Maine StreamStats—A Water-Resources Web Application

Maine StreamStats (http://streamstats.usgs.gov), a geographic information system-based Web application of the U.S. Geological Survey (USGS), is a tool for calculating basin characteristics and streamflow statistics for user-selected sites on streams in Maine.

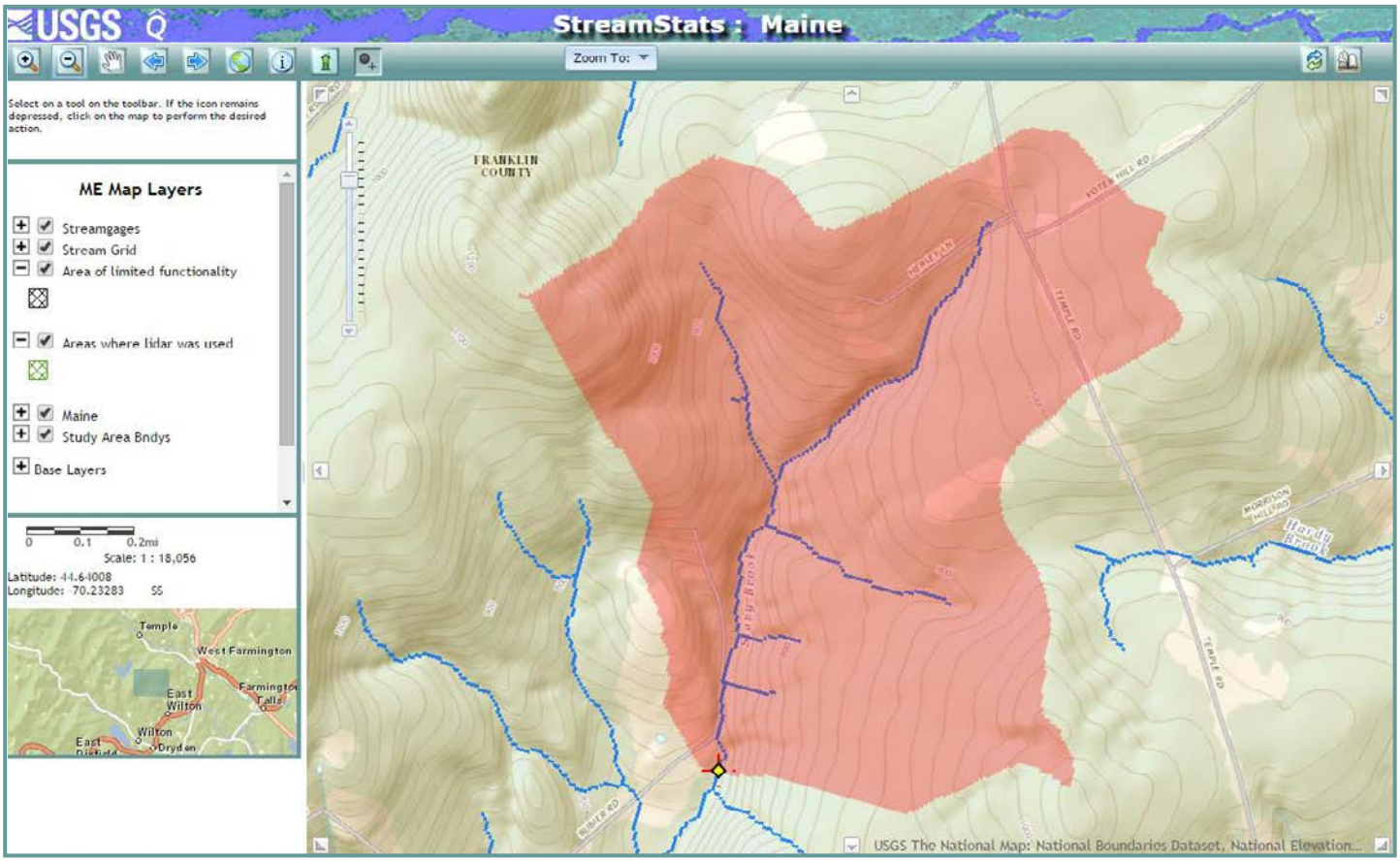

Figure 1. Screen capture from Maine StreamStats Web application showing delineated basin and available map layers.

Introduction

Maine StreamStats is a tool that any user with Internet access can use to delineate a basin on the fly and estimate a wide variety of streamflow statistics for ungaged sites on rivers and streams in Maine (figs. 1 and 2). Estimates are based on regression equations or are from data from similar gaged locations on the stream. Maine StreamStats is based on a national StreamStats application that can be used for streamflow estimates in many other states across the country (Ries and others, 2008).

Reports referenced in this fact sheet present the regression equations used to estimate the flow statistics, describe the errors associated with the estimates, and describe the methods used to develop the equations and to measure the basin characteristics used in the equations. Limitations of the methods are also described in the reports; for example, all of the equations are appropriate only for ungaged, unregulated, rural streams in Maine.

Data Used for Basin Delineations

Basin delineations in StreamStats are based on the integration of the National Hydrography Dataset (24K NHD), the Watershed Boundary Dataset (24K WBD), and the 10-meter resolution digital elevation model (DEM) data from the National Elevation Dataset (NED).

