COMPARISON STUDY OF THE STATES OF WASHINGTON AND OREGON'S TOTAL MAXIMUM DAILY LOAD (TMDL) PROCESSES

by

Aleceia Marie Tilley

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Aleceia Marie Tilley

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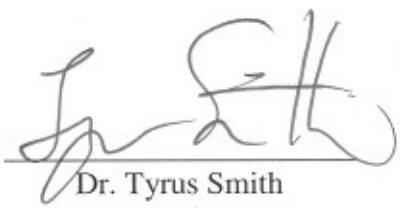

Dr. Tyrus Smith
Member of Faculty

6/13/07

Date

ABSTRACT

Comparison Study of the States of Washington and Oregon's
Total Maximum Daily Loads (TMDLs) Processes

Aleceia Marie Tilley

Under the Clean Water Act, the U.S. Environmental Protection Agency (EPA) requires states or federally recognized tribes to administer the TMDL program to address point source and nonpoint source pollution affecting impaired watersbodies. This study determines how effective Washington State's TMDL program is compared to Oregon State's TMDL program. To measure the effectiveness of both programs, a qualitative and quantitative analysis was conducted. The qualitative analysis consisted of the Oregon and Washington State's regulatory state agency's internal review process, the settlement agreement between EPA and each state, and stakeholder participation. An assessment of the number of approved TMDLs compared to the target amount of TMDLs, and number of waterbodies listed and de-listed on the 303(d) list was performed to conduct the quantitative analysis. Within three years Oregon State develops and submits a Detailed Implementation Plan with the TMDL plan to EPA, whereas Washington State submits a Summary Implementation Strategy with TMDL plan in five years. Oregon has 876 approved TMDLs and Washington has 809 which equates to Oregon having a 76% completion rate as opposed to Washington's 52% completion rate. Oregon has de-listed 666 water quality segments out of 1825 of the impaired waters and Washington State de-listed 576 water quality segments out of 2372 impaired waterbodies. Oregon has de-listed 36% of impaired waterbodies and Washington has de-listed 24%. Based on the findings, Oregon's Program appears to have a better process in developing and implementing TMDLs than Washington State.

Table of Contents

LIST OF FIGURES

LIST OF TABLES

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CHAPTER I INTRODUCTION

Starting in the 1960s, a strong emphasis was put on curtailing environmental damage. Authors like Rachel Carson were taking center stage writing about pollution and its effects on the natural environment (*Silent Spring*). This book, and many others, marked the beginning of more than a decade of environmental legislation. This movement began at the federal level with the enactment of the National Environmental Policy Act of 1969, and was soon followed by the Clean Air Act and Clean Water Act (1970 and 1972, respectively).

In the United States, waterbodies are impacted by two types of pollution - point and nonpoint sources. The Clean Water Act (CWA) establishes and requires states to set water quality standards to protect water for beneficial uses. Whenever waters are impaired by point source or nonpoint source pollution and the standards are not met, the waterbody is placed on the CWA Section 303(d) list. In accordance with Section 303(d), the U.S. Environmental Protection Agency (EPA) requires states or federally recognized tribes to develop a process to improve the impaired waterbody. The process of reducing pollutant loading is achieved by implementing strategies authorized under the CWA. The various programs and strategies of reducing impairments range from issuing National Pollutant Discharge Elimination System (NPDES) permits to establish effluent limits to conducting best management practice to control nonpoint source pollution. However, the most significant strategy is the Total Maximum Daily Load (TMDL) program. The TMDL is a tool for implementing water quality standards under the CWA and is based on the relationship of pollution sources and in-stream or lake water quality conditions. It is the summation of waste load allocations (WLAs) for point sources and load allocations

(LAs) for nonpoint sources including natural background conditions. The TMDL process takes a holistic view of identifying pollutants (e.g., bacteria, pH, nutrients, dissolved oxgen, and temperature), calculating load reductions, and formulating an action plan for both point sources and nonpoint sources to attain water quality standards. The ramification of managing the point and nonpoint pollution programs separately has resulted in a lack of comprehensive action plan to protect and restore the nation's waters. For example, under the authority of the CWA, regulations reducing the point source pollution have improved the nation's waters. The statute requires discharges to comply with effluent-based standards outlined in the NPDES permits. Although the NPDES program has been successful in establishing resource tool to control point source pollution, the NPDES program has not achieved the nation's water quality goals. Over 40% of United States' assessed waters still do not meet the water quality standards. This equates to approximately 300,000 miles of polluted rivers and shorelines and approximately 5 million acres of impaired lakes (www.epa.gov/owow/tmdl/overview). These impairments are primarily the result of unregulated nonpoint sources of pollution that have yet to be controlled. For instance, Congress decided not to tackle the task of controlling the most significant contributor of nonpoint source pollution—agricultural practices. Instead, the nonpoint programs are constructed mainly as volunteer programs with an emphasis of allocating funds to address the issue of assessing and managing nonpoint source pollution.

The TMDL program was overlooked initially as states focused on bringing point sources of pollution into compliance with NPDES permits (National Press Academy, 2000).

In the 1970s, EPA delegated authority to the Washington State Department of Ecology (Ecology). As a result of this delegated authority, Ecology is required to implement both federal and state laws. Ecology has prepared its own 303(d) list and implemented TMDLs for approximately 10 years.

EPA also granted authority to Oregon State Department of Environmental Quality (ODEQ). ODEQ has prepared its 303(d) list and implemented TMDLs for approximately nine years.

Some states have not yet received delegation status from EPA and are therefore not responsible for the implementation and enforcement of federal law. If the TMDL process is not completed correctly, EPA still has oversight and enforcement abilities over states with delegated authority.

In the 1990s, several citizens filed lawsuits against the EPA and Ecology claiming the agencies were not implementing Section 303(d) of the Clean Water Act in a timely manner. As a result, Ecology, EPA, and two environmental advocate groups agreed to a clean-up schedule directing how Washington State will improve the health of nearly 700 water segments by the year 2013 ("Water Cleanup Plans: TMDLs", 2001). As a result of this settlement, Ecology agreed to work with EPA, other federal agencies, stakeholders, and other governmental entities to develop a more efficient approach for TMDLs. However, each state develops and implements their own TMDL process. Even bordering states within the same EPA region have outlined different processes for TMDLs.

By reviewing the process used to prepare and complete Total Maximum Daily Load (TMDL) studies in Washington and Oregon, it is possible to determine the effectiveness of Washington's current program. The intent of this study is to determine

how effective is Washington State's TMDL program compared to Oregon State's TMDL program in addressing water quality impairments.

My approach in assessing the effectiveness of Ecology's TMDL program is to conduct a qualitative and quantitative analysis of comparing Washington and Oregon's practices of developing and implementing TMDLs. I will evaluate the internal review process of TMDLs, settlement of agreement between EPA and each state, stakeholder participation, number of TMDLs completed, the number of waterbodies listed and de-listed on the 303(d) list, and number of approved TMDLs compared to the target amount of TMDLs. In addition, I will use federal regulations and guidelines as a benchmark of measuring the effectiveness of each state's program.

To govern each state's approach in ensuring water quality standards, an evaluation of the effectiveness of the states' TMDL program to control and restore impaired waterbodies is imperative. I believe that comparing Washington's TMDL program to Oregon's in light of federal benchmarks can be an invaluable tool to measure how successful the Washington State Department of Ecology is in implementing Section 303(d) of the Clean Water Act.

Goals

The goals of this thesis are as follows:

1. Examine the Clean Water Act as it relates to impaired waterbodies.
2. Evaluate the current TMDL programs in Washington and Oregon.

3. Compare the administrative structure and implementation of Memorandum of Agreement (MOA) to determine the effectiveness of *Washington and Oregon's TMDL program.*

Methodology

The methods of data gathering I used are literature review and questionnaire.

Literature Reviews. This thesis involved an extensive review of literature associated with the Clean Water Act and TMDL programs of each state. Information was gathered on Washington and Oregon State which included information on submittal of *TMDLs* over the last 10 years. In addition to books and articles on this topic, websites were searched extensively for relevant information for each state, as well as EPA.

Questionnaire. A questionnaire was sent to TMDL coordinators of each state – Washington and Oregon. The questions that were asked covered topics, such as funding for their program, the status of delegation in their state, the role of stakeholders in the TMDL development process, and who is the final implementer of the completed TMDL (local government, state agency, EPA, etc.) (*see Appendix A*). After receiving a response, I followed up with each state's coordinator with an informational interview.

CHAPTER II THE CLEAN WATER ACT

The Clean Water Act (CWA) is the primary federal regulation for protecting our nation's waters. The CWA is implemented nationwide by federal, state, tribal, and local government agencies. The most fundamental goal of the CWA is to achieve a level of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and for recreation in and on the water (Gallagher, 2003). The main objective of the CWA is to restore and maintain chemical, physical, and biological integrity of the United States' waters.

The CWA is extremely comprehensive, covering everything from water quality standards, antidegradation, waterbody monitoring, and assessments to pollution discharge permitting programs, point source and nonpoint source funding, and provisions for citizen lawsuits. This thesis specifically focuses on the use of Water Quality Standards, the CWA Section 303(d) list, and the Total Maximum Daily Load program of the Clean Water Act to restore waterbodies that have been identified as impaired.

