

Forests, Water and People

Drinking water supply and forest lands in Maine

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 Maine. For more detailed description of methods, and results for the Northeast and Midwest United States, see the [full report](#).

The Process

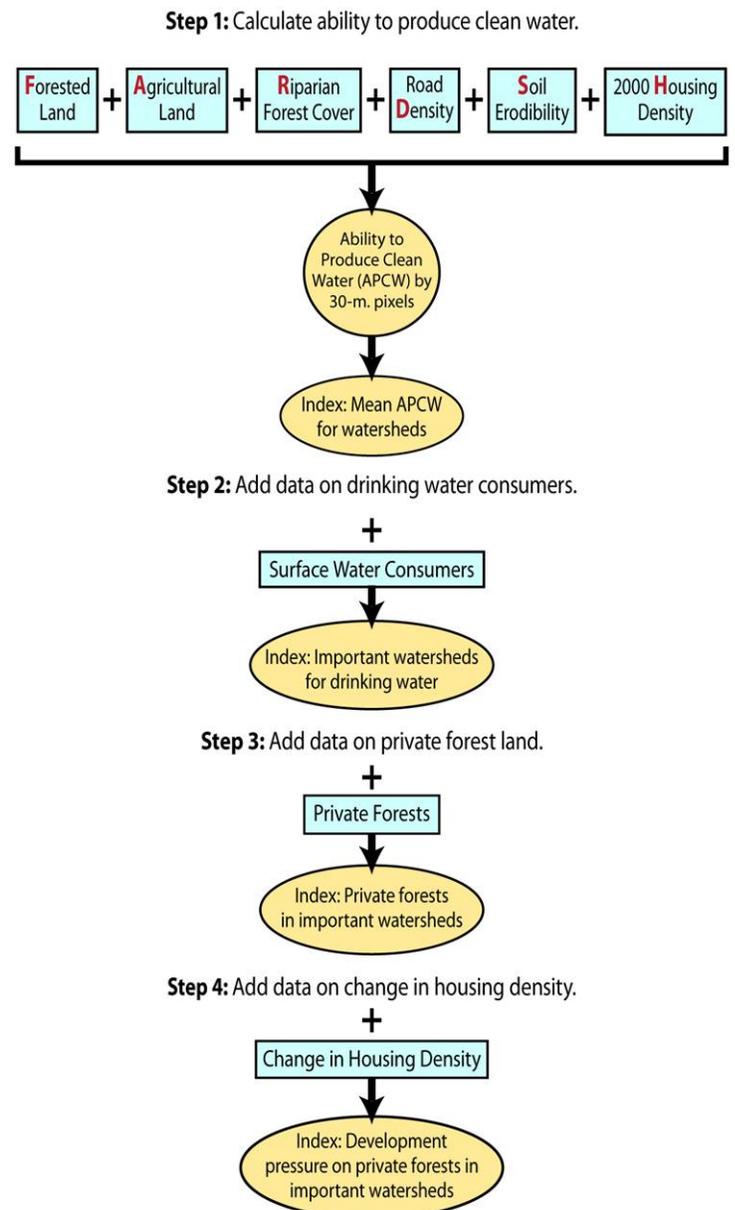
Through a 4 step GIS-based overlay analysis, four indices were developed for each watershed (see Figure 1).



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.



Maine Results

Highlights

- Maine is one of the highest scoring states in the Northeast and Midwest United States with regard to its ability to produce clean water and having important source watersheds near threatened private forest lands.
- Maine scored highest in the study area in its ability to produce clean water. The majority of its watersheds received the highest possible score in this index showing a watershed's ability to produce clean drinking water.
- Maine has a lower population density than most of its southern neighbors; therefore, its watersheds did not score as high as in the importance of watersheds for drinking water supply (step 2).
- Maine scored similarly with other Northeast states in the importance of private forests for drinking water supply across the study area (step 3), more than three-quarters of all forest lands are privately owned.
- The southern portion of Maine, particularly the Presumpscot (ranked first among all study area watersheds), Piscataqua-Salmon Falls (tied for first among all study area watersheds), and the St. George Sheepscot watershed (ranked tenth among all study area watersheds), all ranked very high in risk of development to private forests near surface drinking water supply watersheds (step 4).

