

**EPA Region 9 Science Integration for Decision Making Fact-Finding Interviews  
January 6, 2010  
75 Hawthorne Street, San Francisco, CA**

Four members of the SAB Committee on Science Integration for Decision Making conducted three interviews in EPA Region 9: Drs. Gregory Biddinger and Lauren Zeise in person and Drs. Wayne Landis and Barton H. Thompson by telephone. For each interview, Dr. Vanessa Vu, Director of the SAB Staff Office, provided a brief introduction to the purpose of the interview and the Designated Federal Officer, Dr. Angela Nugent, took notes to develop a summary of the conversation. All interviewees were provided a copy of the committee's Preliminary Study Plan in advance.

Dr. Vu noted in each interview that the purpose of the interview was to help SAB Committee members learn about Region 9's current and recent experience with science integration supporting EPA decision making so that the SAB can develop advice to support and/or strengthen Agency science integration efforts. Dr. Vu thanked participants for taking time for the interviews and thanked Drs. Winona Victory and Eugenia McNaughton for serving as liaisons with the SAB Staff Office in planning the interviews

**EPA Region 9 Deputy Regional Administrator and Senior Managers (9:00 - 10:00 a.m. Session)**

Ms. Jane Diamond, Deputy Regional Administrator  
Ms. Alexis Strauss, Director, Water Division  
Mr. Keith Takata, Director, Superfund Division  
Ms. Loretta Barsamian, Deputy, Management and Technical Services Divisions

The Deputy Regional Administrator began the discussion by describing overall strategies to ensure science integration. Region 9 wants its work force to represent diverse disciplines and has recently hired scientists to ensure fresh scientific perspectives in programs and the regional laboratory. It supports an active Science Council that identifies region-wide science priorities and gaps on an annual basis. The region promotes competition for ORD-funded Regional Applied Research Efforts (RARE) grants, which provides \$200,000 per region per year for short-term regional research needs. Region 9 also participates in the regional methods program, a total of \$600,000, available for methods development in all 10 EPA regions.

The manager of the water division described working with the four states, three territories, and tribes in Region 9. Region 9 is a co-regulator with state and sub-state/regional organizations. Science enters the process at different levels. The national water program sets standards for chemicals at a national level for the Clean Water Act and Safe Drinking Water Act. These standards are science-based regulations that all states depend on and that EPA depends on for regulating state, tribal, and territorial waters. The national program office is not able to meet regulatory mandates, the water quality criteria (CWA) and Maximum Contaminant Levels (MCLs) (SDWA) on which states and regions rely. She noted that emerging contaminants is a category of chemicals in which ORD is invested but we haven't yet determined how to regulate.

In addition to national standards, regions need the national program office to promulgate implementation guidance for CWA and SDWA standard setting. Implementation issues can be quite controversial, because of compliance burdens for small operators and small metropolitan areas.." The regional manager described how drinking water programs from all 10 regions mobilized to send a consensus letter asking the Office of Water to issue implementation guidance for methyl mercury before the Office of Water issued that critical guidance. She also described another example, implementation guidance needed for arsenic treatment. Several tribes and small communities in Region 9 have built treatment plants but cannot afford to operate them. She noted that the Administrator is calling for the Agency to be bolder, but "timidity" in program offices regarding standard setting and implementation guidance prevents regions from moving quickly to address water contamination.

She highlighted the importance of providing environmental information and science to the public in meaningful ways and praised publications by the Southern California Coastal Water Research Project, which does a "spectacular job" of issuing data the public can use. She noted that EPA has lost its ability to produce similarly high quality publications. EPA scientists tend to have "inside conversations" within the federal government and with academicians, but don't effectively translate science into publications or on-line data that reach a public audience. EPA tends to focus its science communication and science education reactively, e.g., when the New York Times publishes articles on turbidity. Another manager agreed that it is exceptional when EPA releases a high quality product that effectively communicates science to the public. One recent example is a public service announcement that educates children about mercury dangers.

Stakeholders in water programs tend to have very localized interests. Ninety-eight per cent of grants go to state water boards, tribes, and territories, with very little other discretionary money for local stakeholders. The interests of state watershed groups are highly localized and water quality issues are state-wide issues. Where there are public listening sessions, for example, an upcoming storm water listening session, the public will be able to discuss future directions of the storm water program, but it is unclear how those ideas, many of which are likely to have merit, will influence the future direction of the program.

