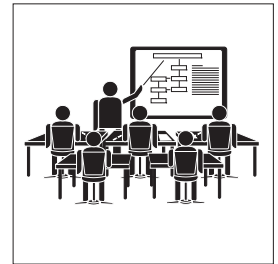
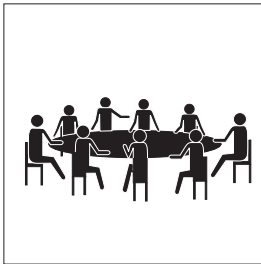


# Handling Scientific and Technical Information in Contentious Public Issues:

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## *A Public Issues Education Approach*

Background material, Discussion points, Handouts, Visuals



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The *Learner's Resources* booklet (CD-46B) that accompanies this guide includes the handouts and case scenarios for this curriculum. A compact disk (CD-46C) contains all of the visuals, including the video clips and PowerPoint slides, as well as PDF files of the *Instructor's Guide* and the learning resources.

## Introduction

*Cooperative Extension educators share a common mission that reaches across many different disciplines: to enable people to improve their lives and communities through learning partnerships and putting knowledge to work.*

**F**rom its beginnings, Extension has provided educational programs about public issues. Traditionally, Extension interaction in public issues involved Extension faculty disseminating information through the network of county agents to help people learn, in an objective and neutral way, about their policy options.

Over the years, Extension public issues educators have continued to uphold the ideals of neutrality and objectivity. At the same time, they have increased the scope of their work considerably. Public issues educators now teach about natural resource and environmental issues, community investment, welfare reform, the school-to-work transition, food safety, and child care. Educators are discovering that effective education on these matters requires working directly with a multitude of citizens to help them identify and resolve public issues through facilitated dialogue and information exchange.

This new mode of public issues education creates opportunities for Extension educators to address issues that are ill-suited to traditional information dissemination methods. Many of these issues, however, are complex and potentially divisive. Scientific and technical information – the currency of the Extension educator – is at the heart of these issues.

Advocates and policymakers look to science and technical experts to help improve their decisions. But, in many cases, the science itself is at the center of the controversy, and Extension educators can find themselves in an uncomfortable position. They must decide how to provide and interpret scientific and technical information in contentious situations. Information provided through university research may be considered one-sided or irrelevant. Moreover, information is often disseminated by warring experts, people may mistrust the source of the data, or equal access to data may become the focus of the debate.

Some of the confusion and complexity that surround public issues can be directly attributed to the way information is organized, interpreted, communicated, and judged to be useful. Government agencies, community groups, advocates, and academics approach data gathering and interpretation in different ways, with different needs in mind. Members of these groups will implicitly value or devalue scientific information according to their training, life experiences, and the rules of their professional cultures. If Extension educators are not mindful of how to work in situations where information is a focus of the debate, their efforts can be compromised.

## The Workshop Curriculum

This workshop curriculum, *Handling Scientific and Technical Information in Contentious Public Issues*, is designed to improve the skills of Extension educators who work on contentious public issues. It focuses on one very important component of public issues education – those situations where information is likely to be debated and discussed apart from the substantive issues. It is based on material developed by a consortium of organizations involved in resolving environmental disputes. RESOLVE, Inc., the U.S. Institute for Environmental Conflict Resolution, and the Western Justice Center Foundation sponsored the development of a report entitled *Managing Scientific and Technical Information in Environmental Cases: Principles and Practices for Mediators and Facilitators*. A copy of this report can be obtained from the following Web site: [http://www.resolv.org/tools\\_pubs.html](http://www.resolv.org/tools_pubs.html).

This workshop curriculum is designed to follow other training courses in public issues education methods, such as educational program design, public issues assessment, group facilitation, conflict resolution, and collaborative decision-making. Workshop participants should have some previous training in these topics.

