



9th ANNUAL  
**ENERGY & CONSTRUCTION**  
**BEST PRACTICES SUMMIT**

**SUSTAINING OUR NATION'S INFRASTRUCTURE**

June 18-19, 2014



[cleanenergyexcellence.org](http://cleanenergyexcellence.org)



[constructioncenterofexcellence.com](http://constructioncenterofexcellence.com)



## *Greetings from the Governor*

*June 18, 2014*

I am pleased to extend warm greetings to all of those attending the *2014 Energy & Construction Best Practices Summit: Sustaining Our Nation's Infrastructure*, led by the Center of Excellence for Clean Energy and the Construction Center of Excellence.

I would like to take this opportunity to congratulate all five of the Centers of Excellence - Clean Energy, Construction, Aerospace & Advanced Manufacturing, Homeland Security-Emergency Management, and Marine Manufacturing & Technology - who are partnering to bring you this 9<sup>th</sup> annual best practices summit. I am proud of their hard work, which is bringing national attention to our state and making our centers a national model of excellence. They have helped our Community and Technical College system become a key economic engine for our state and continue to secure millions of grant dollars to strengthen and expand our educational programs. This is exactly the kind of leadership we need to ensure our workforce is well trained for the jobs of today, as well as the emerging jobs of tomorrow.

This year's summit aligns with the National Climate Assessment released by the White House in May. We need urgent action against the threats of climate change, and we need to design a carbon-reduction and clean energy plan that will work for Washington. Today's summit will advance this important conversation by featuring industry experts who will respond to the implications of climate shifts, carbon solutions and workforce impacts. They will help clarify the most pressing issues we face, as well as potential solutions to these problems and the implications on workforce development, such as recruiting, training and retraining needs.

This summit represents the highly successful collaboration of key industries, organized labor, workforce, education, economic development and government partners. I applaud your efforts and hope you will continue to share ideas and best practices, keeping this collaborative endeavor strong and sustainable into the future.

Thank you for coming, and please accept my best wishes for an informative and rewarding event.

Very truly yours,

A handwritten signature in black ink, appearing to read "Jay Inslee".

Jay Inslee  
Governor



# Welcome

Welcome to the 9th Annual Energy and Construction Best Practices Summit, “Sustaining Our Nation’s Infrastructure.” We are shaking the summit up this year by bringing it to a fresh new venue and incorporating fascinating topics and speakers to address our theme. We are especially pleased to have three additional Washington Centers of Excellence join the team this year – Aerospace and Advanced Materials Manufacturing, Marine Manufacturing and Technology and Homeland Security – Emergency Management. Centers are flagship institutions that build and sustain a regional competitive advantage through state sector strategies.

The thought-provoking topics that frame our program were brought to us during the past year from partners and supporters of the Centers of Excellence. Alan Hardcastle, PhD., Senior Researcher for the Washington State University Energy Program, coordinated the program on the Implications of Carbon Constraints for Sustainability, the Economy and the Workforce. The Cascadia Earthquake Preparedness Workshop was brought to us by Matt Cutts, P.E. Critical Infrastructure Program Manager of the U.S. Army Corps of Engineers and Immediate Past President of the Society of Military Engineers (SAME), Portland Post. A special THANK YOU to the subject-matter



**Barbara Hins-Turner, Executive Director**

Pacific Northwest Center of Excellence for Clean Energy  
“A Centralia College Partnership”

expert speakers and panelists for sharing your knowledge and expertise to keep us abreast of these intricate topics!

We are pleased that Bob and Judy Guenther are again hosting our signature crab feed and scholarship auction. Since our last summit, we’ve enjoyed awarding energy and construction students in need with tuition, books, child care and student memberships in IEEE Power and Energy Society. Students who have received scholarship auction funds are attending programs at partnering colleges across the state at Peninsula, Grays Harbor, Edmonds, Renton Technical and Centralia Colleges. Special highlights of the year were providing scholarships for the new Energy Entrepreneur Program at Peninsula College and the NewTech Skills Center (high school) solar furnace award at this year’s Apprenticeship Conference. Your contributions are ultimately developing the future workforce for the entire Pacific Northwest region. THANK YOU all for your generosity.

Please visit our Vendor Pavilion for a cup of coffee. It is their donations that help us provide a quality summit at no cost to you, our valued attendees.

We hope you enjoy the summit, gain some new insights and use the forum to add to your network of amazing colleagues!!



**Shana Peschek, Director (Left)**

Construction Center of Excellence  
Renton Technical College

## Governor Inslee’s Executive Order 14-04: Washington Carbon Pollution Reduction and Clean Energy Action

Washington Governor Jay Inslee recently signed Executive Order 14-04 outlining a series of next steps to reduce carbon pollution in Washington state and improve energy independence through use of clean energy. The Executive Order builds upon earlier studies and work groups to take action in seven key areas:

**Carbon emission** – Gov. Inslee has established a Carbon Emissions Reduction Taskforce to provide recommendations on the design and implementation of a market-based carbon pollution program.

**Coal-fired electricity imported from other states (“coal-by-wire”)** – State agencies are directed to work with key utilities to reduce, and eventually eliminate, the use of electrical power produced by coal.

**Clean transportation** – The greatest percentage of carbon emissions come from cars, trucks and other transportation-related sources. The state Department of Transportation will lead an effort with other agencies and governments to promote strategies, policies and investments that support electrification of our transportation system, lower-emission multi-modal options, and clean fuels.

**Clean technology** – The state Department of Commerce will work with Washington State University and others on a program to develop and deploy new renewable energy and energy efficiency technologies, including those with an emphasis on solar power.

**Energy efficiency** – One of the most cost-effective strategies for reducing carbon emissions is to use energy more efficiently. The state Department of Commerce is directed to work with WSU and others to significantly improve the energy performance of public and private buildings.

**State government operations** – The state Department of Enterprise Services will lead efforts to achieve carbon reduction and energy efficiency improvements throughout state government including meeting goals established by Gov. Inslee’s Results Washington.

**Carbon pollution limits** – The state Department of Ecology will review the state’s greenhouse gas emission limits and recommend updates.



# Washington State: Leading, Learning and Acting

By Alan Hardcastle, Ph.D.



Alan Hardcastle, Ph.D.,  
WSU Energy Program

**Research Confirms Climate Changes:** Recent global and national reports integrating a large body of climate research underscore conclusions among leading scientists that the effects of climate change are already upon us, and that future climate-based challenges to our economy, environment and society are not just a possibility, but a certainty. Central to the climate change discussion are two important policy questions: How should we move to reverse the anthropogenic causes of climate change; and, how can we adapt to the increasingly-challenging environmental, economic and social conditions we will face in the decades to come?

**Washington Leads:** In Washington State, these questions have long been the subject of debate. State policy discussions and action by the public and private sectors has established Washington as a national and regional leader in addressing climate change and its effects. Governor Inslee's recent Executive Order (14-04) cites additional research on the causes, impacts and effects of climate change on Washington State, and calls for additional

leadership, strategies and coordinated action to reduce carbon pollution and accelerate the development of clean energy solutions. As with prior state energy and environmental policy initiatives, the Executive Order is also significant in its continued emphasis on reducing carbon-based pollution while accelerating investment in new clean energy and efficiency research and development, new technologies, and innovative products and services that address current and future climate challenges while simultaneously spurring new economic development and the creation of good-paying 'green jobs' that will support greater social equity across the state.

**Learning and Acting:** This year's Energy and Construction Best Practices Summit, 'Sustaining our Nation's Infrastructure,' presents an opportunity to hear about the latest climate research and projections, and to learn from industry and government leaders about the likely impacts on key sectors of Washington's economy, the environment and communities. We will explore the solutions and opportunities that lie in public and private-sector innovation, regional policy leadership, and how our state's education and training infrastructure and a skilled workforce will help Washington achieve and sustain a clean energy future.

What are likely to be the effects of climate change on specific industries and how will they adapt to policy changes and shifting environmental conditions? What opportunities exist for developing new, cutting-edge technologies and services that address climate change and can revitalize our economy and communities? How are state education and training providers preparing for a different future that relies on building and nurturing a talented, innovative workforce? What new knowledge, skills and competencies will help Washington achieve its environmental priorities and ensure a prosperous clean energy future for all citizens? These questions are at the core of this year's Best Practices Summit.



**8 – 9 a.m.**

**Registration, Vendor Pavilion Open • HWC**  
Coffee and Continental Breakfast served in Vendor Pavilion

**9 – 9:10 a.m.**

**Opening Ceremony • Corbet Theatre**  
Color Guard, Civil Air Patrol/Lewis County Squadron  
National Anthem, Julie Caukins

**9:10 – 9:20 a.m.**

**President's Welcome • Corbet Theatre**  
Dr. James Walton, President, Centralia College  
Master of Ceremonies Barbara Hins-Turner, Executive Director,  
Center of Excellence for Clean Energy

**9:20 – 10 a.m.**

**Opening Keynote • Corbet Theatre**  
*The Stand-Up Economist: Carbon and the Economy* by Yoram Bauman, Ph.D. the world's first and only stand-up economist.  
Yoram will provide an entertaining and thought-provoking overview of the current science on climate change, the impact on Washington's economy, and the opportunities, solutions and actions that can help the state achieve a prosperous and sustainable future.

**10 – 10:30 a.m.**

**Break**  
Coffee and networking in Vendor Pavilion

**10:30 a.m. – Noon**

**Executive Panel • Corbet Theatre**  
*The Implications of Carbon Constraints for Sustainability, the Economy & the Workforce*  
An executive panel, representing a range of industry sectors, will address implications of the changing climate for the state's economy, sustainability and workforce development.

