



# Jeri Sawyer

## PRINCIPAL ECONOMIST/MANAGING PARTNER

Jeri Sawyer is a senior economist with more than 25 years of experience in socioeconomic and regional economic impact analysis; demographic forecasting; and energy, water, health, and agricultural economic analysis. She is highly proficient in the development and utilization of the appropriate data for economic impact analyses modeling using IMPLAN software. Ms. Sawyer is skilled in health economic analysis, using modeling and statistical analysis to provide support to various clients. Her energy economics expertise includes analysis for various types of generation projects, including hydroelectric, wind, and geothermal, as well as utility-level electric load forecasting, renewable energy analysis, and electric rate impact analysis. She has significant agricultural economic proficiency, including crop, livestock, and ranching analysis, as well as water rights analysis.

### Qualifications

- MS, Economics, Portland State University
- BS, Agricultural Economics, Washington State University

### Expertise

- Economic Impact Analysis
- Development of decision-making tools
- Demographic, economic and water demand forecasting
- Forecasting model development
- Benefit Cost Analysis
- Energy economic analysis
- Agricultural economic analysis
- Health economics



## Relevant Projects

### Economic Impact Analysis

#### Recycling

#### Recycling Economic Impact Analysis, Salt Lake County – Salt Lake County, Utah

Ms. Sawyer is providing economic impact analysis for the recycling industry in Salt Lake County, Utah. This project includes gathering and compiling publicly available data; developing a survey and interviewing industry participants to gather additional data; and using IMPLAN software to analyze the direct, indirect, and induced economic impacts in the study area of Salt Lake County. She serves as project manager, compiling data, using IMPLAN software, and analyzing the results to assess the economic impacts to the county from this industry.

#### Economic Impact Analysis of Recycling Industry, State of Colorado – Colorado

Ms. Sawyer developed an economic impact analysis for the recycling industry in Colorado. She was responsible for project management, compiling existing and additional data, using IMPLAN software to analyze the results to develop economic impacts for each county and for the state as a whole, and documenting the process and results in a comprehensive report for public distribution.

#### Economics of High-Grade Paper with Recycled Content for Magazine Use, National Geographic – United States

Ms. Sawyer conducted research and provided analysis for the long-term use of high-quality recycled paper for magazine printing, including the current and projected worldwide supply of and demand for high-grade recycled paper, to assess possible constraints on the nationwide supply.

## **Agriculture and Water**

### **Socioeconomic Impact Analysis of Changes in Potter Valley Hydroelectric Project Flow Release Schedule, Sonoma County Water Agency – Sonoma, Mendocino, and Marin Counties, California**

Ms. Sawyer assisted in a project to study how changes in the flow release schedule of the Potter Valley Hydroelectric Project would affect the local economy, including how they would impact the municipal and industrial water supply, hydroelectric power production, minimum stream flows (including recreation- and tourism-related), and agriculture. Ms. Sawyer focused on the impacts to agriculture, particularly water for irrigation, and conducted telephone interviews and data collection. Using irrigated agricultural crop acreages for the hydrologic sub-units; production information such as irrigation application rates, frost protection requirements, yields, and crop values; and countywide information gathered from county commissioners' reports and crop budgets, Ms. Sawyer estimated the water requirements, yields, and values of each of the crops under then-current conditions. She used the results of IMPLAN modeling and input-output methodology to determine the indirect impacts related to changes in flows and documented the results.

### **Water Infrastructure Investment Analysis, State of Washington Office of Financial Management – Washington**

Ms. Sawyer was a key member of a team conducting an analysis of the economic implications related to water infrastructure (stormwater, flood protection, and water supply) and fisheries habitat restoration needs in Washington. The analysis considered the state's changing population, climate, land use, and water demand. Through a review of existing data and literature, in addition to an extensive stakeholder outreach process, the team developed a 20-year forecast for investment needs pertaining to water supply, flood protection, stormwater management, and fisheries habitat restoration across the state. Specifically, Ms. Sawyer developed a large database of water infrastructure project costs, both existing and potential, categorized by type and hydrologic unit code water basin. Then, using IMPLAN, she conducted a regional economic impact assessment, considering the impact of investment on water-dependent sectors, employment, and economic output. The final report was presented to the Washington State Legislature.

## **Wind Power**

### **Regional Economic Impacts of Wind Power Development, Columbia Energy Partners – Harney County, Oregon**

Ms. Sawyer provided analysis for the economic impact assessment of two proposed wind power projects in Harney County, Oregon. She evaluated project-related impacts to property values and public services, among others. The assessment included collecting data from project developers and operators, interviews with local service providers, and literature reviews.

