

Oregon Cybersecurity Center of Excellence



Portland
State

Portland State University

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Snapshot Feb 24, 2019 <http://cyberseek.org/heatmap.html>

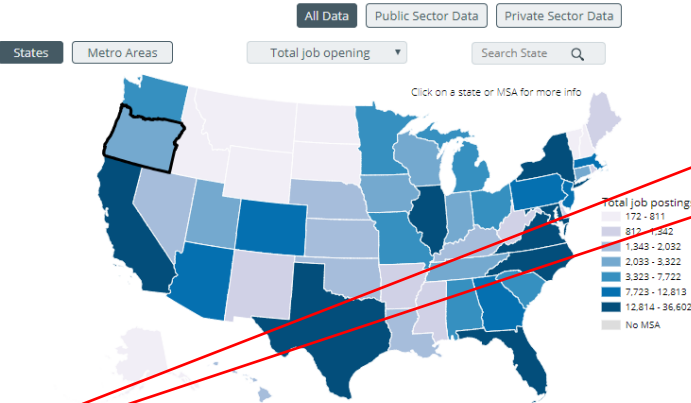


About Interactive map Career pathway Who this tool is for Project partners

Cybersecurity Supply/Demand Heat Map

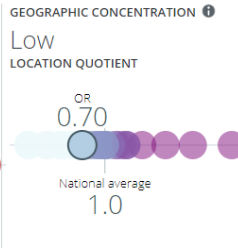
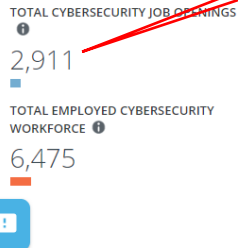
Cybersecurity talent gaps exist across the country. Closing these gaps requires detailed knowledge of the cybersecurity workforce in your region. This interactive heat map provides a granular snapshot of demand and supply data for cybersecurity jobs at the state and metro area levels, and can be used to grasp the challenges and opportunities facing your local cybersecurity workforce.

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Oregon
2,911 unfilled positions