High resolution DEMs from light detection and ranging (lidar) data are available for some areas of Maine and were incorporated into the DEM for the delineating of basins. The DEMs for these areas have a 1-foot vertical accuracy and are much more accurate than the 10-meter DEMs with 10- to 20-foot vertical accuracies with which they are merged. StreamStats indicates where lidar was used. Additional lidar data will be incorporated into StreamStats as they become available.

Flow Estimates and Basin Characteristics

Streamflow statistics that can be output from the tool include peak flows with 1- to 500-year recurrence

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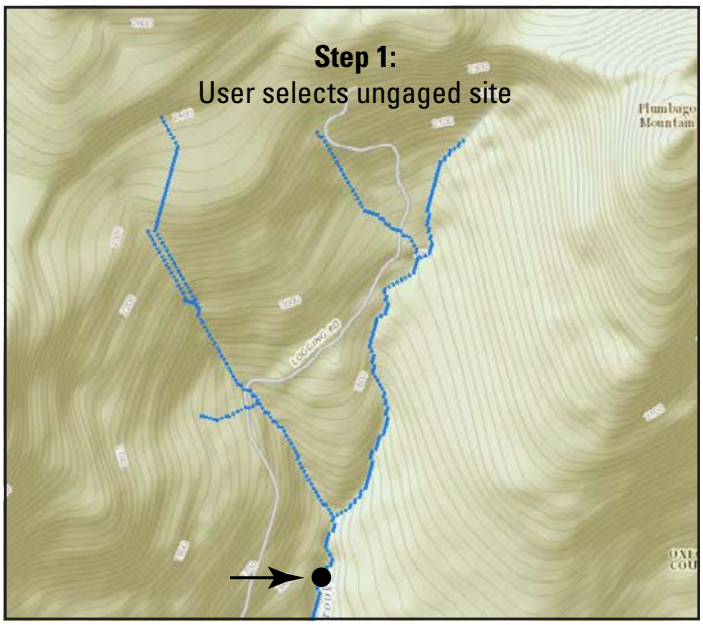

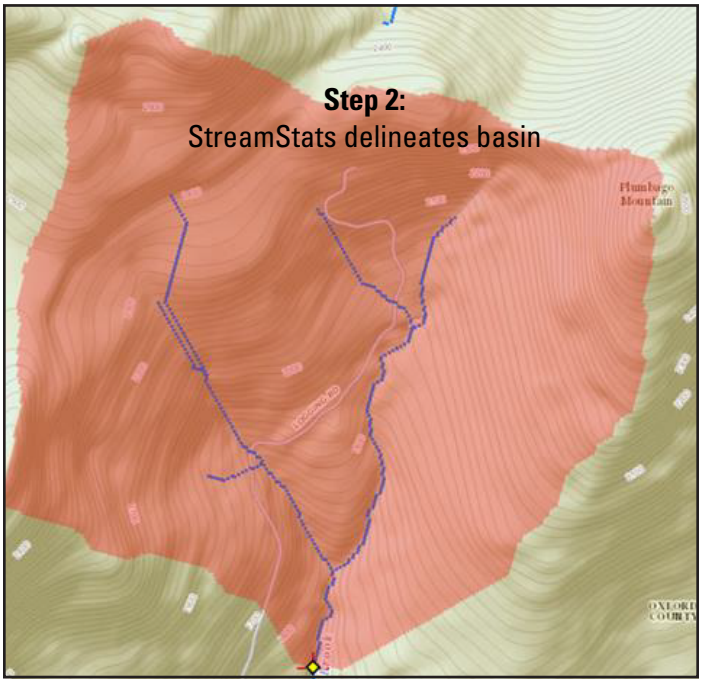

C

Step 3:
StreamStats outputs flow statistics

Statistic	Value	Unit	Prediction Error (percent)
PK2	89.6	ft^3/s	35
PK5	156	ft^3/s	36
PK10	210	ft^3/s	37
PK25	287	ft^3/s	39
PK50	350	ft^3/s	40
PK100	420	ft^3/s	41
PK500	603	ft^3/s	45

Figure 2. Process within StreamStats for *A*, selecting a site, *B*, delineating a basin, and *C*, obtaining streamflow statistics. The arrow and point indicate an ungaged site; PK*X*, peak flow with an *X*-year recurrence interval; ft^3/s, cubic feet per second.

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intervals (fig. 2C); monthly and annual mean and median flows; 7-day 10-year low flows; June median flows for southern Maine; August median flows for southern, eastern coastal, and northern Maine; and bankfull discharge, width, depth, and area for streams in central and coastal Maine.

Basin characteristics that can be calculated within StreamStats include the drainage area, fraction of sand and gravel aquifer, percentage of storage in waterbodies and wetlands, mean annual precipitation, mean winter precipitation, distance from the coast to the basin centroid, and mean basin elevation.

Additional Functionality

StreamStats can also be used to obtain previously published streamflow statistics, basin characteristics, and descriptive information for USGS streamgages and to search upstream or downstream from a selected site to identify connected stream reaches. Delineated basins can be edited, saved, and downloaded for use in other geographic information system applications.

Selected References

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