

# WASHINGTON SEA GRANT

Helping people and marine life thrive through research, technical advice and education supporting the responsible use and conservation of coastal ecosystems.

Eighty percent of Washington residents live along a 3,000-mile coastline that is physically, culturally and economically shaped by the sea. The state's maritime industry employs 69,500 people, generating \$21.4 billion for businesses. Washington's fishing fleets and shellfish farms produce the nation's largest, most prized catches and cultured harvests.

Washington Sea Grant (WSG) works to assure that state residents understand, protect and prosper from our marine riches and are prepared for coastal hazards. With 27 communicators, educators and field agents located in eight coastal counties whose expertise ranges from oceanography and fisheries to economics and urban planning, WSG is uniquely prepared to serve coastal residents.

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"WASHINGTON SEA GRANT EXPERTS PROVIDE SCIENTIFIC AND TECHNICAL ASSISTANCE TO RESOLVE COMPLEX MARINE ISSUES WITH FOCUS ON WIN-WIN SOLUTIONS. BY LEVERAGING SUPPORT, WSG BRINGS ACADEMIC, GOVERNMENT, TRIBAL, INDUSTRY, AND CITIZEN SCIENTISTS TOGETHER TO CONSERVE AND SUPPORT COASTAL ECOSYSTEMS."

*Northwest Yachting Magazine*

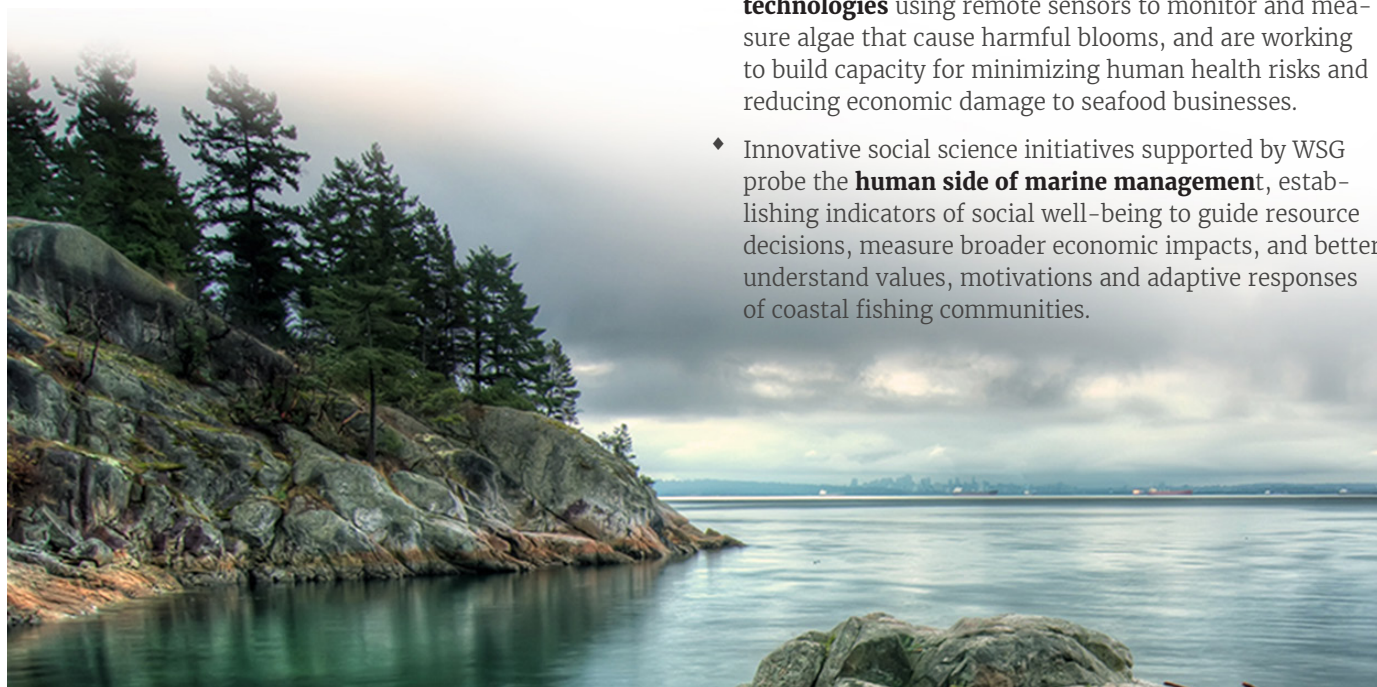
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## RESEARCH

