



FAST FACTS



Photo by Dan Myers // Unsplash

NORTHWEST HYDROPOWER BY THE NUMBERS

14M

approximate US households that could be served by the Northwest's hydroelectric output in an average year.

90%

of the Northwest's renewable, carbon-free annual electricity production.

34K

megawatts of generating capacity of Northwest hydroelectric dams.

47%

of the Northwest's total average annual electricity production.

16K

yearly average output of megawatts by Northwest hydroelectric dams.

0

carbon emissions generated by hydropower production.

CLEAN & EQUITABLE ENERGY FOR THE FUTURE

- Northwest hydropower produces no carbon emissions, thereby significantly reducing the total carbon footprint of the region's energy production. Thanks to the help of hydropower, the Northwest boasts the nation's least carbon-intensive electric grid and the lowest cost for clean energy.
- Electric vehicle owners benefit greatly from carbon-free, low cost hydro by reducing the carbon footprint and price tag associated with every charge.
- Hydropower acts as a renewable energy multiplier. Hydroelectric dams can store water and release it to generate electricity when needed. This ability allows hydropower to fill in the gaps when a change in the weather keeps wind and solar plants from producing electricity. When hydroelectric resources are present, more solar and wind can be added to the grid.
- Some have said hydroelectricity is actually the first form of solar power. Sunlight evaporates water in the ocean which produces the weather that provides rain and snow. That runoff fills our rivers as gravity draws it back towards the ocean. Hydroelectric turbines use the kinetic energy of that moving water to spin them, generating massive amounts of clean, renewable power.





Photo by Austin Rohr // NWRP

A DYNAMIC BALANCE HYDROELECTRICITY & SALMON

- The sharpest declines in salmon populations took place before the construction of the dams. Overharvest by non-native peoples in the Columbia River basin took a huge toll between about 1870 and 1920. By the time Bonneville Dam's construction was completed in 1938, adult salmon return numbers were already at crisis levels.
- A study conducted by NOAA Fisheries found that juvenile salmon size plays a critical role in ocean survival. Smaller juveniles were less successful than their larger counterparts. These findings help influence better hatchery practices and river management, while questioning previous negative assumptions about the role of dams on salmon survival.
- While some people point to a decline in lower Snake River salmon populations as coinciding with the completion of the final dam on that stretch of the river, it also coincided with a notable ocean warming event. Ocean warming is closely correlated with declining salmon populations.

CLIMATE CRISIS

OUR OCEANS IN HOT WATER

- An independent peer-reviewed study conducted by Canadian researchers showed a 65% decline in Chinook salmon survival in Pacific Coast rivers over the last 50 years. This decline spans from Northern California to Southeast Alaska, pointing to a growing problem in the shared ocean environment..
- According to NOAA's 2020 Biological Opinion there is potential for the extinction of some salmon populations within the next two to three decades as a direct result of climate impacts on the ocean, further highlighting the need for swift climate action.
- Rising sea surface temperatures are estimated to lead to a 90% decline in survival for Chinook salmon in the marine stage. NOAA stated that this would place all studied populations at high risk for extinction, regardless of actions to improve freshwater survival.
- Marine heatwaves are predicted to increase in frequency and intensity over the next few decades as a result of increased warming and carbon emissions.
- According to a special report released by the IPCC, the "ocean has taken up between 20 to 30% of human-induced carbon dioxide emissions since the 1980s, causing ocean acidification." This acidification reduces the prey availability for salmon, limiting their population.





Photo by Marco Tjokro // Unsplash

INVESTMENTS IN SALMON RECOVERY

- New fish protections have been put into place at all eight lower Columbia and lower Snake River dams. Examples of protections include fish bypass systems that keep fish from entering the turbines, and cooling systems for fish ladders.
- Major upgrades to the lower Columbia and Snake river dams have led to a survival rate past each dam of 93 to 99%, depending on the fish species. About 50% of the juvenile salmon that enter the uppermost reservoir in the lower Snake River make the journey past Bonneville Dam, which is a comparable survival rate to that of a free flowing river.
- Through the Columbia Basin Fish Accords, which provide approximately \$100 million a year to Northwest states and tribal nations, 968,621 acres of habitat have been protected, treated, or maintained.
- Additionally, the most recent data shows that 7,236 miles of stream have been protected or improved, 397 barriers have been improved or removed, and 37.3 billion gallons of water have been protected and conserved each year.

