

Environmental Assessment and Risk Analysis Element



Research Project Summary

May, 2003



Communicating Status and Trends in Environmental Quality: Reactions of Legislative Staff, Reporters, Activists, and Citizens

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Abstract

When agencies wish to communicate the status or trend in an environmental condition (for example, whether ozone levels currently exceed the federal ambient standard; whether ozone levels have been declining in the past 20 years), they often use quantitative information, particularly in the form of a chart or graph. This research project explored how various audiences would react to visual presentations of status and trend measures across a variety of environmental topics (air quality, drinking water quality, endangered species, etc.). The general reaction was positive, although people attentive to government (legislative staff, reporters, activists) were more skeptical about the information than were ordinary citizens. Making status and trend presentations understandable and accurate can be a problem, and many citizens made the error of inferring local environmental conditions from measures that used statewide data only.

Introduction

Environmental status and trends measures allow citizens and stakeholders to better understand environmental conditions in New Jersey, the factors that affect status and trends, and what conditions need further attention to achieve desired goals. This purpose will be achieved only if those audiences understand, value and trust New Jersey Department of Environmental Protection (NJDEP) status and trends information, and hold NJDEP accountable for such trends to the extent appropriate (but no further). Direct interaction with citizens and stakeholders to get their evaluation of environmental status and trend measures is the only reliable approach to determining whether these communication goals are being achieved.

Thus the purposes of this research project were to (1) determine stakeholder (legislative staff, environmental activists, reporters) and citizen interests in, and reactions to, status and trend information; and (2) test the impact of various status and trend measures on public beliefs and attitudes about environmental quality in New Jersey.

Methods

The project included qualitative and quantitative approaches. Qualitative research uses individual or group interviews to understand the variety of viewpoints on this topic. This is particularly useful given the lack of previous research on non-experts' reactions to environmental trend and status measures. By contrast, a state-wide survey aims at getting quantitative data from a representative sample, to better allow generalization.

The measures selected for qualitative study were taken from the 130 measures in NJDEP's Environmental Indicators Technical Report (1998). These included:

- Water Quality: (1) beach closings (due to high

- fecal coliform counts); (2) stream quality as measured by benthic macroinvertebrates; (3) facilities in "significant non-compliance" (i.e., repeated serious violations of their permits) regarding pollutant discharges to surface water; (4) shellfish waters open for harvesting
- Air Quality: (1) days ozone exceeded the health standard; (2) vehicle miles traveled

A focus group with NJDEP staff clarified the messages they wished to convey with status and trend measures. Open-ended interviews and focus groups were then conducted with 37 members of groups that are key intermediaries between the agency and the public: environmental advocacy groups, journalists, and legislative staff. Revisions to graphics and text were based on reactions from these groups, and the revised measures were then shown to two members of each of the three stakeholder groups, and to 21 members of the general public from four civic organizations in central New Jersey.

The quantitative (survey) test of reactions to trend information included eight measures from different NJDEP programs and showing different trends:

- Improving
 - shellfish harvest—75% shellfish waters open in 1976, 89% in 2001
 - bald eagles—nests and chicks at one each in 1982, at 27 and 34 in 2000
- Worsening (solid waste per capita—increasing 1985-1995, roughly static since)
- Trend slightly ambiguous
 - drinking water standards—97%-99% compliance with microbiological standards, with 98% goal; 87%-93%

compliance with chemical standards, 95% goal

- recycling—increase to 61% by 1996-7, decline to 53% by 2000
- higher-risk pesticides—slight decline, drop and slight rise in total pesticide use
- Trend highly ambiguous
 - beach closings—differing trends for ocean and bay beaches; 1994-2000 trend marked improvement for both, but worsening in 1999-2001 period
 - air quality—unhealthy days decline under old standard through 1997; new standard thereafter shows decline but at higher level

Surveys were sent to a random sample of 800 households in New Jersey during the summer of 2002. The overall response rate was low (19%). Respondents tended to be older (mean age 55), educated, wealthy (48% with household incomes \$75,000 or better) white males. The results should not, therefore, be generalized to the entire population of New Jersey.