### LEVERAGING SUPPORT, SEEDING TRANSFORMATION

*Washington Sea Grant brings academic, government, tribal, industry and citizen scientists together to answer today's tough questions — and tomorrow's.*

- ♦ Oysters that resist disease and acidified marine waters, sustainable culture of native species, assessment of a changing ocean's impacts on traditional shellfish harvests — all are results of WSG research to support Washington's \$184 million **shellfish economy**.
- ♦ WSG-supported studies suggest **ocean acidification** may cause salmon to lose the sense of smell that they rely on for navigation, finding food and avoiding predators. Understanding these effects is vital to the future of the Pacific salmon fishery.
- ♦ WSG-funded research guides **restoration of Puget Sound habitat**: documenting consequences of seawalls and hardened surfaces for shorelines and the diverse life they support, chronicling Elwha River delta recovery when the dams came down, and piloting salmon-friendly replacement of the \$400 million Seattle seawall.
- ♦ WSG researchers developed new, **inexpensive imaging technologies** using remote sensors to monitor and measure algae that cause harmful blooms, and are working to build capacity for minimizing human health risks and reducing economic damage to seafood businesses.
- ♦ Innovative social science initiatives supported by WSG probe the **human side of marine management**, establishing indicators of social well-being to guide resource decisions, measure broader economic impacts, and better understand values, motivations and adaptive responses of coastal fishing communities.



## OUTREACH

### FINDING WIN-WIN SOLUTIONS

*Washington Sea Grant experts provide scientific and technical assistance to resolve complex marine issues.*

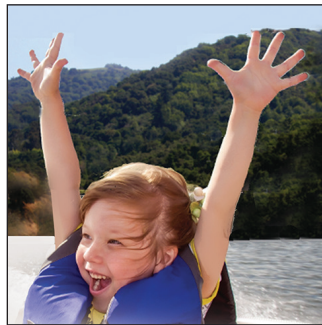
- ♦ WSG brings crab fishermen and tug-and-barge operators together to negotiate **safe, efficient sea lanes** that conserve fuel and prevent costly propeller fouling and lost crab pots. WSG-mediated accords save fishermen and maritime operators about \$1.7 million a year and have opened new fishing grounds.

- ♦ WSG's bird-scaring streamer lines dramatically reduce **seabird bycatch** in Alaska, West Coast, and international



longline fisheries, protecting endangered albatrosses and saving valuable fisheries from closure. Streamer lines in Alaska have saved an estimated 9,400 albatrosses and 141,000 other seabirds in fisheries valued today at nearly \$400 million.

- ♦ **Pumpout Washington**, a WSG partnership with Washington State Parks, prevents dumping of raw sewage from boats and keeps Washington waters clean for recreation, shellfish and wildlife. As a result of water pollution education, boaters diverted a record 10 million gallons of sewage from Washington waters in 2016.



- ♦ WSG leads a broad-based team of scientists, managers and conservation experts focused on strengthening **community resilience to coastal hazards** such as tsunamis and rising sea-levels. The team will fill critical information gaps, evaluate use in coastal planning and restoration, and work with cities and counties to apply findings.

- ♦ WSG Crab Team, a citizen science project with over 200 trained volunteers, tracks the **invasive European green crab** and was first to find the crab in Puget Sound. Working with resource managers, Crab Team coordinates new research, international cooperation and next steps to defend against a destructive invader.



## EDUCATION

### ADVANCING OCEAN LITERACY, MARINE CAREERS AND WORKFORCE DEVELOPMENT

*Washington Sea Grant instills marine stewardship and leadership at every age.*

- ♦ WSG builds **maritime workforce capacity**—and helps commercial and tribal fishermen increase revenues—through technical assistance to improve fish handling and direct marketing.

- ♦ WSG **trains commercial fishermen** in sea safety, rescue, first aid, and weather and marine technologies, making fishing safer and more efficient.



- ♦ Hundreds of WSG-sponsored beachwalks, classes, festivals and school partnerships inspire **young ocean stewards** each year.

- ♦ WSG **fellowships** immerse university students in real-world marine policy, research and communications.

- ♦ **NOAA Science Camp, Orca Bowl and the Experience Maritime Project** launch middle school and high school students on budding careers in ocean science and maritime through hands-on experiences in marine science and boat operations.



### FOR MORE INFORMATION

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