

SB202: Task Force on Independent Scientific Review for Natural Resources

Benefits and Disadvantages of Independent Scientific Review: Themes from the Literature

Objective 1.1 is to evaluate whether natural resource agencies, state legislators, and the public would benefit from independent scientific reviews.

Introduction

A literature search was conducted on the benefits and disadvantages of independent scientific review (ISR). The search was systematic (e.g. search terms, databases and search results documented) but not comprehensive. Databases and search strings searched:

1Search - "external peer review"
1Search - "external scientific review"
1Search - "external scientific review" AND benefits (no filters)
1Search - "independent scientific review" AND benefits
1Search - "independent scientific review" (no filters)
Academic Search Premier - "independent scientific review" and benefit OR benefits
Academic Search Premier - "independent scientific review" and natural resources
Academic Search Premier - "external scientific review" AND benefits
Academic Search Premier - "independent peer review" AND natural resources
Academic Search Premier - "independent scientific review"
Academic Search Premier - "independent scientific review" AND natural resources
Web Of Science - "independent peer review" (topic)
Web Of Science - "independent scientific review" AND benefits (topic)
Web Of Science - "independent scientific review" (title, topic)
Web Of Science - "external peer review" (title, topic)
Web Of Science - "external scientific review" (title, topic)
Web Of Science - "scientific review" AND "natural resources" (topic)
Google Scholar - "independent scientific review" AND benefits
Google Scholar - "independent scientific review" AND "natural resources"
Google Scholar - "external peer review" AND "natural resources"
Google Scholar - "external scientific review" AND benefits
Google Scholar - "external scientific review" AND "natural resources"
Google Scholar - "regulatory peer review" AND "natural resources"

Initial search results were "coarse filtered" for relevance, i.e. titles and/or abstracts scanned. Promising documents were then analyzed in more depth to ascertain relevance and extract relevant content-roughly defined as any concrete statement of a discrete benefit or drawback of an independent scientific review process. The terms *external scientific review*, *independent peer review*, *external peer review*, and *regulatory peer review* were treated as synonymous if the context for their use indicated that was

appropriate. For consistency and brevity, those terms were changed to the acronym “ISR” in this summary

Categories of benefits and disadvantages of independent scientific review identified by this process are listed below, along with examples from relevant documents (paraphrased in most cases). In some cases, the benefits and disadvantages were submitted and defended as such by authors. In other cases, they were “purported by advocates” or cited from other literature.

Following the list of benefits and disadvantages, a few of the most useful and insightful references on the topic of independent scientific review are listed in a short annotated bibliography.

Perceived BENEFITS of independent scientific review

1. Science “quality control”- ISR can help ensure that agencies are using the “best” (most complete, up-to-date, agreed upon) science in support of their policies and regulations.

ISR can help ensure that environmental decisions and policy making reflect the best scientific knowledge of the day.

ISR can help ensure that best available scientific knowledge is brought into the decision or policy-making process.

ISR can help establish general acceptance or consensus on science basis, and expose flaws in scientific evidence on which an agency relied.

ISR, if rigorously applied, could detect cases in which an agency attempted to oversell what its scientific case supports, and thus would be likely to encourage agencies to be more careful in their search for, selection, and interpretation of scientific data and research.

ISR can serve as an important source of scientific information and as a quality assurance mechanism.

ISR can help avoid errors in science synthesis and use, including 1) incomplete presentation of available information and conclusions that would not be drawn if the complete information base had been considered, 2) misinterpretation of scientific findings, 3) misrepresentation of scientific findings, 4) inappropriate emphasis e.g. on particular mitigation strategies that are not supported by scientific findings.

To the degree that ISR produces better quality information upon which agencies base their decisions, ISR also improves the quality (or correctness) of those decisions.

ISR improves the quality of reasoning employed by the agency to make these decisions by detecting holes and flaws in the data intended to support regulatory action, which should ultimately lead to a more complete and well-reasoned [administrative] record that acknowledges flaws and uncertainties inherent in the data.

ISR can help ensure that all relevant information is considered and evaluated, and that all conclusions drawn are consistent with the available scientific information.

Because of resource constraints, agencies may do an inadequate job of addressing complex scientific information on their own. ISR may help counteract such agency tendencies toward superficiality.

2. ISR can increase the credibility and legitimacy of the policy in eyes of public, lawmakers, stakeholders and courts

ISR can raise the level of public trust in the process, alleviating fears that industries, environmental protection organizations, or government agencies are simply promoting their own interests or moving ahead without benefit of relevant scientific information.

ISR can lend additional legitimacy to agency decisions by holding agency scientists accountable to external peers.

ISR can help ensure that influences of bias and special interests are minimized in environmentally relevant decisions or policy making

By improving the scientific quality of risk assessments, ISR can provide a scientific “seal of approval”. This is sometimes seen as an effective shield to deflect criticisms from adversaries of the policy, e.g. industry or environmental groups.

