NEW ENGLAND INTEGRATED SCIENCE AND ASSESSMENT

http://airmap.unh.edu/assessment/

1. Demand Side Assessment (Cameron Wake and David Brown)

1.1. Who are the major stakeholders for your RISA?

Table 1. Stakeholders currently engaged in the INHALE project.

UNH Departments and Institutes

AIRMAP
Institute for the Study of Earth, Oceans and Space
Office of Sustainability Programs
School of Health and Human Services
Whittemore School of Business and Economics
Masters of Public Health Program at the University of New Hampshire
New Hampshire Institute for Health Policy
Cooperative Extension

Key Stakeholders – Government Organizations

New Hampshire Department of Environmental Services
New Hampshire Health and Human Services
Vermont Health and Human Services
Maine Bureau of Health
EPA Region 1

Key Stakeholders – Non - Governmental Organizations

Lung Association (New Hampshire, Maine, New Brunswick)
Maine Thoracic Society
International Center for Air Quality and Health
Asthma Regional Council (ARC) of New England
Wentworth Douglass Hospital (Dover, NH)
Exeter Hospital
Portsmouth Regional Hospital
Dartmouth Hitchcock Medical Center
Penobscot Bay Medical Center
John Snow Institute
Harvard School of Public Health
Columbia School of Public Health
Northeast Regional Climate Center
New England Society of Allergists (NESA)

1.2. What processes are used to include stakeholders in the research planning process, the research implementation process, and the research reporting process?

Our collaboration with stakeholders relies upon early and continued communication and interaction, primarily via working meetings, e-mail and telephone calls, although we have also invited our stakeholders to formal science presentations and have collaborated/shard results during professional meetings.

1.3. How are stakeholder interactions evaluated?

The majority of our evaluation has been informal, and has been based upon our sense of successful collaboration

combined with requests from most of our stakeholders for continued interaction and collaboration. During our meetings with various stakeholders, we also often ask for direct feedback on our efforts. This is recorded and discussed within our group. We have not engaged in any formal independent evaluation of our efforts and in fact do not have the resources from the RISA program to do this.

1.4. What has your RISA learned from the process of stakeholder interaction, and how have its decision processes changed as a result?

Our stakeholder interactions have: (1) reinforced the importance and value of engaging stakeholders early and often, and having their views help shape the research questions; (2) encourage other individuals and institutions to become stakeholders in our assessment; (3) maximized benefits to our stakeholders; (4) provided deeper understanding of the key issues and how to deal with them; (5) taught us that public health professionals want to be connected with project whose focus in climate based and as a result we have been able to bring climate/air quality expertise to the table where it has not been well represented before.

1.5 How did you develop your process for eliciting stakeholder needs/wants?

We essentially learned as we went, once we had tapped into engaged networks in a variety of sectors. We listened respectfully to our stakeholders during several working meetings and informed them of our areas of expertise, and then developed key research questions together.

2. Supply Side Assessment (Tom Kelly and David Brown)

2.1 Briefly describe the research agenda for your RISA.

The NEISA project is a collaborative, interdisciplinary effort involving individuals from several departments, Institutes, and Program at UNH, the NH State Climatologist, the Northeast Regional Climate Center, and a comprehensive range of stakeholders. Our integrated assessment will continue to focus on the relationship among climate, air quality, and human health. Many studies have shown mortality and morbidity related to extreme temperatures, short term increases in criteria air pollutants, and pollen and mold events. All of these air quality measures (biological, chemical, physical) are influenced by seasonal and interannual climate variability. However, there remains much to be learned regarding the nature of the relationship among climate variability, these integrated measures of air quality, and the effect on human health. An improved understanding of these dynamic, non-linear relationships and a focus on developing decision relevant information will help reduce vulnerability to poor air quality in New England on seasonal and interannual time scales by improving adaptive capacities.

2.2 How does your RISA set its own research priorities?

Initially, based on information provided by a variety of previous research indicated that: (1) New England has a significant air quality problem (2) the fasted growing chronic disease in the US is asthma and prevalence rates are greatest in New England; (3) the situation is similar for COPD (4) health care costs are rising; (5) poor air quality has a significant impact on the economy via health care costs, worker productivity, and absenteeism; (6) air quality forecasts are available one day in advance but effectiveness of forecasts for protecting human health has not been examined; also forecasts reach limited audience. Stakeholders also provided additional details and texture to these major issues. Also, we are closely linked with the NOAA funded AIRMAP project whose focus in air quality, weather, and cliamte in New England.

2.3 How has this agenda evolved over the duration of the RISA? What new projects have been started that were not anticipated at the beginning of the RISA? What projects have been terminated, and why?