History

The Federal Water Pollution Control Act was originally passed in 1972 (PL 92-500), and later became known as the Clean Water Act. This was landmark legislation, passed by Congress over a veto by then president Richard Nixon. It was the first law focused solely on protecting the nation's waters from pollution (Hoffbuhr, 2003). Based on the statutory requirements of the CWA, Environmental Protection Agency (EPA) established nationwide effluent standards based the on technological and economical

capabilities of the regulated industries, which became known as technology-based limitation (Waste Environment Federation, 1997). The CWA also created the National Pollutant Discharge Elimination System (NPDES) program, in which an entity must obtain a permit to discharge into waters of the United States.

In 1987, the Clean Water Act was amended to create new programs for toxics control and establish a timetable for regulation of the stormwater. It also formed a revolving loan fund program for construction of sewage treatment plants called the Clean Water Act State Revolving Fund and a grant "pass-though" funding program for nonpoint source pollution called Clean Water Act Nonpoint Source Section 319 Fund. (Waste Environment Federation, 1997).

Within three years, additional legislation was passed in 1990 to modify parts of the CWA and establish water quality criteria for the Great Lakes, addressing 29 toxic pollutants and revamping the oil spills provision Section 311 of the Act governing oil spills liability and compensation (Waste Environment Federation, 1997).

As demonstrated with the each subsequent amendment the CWA is a living document, forever evolving to decrease point source and nonpoint source pollution.

The CWA utilizes both regulatory and nonregulatory tools to restore and protect the integrity of surface and ground water. These tools include regulating industrial facilities and municipal sewage plants to minimize the amount of waste that discharges directly into water, and volunteer programs of cost-sharing with landowners cost to conduct riparian restoration work on private property.

Point Source Pollution

The Clean Water Act defines point source pollution as "any discernable, confined and discrete conveyance [including municipal wastewater plants, industrial facilities pipes, ditches, channels, tunnels, certain kinds of ships, and offshore oil rigs] . . . from which pollutants are or may be discharged to navigable waters" (Section 502 (14), 33 U.S.C. §1362 (14). Generally speaking, discharging pollutants from a point source to waters is illegal. However, Section 402 of the Clean Water Act creates the National Pollutant Discharge Elimination System (NPDES) regulatory program in which discharge of pollutants from a point source is allowable only if the discharger has a NPDES permit. Although a permit is given to the discharger, the NPDES permit sets numerical limitations on the authorized dischargers for a specified pollutant over a period of time (not to exceed 5 years). The permit is issued from states that have delegated authority to administer NPDES program or from the Environmental Protection Agency.

Type and Terms of NPDES Permits. There are two types of NPDES permits—individual and general. An individual permit is given to a single individual facility and the permit is designed for a specific discharge and more complex situations. A general permit is given to several similar facilities for any type discharge. A General permit is limited by certain constraints, such as geographical area and sources. Regardless of type of permit, the basic conditions of permits may include the following provisions:

- Effluent Limitations. Specified numeric concentration of various pollutants discharged by the facility.

- Compliance Schedule. A schedule of dates for submittal of compliance plans is given to permittee that cannot meet the compliance of the permit immediately.
- Monitoring Requirement. Dischargers must monitor at the point of discharge into waters on a regular basis. Type of monitoring equipment and method to analyze the data is specified in the permit. The report result must be submitted to permitting authority
- Best Management Practices. Performance measures a permittee must implement to minimize the release of toxic pollutants.
- Reporting requirements (routine and non-routine). Reporting includes the Discharge Monitoring Report (DMR), discharges that exceeded levels of toxic pollutants, transfer of the permit, and any planned physical alteration or addition to the permitted facility.

Nonpoint Source Pollution

Nonpoint source pollution comes from many diffuse sources. Unlike point source pollution where pollutants enter the waterbodies directly via conveyances such as a pipe, pollutants from nonpoint sources enter waterbodies through runoff. The top three primary impacts of nonpoint pollution are sediment, pesticides, and nutrients (nitrogen and phosphorus). The six (6) major categories of nonpoint pollution include:

- Agriculture (e.g., irrigated, dryland, livestock)
- Forest Practices (e.g., road maintenance, timber harvesting)
- Urban Areas (e.g., stormwater, on-site sewage systems)

- *Recreation (e.g., parks, hikes, off road vehicles)*
- Hydromodification (e.g., stream channelization, dikes)
- Loss of Aquatic Ecosystem (e.g., shoreline development, riparian alterations).

According to the states' 303(d) and 305 (b) reports, agricultural land-use activities are responsible for more impaired waters than industrial facilities, municipal sewage plants. (www.epa.gov/watertrain/cwa/).

The Clean Water Act does not enforce nonpoint control through regulatory means. Rather, clean-up efforts are primarily through volunteer implementation. Revisions of the statue in 1987 created provisions for the states to identify measures of reducing nonpoint source discharges, develop a management plan for implementing actions to maintain and attain water quality standards, and identify the best management practices (BMP) that will effectively and affordably address nonpoint source pollution.

Water Quality Standards

The water quality standards are the first nationwide strategy for surface water quality management. The standards develop criteria to protect the designated uses of each waterbody, and ensure the protection of existing high quality waters from degradation of writing antidegradation statement (www.epa.gov/waterscience/standards). The Water Quality Standards contain three major elements:

1. Determine the designated use (recreation, drinking water, fishing and wildlife propagation, industrial, or agricultural) of each waterbody;
2. Establish water quality criteria to protect designated uses; and

- Recreation (e.g., parks, hikes, off road vehicles)
- Hydromodification (e.g., stream channelization, dikes)
- Loss of Aquatic Ecosystem (e.g., shoreline development, riparian alterations).

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1. Determine the designated use (recreation, drinking water, fishing and wildlife propagation, industrial, or agricultural) of each waterbody;
2. Establish water quality criteria to protect designated uses; and

3. Employ antidegradation statements to protect existing high quality waters.

Waterbodies are monitored to ensure high quality waters are maintained. If the waterbody does not meet the Water Quality Standards, a Total Maximum Daily Load (TMDL) is developed.

Congress mandated that the U.S. Environmental Protection Agency (EPA) implement the water quality standards program. EPA's responsibility is comprised of 1) providing water quality recommendations, 2) approving State-adopted standards, 3) evaluating adherence to the standards, and 4) overseeing enforcement of standards compliance (www.epa.gov/waterscience/standards).

The CWA requires states to create their own standards for measuring the health of a water body. Water quality standards are set by states and federally recognized tribes. States are required to review all of their standards every three years. In evaluating the standards, states must adhere to essential components outlined in the CWA for addressing impaired waterbodies.

Key Elements of the Clean Water Act

The Clean Water Act contains sections that outline the process for listing and dealing with impaired waterbodies. These sections include:

- Section 305 – requires states report the conditions of state's water at the point at which a waterbody is identified as potentially having long-term impairment due to one or more parameters exceeding the limits established by the states.

- Section 303 – establishes water quality standards and outlines the process for identifying a waterbody as impaired, and in need of a TMDL to rectify the problem.

305(b) Report. Every biennium, each state prepares and submits a water quality report (titled Water Quality Assessment Report). The Water Quality Assessment Report serves as the primary tool to report the conditions of the state's water quality. On April 1 of the even years, the report is due to EPA (Houck, 1999). EPA provides the states with guidance for preparation of the reports and information to aid in the state's continuing planning process (EPA, 1982). The basic outline of the 305 (b) reports includes the following:

- A description of the condition of the water and determination of water abilities to provide protection and habitat of shellfish, fish, and wildlife.
- An assessment of how the CWA control programs have improved water quality or will improve water quality.
- A cost-benefit analysis of economic and social implication of achieving goals of the CWA.
- A description of and degree in which nonpoint source occurred. Report must also include a list of recommended programs to control nonpoint sources and estimation of implementation cost.
- An evaluation of the water quality of all publicly owned lakes.

Data and problems identified in the report serves as the basis of developing a water quality management plan (40 CFR 130.8). Water Quality Management Plans are utilized to develop implementation measures based on the priority issues and

geographical area. States are also required under Section 303 (e) of the Clean Water Act to submit Water Quality Management Plans to EPA for approval.

303(d) List. In accordance with the CWA under Section 303(d), states are required to periodically assess and identify waters that do not currently meet or not expected to meet water quality standards after the application of technology standards. Although the 1972 amendments of CWA set provisions for states to submit the list of the identified impaired waterbodies to EPA, it was not until October 1992, that EPA established guidelines for the submittal of list every two years.

The identified waterbodies are impaired due to either point source or nonpoint source pollution, or both. These degraded waters are known as Water Quality Limited Segments (WQLS). Based on the severity of the impairments, the water segments are then ranked and prioritized. The list is ranked according to the following five categories:

- Category 1 – All designated uses are being achieved
- Category 2 – Some designated uses are being achieved
- Category 3 – Insufficient data has been collected to determine if any designated use is attained
- Category 4 –Impaired/threatened, but TMDL is not needed
- Category 5 – Impaired/threatened; TMDL is developed

De-Listed Waterbodies. Once the list is prioritized, states then proceed with the implementing management strategies summarized in the TMDL water cleanup plan for Category 5 water segments (Houch, 1999). The Impaired or threatened WQLS remains classified as a Category 5 until enough information is gathered that water quality standards have been achieved or the water segment no longer at risk.

