genetic, biochemical, and ornamental resources</td>
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<tr>
<td>Genetic resources</td>
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<td>Biochemical, natural medicines, and pharmaceuticals</td>
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<td>Ornamental resources (shells, drift wood, etc.)</td>
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<td>Food and raw materials</td>
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<td>Direct provision of food, or habitat support for edible species</td>
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<td>Support for pollinators of crops</td>
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<td>Raw materials such as fuel (including biofuels), wood, and fibers</td>
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(based on MEA 2005 and McInnes 2013)
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<th>Biological control</th>
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<tr>
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<td>Control of agricultural or livestock pests</td>
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<td>Limit pathogens or vectors of human diseases</td>
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<td>Suppression of noxious weeds</td>
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<td>Support of biodiversity</td>
<td>Support native species</td>
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<td>Support for special-status species (culturally-significant)</td>
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Typology

(based on MEA 2005 and McInnes 2013)
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<tr>
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<td>Nature observation, outdoor recreation, and ecotourism</td>
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<td>Aesthetic value</td>
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<td>Scientific and education</td>
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(based on MEA 2005 and McInnes 2013)
Scenarios - Ecosystem Services Tradeoffs

*Studies in Avian Biology No. 32:198–204*

**ARE SOUTHERN CALIFORNIA’S FRAGMENTED SALTMARSHES CAPABLE OF SUSTAINING ENDEMIC BIRD POPULATIONS?**

*Abby N. Powell*

*A CENSUS OF THE LIGHT-FOOTED CLAPPER RAIL IN CALIFORNIA*

*RICHARD ZEMBAL, U.S. Fish and Wildlife Service, 24000 Avila Rd., Laguna Niguel, California 92677*

*BARBARA W. MASSEY, 1825 Knoxville Ave., Long Beach, California 90815*

*Carbon Sequestration and Sediment Accretion in San Francisco Bay Tidal Wetlands*

*John C. Callaway • Eyan L. Borgnis • R. Eugene Turner • Charles S. Milan*
### Scenarios - Ecosystem Services and Habitat Area

<table>
<thead>
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<tr>
<td>Carbon storage/sequestration</td>
<td>Callaway et al.</td>
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<td>Soil and sediment retention</td>
<td>Vertical accretion</td>
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<td>Callaway et al.</td>
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<td>Mineral accretion</td>
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<td>Support for special-status species</td>
<td>Belding’s Savannah Sparrow</td>
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<td>Powell</td>
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<td>Ridgway’s Rail</td>
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<td>Massey and Zembal</td>
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Scenarios - Ecosystem Services Tradeoffs
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Scenario A

Scenario D
Scenarios - Ecosystem Services Tradeoffs

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Scenarios - Ecosystem Services Tradeoffs

Current conditions

TETRP
Visualization
Visualization

Tijuana_Estuary04, testing web scene
Visualization
Visualization
Lessons learned

“how to use temporal information to steer wetland recovery”

Issues Assessment
(characterization of issues associated with wetland recovery in the region)

Wetland Case Studies
(use of temporal information and ecosystem service concepts in 6 southern California systems)

Regional:
Southern California

Local:
Tijuana River Valley

Ecosystem Services:
Typology, Tradeoffs, & Visualization

TRV Recovery Strategy & Tijuana Estuary Tidal Restoration Program

Other Wetlands & WRP Regional Strategy Update
Next presenter

Greg Gauthier
California Coastal Conservancy
Wetland Recovery Project Manager
REGIONAL STRATEGY UPDATE
WETLAND HABITAT GOALS FOR SOUTHERN CALIFORNIA
REGIONAL STRATEGY 2001

- Regional Goals
- Key Strategies
- County Objectives

- Multi-Year Process
- Member Agencies
- Science Advisory Panel
- County Task Forces

- Work Plan Projects
- Small Community-Based Projects
- Training

- So Cal Wetlands
- Regional Setting
- Wetland Losses
Regional Strategy 2001
Goals

1. Preserve and restore coastal wetland ecosystems

2. Preserve and restore stream corridors and wetland ecosystems in coastal watersheds

3. Recover native habitat and species diversity

4. Integrate wetlands recovery with other public objectives

5. Promote education and compatible access related to coastal wetlands and watersheds

6. Advance the science of wetlands restoration and management in Southern California
Improving Regional Planning of Wetland Ecosystem Restoration and Management in Southern California

Southern California Wetland Recovery Project Science Panel Recommendations

May 15, 2002

Principal Author: Martha Sutula, Ph.D., Southern California Coastal Water Research Project (SCCWRP), Westminster, California

Southern California Wetland Recovery Project Science Panel Members and Contributing Authors:

Richard Ambrose, Ph.D., University of California, Los Angeles, California
John Callaway, Ph.D., University of San Francisco, San Francisco, California
Wayne Ferren, Ph.D., University of California, Santa Barbara, California
Michael Horn, Ph.D., California State University, Fullerton, California
Michael Josselyn, Ph.D., Wetland Research Associates, San Francisco, California
Sharook Madon, Ph.D., Pacific Estuarine Research Laboratory, San Diego, California
Keith Macdonald, Ph.D., Independent Consultant, Seattle, Washington
Kenneth Schwarz, Ph.D., Phillip Williams Associates, San Francisco, California
Eric Stein, Ph.D., PCR Associates, Irvine, California
Stephen Weisberg, Ph.D., SCCWRP, Westminster, California
• Establish quantifiable recovery objectives;
• Develop decision support tools to aid in prioritizing preservation and restoration activities; and
• Implement a regional monitoring program to measure the progress towards objectives.
WMG Statement of Need - 2008

The Wetland Managers Group needs a management framework that will:

- Guide project prioritization, selection and design to reflect regional priorities
- Provide project-specific guidance for practitioners
- Provide a method for assessing progress toward our goals
- Support proactive project solicitation
We are updating the Regional Strategy because:

We have much more data developed over the last decade and a half.

