



Oregon Association of Clean Water Agencies (ACWA) Application for Wastewater CEUs for a two-session webinar workshop entitled:

### **2021 ACWA Stormwater Summit**

CEUs requested: Each webinar workshop session has 3 hours of eligible content, equating to 0.3 CEUs per session. A total of 6 hours of instruction--0.6 CEUs—is requested for the two-session workshop.

This document includes the information required to demonstrate eligibility for general CEUs, including: 1) the educational need for the program provided; 2) the learning outcome for attendees; 3) an outline of the course content; 4) the qualifications of the instructors; 5) the time schedule; and 6) the method of tracking on-line attendance for the duration of the workshops.

### **Educational Need and Learning Goals:**

The ACWA Stormwater Summit is convened annually to update stormwater management professionals across the state on current issues and trends impacting their work to protect Oregon's surface water quality. The goal of this workshop is to increase the knowledge and understanding of wastewater and stormwater managers, engineers and operations professionals regarding water quality regulations, water quality challenges, and technologies and operational controls for managing and improving stormwater quality and adapting stormwater management systems and practices to emerging issues of concern.

The course emphasizes science-based information on stormwater pollutants and the effectiveness of stormwater management practices and facilities intended to improve water quality. It also focuses on regulatory compliance pathways and innovation in best management practices centered on low impact, green infrastructure, as well as best management practices to meet pollution reduction objectives. The course also educates attendees regarding emergent issues and challenges that must be addressed through adaptive management, such as climate change impacts and water quality impacts associated with unhoused populations.

A variety of technical experts and experienced practitioners are included in the program as speakers/instructors. The workshop series will be divided into two sessions as described below.

### **Course Outline, Instructor Information and Time Schedule:**

#### **2021 ACWA Stormwater Summit—Day 1:**

**Wednesday, May 12, 2021; 10:30 am to 2:00 pm; with a 30-minute lunch break scheduled at noon.**

10:30 am	<b>Welcome</b> ACWA Stormwater and Groundwater Committee Co-Chairs
10:40 am	<b>Car Tires and Salmon Mortality—Current Findings on 6ppd Quinone in Urban Stormwater and Where We Go from Here</b> Jen McIntyre, Ph.D., Assistant Professor, Washington State University, Puyallup Research and Extension
11:20 am	<b>Climate Change and Urban Stormwater Management in Oregon: Projections, Adaptation, and Resiliency Planning</b> Paul Loikith, Ph.D., Director, Climate Science Lab, Portland State University Heejun Chang, Ph.D., Professor, Department of Geography and Fellow, Institute for Sustainability, Portland State University
12:00 pm—Lunch Break	
12:30 pm	<b>Managing Water Quality Impacts of Unhoused Populations</b> Arlene Chun, M.S., P.E., Stormwater Program Manager, San Bernardino County Public Works
1:15 pm	<b>Floodplains, Endangered Species, and Stormwater—Potential Stormwater Management Implications of Implementing the Biological Opinion on the National Flood Insurance Program in Oregon</b> Sara O’Brien, Executive Director, Willamette Partnership Erin Cooper, Senior NFIP and ESA Integration Specialist, Federal Emergency Management Agency
1:55 pm	<b>Wrap-Up and Quiz for CEUs</b>
2:00 pm	<b>Adjourn until 10:30 am Thursday, May 13th</b>

### **Course Abstracts and Instructor Information:**

#### **Session: Car Tires and Salmon Mortality—Current Findings on 6ppd Quinone in Urban Stormwater and Where We Go from Here**

**Abstract:** Stormwater runoff contains a complex mixture of chemicals that can impact aquatic organisms in surface waters. Effects range from sub-lethal impairments reducing the health and fitness of individuals to acute mortality. Coho salmon are extremely sensitive to stormwater runoff; acute mortality events are documented for urban stormwater impacts on streams every fall when salmon return from the ocean to spawn. The primary responsible contaminant was recently identified as 6PPD-quinone - a chemical derived from a common tire ingredient. This talk will review the history of the pre-spawning mortality phenomenon, explain the discovery of 6PPD-quinone, and describe approaches to solve the problem of this environmental pollutant.

