Forests, Water and People

Drinking water supply and forest lands in Connecticut

USDA Forest Service
Northeastern Area
State and Private Forestry

Project Description

In the Northeast and Midwest United States, forests are critically important to the supply of clean drinking water. Protecting and managing forests in source watersheds is an essential part of future strategies for providing clean safe drinking water that citizens can afford. The Forests, Water and People analysis identified private forests that are most important for drinking water supply and most in need of protection from development pressure. This fact sheet gives the results of the analysis for the State of Connecticut. For more detailed description of methods, and results for the Northeast and Midwest United States, see the full report.

The Process

Through a 4 step GIS-based overlay analysis, four indices were developed for each watershed (see Figure 1).

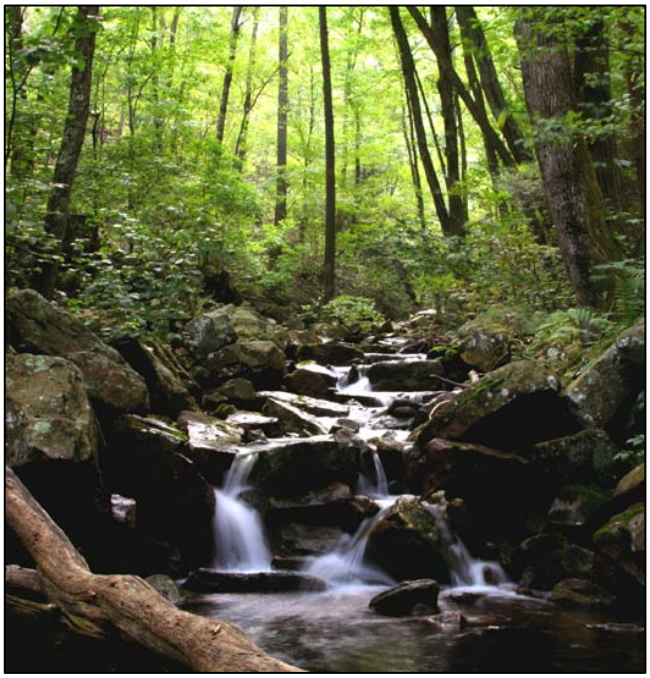
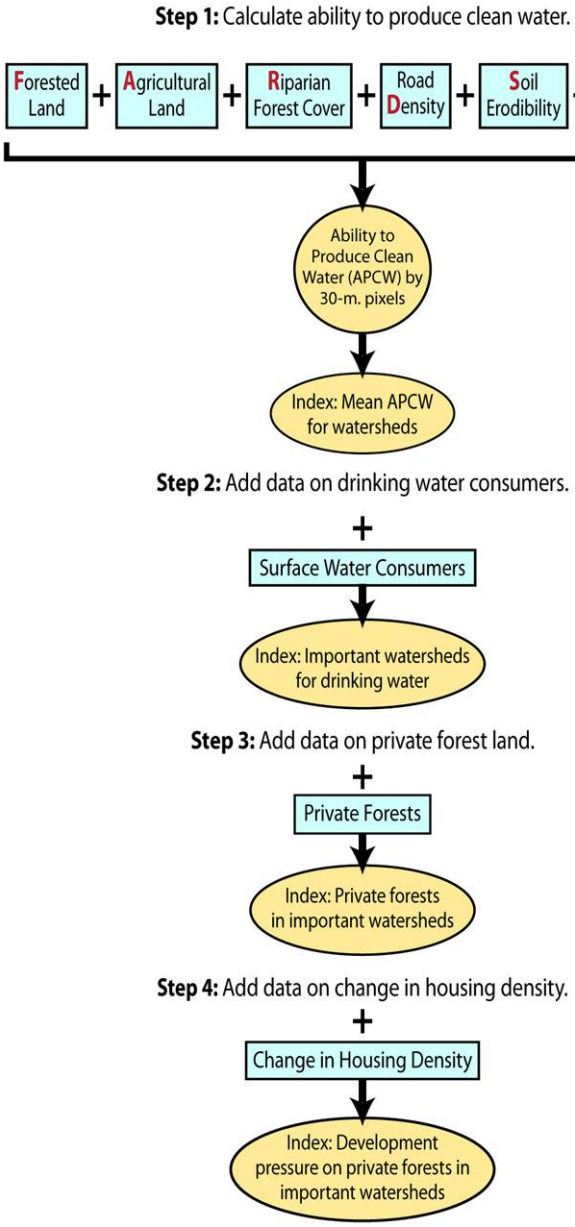


Photo by Michael Land.