Old goals were not based on integrating past, present and future.

We have developed monitoring systems that will measure progress toward our goals and those systems will help define more specific quantifiable goals.

New ways of thinking about resilience, adaptive management and what restoration means.

WRP is part of the State Wetlands Program Plan – define how our regional efforts relate to and support statewide programs.
Approach for the Regional Strategy Update

Past:
- Historical Ecology

Present:
- Monitoring & Research

Future:
- Climate Change Predictions

Ecosystem functions and services, resilient and dynamic landscapes, landscape trajectory goals, watershed context

Regional Strategy = Quantifiable Objectives + Regional Monitoring Program + Decision-support Tool

ILF Program
- Site Specific Restoration Projects
- Regional Management
Sources of Data/Inputs

**Past**
- USGS Topographic Survey Maps (T-sheets): 1850s coastal maps
- In-depth historical ecology studies
- Coastal Wetland Change Analysis (compares T-sheets to NWI maps)

**Present**
- National Wetland Inventory (NWI) mapping
- Wetland assessments (IWRAP, CRAM)
- Regional status and trends monitoring

**Future**
- Coastal Storm Modeling System (CoSMoS)
- Climate Understanding and Resilience in the Tijuana River Valley (CURRV)
- Habitat Evolution Models (SLAMM, WARMER, MEM)

Wetlands Recovery Project
Regional Strategy 2001
Tasks related to completing the Regional Strategy Update

• Analyze changes in ecological function over time

• Analyze climate change predictions

• Update regional habitat goals

• Develop guidance for selection, design and prioritization of restoration projects

• Define the process and protocols for assessing (IWRAP) and reporting progress (EcoAtlas) on the Regional Strategy

• Develop Regional Strategy products including likely a written document, maps and visualization tools.
Regional Strategy Update Team

- Science Advisory Panel
  - Technical Assistance Grants
- Wetlands Managers Group
  - Work Group
- Wetlands Advisory Group
- Task Forces
- Board of Governors
- Conservancy Staff
Role of the Scientific Advisory Panel

- Standing committee
- Provides ongoing technical support
- Initial focus – development of regional strategy
# 2015 Science Advisory Panel

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>Rich Ambrose</td>
<td>UCLA</td>
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<tr>
<td>John Callaway</td>
<td>University of San Francisco</td>
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<tr>
<td>Josh Collins</td>
<td>SFEI &amp; Aquatic Science Center</td>
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<tr>
<td>Jeff Crooks</td>
<td>Tijuana River Nat. Estuarine Research Res.</td>
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<td>Jeff Haltiner</td>
<td>ESA</td>
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<td>Jason Keller</td>
<td>Chapman University</td>
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<tr>
<td>John Largier</td>
<td>UC Davis</td>
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<td>Shelley Luce</td>
<td>Environment Now</td>
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<td>Brett Sanders</td>
<td>UC Irvine</td>
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<td>Erin Stein</td>
<td>SCCWRP</td>
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<td>Martha Sutula</td>
<td>SCCWRP</td>
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<td>Christine Whitcraft</td>
<td>CSU Long Beach</td>
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Final Products
Final Products

DECISION TREES

SELECTION CRITERIA
Final Products

Southern California Wetlands Recovery Project

Celebrating Fifteen Years

PUBLICATION
Funding Support

**NERRS Science Collaborative:**
Temporal Investigation of Marsh Ecosystems (TIME) - Tijuana Estuary

**U.S. FWS - Landscape Conservation Cooperative:**
Climate adaptation measures
Decision-support tool

**EPA Wetlands Program Development Grant:**
Technical Support for RSU
In-Lieu Fee Program development

**Coastal Conservancy:**
Technical Support for RSU
Science Panel Stipends
Next presenter

Jocelyn Christie, MESM
California Sea Grant Fellow
California Coastal Conservancy
Wetlands Recovery Project
Who, what, when, where, and why.
WHY- *Why create the WAG?*

- The WMG declared need for stakeholder input on the RSU
- To receive feedback from the end-users of the Regional Strategy on products *as they are developed*
- To ensure that RSU products are useful to WRP partners
WHAT - *What will the WAG be doing?*

- Helping the WMG and SAP understand the type of info that’s helpful for restoration projects
- Providing feedback on products created by the SAP and WMG
WHO- *Who will be on the WAG?*

- Wetland professionals, restoration partners, grantees

WHERE- *Where will the WAG meet?*

- Dual meetings will be held for each meeting topic
- North San Diego County and Ventura
WHEN - When will the WAG meet?

~3 Meetings per year

May: foundational goals/guiding principles; target ecosystem functions and services

August: archetypes and habitat typology

November: match contemporary archetypes and habitats to target ecosystem functions and services
Questions?
Closing remarks