### Curriculum Objectives

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This workshop curriculum is designed to train Extension educators in one particular aspect of public issues education: handling scientific and technical information. Workshop participants will learn how to:

- ▶ Identify the various roles of Extension educators in resolving public issues where scientific and technical information are key components.
- ▶ Recognize the differences between data conflicts and other substantive conflicts in public issues.
- ▶ Apply appropriate methods of integrating science and technological information into collaborative processes.
- ▶ Use “best-practice” tools and strategies to:
  - Manage conflicting information sources or contested science (including distrust in the science from an educator’s own institution).
  - Manage scientific and technical uncertainty (including lack of good data).
  - Deal with issues that involve power imbalances resulting from limited access to information, such as environmental justice issues.

### Curriculum Overview

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The workshop curriculum is presented in four modules, each building on the other.

#### *Module 1. Public Issues Education Roles for Extension Educators*

An Extension educator can assume a number of roles when getting involved in public issues education. Each role serves a useful purpose. Some educators take on multiple roles. For example, in some situations an educator may assume the joint roles of convenor and facilitator or mediator. It’s important for educators to consider which roles are most appropriate in a public issue education situation given the topic, the educator’s level of experience in public issues education and group process skills, the potential risks of getting involved, and the time and financial resources available.

#### *Module 2. Sources of Conflict*

The conflicts surrounding public issues often emanate from more than one source.

- ▶ *Interest-based conflicts* are caused by differences in the stakeholders’ substantive interests. These differences are typically viewed as the primary sources of conflict, the issues people are divided over.
- ▶ *Value-based conflicts* are caused by different ways of life, ideologies, philosophies, and criteria for evaluating ideas or behavior.
- ▶ *Structural conflicts* are caused by unequal control, ownership, or distribution of resources. Power conflicts are structural.

- ▶ *Relationship conflicts* are caused by stereotyping, misperception, poor communication, or repetitive negative behavior.
- ▶ *Data conflicts* are caused by lack of information, misinformation, distrust in the information (and its sources), different views on what is important, different interpretations of data, and different assessment procedures. Data are often significant sources of conflict.

*Module 3. Rockslides on the Road to Agreement: Key Concepts and Principles*

An educator faces a number of challenges when dealing with scientific and technical information in a public issue dispute. Educators need to understand these challenges and develop appropriate methods and techniques for addressing them. These challenges are grouped for discussion as follows:

- ▶ The Nature of Knowledge
- ▶ Uncertainty
- ▶ Research and Information Gathering
- ▶ Modeling
- ▶ Stakeholders, Experts, and Other Third Parties
- ▶ Information and Conflict
- ▶ The Educator's Role

*Module 4. Tools and Techniques*

This module defines the recommended "best practices" to use during the stages of a collaborative process. Recommended practices are organized around the following topics:

- ▶ Considering Substantive Knowledge and the Educator
- ▶ Assessing the Issue
- ▶ Designing the Process
- ▶ Defining the Problem
- ▶ Working with Experts and Information
- ▶ Negotiating and Problem-solving
- ▶ Making and Implementing Agreements.

## Organization of Workshop Materials

### *Instructor's Guide*

The workshop curriculum is presented in detailed instructor guidelines that contain objectives for each module, thumbnail illustrations of the visual aids, and discussion points. These elements provide the depth of knowledge that workshop instructors need.

### *Case Scenarios*

The curriculum uses three case scenarios to give participants opportunities to work through lifelike situations. Each case scenario highlights the management of a key concept.

- ▶ Managing Warring or Contested Science – *Hog Heaven*
- ▶ Managing Scientific and Technical Uncertainty – *Feet and Inches*
- ▶ Dealing with Information Imbalances – *Knowledge Is Power*

### *Sample Agenda*

The material contained in this curriculum package is designed for a 6-hour workshop session. A sample agenda is included in this *Instructor's Guide* on page 7.