Results and Discussion

Qualitative Research

Direct Relevance. Stakeholders felt that the direct relevance of the data to public and environmental health needed to be outlined. Indeed, most members of the general public wondered how the data related to their daily lives, as when people viewing a statewide "Stream Water Quality" measure wanted to know if it could tell them whether they could fish or swim in a particular river.

Unfamiliar Concepts. Members of the general public were surprised, and some were angered, by standard approaches to environmental protection. Examples included shock that treated sewage is discharged into oceans or to rivers used downstream as water sources, companies are permitted to release pollutants, and companies often report their own monitoring data.

Data Collection. Many interviewees' interpretation

of the data reflected their assessment of the reliability and validity of methods used to collect the data, and their trust in the agency that collected the data.

Color. Nearly everyone interviewed suggested that color be used to display the graphics. We chose not to use color in these research graphics because of concern that intermediaries, such as journalists and environmental organizations, were likely to copy materials in black and white, a "translation" that can lead to communication difficulties.

Graphical Data Displays. Developing easily understood graphic representations is very difficult. Some were misunderstood even after a great deal of revision to make the graphics clear, including such design elements as size, titles, labels of axes, and scale.

Writing Well. Writing that seemed "bureaucratic" tested less well. In some cases, intermediaries saw unclear writing, bureaucratic or otherwise, as deliberate obfuscation. Jargon, acronyms, and use of the passive voice all seemed to contribute to such perceptions.

Intermediaries. The toughest critics of agency data were reporters, members of environmental groups, and legislative staff. They wanted detailed information and said they were likely to use it. However, they were prone to question the reliability, validity or completeness of the data, and to distrust the agency's motives.

Trust. Intermediaries, in particular, were sensitive to what they saw as "spin," and distrust increased with any cue they perceived that the selection or presentation of measures was motivated by a wish to show environmental quality in a positive light.

Quantitative Research

Those who responded to the survey were optimistic about environmental progress, with 53% indicating that the New Jersey environment was getting much better or slightly better (14% slightly or much worse; 13% not changing; 15% see no trend). Environmental quality was moderately important to them: more than 75% agreed that when the

Evaluation Measures (% agree, unless otherwise specified)	Recycling	Solid Waste	Pesticide	Eagles	Beach Closings	Shellfish	Drinking Water	Air Quality
Easy to Understand	78	91	72	83	68	76	89	76
Accurate Knowledge (avg. correct for two questions asked)	80	90	56	80	60	82	88	51
Shows Serious Risk	55	64	53	42	51	22	21	54
Believable	82	93	86	91	68	84	74	82
Make Publicly Available	96	92	95	89	88	92	85	82
DEP Responsibility								
A lot	32	23	31	28	28	48	34	31
Some	46	44	23	47	32	28	43	37
A lot + Some (sum of two rows above)	78	67	54	75	60	76	77	68
Trend								
A lot better	6	3	3	39	22	52	17	6
Slightly better	10	10	67	50	52	36	57	46
Slightly worse	60	46	6	3	0	0	3	11
A lot worse	10	31	0	0	4	4	3	9
Other (no change; no trend; other)	14	10	24	8	22	8	20	28

topic of environmental quality came up, they “try to learn more about it,” but 68% were content to let information on environmental quality come to them “in the course of my daily life.”

Table 1 shows reactions from survey respondents, discussed in more detail below.

Clarity. Most respondents reported each measure easy to understand. But respondents’ perception of their understanding was negatively correlated with actual knowledge. NJDEP cannot assume that people understand a trend presentation because they say they do, but must test that understanding to assure that the information is interpreted correctly.

Respondents were prone to misinterpret the information as presented. This included inferring information about specific local conditions from statewide measures: 51% erroneously agreed that these measures showed “what environmental conditions are like where I live” (past research shows “where I live” is usually interpreted as referring to the community level if left undefined), and 41% erroneously agreed that the information showed “whether certain areas of the state” had conditions related to the specific measures they had just observed. Over half also were willing to say that the information was helpful in showing “what environmental issues are most important for government to address,” although no comparative information was shown.

