Oregon Department of Environmental Quality

Governor's Recommended Budget 2019-21

Feb. 18-21, 2019
Ways and Means
Subcommittee on
Natural Resources





Oregon DEQ Mission



To be a leader in restoring, maintaining and enhancing the quality of Oregon's air, land and water



Oregon DEQ Values



- Our strength is our people
- We base our work on sound science
- We listen to and engage Oregonians
- We enforce the law
- We make consistent progress



Oregon DEQ Priorities





- Strengthening our core work to protect human health and the environment
- Building partnerships to help communities



Oregon DEQ Accountability

Recommendations and Implementation Plan

NPDES Permitting Program Review

November 2016

Prepared for Oregon Department of Environment Quality

Prepared by MWH, now part of Stantec in collaboration with Larry Walker Associates



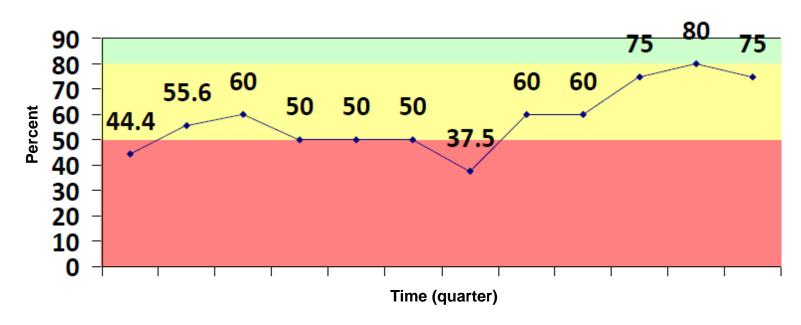
- Performance management
- 2016-17 Water Program External Review (MWH)
- 2018 Secretary of State Performance Audit: Air Permitting and Inspections
- Leadership Team changes
- Internal audit capacity



Oregon DEQ Performance Management

Outcome measures in the Green

Percent of core Outcome measures being reported on that are within their green range.



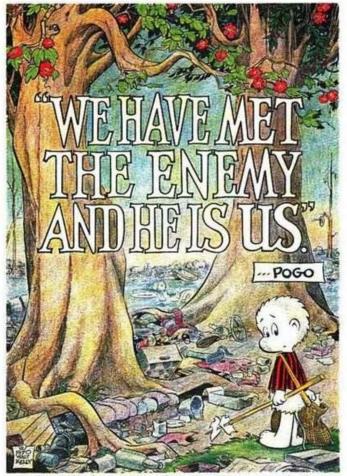
- Tracks approximately 118 measures across the agency
 - Only a portion are Key Performance Measures
- Quarterly Measure Reviews: Meetings to evaluate performance using "scorecards" showing data points and results in red, yellow or green



Oregon DEQ History

2019 is the 50th anniversary of Oregon DEQ

- 1969: Legislature and Governor McCall establish Oregon DEQ
- 1970: First Earth Day
- 1971: Oregon Bottle Bill
- 1973: Vehicle inspection begins
- 1983: Woodstove standards; curbside recycling begins
- 1989: Groundwater Protection Act; cyanide heap-leach mining laws enacted
- 2006: Clean Car standards
- 2011: Umatilla Army Depot decommissioning completed
- 2014: Clean Fuels program
- 2016: Cleaner Air Oregon



Walt Kelly's poster for the first Earth Day



Oregon DEQ At-a-Glance

- Protects surface and ground water from pollution through both federal and state programs
- Regulates air emissions through both federally-delegated and state programs
- Issues licenses and certification for disposal and waste transfer sites across the state
- Operates grant and loan programs for local wastewater and other clean water infrastructure
- Provides technical assistance to businesses to improve compliance with air, land and water regulations







Oregon DEQ Organizational Structure

Environmental Quality Commission

DEQ Leadership Team

Eastern Region

Northwest Region

Western Region

Agency Management

Air Quality Land Quality

Water Quality

Lab



Oregon DEQ Programs

Agency Management

Human resources, info technology, financial services

Air Quality

Federal and state permitting programs, technical assistance and grants

Land Quality

Materials management, licensing/certifications, cleanup and emergency response

Water Quality

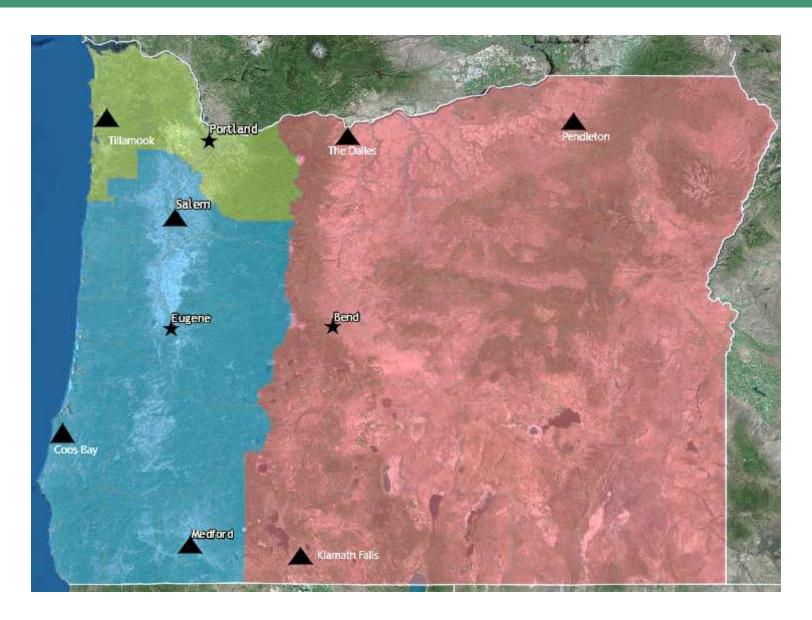
Federal and state permitting programs, groundwater protection and grants/loans

Laboratory and Environmental Assessment

Monitoring, assessment and analysis of Oregon's environment



Oregon DEQ in Communities





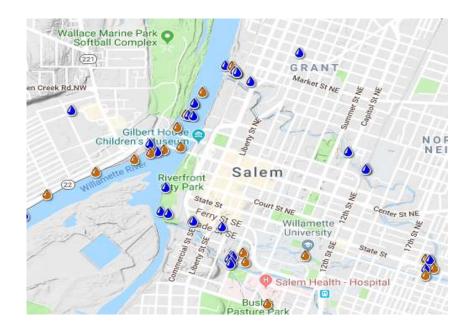
Oregon DEQ Lab and Environmental Assessment

Oregon Air Quality Index

- Upgraded AQI in 2018
- Updated hourly, statewide system
- Available using OregonAir mobile app
- Saw record traffic during 2018 wildfire season





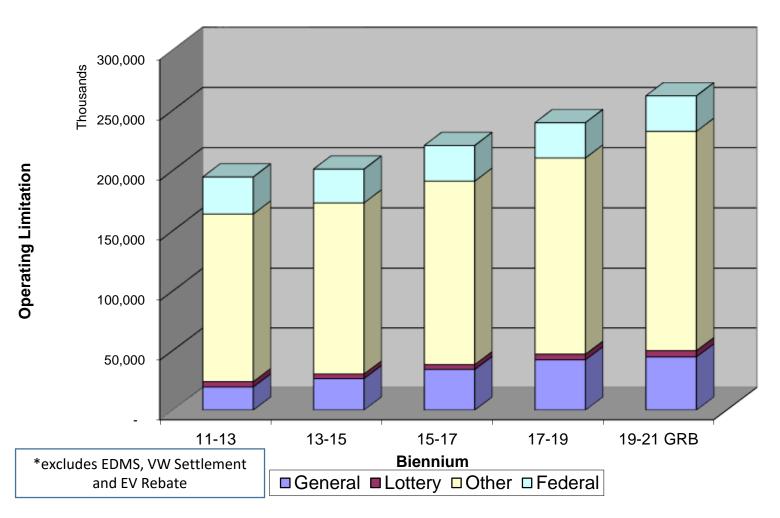


Ambient Water Quality Monitoring System

- Launched Summer 2017
- All DEQ data from 1940present currently available
- Data from 120+ partner agencies available
- Over 16 million individual results