### *Visuals*

The training package includes a compact disc (CD) containing 49 PowerPoint slides and three video film clips. The slides are also loaded on the CD in printer-friendly Acrobat Reader format so that they can be printed on overhead transparencies for use without the PowerPoint program. The video clips can be shown using a computer and an LCD projector by using one of various computer media players. The video clips are used in the workshop to set the stage for discussing the topic and to illustrate the concepts presented.

### *Learner's Resources*

Handouts pertaining to each module, a copy of the slides, and the case scenarios are contained in a separate *Learner's Resource booklet*.

## **Using and Applying the Materials**

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This workshop curriculum contains a full package of materials to guide the instructor through a step-by-step application of the curriculum. However, the authors fully appreciate the fact that there are nearly as many ways to teach public issues education as there are ways to apply it in practice. With this in mind, users of this curriculum are encouraged to use and apply the materials in any way that is consistent with its objective, that is, to enhance the ability of Extension educators to work effectively on public issues. Borrow, apply, and adapt these materials to increase their use and effectiveness in your own public issues education programs.

**Handling Scientific and Technical Information in Contentious Public Issues**  
*Sample Agenda for a 6-Hour Workshop*

Workshop Activities	Timing	Materials
<b>Participant Introductions and Workshop Objectives</b>		
Introduce participants.	10 minutes	
Present workshop objectives.	10 minutes	Slides 1 – 3
<b>Introduction to the Curriculum: Setting the Stage</b>		
Show Video Clip 1: An Extension agent discusses a public issue that occurred in his county and how people distorted scientific information to their advantage. Follow with a discussion of contentious issues that participants have been involved in where data and information were part of the conflict.	25 minutes	Video Clip 1 Slides 4 – 8
<b>Module 1. Public Issues Education Roles for Extension Educators</b>		
Discuss specific roles workshop participants have filled when working on public issues. Briefly discuss roles that are most affected by data and information issues.	30 minutes	Slide 9 Handout 1
<b>Module 2. Sources of Conflict</b>		
Illustrate how data conflicts are different from conflicts based on relationship, structure, values, and interests. Identify reasons for data conflicts.	15 minutes	Slides 10 – 12 Handout 2
<b>Break</b>	15 minutes	
<b>Module 3. Rockslides on the Road to Agreement</b>		
Show Video Clip 2: Citizens of Cameron County, Texas, discuss a problem from their different viewpoints and form a Coexistence Committee. Before showing the clip, ask the group to pay attention to what they see and hear about data and information. Ask participants to report on what they saw and heard regarding data and information in the problem definition stage.	20 minutes	Video Clip 2, Slide 13 Handout 3
Show Video Clip 3: The Cameron County Coexistence Committee develops a solution to a problem. Ask participants to report on what they saw and heard regarding data and information in the problem solution stage.	20 minutes	Video Clip 3
Present Modules 3.1 through 3.7, drawing on examples from the video clip.	35 minutes	Slides 14 – 27
<b>Lunch Break</b>	1 hour	
<b>Module 4. Tools and Techniques</b>		
Present and discuss the overview of tools and techniques. Divide the class into three groups. Distribute the three case scenarios by assigning a different scenario to each group. Ask the participants to take turns reading the cases aloud so everyone is familiar with all three cases.	30 minutes	Case scenarios 1 – 3 Slides 28 – 30 Handout 4
Present Modules 4.1 – 4.3 with a brief discussion.	15 minutes	Slides 31 – 36
Present Module 4.4 with emphasis on situation mapping. Use the situation portrayed in the Cameron County video clips. Build a situation map together. Ask each group to develop a situation map using its case scenario and to answer Question 1 in the case scenario. Each group presents its situation map and answer to Question 1. Discuss and record major themes and lessons.	45 minutes	Slides 37 – 45 Handout 5
<b>Break</b>	15 minutes	
Present Module 4.5. Discuss Slide 46 briefly. Ask each group to answer Question 2 in the case study. Each group presents its answer to Question 2. Discuss and record major themes and lessons. Demonstrate the Focused Discussion Method using Slide 47. Discuss.	30 minutes	Slides 46, 47 Handout 6
Present Modules 4.6 and 4.7. Briefly discuss Slides 48 and 49. Ask each group to answer Question 3 in the case study. Each group presents its answer to Question 3. Discuss and record major themes and lessons.	15 minutes	
<b>Wrap-up and Evaluation: Adjourn</b>		