ABUNDANT OPPORTUNITY FOR ALL

- Some of the largest tech and manufacturing companies in the world have located facilities in the Northwest due to the availability of carbon-free, low-cost power from hydroelectricity. This influx of businesses has led to the creation of new jobs and investments in our communities, such as parks, schools, libraries, roads, and community centers
- Irrigation from dam reservoirs allows for millions of acres of rich farmland that provides thousands of jobs to seasonal workers and an important economic base for rural communities.
- Barging and riverboat tourism, enabled by the dams, support the least carbon intensive means of transporting goods and providing people of all ages a great way to experience the river. The Columbia-Snake river system also allows for over \$21 billion of goods to be transported each year.



RESOURCES

NORTHWEST HYDROPOWER BY THE NUMBERS

- www.nwcouncil.org/energy/energy-topics/power-supply
- www.eia.gov/tools/faqs/faq.php?id=97&t=3

CLEAN & EQUITABLE ENERGY FOR THE FUTURE

- doi.org/10.1073/pnas.1912950116
- www.bpa.gov/news/AboutUs/Hydropower-101/Pages/Integrating-renewables-The-perfect-partner.aspx
- www.pnas.org/content/116/51/25497
- www.usnews.com/news/best-states/rankings/infrastructure/energy
- www.wsj.com/graphics/are-electric-cars-really-better-for-the-environment/?mod=djem10point

A DYNAMIC BALANCE: HYDROELECTRICITY & SALMON

- www.nwcouncil.org/reports/columbia-river-history/CommercialFishing
- www.nwcouncil.org/reports/columbia-river-history/damsimpacts
- www.nwcouncil.org/reports/columbia-river-history/grandcouleeimpactsonfish
- www.fisheries.noaa.gov/feature-story/fish-size-affects-snake-river-salmon-returns-more-route-through-dams
- www.ipcc.ch/srocc/chapter/summary-for-policymakers/
- www.fisheries.noaa.gov/resource/document/biological-opinion-operation-and-maintenance-fourteen-multiple-use-dam-and

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- onlinelibrary.wiley.com/doi/epdf/10.1111/faf.12514
- www.fisheries.noaa.gov/resource/document/biological-opinion-operation-and-maintenance-fourteen-multiple-use-dam-and
- www.ipcc.ch/site/assets/uploads/sites/3/2019/09/SROCC_PressRelease_EN.pdf

INVESTMENTS IN SALMON RECOVERY

- www.nww.usace.army.mil/Locations/District-Locks-and-Dams/Dworshak-Dam-and-Reservoir/
- www.nww.usace.army.mil/Missions/Lower-Snake-River-Dams/
- www.nww.usace.army.mil/Media/News-Releases/Article/919054/16-062-corps-helping-salmon-survive-this-year-by-cooling-lower-snake-river-wate/
- www.salmonrecovery.gov/doc/default-source/default-document-library/2016-citizen's-guideee56923bab16b6cf0b057ff00002e0fb7.pdf?sfvrsn=0
- www.cbr.washington.edu/dart/query/pit_sar_esu
- www.critfc.org/blog/2018/08/14/fish-accords-10-year-summary/

ABUNDANT OPPORTUNITY FOR ALL

- www.usnews.com/news/best-states/articles/2019-05-14/amazon-clean-power-help-fuel-washington
- www.ifiberone.com/columbia_basin/microsoft-pays-it-forward-to-help-fund-several-programs-in/article_ccadfbbe-8249-11e9-8200-130bcb3babb0.html
- files.constantcontact.com/9a08bcf9001/8768ec34-9437-4adb-badb-477bde47019b.pdf