### **Regional Economic Impacts of Wind Power Development, Southeastern Washington Economic Development Council – Southeastern Washington**

Ms. Sawyer provided analysis for the economic impact assessment of three wind power projects in Columbia County in terms of total jobs, income, and tax revenues generated. The study also included evaluation of potential impacts of future wind projects elsewhere in the region. Ms. Sawyer developed an overall socioeconomic overview of the project area and evaluated potential project-related impacts on property values, the value of agricultural production in the region based on the opportunity cost of land, and the overall economy. The economic impact assessment included collecting data from project developers and operators and interviews with local real estate professionals and community organizations including the Chamber of Commerce and economic development agencies.

### **Hatchet Ridge Wind Power Development and Horse Lake Wind Power Development, RES America and Invenergy – Shasta County and Lassen County, California**

Ms. Sawyer prepared several economic studies that evaluated the regional economic impacts of proposed wind developments in northern California for two private wind-energy developers. As a member of the project team, Ms. Sawyer assessed the potential recreational and energy-related impacts to the local community. She

coordinated development of a comprehensive document to present to the client and public, focusing on providing a socioeconomic profile of the region and estimated regional economic impacts of the proposed wind developments. The team assessed changes to aesthetic and property values, and evaluated the benefits of increased tax assessments attributable to the project.

## **Economic Development Impacts of Wind Power, National Wind Coordinating Committee – United States**

Ms. Sawyer contributed to a study of the economic development impacts of wind power, examining the local economic effects related to three existing wind power developments and provided a framework for future studies. She helped develop case studies of the impacts of wind power development on local economies, with a primary focus on investigating and quantifying effects on local infrastructure and community services. Sites investigated included Vancycle Ridge, Oregon; Lake Benton, Minnesota; and Culberson County, Texas.

## **Regulatory Impact and Feasibility Analysis**

### **Review of Regulatory Impact Assessment of Proposed Stream Protection Rule, National Mining Association – United States**

Ms. Sawyer was part of a team of economists estimating the economic impacts from the Office of Surface Mining-proposed stream protection rule on the entire U.S. coal industry. The project evaluated the language of the draft rule and assessed the impact of implementation against current industry statistics and trends. Compliance with the rule was evaluated on 75 current surface and underground mining operations in all regions of the country to determine the impact on access to demonstrated coal reserves. The percent decrease in access to recoverable reserves was determined for both surface and underground mining for three coal-mining regions in the country. For each sector experiencing losses, Ms. Sawyer used IMPLAN software and data, along with data received from the client, to estimate potential employment impacts, including direct mining jobs as well as indirect and induced jobs.

### **Review of Regulatory Impact Assessment of Proposed Air Quality Regulation, American Petroleum Institute – Gulf of Mexico**

Ms. Sawyer was part of a team conducting a review of a regulatory impact assessment prepared by the Bureau of Ocean Energy Management for a proposed rule regarding air quality near offshore oil and natural gas production in the Gulf of Mexico. Ms. Sawyer developed cost calculations for various elements of the proposed rule, and critiqued the RIA prepared by BOEM in regard to its estimation of the proposed rule's cost and benefit impacts. Key deliverables included economic assessment for specific sector, geography, and state; evaluation of market mechanisms; cost benefit analysis; survey design; and review of the RIA.

### **Bristol Bay Assessment, Pebble Partnership – Alaska**

Ms. Sawyer provided a detailed review of the socioeconomic components of a U.S. Environmental Protection Agency draft scientific study document, addressing likely effects of the Pebble Mine in Alaska on the Bristol Bay watershed and its natural resources. Specific review components included existing conditions and impact assessment of economics of ecological resources, and existing conditions and impact assessment of indigenous cultures.

### **Economic Analysis of Critical Habitat Designation for the Kootenai River Population of the White Sturgeon, Industrial Economics, Inc. – Montana**

Ms. Sawyer collaborated to conduct an economic analysis addressing the costs associated with listing the Kootenai River white sturgeon (*Acipenser transmontanus*) as endangered and designating critical habitat. The study provided guidance on the total and relative costs of designating areas as critical habitat. Ms. Sawyer focused on the power impacts related to the Libby Dam, located in Montana; collecting data; and analyzing retrospective and prospective costs. Ms. Sawyer developed a series of draft analyses and helped prepare the draft report for public review and comment. In addition, Ms. Sawyer prepared responses to the energy-related public comments.