## Introductions and Workshop Objectives


**Time required:** 20 minutes

**Handouts:** None

### Visuals

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Handling  
Scientific and Technical Information  
in Contentious Public Issues:  
*A Public Issues Education Approach*



slide 1

**Objectives**  
You will learn to...

- Identify the various roles of Extension educators in resolving public issues wherein scientific and technical information are key components.
- Recognize the difference between data conflicts and substantive conflicts in public issues.

slide 2

**Objectives**  
You will learn to...

- Apply appropriate methods for integrating science and technical information into collaborative processes.
- Use tools and techniques to:
  - Manage warring information sources or contested science, including distrust in the science from your own institution.
  - Manage scientific and technical uncertainty, including lack of good data.
  - Deal with issues that involve power imbalances, such as environmental justice issues.

slide 3

### Objectives

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1. Allow participants to introduce themselves and relay their learning expectations for the day.
2. Outline the workshop objectives.
3. Identify workshop ground rules and other conventions.

- Manage scientific and technical uncertainty (including lack of good data).
- Deal with issues that involve power imbalances, such as environmental justice issues.

### Background and Discussion Points

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Participants will learn how to:

- ▶ Identify the various roles of Extension educators in resolving public issues wherein scientific and technical information are key components.
- ▶ Recognize the difference between data conflicts and substantive conflicts.
- ▶ Apply appropriate methods for integrating scientific and technical information into collaborative processes.
- ▶ Use tools and techniques to:
  - Manage conflicting information sources or contested science (including distrust in the science from an educator's own institution).

## Introduction to the Curriculum – Setting the Stage


**Time required:** 25 minutes

**Handouts:** None

### Visuals

**Traditional Roles in Public Issues Education**

- Creating materials
- Presenting the policy options
- Providing alternatives and consequences
- Remaining objective and neutral



slide 4

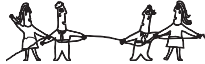
**The scope of your work has increased.**

- You have more opportunities to work directly with citizens and agencies to identify and resolve issues.
- Many issues are complex, contentious, and potentially divisive.
- Many issues are “data intensive.”
- Science itself can be at the center of the controversy.

slide 5

**Information Controversies**

- Information is often disseminated by warring experts.
- People can mistrust the source of the data.
- Equal access to data can become a focus of the debate.



slide 6

**Are you clear about how to work in situations where information is the focus of the debate?  
If you are not, your efforts can be compromised.**


slide 7

**Source of Materials**  
*Managing Scientific and Technical Information in Environmental Cases: Principles and Practices for Mediators and Facilitators.*

RESOLVE, Inc.  
U.S. Institute for Environmental Conflict Resolution  
Western Justice Center

[www.ecr.gov](http://www.ecr.gov)

slide 8



**Video Clip 1**

(30 sec.) An Extension agent describes a controversial public issue that has divided his country. He talks about how people distorted scientific information to their advantage.

video clip 1

### Objectives

1. Provide a rationale for the topic.
2. Introduce the subject material.

### Background and Discussion Points

**Show Video Clip 1.** Extension educators are often involved in public issues that are contentious – that is, people disagree about the problem, the solution, or both. In many cases, the conflict centers on science, information, and technical information.

**Display Slide 4.** Public issues educators teach about natural resource and environmental issues, such as land use, and family and consumer issues, such as welfare reform, the transition from school-to-work, food safety, and child care. Educators are discovering that effective education on these matters requires working directly with a multitude of citizens to help them identify and resolve public issues

through facilitated dialogue and information exchange.