"Water, in all its uses and permutations, is by far the most valuable commodity that comes from the forest land that we manage, assist others to manage, and/or regulate."
Policy Statement, National Association of State Foresters

Figure 1. *Nine layers of GIS data (boxes) were combined in stepwise fashion, to produce four indices (ovals) of watershed importance for drinking water supplies and the need for private forest management to protect those supplies.*



Connecticut Results

Highlights

- All of Connecticut's watersheds ranked above average in their ability to produce clean water, providing surface drinking water supply and having private forests on important watersheds, and were among the highest in the Northeastern Area for high-quality watersheds under development pressure.
- Despite Connecticut's small size, all of the State's watersheds ranked above average in their ability to produce clean water. The highest ranking watersheds in step 1 are the Pawcatuck-Wood and Westfield watersheds.
- Connecticut ranked above average in the ability of its watersheds to provide drinking water because more than 2 million surface water consumers depend on drinking water supplies. Those watershed supplying drinking water to the largest populations are the Lower Hudson and Middle Hudson watersheds.
- Due to the large percentage of private forest (88 percent) among forested lands in general and across the state overall, Connecticut ranked above average because its watersheds are mainly comprised of private forests important for providing drinking water supply. Western Connecticut ranked highest in step 3.
- Overall, 10.6 percent of private forestlands on high-quality watershed areas are subject to development pressure by 2030. However, three of Connecticut's watersheds, Pawcatuck-Wood, Lower Hudson and Middle Hudson, ranked in the top 2 percent of all the region's watersheds because these watersheds are at high risk for development and also provide high-quality drinking water.

Table 1. Watershed results for Connecticut

Watershed Name	Hydrologic Unit Code	Mean APCW for watersheds	Surface drinking water consumers	% private forest in watershed	% watershed with housing density increase	Index: Development pressure on private forests important for drinking water supply Score (Step 4)	Rank (Step 4)
Pawcatuck-Wood	01090005	9 of 10	16,764	69 %	19 %	35 of 40	8 of 540
Lower Hudson	02030101	8 of 10	1,079,846	61 %	10 %	35 of 40	8 of 540
Middle Hudson	02020006	8 of 10	2,769,134	64 %	7 %	34 of 40	10 of 540
Quinebaug	01100001	8 of 10	35,501	69 %	16 %	33 of 40	19 of 540
Shetucket	01100002	8 of 10	25,112	68 %	13 %	33 of 40	19 of 540
Quinnipiac	01100004	7 of 10	554,342	53 %	11 %	33 of 40	19 of 540
Housatonic	01100005	8 of 10	479,036	65 %	8 %	33 of 40	19 of 540
Farmington	01080207	8 of 10	285,181	66 %	6 %	33 of 40	19 of 540
Westfield	01080206	9 of 10	338,282	68 %	2 %	32 of 40	34 of 540
Thames	01100003	7 of 10	114,834	69 %	9 %	32 of 40	34 of 540
Saugatuck	01100006	7 of 10	424,719	54 %	7 %	32 of 40	34 of 540
Lower Connecticut	01080205	7 of 10	423,759	50 %	10 %	31 of 40	50 of 540
Bronx	02030102	7 of 10	107,574	25 %	11 %	29 of 40	76 of 540

Average or total value for all watersheds listed in Table 1

Mean APCW for watersheds:	7.8	of 10
Important watersheds for drinking water composite score:	16.8	of 20
Private forests in important watersheds composite score:	25.2	of 30
Development pressure on private forests in important watersheds composite score:	32.7	of 40
Forested Land (acres):	4,537,802.1	
Private Forest (acres):	4,002,789.9	
Private Forest Land under Development Pressure by 2030 (acres):	424,437.7	
(% private forest land):	10.6%	

