A Profound Misunderstanding:
Current Practice vs. Best Practice in US CEA

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When I first sat down to write this paper, I thought I would focus on a single aspect of the problem that is current US CEA practice: lack of suitable data and models of analysis that can be applied at the appropriate scale for understanding the cumulative effects of the continuing, seemingly inexorable drumbeat of commodity development projects on our publicly-owned and managed lands in the US.

But I discovered that there are at least half a dozen major and related "misunderstandings" that affect our current practice of cumulative effects assessment; so I will talk about these on the way to my original topic, and describe some actions I believe IAIA can take to help resolve these problems for all of us.

First, a little background for our international participants (including our Canadian neighbors). Our US National Environmental Policy Act was signed into law on January 1, 1970 -- the first in the world. While it is a statement of national policy that serves as "our national charter for the environment," its action-forcing mechanism -- analyzing and disclosing potential environmental impacts resulting from decisions about the use of land, money, or other resources -- applies only to Federal government programs and projects, not to private-sector activities unless they have some Federal nexus. The definition of "impact" was specified to include direct, indirect, and cumulative impacts in regulations issued in 1978. This is where cumulative effects are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. "

Although NEPA is intended to apply to all Federal actions, including adoption of official policy, formal plans, planning of programs, and approval of specific projects, in practice the US has no established framework for SEA, as evidenced most egregiously by our lack of a national energy plan, transportation plan, or coordinated response plan for global warming effects. Federal land-managing agencies -- our Forest Service, Bureau of Land Management, National Park Service, Fish and Wildlife Service, and others -- have a planning process for lands under their control, but these plans

are based on political (agency unit) boundaries rather than eco-regions, and are rarely coordinated effectively across agency lines.

In addition, each Federal agency develops its own rules and processes for complying with NEPA; we have no national oversight agency, no "Minister of the Environment" who sets the requirements, reviews the submissions, and approves the plans, programs, or projects. While there are solid historical and philosophical reasons for how we do it, our process also can result in a welter of similar-but-not-identical procedures and requirements that complicates the actual impact analysis task in unpredictable ways. The classic recent example is two offices of the same agency preparing EISs on the "same" kinds of actions in the "same" eco-region yet arriving at widely varying results -- the Powder River Basin, in eastern Montana and Wyoming.

Added to that, we have not yet developed "sector guidelines" that are standardized across agencies and projects. Our US Environmental Protection Agency developed some "checklists" for considering pollution prevention associated with various project types in the mid-1990s -- everything from oil and gas to facility siting to outdoor recreation -- but these have long since vanished. If you blinked, you would have missed them.

Next, although the very definition of cumulative effects reflects the incremental, seemingly "insignificant" nature of each added component of the overall accumulation, there is little explicit guidance and less specific policy framework for dealing with cumulative effects in the lower two tiers of US NEPA practice: the Categorical Exclusion and the Environmental Assessment. The Categorical Exclusion is defined as "a category of actions which do not individually or cumulatively have a significant effect on the human environment" -- they must be on a list, and usually are identified as the result of analyzing the history of types of actions an agency undertakes to discover which ones can safely be put on such a list, under "ordinary circumstances." The Environmental Assessment, on the other hand, documents analysis for those actions whose impacts are either expected to be "not significant" -- that is, to be below the threshold for an EIS -- or for which analysis is needed to make the threshold determination. The usual result of an EA is a Finding of No Significant Impact, or FONSI.

So here are two classes of analysis which, for an individual project, have no significant impact. The question becomes, of course, how and when and with what tools do we add this "no significant impact" to this "no significant impact" to this "no significant impact" and finally understand that all together they do in fact produce significant cumulative impact?

And finally, we lack appropriately-scaled data sets for the kinds of questions that are posed, increasingly, on publicly-owned lands in the US. Yes, there is Google Earth; my academic colleagues tell me many of their students think satellite imagery is all they need to conduct analyses of western rangeland conditions, or identify critical habitat for endangered species, or project land uses in the wildland-urban interface (the WUI) or the farmland-urban interface, which I have dubbed the FUI. But for a specific project, affecting a specific population of plants or animals, in a specific location, season, climate, slope, soil series, hydrologic regime, etc. these data often are simply not fine-grained enough to support an individual project decision, let alone to support a cumulative effects analysis. And for many geographic areas and resource types we simply do not have the data, in spite of nearly 40 years of field surveys, monitoring reports, and project analyses. The scope is just too big.

Now my intent here is not to make us all want to go out and slit our wrists -- but these peculiarities of our system are not going to go away soon. And what is true is that hundreds of practitioners muddle their way through cumulative effects analysis daily, with varying levels of success. I want to focus the rest of my discussion on the nature of the specific problems in this daily practice, and some approaches toward solutions. Here goes.