The next topic was science integration within the context of the Superfund program, a program that focuses on reacting to identified problems either in the context of a large clean-up site or emergency response. The Region 9 Superfund program manager shared a cartoon (Attachment A) that symbolized his program. The Superfund program generates a lot of science, but yet, given all possible risks, the science is limited and has many uncertainties. He often wonders what problems are missed; but can't delay Superfund actions to find out.

The regional Superfund program needs scientists who can make practical decisions "on the spot" and who can effectively explain decisions and supporting science to the public. In many cases, the program can wait for science and research to develop, and so it is difficult for the region to depend on ORD to provide answers within a short-time frame. The Region 9 Superfund program has a technical team of 10-11 people and includes toxicologists, who play a valuable role.

Controversial science issues involve new chemicals and "new science issues related to old chemicals," e.g., how to address a new dioxin number in the context of new clean-up decisions and whether to revisit clean-up decisions in older sites. Where it can develop useful information quickly, Region 9 conducts some research, such as activity-based sampling for asbestos exposures. Such activities are difficult, controversial, and expensive. Another example is indoor air sampling related to vapor intrusion. He expressed concern that decisions get complicated with trichloroethylene (TCE), where he is not sure that the toxicity number is stringent enough, but there is a need for immediate action.

In response to a committee member's question about site redevelopment and possible use of benefit-cost information and information on committee values, the manager responded that his program makes decisions based on community acceptance and reasonably anticipated land use. He did not consider these factors as science-based. He does consider net benefit assessments for sites by using a model that considers multi-factorial considerations, but he did not consider those analyses in an "academic way." He noted that EPA's Brownfields clean-up program focuses more than the Superfund program on potential re-use issues.

For Superfund sites where Region 9 has the lead, community involvement coordinators plan interactions regarding science issues. Community interest in science varies widely. Some sites have no interest; other sites have a huge community involvement process, with community involvement committees, Technical Assistance Grants, or contract mechanisms that help communities contract with local universities for science support.

SAB committee members asked managers to identify where they would ideally like to add science expertise or information to support their programs. Managers agreed that EPA needs scientists to set national standards to support the water and Superfund programs. EPA's central role in updating the science underlying national standards is critical for bringing about consistency across state standards. One manager noted that EPA may not need additional resources; it needs more focus and emphasis on setting national standards as an overall priority.

Interviewees voiced frustrated with ORD's annual planning process and documents. The planning documents are hundreds of pages long and difficult to understand. Region 9 does not understand how regional comments are factored into the process or addressed in the planning documents.

Managers described how their programs cope with changing science. They expect risk numbers often to go down and have a process for planning for those potential changes. The Superfund program, for example issues site-specific decisions allowing for more flexibility, when managers anticipate changes in a risk number. The water program can allow for implementation period of 5 years, allowing for a phase-in period for technologically expensive controls. The manager of the water program noted that her staff is working with the Southern California Wetlands Recovery Project on new measurement methods related to beach pathogens. She expressed confidence that the region can deal effectively with new science and policy issues.

**EPA Region 9 Managers (10:30 a.m. - 12:00 p.m. Session) Participants**

Mr. Steve Armann, Chief, Permitting and Corrective Programs, Waste Management Division  
Dr. Harold A. Ball, Chief, Technical Support Section, Superfund Division  
Ms. Brenda Bettencourt, Laboratory Director, Management and Technical Services Division

Mr. Kerry Drake, Associate Director, Air Division  
Ms. Kathleen Goforth, Chief, Environmental Review Office, Communities and Ecosystems  
Division  
Ms. Janet Hashimoto, Chief, Standards and TMDL Office, Water Division  
Mr. Tom Huetteman, Associate Director, Waste Management Division  
Ms. Cheryl Nelson, Chief, RCRA Facilities Management Office, Waste Management Division  
Dr. Matthew Lakin, Acting Chief, Air Quality Analysis Office, Air Division  
Ms. Corine Li, Chief, Drinking Water Office, Water Division  
Mr. Ben Machol, Chief, Clean Energy and Climate Change Office, Air Division  
Dr. Eugenia McNaughton  
Dr. Lynn Suer, Chief, California Site Cleanup Section, Superfund Division

A regional scientist noted that regions had collaborated on a "45-Day Study" "several years ago that raised issues still relevant to regional needs for scientific tools. He noted that regions increasingly have problems accessing tools and expertise. ORD priorities diverge from regional needs and regions have less access to contractors because of declining budgets.