**Display Slide 5.** This new mode of public issues education creates opportunities for Extension educators to address issues that are ill-suited for traditional information dissemination methods. Many of these issues, however, are complex and potentially divisive. They often involve extensive amounts of information, and some of that information has a narrow focus. A clear understanding of the problems and potential solutions requires considerable effort on the part of stakeholders. Scientific and technical information—the currency of the Extension educator—is at the heart of these issues.

**Display Slide 6.** Advocates and policymakers look to science and technical experts to help improve their decisions. But in many cases, the science itself is at the center of the controversy, and Extension educators can find

themselves in an uncomfortable position: They must decide how to provide and interpret scientific and technical information in contentious situations. Information provided through university research may be considered one-sided or irrelevant. Moreover, information is often disseminated by warring experts, people may mistrust the source of the data, or equal access to data can become the focus of the debate.

**Display Slide 7.** Some of the confusion and complexity that public issues provoke can be directly attributed to the way information is organized, interpreted, communicated, and judged to be useful. Government agencies, community groups, advocates, and academics approach data gathering and interpretation in different ways and with different needs in mind. Members of these groups will implicitly value or devalue scientific information according to their training, life experiences, and the rules of their professional cultures. If Extension educators are not mindful of how to work in situations where information is a focus of the debate, their efforts can be compromised.

**Display Slide 8.** The *Handling Scientific and Technical Information in Contentious Public Issues* workshop curriculum is designed to improve the skills of Extension educators in working on divisive public issues. It focuses on one very important component of public issues education – those situations where information is likely to be debated and discussed apart from the substantive issues. It is based on material developed by a consortium of organizations involved in resolving environmental disputes. RESOLVE, Inc., the U.S. Institute for Environmental Conflict Resolution, and the Western Justice Center Foundation sponsored the development of a report entitled, *Managing Scientific and Technical Information in Environmental Cases: Principles and Practices for Mediators and Facilitators* (Adler et al.).

### ***Training Tip***

*Involve participants by asking them to discuss contentious issues that they have been involved in where data and information were part of the conflict.*

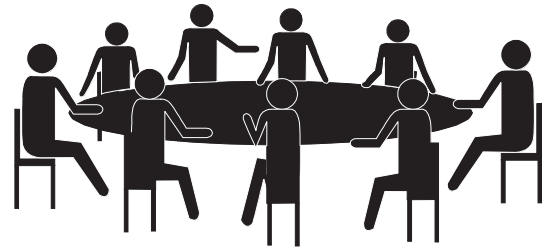
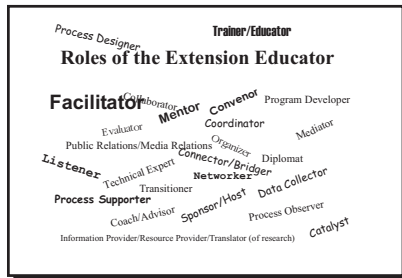
## Module 1. Public Issues Education Roles for Extension Educators

Time required: 30 minutes

### Handout

Handout 1, "Public Issues Education Roles for Extension Educators" (p. 24-25, *Learner's Resources*)

### Visuals



### Objectives

1. Participants become aware of the multiple roles of an Extension educator.
2. Participants identify the roles that are relevant when dealing with scientific and technical information in contentious public issues.
3. Participants consider the roles that are most appropriate for them, given the substantive topic, their level of experience, the potential risks of getting involved, their group process skills, and the time and financial resources available.
4. Participants understand how their roles change when information becomes the focus of the debate.

#### *Training Tip*

*Ask the participants to discuss public issues they have dealt with and their roles in the education process: How appropriate was your role, given the situation? How do you think your role changes when information becomes the focus of the debate?*

### Background and Discussion Points

**Display Slide 9.** An extension educator can play a number of roles when getting involved in public issues education. Each role serves a useful purpose. The roles highlighted in green on the graphic are those that emphasize the data and information aspects of being a public issues educator. Some educators take on multiple roles – for example the joint roles of convenor and facilitator or mediator. It's important for educators to consider which roles are most appropriate in a public issues education situation, given the following: the topic, the educator's level of experience in public issues education, the educator's group process skills, the potential risks of getting involved, and the time and financial resources available.