**Moderator:**  
Alan Hardcastle, Ph.D., Senior Researcher,  
Washington State University Energy Program

**Panelists:**  
David Allen, Executive VP, McKinstry  
Larry Brown, Legislative & Political Director, Aerospace Machinists 751;  
Board Member, State Board for Community and Technical Colleges  
Dr. Ron Langrell, President, Bates Technical College (American College & University Presidents Climate Commitment)  
Keith Phillips, Energy Policy Advisor,  
Governor's Executive Policy Office  
Stacy Smedley, Preconstruction Manager/Sustainability,  
Skanska USA Building

**Noon – 1 p.m.**

**Lunch**  
**Oregon City High School Presentation • HWC**  
**Light Stick Manufacturing**  
Ruslan Volosevych, Yellow Belt Leader,  
and Oregon City High School students  
Dr. Bob Topping, Instructor  
Platinum Sponsor Presentations

**1:15 – 3 p.m.**

**Breakout Sessions in Industry Tracks • HWC**  
Discussion of key learnings and major themes from the day

**Energy • Cafeteria**

**Facilitator:** Arlene Abbott, M. Ed, Consultant, Polar Star Consulting  
Lee Hall, Smart Grid Project Mgr, Bonneville Power Administration  
Chris Janak, Manager Workforce Planning, Puget Sound Energy  
Bill Messenger, WIA Labor Liaison, Washington State Labor Council AFL/CIO  
**Scribe:** Tom Barr, Faculty, Edmonds Community College

**Construction • WSC Lobby**

**Facilitator:** Ann Avary, Director,  
Center of Excellence for Marine Manufacturing & Technology  
David Allen, Executive VP, McKinstry  
Sean Bagsby, Alternative Energy Director, VP,  
Puget Sound Electrical J.A.T.C. Labor Trustee, IBEW Local 46  
Colleen Hall Barta, Director of Development, Institute for Environmental Research & Education (IERE)  
Dan Clarkson, VP Energy Efficiency Finance Corp.,  
Managing Member of Energy Capital Solutions  
**Scribe:** Construction Center of Excellence

**Advanced Manufacturing • WSC 109**

**Facilitator:** Mary Kaye Bredeson, Executive Director, Center of Excellence for Aerospace & Advanced Manufacturing  
Larry Brown, Legislative & Political Director, Aerospace Machinists 751; Board Member,  
State Board for Community and Technical Colleges  
Frank Nichols, CEO/President, Silicon Forest Electronics  
Stacy Smedley, Preconstruction Manager/Sustainability, Skanska USA Building  
**Scribe:** Kelsey Marinoni, Executive Assistant, CoE Aerospace & Advanced Manufacturing

**3 – 3:30 p.m.**

**Break**  
Cookies in Vendor Pavilion

**3:30 – 5 p.m.**

**Wrap-up Session • HWC**  
*What are the top impacts and priorities for each industry?*  
Facilitator reports by industry.  
Reflection: Martha Henderson, Ph. D., Director, Graduate Program on the Environment, The Evergreen State College, and  
Pat McCarty, Generations Manager, Tacoma Power

**5 – 6 p.m.**

**Wine Time and Silent Auction • HWC**  
Silent auction closes 15 minutes after live auction begins.

**6 – 8 p.m.**

**Signature Crab Feed and Scholarship Auction • HWC**  
Hosted by Bob and Judy Guenther

# Why spend a day preparing for the Cascadia Region Subduction Zone Earthquake and Tsunami?

By Matthew Cutts, P.E.



Matthew Cutts, P.E., Master of Ceremonies, June 19.

Two of the highest priorities for the Society of American Military Engineers Portland Post are Promoting Regional Resilience and Strengthening our Student – Industry Link. We are pleased and honored to partner with the Washington Centers of Excellence and the Cascadia Region Earthquake Workgroup to pursue these priorities.

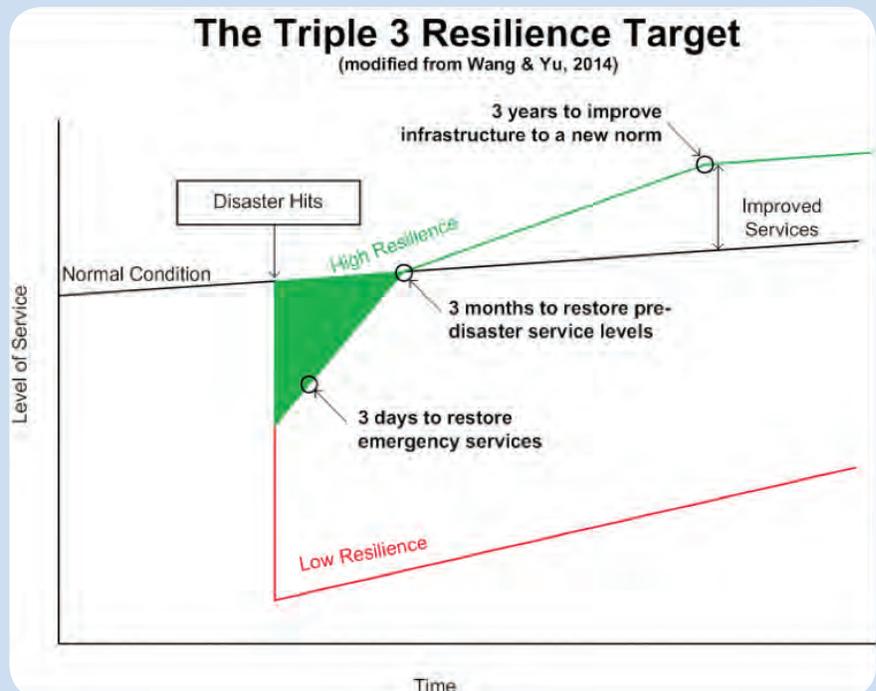
We strive to positively impact students, businesses, public organizations, and our community by enhancing relationships and building the professional competencies of students, those currently in the workforce, and retirees. Our touchstone is contained in our bylaws: “the Post will cooperate with other societies and organizations toward the improvement of the professional status and standards of the engineering, architecture and related professions to foster engineering education and the knowledge of engineering and associated sciences.”

Remember why you have devoted your life to your chosen profession. As a civil engineer, I am trying to make the world a better place, and events like this Cascadia Region Earthquake Readiness Workshop allow me to work toward that goal.

Attending this workshop will contribute to your professional standing, and through your participation you can help build resilience in the Northwest. I encourage all of you to energetically participate in the interactive Breakout Sessions about the Earthquake & Tsunami Impact on Ports and Waterways, Earthquake Impact on Energy Infrastructure, or Emergency Management Earthquake Scenarios. We will use information collected during these sessions to add our input to the existing body of knowledge and worklist to achieve Regional Resilience.

Cascadia Earthquake preparation is a centerpiece for our post – we owe it to our region to lend our expertise to serve our community – and what better way to do that than to call attention to the impending Cascadia Earthquake and resultant Tsunami – and then help plan how the region should take action to proactively address this threat to our population and our economy?

The Triple 3 Resilience Target was proposed by Yumei Wang & Kent Yu in their paper Resilience Engineering Frameworks: Adapting to Extreme Events. They observe that the traditional focus for U.S. civil engineers is on life safety, not on performance of critical infrastructure systems – with insufficient regard to interdependencies on other systems or the consequences of system failures on community disaster recovery. The Triple 3 Resilience Target illustrates how low resilience leads to long disaster recovery while high resilience leads to faster disaster recovery. The green resilience triangle depicts minimal service disruption that can be achieved through highly resilient infrastructure.



# Day 2 • June 19, 2014: Cascadia Earthquake Readiness Workshop Agenda

## Seminar Description:

A catastrophic earthquake of magnitude 9.0 or a series of earthquakes ranging from 8.0 to 9.0 will hit the Pacific Northwest. It's not a question of IF this will occur, but WHEN. The Cascadia Subduction Zone spans the west coast from northern California to Vancouver, British Columbia. It has produced more than 40 large magnitude earthquakes in the past 10,000 years. The most recent full-rupture zone quake occurred 314 years ago with an estimated magnitude 9. History has shown that these large quakes occur every 300 to 500 years and scientists tell us we're due.

Buildings and bridges will collapse, dams and energy systems will fail, all modes of transportation will cease, and many people will perish when the big Cascadia quake hits. Our region's infrastructure will remain poorly prepared to meet the threat unless we start taking action. Is our workforce prepared to inspect, reinforce, and rebuild?

### 8:30 – 9 a.m.

#### Registration, Vendor Pavilion Open • HWC

Coffee and Continental Breakfast served in Vendor Pavilion

### 9 – 9:15 a.m.

#### Welcome, Jim Lowery, Centralia College Trustee • HWC

*Master of Ceremonies: Matt Cutts, P.E., Critical Infrastructure Program Manager, U.S. Army Corps of Engineers, Portland District; Immediate Past President, SAME Portland Post; Captain, U.S. Coast Guard (ret.)*

### 9:15 – 9:30 a.m.

#### Legislative Perspective • HWC

*Sara Crumb, State Director, or Dena Horton, SW Washington Outreach Director for Senator Maria Cantwell (WA-D)*

### 9:30 – 10:15 a.m.

#### Executive Panel • HWC

#### The Current Preparedness State of Transportation, Ports, and Energy Infrastructure in the Pacific Northwest

Response to and recovery from a catastrophic incident such as the Cascadia Earthquake will overwhelm local and state resources. In the event of an extreme event, sectors will join forces to respond. Many disparate private and public organizations are key elements of our local economies and/or operate and maintain critical infrastructure in the Pacific Northwest. The Federal Emergency Management Agency, Washington Emergency Management Division, Oregon Office of Emergency Management, and Portland Bureau of Emergency Management are working together with the private and public sectors to plan for and recover from a catastrophic event.

#### **Moderator:**

*Matt Cutts, P.E., Critical Infrastructure Program Manager, U.S. Army Corps of Engineers, Portland District; Immediate Past President, SAME Portland Post; Captain, U.S. Coast Guard (ret.)*

#### **Panelists:**

*Robert Ezelle, Director, Washington State Emergency Management*

*Pat Massey, Regional Director, National Preparedness Division, FEMA Region X*

*Dave Stuckey, Director, Oregon Office of Emergency Management*

### 10:15 – 10:45 a.m.

#### Break

Coffee and networking in Vendor Pavilion

### 10:45 – 11:30 a.m.

#### Panel Discussion, the Triple 3 Resilience Target • HWC

Yumei Wang & Kent Yu recently drafted a paper on resilience engineering frameworks. Panelists in this session will provide their perspective on the paper as related to their area of expertise. The following is an edited excerpt from the paper:

“Because the Northwest lies along an active plate boundary subduction zone, our region is prone to extreme events like earthquakes and tsunamis. Earthquake shaking can last for several minutes, tsunamis can strike with only 15 to 25 minutes of warning, and coastal lands can experience regional subsidence of one to two meters or more.