He asked the SAB to consider how EPA can meet its science needs to support traditional regulatory programs, as it also assumes responsibilities to protect against climate change and address sustainability issues. As environmental needs change, EPA must have the science to drive smart investments in the private sector, and state and local government. He spoke of the need to invest in strong lifecycle analysis methods to make better choices. He noted a strong need for setting standards for green products, where the scientific framework is not strong. Another scientist said that the Society for Environmental Toxicology and Chemistry has sponsored sessions on lifecycle analysis for 10 years and that other countries use lifecycle analysis. Scientists looked to ORD to synthesize available information so it could be more useful for regions.

A scientist spoke about the intensive use of science in the water programs. She expressed concern that some existing water quality criteria may not be sufficiently protective. Her division evaluates state standards to check that they are adequately protective. Her division reviews the states of the science and takes stakeholder input into consideration. She finds that she often does not have internal resources to evaluate state standards. In those cases, she draws on her networks, built up over decades, to help bring in the science needed.

A manager from the air quality program described the regulatory program as "data rich" and observed that more money and science would help voluntary programs. He noted that Region 9 presents special problems that ORD and Headquarters science has not been designed to address. Some areas designated as "nonattainment" have been caused by windborne dust, due to unusual meteorological conditions. Because the regulatory language is "fuzzy," problem definitions often aren't clear enough to guide useful scientific enquiries. He spoke of the need to spend more time "problem scoping, identifying real questions." Sometimes statutes or regulations don't "lend themselves" to scientists working with a multi-stakeholder process to identify the core questions. Regions have guidance and latitude for making nonattainment decisions but often do not take the time to fully scope the issue. "Defining question up front is not built into the culture." Deadlines and political pressures force decisions. Sometimes it seems like there are "three months of briefing and one week of analysis."

The drinking water program provides a contrast. It has "set protocols" that are very prescriptive. It is a public health program, and people don't question the validity of safe drinking water. It is a data rich program, where uncertainties have been identified in data, the public raises questions about water contamination. It is difficult to communicate about risk, because the public is anxious about contamination they hear about through the media. She called for increasing education for the public about environmental risk assessment. In her view, science increases the drinking water program's effectiveness.

Scientists noted that Region 9 had a history of Agency leadership in risk communication, but hadn't held training lately. A scientist described the core approach of that training as being "committed, open, present, and empathetic," and acknowledged the training as a "kind of social science that raised awareness of qualitative input from stakeholders." Another manager noted that EPA has needs to communicate science to other scientists and the general public. Everyone at EPA should "tune into the audience" and present scientific rationales for Agency decisions appropriate to the audience. One manager said that EPA should "absolutely yes" invest in the social science involved in communicating science, because EPA is "increasingly asking the public to make life choices" that affect climate change and sustainability. Communication becomes increasingly important as the public has more data and information to deal with.

A manager noted that communications become difficult when stakeholders and the public view the environment holistically, while EPA "stovepipes" its programs and problem solving. As a result, a regulatory change becomes a venue for many "non-relevant issues to play out." An environmental activist, for example, used a permit as a "hook" to discuss "cleft palate births" more related to lack of health care or possibly parents working as farmworkers. To communicate effectively and solve environmental problems, EPA needs to partner with others to address public real issues. Another manager noted that EPA scientists and representatives may need to learn how to communicate its ongoing presence, the available science, and EPA's constraints "without whining or communicating we don't care." Another manager acknowledged the need for social science tools to help people bring their values and concerns to the table and the need for effective cumulative risk tools.

Agency managers asked the committee members for clarification of its use of the term "science." The SAB staff director responded that the committee was interested in all the specialized scientific and technical information supporting decisions and EPA's processes for planning, generating, and providing that information to decision makers and evaluating its effectiveness.

One manager noted that the water quality program has "tons of nutrient water quality information" that do not help regions establish bright lines that define good water quality standards. EPA may not understand how specific ecosystems function well enough to establish regulatory requirements for a healthy ecosystem. Even with a data rich environment, for example, EPA doesn't know enough about how hypoxia works to use regulatory tools to establish system response indicators. Having a single nitrogen or phosphorus number may not be useful. The public looks to EPA as experts. Region need to integrate across multiple

disciplines to help us identify standard that are meaningful and help us achieve their mission. The state of the science may not yet exist to support numerical standards for decision making.