Integration of 305(b) List and 303(d) List. In November 2001 EPA developed a document, *2002 Integrated Water Quality Monitoring and Assessment Report Guidance,* which provides states and authorized tribes (federally recognized) with guidance for integrating the development and submission of 305(b) water quality reports and Section 303(d) lists of impaired waters (www.epa.gov/owow/tmdl/2002wqma.html). The combined report and list is now referred to as the *Integrated Report.* The difference between the Integrated Report, the Section 303(d) lists and the Section 305(b) reports is the approach in identifying water bodies. Instead of using water quality limited segments to identify streams and portions of streams that are impaired, EPA requested for states to use assessment units. Assessment units are groups of similar streams within a subbasin that have similar land use practices, ownership, or land management (Wayman, 2001). This revised process will enhance states' ability to streamline the reporting process, focus TMDL resources on waters that are impaired, and focus resources on strategies to remove WQLS from the Section 303(d) list.

CHAPTER III TOTAL MAXIMUM DAILY LOADS

The United States Environmental Protection Agency's (EPA) primary objective, when achieving water quality goals, is to establish and maintain point source technology-based controls. Whenever technology-based controls are inadequate to maintain water quality standards, water quality-based controls are required. Under Section 303, EPA requires individual states to develop Total Maximum Daily Loads (TMDLs) to address surface water impairments. The development of TMDLs provides more stringent water-based controls ("Guidance for Water Quality-Based Decisions: The TMDL Process. Office of Water", 1991).

Litigation has played an instrumental role in ensuring federal and state compliance with addressing the impaired waters on the 303(d) List. Section 505 of the CWA set provisions that allow any person to file legal action against any entity that commits a violation of not executing performance measures identified in the CWA. In the late 1980s and 1990s, citizen lawsuits were the driving force behind EPA scrutinizing states' inabilities to list degraded waters, develop TMDL cleanup plans, and submit the plans for approval (Houck, 1999). The U.S General Accounting Office released a report titled "More EPA Action Needed to Improve the Quality of Heavily Polluted Waters", which stated EPA Region 10 had received and approved only one TMDL for the 602 Water Quality Limited Segments (WQLS) as of 1989 (Houck, 1999). Reports of EPA's unwillingness to enforce provisions identified in Section 303 and hold states more accountable triggered legal activities throughout the United States.

Although there were several cases presented before the courts *(see Appendix B)*, the scope of this paper focuses on lawsuits that were filed in U.S. Environmental

Protection Agency Region 10. Region 10 covers the states of Washington, Oregon, Idaho, and Alaska. In one case, Oregon's failure to submit a list of impaired waters for several years led to a citizen's lawsuit being filed in 1987. Oregon courts ruled in *Northwest Environmental Defense Center v. Thomas* that federal actions would occur against the Oregon State Department of Environmental Quality if the 303(d) List was not submitted to EPA within a certain timeframe. In another case, the Northwest Environmental Defense Center, along with Northwest Environmental Advocates, filed another lawsuit against EPA and Washington State that required the Washington State Department of Ecology to complete TMDLs for all impaired waterbodies identified on the 1996 Section 303(d) list by 2013. And, another court case filed in Region 10 that challenged the quality of the 303(d) list and lack of TMDLs developed was the *Idaho Sportsmen's Coalition v. Browner* filed in 1992. The *Idaho Sportsmen's Coalition v. Browner* case highlighted the inadequate work by the Idaho State Department of Environmental Quality, which had only submitted 36 WQLS to EPA (Houck, 1999).

The EPA responded to claims by providing technical support and developing guidance documents for the states to use, such as *Guidance for Water Quality-Based Decisions: The TMDL Process* and *Guidance for State Water Monitoring* and *Wasteload Allocation Programs.* These documents have facilitated an increase of the states' submittal of TMDLs – water clean-up plans for degraded waterbodies listed on the 303(d) list.

EPA continues to remain diligent in overseeing the states' completion of TMDLs as well as implementation of every aspect of the 303(d) list.

What is a TMDL?

Under the Section 303 of the CWA (40 CFR part 130.7) and EPA regulations, a "TMDL is to include the sum of both point source waste load allocations (WLAs) and nonpoint source load allocations (LAs), plus the margin of error for uncertainty and margin of safety (MOS)".

Equation: $\sum WLA + \sum LA + \{MOS\} = TMDL$

1) *Waste Load Allocation (WLA)*

   As defined in 40 CFR 130.2 (i), "Wasteload allocations is the portion of the loading capacity allocated to existing and future point sources".

2) *Load Allocation (LA)*

   "Load Allocations is the portion of a receiving water's loading capacity that is attributed either to one of the existing or future nonpoint sources of pollution or to a natural background sources"
   (40 CFR 130.2 (g)).

3) *Margin of Safety (MOS)*

   Margin of Safety is different in that the Section 303(d) of the Clean Water Act and regulations requires that TMDL must that into account any lack of knowledge between load and wasteload allocations and water quality (40 CFR 130.7(c)(1)).

Qualitatively, the "TMDL is a calculation of maximum amount of a pollutant that a waterbody can receive and still meet water quality standards and an allocation of that amount to a pollutant" (www.epa.gov/owow/tmdl).

The rationale of the TMDL process allows states to weigh competing pollution concerns and develop a strategy for combining point and nonpoint sources. The TMDL process allows states to take a holistic view of their water quality problems from the perspective of instream conditions ("Guidance for Water Quality-Based Decisions: The TMDL Process", 1991).

TMDL Process

The TMDL process provides a resource tool for states to provide a technically sound course of action and legally defensible decisions for attaining and maintaining water quality standards. This process incorporates the management of both the point and nonpoint pollution sources that contribute to a waterbody's impairment.

Although each state may have a different method of addressing impairments from a water quality-based approach, the following five basic steps are incorporated in processing TMDLs:

- Identify impaired waters (per water quality standards) - states and tribes identify and prepare a list of waters that do not or are not expected to meet water quality standards after applying existing required technology-based controls.
- Establish priority waters/watersheds – states prioritize waters/watersheds and target those waters identified as high priority (protection of endangered species, designated uses, etc.)

- Develop of TMDLs for listed waters – states prepare TMDLs that will achieve water quality standards. The TMDL includes a specified timeframe for achieving water quality standards.
- Implement of control actions –states use the developed TMDL to write and update management plans for point source and nonpoint source pollution. This portion also includes the issuance of water quality permits (NPDES).
- Assess water quality-based control actions – States monitor and evaluate the effectiveness of the TMDL one year after approval from EPA.

Development Of TMDL

When a state develops a schedule for completing a TMDL, the order in which they are completed is dependent on the priority of the listed water. The priority is based on both public perception of the importance or the severity of the impairment, and how it affects the waterbodies' beneficial uses (recreational, fishing, drinking supply, aquatic habitat, etc.).

The TMDL development process involves the use of one or a combination of three technical approaches: 1) the chemical specific approach, 2) the whole effluent toxicity approach, and 3) the biocriteria/bioassessment approach ("Guidance for Water Quality-Based Decisions: TMDL Process", 1991).

The chemical specific approach evaluates loading as it relates to changes on the physical-chemical water quality conditions. For example, this approach will be used to address concentration levels of an impairment. The chemical specific approach is often

used to address impairments that specifically affect those water quality standards that protect human health. The whole effluent toxicity (WET) approach is used to determine the acute or short-term chronic adverse effects of a pollutant (or pollutants) on aquatic life. The biocriteria/bioassessment approach allows states to evaluate the entire health of a waterbody. Surveys and other direct measurement tools of aquatic life are employed to assess based on the species diversity within the system. This approach also evaluates studies completed on the concentration of nutrients, chemicals and temperatures of the waterbody. In most cases, an effort is made to include all three approaches to solve the problem impaired water.

Implementation

Once states receive approval of TMDL from the U.S. Environmental Protection Agency and depending on the source of pollutant (point source verses nonpoint), control measures and strategies are implemented.

Point Source - Waste Load Allocations (WLAs). Through the issuance of National Pollution Discharge Elimination System (NPDES) permits, discharge limits are established and the level of specific pollutant is limited to the permit requirements (www.ecfr.gpoacess.gov). For example, a TMDL may identify a particular waterbody in which a maximum levelof 25 tons/per day of fecal coliform may enter without violating water quality standards. A discharge permit is written specifying the effluent limits cannot exceed the WLA.

Nonpoint Source - Load Allocations (LAs). Based on Load Allocations, the primary control measures used to address nonpoint source pollution in a TMDL is Best

Management Practices (BMPs). Examples of BMPs consist of riparian restoration, off-stream watering provisions,installation of fencing, stream bank re-vegetation, etc. Depending on the type of load allocation either point or nonpoint source, each state has a funding program to help subsidizes the cost to clean-up impairedwaterbodies.

Funding Programs

The Clean Water Act Amendments of 1987 established two primary funding programs to assist states in developing and implementing TMDLs plans—the Federal Clean Water Act Section 319 Nonpoint Source (Section 319) Grant Program and the Clean Water State Revolving Fund (SRF) Loan Program.

Section 319. The Section 319 program provides grant funds to local governments and non-profit organization to implement the nonpoint source pollution control strategies that are specifically identified in each state's Nonpoint Source Management Plan.

SRF. The SRF program provides low loan rates to local governments for projects that improve and protect the state's water quality.

CHAPTER IV

WASHINGTON AND OREGON STATE'S TMDL PROCESS

Washington State

In the 1970s, U. S. Environmental Protection Agency (EPA) delegated authority to the Washington State Department of Ecology (Ecology). As a result of this delegated authority, Ecology is required to implement both federal and state laws. Even though Ecology was delegated this authority, EPA still has oversight and enforcement abilities against Washington State if provisions of Clean Water Act (CWA) is not completed correctly. Since the enactment of the CWA, regulatory agencies and EPA had ignored the requirement of implementing the TMDL process. However, as stated in Chapter 3 *TMDL Process*, litigations in the 1990s modified the attitudes of EPA and States on statute enforcement.

