

Spatial Analysis & Data Systems



Award-Winning Consultancy Providing Innovative Solutions to Meet Regulatory and Environmental Challenges

Geographic information systems (GIS) allow CSI to compile, manage, and analyze complex data to apply the “where” to our client’s projects. By incorporating spatial science in our work, we can integrate many types of data including land use, land cover, hydrography, infrastructure, topography, elevation, and climate attributes to inform interactions at various scales and guide regulatory decisions. We leverage spatial data attributes to quantify geospatial relationships and organize layers of information into 2D and 3D illustrations for fluid integration into work products to facilitate communication and understanding. CSI uses GIS analytics and presentation tools to identify data patterns and relationships that help our clients make better decisions.

Mapping & Visualization

Visualization: CSI specializes in delivering work products that are specifically developed to meet our client’s needs. We produce visualization tools with emphasis on functionality, usability, and presentation-level quality.

Hosting: We host our products on ArcGIS Online for convenient sharing and collaboration. We use this platform to create immersive story maps that combine text, interactive maps, and other multimedia content that can be easily shared publicly or fully protected for confidential and/or proprietary information.

Spatial Analysis

Hydrographic Modeling: CSI employs Digital Elevation Models (DEMs) and related datasets to generate custom stream network layers. This is necessary when publicly available streams layers are insufficiently accurate or too coarse for project decision-making at local scales.

Overlay Analysis: We identify and quantify overlap among different types of data to target potential conservation areas, or otherwise characterize important spatial relationships among wildlife, industrial sites, agricultural land, and boundary layers (among other datasets). We help clients and regulatory agencies characterize the extent of potential offsite chemical transport using existing models and data that are reflective of real-world conditions. We model aerial drift, field runoff, and down-the-drain exposure to produce chemical- and landscape-specific “action areas” that are useful for regulatory and health, climate, and conservation efforts.

Change Detection Analysis: CSI performs change detection analysis to characterize and contextualize updates to existing datasets. This enables us to identify areas of significant change and uncertainty. It also provides valuable information about the utility of older versions of a given dataset.

Land Cover Analysis: We incorporate high-value publicly available land use and land cover datasets, such as the Cropland Data Layer (CDL) and National Land Cover Database (NLCD), into much of our geospatial work. We use GIS tools, metadata, and other datasets to refine these layers at national, regional, and local scales to produce more reliable datasets that can better inform industry or conservation projects.

Statistical Analysis & Data Management

Applied Economic and Econometric Analysis: We use GIS software and econometric principles to evaluate the anticipated benefits and costs associated with changes to agricultural production. Our applied economic analysis has been used to predict changes to commodity yield and prices, based on various policy-based scenarios.

Programming & Statistical Analysis: Our staff is experienced with various scripting languages to facilitate statistical analysis and processing efficiencies, including Python, SQL, R, and SAS.

Geodatabase Administration and Infrastructure: CSI organizes and manages our results within the ESRI geodatabase environment. Geodatabases offer a fully contained comprehensive data model for representing and managing geographic information that can be easily shared, referenced, and archived. We supplement and embed our spatial data products with important documentation and metadata-information about the data. This enables our clients to see how we arrive at our conclusions and validate the underlying methods and data.

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