First, many practitioners simply do not have a clue what cumulative effects might be. They have not read the CEQ definition, or the 1997 guidance, or in many cases their own agency's internal guidance. They have not attended a training course. They have not learned this in college. So you get nonsensical statements in NEPA documents such as "[This agency] recognizes the public's desire for legal access to [agency] lands for recreational purposes. Cumulative effects are not significant." Frankly, this is the most common problem I see in our CEA practice today: inexperienced and untrained practitioners are struggling to do a job for which they are not currently qualified. The solution to this problem is obvious, and I and my colleagues in the education business are trying mightily to rectify it.

Second, many practitioners have the mistaken belief that because they are analyzing only ONE of whatever-it-is (motorcycle race, grazing permit, application for permit to drill an oil well, timber sale, fence or road construction project….) there are no cumulative effects. They misunderstand that cumulative effects may occur from the accumulation of effects from many different kinds of projects, not just multiple instances of the same kind of project.

Third, they mistakenly believe that if their project has no significant direct or indirect impacts, it couldn't possibly contribute to cumulative impacts, significant or not. But the very definition of cumulative effects is of course "individually minor but cumulatively significant" effects of multiple actions over time and across space.

Fourth, is the problem of lack of explicit criteria or thresholds for resources of concern, which often are not subject to quantification. Although we have come a long way since 1970 in developing semi-quantitative or even qualitative frameworks for evaluating such resources and impacts, for example for visual resources, rangeland health, and recreation opportunity, we still have a long way to go. And in general we have no agreed-upon standards for determining when such resources are being threatened beyond what is acceptable, as we do for the "quantified" resources such as air and water and toxic chemicals. This is much more serious, and is the focus of my remarks a bit later on.

Number five is a structural and management problem I see whenever I go into an organization to work with their analysis teams: both government and many private sector consultants fail to consider cumulative effects throughout the impact analysis process. Instead, they try to tack it on at the end, with less-than-stellar results. Probably all of us have been guilty of that early in our careers -- best practices have evolved over nearly 40 years, but many current practitioners remain at a mid-1970s level of understanding.

Finally, the lack of data at an appropriate temporal or geographic scale will continue to plague our analysis until we develop the on-the-ground capability to conduct surveys and analyses at the local level. I am working on a series of proposals for our incoming Administration which will be directed toward remedying this problem. We can't go back and retrieve data that never existed, but we can do better at identifying current conditions and, over time, we can develop a solid long-term and detailed database for resources of concern.

Most practitioners do understand that multiple instances of the "same" project have the potential for creating cumulative effects; here are a few coal-bed methane drill pads in western Wyoming…They are located in an area called the Jonah Field, south of Pinedale, Wyoming, and their cumulative patterns can be seen from space (the last picture is about 35 miles from top to bottom).

But even here we face the challenge of lack of data at the appropriate scale, and lack of relevant and measurable thresholds for resource impacts. The potential for habitat fragmentation, vegetation and wildlife disruptions, ground water and air and noise and light pollution, and creation of boom-and-bust economic patterns are obvious; yet the EISs that covers these and similar developments in the oil fields often estimate potential cumulative impacts in the only units readily available across these vast distances: acres. As long as the total acres of disturbance -- of all kinds -- remains less than the total estimated in the plan, the cumulative effects are viewed by the agency as acceptable.

Over the years, I have been involved in cumulative effect analyses for many kinds of projects: land use plans, water development projects, oil and gas development projects, ski area expansions, you name it. Most of my work in recent years has been with the mid-level threshold analyses called Environmental Assessments. Because of Misunderstanding #1, 2, and 3, many practitioners mistakenly believe that if there is only *one* oil well, or grazing permit, or road segment, or wild horse gather, or fence line, or motorcycle race, there could not possibly be any "cumulative" effects. After all, there's only one project! And MY project has no significant impacts…

But most of these small scale projects, if they are not excluded from analysis altogether (and each agency has its own list of Categorical Exclusions) can and often does have a small, finite but non-significant impact on the environment. The problem is, that because of Misunderstandings #4, 5 and 6 there is no consistent way to evaluate these "threshold analyses" to ensure that their aggregated effects -- their cumulative effects -- are not significant.

Recently I have had the privilege of being involved with two projects that attempted to develop regional frameworks for evaluating cumulative effects, including identifying and analyzing available data sets, setting criteria and thresholds, and determining magnitude and significance of expected effects. I would like to share some insights gleaned from that experience.