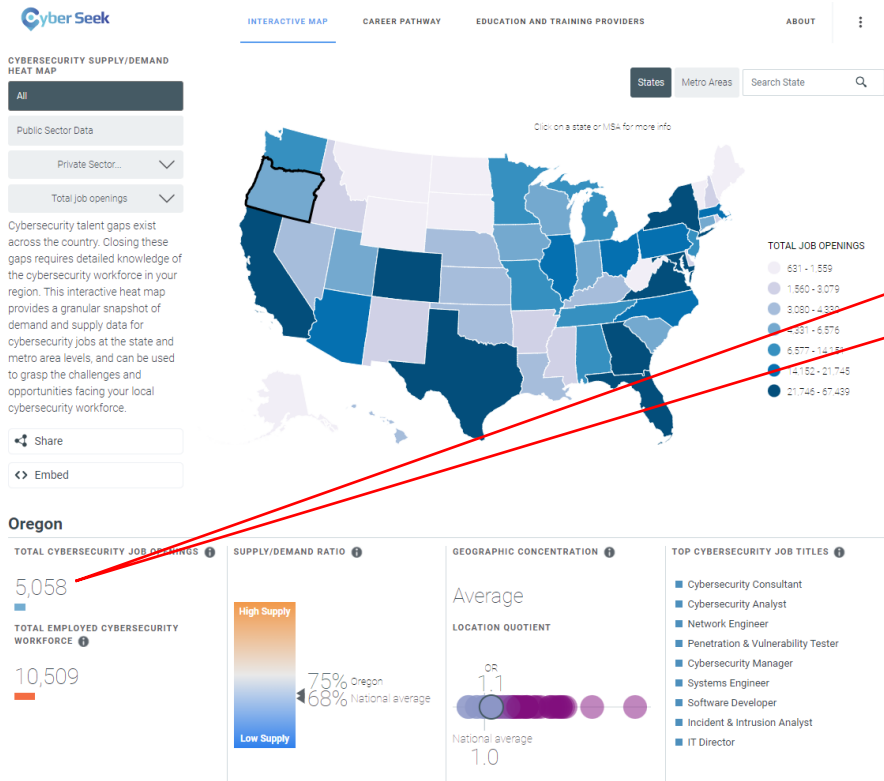
Oregon



- TOP CYBERSECURITY JOB TITLES
- Cyber Security Engineer
 - Cyber Security Analyst
 - Network Engineer / Architect
 - Cyber Security Consultant
 - Vulnerability Analyst / Penetration Tester
 - IT Auditor
 - Software Developer / Engineer
 - Systems Engineer
 - Cyber Security Architect

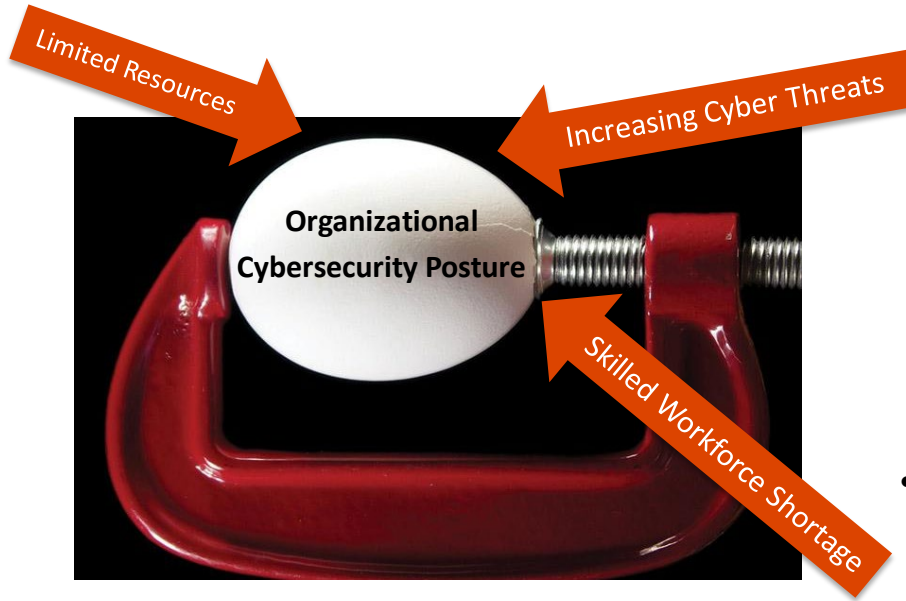


Snapshot Jan 31, 2022 <http://cyberseek.org/heatmap.html>



Oregon
5,058 unfilled cyber positions

- *Since Feb 2019 the number of unfilled openings has gone up by 2,067 – showing that the we are falling further behind in meeting the needs of Oregon.*
- *In aggregate, to keep up with the total need, we must graduate **260** students **per month**.*
- *To address just current **unfilled jobs**, we need to graduate an incremental 144 per month, or **1,738** per year.*



- Cyber attacks and ransoms continue to increase
 - 97% of firms have been impacted by a cybersecurity breach in their supply chain
 - Average ransomware payment increased 82% from 2020 to 2021
 - Global ransomware costs expected to exceed \$265B by 2031
- US cybercrime has increased 300% - 600% since March 2020
- 2021 cybercrime estimated to cost \$6 trillion annually worldwide – equivalent to the 3rd largest economy

Cyber Threats & Challenges Facing OREGON

- A Severe Vulnerability of City, County, Special Districts, Tribal Governments, School Districts, and FEMA, DHS, CISA Regions - *America's Soft-Underbelly- global cost is \$215 billion.*
 - (<https://www.seculore.com/resources/cyber-attack-archive/Oregon>)
- Foreign Enemies of the USA
 - Attacks increased on IT, critical infrastructure, and social engineering via social media to destabilize democracy
- Educational gap – need for a systems approach to cybersecurity education.
- Oregon's strategic position in the Pacific basin for commerce.