The Settlement Agreement – Memorandum of Agreement

As the result of the lawsuits filed, EPA entered into a settlement agreement with Ecology to create a 15-year schedule to develop 1566 TMDLs by 2013 *(see Appendix C)*. To date, Ecology has developed and submitted 809 TMDLs for approval. The benchmark of Washington's progression of completing the required TMDLs started when both agencies signed a Memorandum of Agreement (MOA) on October 29, 1997, that outlined Ecology's internal process of development and plan for implementing of TMDLs (www.ecy.wa.gov/programs/wq/tmdl/303moa12.pdf).

Internal Review Process

Ecology uses a watershed approach for water quality management in which "point and nonpoint source pollution problems are addressed on a cyclical, sequential basis" (Jennings et. al, 2002). The watersheds are categorized by Water Resources Inventory Areas (WRIA). There are 62 WRIAs in Washington State *(see Appendix E).* The significance of this approach is the designation of 23 Water Quality Management Areas (WQMA), watershed/TMDL leads assigned to each WQMA, and a five-step, five-year process of assessing water quality conditions.

The Five-Step, Five-Year Process.

Year1: Scoping. The TMDL clean-up process begins with the development of a scientific study, which culminates in a technical report by the Ecology that analyzes the pollution parameters identified in the Section 303(d) list of impaired water bodies.

Years 2-3: Data Collection and Analysis. This scientific study takes between one and two years to identify the pollution sources and the load allocations needed to bring the water body into compliance with state water quality standards. The technical report provides a single source of data and analysis for the community and Ecology staff (i.e., agency planners and TMDL leads) to join together to determine pollution control strategies (McBride, 2000).

Year 4: WQMA Plan of Action. Community involvement is encouraged during this period as pollution control strategies are reviewed and converted into solutions and activities. These strategies are technology-based solutions that are economically feasible and capable of early implementation by partnering with local

governments and the community. The implementation strategies summarize management activities needed for stakeholders to address, as identified in the TMDL. The summary implementation strategies (SIS) and final TMDL is submitted to EPA.

Year 5: Implementation. Once the SIS is approved, a detailed implementation plan (DIP) is then developed. This plan describes the actions, timeframe, source of funding, and party responsible for implementation. The implementation activities identified in TMDL are on-going until periodic follow-upmonitoring indicates compliance with state water quality standards. TMDL effectiveness monitoring is a fundamental, but often neglected,component of any TMDL implementation activity. It measures to what extent the work performed has attained the needed improvement recommended in the TMDL in order to comply with the state water quality standards. The benefits of TMDL effectiveness evaluation include:

- Measure of progress toward water quality improvements (i.e., how much watershed restoration has been achieved, how much more effort is required).
- More efficient allocation of funding and optimization in planning and decision-making.
- Technical feedback to refine the initial TMDL model, best management practices (BMP), nonpoint source (NPS) plans, and permits.

Proposed TMDL Effectiveness Monitoring Strategy

This initial phase requires that the TMDL modelers provide recommendations for water quality improvement and construct implementation plans. TMDL leads (staff who coordinate TMDL activities in a watershed) and watershed coordinators then assess the

waste load allocations (WLA) for point source and load allocations (LA) for nonpoint source controls in order to make improvements in the watershed. The technical report provides a single source of data and analysis for the community and Ecology staff (i.e., agency planners and TMDL leads) to join together so determine pollution control strategies. Community involvement is strongly encouraged during this period as pollution control strategies are reviewed and then implemented. Water quality improvements, following implementation of these pollution control strategies and activities, form the basis for prioritizing effectiveness monitoring in a watershed. The TMDL leads in the Water Quality Program (staff that coordinate TMDL activities in a watershed) consult with the Environmental Assessment Program and regional staff during the ranking and selection of effectiveness monitoring projects. Ranking is dependent on the extent of the watershed implementation plan that is complete. Ranked projects are submitted to the TMDL effectiveness staff each year for final consultation with the TMDL modelers. This final consultation verifies critical locations and time periods for receiving water monitoring projects (Onwumere and Plotnikoff, 2003). After this final consultation, local partnerships are developed, where possible, in order to expedite completion of quality assurance project plans (QAPP) before the receiving water monitoring projects are initiated.

The final phase involves actual monitoring of receiving water quality conditions to determine compliance with state water quality standards. Waterbodies that meet criteria undergo periodic monitoring on a 5-year cycle to ensure improvement and sustained water quality conditions. Listed segments that continue to fail meeting water quality expectations would be subjected to:

- Reexamination of discharge monitoring reports (DMR) for point sources to ensure compliance with permit requirements.
- Reevaluation of nonpoint source plan implementation projects.
- Reevaluation of critical WLAs and LAs to validate the initial TMDL model, recalibrate the model, or recommend new modeling (Onwumere and Plotnikoff, 2003).

All findings are reported to the TMDL leads for further action.

Stakeholders and Public Participation

Public education and outreach is required step for TMDL submittal. Ecology also forms Advisory Groups for each TMDL project and conducts public meetings to explain details. Stakeholders normally fill the Advisory Group positions. Depending upon the issues and parameters of a TMDL project, the TMDL of the WRIA in which the TMDL project is proposed will select individuals who volunteer for watershed cleanup and individuals from public meetings to participate on the Advisory Group.

Oregon State

As a result of an initiative petition known as the "Water Purification and Prevention of Pollution Bill," the Oregon State Sanitary Authority (now known as Department of Environmental Quality) was formed in 1938. The Water Purification and Prevention of Pollution Bill declared a state policy to preserve the waters of Oregon (www.oregon.gov/deq/about_us.html).

In adhering to the intent of the legal mandate, the Oregon Department of Environmental Quality (ODEQ) established several regulations and programs to protect Oregon's water. An example of one such rule that facilitates the guidance of ODEQ's approach to protect water quality is the Oregon Administrative Rule (OAR) Chapter 340-042-025 Division 42 Total Maximum Daily Loads (TMDL). OAR Division 42 establishes procedures for developing, issuing, and implementing TMDLs.

The Settlement Agreement – Memorandum of Agreement

Like Washington State, ODEQ signed a Memorandum of Agreement with EPA. ODEQ and EPA signed the Memorandum of Agreement on February 10, 2000, which requires ODEQ to complete 1153 TMDLs within a 10-year timeframe *(see Appendix D)*. Oregon is currently on schedule and has completed 876 TMDLs. However, Oregon's internal review process of developing TMDLs varies from Washington. (www.ODEQ.state.or.us/wq/tmdls/moa.html)

Internal Review Process

ODEQ uses a comprehensive approach to maintaining and improving water quality. To solve water quality problems in a stream, river, lake or estuary, ODEQ looks at the water quality of the entire river and watershed rather than whether or not a specific discharge meets its permits requirements (Eaton, 2003).

To facilitate the water quality assessment, ODEQ formed a group comprised of federal, state or local agencies called Designated Management Agency (DMA). The DMA has legal authority over a sector or source pollutant contributing to degradation of

water quality. Formulating the DMA allows different entities to share responsibility for implementing TMDLs. For instance, Oregon Department of Agricultural is the lead entity for developing and implementing the TMDL Implementation Plan on agricultural lands. In each TMDL, a DMA is identified. If a particular entity decides to not implement and/or revise a TMDL plan, ODEQ has regulatory authority to take enforcement action. However, the support of DMA is essential in establishing TMDLs and implementing management strategies.

Establishing TMDLs. TMDLs are established for pollutants based on the stream segments found on the 303(d) list. Stream segments and other water bodies are grouped geographically by subbasin *(see Appendix F).* In scheduling and prioritizing which subbasin will establish a TMDL, the following factors are considered:

- Severity of the pollution;
- Uses of the water;
- Availability of resources to develop TMDLs;
- Specific judicial requirements; and
- Any other relevant information.

Once the prioritized list is determined, strategies are developed to achieve the desired allocations to meet water quality standards. These strategies are identified in a plan called Water Quality Management Plan (WQMP). A WQMP includes six major elements:

1. Description of proposed management strategies designed to meet the wasteload allocation and load allocations;
2. Timeline for implementing strategies;

3. Identification of the Designated Management Agencies (DMA) responsible for implementing the management strategies, and developing and revising sector-specific or source-specific implementation plans;
4. Monitor and evaluate progress toward achieving TMDL allocations and water quality standards;
5. Proposal for public involvement in implementing strategies; and
6. Analysis of costs and funding for sector-specific or source-specific implementing management strategies [OAR 340-042-0040 (1)].

Implementation Plan. The DMA, with the exception of Department of Forestry and Department of Agriculture, is required to develop and submit sector-specific implementation plans and source-specific implementation plans. The Departments of Forestry and Agriculture are exempt from submitting specific implementation plans, as activities are regulated under other statutes and rules (e.g., Forest Practice Act, Agriculture Water Quality Management Area Plans, etc.) (ODEQ, 2006). The plans are due to ODEQ 12-18 months for approval. Within the first few weeks of the 12-18 month period, ODEQ sends a letter to affected parties.

Once the plan has been submitted, ODEQ will review the plan in 60 days to ensure all required components are included and the plan adequately addresses known or suspected sources of pollution. ODEQ will identify portions of the plan considered incomplete and return the plan to the appropriate DMA, if it is deemed unsatisfactory. However, ODEQ does not expect the implementation plans to describe in great detail how the management strategies will achieve water quality standards (ODEQ, March 2006). In fact, ODEQ's mantra is "progress is not perfection." Although ODEQ's

philosophical view of managing the program is "it is not always possible to determine exactly what on-the-ground efforts" it will take to solve problems, an implementation plan must consist of: 1) a list of ongoing and planned activities to achieve the desired levels of load reductions; 2) a timeline for implementing the actions; 3) evidence of compliance with applicable statewide land use requirements; and 4) methods for assessing effectiveness (ODEQ, 2006).