## **Oil Transfer Rule Small Business Economic Impact Statement and Cost Benefit and Least Burdensome Analysis, Washington State Department of Ecology – Washington**

To support the rulemaking process of the Washington State Department of Ecology regarding transfer of oil within Washington State waters, Ms. Sawyer assisted in the completion of several economic analyses. Ms. Sawyer focused on the costs associated with changes in notification practices, “pre-booming” procedures, training, and spill prevention and response planning as they related to mid-sized facilities, called “Class 3 Facilities.” Her analyses included telephone and personal interviews with the facilities’ management, data gathering and management, and cost development. She also participated in the report preparation for the Class 3 Facilities.

## **Washington State Route 504 Feasibility Study, Washington State Department of Transportation and HDR, Engineering, Inc. – Cowlitz County, Washington**

This study evaluated the engineering, environmental, and economic feasibility of constructing an extension of State Route 504 beyond Mount St. Helens. Ms. Sawyer compiled baseline economic conditions for population, employment, and tourism. Her evaluation of economic impacts of selected alternatives included developing population and employment projections, as well as projecting travel impacts.

## **Population and Water Demand Forecasting**

### **Water Demand/Population Forecasting for Little Colorado River Basin, U.S. Department of Justice – Arizona and New Mexico**

Ms. Sawyer is the lead economist responsible for baseline population estimates and collection and assessment of additional population data to update existing population projection models. This population projection model is being used to forecast future domestic, commercial, municipal, and industrial water requirements for the Hopi Indian and Navajo Indian reservations in the Little Colorado River Basin, located in Arizona and New Mexico. This information supports litigation and negotiation efforts by providing a revised forecast to compare to the model used in the settlement agreement related to water right claims on behalf of these tribes.

### **San Juan River Basin Economic/Socioeconomic Analysis, U.S. Department of Justice – Arizona and New Mexico**

Ms. Sawyer estimated the baseline population and collected additional population data to develop a population projection model for the Navajo Indian Reservation in the San Juan River Basin, located in Arizona and New Mexico, to be used to forecast future domestic, commercial, municipal, and industrial water requirements. This information was used to compare model results to the model used in the settlement agreement related to water right claims on behalf of this Tribe.

### **Three Pueblos Population and Economic Analysis, U.S. Department of the Interior/Department of Justice – New Mexico**

Ms. Sawyer developed, prepared, and documented population projections for three pueblos in New Mexico to support the determination of future domestic, commercial, municipal, and industrial water requirements for each of the pueblos.

### **Future Water Requirements for Domestic, Commercial, Municipal, and Industrial Purposes on the Flathead Indian Reservation, U.S. Bureau of Reclamation, Upper Columbia Area Office– Montana**

Ms. Sawyer developed population forecast models for the determination of future domestic, commercial, municipal, and industrial requirements on the Flathead Indian Reservation in Montana. The results were included in an operational water model of the reservation and were used in negotiations for a water rights settlement among the Tribe, the State of Montana, and the federal government.

## **Reserved Water Rights for the Duck Valley Indian Reservation, Bureau of Indian Affairs, Northwest Regional Office – Idaho and Nevada**

Ms. Sawyer provided input for an expert report on the domestic, commercial, municipal, and industrial water needs on the Duck Valley Indian Reservation. The work included developing a model and methodology to project the future population of the reservation. This information was developed to be used in litigation and negotiation related to water right claims on behalf of the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation.

## **Reserved Water Rights for the Lummi Indian Reservation, Bureau of Indian Affairs, Northwest Regional Office –Bellingham, Washington**

Ms. Sawyer developed population projections for the reservation to the year 2100, including the development of models, methodology, and analysis, in order to estimate future domestic, commercial, and municipal water demand. This information was developed to be used in litigation and negotiation related to water right claims on behalf of the Tribe.

## **Reserved Water Rights for the Nez Perce Indian Reservation, Bureau of Indian Affairs, Northwest Regional Office – Idaho**

Ms. Sawyer developed population projection models, methodology, and analysis for use in estimating the future Indian population of the Nez Perce Reservation by river basin and water supply source. The results were combined with water use estimates to determine future water needs for domestic, commercial, and municipal purposes. This information was developed for use in litigation and negotiation related to water right claims on behalf of this Tribe.