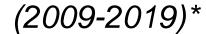


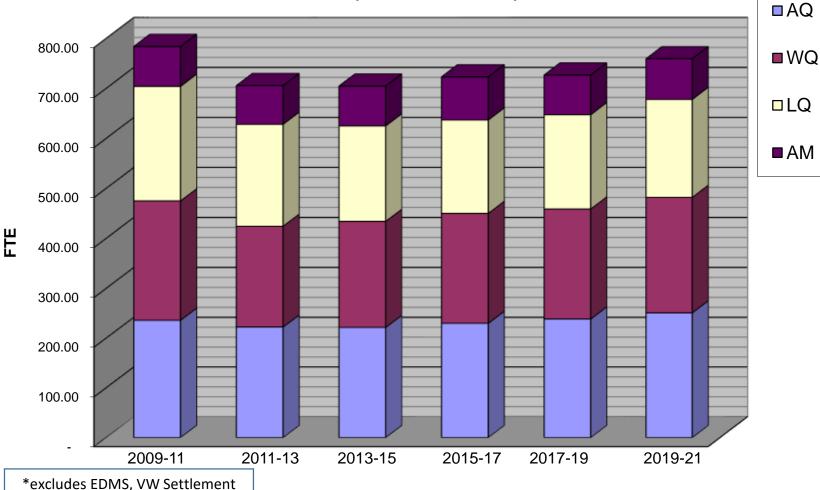
Budget History, Agency Budget*





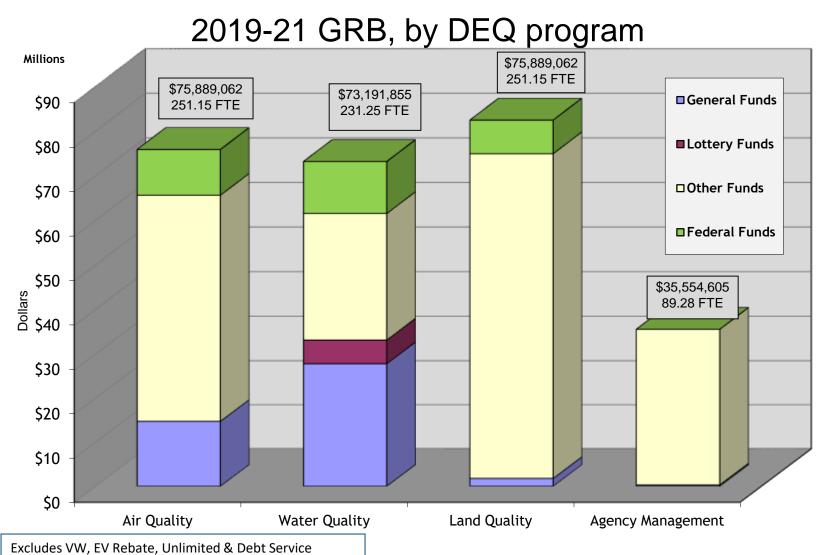
Budget History Agency FTE, by program





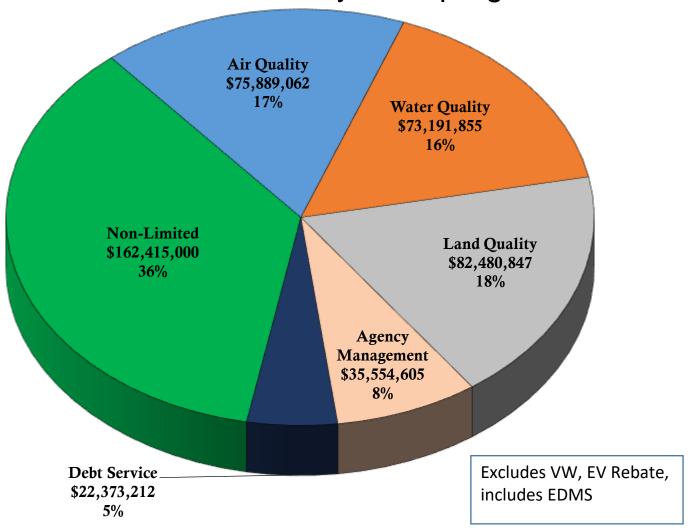
Biennium

and EV Rebate











Land Quality







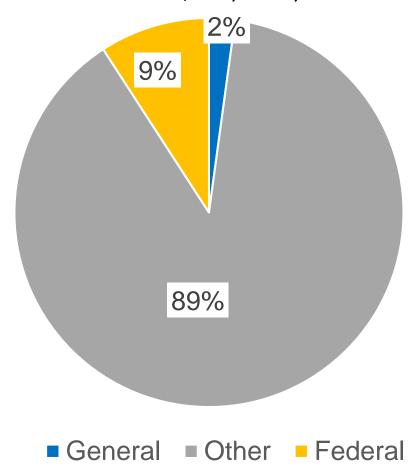


Ensure healthy places where Oregonians live, work and play



Land Quality Budget Overview

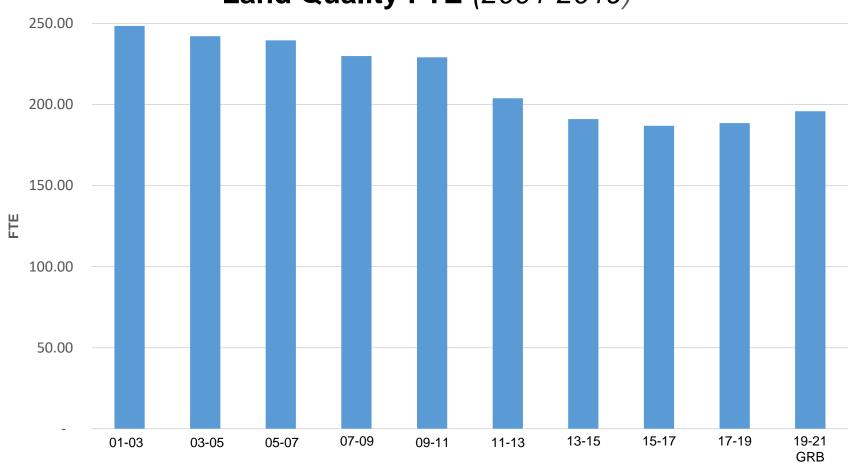
2019-21 GRB - \$82,480,847 total funds





Land Quality Program Staffing







Land Quality Programs

Permitting and Inspections

- Landfills, hazardous waste generators
- Underground Storage Tanks
- Ballast Water Invasive Species Prevention

Response and Cleanup

- Spill response
- Oversee cleanup of contaminated sites, leaking underground storage tanks, and leaking home heating oil tanks

Prevention

- Technical assistance
- Materials Management Program







Land Quality Fiscal Outlook

Fiscally Stable

- Underground Storage Tanks
- Materials Management

Fiscal Shortfalls

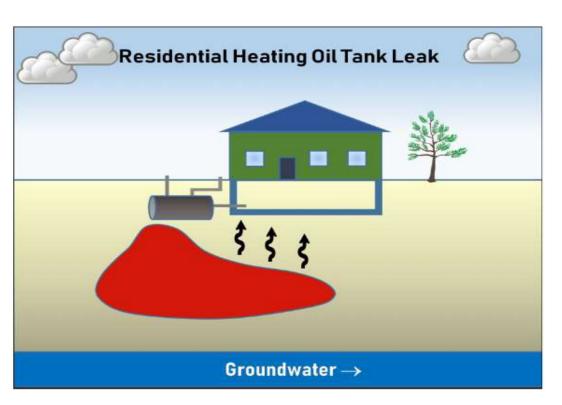
Heating Oil Tanks

Fiscal Challenges

- Hazardous Waste
- Emergency Response
- Cleanup



Heating Oil Tanks Program







Protects residents from potential fumes entering home and protects drinking water from potential pollution

Package 131: Maintain Heating Oil Tank Program

Program	Package Type	FUND	Amount	Pos	FTE
Land	Revenue Enhancement	OF	\$0	0	0

- Senate Bill 40 increases fees paid by homeowners to certify decommissioned heating oil tanks (currently \$75) and fees paid by service providers who perform the work
- Fees would increase Jan. 1, 2020
 - Certification fees by 33% over three years
 - Decommissioning fees by 25% to 180%, based on complexity



Emergency Response Program

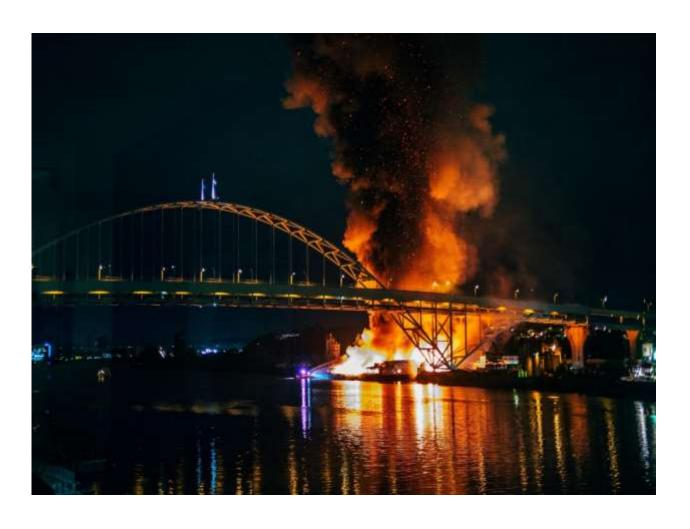








Emergency Response Program



Responding to around 1,300 spills and other emergencies every year

Working with industry to prevent and prepare for spills affecting waterways



Package 134: Statewide Emergency Spill Response and Preparedness

Program	Package Type	FUND	Amount	Pos	FTE
Land	Service Enhancement	GF	\$604,559	2	2.0

- Provides resources for DEQ to fulfill its emergency response duties, which include responding to oil and hazardous material spills and other releases
- DEQ receives about 1,300 incident notifications per year from the Oregon Emergency Response System, the largest volume of any state agency
- General Fund resources are appropriate for statewide and area response planning, and for responses where costs cannot be recovered



Package 132: Maintain and Enhance Oil Spill Preparedness

Program	Package Type	FUND	Amount	Pos	FTE
Land	Service Enhancement	OF	\$224,097	1	1.0

- ORS 468B.405 requires DEQ to assess fees on covered vessels and offshore and onshore facilities (pipelines and storage facilities) to recover the costs of reviewing spill contingency plans and conducting required inspections, exercises, training and activities
- Senate Bill 41 increases these fees, reflecting growing program costs and a growing volume of oil transport
- Current fees range from \$85 per trip (small vessels) to \$9,250 per year (storage facilities)