To save lives and reduce economic losses, we need to learn from past disasters and develop resilience engineering frameworks to adapt to these extreme events. For this purpose, engineers need to move the performance goal beyond life safety to resilience, while resilience engineering frameworks should be developed to focus on achieving reliable critical infrastructure services. Long range action plans should achieve the Triple 3 Resilience Target to meet immediate needs in three days, basic needs in three weeks, and modernized infrastructure with improved services in three years.”

#### **Moderator:**

*Matt Cutts, P.E., Critical Infrastructure Program Manager, U.S. Army Corps of Engineers, Portland District; Immediate Past President, SAME Portland Post; Captain, U.S. Coast Guard (ret.)*

#### **Panelists:**

*Toby Brewer, Chief Dam Safety Engineer, Tacoma Power*

*Eric Heidmann, Chief Security and Continuity Officer, Bonneville Power Administration*

*Deanna Henry, Emergency Preparedness Coordinator, Oregon Dept. of Energy*

### 11:30 – 12:30 p.m.

#### Lunch/Break



# Day 2 • June 19, 2014: Cascadia Earthquake Readiness Workshop Agenda

## Breakout Sessions

### WSC 109

#### SESSION 1: Earthquake & Tsunami Impact on Ports and Waterways

**Current Earthquake Scenario:** While many coastal ports will be flooded by the tsunami, the large ports at Portland, Seattle, Tacoma, and Vancouver B.C. are, fortunately, not in the tsunami inundation zone. However, these and other ports are likely to experience severe currents, which can damage ships and piers within harbors. Also, ports tend to be vulnerable to earthquakes because the ground around and beneath natural waterways often consists of water-saturated soils that become unstable when shaken.

Shipping channels may also be disrupted by a Cascadia earthquake. Sections of the Columbia and lower Willamette rivers, for instance, are likely to be closed to shipping due to underwater landslides and the presence of debris where ground failures have caused parts of structures, such as bridges and electrical transmission towers and lines, to topple into the river.

**Session Focus:** The focus of this session will be a discussion of the improvements necessary to achieve the Triple 3 Resilience Target for water transportation infrastructure, including liquefied natural gas (LNG), considering interdependencies with other sectors. The Session Moderator will guide the conversation between panelists and participants, going through several phases of the Resilience Engineering Framework:

- Conduct gap analysis of Ports and Waterways critical infrastructure with respect to a Cascadia Earthquake & Tsunami, including interdependencies with other sectors;
- Determine viable strategies for reducing the impact of a Cascadia Earthquake & Tsunami; and
- Propose infrastructure improvements for higher resilience to meet the Triple 3 Resilience Target.

#### **Moderator:**

*Ann Avary, Executive Director, Northwest Center of Excellence for Marine Manufacturing & Technology*

#### **Panelists:**

*Dr. Andre Barbosa, Assistant Professor, Oregon State University*  
*Randy Clark, Contingency Planning Security Specialist, U.S. Coast Guard Marine Safety Unit*  
*Pat Corcoran, Coastal Hazards Outreach Specialist, Oregon State University Extension*  
*Mike Ott, P.E., Channels and Harbors Operations Project Manager, U.S. Army Corps of Engineers, Portland District*

**Scribe:** Construction Center of Excellence

**OUTCOME:** Top ten list of recommended Ports and Waterways infrastructure improvements to meet the Triple 3 Resilience Target, including interdependencies with other sectors.

### WSC Lobby

#### SESSION 2: Emergency Management/Earthquake Scenarios (with input from engineers)

It is the responsibility of the state and local jurisdictions to ensure that our communities are safe and protected during emergencies. State and local emergency plans involve the development of realistic, executable contingency plans that are synchronized with all partners and are tested and improved through regular, quarterly exercises. The focus of this session is to discuss how earthquake scenarios (including exercises and training sessions) are currently developed and implemented, and to assess how additional input from engineers and scientists can improve these scenarios.

#### **Moderator:**

*Linda Crerar, Director, Center of Excellence for Homeland Security - Emergency Management (HS-EM), and Paul McNeil, Lead Faculty, HS-EM program,*

#### **Panelists:**

*Jeff Hepler, C.P.G., Readiness Section, USACE Portland District, U.S. Army Corps of Engineers, Portland District*  
*Eric Holdeman, Director, Pacific Northwest Economic Region (PNWER) Center for Regional Disaster Resilience*  
*Dr. Haizhong Wang, Assistant Professor, Transportation, Oregon State University*  
*Scribe: Kelly Hale, Special projects coordinator, Center of Excellence for HS-EM*

**OUTCOME:** Recommended list of action-items to improve current earthquake scenarios. Recommended list of improvements to infrastructure to achieve the Triple 3 Resilience Target.

### Hanson Boardrooms

#### SESSION 3: Energy Education and Training: A Call to Action

*Energy Educators Association Summer Meeting*

The governor has put out a call for carbon pollution reduction and clean energy action through Executive Order 14-04. Energy Educators play a pivotal role in preparing a resilient energy-sector workforce -- facilitating movement toward building a clean energy economy. Let's explore how we answer this call. Join us and share your best educational ideas and materials!

#### **Facilitators:**

*Larry Owens (Shoreline CC)*  
*Carol Lewellen (Edmonds CC)*  
*Tom Barr (Edmonds CC)*  
*Alison Pugh (Edmonds CC)*

## Cafeteria

### SESSION 4: Earthquake Impact on Energy Infrastructure (including hydropower generation facilities and transmission lines)

There are 55 major hydroelectric projects located on the Columbia River and its tributaries. Thirty are federal dams owned by the U.S. Army Corps of Engineers or the Bureau of Reclamation. Twenty five are publicly and privately owned. These give the Pacific Northwest the largest hydroelectric system in the world. What happens when this system, its waterways and highways, the electrical power grid and Oregon's Critical Energy Infrastructure Hub on liquefied soils are threatened?

**Current Earthquake Scenario:** Current Earthquake Scenario: Widespread power outages are expected throughout the Pacific Northwest, and throughout the NW-SW interties which connect the entire west coast grid to Southern California, Arizona and beyond. Dams and power transmission lines will fail; and the electrical grid will go down west of the Cascades. Vulnerable components of substations and transformers will trip off line. A substantial drop in power demand will ripple back to hydroelectric generation facilities, halt power production, and require spillway gate operations to prevent dam overtopping. Emergency generators will experience outages if they are not seismically secured. Liquid fuel deliveries will be delayed by days or months due to bridge, overpass & pipeline failures. Everyone should be prepared to live without electricity, and we all need to take actions to address the identified risks in advance.

**Session Focus:** The focus of this session will be a discussion of the improvements necessary to achieve the Triple 3 Resilience Target for energy infrastructure, considering interdependencies with other sectors. The Session Moderator will guide the conversation between panelists and participants, going through several phases of the Resilience Engineering Framework:

- Conduct gap analysis of critical energy infrastructure with respect to a Cascadia Earthquake, including interdependencies with other sectors;
- Determine viable strategies for reducing the impact of a Cascadia Earthquake; and
- Propose energy infrastructure improvements for higher resilience to meet the Triple 3 Resilience Target.

#### **Moderator:**

*Barbara Hins-Turner, Executive Director, Pacific Northwest Center of Excellence for Clean Energy*

#### **Panelists:**

*Toby Brewer, Chief Dam Safety Engineer, Tacoma Power*

*Dr. Dan Gillins, Assistant Professor, Geomatics,*

*Oregon State University*

*Eric Heidmann, Chief Security and Continuity Officer, Bonneville Power Administration*

*Allison M. Pynch, P.E., G.E., Geotechnical Engineer, Hart Crowser, Inc.*

*Dave Scofield, P.E., Geotechnical Design Section, U.S. Army Corps of Engineers, Portland District*

**Scribe:** *Daniela Todesco, P.E., Senior Engineer, WEST Consultants, Inc.*

**OUTCOME:** Top ten list of recommended Critical Energy infrastructure improvements to meet the Triple 3 Resilience Target, including interdependencies with other sectors.



*The largest hydroelectric system in the world — the jewel of the Pacific Northwest — is located within the Columbia River Basin.*

**2 – 2:30 p.m.**

#### **Break**

Cookies in the Vendor Pavilion

**2:30 - 3:30 p.m.**

#### **Report Out Session • HWC**

*Improving Cascadia Earthquake & Tsunami Emergency Management Scenarios and Improving Resilience of Ports, Waterways, and Energy Infrastructure to achieve the Triple 3 Resilience Target in the Pacific Northwest*

Moderators of Breakout Sessions 1, 2 and 3 will spend approximately 15 minutes summarizing the collective wisdom gathered during their sessions.

This information will be compiled and made available to all workshop participants, and will also be provided to FEMA Region X, the U.S. Army Corps of Engineers, Washington Emergency Management Division, Oregon Office of Emergency Management, Portland Bureau of Emergency Management, Cascadia Region Earthquake Workgroup, the Pacific Northwest Economic Region, and other public and private organizations involved with Cascadia Earthquake and Tsunami readiness, response and recovery.

#### **Closing Comments and Next Steps:**

*Matt Cutts, P.E., Critical Infrastructure Program Manager, U.S. Army Corps of Engineers, Portland District; Immediate Past President, SAME Portland Post; Captain, U.S. Coast Guard (ret.)*

# Energy Educators Association (EEA)

**EEA Mission: To address the challenge of a carbon-constrained world by supporting educators.**

The EEA was formally organized in 2012 through a National Science Foundation (NSF) grant awarded to Edmonds Community College (EdCC) called *Meeting the Challenge of Energy Management in a Carbon-Constrained World*. The grant brought energy efficiency training and curriculum, educator resources and the EEA – an association serving K-16 educators and industry trainers – that offers networking opportunities to build and share energy education best practices.

“The EEA is a *community* of energy educators who work together to improve energy programming across the state,” Barbara Hins-Turner, Executive Director of the Center of Excellence for Clean Energy said. The Center is the connection between industry, labor, economic development and educators (see article about Centers of Excellence).