## **Population Projections for Red River Valley Counties and Municipalities, 2000 through 2050, Bureau of Reclamation, Dakotas Area Office – North Dakota and Minnesota**

Ms. Sawyer developed 50-year population projections for the 20 counties and 40 municipalities in the Red River Valley of North Dakota and Minnesota. She developed interactive models derived from historical data from the U.S. Census Bureau, and assumptions about births, deaths, and net in- and out-migration for the region based on data from the US Census Bureau, the National Center for Health Statistics, and other state and local data sources.

## **Population Projections for Portland and Six Parks and Recreation Subareas, 2000 through 2020, Summary and Technical Documentation Reports, Portland Parks and Recreation – Portland, Oregon**

Ms. Sawyer developed population projections to the year 2020 for six subareas of the city of Portland to support parks and recreation planning. Projections incorporated total population changes, as well as changes segmented by age, race, and ethnicity. Ms. Sawyer assisted in the development of a technical report describing the methodology, which was submitted to the city. The forecast was to be used by the parks and recreation department to determine how best to meet the changing needs of the community.

## **Demographic Profile of the Soboba Indian Reservation, Bureau of Indian Affairs – Riverside County, California**

Ms. Sawyer assisted in the development of a demographic profile of the Soboba Indian Reservation, including a detailed analysis of migration to and from the reservation between 1990 and 2000. She integrated this information into projections of the Indian population of the reservation to the year 2050. The population forecast was used by other team members to estimate future housing needs on the reservation for the Soboba Band of Luiseño Indians.

## **Health Economics Analysis**

### **Economics of Tobacco Harm-Reduction Strategies, RAI Services – United States**

Ms. Sawyer led the economic analysis conducted to develop estimates of health care costs and savings related to tobacco harm-reduction strategies. This was a multiyear project in which she worked on the continued

development and enhancement of a model to estimate changes in life tables related to changes in tobacco harm-reduction, housed in an Access database and with simplified Excel® output reporting.

## **Development of Health Care Cost Wizard, Mercer Benefits Consultants –United States**

Ms. Sawyer completes an annual analysis of employer-based health benefit costs, updating a “benchmark wizard.” Using survey data received from the client, the project team develops Statistical Analysis System models to analyze and predict the costs of various types of health care insurance programs, depending on the composition and needs of a specific business. Ms. Sawyer developed and annually updates a spreadsheet “benchmark wizard” so that costs can be predicted, assessed, and compared for each individual business or business type, based on the results of the SAS models and industry averages.

## **Water Valuation and Feasibility**

### **Valuation of a Quarry, Based on Water Storage Potential, Lehigh Hanson, Frost Brown Todd, LLC – North Vernon, Indiana**

Ms. Sawyer was part of the team developing an analysis to appraise a quarry in Indiana for three different capacities: water storage potential, remaining mineral resources, and other uses such as a landfill. This quarry was the subject of condemnation proceedings for the purpose of constructing a highway. A nearby city was interested in using the quarry pit as a raw water storage facility in order to ensure sufficient future water supplies for the city. The appraisal of the property and its associated mineral rights and other potential uses was important in determining the overall value of the property in relation to its highest and best use. In addition, Ms. Sawyer developed a value for the property based on its potential as a landfill, using the least-cost-alternative method.

### **Valsetz Water Storage Project, Polk County – Polk County, Oregon**

Ms. Sawyer provided economic support for a feasibility study examining the potential construction of a water storage facility that would capture water in the headwaters of the Oregon coastal range, as well as an interbasin transfer of water into the Willamette Valley. The feasibility study assessed current and future water demands and determined whether each of the three different project options, based on dam and reservoir size, would meet future water needs. The study evaluated expected physical and chemical water quality parameters in the reservoir and downstream of the dam, and potential impacts on terrestrial and aquatic resources and cultural/historical resources. Additionally, a preliminary assessment of potential hazardous wastes on the property was completed. The results were used to assess the feasibility of constructing the facility, factoring in the public need; environmental effects, including those to fisheries; and regulatory risk. As a follow-up to this study, the team also completed a rapid assessment of the potential construction of a water storage project in an adjacent basin at a location where no fish were present.

## **Benefit Costs Analysis**

### **Effect of Policy Tools for Encouraging Electric Vehicle Adoption, Newhall Ranch –Santa Clarita, California**

Ms. Sawyer conducted a review of literature pertaining to policies encouraging the adoption of electric vehicles and created a forecasting model for the impact of different policy tools on electric vehicle adoption in a new residential community in California.