Stakeholders and Public Participation

According to OAR-340-042-0050, the ODEQ is required to have stakeholder participation in developing TMDLs. Some strategies which ODEQ employs to accomplish this task are adopting a new ordinance; developing a local advisory group or education and outreach efforts. ODEQ also provides an opportunity for the public to review and comment on the draft TMDL.

CHAPTER V THE RESULTS

The Total Maximum Load Daily (TMDL) process varies between each state. However, comparing Washington and Oregon's administrative structure and implementation Memorandum of Agreement (MOA) will help determine the efficiency of each state's TMDL program.

Administrative Structure

Currently, the Oregon Department of Environmental Quality (ODEQ) has approximately 18 staff orchestrating the two or three-year process of developing and assisting in the implementation of TMDLs throughout the state. Developing TMDLs depends on the source of contaminant—point source or nonpoint source. In developing point source TMDLs, ODEQ takes the lead in addressing all the required elements of submitting the TMDLs to the U.S. Environmental Protection Agency (EPA). The TMDL plans for point source are implemented through the issuance or re-issuance of National Pollutant Discharge Elimination System (NPDES) permits. To develop nonpoint source TMDLs, ODEQ is the lead in identifying the appropriate watershed and the type pollutant(s) to address. ODEQ also provides technical assistance to Designated Management Agencies (DMAs) and local advisory group to collect, manage, and analyze data that is used in the assessment of water quality. However, only ODEQ has statutory authority to develop load allocations for nonpoint sources pollution. To implement a TMDLs nonpoint source plans, the land type dictates which agencies will perform management strategies. For instance, Best Management Practices (BMPs) for agricultural

land are conducted by Oregon Department of Agriculture (www.deq.state.or.us/wq/tmdls/moa.html).

In contrast, Washington State Department of Ecology (Ecology) currently has approximately 69 positions (mostly located in the regional offices across the state) to develop and implement TMDLs regardless of source of pollution or land type. Although Ecology has statutory authority to administer the TMDL program, local governments assist Ecology with the five steps-five year process of submitting development and implementation plans, as described in the Chapter III, *Washington and Oregon State TMDL Process*, page 23.

Implementation of Memorandums of Agreement

The Environmental Protection Agency entered into a Memorandum of Agreement with Washington and Oregon in 1997 and 2000, respectively. The Memorandum of Agreement describes the elements that are required by federal statute for developing and implementing TMDL plans for waters listed on the state's 303(d) list. The statutory requirements for all states to submit TMDLs to EPA for approval consist of:

- Applicable water quality standards and numeric target
- Loading capacity
- Wasteload Allocations (WLAs)
- Load Allocations (LAs)
- Margin of Safety (MOS)
- Season Variation
- Public Participation

However, as shown in the following table, there are negotiated elements that differ between the states in their perspective Memorandum of Agreement.

Table 1. **Differences of Memorandum of Agreement (MOA)**

State's Negotiated Task Elements		
Listed Elements	**WASHINGTON** ***MOA signed 1997***	**OREGON** ***MOA signed 2000***
Approaches to be used to meet load and wasteload allocations which consider flow and seasonal variations	√	√
Interim targets, if appropriate, with the linkages to the pollution source	√	√
Monitoring strategy to measure implementation activities and achievement of interim targets and water quality standards	√	
Schedule for monitoring and evaluation of TMDL	√	√
Timeline for implementation		√
Reasonable assurance of implementation		√
Maintenance of effort over time		√
Discussion of cost and funding		√
Citation of legal authorities under which the implementation will be conducted		√
Proposed management measures tied to attainment of the TMDL		√
Identification of responsible participants and implementation effectiveness, including source demonstrating who is responsible for feedback loops implementing the various measures		√

Source: TMDL Review Guidelines EPA Region 10, January 2002

In addition, a MOA outlines the state's schedule for developing TMDLs and the priority order in which the state will address the impaired waterbodies from the Section

303 (d) list. From the 1996 Section 303(d) list, the Department of Ecology agreed to develop and submit 1566 TMDLs by 2013 (www.ecy.wa.gov/programs/wq/tmdl/303moa12.pdf). Conversely, from the 1998 Section 303(d) list, the Department of Environmental Quality consented to complete 1153 TMDLs by 2010 (www.deq.state.or.us/wq/TMDLs/moa.htm).

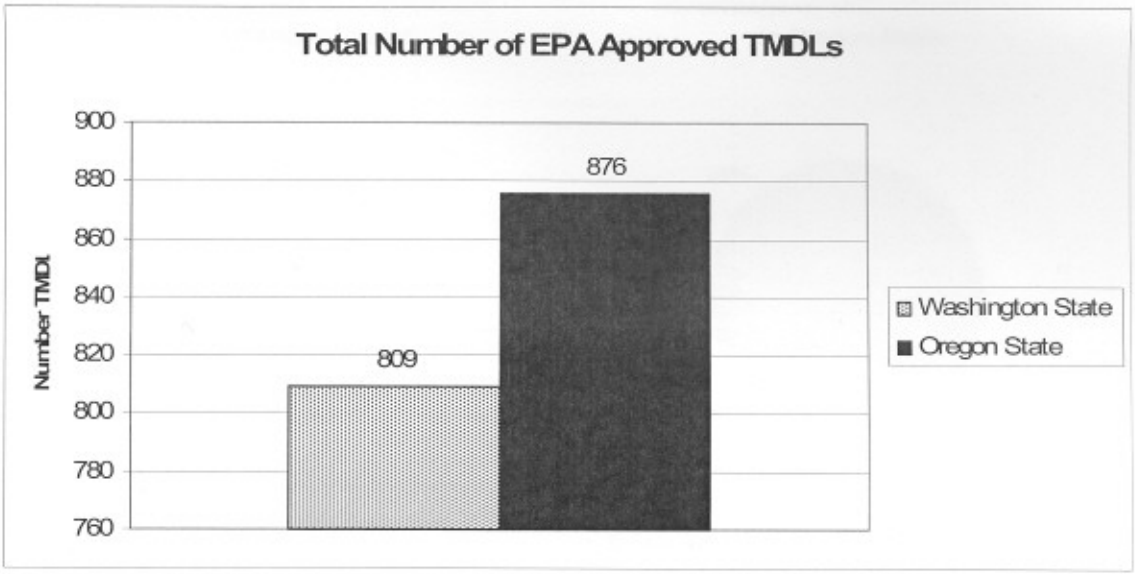
Effectiveness of TMDL Program

Washington's 1996 Section 303 (d) list and Oregon's 1998 Section 303 (d) list was used in this study as a benchmark to compare the effectiveness of each state's TMDL process. The quantitative analysis to measure the effectiveness of the States' TMDL program is the:

- Total number of EPA approved TMDLs (see Fig. 1.)
- Total number of approved TMDLs compared to the target amount of TMDLs (see Fig. 2)
- Percentage of EPA approved TMDLs (see Fig. 3.)
- Total number of water quality segments listed on Section 303(d) list (see Fig. 4.)
- Percentage of water quality segments de-listed in Washington State (see Fig. 5.)
- Percentage of water quality segments de-listed in Oregon State (see Fig. 6.)

Figure 1. **Total number of EPA approved TMDLs**

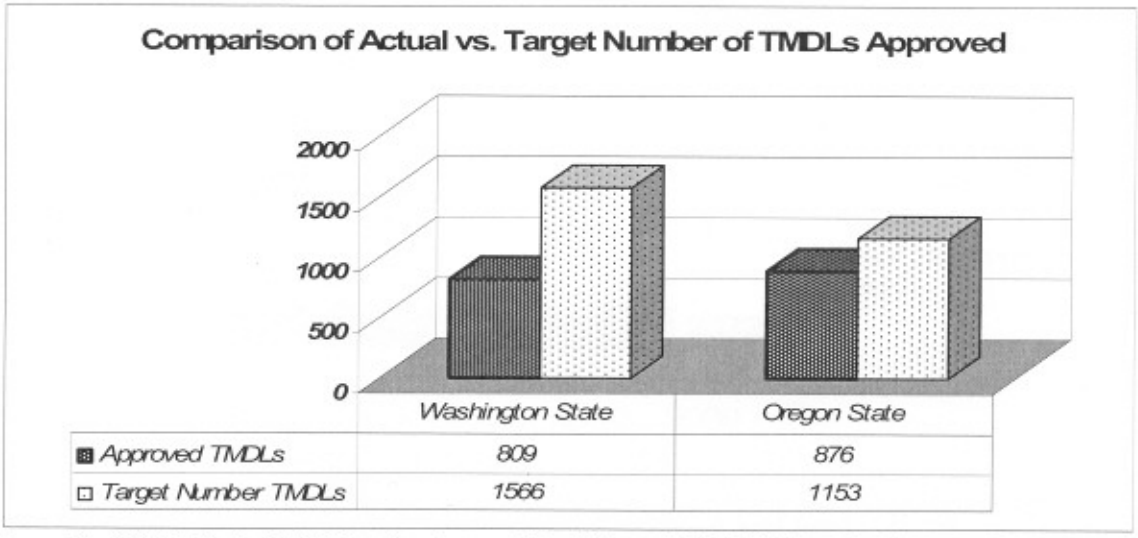
The graph shows Washington State submitted 809 TMDLs and Oregon State submitted 876 TMDLs for approval as of April 2007.