Package 133: Safe Transport of Hazardous Materials by Rail

Program	Package Type	FUND	Amount	Pos	FTE
Land	New Work	OF	\$534,400	2	2.0

- Provides resources for oil spill planning, preparedness and response along High Hazard Rail Corridors in Oregon, including Geographic Response Plan development
- DEQ will work with railroads to ensure they are prepared for a spill, and that the information needed to mitigate damage and complete cleanups is available
- Includes new fees authorized by HB 2064, paid by railroads to cover the cost of the program
- Aligns rail with other transport and storage systems (marine and pipeline)



Hazardous Waste Program







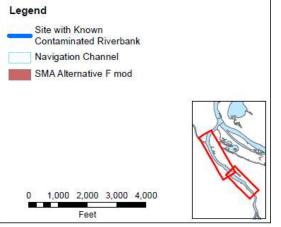
Cleanup Program













Underground Storage Tanks Program







Materials Management Program



Sustainable Materials Management: A "life cycle" view of impacts and actions



Package 136: Solid Waste Orphan Cleanups

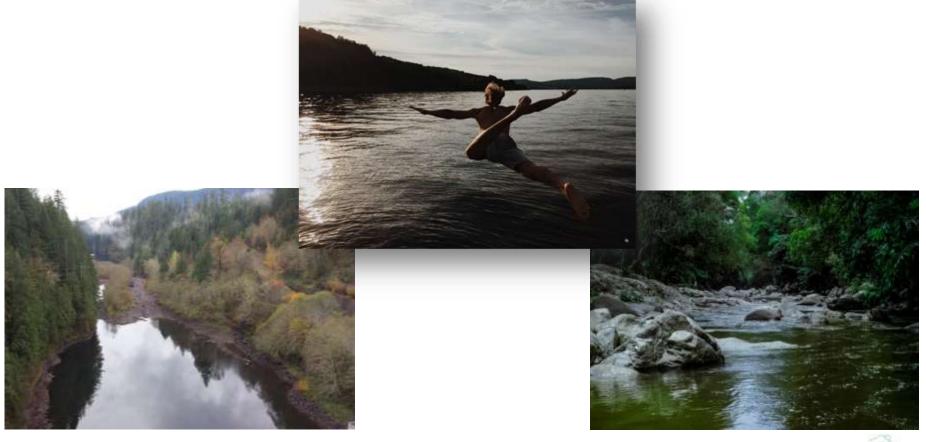
Program	Package Type	FUND	Amount	Pos	FTE
Land	Service Enhancement	OF	\$3,147,316	3	3.0

- Provides limitation for a limited period to pay for cleanup at "orphaned" solid waste disposal sites
- Enables DEQ to increase use of existing funds to inventory, prioritize and provide cleanup oversight of these sites



Water Quality

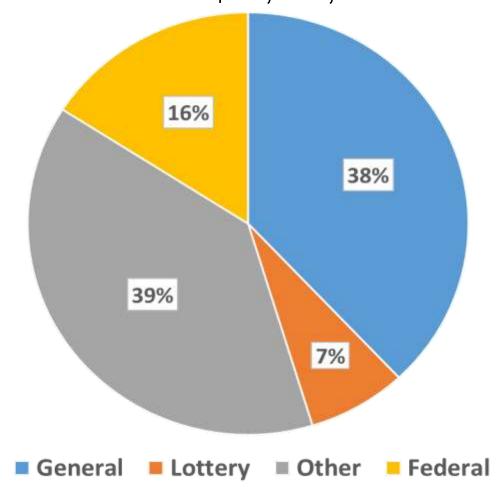
Ensure Oregon's waters are drinkable, fishable and swimmable





Water Quality Budget Overview

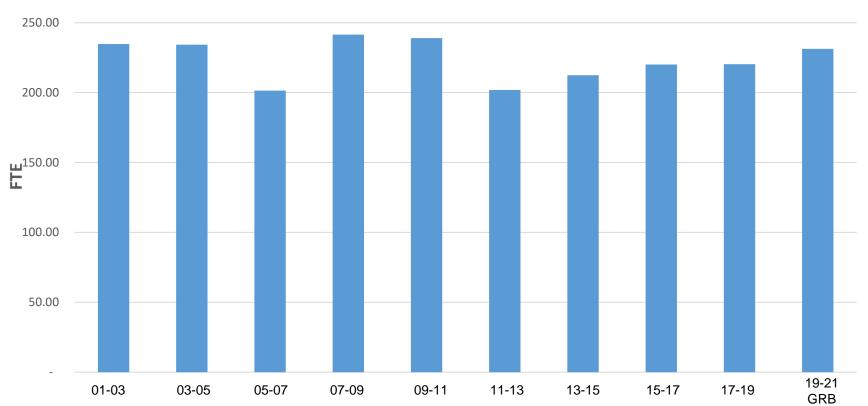
2019-21 GRB - \$73,191,855 total funds





Water Quality Program Staffing

Water Quality FTE (2001-2019)





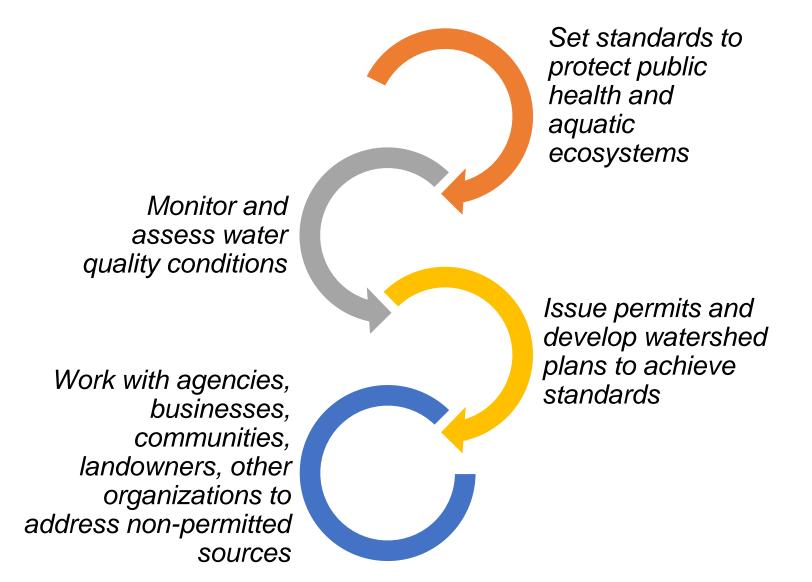
Water Quality Programs

- Surface Water/Groundwater
- Water Quality Standards/Uses
- Monitoring and Assessment
- Clean Water Plans and Strategies
- Wastewater and Stormwater Permitting
- Inspections and Compliance
- Certifications and Licenses
- Grants and Loans





Clean Water Act Framework





Permitting, Certifications and Licensing

Permitting of point source facilities statewide

- Federally delegated NPDES Program
- State authorized WPCF Program
- Municipal and Industrial
- Individual and General
- Stormwater runoff from cities, construction and industrial sites

401 Water Quality Certification

- Review and certify that activities authorized by federal licenses and permits meet Oregon water quality standards
 - USACE Dredge/Fill activities
 - Hydroelectric or Energy Projects

Onsite Septic Systems (Residential and Commercial)

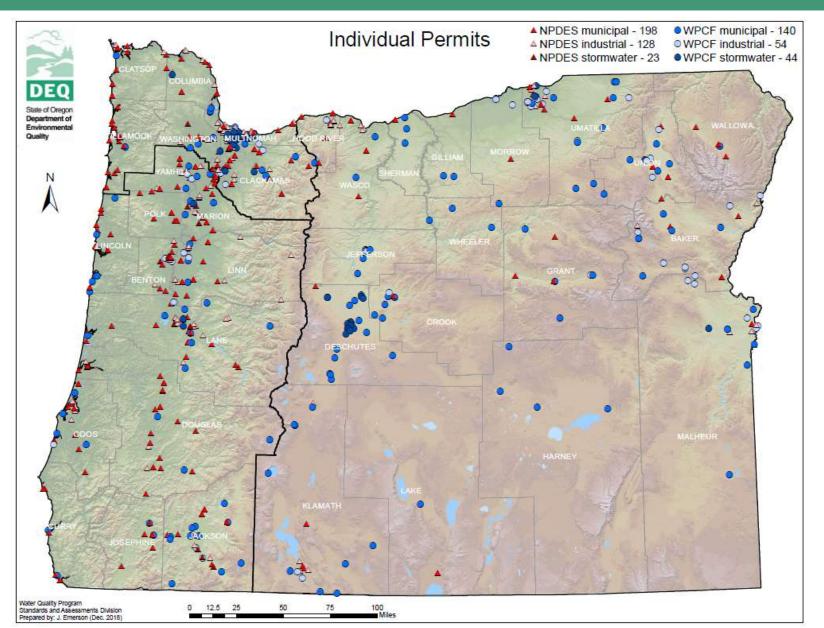
- Implement the residential onsite septic program in 10 counties, evaluating sites and issuing permits
- Manage more than 700 individual permits statewide for large onsite septic systems
- License nearly 700 onsite septic system installers and pumpers