An EEA board of directors was elected last year and is led by Larry Owens (Ameresco), President; Carol Lewellen (EdCC), VP of Outreach; Tom Barr (EdCC), VP of Events; Alison Pugh (EdCC), Treasurer; and Gail Alexander (Cascadia CC), Archivist. The board has been working on building the association by increasing outreach, recruiting members, and participating in conventions, workshops and meetings. A mission statement was adopted, a web presence was added, and other goals were set.

One of the objectives of the NSF grant and the EEA was to develop and/or enhance curricula for degrees and certificates in energy management for community and technical colleges. Visit <http://cleanenergyexcellence.org/about/nef-grant/energy-management-curriculum> for free course outlines and analysis tools.

The grant also supported the creation of a Career Lattice (found at [cleanenergyexcellence.org/careers](http://cleanenergyexcellence.org/careers)) and skill profiles which will be published and posted this month ([cleanenergyexcellence.org/skill-panel](http://cleanenergyexcellence.org/skill-panel)).

Discussions and presentations which occurred during the spring EEA meeting included South Seattle Community College’s Bachelors of Applied Science in Sustainable Building Science Technology program; Shoreline Community College’s growing solar program, EdCC’s enhanced energy management program, national accreditation opportunities through Interstate Renewable Energy Council, Inc. (IREC); and Cascadia Community College’s integrated education and transferable energy program.

The EEA will meet during the afternoon breakout sessions June 19 to focus on preparing a resilient workforce based on Governor Inslee’s Executive Order 14-04. It is a critical time for energy educators. The order states that energy educators will play a big role in preparing the future workforce to meet the needs of the increase in emphasis on clean technologies. Much of the workforce is about to retire and Inslee has asked the state commerce department, Washington State University and others to develop recommendations for a program that can “develop, demonstrate, and deploy new renewable energy and energy efficient technologies.”

Consider joining the EEA. For information, contact [alison.pugh@edcc.edu](mailto:alison.pugh@edcc.edu) or visit <http://energyeducators.org>.



EEA Board (l-r): Larry Owens, Carol Lewellen, Tom Barr and Alison Pugh (not pictured: Gayle Alexander)



This material is based upon work supported by the National Science Foundation under Grant No. 1002931.

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.



## Day 1, Main Summit Day: Sustaining Our Nation's Infrastructure

### Keynote Speaker

#### Yoram Bauman, Ph.D.

*The Stand Up Economist (standupeconomist.com)*

Yoram Bauman is an environmental economist who is part of the CarbonWA.org effort to bring a revenue-neutral carbon tax to Washington state. Dr. Bauman is the co-author of the two-volume Cartoon Introduction to Economics, the forthcoming Cartoon Introduction to Climate Change, and the 1998 book Tax Shift, which was written with Alan Durning of Sightline Institute. He also helped inspire the revenue-neutral carbon tax in British Columbia. Dr. Yoram has a B.A. in mathematics from Reed College and a Ph.D. in economics from the University of Washington.

#### David Allen

*Principal and Executive Vice President, McKinstry*

David Allen has been responsible for McKinstry's brand development through managing its strategic positioning and overseeing its business development, community relations, and client service activities. Mr. Allen is widely respected for his contributions of creating McKinstry's positioning strategy that has resulted in the firm's national reputation as a leader in integrated delivery of engineered solutions in facility and energy services.

During his 35 years in the design, construction and facility management industry, Mr. Allen has championed countless marketing, client development, and strategic initiatives for his firm, driving its brand value to remarkable heights. In 2009, he played a key role in establishing McKinstry's Innovation Center, a business incubator that brings together like-minded entrepreneurs under one roof to develop revolutionary energy efficiency technologies and services geared toward eliminating waste in the built environment.

Mr. Allen serves on the boards of several industry associations, trade groups, community organizations, and business alliances. In November 2011, Seattle Magazine named him one of the City's Most Influential People.

#### Sean L. Bagsby

*Vice President and Alternative Energy Director, International Brotherhood of Electrical Workers (IBEW) Local 46*

Sean Bagsby also serves as a Labor Trustee for the Puget Sound Electrical Joint Apprenticeship and Training Trust, President of the Electrical Workers Minority Caucus Seattle Chapter, member of the F.A.S.T. Coalition, and Core Team member of the Construction Jobs Equity Coalition.

Mr. Bagsby participates on the Technical Advisory Committees for Cascadia Community College, and Shoreline Community College's Zero Energy Technology Program. He has served on the Technical Advisory Board for the Seattle Vocational Institute Pre-Apprenticeship and Construction Training Program since 2009 and in 2010 was elected Chairman. He has participated as a Core Team Member of the Emerald Cities Seattle Coalition since 2009, and was elected to serve as the Executive Committee Chairman in 2012.

Mr. Bagsby was a Union member of U.F.C.W. Local 1105, then Local 21 for 20 years, and has been a Member of IBEW Local 46 for 14 years. He holds an A.A.S. and B.A.S. in Electronic Engineering Technology from ITT Technical Institute and is a certified C.E.U. instructor.

#### Tom Barr, M.A.

*Energy Management Faculty, Edmonds Community College  
Energy Educators Association board member*

Tom Barr has been teaching energy coursework since 2009. He has experience in designing human-powered agricultural machines, wind energy, and solar-heated buildings. As a Peace Corps volunteer in Ecuador, he worked on solar crop dryers, solar water heaters, biogas digesters, wind-powered water pumps and hydraulic ram pumps. His graduate studies included teaching architectural design. Thereafter for 20 years, Tom worked for architectural firms specializing in health care design. He coordinated construction drawings for institutional buildings, including building envelope, interior build-out, finishes, mechanical/electrical coordination, and construction administration. Concurrently, he collaborated in the design of Songaia Cohousing Community in Bothell, WA – small homes and common amenities in a village-like setting, supporting a low-impact, sustainable lifestyle. Tom holds a bachelor's degree and Masters of Architecture from the University of New Mexico.

## Mary Kaye Bredeson

*Executive Director, Center of Excellence for Aerospace and Advanced Manufacturing, Everett Community College*

Mary Kaye Bredeson, director of the Center since 2005, provides leadership in promoting and maintaining the Center of Excellence as a recognizable and highly valuable component in Washington's economic and workforce development initiatives. She is Chair of the Aerospace Curriculum Alignment Team, Air Washington Executive Advisory Board, and the Washington State Centers of Excellence Board of Directors; and serves as a board member for the Pacific Northwest Aerospace Alliance, Future of Flight Foundation, and Workforce Snohomish.

Prior to the center, Ms. Bredeson was the CIT Program Director for Tulalip Tribes, and Certified Cisco Academy Instructor at Edmonds Community College. She won an Exemplary Leadership Award from the Chair Academy in 2013.

## Larry Brown

*Legislative and Political Director, Aerospace Machinists Union District Lodge 751*

Larry Brown has worked in the aerospace industry for 36 years and for the union for 15 years. Larry has served the Machinists Union – which represents more than 34,000 and hourly employees at The Boeing Company – as a steward, local lodge officer, district council delegate, staff assistant, and union representative. He serves on the Board of the Washington Aerospace Partnership. Larry served as a trustee at Green River Community College for 13 years (from 1998 to 2011), as president of TACTC in 2005-06, and Chair of the TACTC Legislative Steering Committee, 2001-03. He has served on many significant public policy committees over the years. He earned his bachelor's degree in Labor Studies from the National Labor College in Maryland.

## Dan Clarkson

*Vice President, Energy Efficiency Finance Corp. (EEFC)  
Managing Member, Energy Capital Solutions*

Dan Clarkson is an attorney specializing in government relations and corporate and project finance in the energy sector. Mr. Clarkson develops energy efficiency loan programs with local governments, finance options for the commercial sector, and is responsible for all legal aspects of these relationships at Energy Efficiency Finance Corp. In the commercial sector, he developed the legal structure for a utility on-bill repayment program that incorporates credit enhancements from city, state, and federal sources. He developed the legal structure for community funding of energy efficiency projects, focusing on jobs, healthy environment, and a vibrant urban core. EEFC has been part of the U.S. Department of Energy's Financial Technical Assistance Team for ARRA grant recipients, advising state and local governments on credit enhancement programs with private lenders, working on the commercial sector program credit enhancements for commercial PACE for Los Angeles, and has helped structure the financial component of Illinois' investor-owned utility on-bill finance program.

Mr. Clarkson graduated from Harvard Law School in 1990 and worked eight years with the Washington State Department of Ecology, drafting air quality regulations and negotiating environmental agreements. Prior to joining EEFC, Mr. Clarkson co-founded a publicly traded waste-to-clean fuel company, Prometheus Energy, that converts landfill and other waste gases to liquid bio-methane used to fuel transit fleets. With Prometheus, Dan was Vice President, responsible for general corporate and financial transaction legal work and government relations.

## Lee Hall, M.S., M.B.A.

*Smart Grid and Demand Response Manager,  
Bonneville Power Administration (BPA)*

Lee Hall leads BPA's efforts in the Pacific Northwest Smart Grid Demonstration Project, which is managed by the Battelle Memorial Institute. He has been at BPA for 11 years, and has held leadership positions in Information Technology, IT Project Management, and Power Services. Mr. Hall served in the U.S. Navy as a submarine officer. He holds a B.S. in physics from the U.S. Naval Academy, an M.S. in engineering science and an M.B.A. He is a former project management professional, and served as president of the Portland Chapter of the Project Management Institute.

# Biographies

## Colleen Hall Barta

*Director, Development for the Institute for Environmental Research and Education (IERE)*

Collene Hall Barta serves as support staff to the American Center for Life Cycle Assessment (ACLCA) which is the professional society for LCA for the U.S. and Canada, working with the IERE Team to administer the ACLCA annual International Conference.

Ms. Barta is the lead for the Institutes' Life Cycle Communities Program which aligns government with environmental performance and works to embed life cycle thinking in policy, procurement and public works projects. She also works extensively with IERE's Environmental Labeling Program, Earthsure, assisting US companies to obtain their EPD labels.

She has 25 plus years of Economic and Fund Development in the Non-Profit arena.

