

# COMPREHENSIVE WATER RESOURCE INVESTIGATIONS IN THE CONNECTICUT RIVER BASIN \*

By Robert J. Frazier, *Chief, Basin Planning Section U. S. Army Engineer  
Division, New England, Waltham, Mass.*

“**W**ORLD'S Population to Double in 35 years, Says Computer”. This was the headline of a feature article in a Boston newspaper less than 10 days ago. As we consider the traffic we witnessed on the highways as we drove to Cheshire this spring morning, the concept of doubling gives us a pause. On second thought, the headline said the world population and maybe it will take place in another part of the world rather than in the United States.

We cannot sit back and relax. Population projections for the nation, our nation, indicate a ninety-eight per cent (98%) increase between 1960 and 2000, a period of 40 years. Again these figures are for the total country, and possibly we can think of this growth occurring in California, Texas, and other areas while our growth in New England will be much more moderate. After all, New England is a long-established region, our lands are substantially developed, and our expansion is likely to be slower.

Here, too, our wishes may be fathers to our opinions. Projections for New England have population increasing by thirty-two per cent (32%) between 1960 and 1980 and seventy-eight per cent (78%) in the forty-year period between 1960 and 2000. This is not doubling, but represents a major increase amounting to eight and one-third million people. Here in Connecticut projections indicate a forty per cent (40%) increase in people between 1960 and 1980 and a ninety-two per cent (92%) increase between 1960 and the turn of the century.

These major anticipated increases in population are naturally of immense concern to us as engineers and planners for reasons other than the automobile traffic, and highway aspects. Everyone uses water, individually and collectively, domestically and industrially. The ever-increasing population will inevitably expand our water requirements. In addition, I have recently seen estimates of increases of thirty per cent (30%) in per capita water use by the turn of the century.

Concern as to demands for water, present and future, is the reason why a comprehensive investigation of water and related land resources is in

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process. Concern as to imminent demands on a potentially limited supply has been evidenced by many for a considerable period. In the late 1950's, the Select Committee of the United States Senate, in recognition of the growing utilization of the nation's waters and of shortages in some regions, made an extensive survey of the problem nationally. During the course of this survey, hearings were held in twenty-nine (29) locations. The findings of the Committee published in Senate Report No. 29, 87th Congress, 1st Session, with thirty-two (32) appendices recommended that "The Federal Government in cooperation with the States, prepare and keep up to date plans of comprehensive water development and management for all river basins in the United States." The Administration in Washington adopted this recommendation as a policy and directed that comprehensive investigations of all river basins be carried out by 1970.

Investigations for the Connecticut River, which are in accordance with the policy of the Administration, were initiated by a Resolution adopted by the Public Works Committee for the Senate. The Board of Engineers was requested to review prior reports on the Connecticut River, with a view to determining the advisability of modifying existing projects with particular reference to developing a comprehensive plan of improvement for the basin in the interest of flood control, navigation, hydroelectric power development, water supply, and other purposes coordinated with related land resources. The resolution was submitted to the Public Works Committee by former Senator Prescott Bush of Connecticut.

In brief, the survey comprises looking into the future, estimating what the demands will be for water, determining what additionally we will need, taking into account what we presently have developed, examining what the potentials are for satisfying the needs, and formulating a plan for best meeting the requirements.

The investigations, while under the leadership of the Corps of Engineers, are a joint effort with active participation by some eighteen (18) agencies representing eight (8) Federal departments and with assistance of several agencies from each of the states. Guidance is provided by a Coordinating Committee comprised of six (6) Federal representatives and a member designated by the Governor of each State. In Connecticut, William S. Wise, Director of your Water Resources Commission is a member of this Committee.