Perception of seriousness. Respondents’ perceptions of seriousness of the problem varied considerably, with roughly equal proportions perceiving both, one and neither of the two topics whose trend data they saw being serious problems. Perceptions of seriousness were not correlated with whether the trend was seen as getting worse or better. However, the two issues for which the trend was seen as getting worse, recycling and solid waste, were also seen as among the most serious.

Credibility. All trend presentations were believable to a majority. Credibility might, however, reflect personal familiarity with the issue, through direct experience or exposure to mass media coverage.

Public availability. Regardless of confusion or credibility, solid majorities agreed that the data should be made public. This is consistent with other studies showing that citizens tend to say they want more information on all kinds of environmental issues.

NJDEP responsibility. Roughly a third of respondents saw NJDEP as having “a lot” of responsibility for all environmental conditions; nearly half thought that NJDEP was responsible for water quality associated with opening of shellfish beds. These results imply that citizens are inclined to use status and trend data for environmental conditions as a “report card” for the agency, whether NJDEP intends this result or not.

Trend. Respondents’ and researchers’ interpretations of the trend in each presentation were generally in agreement.

Conclusions for Communication about Status and Trends in Environmental Quality

The qualitative and quantitative responses both indicate that pre-testing of status and trends

information is essential before release. Information that scientists found understandable was not necessarily understood by those outside the agency. Because readers can respond in ways that even the best hunches cannot predict, measures that agencies wish to use extensively should be pre-tested in advance with their intended audiences.

1. **Clarify the potential roles of NJDEP and other institutions or individuals.** The measures convey environmental trends, not what to do about them. In the absence of other information, most people hold NJDEP primarily responsible (which, of course, may be correct in some cases).
2. **Outline the measure’s direct relevance.** Agencies need to anticipate ways people may want to use the data and make the measures as useful as possible for those purposes. To avoid inappropriate conclusions, the text accompanying measures should include warnings about how the data should not be used (for example, to infer local conditions when only state-wide summary data are used).
3. **Explain unfamiliar concepts,** such as self-reported industrial monitoring. Simple explanations may reduce negative reactions. At minimum, agencies should expect and prepare for the reaction.
4. **Explain data collection.** When portraying environmental data, clearly explain how these data were collected and confirmed. Pointing to other groups that can verify the accuracy of these data, or suggesting how an audience might themselves collect verifying data, may help to decrease distrust.
5. **Use color with care.** Agencies often color their status and trend presentations, and audiences think color makes these more attractive and attention-grabbing. But color can create communication problems, on its own or when copied in black and white by others.
6. **Test graphical displays.** It is important to attend to the potential effects of each design feature (for example, choice of chart type, units for reporting data, jargon, coordinate labels, etc.). People do not react to these uniformly, nor can their reactions be accurately predicted on the basis of agency staff assumptions; draft graphics have to be tested directly with members of target audiences.
7. **Avoid bureaucratic jargon and other unclear writing.** At best, these characteristics confuse people; at worst, they foster suspicion that the measures are intended to hide information or mislead people. Jargon, for example, may be common and appropriate when status and trend information is conveyed to other officials and experts, but should be translated or at least defined carefully (with the definition tested with intended

audiences) for other uses.

8. **Take intermediaries' reactions seriously.** If agencies wish to communicate effectively with "the public," they may want to ensure that reporters and environmental groups, for example, understand and trust the representations of status and trend measures. Far more people may see the interpretations offered by intermediaries than will see those originating with NJDEP, and the skepticism they expressed in their discussions with us may affect those transmissions.
9. **Trust that people are able to accept negative information.** The opportunity to put only a positive spin on status and trend information may be tempting, but the negative reaction of intermediaries in our research suggests that agencies should clearly point out the positive and negative implications of environmental data. Even if some people may never accept positive results as true, NJDEP's willingness to point out alternative views, even if it concludes that environmental quality is indeed getting better, should help build trust in the rest of its audiences.

Funding

Environmental Indicators.
NJDEP/DSRT contract SR97-080.

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