**Instructor:** *Jen McIntyre, Ph.D., Assistant Professor, Washington State University, Puyallup Research and Extension Center*

Dr. Jenifer McIntyre is an assistant professor of aquatic toxicology at the Washington State University’s School of the Environment, a position she has held since 2016. Located at the Puyallup Research & Extension Center and collaborating with the Washington Stormwater Center, Dr. McIntyre’s current research focuses on the ecotoxicology of urban stormwater runoff and the biological effectiveness of green stormwater infrastructure. Prior to her current position, she was a Post-Doctoral Researcher for the WSU Puyallup Research & Extension Center from 2011 to 2016.

Dr. McIntyre holds the following educational degrees:

Ph.D., Aquatic and Fishery Sciences, University of Washington. Seattle, WA.  
M.S., Aquatic and Fishery Sciences, University of Washington. Seattle, WA.  
B.S., Environmental Sciences, Queen's University. Kingston, Ontario, Canada.

**Session: Climate Change and Urban Stormwater Management in Oregon: Projections, Adaptation, and Resiliency Planning**

**Abstract:** This talk will present current climate change science as it relates to impacts on stormwater management in Oregon. First, observed trends in temperature, precipitation, and mountain snowpack will be presented to provide an overview of recent and ongoing changes. Next, the latest projections for future change in these variables throughout the 21st century will be presented, with a regional focus across the state. Finally, some examples of blue-green infrastructure and nature-based solutions to stormwater management will be presented based on recent research in urban and suburban watersheds in Oregon.

**Instructors:**

*Paul Loikith, PhD., Associate Professor, Director of the Climate Science Lab, Portland State University.*

Dr. Loikith is an Associate Professor in the Department of Geography. Prior to serving as in this position, he was an Assistant Professor in the same department from 2015 to 2020. He was a Postdoctoral Scholar at the California Institute of Technology, Jet Propulsion Lab, from 2012 to 2015.

Dr. Loikith holds the following educational degrees:

Ph.D., Atmospheric Science, Rutgers University  
M.S., Atmospheric Science, Rutgers University  
B.S., Meteorology, Rutgers University

*Heejun Chang, PhD., Professor, Geography; Fellow, Institute for Sustainability, Portland State University*

Dr. Chang's research and teaching focus on water sustainability in a changing climate, land cover, and management. He has collaborated with local watershed councils, municipalities, and regional governments across the Pacific, in studying future climate change impacts on water quantity and quality and flood hazards using spatial statistics, social surveys, and process-based modeling.

Dr. Chang holds the following educational degrees:

Ph.D., Pennsylvania State University  
M.S., Seoul National University

B.S., Seoul National University

**Session: Managing Water Quality Impacts of Unhoused Populations**

**Abstract:** Many urban areas in Oregon and across the west are grappling with expanding populations of unhoused communities that live in make-shift camps, often along waterways. Without sanitation and garbage control in many of these locations, water quality impacts, including elevated bacteria in particular, can result. This session will educate Oregon stormwater professionals through case examples and lessons learned from communities in California with significant experience in working to address water quality impacts.

**Instructor:** *Arlene Chun, M.S., P.E., Supervising Engineer, Stormwater Program Manager, San Bernardino County Public Works*

Ms. Chun has managed the County’s stormwater program since 2017. Prior to her work with San Bernardino County, she worked as an Associate Engineer for the Riverside County Flood Control and Water Conservation District for 17 years.