ISR can serve as a source of scientific credibility and legitimacy for decision making.

Wisely designed ISR can lead to greater legitimacy of agency decisions in the eyes of the public, legislatures, and the courts.

ISR processes are designed to add to the credibility of the information being applied in policy-making and contribute to the legitimacy of the overall decision-making process.

3. ISR can help reduce costs, and increase efficiency in natural resource policy making, particularly by reducing the likelihood and susceptibility of the decision to legal challenge.

The additional time and effort associated with ISR early in the policy making process may provide later dividends if the review reduces the likelihood of successful judicial challenges.

The additional legitimacy ISR can lend to agency decisions can help make these decisions more resistant to legal challenge and thus reduce costs of controversy.

By improving the quality, reasoning, and transparency of policy making, ISR will make policies more likely to withstand judicial scrutiny and ultimately reduce the costs imposed by judicial review. This is especially true for policies that involve complex scientific issues because courts tend to defer to agency expertise on scientific matters.

Extra effort invested in ISR early in the process is likely to provide a net benefit by reducing the prospect of challenges to a regulation that later may trigger time-consuming and resource-draining litigation.

4. ISR can improve policy by helping to clarify the line between science and policy judgments, by making policy judgments more explicit, and more clearly delineating risks and uncertainties

One benefit - perhaps the chief benefit - that could reasonably be expected to derive from the use of ISR is that it would encourage agencies to provide sharper delineations between scientific and policy bases for decisions.

ISR can help decision makers focus on the objective, scientific variables apart from economic, historical, or cultural factors

ISR can help ensure that risks associated with different interpretations of data or alternative management decisions are articulated

To the degree that ISR improves the quality of agencies' use of science, it should also improve agencies' policy deliberations by providing more confidence in the scientific input and more explicit delineation between science and policy in the justification the agency presents for its final decision.

ISR can help inform the public about where an agency's use of science in support of a proposed decision ends and where its use of professional judgment and normative policy choices begins.

5. ISR can help increase the transparency and openness of natural resource policy making to public, administrative and legal oversight.

ISR can improve oversight of agencies by providing increased transparency for lawmakers, administration officials, courts and constituent groups.

ISR can help ensure that decisions or policies are achieved in an open and transparent manner.

ISR can help ensure that assumptions are made explicit.

ISR increases the transparency of agency reasoning by revealing the underlying facts, assumptions, and judgments that combine in every policy based on scientific data.

ISR, when properly conducted, is a critical component of the objectivity, transparency, and openness desired to instill public confidence in regulatory decisions.

ISR can also increase transparency by pointing out limitations in the data, unconventional scientific judgments, or places where policy judgments must have been made.

Wisely designed ISR can lead to greater transparency in agency decision processes.

6. Involvement of independent experts enhances collaborative, social learning about the issues, science, and policy options among agencies, scientists, and the public. This collaboration can expose novel policy options and enhance public participation.

ISR can facilitate learning and help improve public understanding, and thus deliberation and political participation on an issue.

ISR can improve policy deliberations by creating opportunities for collaboration and dialogue with other experts.

ISR can uncover alternative approaches or solutions to policy problems and provide new information to guide future agency decision making and research.

Because authority is highly decentralized in the legislative, judicial and executive branches, examining science and technology issues in a single ISR process can help bridge mandates and responsibilities.

Regulatory agencies can benefit from ISR if non-agency scientists can bring additional expertise and perspectives to the table, especially in cases where advances in science outpace the training of agency specialists.

ISR entities can help build trust in groups of technical experts from different agencies by keeping debates scientifically grounded and ensuring that arguments over analyses and results are based on facts, not agency positions, and serving as arbiter of alternative hypotheses put forward by different scientists.

Public comments on proposed regulations rarely come from truly independent parties because the time investment is only worthwhile for those with a stake in the outcome. In contrast, ISR allows agencies to hear collaborative criticism from independent experts, a process that is more likely to actually help the agency improve its understanding and use of science.

ISR can function as a forum for sharing and collaborative learning about science information in environmental governance groups, e.g. the NWPCC. Scholars of adaptive management have long argued that such "learning organizations" are critical for resource managers to learn which types of management strategies work best. The NWPCC use of its ISAB to review plans and the state of knowledge on fish and wildlife management in the basin supports this process.

Periodic ISR of ongoing (multi-year) natural resource management programs provides critical assessment of progress and potential for success, and concomitantly, it can be used to build program support. By addressing barriers to success identified during follow-up ISRs, managers can improve the probability of success directly through targeted changes, and indirectly through renewed interest and support generated by responding to ISR recommendations.

Perceived DISADVANTAGES or DRAWBACKS of independent scientific review

1. Disincentives to ISR use- financial and human resource costs, distraction of agency resources from other work, procedural hurdles, delays in getting policies implemented.