Permitting Universe





Permitting Challenges



- 78% of individual NPDES permits are not renewed and updated on time
- Contributing factors
 - Increasingly complex permit requirements
 - Complex data needs
 - Limits on local capacity
 - Standards protect sensitive uses
 - Declining resources
- Consultant recommendations
 - Centralize decision-making
 - Improve data management
 - Improve permitting integration with standards, TMDLs
 - Restore and increase resources
 - Improve accountability and transparency

Permitting Process Improvement

Progress

- Permit readiness evaluation
- Permit process evaluation and consultation
- Data management and systems upgrades
- Re-organization/centralized NPDES team
- Stakeholder engagement

Outcomes

- 2018 permit issuance success
 - Acted upon 32 individual permits and three general permits
 - Twice as many permits issued in 2018 relative to average number in 2014-2016
- 2019 Issuance Work Plan



Package 127: Water Quality Permitting Program Improvements

Program	Package Type	FUND	Amount	Pos	FTE
Water	Service Continuation	GF OF	\$2,876,498 \$2,003,192	27	19.8

- Provides permitting program resources needed to address deficiencies, including:
 - Wastewater and stormwater
 - Individual and general permit development (NPDES/WPCF)
 - Issuance, compliance assurance, inspections, and e-reporting
- Based on 60/40 split funding (Fees/GF)
- Projected 35% fee increase proposal (July 2020), in addition to annual fee increase of up to three percent
- Included in agency budget proposal; no statutory amendment needed





Standards and Assessment Program

Establish standards to protect beneficial uses of surface waters as well as compliance options; Assess waters to identify those that are not meeting standards









Water Quality Monitoring

DEQ's Laboratory and Environmental Assessment Division collects and analyzes water samples to support DEQ's water quality program





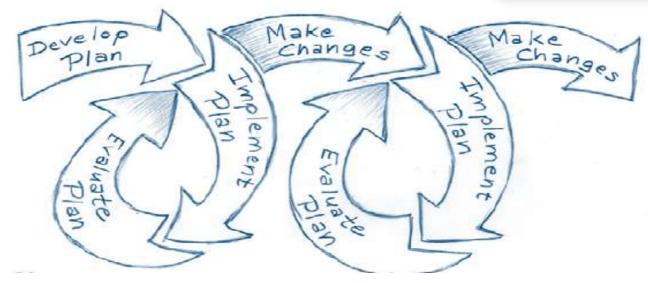
Clean Water Plans

Develop watershed management plans and strategies to achieve water quality standards through both regulatory and non-regulatory means, including partnerships with ODA and ODF



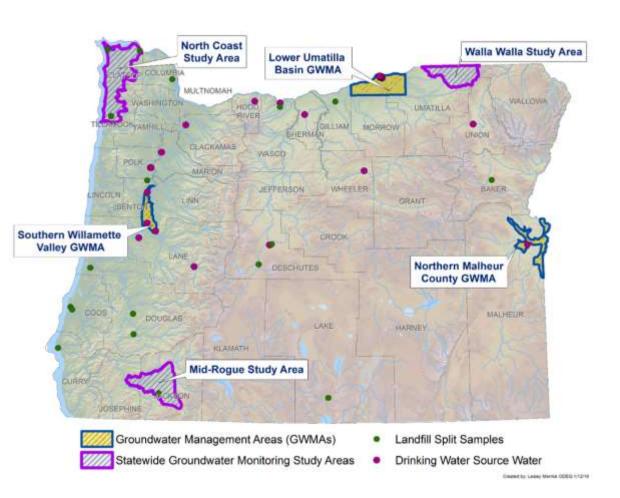








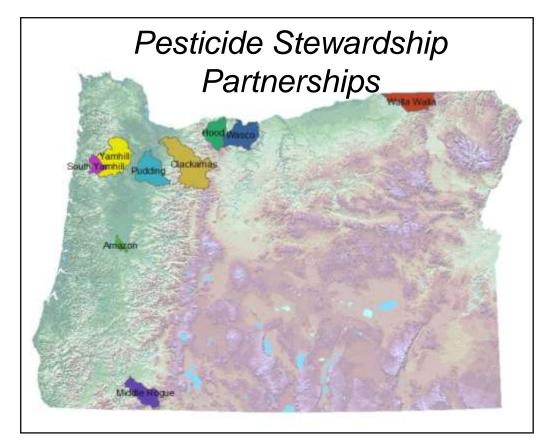
Groundwater



Preventing groundwater contamination from point and non-point sources of pollution, cleanup of pollution sources and monitoring and assessing groundwater and drinking water quality



Partnerships and Interagency Coordination







Modernizing Water Quality Services

- Data management
- Lab services
- Infrastructure investments
- Technical assistance to small communities
- Stakeholder engagement





Documenting Needs for Clean and Abundant Water

Out of Sight, Out of Mind: Funding Oregon's Water Infrastructure Needs

Oregon League of Cities, 2016

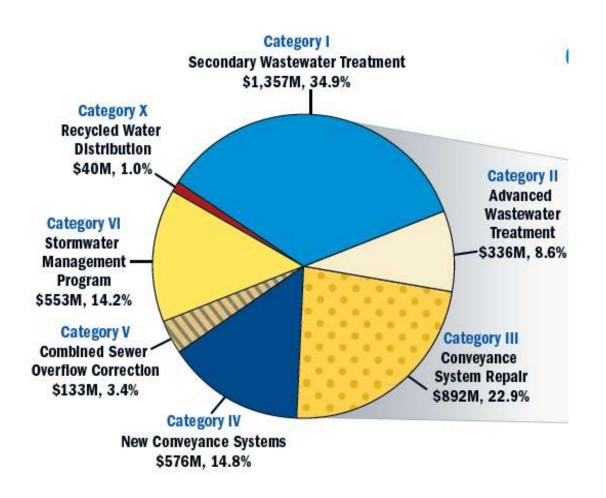
"The League's infrastructure survey...identified an estimated \$4.3 billion in wastewater infrastructure needs over the next 20 years, and approximately \$3.3 billion for drinking water supply"

"In total, 67 percent of responding cities indicated the need for additional water supply storage in the next 20 years"



Documenting Needs for Clean and Abundant Water

Clean Watershed Needs Survey (2012)





Package 161: Water Infrastructure/Inventory

Program	Package Type	FUND	Amount	Pos	FTE
Water	New Work	GF	\$250,000	0	0

- Working with OWEB, OWRD, stakeholders and other agencies and units of government, inventory longterm needs for water infrastructure, including both built and natural systems
- Scope of this work will reflect both broad statewide needs and locally-anchored and driven requirements for waterrelated infrastructure





Clean Water State Revolving Loan Fund

Supports communities and improves water quality statewide Financed over \$75 million in 2018







Packages 181/191: Clean Water State Revolving Fund

Program	Package Type	FUND	Amount	Pos	FTE
Non-limited	Service Continuation	OF	\$30,150,000	0	0
Debt service	Service Continuation	OF	\$10,020,000	0	0

- Limitation increase for receipt of:
 - \$30 million from federal capitalization grants
 - \$10 million in bond refinancing to provide 20% state match, a grant requirement
 - \$150,000 bond issuance costs





Package 125: CWSRF Loan Specialist

Program	Package Type	FUND	Amount	Pos	FTE
Water	Service Continuation	OF	\$198,894	1	0.88

- Establishes new position to provide effective and efficient loan servicing and financial management of the Clean Water State Revolving Fund loan program
- Funded from earnings of the CWSRF
- Will help meet anticipated increase in demand for CWSRF financing





Package 163: CWSRF Loan Software

Program	Package Type	FUND	Amount	Pos	FTE
Water	Service Continuation	OF	\$500,000	0	0

- Assessment of loan management software improvement needs and options
- Business software requirements analysis funded from earnings of the CWSRF
- Anticipates procurement of commercial off-the-shelf software





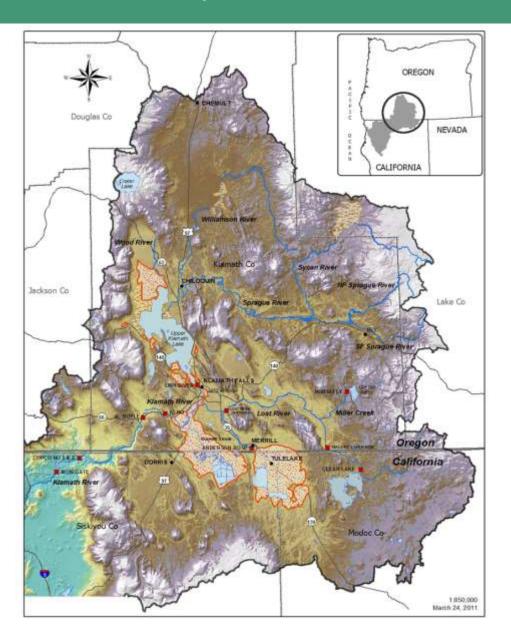
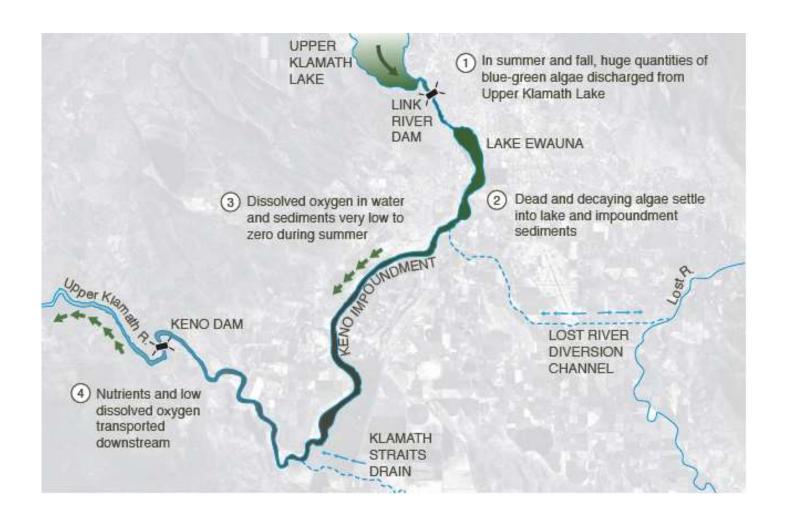






Fig. 4.2 (Above right) Algae bloom on Upper Klamath Lake. Photo: Brett Cole.