Table 1. Watershed results for Maine

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)
Piscataqua-Salmon Falls	01060003	9 of 10	111,575	76 %	33 %	37 of 40	1 of 540
Presumpscot	01060001	9 of 10	115,020	73 %	19 %	37 of 40	1 of 540
St. George-Sheepscot	01050003	8 of 10	33,693	82 %	22 %	34 of 40	10 of 540
Lower Androscoggin	01040002	10 of 10	42,723	78 %	9 %	32 of 40	34 of 540
Saco	01060002	10 of 10	42,105	63 %	12 %	32 of 40	34 of 540
Lower Kennebec	01030003	9 of 10	59,833	81 %	9 %	31 of 40	50 of 540
Maine Coastal	01050002	10 of 10	50,409	87 %	5 %	30 of 40	61 of 540
Lower Penobscot	01020005	10 of 10	1,538	84 %	7 %	28 of 40	88 of 540
Upper Connecticut	01080101	10 of 10	30,136	68 %	1 %	26 of 40	126 of 540
Piscataquis	01020004	10 of 10	4,348	91 %	1 %	24 of 40	169 of 540
Upper Androscoggin	01040001	10 of 10	2,630	84 %	1 %	24 of 40	169 of 540
Upper Kennebec	01030001	10 of 10	1,060	90 %	0 %	23 of 40	199 of 540
St. Croix	01050001	10 of 10	0	83 %	1 %	23 of 40	199 of 540
Dead	01030002	10 of 10	0	86 %	0 %	23 of 40	199 of 540
Upper St. John	01010001	10 of 10	2,965	96 %	0 %	23 of 40	199 of 540
Aroostook	01010004	9 of 10	13,692	85 %	0 %	23 of 40	199 of 540
Fish	01010003	10 of 10	756	82 %	0 %	23 of 40	199 of 540
Mattawamkeag	01020003	10 of 10	0	93 %	1 %	23 of 40	199 of 540
Meduxnekeag	01010005	9 of 10	1,800	76 %	1 %	23 of 40	199 of 540
West Branch Penobscot	01020001	10 of 10	5,400	87 %	0 %	23 of 40	199 of 540
Allagash	01010002	10 of 10	0	94 %	0 %	22 of 40	229 of 540
East Branch Penobscot	01020002	10 of 10	0	71 %	0 %	22 of 40	229 of 540

Average or total value for all watersheds listed in Table 1

Mean APCW for watersheds:	9.7	of 10
Important watersheds for drinking water composite score:	12.8	of 20
Private forests in important watersheds composite score:	22.7	of 30
Development pressure on private forests in important watersheds composite score:	26.6	of 40
Forested Land (acres):	20,605,462.0	
Private Forest (acres):	18,547,995.9	
Private Forest Land under Development Pressure by 2030 (acres):	1,000,261.6	
(% private forest land):	5.4%	