## Module 2. Sources of Conflict

Time required: 15 minutes

### Handout

Handout 2, "Sources of Conflict" (p. 26, *Learner's Resources*)

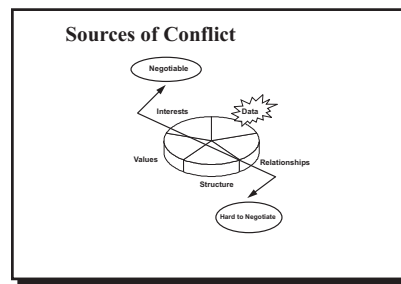


### Visuals

**Sources of Conflict**

Working with Scientific and Technical Information in Contentious Public Issues

slide 10



slide 11

**Data Conflicts**

- Lack of information
- Misinformation
- Distrust of the information, the sources, or both
- Different views on what is important
- Different interpretations of data
- Different assessment procedures

slide 12

### Objectives

1. Participants understand that public conflict can have many sources and that those sources can be identified.
2. Participants learn five sources of conflict.
3. Participants learn the causes of data conflicts.

### Background and Discussion Points

**Display Slide 10.** Ask participants to discuss public issues conflicts with which they are familiar. Ask them to list reasons why people were in conflict. Tease out Moore's five sources of conflict by referring to the handout. Discuss why data conflicts might be particularly vexing for Extension educators.

**Display Slide 11.** The conflicts surrounding public issues often emanate from more than one source. Data are significant sources of conflict.

- ▶ *Interest-based conflicts* are caused by differences in the stakeholders' substantive interests. These differences are typically viewed as the primary sources of conflict, the issues that people are divided over.

- ▶ *Value-based conflicts* are caused by different ways of life, ideologies, philosophies, and different criteria for evaluating ideas or behavior.
- ▶ *Structural conflicts* are caused by unequal control, ownership, or distribution of resources. Power conflicts are structural.
- ▶ *Relationship conflicts* are caused by stereotyping, misperception, poor communication, or repetitive negative behavior.

**Display Slide 12.** *Data conflicts* are caused by lack of information, misinformation, distrust of the information (and its sources), different views on what is important, different interpretations of data, and different assessment procedures.

## Module 3. Rockslides on the Road to Agreement: Key Concepts and Principles

**Time required:** 1 hour and 15 minutes

Module 3 introduction: 20 minutes for each 10-minute video clip and its discussion  
Modules 3.1 through 3.7: 5 minutes each, including questions and discussion

### Handout

Handout 3, "Rockslides on the Road to Agreement" (p. 27-29, *Learner's Resources*)




### Visuals

**"Rockslides"**  
**Key Concepts and Principles**


Working with Scientific and Technical Information in Contentious Public Issues

slide 13

 **Video Clip 2**

(10 min.) The setting is Cameron County, Texas. Stakeholders describe what happened when the US EPA introduced a list of pesticides that it proposed to ban in an effort to protect the Aplomado falcon, an endangered species.

video clip 2

 **Video Clip 3**

(5 min.) Cameron County stakeholders describe how they resolved the issues related to farming cotton and protecting the falcon.

video clip 3

### Objectives

1. Participants become familiar with concepts and principles that frame how we think about the challenges of handling scientific and technical information in public issues education.
2. Participants understand the relationship between key concepts and principles and methods and techniques for meeting such challenges.

### Background and Discussion Points

Certain principles frame how we think about the challenges of dealing with scientific and technical information in public issues education. Public issues educators need to understand these key concepts and principles so they can develop ways to meet such challenges.

