

# Chapter 1 Introduction

## 1.1 WHAT IS SURFACE WATER?

Surface waters are streams, rivers, lakes, ponds, wetlands, and the ocean. Rainfall flowing on the ground and in the upper layers of the soil and stormwater runoff from roofs, roads, and parking lots are also surface water.

Surface water is one of our most valuable natural resources. We all need clean water for domestic use. It is an important factor for industrial production. Farmers need it to irrigate crops and water livestock. Surface waters provide habitat for fish, shellfish, and wildlife. We use them for swimming, boating, fishing, and other recreational activities. And the sight of streams, rivers, lakes, and the ocean provides enjoyment to us all.

Managing our surface water resources to protect these benefits is an important function of County government.

## 1.2 THE HYDROLOGIC CYCLE

In order to understand the concept of surface water, it is useful to begin with a brief discussion of the hydrologic cycle. The hydrologic cycle describes the continuous movement of water through the Earth and the atmosphere. It includes the processes of evaporation, condensation, precipitation, runoff, infiltration, and transpiration.

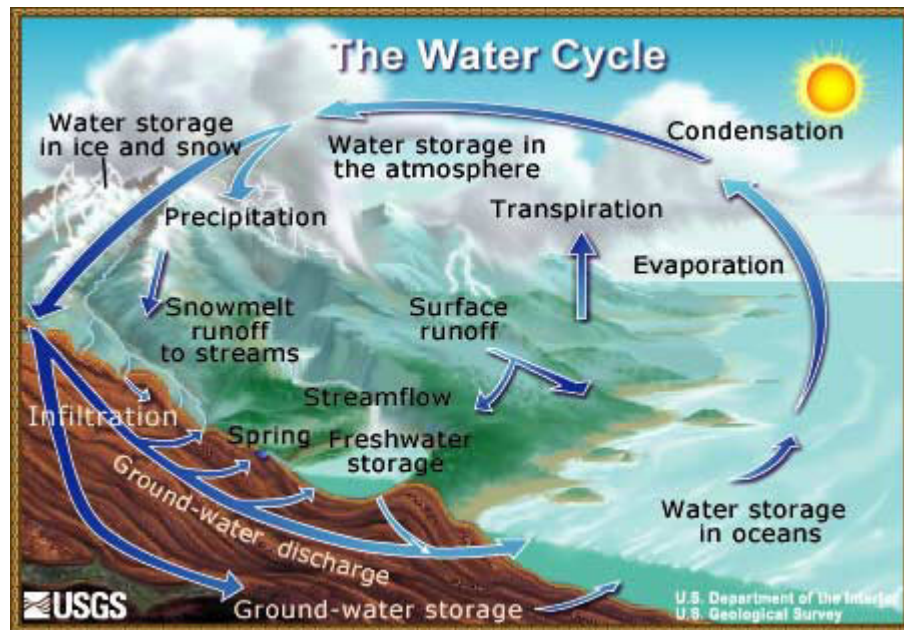


Illustration by John M. Evans, Colorado District, USGS

When ocean water is warmed by sunlight, some of it evaporates. As this moisture laden air rises and cools, condensation occurs. Water vapor in the air is converted to tiny moisture droplets that coalesce to form clouds. When the air becomes saturated with moisture, precipitation occurs, most commonly in the form of rain and snow.

When precipitation reaches the ground, it becomes surface water. At this point several processes can occur. Some of it returns to the atmosphere by evaporation. Some is stored as snow and ice. This is an important factor in the Pacific Northwest where we typically receive the majority of our precipitation in the winter months. Winter snow accumulation in the Olympics and Cascades is an important source of stored water for the dry summer months. Some surface water, particularly in developed areas, runs off directly to streams and rivers and returns quickly to the ocean.

Some surface water infiltrates into the shallow layers of the soil where it is taken up by plants and re-enters the atmosphere through transpiration. Some flows through the soil until it enters streams and rivers. Some percolates below the shallow soil layers where it enters aquifers (underground water storage areas) and becomes groundwater. The movement of water from surface water to groundwater depends on soils, vegetation, the extent of impervious surfaces, and the underlying geology. This movement is referred to as connectivity.

Some groundwater is discharged into rivers, streams, lakes, and wetlands and continues its flow to the ocean. Some is pumped to the surface from wells and again becomes surface water. Water may reside in the ground for intervals ranging from weeks to thousands of years, but eventually groundwater returns to the ocean, completing the hydrologic cycle.

The relationship between surface water and groundwater is an important consideration in surface water management. It is discussed in greater detail in Chapter 3 Analysis.

### **1.3 WHAT IS SURFACE WATER MANAGEMENT?**

Surface water management includes a wide variety of activities that protect the natural functions and beneficial uses of surface waters including:

- Controlling erosion from construction sites,
- Controlling the quantity and quality of stormwater runoff from development,
- Gathering and analyzing data through water quality monitoring and stream gauges,
- Protecting and restoring fish habitat,
- Comprehensive land use planning,
- Watershed planning,
- Managing waste water treatment and disposal,
- Flood hazard management,
- Shellfish protection,
- Shoreline planning and management,
- Public education and outreach, and
- Allocating surface water rights.