## Alan Hardcastle, Ph.D.

*Senior Research Associate, Washington State University Energy Program*

hardcast@wsu.edu / 360-956-2167

Alan Hardcastle has more than 20 years of research, policy and consulting experience through public and private-sector clients in industry, organized labor, education, workforce, and economic development. His current research addresses energy industry trends and employment, the impact of smart grid technology on the energy workforce, energy efficiency/energy management education and training, energy sector skill standards, and workforce development for the clean economy.

Dr. Hardcastle holds a Ph.D. in higher education from U.C. Los Angeles. He serves on the advisory board for the Center of Excellence for Clean Energy and is an adjunct faculty member at The Evergreen State College, where he teaches a graduate course on clean energy. His research is available at: <http://www.energy.wsu.edu/ResearchEvaluation/WorkforceDevelopment.aspx>

## Martha Henderson, Ph. D.

*Faculty and Graduate Program of the Environment Director, The Evergreen State College*

The graduate program that Martha Henderson directs includes a curriculum in energy and environmental climate studies. Her professional interests include geography of the Pacific Northwest, landscapes and identity of the Eastern Mediterranean, political ecology of public lands, and the environmental history of wildfire events. She has supervised numerous thesis projects in environmental studies.

## Barbara Hins-Turner, M.B.A.

*Executive Director, Pacific Northwest Center of Excellence for Clean Energy, Centralia College*

Barbara Hins-Turner was appointed to the Washington State Community and Technical College system in 2005 as Executive Director for the Center of Excellence for Clean Energy. Previously, she was employed by Portland General Electric/Enron for 10 years as Corporate University Director and Apprenticeship Coordinator. Ms. Hins-Turner is a member of the Chair Leadership Academy, serves on the Regional Education and Training Center Executive Board and is past chair of the Washington State Centers of Excellence Board of Directors. She previously served 2010-13 on Washington HB2227 Evergreen Jobs Team advising the Governor and Legislature on federal ARRA investments in clean energy; 2008-2012 national Center for Energy Workforce Development Education Committee; 2010 U.S. Department of Education delegation to Germany's Global Sustainable Education Training and U.S. Canada Clean Energy Forums; 2009 National Commission on Energy Policy's Task Force on America's Future Energy Jobs and U.S. Senate Democratic Policy Commission Green Jobs Roundtable.

Ms. Hins-Turner holds a bachelor's and master's degree in Business Administration, Marylhurst University; graduate level certifications as Master Facilitator, Oregon State University; Professional Development, Eastern Oregon University; and International Management, Concordia University.

## Chris Janak, CPCC, ACC

*Manager, Workforce Planning, Puget Sound Energy (PSE)*

Chris Janak has been employed by PSE since 2005, serving in his current role for more than a year. His experience includes workforce planning, staffing & recruiting, job framework & compensation design, leadership development coaching and consulting.

Prior to this position, Mr. Janak served as Credit Risk Manager at PSE, Market Risk and Internal Controls Director at PG & E National Energy Group, and Credit Risk Manager for Merchant Energy Group of the Americas, Inc.

Mr. Janak is a certified Co-Active Coach (CPCC) from the Coach Training Institute, -Associate Certified Coach (ACC) from the International Coach Federation. He holds a Utility Management Certificate from Willamette University, an M.A. in International Trade & Investment Policy from The George Washington University and a B.A. from James Madison University.

## Ron Langrell, Ph.D.

*President, Bates Technical College*

Ron Langrell was appointed president of Bates Technical College in July 2012. He brings more than 30 years of higher education experience, including postsecondary service in the roles of Chief Academic Officer, Chief Workforce and Economic Development Officer, and Chief Student Affairs Officer, all at two-year institutions in the western United States.

In addition to his postdoctoral study with the Institute for Educational Management at Harvard University, Dr. Langrell has been acknowledged nationally as an Exemplary Leader by The Chair Academy and as a Distinguished College Administrator by the Phi Theta Kappa Honor Society. In Washington state, Dr. Langrell has been elected into leadership roles with the Continuing Education Council, the Workforce Education Council, and the Partnership for Rural Improvement. Dr. Langrell currently serves on the national Board of Trustees for the American Technical Education Association (ATEA).

## Kelsey Marinoni

*Executive Assistant, Center of Excellence for Aerospace & Advanced Manufacturing, Everett Community College*

Kelsey Marinoni has provided administrative support to the Executive Director since November 2013. Her prior experience includes working several years at Integrated Technologies as a technical aide, a position which piqued her interest in the aerospace field.

Ms. Marinoni assists with the Center's travel plans, event coordination, and budget management and is key in communication between college staff, external partners, and other CoE staff.

## Bill Messenger

*WIA Labor Liaison, Washington State Labor Council AFL/CIO*

Bill Messenger works to find alternatives to plant closure and job dislocation, and when such closures and layoffs can't be avoided, he helps the affected workers have access to job retraining and reemployment program opportunities available through the Workforce Investment Act and the Trade Adjustment Assistance programs.

Mr. Messenger became a union member with the Retail Clerks union while attending school and ultimately earned a Forestry degree from Grays Harbor College. He's been a member of the IWA, LPIW and AWPPW unions. In the 15 years prior to joining the WSLC, he was active in Local 211's leadership in various roles including Safety Steward, Vice-President, Standing Committee, and President for five years.

## Frank Nichols, M.B.A.

*Founder, CEO and President, Silicon Forest Electronics (SFE)*

Frank Nichols has grown SFE from a green field start-up to a \$20M per year aerospace and unmanned systems business which specializes in mission critical electronics manufacturing. Prior to SFE, he worked as a business consultant within the Department of Defense and Department of Energy and DOD contractors. He has had significant contributions to military projects and environmental remediation projects contracted by Aerojet, Eaton, Chamberlain Manufacturing, U.S. Navy Cruise Missile programs and other U.S. Navy air launched combat weapons.

Mr. Nichols supports the increase of STEM education, intern programs at Oregon State and Washington State universities, and "Gateway to College" promoting continuing education beyond the secondary level with "at risk" students. He is also a member of the Governor's Aerospace Pipeline Committee which is involved in creating recommendations on budgets concerning the aerospace needs in acquiring and keeping well trained aerospace workers.

He travels both domestically and internationally as a photographer, tour leader and instructor and is writing a book on Yellowstone National Park, "Forty Days and Four Seasons of Yellowstone." Mr. Nichols holds an M.B.A. from the University of Phoenix; a B.S. from California State University at Fresno, and a Master's from the Professional Photographers of America.

## Shana Peschek, M.B.A.

*Director, Construction Center of Excellence, Renton Technical College  
National Chair, U.S. Green Building Council Community Green Program*

As director, Shana Peschek links industry to the community college system in Washington State for the purpose of coordinating education and training efforts to build a competitive workforce in a global economy. With four priorities: Economic Development, Industry Sector Strategy, Workforce Supply and Demand, and Education, Innovation and Efficiency, the Center is positioned to sustain Washington's competitive advantage through statewide leadership. The Center supports curriculum development, career pathway development and professional development for faculty. The Center also plays an integral role in supporting the development of stackable credentials and Applied Baccalaureate degree programs in the Community/Technical College programs. Ms. Peschek is also a National Chair for the United States Green Building Council Community Green Program, as well as member of numerous advisory boards and workforce focused committees. She holds a B.A. from Washington State University and an M.B.A. from City University.

# Biographies

## Keith Phillips

*Energy Policy Advisor, Governor Inslee's Executive Policy Office*

Keith Phillips was appointed by Governor Inslee in January 2013, first as Senior Policy Advisor on Energy and Environment and currently as Special Assistant for Climate and Energy. He previously served eight years as an executive policy advisor to Governor Gregoire, on energy, environment and other topics. Mr. Phillips has worked 17 years with the Washington State Department of Ecology, including management roles in water resources, environmental review, environmental science, and sediment management programs. Prior to working for the state, Mr. Phillips spent 10 years as an environmental planner at the U.S. Army Corps of Engineers in Seattle. He studied Oceanography at the University of Washington.

## Stacy H. Smedley, L.E.E.L.D. B.D.+C.

*Preconstruction Manager/Sustainability, Skanska USA Building Executive Director, The SEED Collaborative*

Stacy Smedley has worked 11 years in the architecture and construction professions – including the first LEED for Homes Platinum certified project in Washington state as well as the first project in the world to be certified under Living Building Version 2.0 standards, the Bertschi School Living Science Building in Seattle. At Skanska, Ms. Smedley fulfills preconstruction management and sustainability roles, focusing on creating sustainable initiatives and opportunities office wide.

She is also the co-founder and Executive Director of The SEED Collaborative, a non-profit committed to creating environmentally restorative learning spaces that educate and inspire children to be the next generation of environmental stewards. She managed the Bertschi School living building and witnessing the transformational impact it had on its students. Ms. Smedley is committed to educating and engaging children and her community on sustainable design and serves in various volunteer and mentorship roles, including Guest Editor of Green Building + Design Magazine; Membership for the Seattle Branch of Cascadia Green Building Council; Regional Emerging Professionals Recruitment Chair for USGBC; Sustainable Design and Curriculum Consultant to Northshore School District; and 2013 Scholar in Residence for the National Association of Independent Schools Summit on the Environment. She also volunteers at various K-12 public and private schools, offering sustainable design workshops that engage students to think creatively and apply Living Building Challenge principles to design spaces that they would like to learn in and from. Ms. Smedley, who was named a Living Building Challenge Hero in 2012, holds a B.A. in Architecture from the University of Washington.

## Dr. Robert “Bob” Topping, Ed.D.

*Director for Strategic Partnerships, Regional Education and Training Center (RETC)*

Bob Topping is charged with identifying and qualifying key workforce core-competencies that drive regional economic and talent development. His focus at RETC aligns with his doctoral dissertation which addressed state-of-the-art designs for workplace learning, career education, and workforce talent development. Dr. Topping has worked to develop, organize, and implement multiple broad-based initiatives to drive creativity and innovation in local industries for regional economic development, two of which were awarded a “Center of Excellence” recognition. Beyond his 20 years of experience at the collegiate level, he also brings 21 years of hands-on-experience in the construction industry – holding a variety of positions ranging from apprentice to project manager.

Dr. Topping has served higher education as an executive director, campus administrator and department chair. Through effective collaboration and strategic partnerships, Dr. Topping has been instrumental in connecting Career and Technical Education (CTE) to industry, advancing student enrollment and developing innovative training models all of which have received national attention.