The first, sponsored by the Colorado Department of Transportation (CDOT) under the auspices of the Federal Highway Administration (FHWA), sought to lay out a regional context for decision-making that could be usefully applied to four independent highway construction projects within El Paso County, Colorado. We brought together two panels of experts, held numerous panel meetings and several public meetings over a period of about a year, soliciting input about which natural and cultural resources to explore further (including community and other social components), with the ultimate goal of establishing explicit criteria and thresholds of value for the various resources of interest. We hoped the resulting report, Sustaining Nature and Community in the Pikes Peak Region, would provide sufficient data on past, present, and reasonably foreseeable future projects such that evaluations of cumulative effects could easily be conducted for each of the four proposed highway projects.

Alas, it was not to be. Relevant data, even at the regional scale, were missing altogether; or were available only in incompatible scales or formats; or were not available for the relevant time period;

or were so fragmentary as to be misleading at best. The report instead became a narrative overview of regional history and resource concerns; a worthwhile contribution to scenario-building but not very helpful for on-the-ground applications.

The second project, also sponsored by CDOT and FHWA, sought to remedy these problems by focusing on a study area with a (comparatively speaking) large quantity of data; assigning the project to a university so as to avoid the time and cost constraints of private-sector research; and enlisting the support of literally hundreds of consultants, cooperators, technical advisors, workshop participants and student researchers. The resulting report, Area-wide Coordinated Cumulative Effects Analysis - Part I, took over 4 years to prepare, and outlined the process and results of the analysis. The major objective of the project was to identify suitable data sets, metrics, and methodologies for future cumulative effects analysis of highway projects in the Denver, Colorado metropolitan area.

Alas, it was not to be. Although data were gathered and evaluated from 60 sources, and over 100 metrics were examined and evaluated, the results were disappointing to nearly everyone involved. Problems arose again of data integrity and availability; of failure to agree on criteria and thresholds for impacts or resource values; and of limited applicability of the spatial accounting methodology by actual highway engineers in the field.

I think one major result of these two projects, however, lies simply in helping us identify the principal gaps and shortfalls in our thinking about cumulative effects, at least in the US. It is one thing to complain about short timeframes for analysis and missing data and lack of staff expertise when you are trying to figure out the aggregate effects of THIS half-mile of fence line when added to the past 150 years of fence construction on western rangelands. It is quite another to realize that even a long-term project with the best and the brightest university scholars can't answer the important questions about data, thresholds, and methodologies either.

So what is the solution?

I want to be very selfish here. I have labored in this EIA garden for 35 years, and I want some help -- for myself, for my clients and students, and for all the isolated EIA practitioners in small federal agency offices throughout my country who try to do this work every day.

First, we have to begin to fill the data gaps. This will not be cheap, easy, or fast. But once we are all focused on this, we can develop the mechanisms to make it happen. I am thinking of programs such as Man and the Biosphere, International Geophysical Year, the USGS section-mapping program in the 20th century, etc. Each of us in our nations can work to create suitable field inventory programs and get them funded, whether through universities, agencies, NGOs, the World Bank, or the UN.

And, I think the IAIA members should take the lead, as they have in so many other aspects of EIA professional practice, and take at least 4 future actions:

1. Collect examples of failures, successes, methodologies, applications -- this conference is a great beginning. By making the proceedings widely available we can go far to update the now more-than-ten-year-old collection of examples published by the US Council on Environmental Quality in 1997.

2. Develop some appropriate Sector Guidelines for various project types, along the lines of those developed by many governments and other entities for direct and indirect impacts. We all know in general how the environmental effects from pipelines, housing or industrial estates, mines, forestry projects, roads, fences, etc. accumulate -- we should write down our knowledge and use it to enhance day-to-day practice in the field. This may or may not lead to development of suitable metrics, but it should lead to helpful conceptual tools such that practitioners can focus on what are known to be important cumulative effects for various project types.
3. Ultimately, it would be extremely helpful to compile a list of Best Practices, culled from existing government or NGO guidelines and the collected examples and success stories.
4. Finally, with a nod to 21st century technology, IAIA could sponsor an international wiki for practitioners, a collaborative workspace where practitioners could post examples, questions, guidelines, proposed criteria, works-in-progress, comments, problems, solutions -- including documents, maps, links, blogs, photos, all the paraphernalia of cumulative effects analysis in the modern world. We could either charge a small fee to participate, or include it as a benefit of IAIA membership. I will happily volunteer to lead such a project, as such applications of collaborative technology are very exciting to me personally and I believe them to be a big part of the wave of the future.

So, send me your thoughts: here is my email address. Better yet, visit our web site -- ETCI sponsors both a blog and a wiki, on which I will post a version of this paper: post a comment, let's get a discussion going, it can only benefit us all. Thank you for your attention.

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