### **Benefits and Costs of Nature-Based Adaptation to Climate Change, The Nature Conservancy – Ventura County, California**

Ms. Sawyer developed a large database to be used in the analysis of costs and benefits related to nature-based adaptation to climate change. For this study, all economic costs and benefits of adaptation alternatives for Ventura County were developed, including changes in the ecosystem service levels. Flood and hazard damages, including damages to public infrastructure, privately owned structures (business and residential), and agriculture, were evaluated for over 31,000 parcels in a Geographic Information Systems database. Ms. Sawyer assisted in the development of an interactive sensitivity analysis tool to vary assumptions to determine sensitivity of benefits

and costs. The team worked closely with stakeholders representing city governments, state agencies, emergency managers, and the U.S. Navy.

## **Agricultural Economic Analysis**

### **Assessment of Small Farms Programming at Washington State University, Washington State University – Pullman, Washington**

Ms. Sawyer provided support to WSU in the assessment of its Small Farms Program. The work involved quickly gathering the necessary information through telephone interviews with core WSU SFP staff and conducting surveys of other people who have worked or were working with the SFP (approximately 300), using Survey Monkey, an online survey tool. Survey questions were developed in consultation with the Small Farms Team. Survey participation was increased through a concerted communication effort. Ms. Sawyer led preparation of the final report with draft recommendations for a five-year vision. Throughout the entire process, Ms. Sawyer communicated with the SFP staff members to integrate alternative approaches and ideas to better meet project goals.

### **Economic Analysis of Increasing Use of Compost on Food Crops, Portland Metro – Portland, Oregon**

Ms. Sawyer led a team providing economic analysis for a study of the potential for increasing compost use on food crops. The analysis investigated the potential for increasing food growers' compost use by identifying barriers to market penetration, education, and knowledge; and specific requirements in nutrients and quality that may not have been met at the time of the study. Ms. Sawyer incorporated a market overview of compost supply and demand along with illustrated areas where demand may increase. In addition, she led a review of the financial impact of compost in terms of costs and revenues to local food growers. The analysis included an assessment of the existing supply of compost, both in quantity and type, and the potential for increasing the supply, conducted through interviews with compost processors and analysis of the existing data. It also included an assessment of current demand for compost for food crops and a demand forecast for the use of compost, developed through interviews with farmers in the study area as well as farmers with established compost use outside the study area.

### **Global Resource Issues Related to Berry Production, Driscoll's Berries – Worldwide**

Ms. Sawyer conducted an environmental scan for a global berry producer, evaluating the risks and challenges associated with global access to labor over the next 15 to 20 years. Ms. Sawyer reviewed global forecasts for labor availability and analyzed how changing access might influence decisions to invest in areas throughout the world. Results were used by the firm in developing long-range business strategies.

### **Corn Variation Coexistence White Paper, Monsanto – United States**

Ms. Sawyer assisted in conducting research and developing the resulting white paper regarding the coexistence of various corn types (e.g., conventional, organic, and biotechnology corn), including markets for, prices of, regulations of, and stewardship practices for these types of corn.

### **White Mountain Apache Water Use Claim Study, Bureau of Indian Affairs – Arizona**

Ms. Sawyer provided agricultural economic analysis for potential agricultural enterprises related to irrigation needs and water use claims. This analysis included the development of an organic beef enterprise budget and market analysis, and a preliminary analysis of a startup organic dairy enterprise for the White Mountain Apache Indian Tribe on the Fort Apache Reservation in Arizona.

### **Comprehensive Water Management Plan Study for the Duckwater Shoshone Indian Reservation, Bureau of Indian Affairs – Nevada**

Ms. Sawyer led the effort to develop a comprehensive water management plan for the Duckwater Shoshone Indian Reservation in Nevada, overseeing and coordinating work of staff and subcontractors from a wide variety of disciplines, including hydrology, engineering, and legal analysis. In addition to her project management

duties, she conducted the agricultural economics analysis for the project, focusing primarily on hay and cattle production.

## Recreation

### **Human Use Services Information System, Arnold and Porter – United States**

Ms. Sawyer assisted in the development of a Web-based information management system that compiles, evaluates, and facilitates access to publicly available data, reports, articles, and geospatial information related to baseline ecological and human use of ecosystem services related to a large water body.