ODA Water Quality Monitoring Program 2018-2019

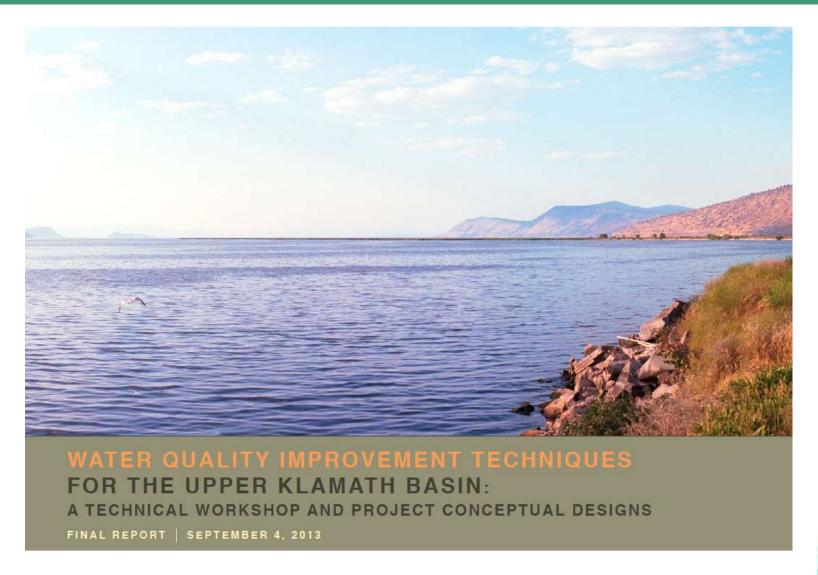
Upper Klamath Lake Agricultural Pump Sites and Drainage Areas













Package 126: Klamath Basin

Program	Package Type	FUND	Amount	Pos	FTE
Water	Service Continuation	GF	\$640,412	3	2.5

- Supports DEQ role in multi-agency restoration and economic development efforts
- Addresses water quality information gaps that are critical for Klamath Basin salmon and steelhead reintroduction





Air Quality







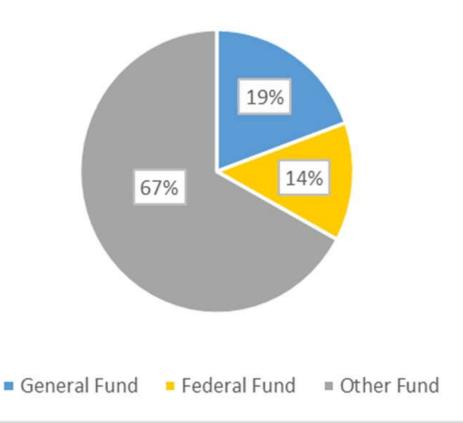
Protects public health, quality of life and the environment by working with communities to improve the quality of the air we breathe



Air Quality Budget Overview

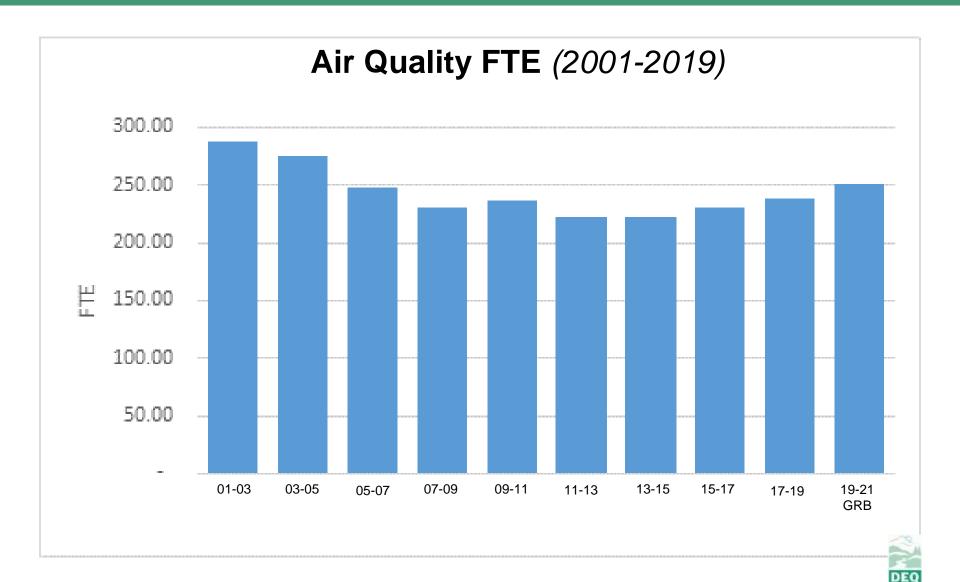
2019-21 GRB - \$75,889,062 total funds

Excludes EV Rebate and VW pass-through dollars

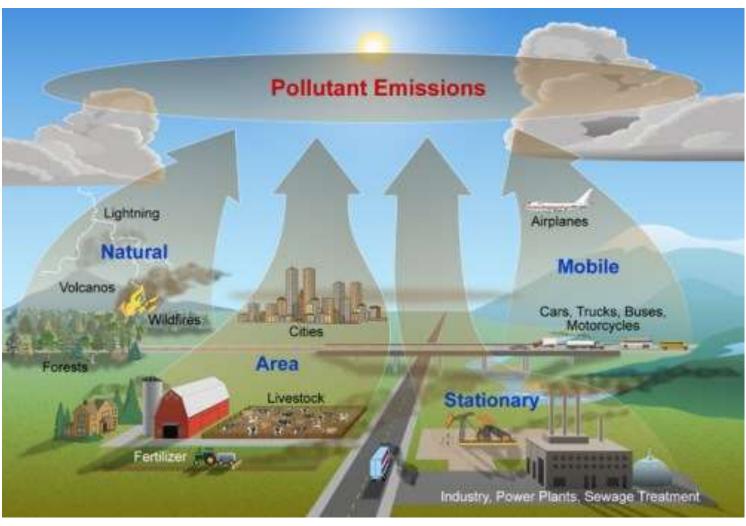




Air Quality Program Staffing



Policy Framework



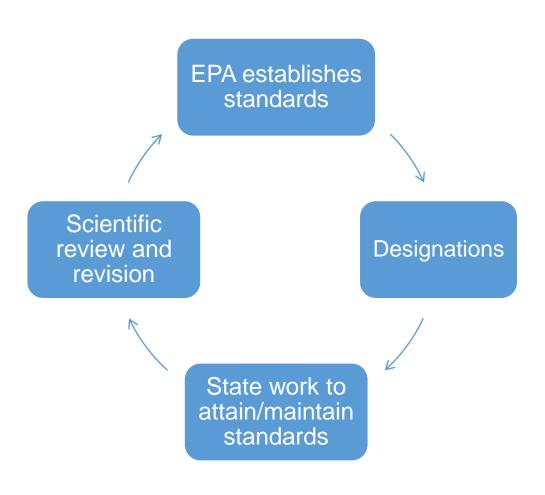




National Ambient Air Quality Standards

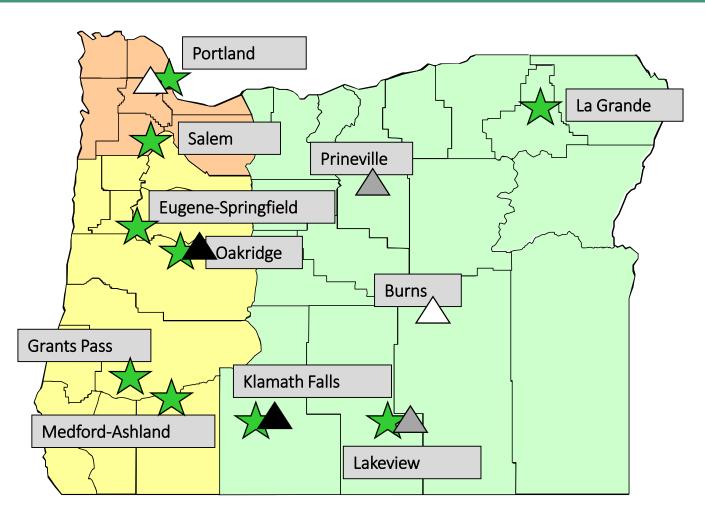


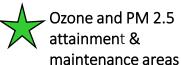
- Ozone
- Particulate Matter
- Carbon Monoxide
- Lead
- Sulfur Dioxide
- Nitrogen Dioxide