Source: Ron McBride, Ecology TMDL State Coordinator and Daniel Turner, ODEQ TMDL State Coordinator

Figure 2. **Total number of approved TMDLs compared to the target amount of TMDLs**

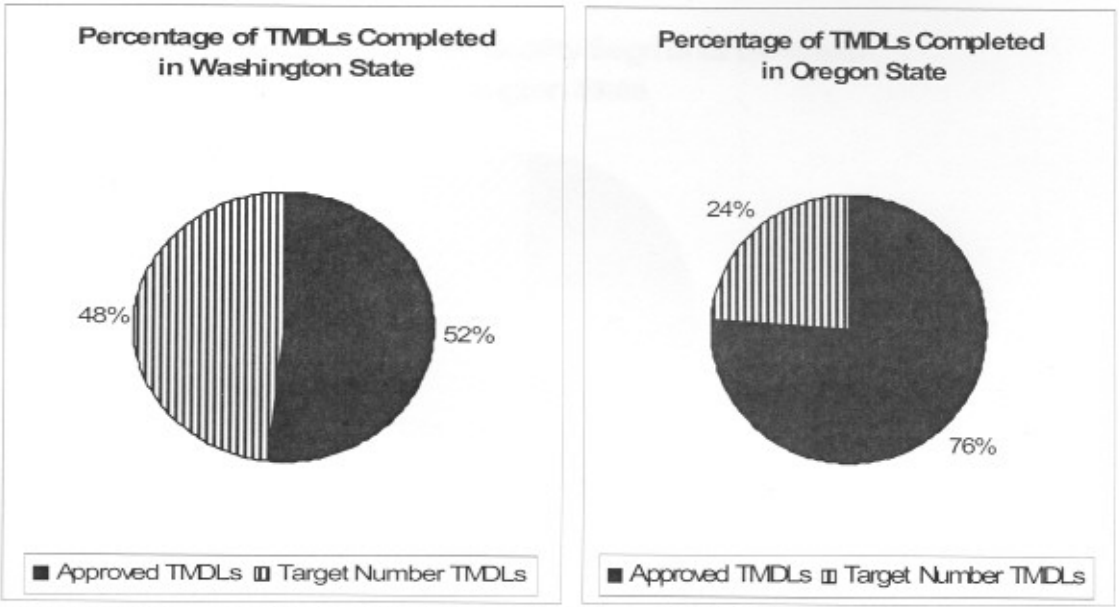
The graph compares the total number of approved TMDLs to the required number of TMDLs submitted to EPA based on the Washington and Oregon's MOA (1997 and 2000, respectively).



Source: Ron McBride, Ecology TMDL State Coordinator and Daniel Turner, ODEQ TMDL State Coordinator

Figure 3. **Percentage of EPA approved TMDLs**

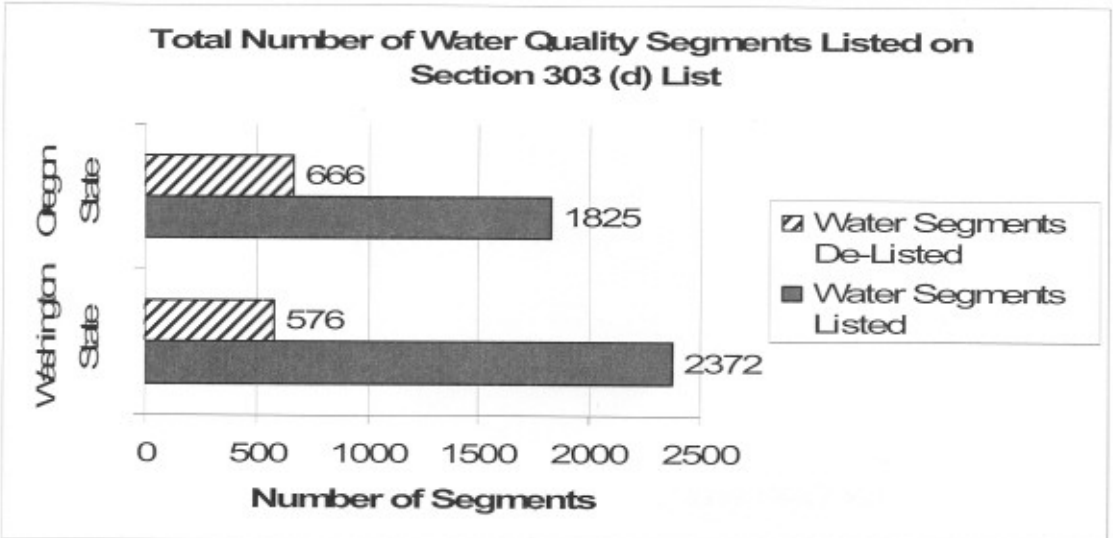
The graphs show the percentage in which Washington state and Oregon state accomplished the task of completing the required number of TMDLs submittal.



Source: Ron McBride, Ecology TMDL State Coordinator and Daniel Turner, ODEQ TMDL State Coordinator

Figure 4. **Total number of water quality segments listed on Section 303(d) list**

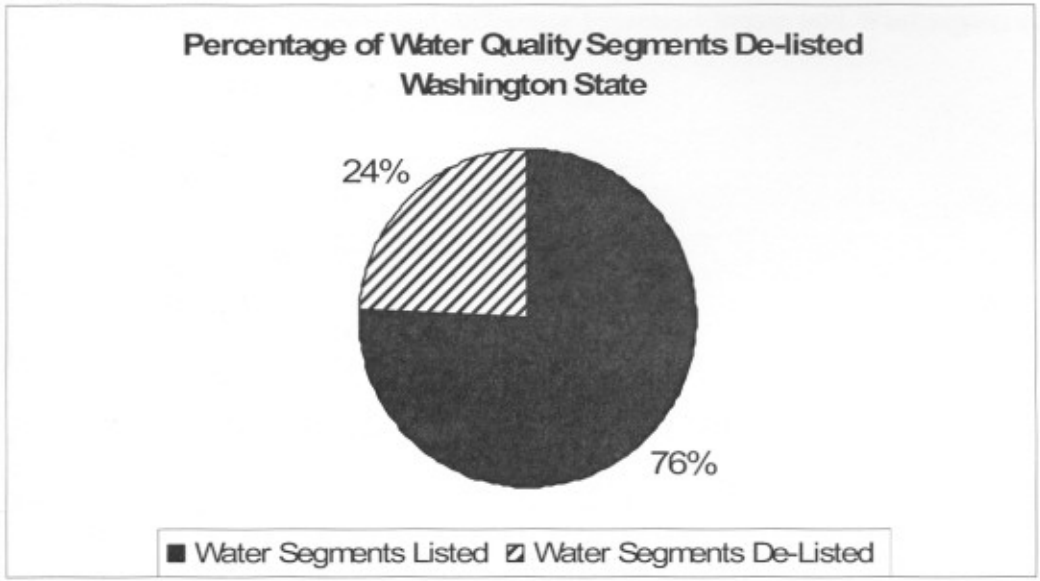
The graph compares the total number water bodies listed on the Washington State Section 1996 list to the number of impaired waterbodies to 2004-2006 Section 303(d) submittal. The graph also shows the total number Oregon's Section 1998 list to the number of impaired waterbodies to 2004-2006 Section 303(d) submittal.



Source: Department of Ecology's Water Quality Assessment Tool – Query Form and Daniel Turner, ODEQ TMDL State Coordinator

Figure 5. **Percentage of water quality segments de-listed in Washington State**

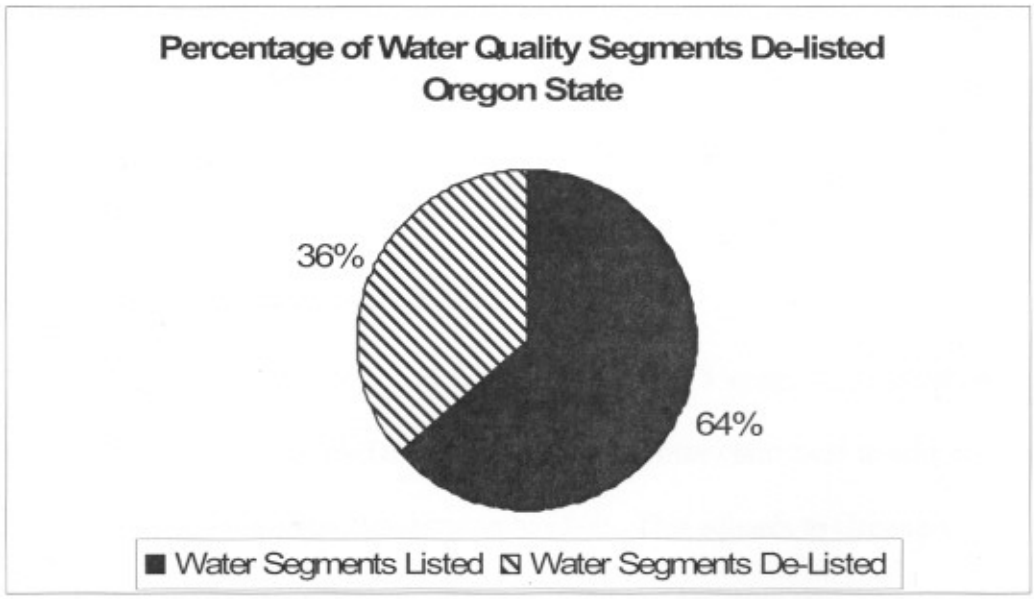
The graph shows the percentage of imparied waterbodies listed on the Washington State 1996 Section 303(d) list to the number of impaired waterbodies on 2004-2006 Section 303(d) submittal.



