In Government (/channels/government/)

Critigen Develops Web-Based Tool for Complex Fish Habitat Modeling

Denver-based spatial solutions consultant Critigen, working with Downstream Strategies, has developed a web-based mapping tool for modeling fish habitat based on hundreds of different habitat variables. The Fish Habitat Decision Support Tool was developed through a public/private partnership lead headed by the US Fish and Wildlife Service (USFWS) and is based on modeling work and initial development performed by Downstream Strategies and West Virginia University.

The goal of the overall project is to translate data into actionable information to help fish habitat scientists target their limited habitat restoration funding. "Over and over again we've heard from conservation planners about how hard it is to pin down project sites where you will really get the most bang for your buck," Boettner said. "The plan we outlined with the U.S. Fish and Wildlife service was to build something—not just tools, but also methods—that can assist planners in getting over that last hump from great information and local knowledge to effective, on-the-ground work." Critigen was engaged by Downstream Strategies in 2013 to extend an existing ArcGIS-based desktop tool used for fish habitat modeling. After initial development, it was decided to switch

gears and concentrate on developing a robust, web-based tool that included existing tool functionality and added the desired additional functionality. The thinking was that this tool that would be easier to use and available to a wider base of users.

A design workshop with stakeholders from various fish habitat partnerships and the USFWS was conducted in May 2014. The challenge presented to Critigen was to develop a web-based mapping tool that was easy to use and navigate while simultaneously supporting complex workflows enabling users to visualize and rank fish habitat data and develop future-state scenarios for multiple fish species. To achieve this Critigen put together a team of user interface designers, spatial web developers, and geoprocessing modelers. The team selected the Esri JavaScript API as the platform on which to develop the decision support tool. The primary user interface was designed to maximize the map area while still providing access to the required habitat analysis tools. The analysis tools themselves were developed using Python scripting published as ArcGIS Server geoprocessing services. These services take user input from the web interface, pass the input values through structured analytical processes, and produce map-based results that users can interact with and download for further analysis.

The tool supports the following fish habitat modeling workflows:

• Visualization – users can choose from hundreds of different landscape and species-specific attributes and create classified maps to better visualize and understand the data. The results are displayed using one of several dozen unique classification schemes designed by Critigen and Downstream Strategies.

• Ranking – users can create weighted rankings using up five of the same attributes to identify areas where defined combinations of criteria are present. The weighted ranking methodology was designed by Downstream Strategies and implemented by Critigen.

• Futuring – users can change the values of specific attributes for defined areas and produce a map of the cumulative downstream effects of their changes. This component of the tool includes complex flow accumulation analyses and integration with the R statistical package. West Virginia University and Downstream Strategies developed the R models which relate landscape conditions to probability of presence for specific fish species.

The Fish Habitat Decision Support Tool can be used by anybody, making collaboration simple for anyone passionate about fisheries conservation and restoration, both inside and outside of the USFWS. “I'm really excited that it’s a web-based tool, I think that’s going to make it a lot more accessible to agency folks as well as consultants and contractors,” said Julie Devers, a USFWS fisheries biologist from the Maryland Fisheries Resource Office. “If it was a desktop GIS application, people would be less likely to use it." The completed tool incorporates up to 150 different variables for eight distinct fish habitat partnerships covering over one million unique catchments spread across two-thirds of the continental United States. Future plans call for adding and updating attributes and adding new statistical models for additional fish species. The Fish Habitat Decision Support Tool can be accessed at www.fishhabitattool.org.

About Downstream Strategies

Downstream Strategies is an environmental science and policy consulting firm based in West Virginia. Learn more at www.downstreamstrategies.com.

About Critigen

Critigen is an Esri Platinum Partner and a full-lifecycle spatial systems integrator. Critigen delivers all components of a geospatial program: data collection, spatial processing, spatial analysis, application development, and mobile solution development. Critigen's spatial consulting services tie these technology and process components together with business strategies that maximize the value of geospatial information. www.critigen.com

Based%20Tool%20for%20Complex%20Fish%20Habitat%20Modeling&caption=Directions Magazine&redirect_uri=http%3A%2F%2Fwww.directionsmag.com%2Fpressreleases%2Fcritigen-develops-web-based-tool-for-complex-fish-habitat-modeling%2F467553) (https://plus.google.com/share?url=http%3A%2F%2Fwww.directionsmag.com%2Fpressreleases%2Fcritigen-develops-web-based-tool-for-complex-fish-habitat-modeling%2F467553)

Published Tuesday, April 26th, 2016

Published in

Government (/channels/government/)