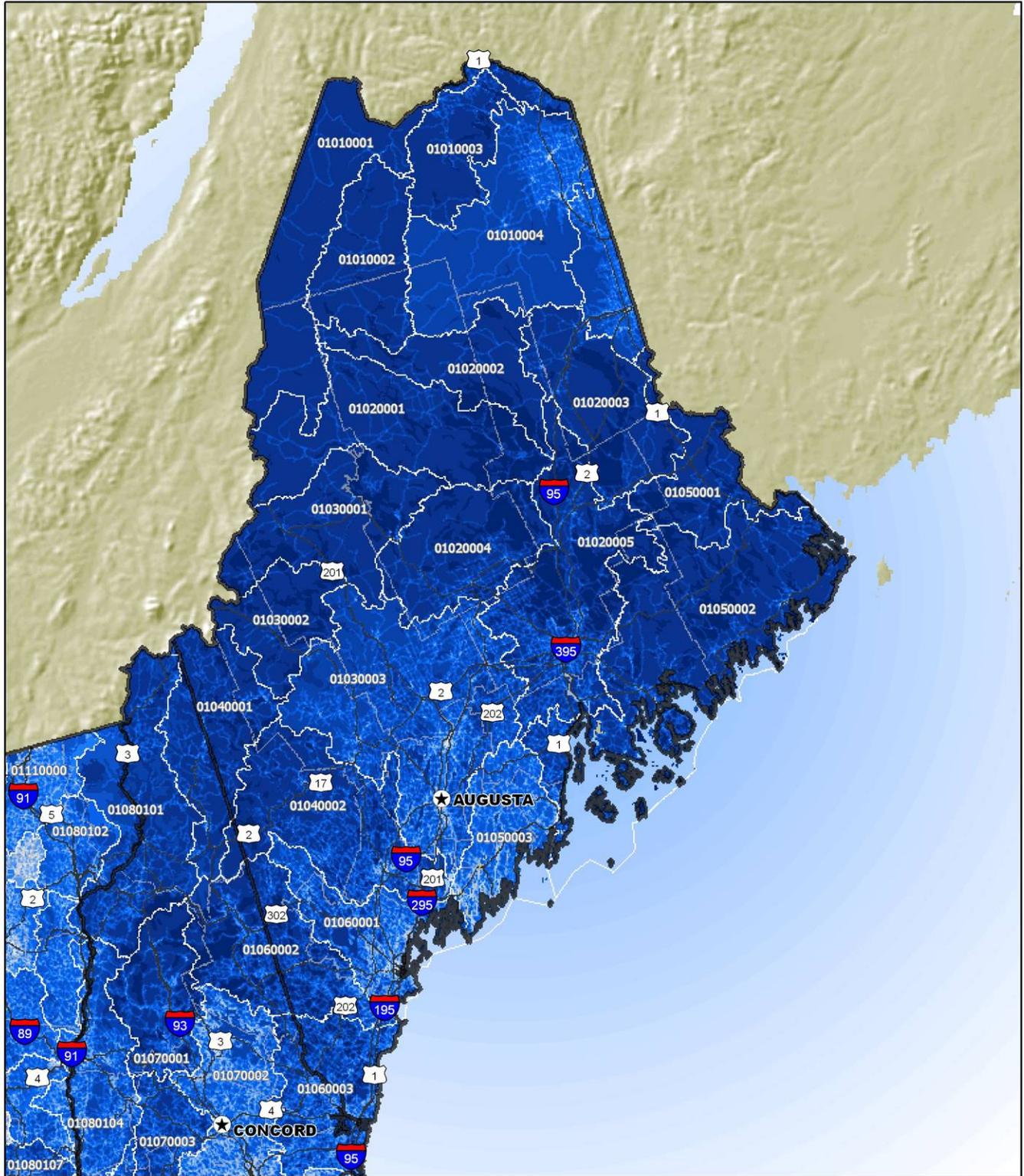
Note: If a watershed fell partially in Maine, the whole watershed was considered for this project. State results reflect the total acreage for all watersheds that impact that State (this may account for a higher acreage figure than if only lands within State boundaries were considered).

Maps

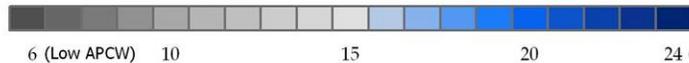
The following maps depict the results of each step in the Forests, Water and People analysis. Each watershed is labeled with the eight-digit HUC and the watershed composite score for the analysis step. (Note: the APCW, 30-m. pixel view does not have a watershed score)

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 - Maine



STEP 1 COMPOSITE SCORE, 30m VIEW

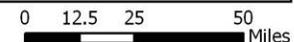


6 (Low APCW) 10 15 20 24 (High APCW)

