StreamStats: Inside-Out and from the Ground Up

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Outline

• Overall Design
• Development Approach
• Computer System
• GIS Data Preparation

Photo by W. H. Jackson, USGS Photographic Collection
Remember the good old days?

Planimeter

or

StreamStats?

Photo credit: Curtis Weaver
Overall Design

• Based on Leaflet
• Desktop and mobile
• Uses StreamStats data & National Map
• Delineations in StreamStats services & NSS services
StreamStats: Customizable!

- State-specific datasets
- State-specific projections
- Unique functionality
Development Approach: Interface

• How to make it more user friendly?

Photo by W. H. Jackson, USGS Photographic Collection
Development Approach: Interface

- How to make it more user friendly?

- Step-wise buttons
Development Approach: Interface
Development Approach: Interface
Development Approach: Interface

StreamStats Report
Region ID: OH
Workspace ID: 020160705344923317090
Clicked Point (Latitude, Longitude): 39.28031, -83.14200
Time: 2016-07-05 18:49:52 -0400

Map of Ohio showing a highlighted area and a blue marker indicating a location.
Development Approach: Processing

- How to make it more accessible?
- StreamStats Services API

StreamStats Services

Introduction
The StreamStats application uses data services that were created for it. When in use, the application may access the StreamStats Service API documented here, or consumed by a custom client application.

The StreamStats Service API performs multiple high level procedures which include database queries, geospatial analysis, and other services consumed by custom client applications. As documented by this page, which can also serve as an URL built predictable URLs.

Getting Started
The URL of each resource can be obtained by accessing one of the resources located to the left. Every resource is exposed as a URL and follows the outlined pattern described below:

- The description of the resource.
- The service URL
- Optional response formats, such as xml, json, or geojson
- URL parameters (if any):
  - Parameter Name
  - Value Type. (string, number, boolean, etc.)
  - A description of what the parameter represents.
  - Whether the parameter is required or optional.
  - And an example input parameter.
- A REST Query URL test tool that builds an example url, based on the given input parameter values.
- An example response from the REST Query

http://streamstatsags.cr.usgs.gov/streamstatsservices/
Development Approach: Architecture

Web-Based User Interface

- Delineation Service
  - ArcHydro geoprocessing tool
  - ArcGIS DB
- Basin Characteristics
  - ArcHydro geoprocessing tool
  - ArcGIS DB
- National Streamflow Statistics
  - NSSDB
- Stream Gage Statistics
  - StreamStatsDB
Development Approach: Architecture

StreamStats Server Config
Overview

John D Guthrie – 5/-10/2016
Data Creation

- Standard ingredients:
  - NHD High resolution
  - NED/3DEP elevation data
  - Watershed Boundary Dataset
- Non-standard Ingredients
  - LiDAR streams and elevations
  - Unusual pixel sizes

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Data Creation

- StreamStats Toolbox
  - Optimal approach
- ArcHydro-based
- Python & AML scripts
- NHD Plus
  - Saves some preprocessing
  - Some ArcHydro work
Data Creation

Digital Elevation Model (DEM) Cross Section

- DEM stream grid cell
- 60 meters "Buffer Distance"
- 60 meters "Buffer Distance"
- Original DEM surface
- -5 meters "Smooth Drop Distance"
- -500 meters "Sharp Drop Distance"

AGREE parameters in RED
Not drawn to scale

NHD flowline grid cell

USGS
science for a changing world
Data Creation
Thank you!

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