Appropriate Data For Environmental Impact Assessments
(Newsletter)*

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Companies developing a project requiring the preparation of an environmental impact assessment may commit a lot of time and money to baseline studies at a very early stage. This effort is not the same as an environmental fatal-flaw analysis, but is meant to save time by collecting a large quantity of data on existing conditions during project planning and definition. Unfortunately, this effort does little to answer the question of which project alternative will leave the least residual undesired negative impacts on the natural, economic, and societal environments. Fortunately, there is an alternative approach to describing existing and alternative future conditions that is more robust, less costly, quicker, and more resistant to quibbles, dueling experts, or arguments over numeric details.

These baseline data collections do not work for environmental impact assessments because of high variability of natural systems. Weather and financial markets are two well-known examples of high variability that do not allow meaningful forecasts. The US National Science Foundation recognized high variability of natural systems in the early 1970s and funded a set of Long Term Ecological Reserves. These LTERs are still funded almost 40 years later, and academic scientists crank out large numbers of research papers documenting the variability on various temporal and spatial scales. Yet, they still cannot make any usable predictions despite this extensive data. This means that a year or two of baseline data for an impact assessment is equally meaningless in predicting quantitative changes under various project alternatives. Fortunately, there is a functional, robust, and meaningful way to describe existing and alternative future environmental conditions.

The more technically sound and legally defensible approach describes existing environments using qualitative terms, the same linguistic variables we use in our everyday conversations. We can describe existing water quality as "fully compliant," wildlife habitat quantity as "extensive" and quality as "moderate", vegetation cover as "sparse," transportation infrastructure condition as

"poor." These are broad terms to which everyone can relate and they avoid the value judgments of a single number or range of numbers.

Project alternatives are described with qualitative terms expressing changes relative to what exists. Wildlife habitat quantity might be "slightly reduced" while its quality is "greatly improved." Air quality might be "unchanged." Traffic volume might be "slightly increased" with one alternative, but "greatly increased" with another alternative. Forecasting the effects of alternative project approaches or mitigation using relative terms is valid, credible, and much easier for technical experts to determine than are predictions of specific numbers. If desired, a measure of significance can be calculated for each of these changes by assigning an appropriate qualitative term to each of the eight components of significance.

This approach is realistic and appropriate. The descriptions are easier to communicate with non-technical decision-makers and the general public. This approach can be implemented more quickly and with lower cost than can the traditional data collection approach. Most importantly, the use of qualitative linguistic variables allows us to answer the question of which project alternative has the least residual undesirable negative impacts, all things considered.