**Network & Systems
Security and
Resiliency**



**Cyber Security
Operations**



**Public Policy &
National Security**

OREGON CYBERSECURITY CENTER of EXCELLENCE

Cutting Edge Research

Community Engagement

Workforce Development



PSU's Contribution to OCCoE

COMMUNITY ENGAGEMENT

State Agencies
County Governments
Local Governments
Special Districts
Tribal Governments

Industry Partnerships &

NSA, DHS, FBI,
US Cyber
Command

MCECC

Graduate Cybersecurity
Certificate in Computer
Science
Technology Roadmapping
& Engineering Technology
Mgmt. (ETM)

NSA/DHS Designated National Center for Academic Excellence in Cybersecurity

HATFIELD SCHOOL

Energy Policy and
Management
Certificate

HATFIELD SCHOOL

Master's in Public
Policy
Cyber Resilience
Certificate for Local
& Regional
Governments

SCHOOL OF BUSINESS

Master's Applied Data
Science for Business
Business Blockchain
Certificate



PSU Supporting Programs

- GenCyber Program
 - Working with Middle and High Schools for cybersecurity awareness. Served hundreds of K-12 students.
- Technology Road-mapping through Engineering and Technology Management Lab.
- Partnership with BPA and PNNL for student internships.
- Business Blockchain Certificate program for the private sector.
- Public Policy solutions and National Security strategies with nationally and internationally recognized faculty serving on important policy committees and commissions.
- PSU Community Engagement
 - A physical presence in every county through Hatfield School's Center for Public Service and National Policy Consensus Center, and the Institute for Tribal Governance.
 - Noncredit workforce training certificate in Cybersecurity for City & County governments, Special Districts, and Tribal Governments.



Cybersecurity at Oregon State

Continuous Investment in Research and Education Capacity-Building Since 2013

12 Core Tenured/Tenure-Track Faculty and 6+ Affiliated Faculty

Security Operations
Incident Response
Cryptography
AI-Based Security
Human Factors

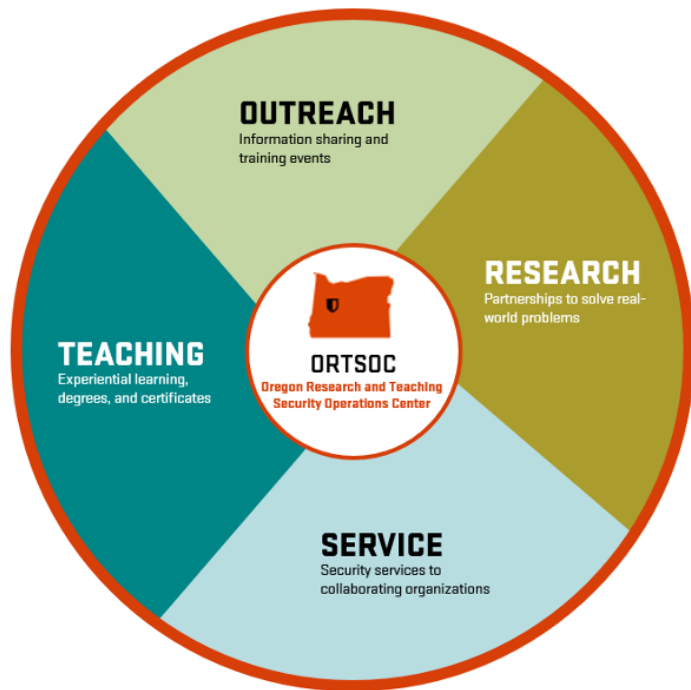
Multiple Degree and Certificate Options
~50 graduates/year with cybersecurity concentration

Training:
Top-Tier Nationally Competitive OSU Security Club with 350+ Students

Workforce Dev't:
ORTSOC
NW Cyber Camp
OSU Extension



Oregon Research and Teaching Security Operations Center (ORTSOC)