Ms. Chun holds the following educational degrees:

M.S., Environmental Engineering, University of Hawaii at Manoa

B.S., Civil Engineering, University of Hawaii at Manoa

**Session: Floodplains, Endangered Species, and Stormwater—Potential Stormwater Management Implications of Implementing the Biological Opinion on the National Flood Insurance Program in Oregon**

**Abstract:** FEMA and its state and federal agency partners have been working with local and tribal governments and other stakeholders across Oregon to find ways for the National Flood Insurance Program to address concerns related to threatened and endangered species in the state. Implementation of a biological opinion, issued by NOAA Fisheries, requires FEMA to demonstrate that the combined land use impacts of NFIP communities in the regulated floodplain do not create a net loss of habitat for listed species, in terms of water quality, flood storage and attenuation, and riparian habitat. The presenters will share some of the results of this collaborative work, with an emphasis on how implementation of the biological opinion might require changes in stormwater management at the local level.

**Instructors:**

*Sara O’Brien, Executive Director, Willamette Partnership*

Sara O’Brien is Executive Director of the Willamette Partnership, a conservation non-profit focused on building stronger, healthier, and more equitable communities with nature. She assists

communities in Oregon and Washington craft collaborative, community-driven solutions to complex natural resource challenges.

Ms. O’Brien holds the following educational degrees:

M.S., Natural Resources Management, University of Arizona  
 B.A., Anthropology, Grinnell College, Iowa

*Erin Cooper, CFM, Senior National Flood Insurance Program (NFIP) and Endangered Species Act (ESA) Integration Specialist, Federal Emergency Management Agency (FEMA) Region 10’s Mitigation Division (Floodplain Management and Insurance Branch)*

Ms. Cooper’s work is centered around integrating ESA compliance into floodplain management standards for the NFIP in the state of Oregon, the Puget Sound basin, and at the national level. Her experience in floodplain management prior to FEMA stems from multiple related roles in flood recovery and watershed restoration in the Colorado Front Range.

Ms. Cooper holds the following educational degrees:

M.S., Environmental Science, (focused on Applied Coral Reef Ecology), Miami University of Ohio  
 B.A., Hiram College  
 Alumnus, John A. Knauss NOAA Sea Grant Marine Policy Fellowship.

**2021 ACWA Stormwater Summit Day 2:**

**Thursday, May 13, 2021; 10:30 am to 2:00 pm; with a 30-minute lunch break scheduled at noon.**

10:30 am	Welcome ACWA Stormwater and Groundwater Committee Co-Chairs
10:40 am	The Role of Plant-Microbe Associations in Effectively Functioning Green Infrastructure Krista McGuire, PhD. Associate Professor, Biology and Environmental Studies, University of Oregon
11:20 am	Green City, Clean Waters—Philadelphia’s Approach to Implementing Green Stormwater Infrastructure Jessica Brooks, P.E., Director, Green Stormwater Infrastructure Implementation Unit, Philadelphia Water Department
12:00 pm—Lunch Break	
12:30 pm	Wildfires and Water Quality—Post-Fire Response and Planning for Water Quality and Flood Protection Jennie Morgan, Ph.D., Stormwater Program Manager, Rogue Valley Sewer Services Jon Frye, P.E., Engineering Manager, Santa Barbara County Flood Control & Water Conservation District
1:20 pm	The Agricultural and Urban Stormwater Interface—How Agriculture and Urban Areas Can Work Together for Clean Water and How ODA Can Help Marganne Allen, Water Quality Program Manager, Oregon Department of Agriculture
1:55 pm	Wrap-Up and Quiz for CEUs
2:00 pm	Adjourn

## **Session: The Role of Plant-Microbe Associations in Effectively Functioning Green Infrastructure**

**Abstract:** The implementation of stormwater facilities that treat and infiltrate urban runoff biologically is a cornerstone of recent innovations in green infrastructure. Evidence demonstrates that these systems improve water quality and water flow regimes, however, the long-term success of green infrastructure networks will rely on integration of their biological components. The survival and performance of plants in green infrastructure depend on the microbes with which they are associated and the soil media in which they grow. Microbes in GSI are only beginning to be analyzed, but studies suggest they are diverse and functionally significant. In this talk Dr. McGuire will highlight studies from her lab looking at the composition and function of microbes in green infrastructure in New York City and the Pacific Northwest focusing on green roofs and bioswales. She is finding that each type of green infrastructure has its own microbial signature possibly driven by similar microclimate and soil media composition. She is also finding increasing evidence for the role of plant selection in determining the composition of microbes in green infrastructure and that different microbial communities can have unique impacts on plant performance and contaminant degradation. Finally, they have also found that canine urine negatively impacts microbes in ground-level green infrastructure with consequences for nutrient runoff. Together, these results highlight the importance of the plant palette in driving microbially-mediated functions in green infrastructure and how further research is needed to guide design and maintenance plans for optimal multifunctionality in these engineered systems.