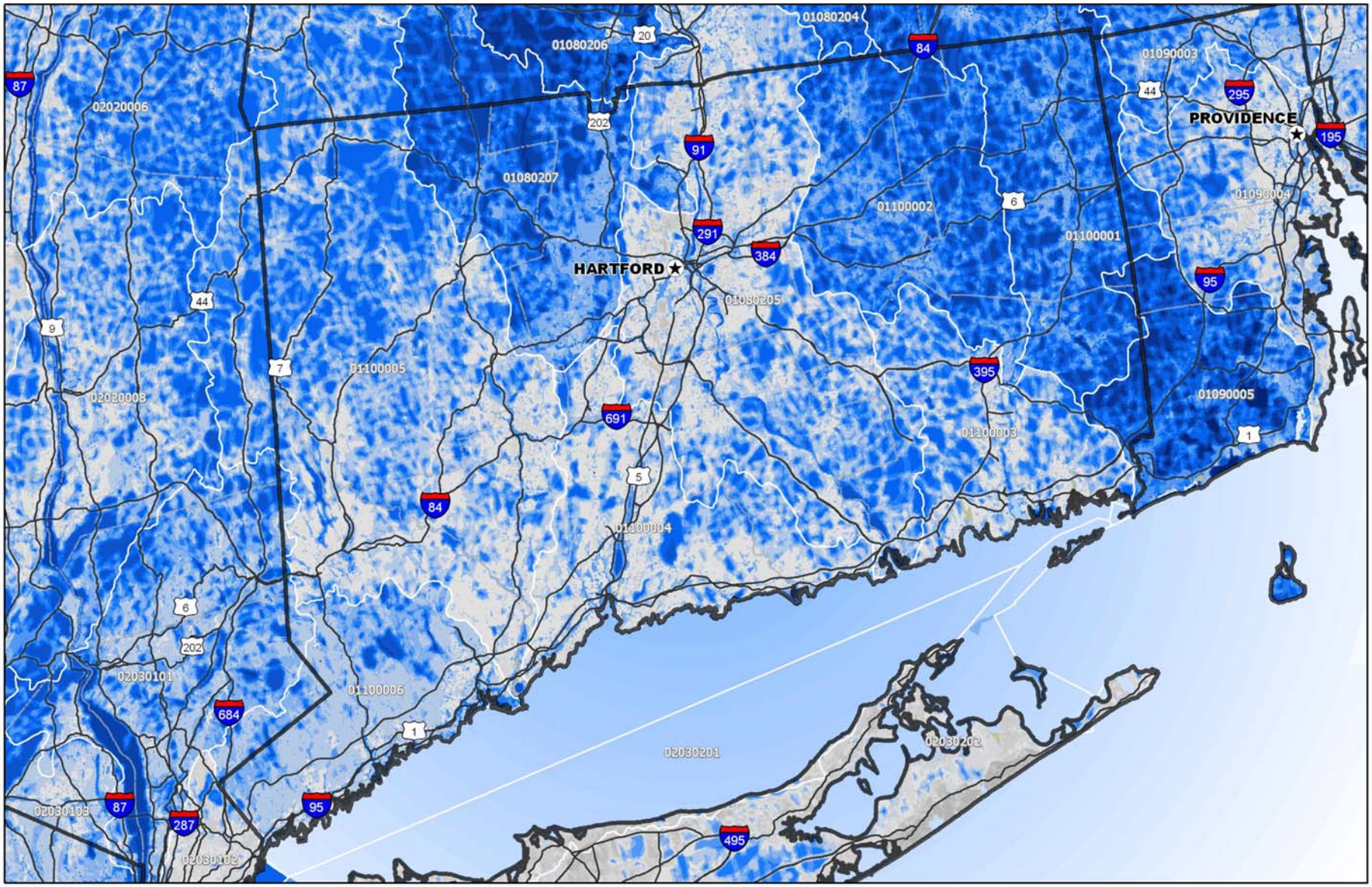
Note: If a watershed fell partially in Connecticut, the whole watershed was considered for this project. State results reflect the total acreage for all watersheds that impact that State (this may account for a higher acreage figure than if only lands within State boundaries were considered).