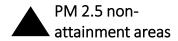


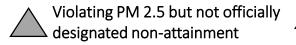


Compliance with Federal Standards





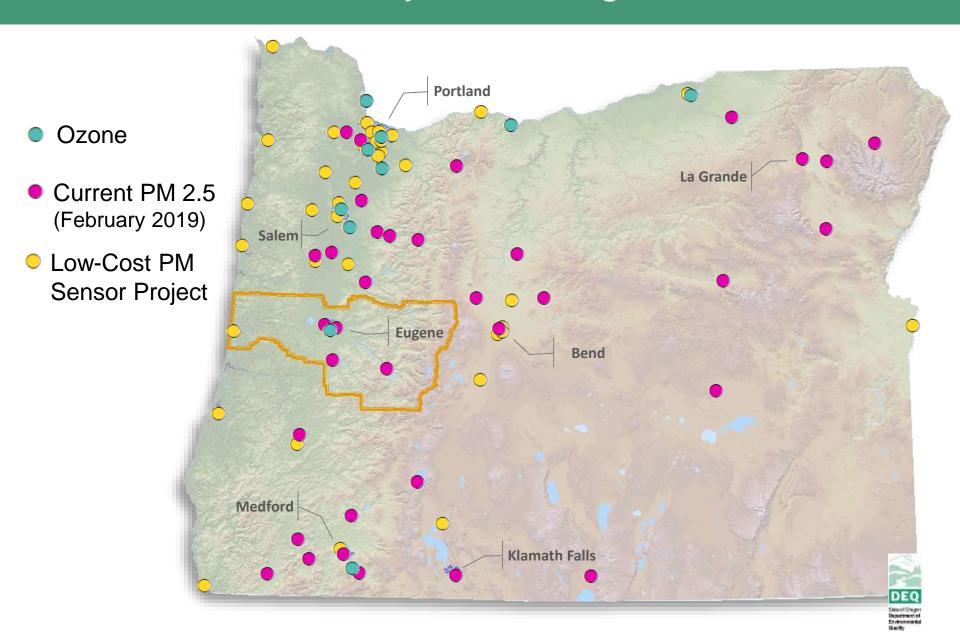






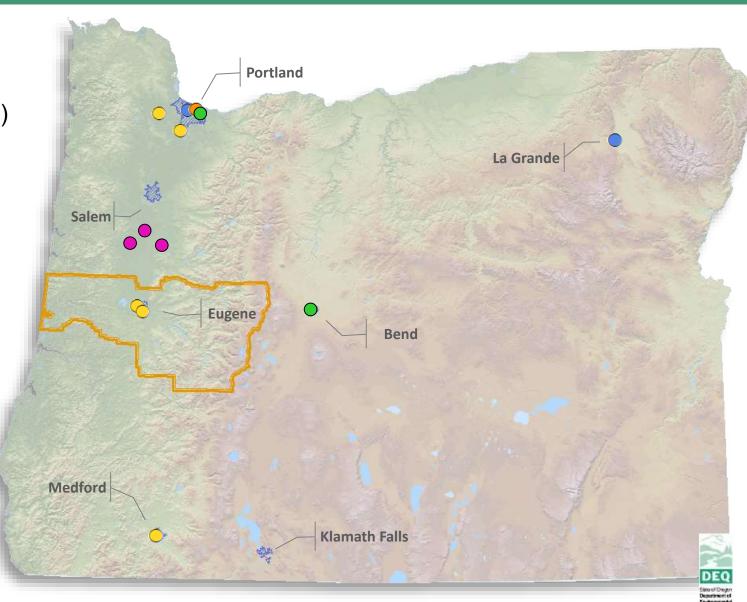


Air Quality Monitoring Sites

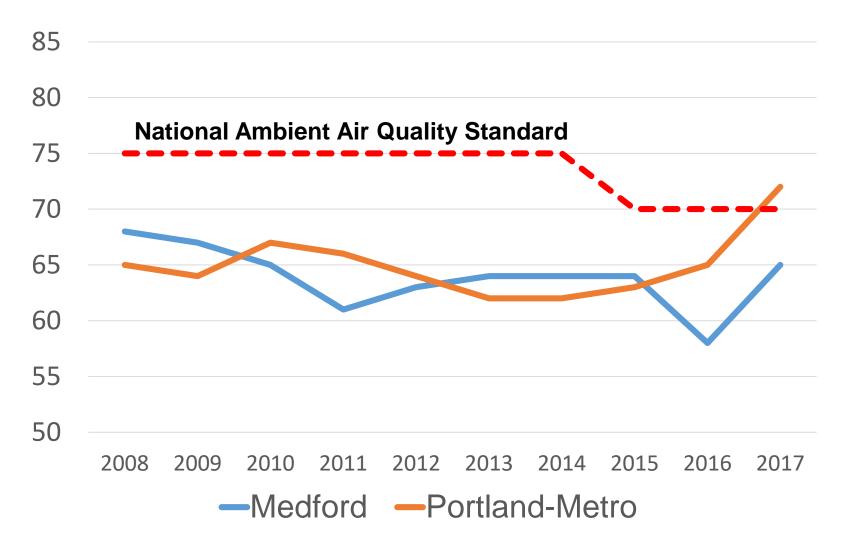


Air Quality Monitoring Sites

- National Air Toxics Trend Sites (NATTS)
- Long-termTrend Sites
- Rotating Annual Sites
- Planned Long-Term Trend Sites
- PlannedRotatingAnnual Sites

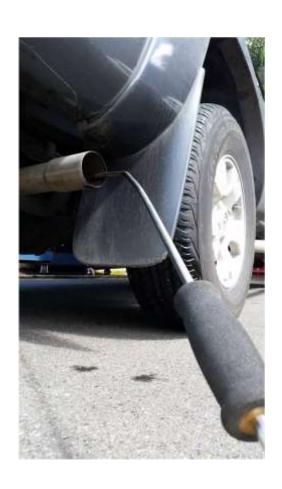


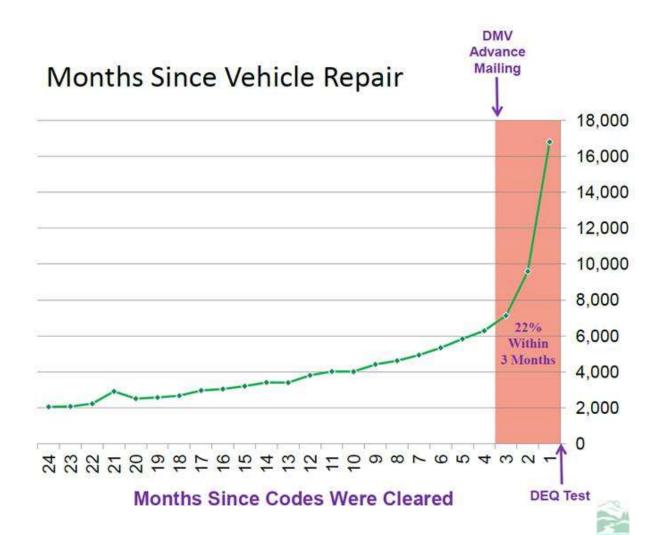
Ozone



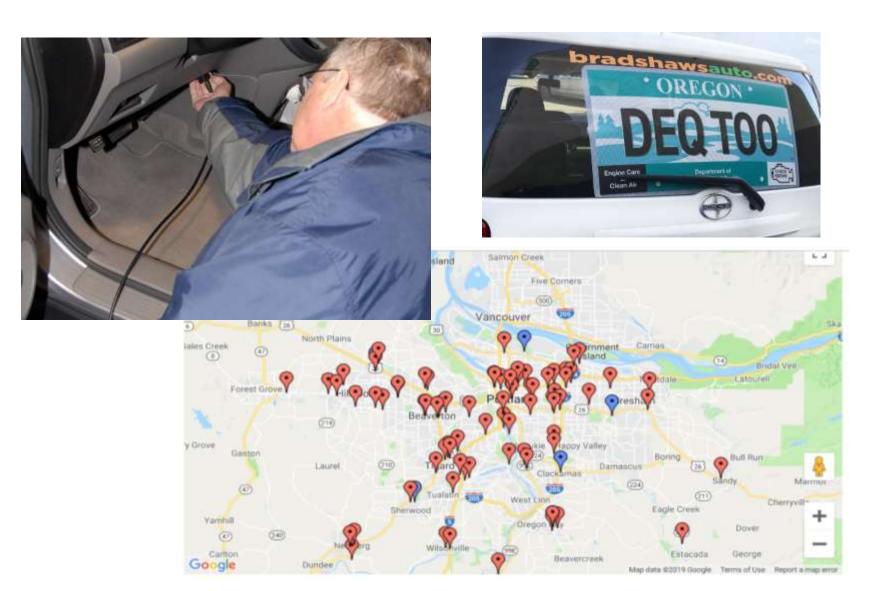


Vehicle Inspection Program





Vehicle Inspection Program: DEQToo





Package 118: Maintain Effective Vehicle Inspection Service

Program	Package Type	FUND	Amount	Pos	FTE
Air	Service Continuation	OF	\$1,454,686	8	8.0