**Instructor:** *Krista McGuire, Ph.D., Associate Professor, Biology and Environmental Studies, University of Oregon*

Dr. McGuire joined the University of Oregon faculty in 2019. She is also a Research Associate at the Smithsonian Tropical Research Institute. Prior to teaching at the University of Oregon, she was an Assistant Professor of Biology at Barnard College, Columbia University in New York.

Ms. McGuire holds the following educational degrees:

Ph.D., Ecology & Evolutionary Biology, University of Michigan (Ann Arbor)

B.S., Biology (honors), Spanish minor, Muhlenberg College, Allentown, Pennsylvania

## **Session: Green City, Clean Waters—Philadelphia’s Approach to Implementing Green Stormwater Infrastructure**

**Abstract:** Ms. Brooks will review the City of Philadelphia’s innovations and pioneering approaches in the field of green infrastructure. In 2011, Philadelphia set out on an ambitious 25-year effort they call “Green City, Clean Waters.” The GSI Implementation Unit manages the various methods, including public projects, incentivized retrofits on private property, and stormwater regulations for development sites, which result in decentralized, often vegetated stormwater management systems that can be integrated into the urban landscape. Philadelphia

Water uses many of the traditional green stormwater infrastructure tools used in other communities, such as bioretention facilities and rain gardens, but has also adapted tools, such as the stormwater tree trench, to fit into the streets of Philadelphia. Philly's approach also partners with community groups and non-profits to manage stormwater on public and quasi-public spaces – from streets and parks to schools and vacant lots.

**Instructor:** *Jessica Brooks, P.E., Manager, Green Stormwater Infrastructure Implementation Program*

Jessica Brooks, P.E., is the Manager of the Green Stormwater Infrastructure Implementation Program for the Philadelphia Water Department's Office of Watersheds. Throughout her career, Ms. Brooks has applied her engineering background to a wide range of water resource protection projects from the city block up to the watershed scale. Her primary focus at PWD is developing the Green Stormwater Infrastructure Program, where she designs decentralized, vegetated stormwater management systems that can be integrated into the urban landscape. Ms. Brooks also collaborates with other City departments, community groups, and non-profit agencies to enhance green stormwater infrastructure designs included in a variety of sites, such as streetscaping and park improvement projects.

Ms. Brooks holds the following educational degrees:

B.S., Science and Engineering, University of Pennsylvania  
M.S., Engineering, Northeastern University

### **Session: Wildfires and Water Quality—Post-Fire Response and Planning for Water Quality and Flood Protection**

**Abstract:** Wildfires are happening with increasing frequency and hitting closer to urban areas throughout Oregon. In 2020, a plethora of wildfires threatened urban areas and one, the Almeda fire, burned through 3,200 acres of urban area in Southern Oregon destroying 2,400 structures. In the days following the fire, Rogue Valley Sewer Services initiated meetings to discuss and begin implementing best management practices to protect water quality and monitor impacts of runoff from the burned area on water quality. RVSS, and collaborators, are currently pursuing development of a fire response action plan, to provide guidance in the event of future urban fires. This presentation will discuss RVSS' experience with fire recovery. The impacts of fires are both immediate and long lasting and managing them can extend for years. Santa Barbara, CA has experienced a number of fires in the surrounding area over the past decade plus. Jon Frye from the Santa Barbara Flood Control and Water Conservation District will discuss the relationship between fire, precipitation and flood and the best management practices they implement for ground stabilization following fire. Jon will also touch on the tragic debris flow that followed the Thomas Fire in Montecito.