### **Planning Strategies for Revenue Enhancement on the Valles Caldera National Preserve, Valles Caldera Trust – New Mexico**

Ms. Sawyer assisted with a business plan for the Valles Caldera National Preserve in New Mexico. Specifically, Ms. Sawyer performed research and evaluation of a variety of recreational ventures for the preserve, including an equestrian center, equestrian trails, and a horse campground. She also assisted in the development of an interactive financial model to be used for planning purposes. The model allows board members and preserve staff to adjust model assumptions to see impacts on future cost and return projections.

### **Pelican Butte Ski Area Master Plan Environmental Impact Statement: Alpine Skiing Market Analysis, U.S. Department of Agriculture, Forest Service – Pacific Northwest Region, Oregon**

The overall project evaluated the potential market for downhill skiing at the proposed Pelican Butte Ski Area in southern Oregon. Ms. Sawyer was responsible for population projections by county and age cohort, skier demand analysis, and other economic analysis. She projected population by age cohort in the local and regional market areas, and projected potential participation by selected age cohorts for counties in the market area. She also completed an analysis of the allocation of potential skiers to ski areas in and outside the market area.

## Energy Economic Analysis / Federal Energy Regulatory Commission

### **Economic Analysis of Proposed Hydroelectric Project, Haines Borough – Haines Borough, AK**

Ms. Sawyer provided economic analysis for a proposed hydroelectric project on Excursion Inlet in Haines Borough, Alaska. The first phase of the project involved a preliminary fish habitat study. The second phase of the project focused on a reconnaissance of: resources identification and analysis; land use, permitting, and environmental analysis; preliminary engineering design and costs analysis; cost of energy and market analysis; and a simple economic analysis. Ms. Sawyer developed costs and energy benefits of the project and a payback analysis. She researched, compiled, and analyzed economic data regarding the project and the project area to determine potential impacts to the surrounding community.

### **Enloe Dam FERC Hydroelectric Dam Relicensing and Energy Analysis, Okanogan Public Utility District – Okanogan County, Washington**

Ms. Sawyer provided economic and socioeconomic analysis for the Enloe Dam FERC licensing process. She developed the power economics and socioeconomic sections of the license application. Specifically, she collected, compiled, and analyzed power cost and revenue data, and developed a socioeconomic impact analysis of the project.

### **Economic and Energy Analysis for Proposed 230-KV Transmission Line and Wind Project, Harney Electric Cooperative & Columbia Energy Partners – Harney County, Oregon**

Ms. Sawyer provided economic and energy analysis relating to a proposed transmission line right-of-way to connect a wind power project to the existing power grid in Harney County, Oregon. The preferred ROW path crossed national wildlife refuge lands that are under the general management plan direction of the U.S. Fish and Wildlife Service and the Bureau of Land Management.

## **Pelton Dam FERC Hydroelectric Dam Relicensing, U.S. Department of Interior, Bureau of Indian Affairs – Jefferson County, Oregon**

Ms. Sawyer served as project manager and provided technical analytical support on economics, recreation and land use, and database and document management to protect the trust resources of the Warm Springs Indian Reservation. She was responsible for oversight and coordination of staff and subcontractors performing studies for a wide variety of disciplines, including fisheries, terrestrial resources, power engineering, water quality and hydrology, cultural resources, and Geographic Information Systems. She also developed a methodology and price calculations for the sale of allotted reservation land used in the production of power to the licensees.

## **Similkameen River Proposed Hydroelectric Project FERC Study, Okanogan Public Utility District – Okanogan County, Washington**

Ms. Sawyer provided economic and flooding analysis for the proposed Similkameen River hydroelectric project FERC study for the license applicant. She developed the power economics and flooding impact analyses through collection, compilation, and analysis of county tax data. She was also responsible for developing a socioeconomic impact analysis of the project.

## **St. Lawrence River/FDR Power Project FERC Relicensing Study, U.S. Department of the Interior/Bureau of Indian Affairs – Franklin County, New York**

Ms. Sawyer was responsible for oversight and coordination of the work of subcontractors from a wide variety of disciplines in the FERC relicensing studies for the St. Lawrence/FDR Project in New York, for which Section 10(a) recommendations were submitted. She was responsible for the overall project management and technical support to the Bureau of Indian Affairs in economics, recreation and land use, and database and document management. She coordinated the work of subcontractors performing studies for fisheries, terrestrial resources, power engineering, water quality and hydrology, and cultural resources. Deliverables focused on the protection of the trust resources of the St. Regis Mohawk Tribe Reservation.