The look into the future began with a projective economic survey. Some of the figures cited in the opening paragraphs came from this analysis. The economic projections, developed by Arthur D. Little, Inc. of Cambridge, Mass., and including data developed by agencies of the Department of Agriculture, provide figures for population, employment, in-

come, and in some cases, production. The employment figures are separated for industry groupings, such as Agriculture and other resource industry. Manufacturing, and Services. In addition, specific manufacturing industries, found to require especially large amounts of water have individual projections.

The economic survey is in three phases: first, the New England Region with a tie into the national picture; secondly, the individual states within the region; and thirdly, substate areas comprised of county groupings. It is pertinent to note that while projections are made to the years 2000 and 2020, the principal aim of our water resource planning will be to meet the 1980 requirements. Potentials for meeting later needs will also be identified.

The projections of future population, employment, and productivity together with their anticipated locations will be factors in arriving at estimates of future demands on our water resources and related lands. These estimates will be prepared by various participating agencies concerned with specific resource responsibilities and will be reviewed by all participants and the Coordinating Committee. Estimates will recognize that future demands will arise not only from peoples and activities within the basin, but also from outside the basin. For example, total requirements for water-based recreation and lake and stream fishing will include those of people in the metropolitan centers in other parts of New England, the metropolitan New York area, and beyond. Currently, we know that Quabbin Reservoir plus the Ware River Diversion provide a substantial segment of the water supply requirements for the Boston metropolitan area. The possible augmentation of this supply from the Connecticut River Basin must be considered in our planning. Conversely, the possibility of satisfying requirements of some portion of the population of the basin from outside the basin will be considered.

An inventory of present water resource developments within the basin points up quite vividly the need for multi-purpose or comprehensive water resource planning. The letter size basin map I have distributed, for example, shows sixteen (16) flood control reservoirs either completed, under construction, or in a design stage and fifteen (15) projects for local flood protection in a similar status. Most of these projects are designed for a single purpose flood protection. Two have water supply as a companion purpose, and one of these also has flow augmentation for fish and wildlife as a purpose. Recreation facilities are included at several reservoirs, but recreation is incidental to the primary project purpose.

Other present developments in the basin include portions of two (2) national forests, one hundred thirteen (113) state parks and forests, forty-

four (44) hydro-electric generating installations with an installed capacity of one (1) megawatt or greater, ten (10) completed or approved work plans of watershed protection under the provisions of Public Law 566, and seventy-four (74) major surface water supplies. A large majority of these two hundred and forty-three (243) facilities also have been developed to serve a single resource purpose, although in recent years there is a trend towards multiple use of water developments. This trend must be rapidly accelerated, if we are to satisfy the demands we know are constantly increasing and will continue to increase in the foreseeable future.

In addition to looking at the future, initiating an assessment of future requirements, and taking inventory of our current water resource development, we also are embarking on a preliminary analysis of potentials for satisfying the requirements. Fortunately, there is a wealth of data from earlier investigations by many organizations both Governmental and private. This provides a base, which combined with additional investigation and analyses of more recently acquired data, will identify a group of potential water resource developments for further critical analysis, more refined design, and ultimate project selection and formulation of a basin plan. The basin plan may include a number of major water impoundment structures and many smaller developments to supplement the first group. However, at this stage of the investigations any forecast of results would be unrealistic and unwarranted.

I would point out, however, that the report will include sufficient detail analysis to support a recommendation for Congressional authorization of developments meriting Federal participation. In addition, the report will identify potential developments that are required to satisfy segments of future need and should be implemented by non-Federal interests.

In summary, the comprehensive water resource investigations for the Connecticut River Basin have been initiated in response to an awareness of constantly increasing demands on our water resources. The investigations will consider many facets of water resources and will emphasize multiple-use development. Economic projections are substantially complete and will provide one of the important tools in evaluation of future water resource needs. The assessment of the future needs and preliminary consideration of potentials for meeting needs are under way in a joint undertaking by several Federal resource agencies with the assistance of the states. A report of the investigations including recommendation for a basin plan of development is scheduled for completion in 1969.