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Summary

- Called upon by natural resource industries, attorneys, and consultants to address issues of aquatic ecology, hydrology, hydraulics, fluvial geomorphology, ecological flows, sediment transport dynamics, fish, and macroinvertebrates by applying advanced statistical and spatial models with expert ecological interpretation of results.
- Clearly and effectively communicates complex scientific issues in plain English easily understood by regulators and other non-technical decision makers.
- Kept three aggregate mining companies in business by obtaining dredging permits in highly sensitive and contentious locations; these companies subsequently sold for \$36 million.
- Author of the book, *Quantifying Environmental Impact Assessments Using Fuzzy Logic*, published by Springer-Verlag in 2005 and acknowledged as a pragmatic approach by state and federal agencies in the US and Canada.
- Broad expertise in watersheds and the rivers that drain them, including the Clean Water, Endangered Species, and National Environmental Policy Acts.
- Expert witness for the defenants in a preliminary injunction hearing to withdraw a coal mining permit in West Virginia and for an Oregon private dam owner sued for flooding of a downstream property.

Major Achievements

Developed techniques to quantify subjectivity inherent in complying with environmental regulations (e.g., defining *significant* and objectively measuring *sustainability*). Created an approach to characterize and rank the suitability of properties assessed differently based on a company's growth strategy, willingness to assume risk, and criteria of importance. Wrote the breakthrough book, *Quantifying Environmental Impact Assessments Using Fuzzy Logic*, published by Springer-Verlag, New York. The approach removes subjectivity and quantifies values and beliefs to produce a much higher quality environmental assessment that reduces (or eliminates) legal challenges. This saves clients time and money and provides decision-makers with objective criteria for better--and better supported--decisions.

Served a term on Oregon's *Independent Multidisciplinary Science Team* by joint action of the Governor, Senate President and Speaker of the House. The IMST provides scientific guidance and advice to the natural resource agencies responsible for implementing the Oregon Plan for Salmon and Watersheds.

A hard-rock quarry just outside the city limits of Portland, Oregon, had been trying to expand their permitted area for five years. I developed a strategy to overcome the objections. My advice to the owner, and my testimony at the city and state levels, resulted in the permitted area increasing from 40 acres to 184 acres. Everyone was satisfied, and the opponents felt they had "won" a major concession from the operator. A win-win solution. Not long after this permitting marathon was settled, the operator sold the site to a major aggregate mining company for more than \$20 million.

Successfully permitted commercial sand dredging for several companies operating in the Columbia and Willamette Rivers in the vicinity of Portland, Oregon. Over eight years I obtained almost a dozen operating permits (from both the Army Corps of Engineers and the State of Oregon). Despite all the concerns about salmon in the river I was able to expand both the space and time during which the companies could operate in the river as permits were re-evaluated for renewal. The owners of each of these companies told me that my efforts both saved their businesses and permitted three of the dredging company owners to retire with a significant amount of money.