Projection: Albers

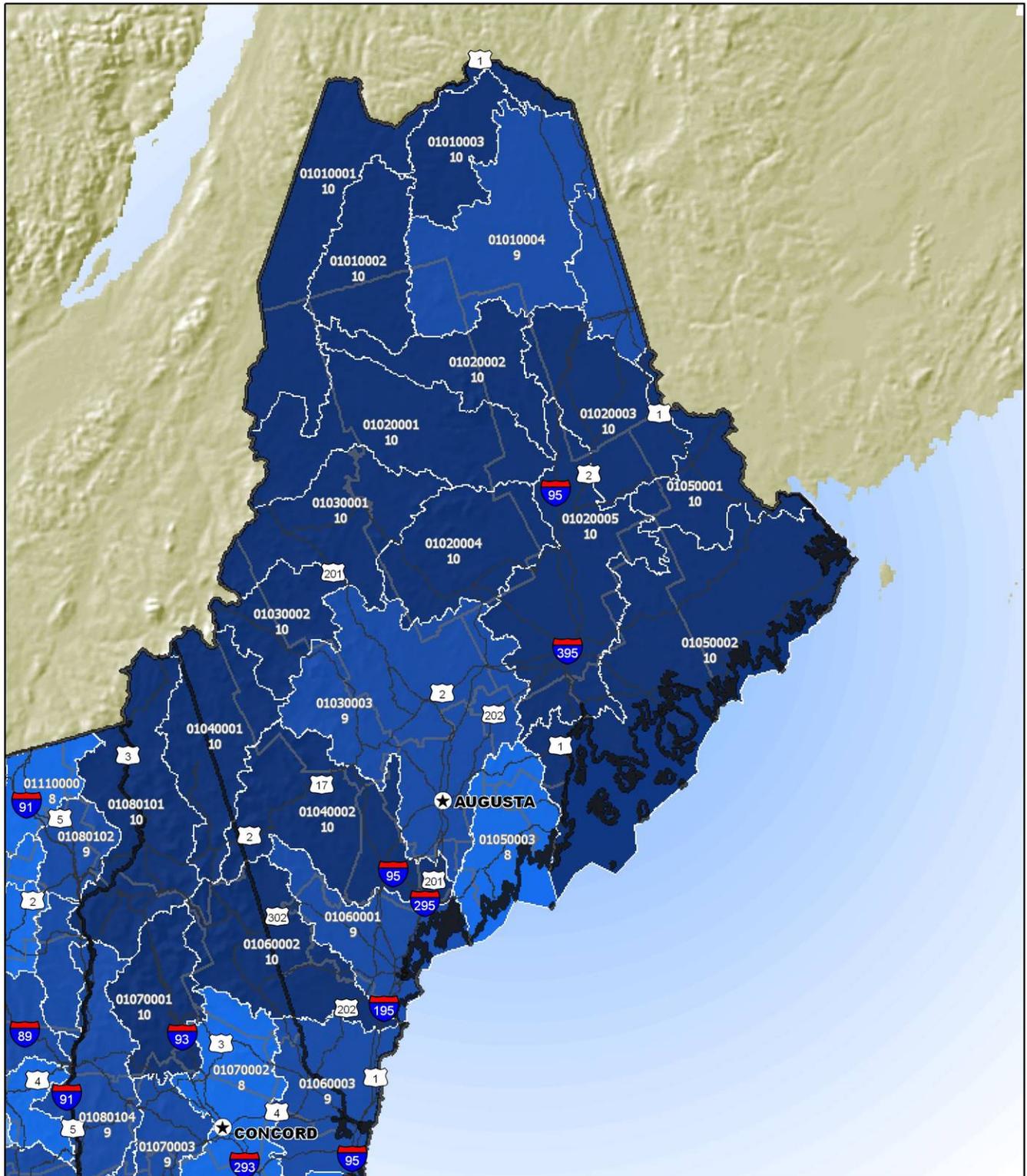


Watershed labels describe the 8-digit hydrologic unit code (HUC)