- Maintains current level of service
- Ensures low wait-times and continued innovation
- First fee increase since 1997
 - Increase Portland fee from \$21 to \$25
 - Increase Medford fee from \$10 to \$25, over six years



Permitting and Inspections

Title V: 105 sources

- Federally delegated program
- Fully fee-funded

Air Contaminant Discharge: 2,400 sources

- State-level permits for construction and operation
- Funded by fees, General Fund and Federal Funds

Cleaner Air Oregon

- Air toxics risk assessment and management
- Applies to existing and new sources
- Recently authorized by the Legislature, SB 1541 (2018)
- Funded by fees and General Fund





Cleaner Air Oregon



Report air toxics

Companies to report use of 600 pollutants to state regulators



Assess risk

Assess potential health risks to people who live, work, and go to school nearby

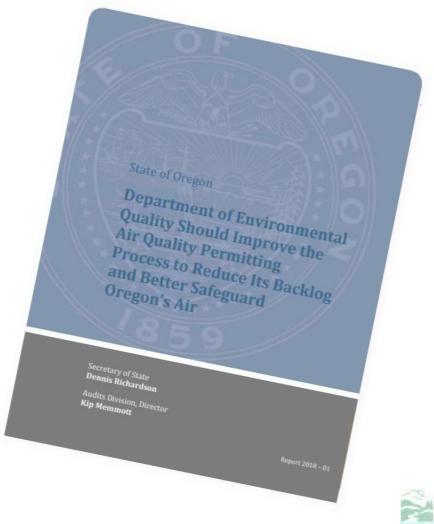


Regulate to reduce risk

If the levels of air toxics emitted exceed health risk action levels (RALs) established in statute, facilities must act to reduce those risks

Air Quality Permit Backlog

- 43% of complex permits are not renewed on time
- Contributing factors:
 - Competing priorities
 - Increasingly complex federal requirements
 - Unclear guidance and application support materials
 - Resource deficiencies





Improving Systems and Processes



Process improvement for Title V permitting



Overhaul permitting webpages and forms



Improve pre-application guidance



Standardize inspection tracking



Fill permitting vacancies



Comprehensive workload analysis



Package 116: Eliminate the Air Quality Permit backlog

Program	Package Type	FUND	Amount	Pos	FTE
Air	Service Continuation	OF	\$903,579	10	4.32

- Ensures timely issuance of new permits, applications for permit modification and elimination of permit backlog
- Authorizes eight new positions
 - Six ACDP permit writers/inspectors
 - Two Title V permit writers/inspectors
- Proposes a fee increase for ACDP holders; no Title V fee increase
 - Total fee increase will vary by permit category, subject to agency rulemaking, effective fall 2020



Package 119: Implement Air Toxics Permitting Program

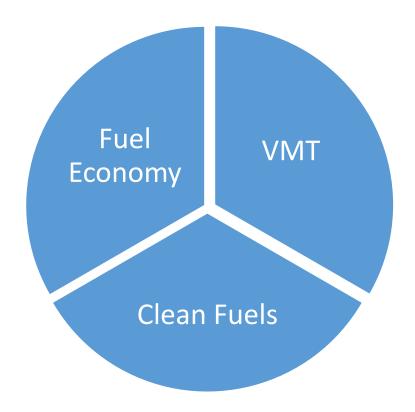
Program	Package Type	FUND	Amount	Pos	FTE
Air	New Work	OF	\$2,581,253	11	11.0

- Transitions 11 LD positions authorized in 2018 to permanent status
- Fees also support 2.60 FTE in Oregon Health
 Authority staff resources to support health risk analysis
- Related to HB5018 (fee ratification bill)
- Fees take effect in Fall 2019
- Legislature authorized the program in SB 1541 (2018)



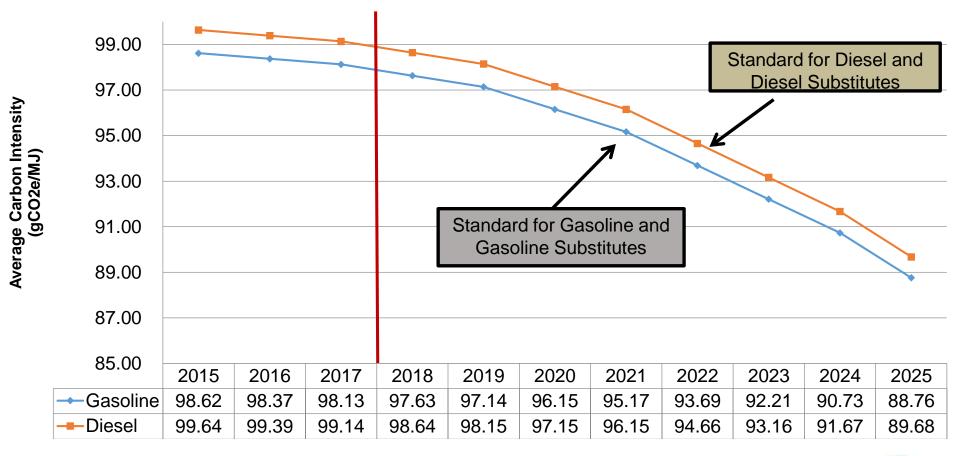
Transportation Greenhouse Gas Emissions

	1990	1995	2000	2005	2010	'11	'12	'13	'14	'15	'16	'17
Transportation (MmtCo2e)	21	23	24	25	23	22	22	21	21	23	24	25.7





Low Carbon Fuel Standard





ZEV Requirement

- Oregon adopted the Zero Emission Vehicle program effective with the 2009 model year
- Portion of manufacturer sales must be EVs
- Aligned with California requirements for manufacturers
 - Eight other states have also adopted the California requirements





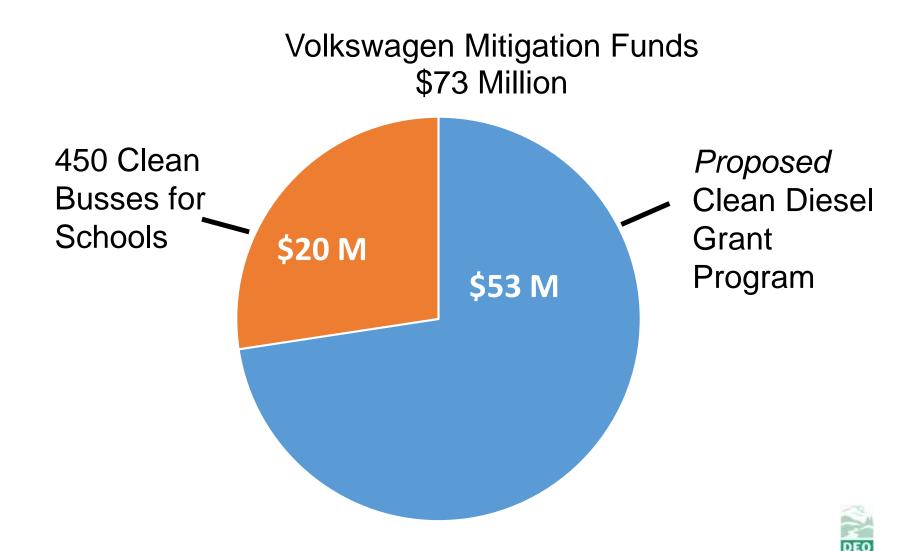
Incentive Programs







House Bill 2063 – VW Funds



Package 111: Electric Vehicle Rebate Program

Program	Package Type	FUND	Amount	Pos	FTE
Air	Service Continuation	OF	\$5,749,259	1	1.0

- Technical adjustments for the EV Rebate Program:
 - Transition 1 limited duration position to permanent status
 - Increase Other Fund limitation to align with expected revenue
- Allows DEQ to issue the full \$24 million in rebates for 2019-21 biennium
- Ensures continued oversight of program operated by private contractor



Agency Management

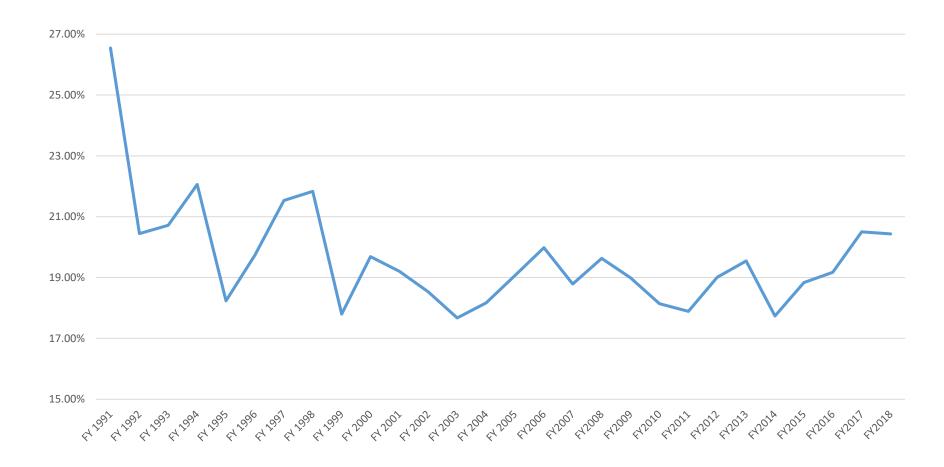
- Information Technology
- Human Resources
- Financial Services
- Internal Policy