Maps

The following maps depict the results of each step in the Forests, Water and People analysis. Each watershed is labeled with the eight-digit HUC and the watershed composite score for the analysis step. (Note: the APCW, 30-m. pixel view does not have a watershed score)

All of the maps were produced by Rebecca Whitney Lilja, Office of Knowledge Management, Northeastern Area State and Private Forestry.

Step 1 - Ability to Produce Clean Water, 30m View - Connecticut



STEP 1 COMPOSITE SCORE, 30m VIEW

6 (Low APCW) 10 15 20 24 (High APCW)

N W E S

0 4 8 16 Miles

Projection: Albers

Watershed labels describe the 8-digit hydrologic unit code (HUC)

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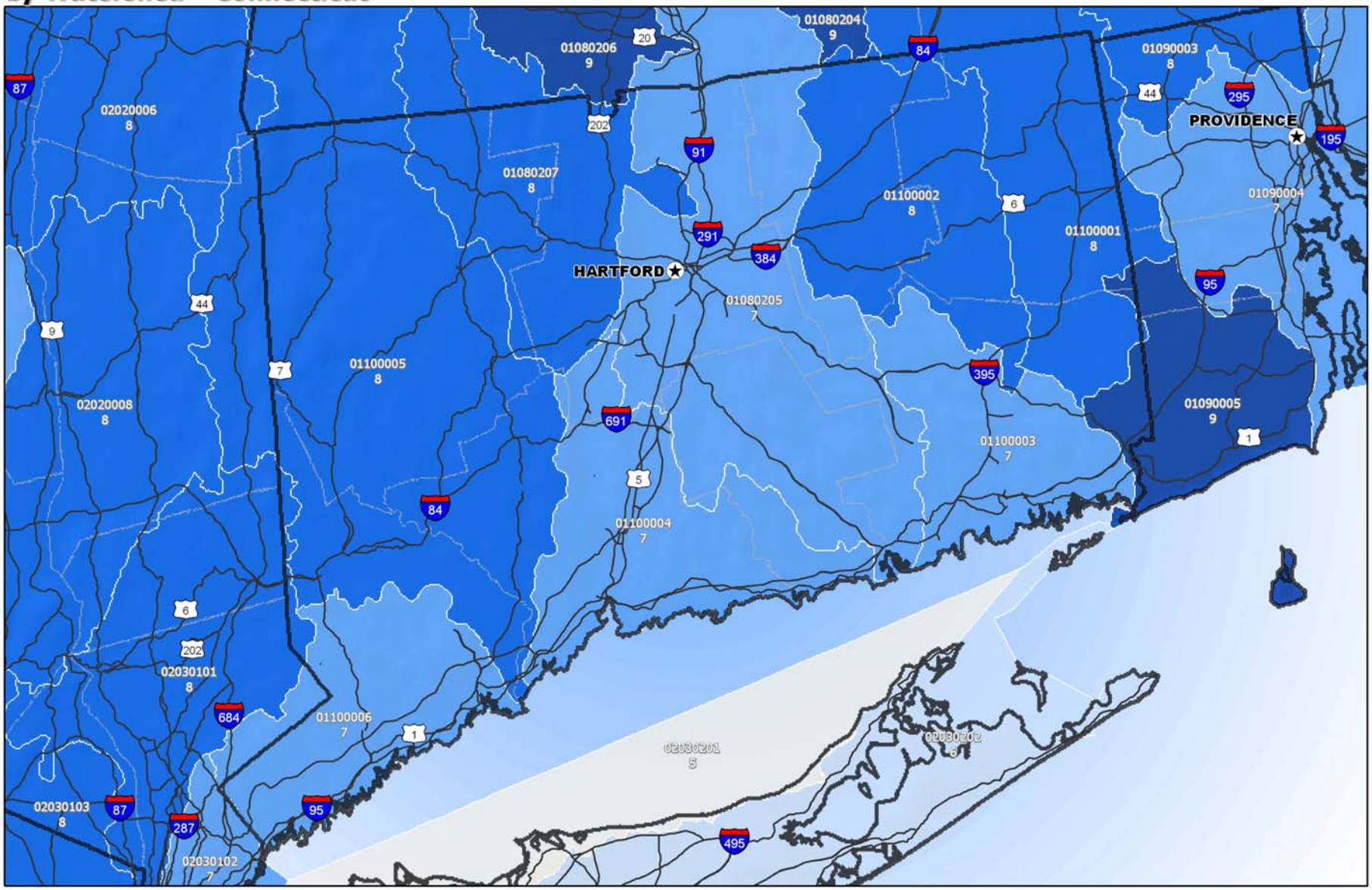
Step 1 (Continued) - Mean Ability to Produce Clean Water by Watershed - Connecticut