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



STEP 1 COMPOSITE SCORE



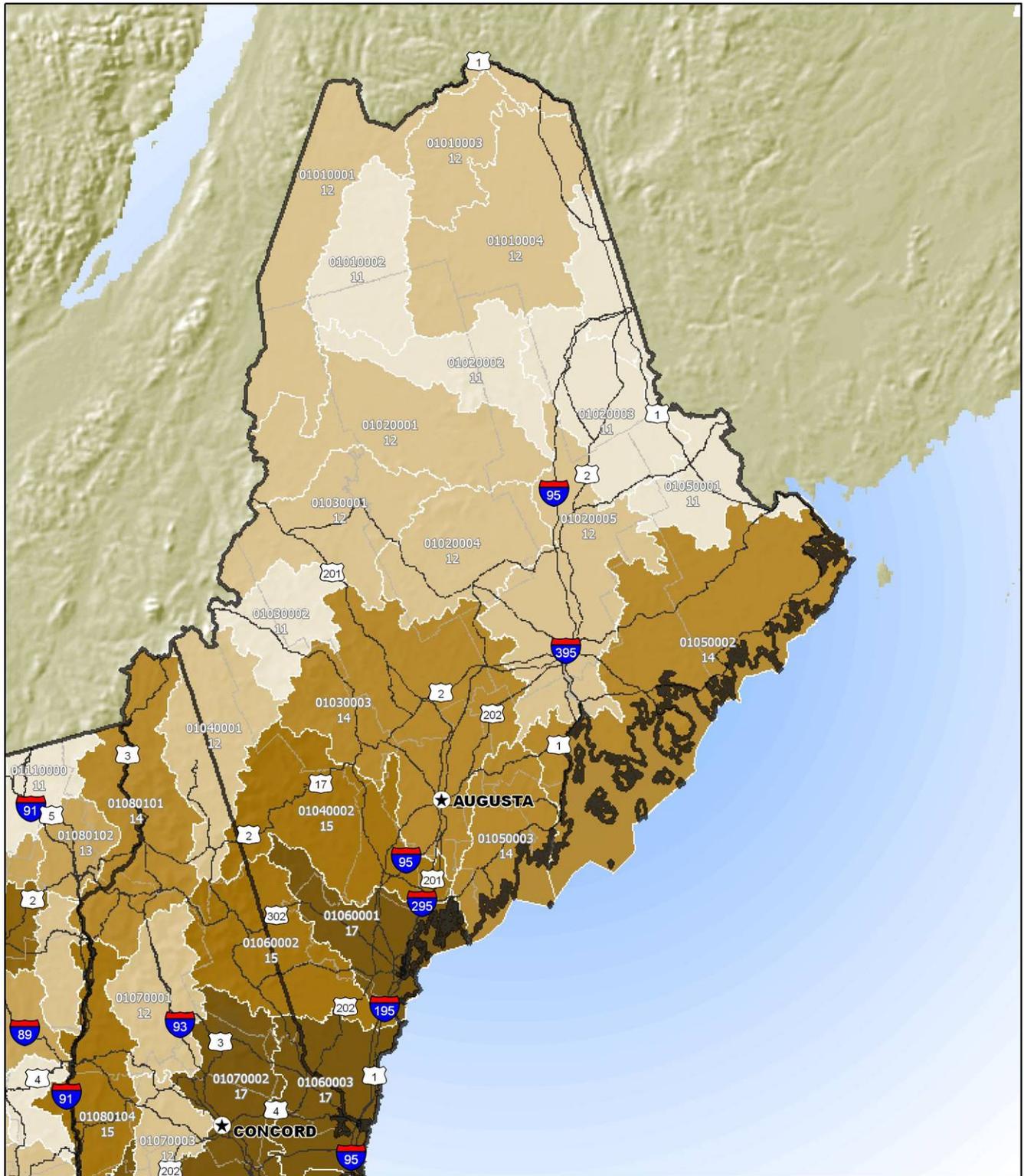
Projection: Albers

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

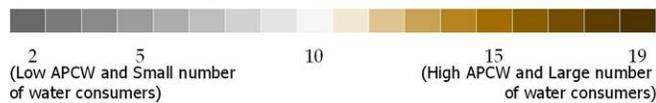


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Step 2 - Importance of watersheds for drinking water supply Maine



