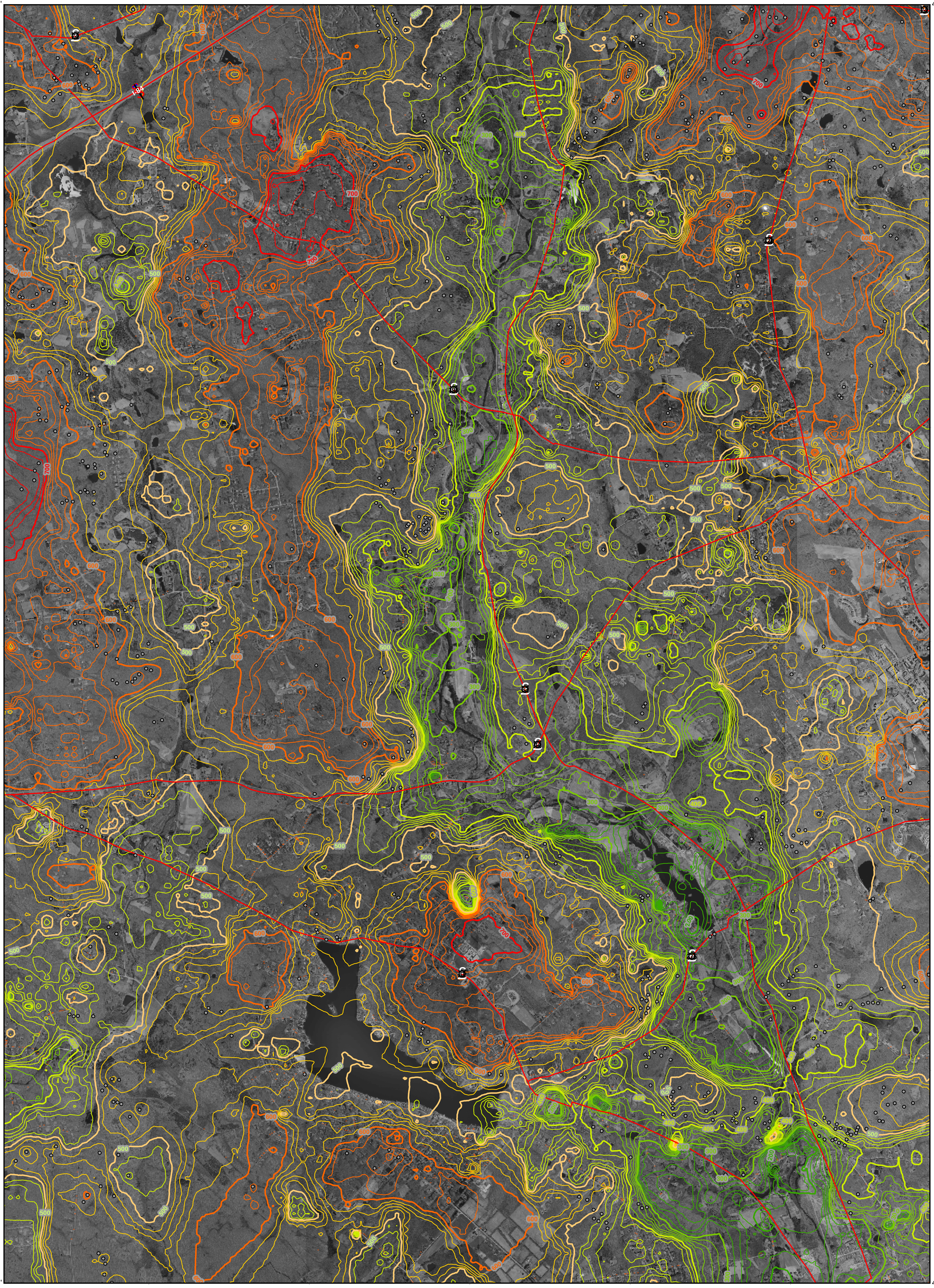
72°22' 30"
41° 52' 30"