STEP 1 COMPOSITE SCORE

1 (Low APCW) 5 10 (High APCW)

N W E S

0 4 8 16 Miles

Projection: Albers

Watershed labels describe the 8-digit hydrologic unit code (HUC) and wateshed composite score

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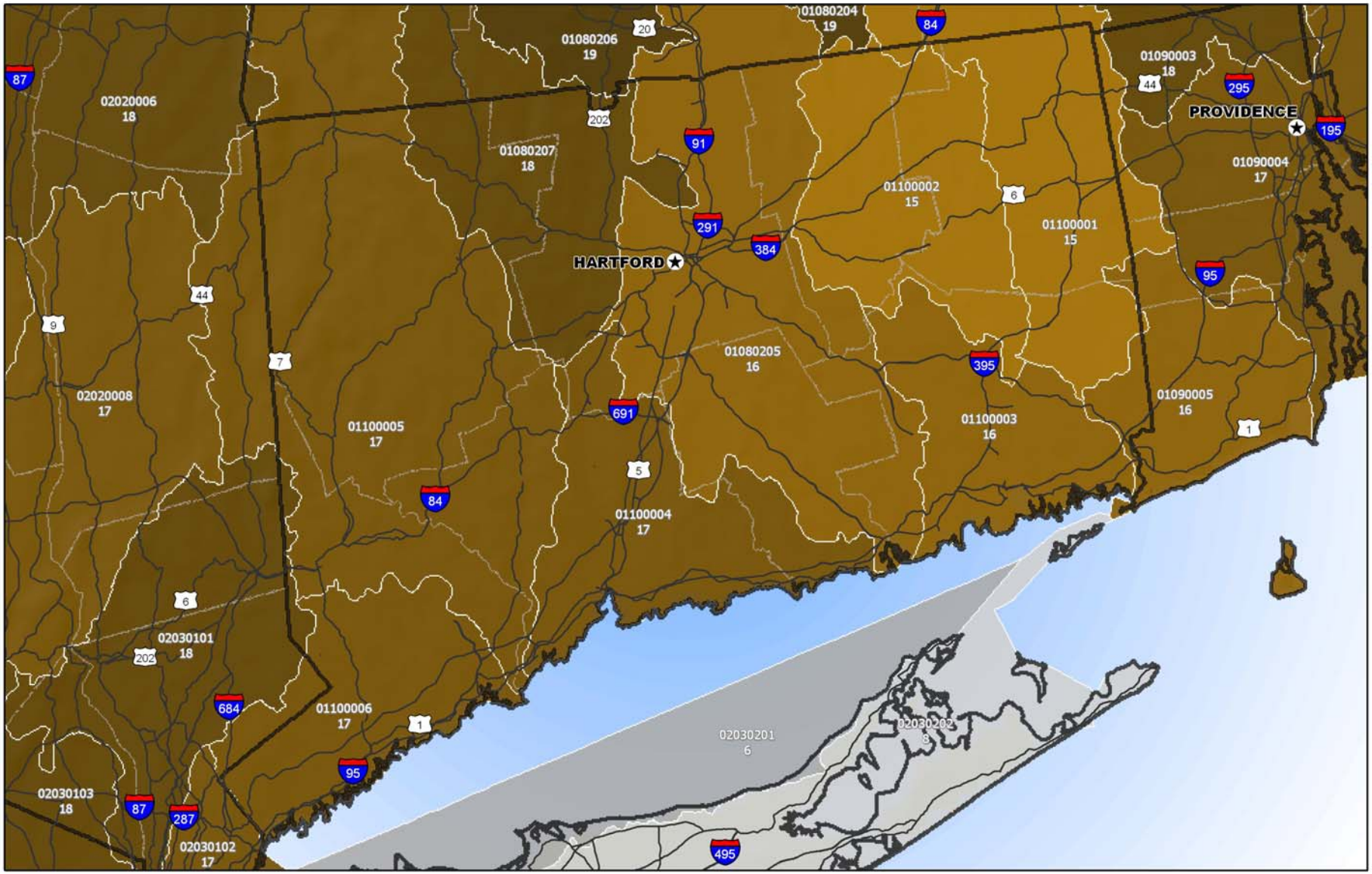
Step 2 - Importance of watersheds for drinking water supply - Connecticut