## **Instructors:**

*Jennie Morgan, Ph.D., Stormwater Program Manager, Rogue Valley Sewer Services*

Jennie Morgan has been the Stormwater Program Manager for Rogue Valley Sewer Services since 2012. As Program Manager she oversees development and implementation of the Municipal Separate Storm Sewer System Phase II permit. A significant portion of her time is spent leading collaborations for revisions to the Rogue Valley Stormwater Design Manual. Since the Alameda fire in September 2020 she has been monitoring water quality impacts and managing implementation of best management practices to protect stormwater runoff. Prior to her role with RVSS, Ms. Morgan worked as an environmental consultant conducting wetland delineations, mitigation monitoring and developing wetland mitigation plans.

Ms. Morgan holds the following educational degrees:

B.S., Environmental Science, Portland State University

M.S., Natural Resources Management, Ohio State University

Ph.D., Environmental Science, Ohio State University

*Jon Frye, P.E., Engineering Manager, Santa Barbara County Flood Control & Water Conservation District*

Jon Frye, P.E., is the Engineering Manager of the Santa Barbara County Flood Control & Water Conservation District and has been there since 1994. He graduated from the University of Illinois with a BS in Civil Engineering. In his time with Santa Barbara County, he has been involved in the local response, recovery, and mitigation efforts of numerous federally declared emergency events, including those caused by wildfire, flooding, and debris flow. His focus the past three plus years has been on the recovery of the Montecito community in the aftermath of the Thomas Fire/1-9 Debris Flow. Finding a positive out of the January 9th debris flow in Montecito in the aftermath of the Thomas Fire is his deep gratitude and appreciation of the group of technical and disaster relief professionals who came and gave so much of themselves to our community.

## **Session: The Agricultural and Urban Stormwater Interface—How Agriculture and Urban Areas Can Work Together for Clean Water and How ODA Can Help**

**Abstract:** Oregon Department of Agriculture is the lead agency to work with agriculture to achieve Oregon's water quality goals. We have several programs that help fulfill this responsibility, including the Ag Water Quality Program, Confined Animal Feeding Operation program, and Pesticide Stewardship Partnerships. Much of ODA's work is accomplished through partnerships, through strategic initiatives in specific watersheds in the state, and by responding to specific concerns raised by the public and partner agencies and organizations. This session will focus on the Ag Water Quality Program and provide an update



on how ODA is approaching these responsibilities and working with partners to track impacts and outcomes. It will also include dialogue with participants on how we can work more closely together to address issues in the agriculture-stormwater interface.

**Instructor:** *Marganne Allen, Water Quality Program Manager, Oregon Department of Agriculture*

Marganne Allen has managed a variety of teams focused on water quality protection and other environmental benefits in Oregon state government since 2006. She has been in her current role as the Water Quality (WQ) and GIS Program Manager for the Oregon Department of Agriculture (ODA) since February of 2020. The ODA WQ program is responsible to work with farmers and ranchers in Oregon to prevent and control water pollution from agricultural activities. The water quality program works closely with soil and water conservation districts (SWCD) and other partners to conduct its work. Prior to this, Marganne worked for the Oregon Department of Forestry leading teams responsible for the education, administration, enforcement, policy, and monitoring of the Forest Practices Act. She has held positions in the United States and New Zealand in land use planning, sustainable business practices, research, and monitoring on a range of soil-water topics, and NEPA analysis.

Ms. Allen holds the following educational degrees:

M.S., Forest Management/Minor Soil Science, Oregon State University  
B.S., Forestry in Forest Hydrology, Oregon State University

**Method of Tracking Attendance for CEU Certification:**

ACWA is conducting the workshop series on the Zoom webinar platform. All attendees will be required to register, and the registration information will include their name, agency, address, and certification number. Each attendee will enter the workshop by clicking on a link sent via email following registration. The host (ACWA) will manually let each attendee into the Zoom on-line sessions and record their attendance. The duration of attendance (in minutes) will be tracked and recorded for each participant and reported by ACWA with the roster.