Source: Department of Ecology's Water Quality Assessment Tool – Query Form

Figure 6. **Percentage of water quality segments de-listed in Oregon State**

The graph shows the percentage of impaired waterbodies listed on the Oregon's 1998 Section 303(d) list to the number of impaired waterbodies to 2004-2006 Section 303(d) submittal.



Source: Daniel Turner, ODEQ TMDL Coordinator

Chapter VI DISCUSSION/CONCLUSION

Discussion

Basically, the fundamental difference between Oregon and Washington could be divided into two major categories:

- The Program Process
- Achieving Water Quality Standards

The Program Process

The *State's Negotiated Task Elements* matrix, in Chapter V *The Results*, shows the various elements checked in the Oregon State column differ from those in the Washington State column. However, each state accomplishes the majority of the tasks listed in the matrix, but at a different timeframe. For instance, the most significant difference is that Washington submits a Summary Implementation Strategy (SIS) instead of forwarding an implementation plan with the TMDL. Washington develops and forwards a Detailed Implementation Plan (DIP) to U.S. Environmental Protection Agency (EPA) one year after the TMDL has been approved. Oregon, on the other hand, forwards an Implementation Plan to EPA simultaneously with the TMDL for approval.

Achieving Water Quality Standards

Oregon State develops and submits TMDLs in 3 years, while Washington State submits and implements TMDLs in 5 years, which may contribute to why Oregon has 876 approved TMDLs and Washington has 809. This equates to Oregon's 76% completion rate as opposed to Washington's 52% completion rate.

On average, Oregon submits 125 TMDLs per year. Washington submits 89 TMDLs per year. If Washington State continues at its current pace, it will fall short of hitting its target number by 15%. Oregon, however, will exceed its target number by 8%.

Oregon has de-listed 666 water quality segments out of 1825 of the impaired waters and Washington State de-listed 576 water quality segments out of 2372 impaired waterbodies. Oregon has de-listed 36% of impaired waterbodies and Washington has de-listed 24%, which makes Oregon State closer to achieving its water standards.

Conclusion

In conclusion, due to the collaborated efforts between Oregon Department of Environmental Quality and other state and federal regulatory agencies, Oregon has achieved a higher percentage of approved TMDLs and de-listed water quality segments. Therefore, Oregon's Program appears to have a better process in developing and implementing TMDLs than Washington State. However, Washington State Department of Ecology takes a more methodical approach to addressing the Environmental Protection Agency's requirements in administering the state's Program. For example, the Department of Ecology takes two additional years to analyze the parameters causing the impairment of the waterbody and conducts effectiveness monitoring to ensure the strategies identified in the Detailed Implementation Plan will achieve water quality standards.

Study Limitations

Due to the lack of written data available on Oregon's TMDL program, it was very difficult to determine the process. The majority of Oregon's policies and guidelines came

from its Department of Environmental Quality's websites (which was "under construction" most of time). I relied greatly on the TMDL State Coordinator, for information on the number of waterbodies that have been de-listed. Oregon does not have a mechanism in place for the general public to retrieve information of this type. Washington has a user-friendly database called "Water Quality Assessment for Washington—Simple Query Form" where the public may determine the number of waterbodies listed in all five water quality standards categories.

In addition, the funding information for both states was deficient. I wanted to conduct an in-depth comparison of each state's primary funding programs for TMDLs – State Revolving Funds (SRF) and the Clean Water Act Nonpoint Source Section 319 funds. Unfortunately, neither state tracks the amount of SRF funds used to address TMDLs. For the Section 319 funding program, Oregon tracks all nonpoint projects that focus on TMDLs, Washington does not.

Suggestions for Future Study

The following questions are beyond the scope of this thesis and are suggestions for further study:

Washington State's TMDL process includes submitting the DIP one year after EPA approves the TMDL. Does this process ensure better strategies and measures of controls for point and nonpoint source pollution?

Oregon collaborates with other regulatory agencies, referred to Designated Management Agencies (DMAs), when it submits its TMDLs. Do these more collaborative efforts allow Oregon to achieve better water quality standards than

Washington State, in which one state agency (Ecology) conducts all EPA-required elements?

Each fiscal year, Congress appropriates federal funds to every state to clean-up their waters. How do the states use their funds? Do the way states use these funds lead to a more efficient TMDL process?

In late 1990s litigations between state agencies, EPA, and special interest groups were instrumental in addressing the low submittal of TMDLs. Were these lawsuits the only catalysts for states to make a more valiant effort to develop and implement TMDLs?

The *State's Negotiated Task Elements* matrix shows that each state accomplishes the majority of the tasks listed in the matrix, but at a different timeframe. Would merging the complimentary aspects of both programs produce a more effective and efficient process?

APPENDICES

Appendix A. TMDL STATE COORDINATOR QUESTIONNAIRE

1. Do you have Delegation Authority from U.S. Environmental Protection Agency to administer TMDL program?

2. Is your state operating under a court settlement and MOA with EPA? *(If possible, please send me a copy or a link to court settlement and MOA.)*

3. How does your state address identifying, developing, and implementing TMDLs? *(If at all possible, please send me a copy (or a link to) of your process of completing TMDLs.)*

4. How many waterbodies listed on the current 303 (d) list? *(Please indicate year of the list)* Is this list driving your production schedule *(please explain)*?

5. What is your agency listing policy? *(Please provide a copy or a link)*

6. How many waterbodies were taken off the 303 (d) list due to a TMDL?

7. How many years do you have to submit how many TMDLs? *(Please provide start and ending years of schedule)*

8. Are you currently on schedule for completing TMDLs?

9. How many TMDLs have you submitted to EPA?

10. How many TMDLs have been approved as of _____ *(please provide date)*?

11. How long does it take to complete a TMDL technical report and submittal report?

12. How many FTE do you have in the TMDL program?

13. How are you organized to develop and implement TMDLs?

14. Who implements the TMDL once approved by EPA? Is implementation primarily conducted by local jurisdiction or the state?

15. What type of funding do you receive for developing and implementing TMDLs?

16. Do you participate in public education/outreach as part of your TMDL process?

17. Do you have stakeholder participation? How is that developed and orchestrated?

Appendix B. TMDL LITIGATION BY STATE

Summary of Litigation on Pace of TMDL Establishment (June 2006)

22 States in which EPA is under Court Order or agreed in Consent Decree to Establish TMDLs if States do not establish TMDLs

Alabama (1998; 5 yr schedule)

Alaska (1992; no schedule)

Arkansas (2000; 10 yr schedule)

Calif. (LA) (1999; 13 yr schedule)

Calif. (North Coast) (1997; 11 yr schedule)

Delaware (1997; 10 yr schedule)

District of Columbia (2000; 7 yr schedule)

Florida (1999; 13 yr schedule)

Georgia (1997; 7½ yr schedule)

Iowa (2001; 9 yr schedule)

Kansas (1998; 10 yr schedule)

Louisiana (2002; 10 yr schedule)

Mississippi (1998; 10 yr schedule)

Missouri (2001; 10 yr schedule)

Montana (2000; 7 yr schedule, extended to 2012)

New Mexico (1997; 20 yr schedule)

Ohio (2004; 4 yr schedule)

Oregon (2000; 10 yr schedule)

Pennsylvania (1997; 12 yr schedule)

Tennessee (2001; 10 yr schedule)

Virginia (1999; 12 yr schedule)

Washington (1998; 15 yr schedule)

West Virginia (1997; 10 yr schedule)

States with a pending case in which plaintiffs have filled litigation seeking to compel EPA to establish TMDLs.

None

Actions Dismissed without orders that EPA estblish TMDLs (some cases were resolved with settlement agreements or EPA Completed All Court Ordered Obligations and case dismissed)

Arizona (EPA completed all consent decree obligations; decree terminated July 17, 2000)

California (9th Circuit affirmed dismissal, 2002)

California (Newport Bay) (EPA completed consent decree obligations; decree terminated 2003)

Colorado (Joint Motion for Administrative Closure filed August 24, 1999; parties signed settlement agreement in which EPA agreed to establish TMDLs if State did not)

Hawaii (EPA completed all consent decree obligations; decree terminated December 9, 2002)

Idaho (EPA Motion to Dismiss granted 1997; settlement agreement signed 2002)

Lake Michigan (WI, IL, IN, MI) (Scott case -- final order 1984; related NWF case challenging EPA actions in response to Scott order -- case dismissed 1991)

Minnesota (Dismissed 1993)

Maryland (Dismissed 2001 and in 2006)

Nevada (EPA completed consent decree obligations)

New Jersey (Dismissed 2002)

New York (EPA Motion to Dismiss granted on all but one claim May 2, 2000)

North Carolina (Joint Stipulation of Dismissal filed June 1998; EPA agreed by letter to ensure development of a TMDL for the Neuse River by date certain)

Oklahoma (Tenth Circuit upheld dismissal of case on August 29, 2001)

South Dakota (Dismissed without prejudice on August 27, 1999)

Wyoming (Dismissed 2003)

Source: http://www.epa.gov/owow/tmdl/lawsuit.html

Appendix C. WASHINGTON'S TMDL SCHEDULE

Schedule for TMDL Submittal																		
State Fiscal Year (July 1 through June 30)																		
Water Quality Management Areas	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	Total TMDLs
Skagit/Stillaguamish, Columbia Gorge, Horse Heaven/Klickitat, Upper Columbia, Pend Oreille	12						14	15							18			59
Island/Snohomish, South Puget Sound, Okanogan, Crab Creek, Esquatzel	20						4	11								13		48
Nooksack/San Juan, Western Olympic, Wenatchee, Upper Snake, Lower Snake	4	19*					44					32						99
Kitsap, Lower Columbia, Upper Yakima, Mid Columbia	1		14				29						13					57
Cedar/Green, Eastern Olympic, Lower Yakima, Spokane	22						24	53						36				135
State Wide Group							115	400								653		1168
TOTAL ANNUAL TMDLs	59	19*	14	24	14	119	44	29	53	15	411	32	13	36	18	666		1566*
TOTAL 5 YEAR CYCLE TMDLs						249					552					765		1566

CUMULATIVE PERCENT OF ALL TMDLs						16%					51 %					100 %

NOTES: Shaded areas are implementation startup years.
* includes Chehalis Temperature TMDLs not on the 1996 Section 303(d) list.