The manager described how she might build a systems model for nutrient flows at a spatial scale useful for the regions. The SPARROW model might be transferable to different scales but would need to be validated. The region could attempt this modeling, but would need tools and resources.

A manager noted that Region 9 used science to prioritize actions, e.g., enforcement actions or grants. "The more we're aware of what science and data are telling us, we can make better decision across the board."

A manager from the Superfund program noted that Remedial Project Managers (RPMs) are "dogged" about finding technical expertise to support decisions. They look internally and look to states, academics, Headquarters, and their personal professional networks. Region 9 staff are very knowledgeable and "very plugged in at the national level." The region "triages well" to manage resources. He also noted Region 9's comparative advantage, relative to other regions. Region 9 draws on science available in the state of California and on experts in regional universities. They also spoke of the value of their organization, which places technical staff within program divisions. The Superfund program also fosters collaborative decision making. Technical staff is at the table when decisions are made to ensure that decisions are technically supportable.

Managers spoke about the need for more science investments in emerging contaminants, despite the lack of a regulatory framework. ORD research could help the regions prioritize activities relating to emerging contaminants. He noted the value of possible reform of the Toxic Substances Control Act and the "fantastic science resource" of the Office of Pesticides and Toxic Substances, which is "pretty invisible" because of confidential business information restrictions and history of the program.

A manager spoke of Region 9's need for technology that will be needed to enable the State of California to attain the National Ambient Air Quality Standard (NAAQS) for particulate matter and ozone, in addition to California's "heroic efforts" to control air pollution. EPA signed a Memorandum of Agreement to accelerate the development and deployment of air pollution control technology the California Air Resources Board, the San Joachin Air District, ORD's National Risk Management Research Laboratory, and OAR's Office of Air Quality Planning and standards and Office of Transportation and Air Quality. There are plans for two place-based technology demonstration platforms (one near the coast and another in the San Joachin Valley. Factors involved in choosing sites included environmental justice considerations, proximity to a port, movement of goods and materiel, history of relationship-building with local communities, and possibility for demonstrating new technologies. The project will also include consideration of air toxics and emissions inventory and use of results from a social vulnerability analysis developed through a RARE grant (the vulnerability analysis index helped the Region frame questions to be asked in the study) The manager noted that SAB support for such a local research and demonstration project would be helpful.

Managers spoke briefly about the role of the regional science council and regional science team. The Regional Science Council develops an annual science plan; provides a forum for regional scientists to talk about their work; organizes classes, seminars, and speakers' presentations; and follows up on Headquarters-generated science action items. The team also supports scientists in developing RARE grant applications and prioritizes the applications.

As a last point for discussion, one manager asked how the committee will address whether states have sufficient science. Committee members noted that this topic is an important one that might be addressed at the committee's workshop, tentatively planned for May-June 2010.

### **EPA Region 9 Scientific and Technical Staff (1:30 p.m. - 3:00 p.m. Session) Participants**

Ms. Katherine Baylor, Hydrogeologist, Corrective Action Office, Waste Management Division  
Dr. Debra L. Denton, Environmental Scientist, Monitoring and Assessment, Water Division  
Mr. José García, Environmental Protection Specialist, Immediate Office, Communities and Ecosystem Division  
Dr. Gerald Hiatt, Senior Risk Assessor, Technical Support Office, Superfund Division  
Dr. Meredith Kurpius, Environmental Scientist, Air Quality Assessment Office, Water Division  
Dr. Bruce Macler, National Microbial Risk Assessment Expert, Drinking Water Office, Water Division  
Mr. Kevin Mayer, Environmental Engineer, CA Cleanup Site Section 2, Superfund Division  
Mr. George Robin, Environmental Engineer, Underground Injection Control (UIC) Program, Ground Water Office, Water Division  
Dr. Daniel Stralka, Environmental Scientist, Technical Support Office, Superfund Division  
Mr. Max Weintraub, PCB Coordinator, Toxics Office, Communities & Ecosystems Division  
Dr. Winona Victory  
Dr. Patrick Wilson, Toxicologist, Corrective Action Office, Waste Management Division  
Dr. Patti L. TenBrook, Communities and Ecosystem Division

Scientists began the discussion by describing Region 9's definition of science as "applied technology." It can include information on toxicity or ways to measure exposures, including biomarkers, in communities living near Superfund sites. Sometimes the science is established (e.g., are exposures above or below a bright line) and sometimes the science is "undefined," and regional scientists must define the question, create a hypothesis, develop a study approach, gather data and analyze it, and provide information to decision makers.