### **1.4 RESPONSIBILITY FOR SURFACE WATER MANAGEMENT IN JEFFERSON COUNTY**

No single agency has overall responsibility for surface water management in Jefferson County. Several County Departments and other agencies are responsible for different surface water management activities. These include:

- Jefferson County Community Development Department,
- Jefferson County Environmental Health Department,
- Jefferson County Natural Resources Division,

- Jefferson County Public Works Department,
- Jefferson County – WSU Cooperative Extension,
- Jefferson County Conservation District,
- Jefferson County Public Utility District,
- City of Port Townsend,
- Port Ludlow Drainage District,
- Washington State Department of Ecology,
- Washington State Department of Fish and Wildlife
- Washington State Department of Health,
- U.S. Forest Service, and
- National Park Service.

One of the primary goals of this Surface Water Management Plan is to assess the roles of these departments and agencies and to recommend how their activities can be coordinated to increase efficiency and effectiveness.

### **1.5 JEFFERSON COUNTY COMPREHENSIVE PLAN**

Comprehensive planning is an activity that is critically important for surface water management. Washington’s Growth Management Act (RCW 36.70A.070(1)) requires the Land Use Element of the County Comprehensive Plan to “review drainage, flooding, and stormwater runoff...and provide guidance for corrective actions....” In order to comply with this requirement, Jefferson County’s Comprehensive Plan includes the following information:

- A review of Federal, State, and local regulations that govern surface water management,
- A description of existing surface water conditions,
- A discussion of County programs that protect surface water resources, and
- A discussion of Jefferson County’s compliance with the Puget Sound Water Quality Management Plan Stormwater Management Program.

The County Comprehensive Plan includes goals and policies related to managing stormwater, reducing flood hazards, and protecting the County’s surface water resources. It recommends additional steps to protect the County’s surface water resources, including developing a Comprehensive Surface Water Management Plan. This Surface Water Management Plan proposes to achieve the Comprehensive Plan goals through developing a Surface Water Management Program.

### **1.6 SURFACE WATER MANAGEMENT PLAN ORGANIZATION**

This Plan presents a wide range of information and analysis related to surface water management in Jefferson County. The ultimate purpose of the Plan is to provide guidance to Jefferson County citizens and government for developing a comprehensive Surface Water Management Program.

The following is a brief description of the remaining chapters of this Plan:

**Chapter 2 Existing and Projected Conditions** presents a summary of Jefferson County’s landforms and climate, existing and projected population and land use patterns, and surface water characteristics. It includes analysis of surface water conditions in major County watersheds.

**Chapter 3 Analysis of Major Issues** discusses a wide range of surface water management issues including impacts related to:

- Rural resource activities: forest management and agriculture,
- Rural residential development, and
- Rural commercial development.

Chapter 3 also discusses other surface water management issues, including:

- Urban Stormwater Management
- Surface Water and Groundwater
- Low Impact Development
- Flood Hazard Management
- Salmon Recovery
- Shellfish Protection
- Marinas and Boat Launches
- Marine Shoreline Habitat Protection.

**Chapter 4 Existing Activities** discusses and evaluates the surface water management activities currently conducted by:

- Jefferson County departments,
- Jefferson County Conservation District,
- Jefferson County / Washington State University Cooperative Extension,
- Jefferson County Public Utility District,
- Port Ludlow Drainage District, and
- Community Organizations.

**Chapter 5 Policy and Regulation** discusses the wide range of Federal, State, and Jefferson County policies and regulations that guide the development of a surface water management program. These include the:

- Federal Clean Water Act,
- Federal Endangered Species Act,
- State Pollution Control Act,
- State Growth Management Act,
- Puget Sound Water Quality Management Plan,
- Jefferson County Comprehensive Plan, and
- Jefferson County Unified Development Code.

**Chapter 6 Program Components** presents a description and analysis of surface water management activities that should be considered for inclusion in a Jefferson County Surface Water Management Program. These are based on recommendations from the Federal Clean Water Act and the State's Puget Sound Water Quality Management Plan. They also include activities required by State law and Jefferson County policies. The Chapter recommends components to include in a Surface Water Management Program and provides a planning level analysis of their cost.

**Chapter 7 Revenue** discusses Jefferson County's financial capacity to fund surface water management activities and potential revenue sources. It provides planning level estimates of specific revenues.

**Chapter 8 Goals and Policies and Strategies** presents recommended goals and policies to guide a Jefferson County Surface Water Management Program.

**Chapter 9 Public Education** presents a Surface Water Management Public Education Plan that was prepared by the Jefferson County – Washington State University Cooperative Extension. The Plan describes Jefferson County’s strategy to emphasize public education to protect surface water resources.

**Chapter 10 Program and Funding Options** describes and evaluates options for creating a Jefferson County Surface Water Management Program. For each option, it addresses program development, management structure, components, staffing, expenditures, and revenues. Each option is evaluated on the basis of:

- Goals and Policies: Does it achieve the surface water management goals and policies identified in Chapter 8?
- Program Components: Does it implement the priority Surface Water Management Program components identified in Chapter 6?
- Revenue: Does it identify adequate, stable, and equitable revenue sources to fund Program components?

The Program Options include:

- Option 1: Program Development and Coordination
- Option 2: Implement a Comprehensive Surface Water Management Program
- Option 3: Implement a Comprehensive Surface Water Management Program within a Public Works Department Utility Division.

Chapter 10 includes two spreadsheets that depict the options, program components and costs, and revenues that would be necessary to fund the options. The first depicts a County-wide Surface Water Management Program. The second depicts a Port Hadlock UGA Stormwater Management Program.

Chapter 10 concludes with a recommendation for developing a Surface Water Management Program.