## Dr. James Walton, Ph.D.

*President, Centralia College*

Dr. James Walton has been president of Centralia College since 2002 and serves as a member of the Washington Association of Community and Technical College Presidents, Centralia Rotary, Economic Development Council, the Chamber of Commerce and the Workforce Development Council. His experience includes nine years as VP of Workforce Education and nearly 13 years as professor of fisheries technology at Peninsula College. He holds a BS and MS of Natural Resources Management from the University of Michigan and a PhD in Fisheries from the University of Washington.

## Day 2

(note: some presenters are found within Day 1)

### Ann Avary

*Director, Northwest Center of Excellence for Marine Manufacturing & Technology, Skagit Valley College*

Ann Avary, director since 2006, is Chair of the Marine League of Schools, a national consortium of marine technology education providers and former co-host of ProBoat Radio. Her experience includes consulting, project management and Executive Director of Jefferson County's Economic Development Council. Ms. Avary holds a B.A. in Economics from Indiana State University.

### André Barbosa, Ph.D.

*Assistant Professor of Civil & Construction Engineering, Oregon State University*

Dr. Andre Barbosa's research interests include performance-based earthquake engineering, nonlinear structural analysis, structural reliability and risk analysis, structural dynamics, multi-hazard loss estimation, assessment of robustness and resilient design of building and bridge structures, high-throughput computing, and virtual reality modeling of engineering structures.

His courses include structural analysis, structural dynamics, structural reliability and risk analysis, probabilistic methods applied to engineering, earthquake engineering, reinforced concrete structures, and performance-based earthquake engineering.

Dr. Barbosa worked for seven years designing buildings and bridges prior to joining the PhD program at UCSD. This experience serves as the foundation for his current research and teaching interests. He earned his Ph.D. in Structural Engineering from the University of California San Diego, an M.S. in Structural Engineering and a Licenciatura in Civil Engineering from the Instituto Superior Técnico in Portugal

### Toby Brewer, P.E.

*Chief Dam Safety Engineer, Tacoma Power*

Toby Brewer graduated from Gonzaga University in 1988 with a degree in Civil Engineering and a commission in the United States Army. He went on to active duty in January 1989 where he served at various locations around the world until he joined Tacoma Power in 1997. Since that time, he has been promoted through a series of engineering positions and is currently a Senior Principal Engineer. Mr. Brewer is licensed as a Professional Engineer in Washington state and has been serving as Tacoma Power's Chief Dam Safety Engineer since December 2006.

### Randy Clark

*Security Specialist, U.S. Coast Guard Marine Safety Unit*

Randy Clark has 20 years of experience within U.S. Coast Guard. Assignments and positions held include: Marine Inspector, Marine Investigator, Chief Waterways Management, Chief Environmental Response, Chief Support and Logistics, Chief of Operations, Chief of Planning, Marine Safety Unit Supervisor and Liaison on to the American Samoan Government. His current Position: Security Specialist concentrates on contingency planning for Marine Transportation Recovery, Marine Salvage and Marine Fire Fighting. His background includes eight years combined civilian-federal service including: National Park Service, FEMA and USC Coast Guard. Mr. Clark holds a B.S. in Marine Science and Biology from the University of Alabama and is a graduate of National Park Service Law Enforcement Academy and the USCG Officer Candidate School.

### Patrick Corcoran

*Extension Coastal Hazards Outreach Specialist, OSU Extension Service*

Patrick Corcoran is a coastal natural hazards specialist based in Astoria, OR. His goal is to help coastal communities become more resilient to natural hazards. Mr. Corcoran engages university researchers and coastal residents in collaborative research and shared learning about the nature of coastal natural hazards; helps communities identify their vulnerability to hazards; and connects local people with data and decision support tools designed to help communities adapt to coastal hazards. His primary areas of work are tsunami preparedness, coastal storms and shoreline change. In 2014 Mr. Corcoran was named a Weather-Ready Ambassador for NOAA's Weather-Ready Nation initiative.

### Linda Crerar

*Director, Center of Excellence for Homeland Security-Emergency Management (HSEM), Pierce College*

Linda Crerar holds more than 35 years of experience in private and government sectors as a business and government executive. During the past 12 years she has worked to develop strategies to help build capacity in the public, private, and civic sectors to be resilient in the face of disasters and other crises.

Ms. Crerar has served on the state's Homeland Security Strategic Plan Development working group and the state's Homeland Security Committee and was the executive staff to the Governor's Emergency Management Council. She is a member of the state board for the Washington Information Network 211 and is active on a number of other local, regional and national HSEM organizations and groups. Ms. Crerar is an instructor for the statewide HSEM Degree Program. She holds a Masters in Applied Behavioral Science from Whitworth and B.A from The Evergreen State College.

# Biographies

## Sara Crumb

*State Director, U.S. Senator Maria Cantwell*

Sara Crumb has been State Director for U.S. Senator Maria Cantwell since May 2013. Prior, she worked as a District Director for Congressman Jim McDermott and as a Deputy District Director for Congressman Norm Dicks – since March 2005. Her background includes serving as a Government Affairs Associate for the Washington Association for Justice, a Law Clerk for the U.S. States Attorney's Office, a Scheduler for Congressman Norm Dicks and an intern in Senator Patty Murray's Office and the House Rules Committee. Ms. Crumb holds a J.D. from Gonzaga University Law School and a B.A. in Political Science from the University of Washington.

## Matthew E. Cutts, P.E.

*Critical Infrastructure Program Manager, U.S. Army Corps of Engineers – Portland District; Planning, Programs and Project Management Division*

Matthew Cutts is interested in the application of public policy theory to achieve measurable risk reduction and increased infrastructure resilience to address a wide range of natural and man-made emergencies with an emphasis on low probability, high consequence events, especially Cascadia Subduction Zone earthquakes.

Mr. Cutts retired as a Captain in the U.S. Coast Guard and became the U.S. Army Corps of Engineers Portland District Critical Infrastructure Program Manager in 2010. In this position, he formulates and executes strategies and plans to maintain and recapitalize U.S. Army Corps of Engineers Portland District infrastructure valued at over \$4 billion, including 22 harbors along with associated jetties and channels, 20 dams, four navigation locks, 33 recreation areas, and four visitor centers.

He is a registered professional engineer, and holds an M.A. in Security Studies from the Naval Postgraduate School, an M.S. in Civil Engineering from the University of Illinois at Urbana-Champaign, and a B.S. in Marine Engineering from the Coast Guard Academy.

## Robert Ezelle

*Director, Washington Military Department's Emergency Management Division (EMD)*

Robert Ezelle was appointed Director of the Washington Military Department's EMD in April 2013. He joined the division in October 2010 as the Homeland Security Section Manager and in May 2011, he became the state's Enhanced-911 and Homeland Security Unit Manager. He oversaw the planning and operation of the statewide E-911 emergency phone system, as well as management of the state's homeland security and emergency preparedness grant programs.

Mr. Ezelle spent nearly 17 years in the Washington Air National Guard in various senior leadership roles. He served as Vice Commander of the Western Air Defense Sector, which is responsible for air sovereignty and air defense of the western United States.

Prior to the Washington Air National Guard, Mr. Ezelle spent 13 years as a fighter pilot, pilot trainer and operations officer in the U.S. Air Force. He flew F-4 and F-15 fighters and AT-38B fighter trainer aircraft.

## Dr. Dan Gillins, Ph.D.

*Assistant Professor, Civil Engineering (Geomatics), Oregon State University*

Dr. Gillins's research interests include surveying and mapping earthquake hazards, such as liquefaction and lateral spreading. He developed new liquefaction hazard mapping techniques to estimate the probability and magnitude of liquefaction-induced lateral spreading. Dr. Gillins is evaluating recent case studies of liquefaction after great and long-duration subduction zone earthquakes in Japan and Chile. His other projects include developing a web-GIS for exploring mapped earthquake hazards in Oregon, and investigating the use of unmanned aerial systems for collecting spatial data after extreme events. Dr. Gillins holds a Ph.D. in civil engineering from the University of Utah.

## Kellie Hale

*Special Projects Coordinator, Center of Excellence for Homeland Security-Emergency Management, Pierce College*

Kellie Hale has worked with the Center and Pierce College's HSEM Degree Program since 2012. She is the lead staff for the Center's Annual Educators-Practitioners Summit, coordinator of the Center's website and blog, and serves as a Community College Citizen Preparedness (3CP2) trainer. Ms. Hale is finishing her degree at Pierce College and will be pursuing a bachelor's degree in business and organization management.

## Eric Heidmann

*Chief Security and Continuity Officer,  
Bonneville Power Administration (BPA)*

Eric Heidmann oversees physical, information, and personnel security programs, continuity of operations and emergency management. He has worked for BPA more than 22 years and has held previous positions within Corporate Services, Transmission Services, Public Affairs and Continuity of Operations.

## Eric Holdeman

*Director, Pacific Northwest Economic Region (PNWER)  
Center for Regional Disaster Resilience*

*Principal, Eric Holdeman and Associates*

Eric Holdeman is a nationally known emergency manager for his work with federal, state and local governments. He has authored numerous articles for professional journals and opinion pieces for newspapers including the Washington Post; and he authors “Eric’s Corner,” a regular column in Emergency Management Magazine. He is host of [www.disaster-zone.com](http://www.disaster-zone.com).

Mr. Holdeman’s areas of expertise include: building regional coalitions between agencies, governments, the private sector and non-profits; disaster planning, regional planning, port security operations, Emergency Operations Center design and construction; multi-media public education programs; and Joint Information Center formation and operations.

His work experience includes Port Security Director for the Port of Tacoma, a consultant for ICF International, and Emergency Management Director for King County Washington. In this position he established the King County Office of Emergency Management as a national leader in many areas of emergency management and homeland security. He also worked for the Washington State Division of Emergency Management and completed a 20-year career in the U.S. Army as an Infantry Officer.

Mr. Holdeman is a member and past president of the Washington State Emergency Management Association. He currently serves on the Advisory Council for the Center for Regional Disaster Resilience and the Pacific Northwest-Advanced National Seismic Safety Region Advisory Committee. Additionally, he is on the Advisory Board for the University of Washington’s Masters in Strategic Planning for Critical Infrastructures. He holds a B.A. in Education from Concordia University Chicago.