- “**Teaching Hospital**” to develop skilled workforce
 - National model for hands-on training
- Top-quality **Security Operations Center** to serve “underserved” and “resource constrained” organizations
- Research and Innovation to solve real-world problems
- Keystone of a World-Class Cybersecurity program
- Outreach for positive community impact
- **Expected to increase cybersecurity-focused degrees awarded by 4x**



OSU Supporting Programs

- NW Cyber Camps
 - Collaboration between OSU STEM Academy, Mt. Hood Community College, EnergySec, and Center for Advanced Learning (CAL) Charter School
 - Founded and operating continuously since 2016
 - Served hundreds of K-12 students
- OSU Extension Service
 - A physical presence in every county
 - A good launching pad for cybersecurity awareness and outreach to Oregon citizenry



Cybersecurity at the University of Oregon

TRAINING

Multiple Programs
Cyber Law & Ethics
Experiential Learning
CSOC, Internship

EXPERTISE

11 Faculty in Computer Science
3 Faculty in Cyberlaw & Ethics
Experienced Engineers

RESEARCH

Network Telemetry, IoT
Resiliency, Malware Detection
Privacy, Crypto Scam
AI-Enabled Defense
Social Net. Security

CAPABILITIES

In-network defense
Resiliency Assessment
Optical Net. Defense
Cloud Security
Incident Analysis

PARTNERSHIPS

With ISPs & companies
State Agencies, LCC
City of Eugene
Cyber Resilience Summit
Security Day

CENTERS

OR-CSOC
CCSP
ONRG
OACISS



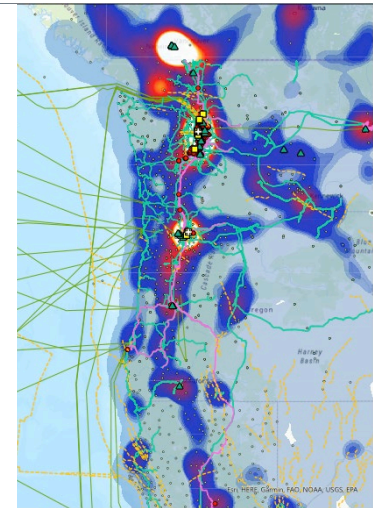
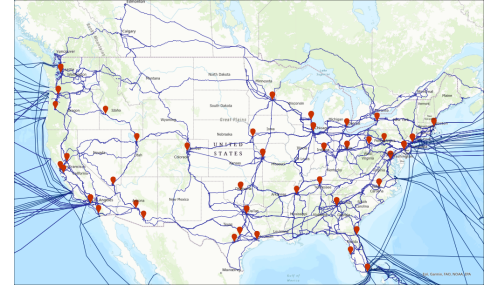
Workforce Training at UO