Increased use of ISR will undeniably impose costs on agencies.

ISR can slow the agency process to the point of frustrating agencies' missions to protect the public welfare.

Inflexibly mandating rigorous ISR can add substantial demands on agency resources, potentially draining resources from other decision making components and, in many cases, impeding decision making altogether.

If ISR were to significantly lengthen the decision process, it is possible in some cases that an agency would be unable to act before it is too late, e.g., allowing an endangered species to move ever closer to extinction while the agencies engage in further process.

Potential for ISR procedural hurdles can be a disincentive for agencies to promulgate new policy.

Overuse of ISR can delay or even destroy decision processes and needlessly use up limited staff time and funds.

The prospect of ISR may be a disincentive for an agency contemplating issuing or revising regulations. Some observers call this "paralysis by analysis".

If it does not help steer an agency early in the process, ISR may become an ominous hurdle for agencies to surmount, both in terms of the difficulty of undergoing that scrutiny and because of the prospect of judicial invalidation triggered by the inevitable criticisms from ISR.

There is a real risk that benefits of ISR are not be worth the cost to the public in terms of health and environmental effects attributable to diverted agency resources, delayed access to information, and delayed implementation of rules.

2. Misuse of ISR by stakeholders, "politicization" of the ISR process, using it as a stalling tactic, to manufacture or exaggerate uncertainty, to delegitimize the agency and its decision, fan public distrust.

ISR can further politicize the decision making process.

Sometimes regulated entities will persuade lawmakers to convene an ISR as a way of delaying agency action.

ISR in natural resource and environmental policy arenas inevitably exposes data/knowledge gaps and uncertainties, which regulatory opponents may manipulate for political reasons [especially in post-hoc reviews].

In some recent cases, ISRs [NRC] have ultimately, but unwittingly, served as political tools wielded by influential lawmakers to delegitimize environmental decisions on behalf of agricultural interests.

ISR in natural resource and environmental policy arenas inevitably exposes data/knowledge gaps and uncertainties, which regulatory opponents may exploit for political reasons in efforts to delegitimize agency decisions and erode public support for them.

Post-hoc ISR may function more as a "science court" brought in to try to resolve conflicting positions on issues that transcend science. This may serve mainly to promote conflict rather than resolve it.

Unnecessary calls for ISR could be used to mire regulatory agencies in a host of new procedural requirements that would make the task of promulgating regulations even more difficult, sidetrack policy, or stall decisions.

Rather than make technical corrections to science information, industry groups often misuse ISR to attack policy judgments and delay information dissemination.

“Paralysis by analysis” describes the ability of a well-financed regulated industry to fight new regulations at every step of the process, delaying potentially costly regulations for years through the use of every procedural tool a small army of attorneys can find. ISR can serve as one such procedural tool.

ISR is often used as a back door tool for disputing assumptions about acting in the face of uncertainty and challenging unfavorable policy judgments and decisions made pursuant to environmental, health, and safety statutes.

Most natural resource conflicts boil down to disagreements over values and priorities. By focusing attention (and encouraging arguments) on the science basis of agency decisions, ISR can distract stakeholders and the public from the policy rationales and values underlying those decisions, thereby exacerbating conflict rather than alleviating it.

The "sound science" argument is born of the understanding that it is much easier to oppose a regulation for being based on faulty science than it is to oppose it based simply on costs to regulated industries and the public. Avoidance of responsibility by questioning the validity of data is a classic tactic of industries whose activities may be causing harm. Attacking the information that an agency intends to rely upon in policy or rulemaking can be an effective way to prevent or delay regulation, and ISR may potentially be an effective antiregulatory tool.

Rather than genuine concerns about the quality of science used, proponents of ISR may actually be more concerned with the "presumption of protection" built into environmental regulations. ISR is not the appropriate means to address disputes over the proper level of regulation.

3. Misuse of ISR by agencies, lawmakers or reviewers; tendency of agencies to ignore unfavorable recommendations.

Agencies may sometimes invite ISR in order to defer making a decision.

There is the potential that ISR, rather than eliminating bias from agency decisions, will actually exacerbate these concerns by allowing agencies to mask their biases with the veneer of science.

In some cases, agencies may use ISR to support their decisions rather than as a critical outside check on the accuracy of their decisions. In worst cases, ISR can become a cynical exercise, allowing agencies to manipulate the process and rig outcomes (e.g. by cherry-picking reviewers) to justify agency decisions that might not withstand legitimate peer scrutiny.

Relying too heavily on ISR to render judgments that inherently involve policy choices can result in shifting problems rather than solving them and reducing agency accountability by abdicating policy formulation to unaccountable outside experts.