## Deanna Henry

*Emergency Preparedness Manager,  
Oregon Department of Energy*

Deanna Henry manages the nuclear, petroleum, and Liquefied Natural Gas (LNG) programs within the Oregon Department of Energy. Deanna works with industry, the federal government, 14 western states, Oregon state agencies, and local emergency response organizations to ensure that the region is prepared to respond effectively to: 1) radioactive material releases to the environment from the Hanford Nuclear Reservation and the Columbia Generating Station; 2) severe and long-term petroleum disruptions; and 3) LNG emergencies should one or more proposed export terminals be built in Oregon. Deanna is a Certified Emergency Manager. Ms. Henry joined the Oregon Department of Energy in 1992. She earned a B.A. in Journalism from the University of Oregon.

## Jeff Hepler, C.P.G.

*Readiness Section, U.S. Army Corps of Engineers, Portland District*

Jeff Hepler is a Debris Subject Matter Expert and manages the Portland District Debris Planning and Response Team. This 30-member team performs disaster debris cleanup in the United States and territories. He has been deployed as an Action Officer to debris disasters including hurricanes, typhoons, tornados and floods.

Mr. Hepler is an instructor for E/G/L202, “Debris Management Planning for State, Tribal and Local Officials” and provides guest lectures on debris management to local, state, federal and private-sector partners. He also served as the Head of Vertical Structures, U.S. Agency for International Development in Afghanistan from 2007-2010 and was responsible for overseeing earthquake-resistant construction of high schools, college facilities, health clinics and hospitals.

Mr. Hepler is a Registered Professional Hydrologist and Geologist with degrees from the University of Alberta, Colorado State University and Oregon State University.

# Biographies

## Dena Horton

*Southwest Washington Outreach Director,  
U.S. Senator Maria Cantwell*

Dena Horton has been the SW Washington Outreach Director for U.S. Senator Maria Cantwell since February 2014. Prior, she worked as a caseworker and then field representative for Congressman Brian Baird from 2000 to 2004. Her background includes eight years as a private consultant for communications, governmental relations, and public involvement at a firm that focused on transportation, energy, renewable energy and economic development projects. She also worked as a Program Director with the Southwest Washington Area Agency on Aging to provide services to low income seniors and adults with disabilities and assisted the Advisory Council with legislative policy and education. Ms. Horton holds a B.A. in Political Science from Gonzaga University.

## Carol Lewellen

*Instructor, Energy Management, Edmonds Community College  
Vice President of Outreach, Energy Educators Association  
Co-owner, Lewellen Associates, LLC – energy consulting*

Carol Lewellen has been in the energy efficiency business since 1978. She has worked in the Conservation Departments of Seattle City Light and Snohomish County PUD; and has taught Energy Management at Edmonds Community College for five years. Ms. Lewellen is the Vice President for Outreach for the Energy Educators Association.

## Patrick Massey

*Federal Preparedness Coordinator and Director,  
National Preparedness Division, FEMA Region 10*

Patrick Massey has served in FEMA Region 10 since 1996, and currently serves as the Federal Preparedness Coordinator and Director, National Preparedness Division, where he is responsible for managing a range of all-hazards internal and interagency preparedness programs to include: training and exercises, assessments, improvement planning, continuity programs, radiological preparedness, community preparedness, and various technical assistance programs.

While at FEMA Mr. Massey has also served as the Floodplain Management Coordinator for the states of Washington, Idaho and Alaska, and served as a Hazard Mitigation Officer during a number of Federally-declared disasters, and authored several publications on floodplain management and mitigation approaches. Prior to joining FEMA, he served as a Planner with the Illinois Emergency Management Agency, and also served as a Flood Recovery Planner for a Regional Planning Commission in Illinois. Mr. Massey has served on a number of large disasters to include: the Great Mississippi River Flood of 1993 (IL), Red River Flood of 1997 (MN), Hurricane Floyd, 1999 (NC), Hurricanes Jean/Ivan, 2004 (FL), Hurricanes Katrina/Rita, 2005 (LA), Hurricane Sandy, 2012 (NYC) and a number of other disasters throughout the region and country.

He holds master's degrees from the U.S. Army War College, Naval Postgraduate School and Southern Illinois University; and a B.S. from Southern Illinois University. Mr. Massey holds certificates in floodplain and emergency manager and professional continuity practitioner.

## Paul McNeil

*Lead Instructor, Homeland Security-Emergency Management,  
Pierce College*

Paul McNeil has extensive experience in military, international, federal, state and local HSEM systems including development. Following a U.S. Army and Air Force career, Mr. McNeil began a 30 year civil service career in emergency medical services and emergency management. He began in Pierce County EMS, and later spent three years developing EMS systems in the Middle East. He returned to local and state government public safety services and spent the last 10 years managing the 24/7 emergency operations for the Washington Emergency Management Division (EMD). He retired from EMD in July 2012. Paul is an alumnus of Saint Martin's College, Gonzaga University, and the Naval Postgraduate School's Center for Homeland Defense and Security.



# Biographies

## Carmen Merlo, M.C.J.

*Director, Portland Bureau of Emergency Management*

Since 2007, Carmen Merlo has been responsible for planning, implementing and improving emergency management plans, programs, and procedures to ensure a coordinated response to major emergencies or disruptions for the City of Portland. She leads the activities of the bureau to maintain the city's overall emergency management mitigation, response, and recovery strategy; coordinates bureau and city response and recovery efforts; and oversees the activation and expansion of the City's Emergency Coordination Center and Neighborhood Emergency Teams.

Ms. Merlo previously worked 10 years at the State Office of Homeland Security/Oregon Emergency Management administering grant funds to improve local, regional and state capabilities to respond to and recover from emergencies. She earned a Master's Degree in Criminal Justice from the Rockefeller College of Public Affairs and Policy, School of Criminal Justice in New York.

## Mike Ott, P.E.

*Project Manager, Channels and Harbors Operations,  
U.S. Army Corps of Engineers, Portland District*

Mike Ott is a Supervisory Civil Engineer and has worked for the agency more than 13 years in various positions including: Hydraulic Engineer, Project Manager, Program Manager and Operations Manager.

Mr. Ott's Corps activities has included ecosystem restoration studies, the Columbia River Channel Improvement, sediment management at Mount Saint Helens, the highly successful regional sediment management efforts at the Mouth of the Columbia River, and the maintenance dredging of the District's navigation projects. He has deployed to both Iraq and Afghanistan in support of the Corps mission in Overseas Contingency Operations.

In his current role, Mr. Ott is responsible for the maintenance of all navigable waterways within the district, as well as the operation and maintenance of two government-owned hopper dredges, and three hydrographic survey vessels.

He holds a B.S. in Civil Engineering from Portland State University, a Professional Engineering License from the State of Oregon and is a Project Management Professional.

## Larry Owens

*Adjunct Instructor, Clean Energy Technology,  
Shoreline Community College*

*Business Executive, Ameresco*

*President, Energy Educators Association*

Larry Owens has taught clean energy program since 2008 after spending 12 years designing and developing residential and commercial projects for the solar industry. He has also developed more than \$10 million in energy efficiency projects for higher education, K-12 school districts and local governments. Mr. Owens is the co-founder of Shoreline Solar Project; host and producer of NW Solar Fest, the largest renewable energy & sustainability event in the region; and former Vice President of Solar Washington.

## Alison Pugh

*Chair, Energy Management, Edmonds Community College (EdCC)*

Alison Pugh led the development of EdCC's energy management program, including convening the industry-led advisory committee, developing course sequencing within the degree and certificates to modularize "stackable" certificates leading to the degree, and developing curriculum and online content. In addition to serving as department chair, Ms. Pugh serves as the Principal Investigator for a National Science Foundation grant, Meeting the Challenge of Energy Management in a Carbon-Constrained World, as well as directed three other energy-related grants at the college. Ms. Pugh also serves as the college's Sustainability Researcher and is one of the resident experts on sustainability at the college – developing green curriculum as well as providing support operationally for the college to meet its greenhouse gas reduction goals and reduce the campus' overall impact on its ecosystem.

# Biographies

## Allison Pynch, P.E., G.E.

*Senior Engingeer, Hart Crowser, Inc.*

Allison Pynch has more than 11 years of geotechnical engineering consulting experience, with a background that includes many infrastructure, development, and transportation projects such as interstate improvements, wastewater treatment plant projects, large residential and commercial developments, and local agency bridge replacements. Her direct design experience includes seismic hazard analysis and mitigation design, bridge foundation design, settlement analysis, retaining wall and shoring design, embankment and cut slope design, and construction consultation.

Ms. Pynch has also been active in the American Society of Engineers' Technical Council on Lifeline Earthquake Engineering (ASCE - TCLEE). She travelled to Chile in April 2010 and Japan in June 2011 with the TCLEE team to evaluate lifeline performance during and after the major subduction zone earthquakes and tsunamis in those countries. She has since been active in Oregon, working with government personnel, engineers, and geologists to increase earthquake awareness and preparedness at home.

Ms. Pynch's presentation will focus on the effects of subduction zone earthquakes on the built environment and lifelines in Chile and Japan and the damage we can here in the Pacific Northwest when a similar quake event occurs. She holds a B.A. from Whitman College, a bachelor's and master's degrees in engineering from Oregon State University.

## David Scofield, P.E.

*Geotechnical Design Section, U.S. Army Corps of Engineers, Portland District*

David Scofield has more than 35 years of geological/geotechnical experience – the last 11 years serving as a geotechnical engineer for the Corps of Engineers Portland District. He is the Corps of Engineers Northwestern Division regional technical expert on seismic issues. Mr. Scofield has a broad based experience with geological site characterization, design of dams and navigation projects, ground water and well field evaluations, geologic and seismic hazards evaluations, and dam safety and risk evaluations. Mr. David Scofield, CENWP-EC-DG, is a Professional Engineer, Professional Geologist and Certified Engineering Geologist in the state of Oregon.