The project has evolved to include a wider definition of air quality (going from purely atmospheric chemistry (i.e. criteria pollutants) to a definition that encompasses biological, chemical and physical properties of air. It has also evolved from an initial focus on weather time scales to a focus on seasonal and interannual climate variability. Finally, our role has evolved as we have learned more of the wide variety of organizations and individuals working on the broader issue of environment and human health that while we are taking the lead (in collaboration with a few other university researchers) on the climate – air quality – human health issue, we also often a key stakeholder at the table dealing with the broader environment-health issue.

New projects started:

1. Fall rise in hospital services for asthma and respiratory problems link to fall rise in pollen (and mold?)
2. Developing example of how a systematic pollen and mold data collection network should function (physical and chemical properties of air already well tracked via EPA and NOAA)
3. Forecasting of winter snowfall and frequency of east coast winter storms based on SST, NAO. And ENSO

Projects Terminated:

1. High resolution (i.e., daily) air quality versus pulmonary function study. This study was a one time opportunity building on summer 2004 ICARTT campaign in New England

2.4 In your RISA, what is the balance between research on new subjects, and assessment/compilation of existing knowledge? How is this balance determined?

We are continuously integrating existing and new knowledge into our research efforts. The cycle of assessing – compiling – integrating – new research is ongoing and not one that is broken out into different bins. This may evolve as our project matures over time. Our direction is determined primarily via (1) discussions with engaged faculty and their students, and (2) needs/desires of our stakeholders.

2.5 Please describe the specific ways that knowledge is disseminated from your RISA. How would you assess the relative importance of various dissemination mechanisms, such as peer-reviewed publications, other types of publications, web-based presentations, public fora, etc.?

Dissemination occurs primarily via presentations and small workshops with our stakeholders, although dissemination also occurs via published papers and presentations at scientific meetings, via our web page, and via short reports written specifically for a broader, non-scientific audience. We assess the relative importance of various dissemination mechanisms via feedback from stakeholders. Published papers appear to be critical for reputation and for scientifically literate stakeholders (we provide links to our published papers and many other related published papers via a password protected area on our web site. This has apparently been very useful to a handful of our stakeholders). However, many of our stakeholders appreciate the public presentations, especially as we can provide them with the results of our most recent research and they are able to provide input to how the data is analyzed.

In the future we plan to disseminate many of our results via our recently improved web page (neisa.unh.edu). This includes access to newly developed database on air quality and a quarterly newsletter (that will also be sent out in print form).

3. Reconciliation/Managing Ecology of S&D (Tom Kelly and Cameron Wake)

3.1 In what ways have considerations of supply for research shaped the evolution of your research agenda?

- Greater emphasis on the influence of seasonal to interannual climate variability on air quality and human health
- Role of the North Atlantic Oscillation on New England climate variability
- The AIRMAP project focus on atmospheric chemistry
- Forecasts of opportunity that may be of use to health management
- Survey of worker productivity (poor air quality = lower productivity)

3.2 What tensions have arisen between stakeholder needs, demands, and expectations, and the scientific capabilities and priorities of the RISA? How have those tensions been addressed or resolved?

We have worked not to raise expectations by not presenting ourselves as the experts, but rather presenting ourselves as wanting to contribute to a larger effort on environment and health, but bringing a climate and air quality point of view.

In terms of stakeholder needs, there was a strong interest for quantification of the economic impact of poor air

quality along the lines of "if your research is going to influence policy, you need to determine the economic impact". As a result, we identified and invited into the project a health economist and business management faculty (Robert Woodward and Ross Gittell) and several economics and business graduate students, worked with the Ontario Medical Association to develop a New England specific model to calculate the illness cost of air pollution, and sought out additional stakeholders that brought an economic interest to the table.

There was a minor conflict regarding the temporal range of our initial analysis (primarily from the NOAA-RISA program) as we initially focused on weather (i.e. daily) time scales in our analysis. However, this was the primary interest of many of our stakeholders. We first approached the problem from the time-scales they were interested in, and have now begun the shift to seasonal-interannual time scales and are raising this climate based variability with our stakeholders.

We also identified the lack of a systematic pollen and mold monitoring/data archiving network as a major flaw in attempting to understand the climate – air quality – health link. To address this we have identified and brought in additional scientific expertise (John King from URI and Christine Rogers and colleagues from Harvard Medical School). We will continue to look for additional expertise as we identify new needs.

3.3 How does your RISA evaluate the appropriateness of stakeholder needs (e.g., from the standpoint of public/private sector roles and responsibilities)?