ISR panels may implicitly invoke the higher evidentiary standards used in research settings rather than the more deferent "arbitrary and capricious" standards typically afforded agencies in legal settings. This shift

upward in evidentiary standards and burden of proof can reduce the ability of agency policy actions to withstand legal challenges.

One hazard of making ISR comments part of the administrative record is the tendency to focus on the inevitable, usually constructive, criticisms found in any ISR peer review report and take them out of context.

Policymakers sometimes conflate ISR with science itself, which in turn may lead them to exaggerate the possible utility of ISR in decisions based on science. Ultimately ISR cannot and should not displace the broader deliberative process about hard policy questions that science cannot answer.

Without a clearly defined role for the ISR, recommendations that are not well-received by public officials and agencies are often ignored or have a small role in the final decision-making.

The following papers were the most useful and relevant found to date

Independent Scientific Review in Natural Resource Management. Gary K. Meffe, P. Dee Boersma, Dennis D. Murphy, Barry R. Noon, H. Ronald Pulliam, Michael E. Soulé and Donald M. Waller. *Conservation Biology*. Vol. 12, Issue 2, p268–270, April 1998. Available online at: <http://www.botany.wisc.edu/waller/PDFs/Meffeetal1998.pdf>

- **Note:** This short (3-page) note is fairly commonly cited in literature on ISR.
- **Summary:** Makes a case for, and describes benefits of ISR in improving integration of science into environmental decision making. Discusses these questions: Why is ISR needed? What are the goals of ISR? What constitutes an appropriate “independent reviewer?” Under what circumstances should ISR be conducted? When in the process should ISR be conducted? Who should coordinate the ISR process in individual cases? What is a good format for ISRs? Should reviewers be compensated?

In Defense of Regulatory Peer Review. James Salzman & J.B. Ruhl. 84 *Washington University Law Quarterly*. 2006. p.1-48. Available online at: http://scholarship.law.duke.edu/faculty_scholarship/1599

- **Note:** Legal analysis of ISR (termed “regulatory peer review”) in context of Bush-era “sound science” movement, Klamath Committee NRC report and controversy, and passage of the Information Quality Act and subsequent OMB guidelines mandating peer review for a wide variety of government information.
- **Summary:** Defines and discusses peer review in research context, and applying peer review in regulatory context. Includes sections on the cases “for” and “against” regulatory peer review. Useful explanation of institutional biases and pressures that could lead agencies to systematically overstate how much the available science supports a particular policy decision. Discusses potential benefits of ISR. Provides a template for applying ISR that includes steps and questions that reviewers should answer. Addresses potential shortcomings, pitfalls and criticisms of ISR.

Scientific 'Republicanism': Expert Peer Review and the Quest for Regulatory Deliberation. Noah, Lars. Emory Law Journal, Vol. 49, 2000. Abstract available at:

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=266963

Full text available through Lexis-Nexis.

- Note: Similar in some ways to paper above.
- Summary: Discusses pros and cons of routine use of ISR to referee the work of federal regulatory agencies. Notes that ISR represents something of a throwback to New Deal enthusiasm for decision making by expert regulators and a repudiation of more recent conception of agencies as forums open to wide interest group representation. But by harnessing nongovernmental expertise and retaining current mechanisms for review by nonexperts, regulatory peer review may help agencies aspire to the deliberative ideal recently espoused by political scholars.

Discusses different modes of peer review used in the scientific community, existing forms of ISR, and introduces competing conceptions of the process. Suggests that as a supplement to opportunities for supervising agency actions, the benefits of early brainstorming should counterbalance concerns about associated costs of ISR. But if viewed as a substitute for public involvement in, or judicial review of, agency decision making, ISR will not live up to its potential. Concludes by suggesting ways of integrating ISR with existing rulemaking procedures and avenues for judicial review to maximize the potential utility of ISR.

Reassessing the Role of the National Research Council: Peer Review, Political Tool, or Science Court? Fein, Ian. California Law Review. Vol. 99 Issue 2, p465-555. April 2011. 91p.

Available online (PDF) at:

<http://scholarship.law.berkeley.edu/cgi/viewcontent.cgi?article=1045&context=californialawreview>

- Note: Long (91-page) paper, the bulk of which is a blow-by-blow summary of various stages in three recent National Research Council (NRC) reviews and associated natural resource controversies. Material relevant to the SB202 Task Force is mainly in the introduction and summary/conclusions.
- Summary: Assesses benefits and drawbacks of ISR through the lens of three recent NRC reviews. Paints a picture of increasing politicization of NRC reviews in recent years. Explains how ISR can be misused, how framing the charge assigned to the review panel influences its work, and the role of the press in high-profile ISRs. Discusses how conflation of science and policy complicates natural resource conflicts, and how ISR can both exacerbate and mitigate this. Conclusion summarizes benefits and pitfalls of ISR, and several ways to maximize the benefits and minimize the costs of the NRC's future regulatory peer reviews.