STEP 2 COMPOSITE SCORE

2 5 10 15 19

(Low APCW and Small number of water consumers) (High APCW and Large number of water consumers)

N W E S

0 4.5 9 18 Miles

Projection: Albers

Watershed labels describe the 8-digit hydrologic unit code (HUC) and wateshed composite score

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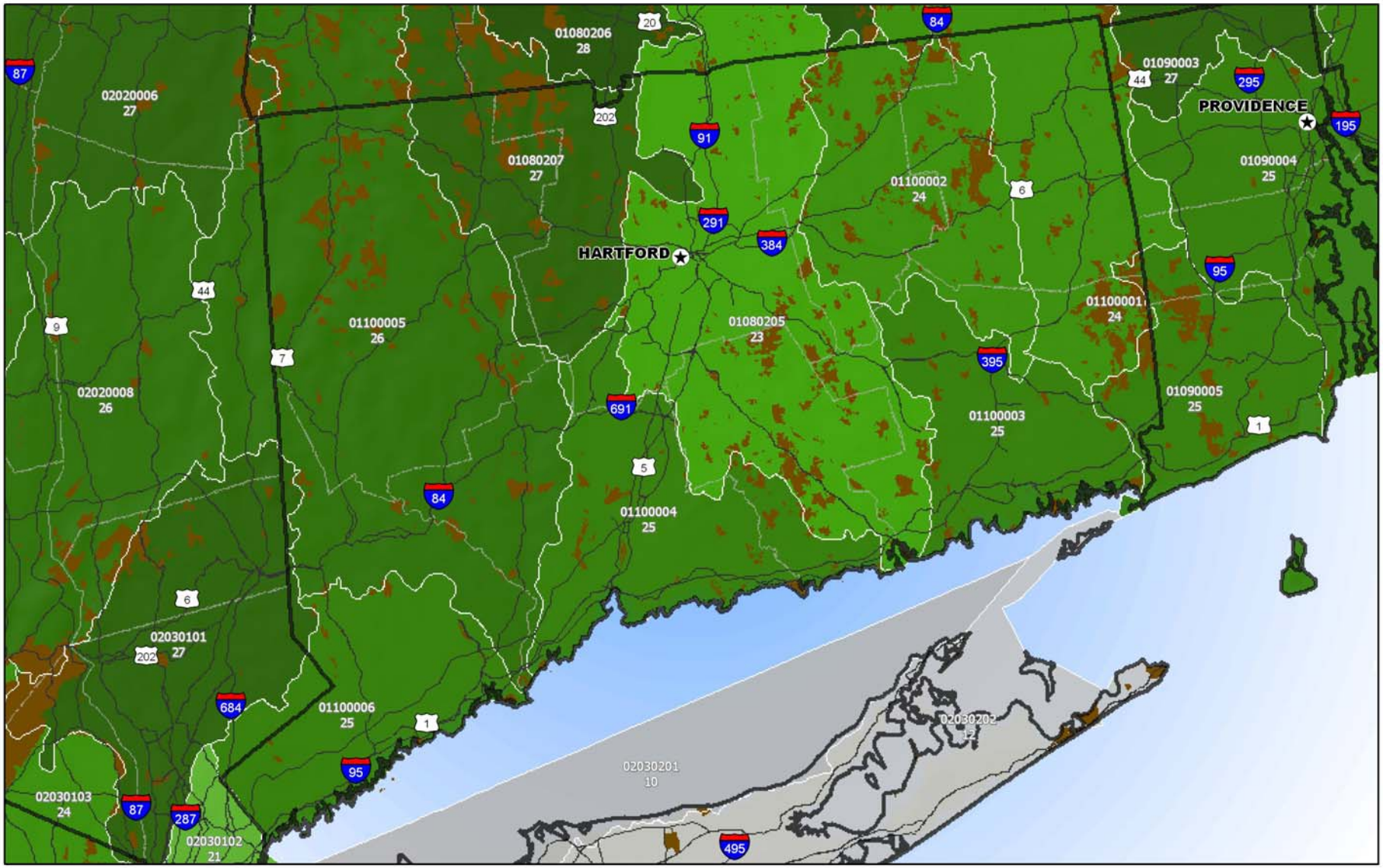
Step 3: Importance of watersheds and private forest for drinking water supply Connecticut