STEP 2 COMPOSITE SCORE



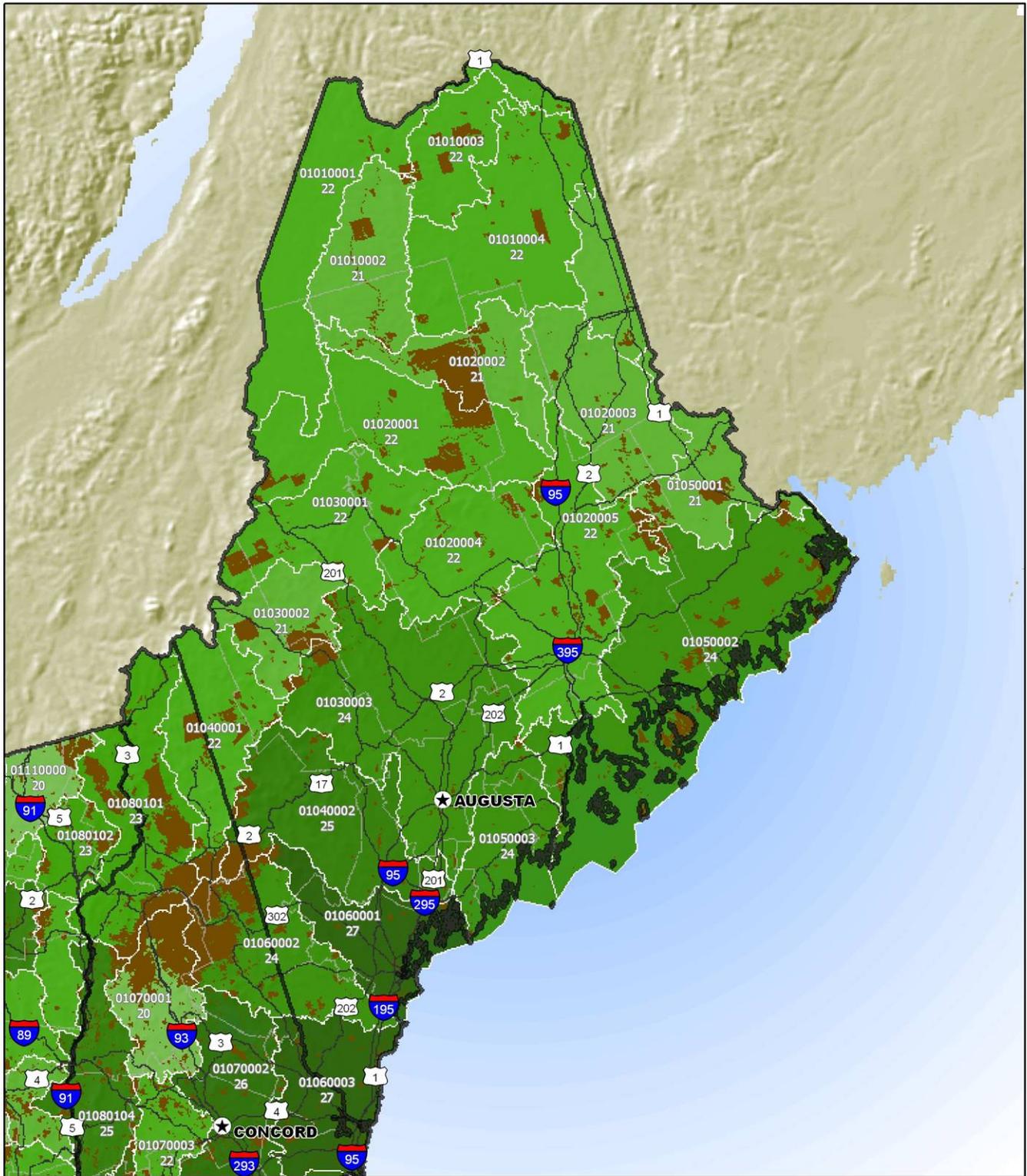
Projection: Albers

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



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

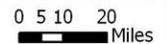


STEP 3 COMPOSITE SCORE



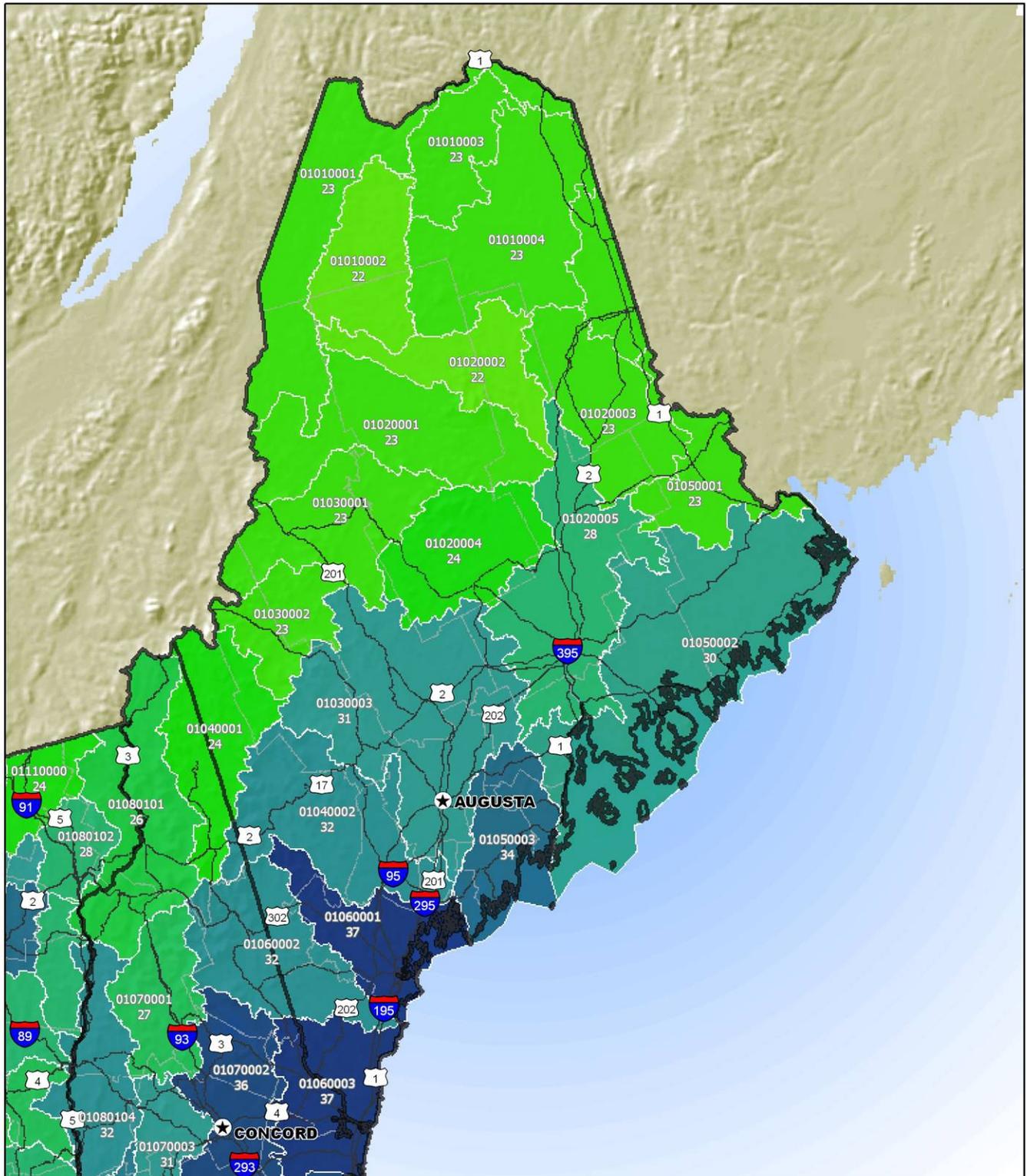
Projection: Albers

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

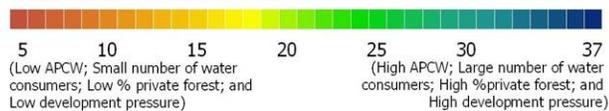


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Step 4: Development pressure on private forests in drinking water supply watersheds - Maine



STEP 4 COMPOSITE SCORE



Projection: Albers

Watershed labels describe the 8-digit hydrologic unit code (HUC) and watershed 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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June 2009