Teacher-Scientist Partnerships (TSP)
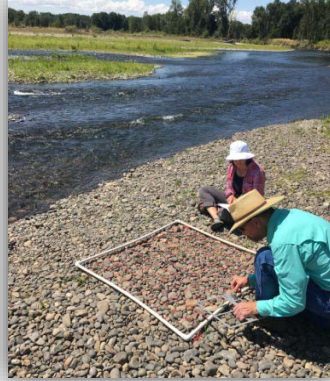
Invitations for teachers to design a solution to a proposed problem aligned with PNNL's mission
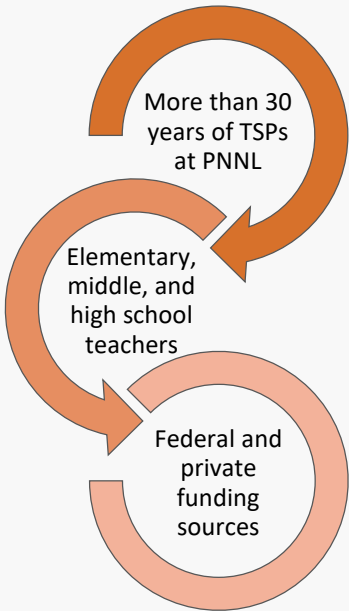
Pacific Northwest NATIONAL LABORATORY

The Six Takeaways of TSPs...

1 TSPs are a powerful form of professional development for both teachers and scientists

2 Office of STEM Education forms a critical "bridge" linking teachers and scientists

3 Teachers benefit when setting aside their role as "educator" and embracing the role of "learner"

4 Learning should be interactive in nature, not just lecture-based

5 Teachers experience the nature of science as it is done at a national laboratory

6 Scientists link their work to what is being taught in schools

Goal: *Accelerate sustainable STEM workforce improvement through the professional development of teachers in an adult oriented, real-life , problem-based immersion in partnership with PNNL scientists and engineers. The experience is designed to impact the teaching and curriculum delivered to students in the classrooms of those teachers.*

History of PNNL TSPs

More than 30 years of TSPs at PNNL

Elementary, middle, and high school teachers

Federal and private funding sources

TSP General Model

Program Structure	• Three part teams: PNNL researchers, OSE Science Education Specialist, and classroom teachers • One to two week summer program
Scientist Professional Development	• Work with Science Education Specialist to develop scenario • Design constructive learning experiences • Review research on TSPs and lessons learned
Scenario Development	• Scenario similar to the research done at PNNL • Solvable within a week • Aligned with Next Generation Science Standards (NGSS)
Classroom Teachers	• Coming in teams of at least two per school • Teachers, as "learners", engage in problem-based learning • Continuous reflection on experience
After Action Review	• All members of the team assess their experience • Teachers evaluate experience alignment with NGSS • Feedback is used to refine future TSPs

Monday	Tuesday	Wednesday	Thursday	Friday
• Preparation for the week (Laboratory Record Books, Collaboration Norms, Learner hat) • Introduction to scenario	• Field site visits • Utilize hands-on scientific tools and techniques to collect data	• Additional data collection in field and classroom • Begin data analysis	• PNNL Lab visits • Data analysis and development of final presentation	• Final teacher presentations • Reflections on NGSS • Development of ideas for classroom impact

Teacher-Scientist Partnerships:
2019 Association of Washington Business Institute

AWB INSTITUTE — Economic & Workforce Solutions

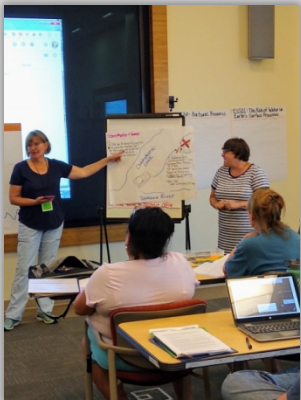Pacific Northwest NATIONAL LABORATORY

The Scenario

Evaluate options for reintroduction of salmon and steelhead above Chief Joseph and Grand Coulee dams: Examine different methods for tracking movements of fish; Incorporate elements from geology, chemistry, biology and engineering

Teacher Testimonials

"This specific scenario is ideal for my classroom, but better. Walking through the process of project-based research as a student allows me the backbone of implementation."

"Greatest professional development I have attended in my 25 years. Relevant to where I am and my teaching of students."
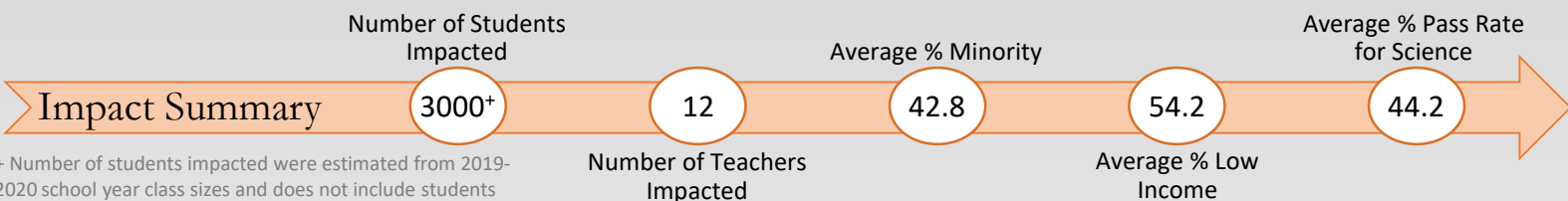
Scientist Testimonials

"Giving back through STEM outreach has been a crucial component of my career. Participating in the AWB Teacher-Scientist Partnership helped improve my communication skills, and looking at our work from a teacher's perspective reminds me how cool the work we do really is! I especially enjoy working with teachers because the impact will be amplified 1000x as they carry this knowledge back to their classrooms."

Demographics*

*Arrows indicate whether percentage is above or below state average

School District:	Hockinson	Mount Vernon	Rainier	Sequim	Sunnyside	Walla Walla
% Minority (State Average: 47%)	14 ↓	61 ↑	22 ↓	24 ↓	94 ↑	42 ↓
% Low Income (State Average: 46%)	21 ↓	65 ↑	48 ↑	49 ↑	86 ↑	56 ↑
% Pass Rate for Science (State Average: 47%)	46 ↓	36 ↓	52 ↑	53 ↑	30 ↓	48 ↑

Impact Summary

Number of Students Impacted	Number of Teachers Impacted	Average % Minority	Average % Low Income	Average % Pass Rate for Science
3000+	12	42.8	54.2	44.2

+ Number of students impacted were estimated from 2019-2020 school year class sizes and does not include students impacted in future years