STEP 3 COMPOSITE SCORE

3 5 10 15 20 25 29

(Low APCW; Small number of water consumers; and Low % private forest)

(High APCW; Large number of water consumers; and High % private forest)

Protected Land

N W E S

Projection: Albers

Watershed labels describe the 8-digit hydrologic unit code (HUC) and wateshed composite score

0 4 8 16 Miles

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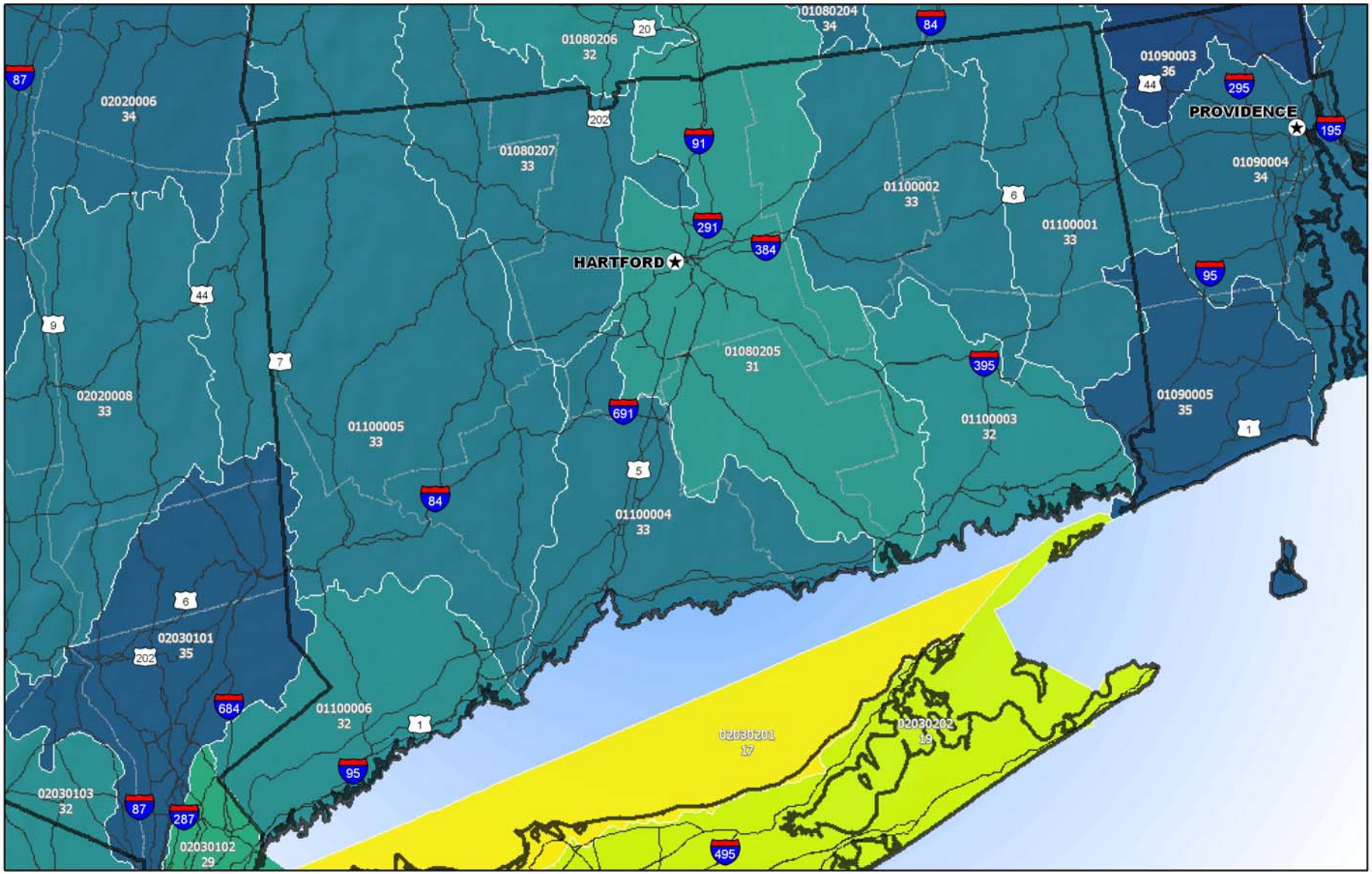
Step 4: Development pressure on private forests in drinking water supply watersheds - Connecticut