## **Friant Power Authority Impacts, Friant Power Authority – San Joaquin Valley, California**

Ms. Sawyer provided technical support and analysis of the impacts to the Friant Power Authority from various alternative flow regimes of the San Joaquin River. The Friant project consists of three generators, one on each of the following: the Madera Canal, the Friant-Kern Canal, and the San Joaquin river outlet of the Friant Dam. Ms. Sawyer analyzed the proposed reductions in flow through the two canals as applicable to the Friant Power Authority as a whole as well as to its member districts. Power generation impacts to the three power facilities and financial impacts to the Friant Power Authority, its eight-member water, irrigation, and municipal utility districts, as well as the final consumers in the region, were included in the analysis.

## **Annual Charges Related to Wisconsin River Headwaters Hydroelectric Project FERC Application, Bureau of Indian Affairs, Minneapolis Area Office – Gogebic County, Michigan**

Ms. Sawyer developed recommendations for Section 10(e) annual charges to be paid to the Lac Vieux Desert Band of the Lake Superior Chippewa Tribe. She conducted a study on the Lac Vieux Desert Indian Reservation in northern Michigan to determine the amount and value of reservation land flooded by the headwaters of the hydroelectric project.

## **Licensing Conditions and Annual Charges Related to Cushman Hydroelectric Project FERC Application, U.S. Department of the Interior/Bureau of Indian Affairs – Mason County, Washington**

Ms. Sawyer was responsible for overseeing and coordinating the work of subcontractors from a wide variety of disciplines and providing economic analysis for the multiyear Cushman Hydroelectric Project FERC relicensing. She coordinated the development of Section 4(e) conditions and developed the recommended 10(e) annual charges for the relicensing of the Cushman Hydroelectric Project, which impacts the Skokomish Indian Reservation in western Washington. As project manager, she coordinated the work of six subconsultant firms, including experts in fisheries, hydrology, power engineering, geology, sediment transport, wetlands, wildlife,

and cultural resources, to address project impacts, including loss of fish habitat and fish passage, flooding, changes in groundwater, changes in wetland and wetland habitat, and impacts on cultural resources.

## **West Enfield Hydroelectric Project Operations Modification Assessment, U.S. Department of the Interior/Bureau of Indian Affairs – Penobscot County, Maine**

Ms. Sawyer was responsible for overseeing and coordinating the work of subcontractors from several disciplines. This study evaluated the potential impacts of a proposal to raise the dam at the West Enfield Project (FERC Project No. 2600) in Maine, which could cause further flooding of lands of the Penobscot Indian Nation. Based on information provided by Geographic Information Systems analysts, including the identification and quantification of additional lands and habitat that could potentially be flooded by a rise of 1 foot or 2 feet in the pool level, Ms. Sawyer developed an annual charge for the flooded lands to be paid to the Penobscot Indian Nation and made recommendations to the Bureau of Indian Affairs.

## **Box Canyon Hydroelectric Project Relicensing, U.S. Department of the Interior/Bureau of Indian Affairs – Pend Oreille County, Washington**

Ms. Sawyer provided technical support to the Bureau of Indian Affairs and the Department of the Interior in developing recommendations for Section 10(e) annual charges to be paid to the Kalispell Tribe for the relicensing of Pend Oreille Public Utility District's Box Canyon FERC Hydroelectric Project lands located on the Tribe's reservation. This included economic analysis related to the costs of the project and alternative sources of electric power for the PUD, as well as determining the appropriate methodology to be used in the calculation.

## **Priest Rapids-Wanapum FERC Hydroelectric Project Relicensing Study, PacifiCorp and the Yakama Nation – Washington**

Ms. Sawyer provided technical analytical support to the client in the areas of power economics and agricultural benefits. She served on a technical subcommittee assisting in the development of an initial consultation document in preparation for compiling a draft license application.

## **Socioeconomic Base Study Report for the Spokane River Hydroelectric Project Relicensing, Avista Corp. – Spokane, Washington**

Ms. Sawyer served as project manager, leading a team of economists conducting a socioeconomic base study for the economic region surrounding the Spokane River Hydroelectric Project. The base study, part of the FERC relicensing process, focused on the project's ties to the community, lake and river recreation, jobs, income, and related industrial and retail business.