Scientists said that they "need to know our stuff" for all contaminants (even undefined contaminants): how to define toxicity and exposure, how to measure it, and how to manage it. For undefined contaminants, sometimes EPA scientists assume it is similar to another chemical that EPA has data for; sometimes if there are multiple contaminants, EPA assumes that cleaning up for one will adequately clean up for others; and some times EPA targets stringent cleanups for chemicals with known toxicity and assumes other chemicals will contribute only minor risks.

A scientist in the pesticide program spoke about the need for research on regional pesticide issues. The national model for some urban pesticides doesn't work for Region 9. Pesticides show up in waters; models and science need to be adjusted; and pesticide labels need to say something different. It is difficult for data generated in the region to have an impact on

reregistration evaluation of pesticides. Another scientist agreed that water bodies are designated as impaired under section 303(d) of the Clean Water Act because of pesticides. She called for a more transparent process for the science used in Total Maximum Daily Loads (TMDLs). Regions need tools for analysis at the watershed level to specify best management practices so they can be confident about TMDL numbers in contentious discussions.

Another scientist identified a need for training in using social science data for enforcement targeting. In the case of lead-based paint, social science methods could be used to identify vulnerable communities and help implement environmental justice policies. Another scientist compared Superfund's "exquisite tools to examine contaminant concentrations" with the lack of tools to respond to communities' concerns about social stressors that enhance their environmental risks. They noted that Superfund and RCRA do not have explicit language regarding environmental justice, a priority of Administrator Jackson, and many managers are reluctant to bring in factors to supplement risk assessments for fear that the resulting permit would be vulnerable to appeal. A scientist noted that the region typically conducts analyses of social issues only in dealing with tribes. Yet another scientist noted that the air division tries to target air monitoring on environmental justice communities. She also observed that the climate change program may also use vulnerability analyses and may lead EPA in new areas of social research.

A scientist spoke about the need for enhanced communication of scientific information - not just about risk assessments and their conservative assumptions, but also about benefit-cost analysis. He spoke of the need to communicate benefits more effectively in ways people can understand.

Scientists spoke briefly about EPA's lack of progress on cumulative risk approaches. Although EPA conducted two workshops on cumulative risk, the Risk Assessment Forum has not generated a document. One scientist recommended that the Science Policy Council should take the lead on cumulative risk.

Scientists then talked briefly about the overall state of EPA's science. One interviewee noted that EPA science is not academic science. It is driven by statute and precedent and sometimes "flies in the face of the general scientific community." In many cases, statutes must change for EPA to conduct and use "state of the art" science. Participants spoke of their awareness of the recent National Academy of Science "Silver Book," but complained that EPA has no integrated mechanism to respond to its recommendations. The Science Policy Council might be the appropriate organization to respond, but scientists viewed it as unlikely to respond. A scientist observed that EPA typically does not do "problem formulation" before it begins research. Another participant spoke of the difficulty factoring qualitative concerns identified in a problem formulation conducted to address tribal concerns about out gassing from a thermal oxidation unit into a quantitative analysis of air modeling. Other participants spoke of their frustration with EPA chemical hazard assessments, such as trichloroethylene, that lag behind published literature and Agency guidance. They spoke of the chilling effect of management decisions made with the expectation that science would be "ginned up" to support decisions already made.