STEP 4 COMPOSITE SCORE

5 10 15 20 25 30 37

(Low APCW; Small number of water consumers; Low % private forest; and Low development pressure)

(High APCW; Large number of water consumers; High % private forest; and High development pressure)

N W E S

Projection: Albers

0 4 8 16 Miles

Watershed labels describe the 8-digit hydrologic unit code (HUC) and wateshed composite score

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References

Table 2. Datasets used in the Forests, Water and People Analysis

Attribute	Dataset	Source*
Forest land	1992 National Landcover Dataset	U.S. Geological Survey 1999
Agricultural land by watershed	1992 National Landcover Dataset	U.S. Geological Survey 1999
Riparian forest cover by watershed	1:100,000-scale National Hydrography Dataset, buffered to 30 meters	Hatfield 2005
Road density	2002 Bureau of Transportation Statistics (BTS) Roads	U.S. Department of Transportation 2002
Soil erodibility	STATSGO Soil Dataset, kffact	Miller and White 1998
Housing density by watershed	Housing density in 2000	Theobald 2004
Surface drinking water consumers per unit area	Public Drinking Water System (PWS) Consumers by eight-digit HUC; City Drinking water consumers for New York City, Philadelphia, St. Louis, St. Paul, and Washington DC	U.S. Environmental Protection Agency 2005
Private forest by watershed	Protected Areas Database, Version 4; Wisconsin Stewardship Data	Conservation Biology Institute 2006; U.S. Geological Survey, Upper Midwest Environmental Sciences Center 2005
Development pressure per unit area	Housing density in 2000 and 2030	Theobald 2004

*Note: See the **full report** for complete reference citations.

Watershed Resources

Northeastern Area Watershed— http://www.na.fs.fed.us/watershed

Forest-to-Faucet Partnership—http://www.wetpartnership.org/index.html

Trust for Public Land Source Water Stewardship Project—http://www.tpl.org/

Forests on the Edge—http://www.fs.fed.us/openspace/fote/index.html

American Water Works Association—Professional and Technical Resources—
http://www.awwa.org/Resources/index.cfm?&navItemNumber=1416

Source Water Collaborative—http://www.protectdrinkingwater.org/

Environmental Protection Agency—Surf Your Watershed—http://cfpub.epa.gov/surf/locate/index.cfm

Environmental Protection Agency—Safe Drinking Water Information System—

http://www.epa.gov/enviro/html/sdwis/sdwis_ov.html

This project was a collaborative effort between the Northeastern Area and Dr. Paul K. Barten, Associate Professor, University of Massachusetts-Amherst and Co-director of the Forest-to-Faucet Partnership.

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