72°15'
41° 52' 30"




41° 45'
72°22' 30"

41° 45'
72°15'

## Explanation

This data is part of a multi-layer product of the Digital Compilation of Surficial Geologic Map and Bedrock Contours for the Coventry Quadrangle, Eastern Connecticut. Mapping and analyses supported by the National Cooperative Geologic Mapping Program, U.S. Geological Survey in cooperation with the Connecticut Geological and Natural History Survey, Department of Environmental Protection for Statemap FY2006.

The Coventry Quadrangle was used as a demonstration project area for showcasing the utility of water well data in providing necessary information for subsurface mapping of bedrock elevation, one of the most basic information needs of environmental applications.

The primary products for the quadrangle are the Bedrock Surface Elevation map, Depth to Bedrock map, and Bedrock Elevation Confidence Isopleths map for the Coventry quadrangle.

Bedrock elevations and depth to bedrock isopleths for the USGS Coventry Quadrangle in eastern Connecticut were mapped using cokriging estimation. Kriging works by developing statistical measures of spatial autocorrelation of the variable to be mapped (the variate). Kriging is used to estimate the variate's value where samples were not collected. Cokriging works by developing statistical measures of spatial correlation between one or more ancillary variables (the covariates) with the variate to provide additional information. For mapping bedrock elevations, we determined depth to bedrock at roughly 3200 locations by examining private well completion reports, which include a boring log indicating minimum depth to rock, which is our variate. We used Light Detection And Ranging (LIDAR) data as a surface elevation covariate. Cokriging provided bedrock elevation point estimates, with a variance estimate, which yielded 20' interval bedrock contours. Subtracting the bedrock surface from the topographic surface yielded a depth to bedrock map. We produced a confidence interval map from the variance estimates, as well. To our knowledge, these three products are unique and constitute the highest resolution bedrock elevation map to date and are the only maps of their kind with an associated map of statistical uncertainty to support the choice of a 20' contour interval.

### Data Sources

Coventry Quadrangle Boundary from 7.5 minute quadrangle index produced by Department of Environmental Protection in Connecticut State Plane (feet), NAD83 from USGS Digital Line Graph data.

Surficial Materials Map from Stone et al, Surficial Materials Map of Connecticut, 1992, USGS Special Map 1:125,000 scale, 2 sheets; digital data from 1:24,000 scale compilation available through the CT Department of Environmental Protection.

Outcrop locations digitized for this study are from Fahey, Richard J., Pease, Maurice Henry, Bedrock Geologic Map of the South Coventry Quadrangle, Tolland County, Connecticut, 1977, USGS.

Roads from Connecticut Street Network State Plane, TIGER/Line 2000, U.S.Department of Commerce; U.S. Census Bureau. Edited by U. Connecticut.

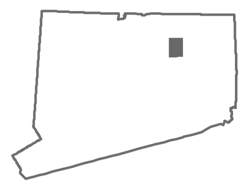
### Legend

Bedrock Elevation Contours (feet)
Contour Interval is equal to 20 feet

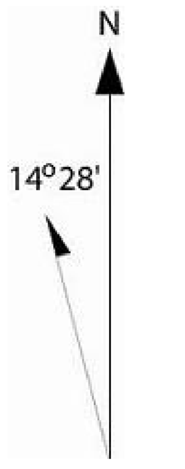
- 120 - 299
- 300 - 399
- 400 - 499
- 500 - 599
- 600 - 699
- 700 - 800

**Other**

- Well Locations
- Outcrop Locations
- Major Roads



Quadrangle Location




0 0.5 1 2 Miles
0 5,000 10,000 Feet
0 0.5 1 2 Kilometers

**Scale 1:24,000**

# Bedrock Surface Elevation, Coventry Quadrangle, Connecticut

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