## **Review of Training Manual on Economic Analysis of FERC Hydroelectric Relicensing, and Conducting Training, Industrial Economics, Inc. – United States**

As a subcontractor, Ms. Sawyer provided training support on applied economics issues in FERC relicensing through a review of training materials and participation in a training session on economic analysis for hydropower project relicensing for the U.S. Fish and Wildlife Service. She performed a review and provided comments on the training manual, *Economic Analysis for Hydropower Project Relicensing: Guidance and Alternative Methods*, prepared under contract with the USFWS. The primary focus of the review was the practical applicability of the methods described in the report to hydroelectric relicensing projects. Ms. Sawyer also participated, in an advisory role, in the training session conducted with representatives of several federal government agencies, focusing on the application of the methods to then-current hydroelectric relicensing projects.

## **Shoreline Erosion Study and Monitoring near St. Ann's Church, U.S. Department of the Interior/Bureau of Indian Affairs – Penobscot County, Maine**

As a Section 4(e) condition of the FERC license for the Milford Hydroelectric Project, this project involved using global positioning system technology and Geographic Information Systems to monitor streambank erosion that threatens the historic St. Ann's Church on the Penobscot Indian Reservation in Maine. Ms. Sawyer assisted in the preparation of a base report, describing current conditions to which changes can be compared. Ongoing

erosion would be measured and assessed as needed. Ms. Sawyer assisted in cost development and report writing.

## **Long-Term Environmental Water Account Environmental Impact Report/Environmental Impact Statement Power Impact Analysis, CDM – Central California**

Ms. Sawyer was the lead economist developing the impact to power production and prices under the various alternatives of the long-term EWA EIR/EIS. This analysis included assessing the power model results provided by the client, including the energy output of several state- and federal-operated dams, and determining whether the impacts under each of the alternatives were “significant” or “not significant,” as well as determining the impact on power and power prices in the entire project area.

## **Population Projections/Agricultural Economic Analysis**

### **Federal Reserved Water Rights Claim for the Fort Belknap Indian Reservation, Bureau of Indian Affairs, Northwest Regional Office – Montana**

The project analyzed the economic feasibility of a comprehensive water right claim plan. Ms. Sawyer developed population forecast models for the determination of future domestic, commercial, and municipal water needs. This information was developed for use in litigation and negotiation related to water right claims on behalf of the Tribe. Agricultural economic analysis performed by Ms. Sawyer for this project included development of an organic beef enterprise budget and market analysis, and studies related to buffalo production on the reservation.

### **Reserved Water Rights for the Flathead Indian Reservation, Bureau of Indian Affairs, Northwest Regional Office – Montana**

Ms. Sawyer was a part of a multidisciplinary study team assembled to quantify water rights. The team conducted farm economics and feasibility analyses for irrigation development. The team also inventoried facilities for domestic and municipal water supply, livestock ponds, and undeveloped springs. An analysis of future domestic, commercial, municipal, and industrial water needs of the Tribe was also conducted. Ms. Sawyer developed a population projection model, methodology, and analysis for the reservation. This information was developed for use in litigation and negotiation related to water right claims on behalf of this Tribe. Ms. Sawyer also developed agricultural economic analyses for this project, including the development of an organic beef enterprise budget and market analysis, as well as studies related to buffalo production on the reservation.

### **Reserved Water Rights for the Crow Indian Reservation, Bureau of Indian Affairs, Rocky Mountain Regional Office – Montana**

Ms. Sawyer served as part of a multidisciplinary study team assembled to investigate water rights over a number of years. The team analyzed the economic feasibility of a comprehensive water right claim plan, including a detailed analysis of farm enterprises. Ms. Sawyer developed population projections for the reservation. This work included the development of population projection models, methodology, and analysis, which were used to forecast future domestic, commercial, municipal, and industrial water needs on the reservation. In addition, Ms. Sawyer provided agricultural economic analysis to the team, including the development of an organic beef enterprise budget and market analysis, as well as studies related to buffalo production on the reservation. This information was developed for use in litigation and negotiation related to water right claims on behalf of this Tribe.

## **Published Papers and Presentations**

Metro Compost Use: Economic Analysis of Supply, Demand, and Utilization. BioCycle West Conference, Portland, Oregon, 2015.

Economic Impacts of Recycling in Colorado. Colorado Association for Recycling Annual Meeting, Denver, Colorado, 2014.

The Importance of Detailed Small Area Population Projections in Local Planning Efforts. Pacific Northwest Regional Economic Conference, Tacoma, Washington, 2004.

Estimating AIAN Migration on Indian Reservations in the Western United States. Population Association of America Annual Meeting, Boston, Massachusetts, 2004.

Projecting Indian Populations for the Purpose of Determining Water Requirements: Methodological Issues. Population Association of America Annual Meeting, Minneapolis, Minnesota, 2003.