

PUBLIC WATER SUPPLIES IN
THE SEATTLE-TACOMA URBAN COMPLEX
AND ADJACENT AREAS, WASHINGTON
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INTRODUCTION

This report is the third in a series of basic-data contributions which graphically depict various hydrologic aspects of the urbanization of the eastern part of the Puget Sound lowland. The report was prepared to present a generalized illustration of the summary of the areal distribution of the public water-supply systems. The preceding reports in this series discuss low flows and temperatures of streams (Hidaka, 1972) and emergency ground-water supplies (Poworothy, 1972).

As defined in this study, the Seattle-Tacoma urban complex and adjacent areas include southwestern Snohomish County, western King County, western Pierce County, and northeastern Thurston County, a total area of about 3,330 square miles (8,620 square kilometers). The population of the study area in 1972 was about 1,840,000—54 percent of the State's population—of which approximately 1,760,000 people live in the area herein described as the Seattle-Tacoma urban complex. This urban complex covers approximately 800 square miles (2,070 square kilometers) and is generally outlined by the shaded area on the map. An average of 2,200 people per square mile (850 people per square kilometer) live in this urbanized area which is only slightly more than 1 percent of the State's area.

PUBLIC WATER SUPPLY

In a highly urbanized area a safe and reliable source of potable water is fundamental to a healthy populace and a viable economy. The map shows general areas served by public water-supply systems, without distinction between municipalities, water districts, private water companies or water cooperatives. Only criteria used to delineate the areas on the map was that they be served by public water-supply systems.

The Washington State Department of Social and Health Services (written commun., January 1973) indicates that in 1972 King County had 18 Class I (more than 100 services) water-supply systems, and at least 783 Class II (less than 100 services) systems. Pierce County had 41 Class I and 275 Class II water-supply systems, Snohomish County had 45 Class I and 182 Class II systems, and Thurston County had 11 Class I and 130 Class II systems. Not shown on the map are individual systems and many small suburban systems that were not located. However, the delineation of the public water-supply areas is estimated to be more than 95 percent complete. Almost all houses outside the shaded area use water from individual wells, while a few use water from springs or streams.

Water-use data indicate that in 1970 about 1,720,000 people used water from public-supply systems within the study area. This was almost 94 percent of the total population in the study area. In King, Pierce, Snohomish, and Thurston Counties the numbers of people served were about 1,091,000, 375,000, 212,000, and 41,000, respectively. The annual water use by county was as follows: King County, 57.1 billion gallons (216 million cubic meters); Pierce County, 37.2 billion gallons (141 million cubic meters); Snohomish County, 41.8 billion gallons (158 million cubic meters); and Thurston County, 2.3 billion gallons (8.7 million cubic meters). The total water used was 138 billion gallons (522 million cubic meters), which includes all water used from public-supply systems by industrial and business users as well as domestic users but excludes irrigation water and water self-supplied by industry.

About 82 percent of the public water supplies in the study area came from streams and lakes rather than from springs and wells. Streams and lakes supplied 85 percent of the water used in King County, 59 percent of that used in Pierce County, and 99 percent of that in Snohomish County. The exception was Thurston County which used ground water from wells and springs exclusively.

CONCLUSIONS

The use of publicly supplied water in the study area was almost unchanged between 1965 and 1970, while such use in the State as a whole increased by about 8 percent. This lack of increase in the study area probably was due in part to the economic problems in the Seattle-Tacoma urban complex which severely curtailed the activity of some of the large industries. Also, the area had a small population decrease during this period.

Most of the public water systems in the study area can deliver sufficient water to meet the demands, and severe water-use restrictions have not been common in the area. However, if the urbanized population resumes its growth as predicted, and if the large industrial users of public water also expand and increase their use, shortages during peak-demand periods could occur if some of the present water-supply systems are not expanded.

Two levels of annual water demand have been predicted for the study area—a high level which maximizes population growth and economic conditions and a low level which assumes a lower rate of population increase and economic growth. A high-level demand is based on predictions by Parker (1971) that annual public-system water use in the study area could be as high as 163 billion gallons (617 million cubic meters) by 1975, 186 billion gallons (704 million cubic meters) by 1980, and 211 billion gallons (793 million cubic meters) by 1985. A low-level demand is based on predictions that public water use will be 139 billion gallons (526 million cubic meters) by 1975, 155 billion gallons (586 million cubic meters) by 1980, and 173 billion gallons (655 million cubic meters) by 1985. The actual demand probably will be between these two extremes.

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SELECTED REFERENCES

- Cornell, Howard, Hayes, and Merryfield, 1972, Planning background, volume I of Thurston County. A comprehensive water and sewerage plan: Seattle, Wash., chap. 1-7.
- 1972, Water plan, volume II of A comprehensive water and sewerage plan: Seattle, Wash., chap. 1-10.
- Poworothy, B. L., 1972, Emergency ground-water supplies in the Seattle-Tacoma urban complex and adjacent areas, Washington: U.S. Geol. Survey Basic-Data Contribution II, open-file report, 1 p.
- Hidaka, P. T., 1972, Low flows and temperatures of streams in the Seattle-Tacoma urban complex and adjacent areas, Washington: U.S. Geol. Survey Basic-Data Contribution I, open-file report, 11 p.
- Kennedy Engineers, 1969, Comprehensive sewerage plan for Pierce County, Washington 1969: Tacoma, Wash., chap. 1-5.
- Laird, L. B., and Walters, K. L., 1967, Municipal, industrial, and irrigation water use in Washington, 1965: U.S. Geol. Survey open-file report, 13 p.
- Parker, G. G., Jr., 1971, Municipal, industrial, and irrigation water use in Washington, 1970: U.S. Geol. Survey open-file report, 21 p.
- Puget Sound Task Force, 1970, Municipal and industrial water supply, appendix VI, of Comprehensive study of water and related land resources, Puget Sound and adjacent waters, State of Washington: Pacific Northwest River Basins Comm., Vancouver, Wash., sections 1-14.
- Slesvink-Kore, Inc., 1972, Comprehensive water plan for rural Pierce County, Washington: Tacoma, Wash., sections 1-5.
- Washington State Office of Program Planning and Fiscal Management, 1972, 1970 Census data book: Olympia, Wash., 496 p.
- 1972, Pocket data book 1971: Olympia, Wash., 331 p.
- 1972, State of Washington population trends 1972: Olympia, Wash., 44 p.



EXPLANATION

Areas served by public water-supply systems

Based on data for 1970-72