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Overview

- Social Values for Ecosystem Services
- SoLVES Methodology and Design
- Selected SoLVES 3.0 Features
- SoLVES 3.0 Interface
Social Values for Ecosystem Services

- Social values = nonmarket values perceived by stakeholders for ecosystem services
- Close correspondence with cultural ecosystem services such as aesthetics and recreation
- Consideration of social values is lacking relative to ecological and economic values
- SolVES = a GIS tool allowing users to assess, map, and quantify social values
  - Developed as an ArcGIS 10 Add-In toolbar for ArcMap
- Enhance assessment of ecosystem service trade-offs
Social Values and Stakeholder Groups

AESTHETIC
BIODIVERSITY
CULTURAL
ECONOMIC
FUTURE
HISTORIC
INTRINSIC
LEARNING
LIFE SUSTAINING
RECREATION
SPIRITUAL
THERAPEUTIC

FAVOR
or
OPPOSE?
SoIVES Methodology

- Calculates and maps a 10-point (0-10) “value index”, a nonmonetary, spatially explicit metric of social values
- Derives value index from a combination of spatial and nonspatial public value and preference survey responses
SoIVES Methodology

- Evaluation of mapped points indicating locations ascribed specific social values
  - Average nearest neighbor statistics describing the relative clustering or dispersion of points
  - Kernel density surfaces comparing relative intensity of social values within and among stakeholder groups
  - Maxent maximum entropy software generates logistic surfaces and statistical models describing relationship between relative social-value intensity and underlying environmental variables
    - Area Under the Curve (AUC) statistics for each model
SolIVES Design

- Originally developed for terrestrial environments
- Flexible analysis framework and geographic portability makes it readily adaptable to coastal areas
  - Study area defined by environmental and survey data user loads into file geodatabase
  - Geodatabase is source of several analysis parameters
- Models generated from data in one study area can potentially be used to transfer values to physically and socially similar areas lacking data
SoLVES Analysis Flow

SoLVES: Social Values for Ecosystem Services

- SolVES.gdb
- ATTITUDE_TYPES
- COUNTRIES
- DTR
- DTW
- ELEV
- HILLSHADE
- LANDFORM
- LULC
- SLOPE
- STATES
- STUDY_AREA
- SURVEY_POINTS
- USE_ATTITUDE
- USE_TYPES
- VALUE_ALLOCATION
- VALUE_TYPES

Maxent

- Average Nearest Neighbor Statistics
- Maximum Value Index
- Logistic Surface
- Value Index Maps and Environmental Metrics

Models with AUC Statistics
Selected SolIVES 3.0 Features

- Analysis of all surveys or selected survey subgroups
- Value comparisons within or among survey subgroups
- Flexible number and type of environmental variables
- Adjustable output resolution
- User-defined value typologies and public uses
- Optional weighting of mapped survey points
Pike and San Isabel National Forests
Motorized Recreation_OPPPOSE
Aesthetic

Aesthetic
Training AUC = 0.8263
Acceptable model for study area
Test AUC = 0.7735
Potential model for value transfer

Refer to the relevant environmental dataset for a description of the categories indicated by the numeric values displayed on the x-axis of any categorical data graphs.
Solves.cr.usgs.gov

Social Values for Ecosystem Services (SoLVES)

SoLVES 3.0 Now Available (ArcGIS 10-compatible)

A GIS Application for Assessing, Mapping, and Quantifying the Social Values of Ecosystem Services

Ecosystem services are the benefits provided by nature, which contribute to human well-being. These benefits can range from tangible products such as food and fresh water to cultural services such as recreation and aesthetics. As the use of these benefits continues to increase, additional pressures are placed on the natural ecosystems providing them. This makes it all the more important when assessing possible tradeoffs among ecosystem services to consider the human attitudes and preferences that express underlying social values associated with their benefits. While some of these values can be accounted for through economic markets, other values can be more difficult to quantify, and attaching dollar amounts to them may not be very useful in all cases. Regardless of the processes or units used for quantifying such values, the ability to map them and relate them to the ecosystem services to which they are attributed is necessary for effective assessments.

In response to the need for incorporating quantified and spatially explicit measures of social values into ecosystem service assessments, the geographic information system (GIS) application, Social Values for Ecosystem Services (SoLVES), was developed. SoLVES is designed to access, map, and quantify the perceived social values of ecosystem services. Social values, the perceived, nonmarket values the public ascribes to ecosystem services, particularly cultural services, such as aesthetics and recreation can be evaluated for various stakeholder groups. These groups are distinguishable by their attitudes and preferences regarding public uses, such as motorized recreation and logging. SoLVES derives a quantitative, 10-point, social-values metric, the "value index," from a combination of spatial and nonspatial responses to public value and preference surveys and calculates metrics characterizing the underlying environment, such as average distance to water and dominant landscape.

Version 3.0 (SoLVES 3.0) continues to extend the functionality of SoLVES. Like previous versions of SoLVES, SoLVES 3.0 is integrated with the Maxent maximum entropy modeling software to generate more complete social-value maps and to produce robust models describing the relationship between social value intensity and explanatory environmental variables. Maxent also more readily permits the transfer of social-value models to physically and socially similar areas where primary survey data are not available. Due to its flexible design, SoLVES 3.0 users are able to define their own social values and public uses, model any number and type of environmental variables, optionally weight mapped survey data, and modify the spatial resolution of analysis. SoLVES 3.0 provides an improved public-domain tool for decision makers and researchers to evaluate the social value of ecosystems and to facilitate discussions among diverse stakeholders regarding the tradeoffs among different ecosystem services in a variety of physical and social contexts, ranging from forest and rangeland to coastal and marine.

Getting Started with SoLVES 3.0

- SoLVES 3.0 requires ArcGIS 10, 10.1, or 10.2 software.
- Download the SoLVES 3.0 tool.
- Download the Sample Data for use with the Quick-Start Tutorial. These sample data are provided for demonstration purposes only.
- The Quick-Start Tutorial includes instructions for installing SoLVES 3.0 and exercises providing immediate, hands-on experience using SoLVES 3.0 with the provided Sample Data.
- More detailed information about how SoLVES 3.0 works, data requirements, advanced options, and troubleshooting is included in the User Manual.
- Journal articles and other SoLVES publications are available under publications.
- A blank, sample copy of the public value and preference survey described in the User Manual is also available.
- Check for known issues with SoLVES 3.0.
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