We have not evaluated the appropriateness of stakeholder needs, but have rather identified areas of their particular needs that we can help address. Our efforts are limited by the small size of our project. Our response to stakeholder needs is therefore driven by our own capabilities and what the project advisory committee feels we can deliver on.

As process matures, we expect to more explicitly manage our capabilities, or expand our capabilities where resources are available. We have also identified/collected/distributed products already developed by other institutions (e.g., EPA, Ontario Medical Association). Over time, we expect to be better able to focus our efforts (this in fact is already happening) as we clearly identify specific questions/issues that we can address (based on input from within RISA and our stakeholders).

3.4 How are stakeholders identified? Which stakeholder groups are most important in influencing your RISA research agenda? Why? Which stakeholder groups are least important? Why?

Stakeholders are identified via engaged networks of individuals working in this field (e.g., word of mouth, recommendations, personal contacts). Stakeholders that are most important in influencing our research agenda are those who share interest/concern for environment/health links AND who share the integrated assessment approach/philosophy. (and vices versa for least important stakeholder groups). Those individuals and institutions who mange their boundaries by putting up walls are not important stakeholders, while those individuals and institutions who mange their boundaries with porous walls and have adopted an integrated approach to problems are our most important stakeholders.

It is therefore not necessarily different stakeholder groups that are more or less important, but rather the characteristics of individuals and institutions within different stakeholder groups that make them more of less important (health insurance companies being on exception, but we are working on this through one of our key stakeholders). We therefore are part of an emerging community of inquiry working with progressive individuals and progressive organizations with common concerns and common outlooks. One criticism of this may be that the project will remain isolated. However, we see this as an evolutionary process and, if we are successful, our approach will be adopted by others. Right now we are, in a sense, working with the early adopters of the RISA approach to move our efforts forward. We have already experienced success in our relationships with early adopters – for example being invited to give a keynote address at a large asthma conference in New Hampshire and sitting at the table with the entire senior management team for Exeter Hospital discussing ways we can improve hospital management via data analysis and enhanced messaging to employees and patients around air quality forecasting and protecting your health.

3.5 How does your RISA evaluate its research planning process?

- Ongoing stakeholder participation and engagement in NEISA
- Regular meetings and discussion by advisory committee (quarterly) and core team (monthly or more frequent)
- Informal communication with stakeholders
- Funding from stakeholders; Reports to stakeholders

3.6 What lessons in the process of the reconciliation of supply of and demand for science are relevant to the broader implementation of the CCSP?

The mission of the U.S. Climate Change Science Program is to "*facilitate the creation and application of knowledge of the Earth's global environment through research, observations, decision support, and communication*" (CCSP 2003). The NEISA project plan proposed above integrates a wide range of research and observations on air quality, climate, and health performed by a variety of federal agencies, universities, other institutions, and NEISA to develop and evaluate a suite of decision support products in collaboration with our stakeholders. This collaboration relies upon early and continued communication and interaction with our stakeholders.

In particular, CCSP Goal 5 is to "*explore the uses and identify the limits of evolving knowledge to manage risks and opportunities related to climate variability and change*". This includes building on past experiences of the scientific and technical communities to develop decision support processes and products. NEISA will integrate and apply information from the natural and social sciences to provide our stakeholders with decision support toolkits that will reduce the risk of adverse health effects resulting from poor air quality and interannual variability in the hydrological cycle. Through this process we will address our primary objective of improving public health. In addition, two of the core approaches identified CCSP to meet its goals are decision support (develop improved science based resources to aid decision making) and communication (communicate results to domestic and international scientific and stakeholder communities, stressing openness and uncertainty). Both of these approaches are central to the NEISA effort. The development and dissemination of decision support tools are described in detail above. For communication, this includes: frequent meetings (monthly and annually) with our stakeholders to share methodology, assumptions, results and to obtain feedback; dissemination of reports (based on papers published in the scientific literature) written in collaboration with and for our stakeholders; web-based dissemination of data, information, and decision support tools (via NEISA, AIRMAP and the Northeast Regional Climate Center), and via focused links to other quality sources of information (e.g., other RISAs, select EPA and NOAA sources of information).

Finally, the overall goals and activities of NEISA are most closely related to the "Decision Support Resources Development" of the CCCP. Our project embodies the decision support framework outlined in Chapter 11, consisting of: problem identification and formulation in collaboration with stakeholders; development of decision resources based on observations and data, interdisciplinary research, communication, and product development and evaluation; and eventually leading to, in our case, improvement of public health, informed policy, and identification of knowledge gaps.