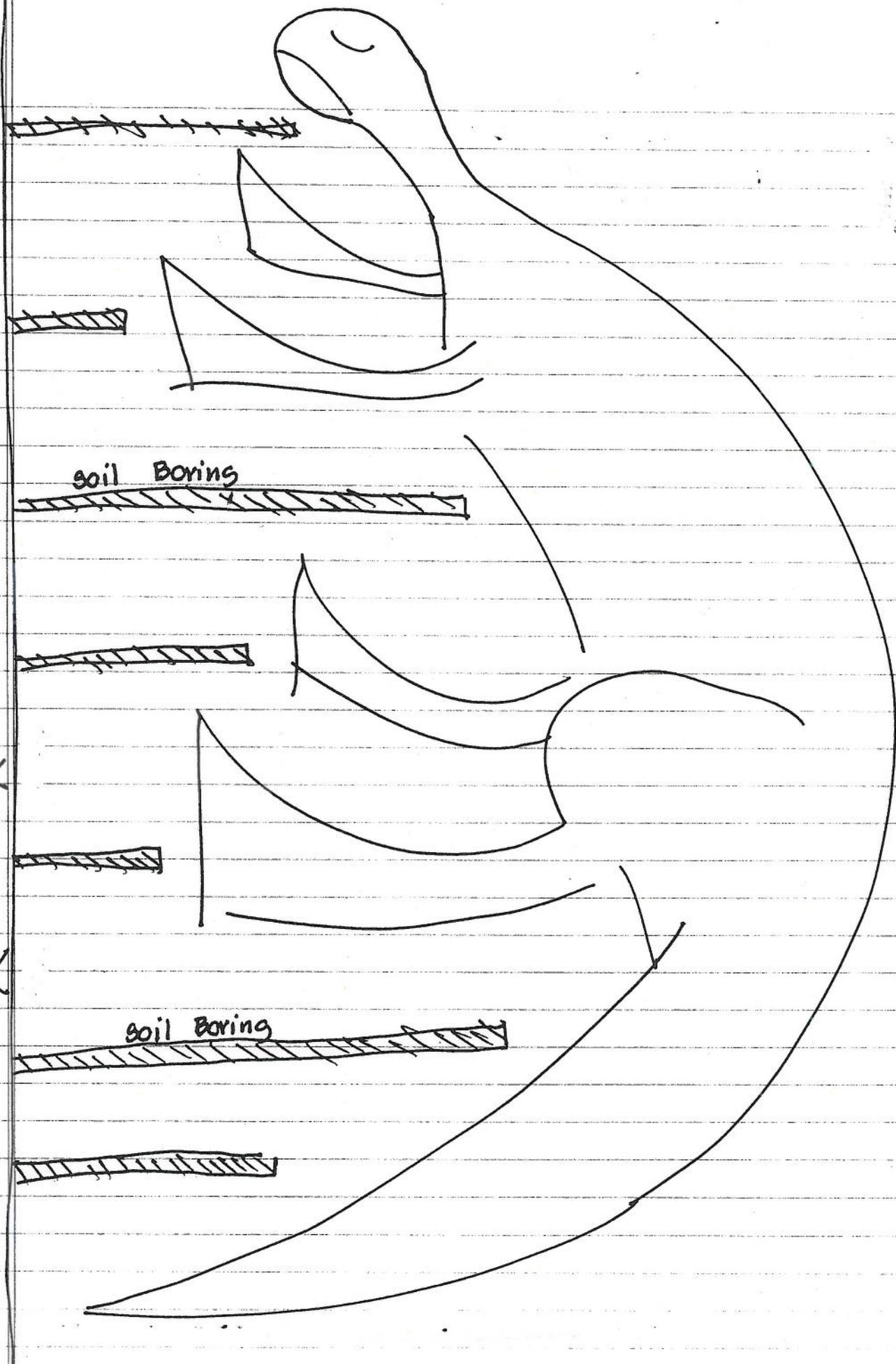
Some scientists then spoke of new directions for Agency science, such as a new rule disclosing pesticide inert ingredients; a new public process for new pesticides; analyses of pesticides volatilizing off fields; and new studies focused on the children of farm workers. These new changes are happening quickly. They reflect a new political will and suggest that legal barriers to the use of science may be fewer than many assume.

SAB members asked scientists to conclude the discussion with their "wish list" for science integration. Individual participants responded with the following thoughts:

- Pesticide monitoring to validate predictions made during assessment and modeling
  - Two scientists spoke about their proposal for a modeling and monitoring study of multiple stressors, including pesticides, and impacts on land use, water, and air.
- More support from ORD (especially more than the limited RARE funds, \$200,000 per region per year) and better ways to interact with them.
  - ORD scientists' performance standards require 25-50% of each scientist's time involve work with regions
  - More support like the ORD laboratory in Ada, Oklahoma for modeling
- Need for regional statistician
- Economists to help communicate environmental benefits and environmental justice concerns
- More science supporting controls for underground injection of carbon dioxide
- Better data management, better data sharing among EPA programs, and improved data quality

"I agree!"

"No dinosaur here."



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