



Justin Heyerdahl

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Justin Heyerdahl is a Geospatial Analyst with 4 years of professional experience in applied environmental science and 5 years of experience in communication & policy administration. Having developed a diverse skill set in geographic information systems (GIS), data science, and storytelling, he is adept at crafting compelling, data-driven narratives for stakeholder communication across technical and non-technical audiences alike.

Prior to joining CBI in 2023, Justin worked in the private environmental consulting sector providing scientific support for both public and private clients, including in support of environmental litigation on behalf of State Trustees. In this capacity he helped characterize the historical and current condition of landscapes, evaluate changes in their form and function due to natural and anthropogenic factors, and explore alternative future recovery scenarios. His work frequently sought to better understand – on a qualitative and quantitative level – the many ways in which ecosystems provide an array of valuable services that benefit humans, wildlife, and the long-term integrity of landscapes themselves.

Justin holds a Master of Environmental Science and Management (M.E.S.M.) from the Bren School at the University of California, Santa Barbara, a Certificate in Global Sustainability from the University of California, Los Angeles, and a B.A. in Communication from Northwestern University. He enjoys utilizing this hybrid background to analyze and educate on the where, what, when, why, and how of the natural and built environment and the many ways the fields of ecology and technology can be combined to better manage the world around us.

EDUCATION

M.E.S.M, Specializations: Conservation Planning, Water Resources Management,
Emphasis: Geographic Information Systems, Environmental Data Science, Bren
School of Environmental Science & Management, University of California, Santa
Barbara, CA, 2018

Certificate in Global Sustainability, Focus: Urban & Systems Ecology; University of
California, Los Angeles, 2012

B.A., Communication, Focus: Performance & Storytelling, Northwestern University,
Evanston, IL, 2008

EMPLOYMENT HISTORY

- 2023 - Present Geospatial Analyst, Conservation Biology Institute, Corvallis, OR
- 2022 - 2022 GIS Analyst, Geosyntec Consultants, San Diego, CA
- 2019 - 2022 Ecologist & GIS Analyst, Great Ecology, San Diego, CA
- 2017 - 2017 Science & Stewardship Intern, Irvine Ranch Conservancy, Irvine, CA
- 2011 - 2016 Policy & Compliance Specialist, University of California, Los Angeles, CA
- 2009 - 2011 Urban Forestry & Outreach Volunteer, TreePeople, Beverly Hills, CA

PROFESSIONAL SKILLS

Geographic information systems, spatial modeling, landscape ecology & modeling, wildlife corridor & connectivity analysis, ecosystem service valuation, population viability modeling, least-conflict analysis, impact-offset analysis, decision support analysis, data management, cartography, scientific communication & technical coordination, conservation planning

Software: ESRI Spatial Software Suite (ArcMap, ArcGIS Pro, ArcGIS Online), ESRI Extensions & Geoprocessing Workflows (Spatial Analyst, Geostatistical Analyst, Imagery Analyst, 3D Analyst, Network Analyst, ModelBuilder, Web AppBuilder, Field Maps), QGIS, Fragstats, Circuitscape, Marxan, MaxEnt, Vortex, Forest Vegetation Simulator, FlamMap, BASINS, InVest, Surfer

Statistics & (Spatial/Non-Spatial) Analysis: R, Excel, Descriptive Statistics and Hypothesis Testing, Exploratory and Predictive Regression, Time Series & Change Detection, Principal Component & Factor Analysis, Cluster Analysis, Random Forest Machine Learning, Analytical Hierarchy Process, Habitat Equivalency Analysis

SELECT PROJECT EXPERIENCE

Ecological Damages Evaluation for the 2019 Kincade Fire (Sonoma County, CA) – As technical lead and GIS analyst, modeled ecosystem service loss using remotely sensed burn severity to quantify over \$75 million in damages resulting from the 2019 Kincade Fire on an 8,000-acre conservation easement. Evaluated the magnitude of tree mortality within the first year after fire to help inform restoration compensation.

Salton Sea CEQA Permitting for Geothermal Development (Imperial County, CA) – As a GIS analyst, produced a characterization of 100 years of landscape changes along the shoreline of the Salton Sea using historical aerial imagery. Executed a geospatial analysis of wetland function adapted from the California Rapid Assessment Method to provide insight on reference conditions, potential impacts, and mitigation ratios to guide permitting for potential development. Efforts informed overall environmental planning, permitting, and mitigation efforts for a proposed geothermal energy production and lithium extraction facility undergoing review as part of the California Environmental Quality Act (CEQA).