## David Stuckey

*Director, Oregon Office of Emergency Management*

Formerly the Deputy Director of the Office of Emergency Management (OEM), for two years, David Stuckey was appointed as Director of OEM, in May 2013. He joined OEM following a career in the Oregon Army National Guard (ORANG), retiring as a Colonel. His last position with ORANG was the Senior Operations officer, which involved overseeing the requirements necessary to build army formations for the Global War on Terrorism and the domestic support to local authorities during numerous emergency exercises and winter storm events.

Mr. Stuckey's final two assignments included: Financial Manager for the United States Property and Fiscal Office and Joint Operations Officer for the Oregon National Guard. He managed and coordinated sections responsible for officer training, training sites, mobilization, force structure, and Military Support to Civilian Authorities, as well as being responsible for the Oregon Guard's coordination and response procedures to state and national emergencies.

Mr. Stuckey received numerous recognition awards throughout his 25 years of military service, including Legion of Merit, Meritorious Service Medals, Army Commendation Medals, Army Achievement Medal, Army Reserve Component Achievement Medal, Army Service Ribbon, Overseas Service Ribbon, Army Component Training Ribbon, Armed Forces Reserve Medal, National Defense Medal, and the Oregon Distinguished Service Award.

Mr. Stuckey completed numerous military courses including the Infantry Officer Basic Course, Armor Officer Advance Course, Command and Staff Services School, and the resident Command and General Staff College. He has completed various National Incident Management Systems courses as well as FEMA's State Emergency Management Director Training Course. He holds a B.S. from Western Oregon State College.

## Daniela Todesco, P.E., M., A.S.C.E.

Senior Engineer, WEST Consultants

Daniela Todesco has 10 years engineering and research experience in hydraulics and hydrology, systems analysis of rivers and watersheds, river mechanics, sediment transport, and Geographical Information Systems. Ms. Todesco has applied a number of computer modeling programs to numerous riverine studies throughout the United States and Mexico, focusing on floodplain delineation, dam break and multi-purpose detention basin analyses, bridge scour and scour protection, and real-time flood forecasting.

Ms. Todesco helped develop and teaches WEST's 'GIS for Hydraulic and Hydrologic Modeling' and 'Dam Breach Analysis Using HEC-RAS' classes for ASCE. She is a member of several professional societies and the current Emergency Preparedness Committee Chair for the Society of American Military Engineers – Portland Post. She holds a B.S. in Civil and Environmental Engineering from the University of Pavia, Italy, and her M.S. in Water Resources Engineering from Marquette University.

## Haizhong Wang, Ph.D.

Assistant Professor of Transportation Engineering, School of Civil and Construction Engineering, Oregon State University

Dr. Haizhong Wang has published more than 20 journal and major conference papers and is very active in serving a wide variety of professional organizations and committees. He is a member of TRB Committee on Artificial Intelligence and Advanced Computing Applications.

His active projects covers different areas: (1) Assessment of Mobile Technology in Tsunami Evacuation using Agent-based Modeling, (2) Lifeline transportation network resiliency and response, (3) Roadmap for Connected and Autonomous Vehicle, (4) Potential changes to Future Travel Behavior Due to Emerging Technologies, (5) Road User Charge Economic Analysis, (6) Risk factors for pedestrian and bicycle crashes, etc.

Dr. Wang holds an M.S. and Ph.D. from University of Massachusetts, Amherst in Applied Mathematics and Civil Engineering (Transportation), and B.S. and M.S. degrees from Hebei University of Technology and Beijing University of Technology, China.

## Centralia College - a clean energy producing campus

**C**entralia College's outdoor Energy Lab is a combined renewable generation system. It utilizes six solar panels and an Energy Ball wind turbine that rotates 45 feet above the Kaiser Natural Outdoor Learning Lab (KNOLL). Together, they produce energy which is fed back into the local power grid managed by Centralia City Light.

The lab teaches residents and Centralia College's Energy Technology students how we can incorporate wind turbines and solar panels into our community. Students will observe and measure power production and will report on the potential for solar and wind power generation in Lewis County. The lab was designed by students and funded by the Mark and Laura Johnson Fund, Lewis Economic Development Council and the U.S. Department of Energy Smart Grid Workforce Training Grant awarded to the Center of Excellence for Clean Energy/A Centralia College Partnership.



# Sponsor Recognition

## PLATINUM



LabVolt

## GOLD



IBEW Local 46



Lady Electric LLC

## SILVER



Seattle Building & Construction Trades Council



Pacific Northwest ICF

## BRONZE

PAC-5 (Energy programs in Lewis, Thurston, Grays Harbor, Mason, Pacific Counties)

Washington State Building Trades



Northwest Washington Electrical Joint Apprenticeship & Training Committee



PSE Joint Apprenticeship Training Committee



The Sierra Club



Klein Education Systems

# Thank you

### Signature Crab Feed:

Bob Guenther, coordinator

### Scholarship Auction:

Judy Guenther, coordinator; Larry Kite, auctioneer; and Centralia College Board of Trustees

### Committee Members:

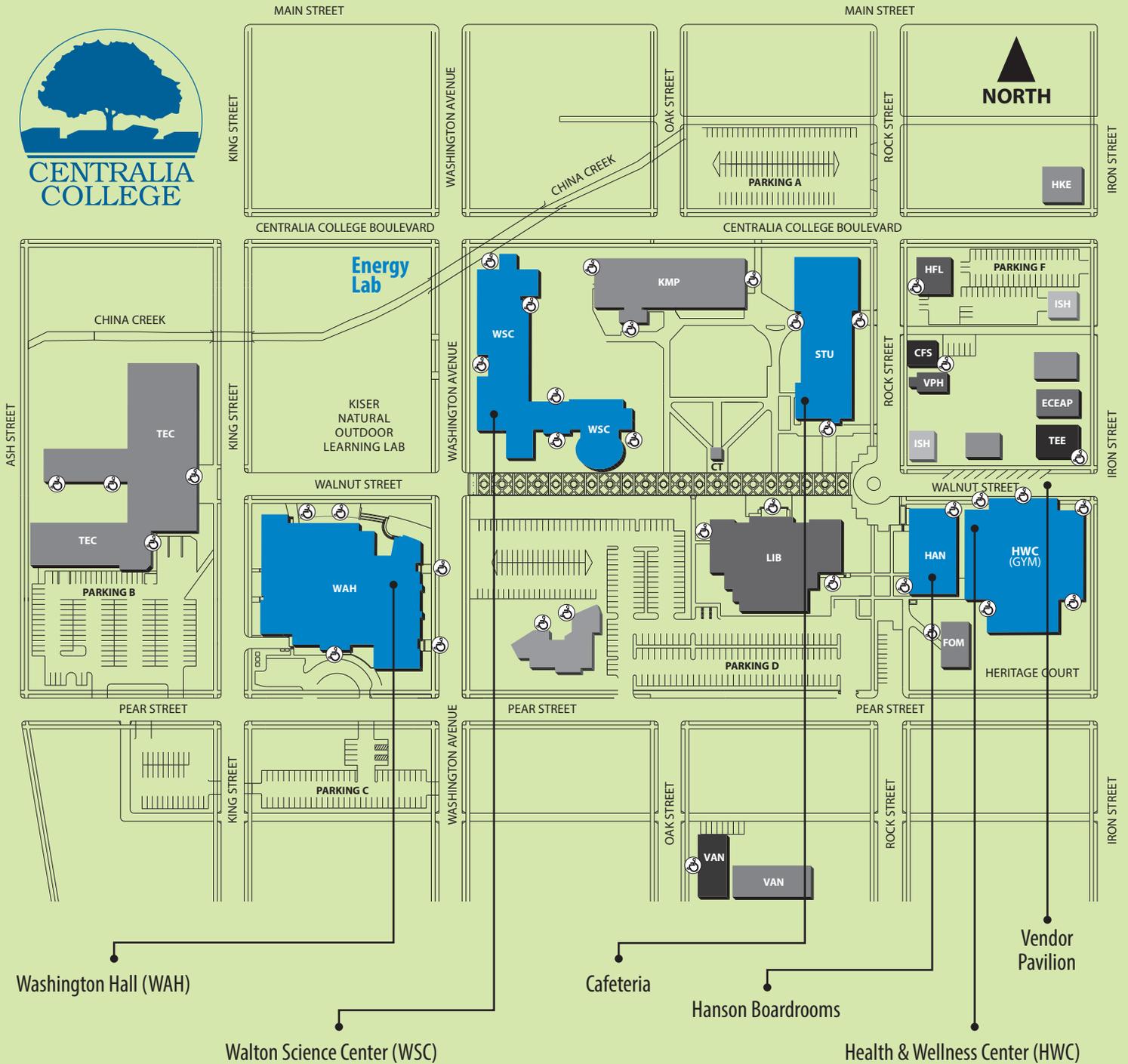
- Ann Avary, Northwest Center of Excellence for Marine Manufacturing & Technology
- Sean Bagsby, IBEW Local 46
- Mary Kaye Bredeson, Center of Excellence for Aerospace & Advanced Manufacturing
- Monica Brummer, Center of Excellence for Clean Energy
- Alan Hardcastle, WSU Energy Program
- Linda Crerar, Center of Excellence for Homeland Security-Emergency Management
- Matthew Cutts, U.S. Army Corps of Engineers
- Sally Zeiger Hanson, WSU Energy Program
- Barbara Hins-Turner, Center of Excellence for Clean Energy
- Andreas Keodara, Center of Excellence for Clean Energy
- Candy Lunke, Centralia College
- Shana Peschek, Construction Center of Excellence
- Kairie Pierce, Washington State Labor Council (AFL-CIO)
- Alison Pugh, Energy Educators Association
- Daniela Todesco, WEST Consultants

### And a Special Thanks to:

- Centralia College Facilities, Operations, and Maintenance Department
- Joli Winsett, graphic designer



Centralia College does not discriminate against any person on the basis of race, color, national origin, disability, sex, genetic information, or age in admission, treatment, or participation in its programs, services and activities, or in employment. All inquiries regarding compliance with access, equal opportunity and/or grievance procedures should be directed to the Vice President of Human Resources and Legal Affairs, Centralia College, 600 Centralia College Blvd, Centralia, WA 98531, or call 360.736.9391, ext. 671, or 360.807.6227/TTY.



**Centralia College is a clean energy producing campus.**

*Be sure to visit our Energy Ball and photovoltaic dual power producing Energy Lab in the KNOLL.*