Supporting the agency to fulfill its mission



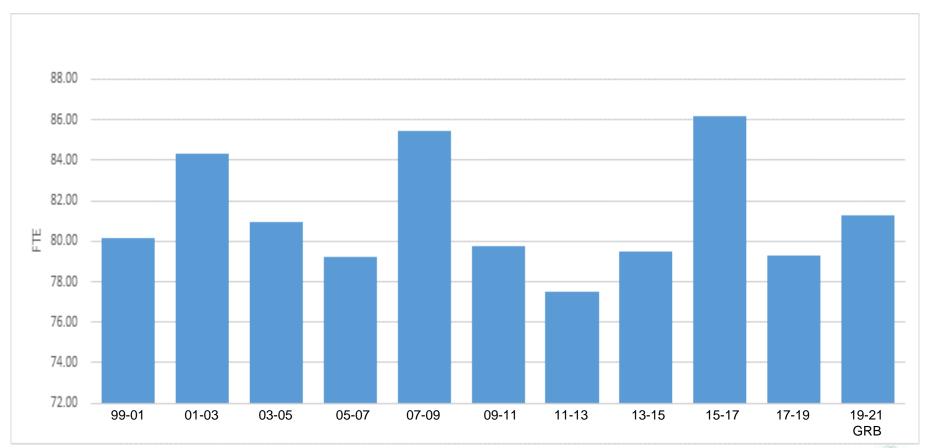
Agency Management Budget Overview





Agency Management Budget Overview

Agency Management FTE (1999-2019)





Package 140:

Environmental Data Management System Project

Program	Package Type	FUND	Amount	Pos	FTE
Agency Management	Service Continuation	OF	\$5,123,293	7	7.0

- Standardize permitting processes across air, land and water programs, support efforts to reduce program backlogs
- Major modernization of legacy data management and business systems
- Commercial off-the-shelf system being used successfully in other states
- Nearing Stage Gate 3 approval, in second round of funding, following first phase approval by Legislature in 2017





Package 143: Agency Internal Auditor

Program	Package Type	FUNDS	Amount	Pos	FTE
Agency Management	New Work	OF: \$130,563 GF: \$154,715	\$285,278	1	1.0

- Implements recommendation from the Secretary of State, Audits Division, that identified DEQ as one of the agencies where this capacity is needed
- Supports DEQ's Leadership Team's work to identify key areas of risk and opportunities for efficiencies



Package 144: Environmental Justice Coordinator

Program	Package Type	FUNDS	Amount	Pos	FTE
Agency Management	New Work	OF: \$135,206 GF: \$160,364	\$295,570	1	1.0

- Provides capacity to evaluate effects of policy decisions in under-represented communities
- Responds to federal obligations to consider environmental justice and civil rights in implementation of federal programs and funding
- Builds on DEQ's experience in evaluating environmental justice impacts, to create a more consistent approach and level of attention



Package 180: Issue XI-Q bonds for Environmental Data Management System

Program	Package Type	FUNDS	Amount	Pos	FTE
Agency Management	Issuing bonds	OF	\$5,065,000	0	0.0

- Funds second round of implementation for the Environmental Data Management System project
- Non-Limited Funds for bond issuance and General Obligation Bonds to provide funding for project



Package 190: Environmental Data Management System Debt Service

Program	Package Type	FUNDS	Amount	Pos	FTE
Agency Management	Debt service	GF	\$834,752	0	0.0

 Debt service for General Obligation Bonds requested in POP 180



2019-21 Governor's Recommended Budget



Revenue Shortfalls: Package 070

Redu	Reductions		R	estoration Requests
Dollars	FTE	Fund	Pkg	Status
		!		

Aligning to Conditions

Clean Water Revolving Fund Project Management	\$ (233,200)	-1.00	OF
	\$ (233,200)	-1.00	

Impacting Services

Vehicle Inspection Program	\$ (1,383,610)	-8.00	OF	118	Recommended
Integrated Water Resources Strategy	\$ (201,984)	-1.00	FF	124	Not recommended
Nonpoint Source Pollution Control	\$ (197,917)	-1.00	FF	128	Not recommended
Water Quality Information Management and Data Coordination	\$ (207,473)	-1.00	FF		
Water Quality Surveys	\$ (66,007)	0.00	FF		

\$ (2,056,991) -11.00



Reductions in GRB: Package 090

Program	Fund type	Reduction	Dollars	FTE
Water	General	 TMDL implementation Integrated Water Resources Strategy Water Quality legal policy advice Stormwater management oversight Groundwater and air speciation field collection and sample analysis Services and supplies 	(\$1,924,979)	6.0
	Lottery	 Services and supplies 	(\$4,475)	0.0
Air	General	Cleaner Air Oregon supportAir speciation dataServices and supplies	(\$815,941)	2.0
Land	General	Vacancy savingsServices and supplies	(\$42,804)	0.0

General Fund Reduction Options

First 5 percent

Priority	Program	Description	Amount	Pos	FTE
1	Water	Water Quality Hydrogeologist	\$133,000	0	0.50
2	Cross- Program	Regional Solutions	\$297,000	1	1.00
3	Water	Ground Water Monitoring	\$480,000	2	2.00
4	Air	Air Toxics Monitoring	\$405,000	3	2.50
5	Air	PM2.5 Speciation	\$359,000	2	1.50
6	Air	Ozone Monitoring	\$168,000	1	1.00
7	Water	Western Region Integrated Water Resources Strategy	\$277,000	1	1.00
		5% General Fund Reduction Options	\$2,119,000	10	9.5



General Fund Reduction Options

5 to 10 percent

Priority	Program	Description	Amount	Pos	FTE
8	Air	Air Toxics Support	\$221,246	1	1.00
9	Water	Compliance and Enforcement	\$288,000	1	1.00
10	Air	Air Quality Planning	\$269,000	1	1.00
11	Water	Biosolids and Reuse Program	\$255,000	1	1.00
12	Water	Basin Specialist	\$210,954	1	1.00
13	Water	WPCF Permit Writer	\$210,000	1	1.00
14	Water	Water Quality Engineer	\$313,000	1	1.00
15	Water	Water Quality Toxics Monitoring	\$412,467	2	2.00
Total General Fund Reduction Options \$4,298,667			19	18.50	

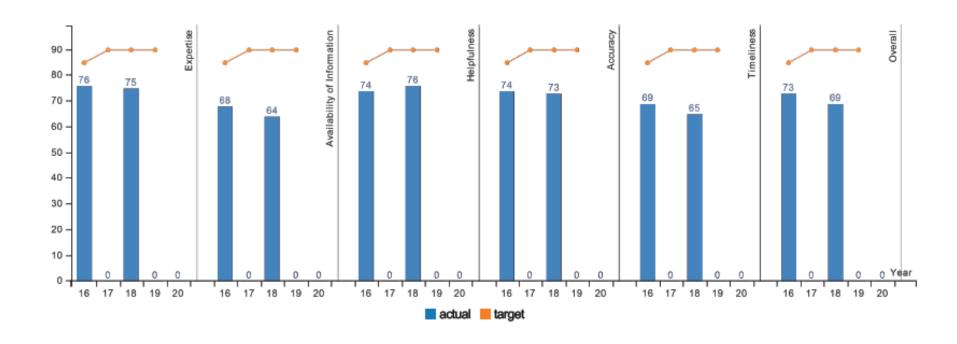
Lottery Fund Reduction Options

10 percent

Priority	Program	Description	Amount	Pos	FTE
1	Water	Biomonitoring	\$262,000	1	1.00
2	Water	Biomonitoring	\$271,500	1	1.00
Total Lottery Fund Reduction Options		\$533,500	2	2.00	



Key Performance Measures



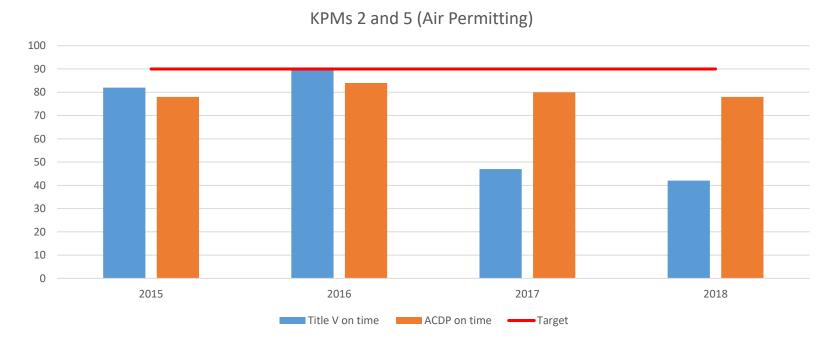
- Annual reporting on 14 KPMs, representing functions across the agency
- Changes proposed for two Air Quality permit-related KPMs



Proposed KPM Changes

Delete two KPMs:

- KPM 1: Percent of Air Contaminant Discharge Permits issued within the target period
- KPM 5: Percent of Title V operating permits issued within the target period





Proposed KPM Changes

Replace with three new KPMs:

- Percentage of new air quality permits that are issued within timeliness targets
- Percentage of air quality permit modifications that are issues within timeliness targets
- Percent of air quality permits that are current (not on administrative extension)



Appendix Materials

- Agency Key Performance Measures report
- Audits
- Span of Control report
- Proposed technology projects
- Other Funds ending balance form



Building resilient programs to ensure that DEQ provides the high quality and timely services our communities need, expect and rely on