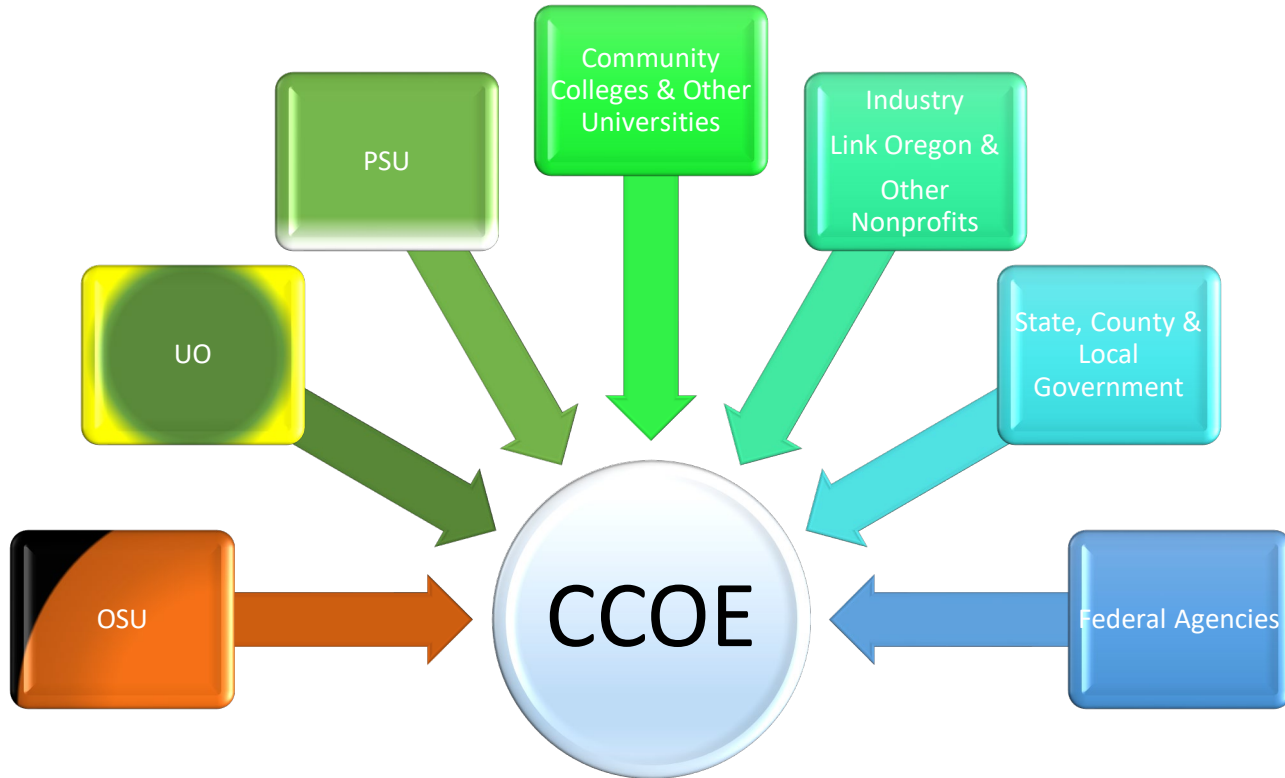
- Multi-disciplinary B.S., M.S. programs & certificates
 - Covering cyber law and ethics
 - Leveraging core competency in networking, AI, data science
 - Courses can be delivered online and over summer
- Emphasis on experiential learning
 - Access to state-of-the-art experimental testbed
 - UO-CSOC exposes students to real-world problem solving
 - Gamification of cybersecurity problems
 - Students engage in research projects and internship programs
- Research Experiences for Undergraduates (REU)



Expertise & Capabilities at UO

- 14 faculty members related to cybersecurity
- Advanced research projects & capabilities including
 - Agile in-network attack detection and mitigation
 - Cross-layer programmable defense
 - Assessing the resiliency of cyberinfrastructure
 - Funded by NSF, NSA, DoD, DARPA, ARO, ISOC, ...
- Centers & Institutes
 - Oregon Cyber Security Operations Center (OR-CSOC)
 - Center for Cyber Security & Privacy (CCSP)
 - Oregon Network Research Group (ONRG)
 - Oregon Advanced Computing Institute for Science & Society (OACISS)
- Community partnership with local ISPs, companies, LCC, ...





Conclusions

- No single institution can meet the challenges posed by Cyber threats.
- We need a partnership between our academic institutions, government(s), industry, and citizens.
- This will enable us to create the necessary synergies to better serve Oregon as we have unique expertise/resources/capabilities/capacities that are essential to take the cybersecurity problems across the state.
- Free of commercial conflicts of interest, our partnership will enable our institutions to better serve the citizens of the State and better train our students for careers in cybersecurity and cyber defense.
- Legislative financial support will serve as a catalyst to attract private and federal funding to OCCoE.





Thank You for Listening