Source: Memorandum of Agreement EPA and Ecology

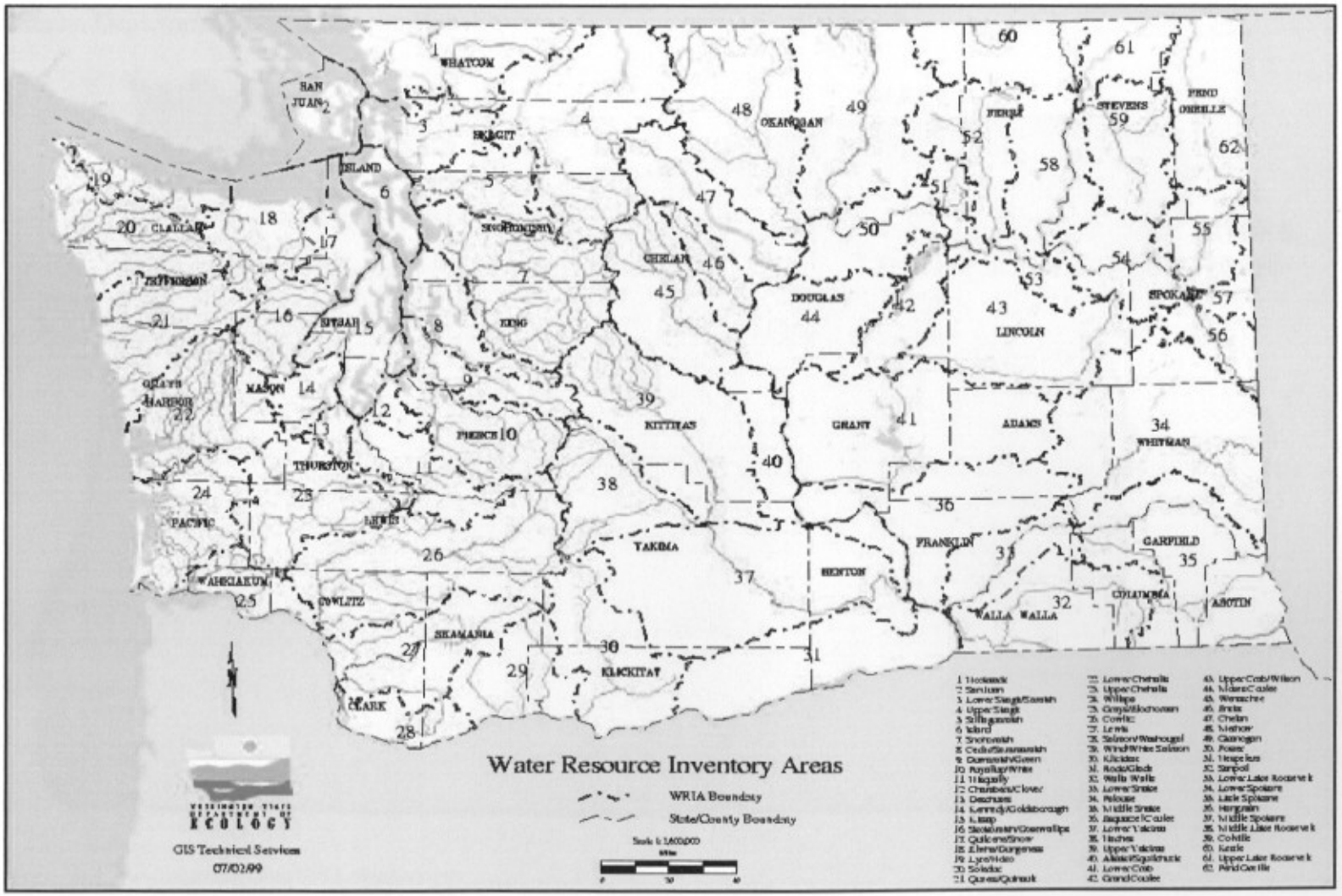
Appendix D. OREGON'S TMDL SCHEDULE

CUMULATIVE NUMBER OF TMDLs
TO BE ESTABLISHED

YEAR	CUMULATIVE NUMBER OF TMDLs TO BE ESTABLISHED ON OR AFTER JANUARY 1, 2000
2004	310
2008	982 –
2010	1,153

Source: Oregon and EPA Consent Decree October 2000

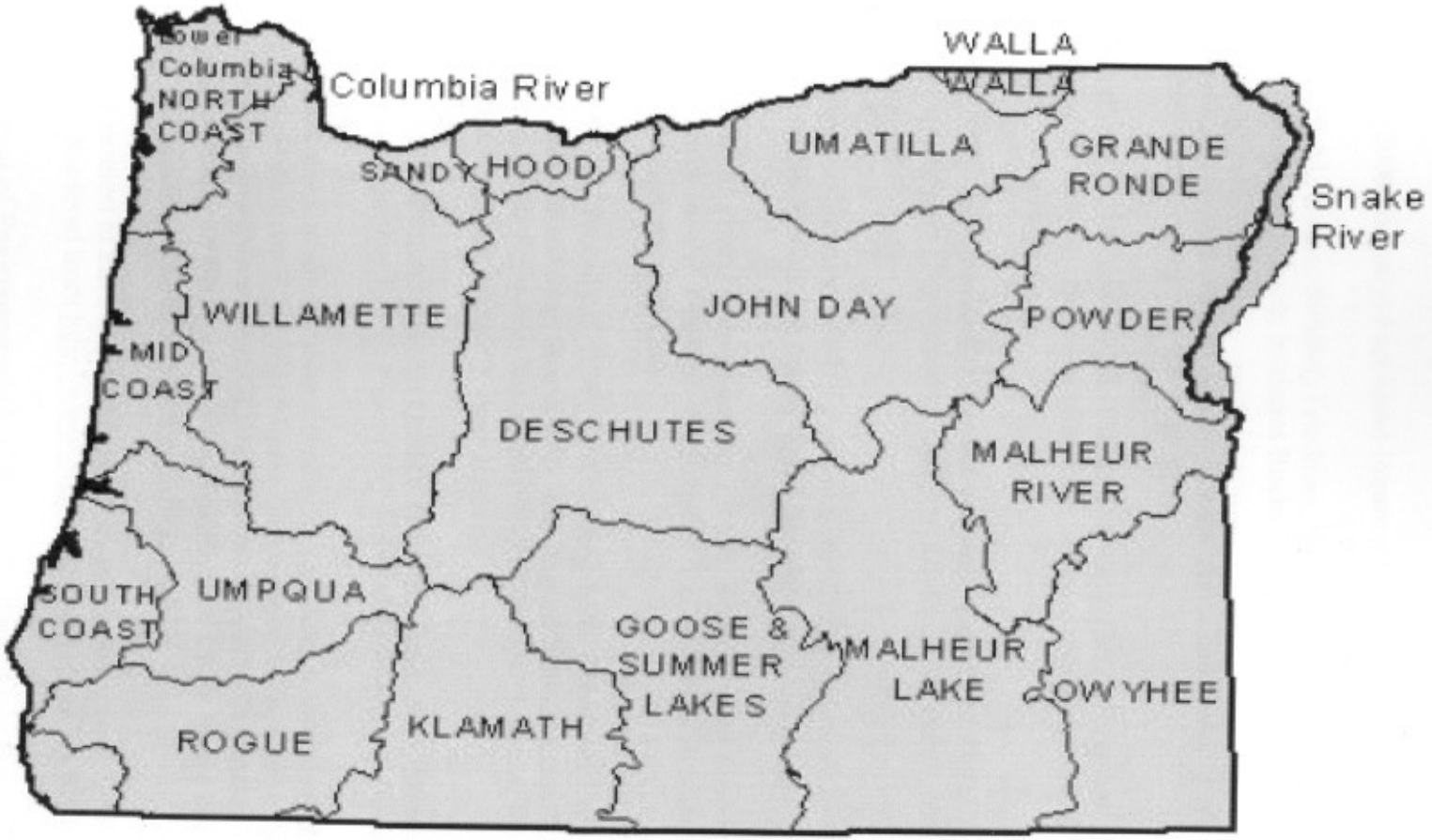
Appendix E. MAP OF WASHINGTON'S STATE WRIA



Source: http://www.ecy.wa.gov/services/gis/maps/wria/wria.htm

Appendix F. MAP OF OREGON'S STATE SUBBASIN

Oregon Department of Environmental Quality



Source: http://www.deq.state.or.us/wq/TMDLs/basinmap.htm

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