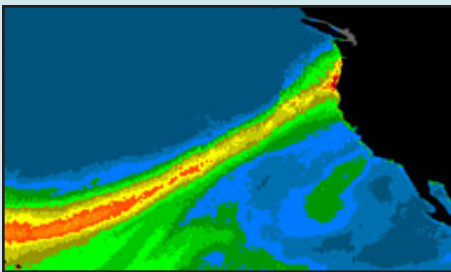


# NOAA

## Habitat Blueprint



Atmospheric Rivers—long lines of rain storms that stream in from the Pacific—often cause flooding in the Russian River watershed.



Lake Mendocino during the 2013 drought.



A frost fan used to prevent or minimize damage to vineyard crops by frost events.

## Russian River Habitat Focus Area Projects are Underway

Several projects that will address the critical needs of the people and fish in the Russian River watershed are now underway. Along with estuary management, monitoring, and habitat restoration, improved meteorological prediction and hydrologic modeling are among the aspects of these projects that seek to balance the needs of all water users. All projects will benefit listed species—particularly salmon and steelhead—but will also provide ecosystem services such as resilient coastal communities. For example, through climate modeling, we will provide tools to help resource managers and the public prepare for a changing climate and sea level rise.

### Develop Reservoir Forecast-Based Operations

There is a great need to incorporate the best physical climate science into weather forecasts to manage reservoirs in the Russian River watershed. NOAA scientists are collaborating with other federal and state agencies to optimize reservoir operations to benefit all stakeholders, including those concerned with protecting fisheries. Developing the science and data to enhance operational flexibility, stream-flow reliability for fisheries, and resiliency to drought will aid in the management of competing water interests.

***Participating NOAA Offices: NOAA Office of Oceanic and Atmospheric Research, NOAA Fisheries & National Weather Service***

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### Improve Frost Forecasting and Protection Methods

The Russian River serves as a source of community drinking water, agricultural irrigation, and fish habitat for many species. In the spring, during frost events, vineyards withdraw water from the streams to spray the budding vines to protect them from damaging frost. Sometimes, water extraction can cause reduced stream flows, impacting aquatic species.

NOAA scientists are working to improve frost forecasting using digital forecast systems. Twenty temperature inversion monitoring towers will be installed to make real-time data accessible to vineyard managers. With advanced notice of frost events, growers can use water more efficiently or rely on other methods, such as fans, to prevent or minimize frost damage. This can reduce the potential streamflow impacts in adjacent tributaries where salmon and steelhead spawn and rear their young.

***Participating NOAA Offices: NOAA Office of Oceanic and Atmospheric Research, NOAA Fisheries & National Weather Service***

## Key Partners Include:

Sonoma County Water Agency

U.S. Army Corps of Engineers

Scripps

Bodega Marine Laboratory

U.S. Geological Survey

Univ. of CA Cooperative Ag. Extension

Gold Ridge Resource Conserv. District

CA Dept. of Fish & Wildlife

Sonoma and Mendocino Farm Bureaus



Russian River Chinook salmon.



The mouth of the Russian River Estuary.

## Study Russian River Tributary Hydrology

Tributary streams of the Russian River watershed vary widely in their geology and hydrology. To understand the complexities of stream-flow patterns, hydrologic investigations and high-resolution modeling are needed to better understand water demand and availability. This project also seeks to define the needs of various salmon life stages, particularly during critical stream flow periods. Ultimately, the goal of this project is to prioritize stream reaches and streamflow restoration projects to reduce uncertainties associated with water availability and help recover salmon and steelhead populations.

*Participating NOAA Offices: NOAA Office of Oceanic and Atmospheric Research, NOAA Fisheries, National Weather Service & CA Sea Grant*

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## Implement Coastal Monitoring Plan

California Endangered Species Act (CESA) and federal Endangered Species Act (ESA) listings require recovery plans that call for monitoring to provide population trends and recovery progress. California Department of Fish and Wildlife's Coastal Salmonid Monitoring Plan is incorporated into both state and federal recovery strategies as the foundation for determining coho salmon recovery status and trend monitoring. This data is crucial to NOAA Fisheries for management of ESA-listed salmon. Through the Russian River Habitat Focus Area, NOAA Fisheries and CA Sea Grant are assisting with data collection, fisheries monitoring, and overall Plan implementation.

*Participating NOAA Offices: NOAA Fisheries & CA Sea Grant*

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## Model Russian River Estuary Water Quality

Estuaries are highly productive juvenile salmon habitat. However, in the Russian River estuary there's a great deal of variability in habitat and food availability due to natural seasonal changes, human-related effects, and management. A quantitative measurement of habitat availability is needed to identify management options and desirable habitat salmon rearing conditions.

*Participating NOAA Offices: NOAA Ocean Service, NOAA Fisheries & CA Sea Grant*

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## Study Climate Change and Sea Level Rise

This project will develop a high resolution simulation model of the Russian River estuary that can be used to examine coastal, hydrodynamic, and environmental conditions. This model will integrate existing data and models on sea level rise projections, future wave climatology, barrier beach and river mouth sedimentations regimes, and Russian River mainstem and tributary flows. We will use the results to increase our understanding of the connection between coastal and watershed processes. Ideally, this integrated model and associated data will be useful for management of estuary resources, guiding habitat restoration, and informing coastal planning.

*Participating NOAA Offices: NOAA Ocean Service, NOAA Office of Oceanic and Atmospheric Research, NOAA Fisheries & National Weather Service*