Compensation Evaluation for PCB Impaired Waters (United States) – As technical lead and GIS analyst, conducted a nationwide geospatial analysis of EPA 303(d) impaired waters to evaluate the cost of regulatory compliance through watershed best management practices for over 200 civic members of a class action lawsuit. Engaged directly with counsel and class members to inform the decision-making process, developed a modeling approach for building data-supported case evidence, and updated compensation estimates based on improvements made to opposing counsel’s original settlement formula that revealed a previous under-valuation of over \$1 billion.

Natural Resource Damages Assessment for Estuarine Wetland Ecosystem – As technical lead and GIS analyst, researched and developed a Habitat Equivalency Analysis (HEA) model to quantify over \$500 million in lost ecological services due to chemical and physical injuries from an industrial fossil fuel refinery. Justin collaborated with field teams and authored the Quality Assurance Project Plan as well as several Sampling and Analysis Plans to conduct additional data collection, further characterize the local aquatic food web, and identify toxicological impacts. Working directly with restoration designers, translated lost productivity into monetary damages by quantifying the optimal amount and associated cost of restoration necessary to offset ecological service loss from site injuries.

Natural Resource Damages Assessment for Freshwater Tidal Tributary – As technical lead and GIS analyst, researched and developed a Habitat Equivalency Analysis (HEA) model to quantify over \$200 million in lost ecological services due to chemical injury from PCB waste buried in a freshwater tidal embayment for over five decades. Modeling was complemented by an attribution analysis linking the contaminant signature to the responsible site. Performed habitat suitability assessments to evaluate indicator organisms in the local ecosystem that helped inform restoration designs for mitigating service loss. Provided review of opposing counsel’s settlement based on improvements in landscape habitat connectivity and detected a \$32 million dollar miscalculation in modeling workflow.

Lake San Marcos Eutrophication Study, CA (San Marcos, CA) – As technical lead and GIS analyst, developed a geospatial time series analysis of historical land use and precipitation changes impacting nutrient loading in a managed lake. Working under a consulting expert, helped update a watershed model to estimate nutrient loading from across the landscape using variable nutrient export rates and sensitivity testing across several land use scenarios.

Lazy Point Coastal Erosion Control Plan (East Hampton, NY) – As technical lead and GIS analyst, developed a geospatial time series to estimate the extent of coastal shoreline loss over time due to the installment of a groin along a public beach. With input from field team, developed a multi-year volumetric beach analysis to monitor the performance of pressure equalizing modules, providing the necessary evaluation of sand accretion to replenish the depleted shoreline and protect coastal infrastructure, as required for permitting compliance.

Canon City Mill & Schwartzwald Mine Conservation Plan (Jefferson & Fremont Counties, CO) – As technical lead, coordinated the planning and development of a

conservation easement roadmap for two former industrial sites under active reclamation from uranium contamination. Led the development of cartographic-rich marketing materials to characterize natural resources at both properties and highlight conservation potential. Using these materials for outreach, identified potential local and national land trust easement holders and developed a prioritization matrix matching client needs with land trusts' conservation priorities, organizational values, and operational capabilities.

Solar Site Viewshed Analysis (Anaheim, CA) – As a GIS analyst, modeled and mapped over 8,000 acres to understand potential visual impacts from a proposed solar development site. Using USGS LiDAR data, constructed a digital surface model (DSM) that included the height of buildings and surrounding vegetation in combination with terrain to accurately reflect viewpoints of the site. Locations of notable visual impact were documented with in-field photography and used to inform landscape designs for mitigation and permitting.

Pond 20 Wetland Mitigation Bank (Port of San Diego, San Diego, CA) – As a GIS analyst, modeled and mapped 80 acres of anticipated transitions in habitat form and function across six sea-level rise scenarios. Collaborated with hydrologic engineers at a partner firm to integrate flood modeling data and classify habitats according to elevation shifts in response to projected inundation under potential climate futures. Analyzed and visualized the resiliency of the project site across seven types of habitats and two risk aversion probability scenarios to help inform overall planning and permitting efforts.

Reducing Fire Severity through Vegetation Management Study (Sierra Resource Conservation District and U.S. Forest Service, Fresno County, CA) – As a GIS analyst and project data manager, contributed to the modeling of forest growth, vegetation range shifts, and fire behavior over various vegetation treatment and climate futures. Quantified and compared risk reduction and restoration strategies in the wildland-urban interface, revealing up to \$300 million in potential stakeholder net benefits. Visualized treatment tradeoffs for fire and forest resiliency in a custom web app developed in R and Shiny, helping to translate the study findings into actionable recommendations.