#### **Training Tip**

*Before showing Video Clip 2, ask the group to pay close attention to what they see and hear about the use of data and information. After the group has viewed the clip, ask participants to report how data and information were used and presented in defining the problem. Discuss how data and information can be used both negatively and positively. Data and information can magnify the conflict as well as clarify the issues.*

*Prior to showing Video Clip 3, ask the group once again to pay close attention to what they see and hear about the use of data and information. After the group has viewed the clip, ask participants to report on how data and information were used in solving the problem.*

*Initiate a group discussion: Why are there important differences between the use of data and information in defining and solving a public issue?*

## Module 3.1. On the Nature of Knowledge

**Time required:** 5 minutes

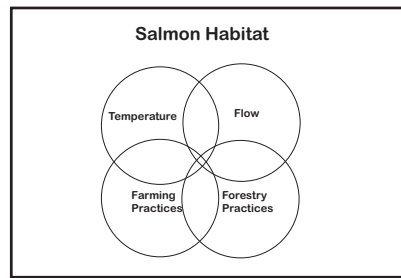
**Handouts:** None

### Visuals

**On the Nature of Knowledge**

- Scientific research rarely provides definitive, unequivocal answers. All information is subject to questions of validity, accuracy, authenticity, and reliability.
- We can examine and debate information, but not always test. Subjective awareness, including intuition and hunches, often plays a role.
- Complex public issues often deal with systems. The whole is different than the sum of its parts.

slide 14



slide 15

### Background and Discussion Points

- ▶ Good scientific analysis is neutral. It does not seek to support or refute the claims of any party in a dispute. It is also objective. Any scientist who knows the rules of observation of a particular field of study can, in principle, obtain the same results. But scientists are not necessarily neutral and objective in the ways they frame problems or choose assumptions.

**Display Slide 14.** Science rarely provides definitive, unequivocal answers. All information is subject to questions of validity, accuracy, authenticity, and reliability. Every type of knowledge (be it scientific, “local,” or cultural) has standards of quality that can be examined, debated, or shaped. There is usually room for reasonable people to disagree on both the methods by which knowledge is generated and the evidence used to substantiate it. Thus, what is examined, how it is examined, who examines it, and when it is examined are all negotiable.

- ▶ Many people think that science is conducted wholly in the realm of testable knowledge. Subjective knowledge – including past experiences, intuition, hunches, and values about what facts are important – often enters into the scientific

process, particularly in framing questions for research.

**Display Slide 15.** Complex public issues, such as the environment, public health, or community development, often deal with systems. Reductionism – seeking to understand the system by looking only at its units and their interrelationships – is prone to inducing error. The whole is different than the sum of the parts. For example, several complex, overlapping factors affect salmon habitat.

#### **Training Tip**

*Initiate a group discussion: Knowledge and information are important, but they don't always give us the answers we are looking for to resolve a controversy. Sometimes we have information, but others are unwilling to accept it. Have you been in a similar situation? How was it handled? What worked? What didn't?*

## Module 3.2. On Uncertainty

**Time required:** 5 minutes

**Handouts:** None


### Visuals

**On Uncertainty**

- Biological and social uncertainties are facts of life. We will never know everything we need to make perfect decisions and predict all their impacts.
- Uncertainties arise from:
  - Insufficient measurements or observations.
  - Conflicting measurements.
  - Competing or fragmentary theoretical frameworks.
- Most decisions have unintended consequences, not merely calculated risks, side-effects, or trade-offs.

slide 16

**Should We Breach Dams for Salmon?**



slide 17

### Background and Discussion Points

**Display Slide 16.** Uncertainties are always present. We will never know enough to make perfect decisions. Uncertainty allows participants in a debate to develop competing technical analyses to support their conflicting policy arguments. Three types of uncertainties tend to arise in science-oriented public issues:

- ▶ Uncertainties from measurements or observations that are not complete.
- ▶ Uncertainties from conflicting measurements.
- ▶ Uncertainties over competing or incomplete theoretical frameworks. These uncertainties make it difficult to explain and interpret the available information.

Most decisions have unintended consequences, not merely calculated risks, side effects, or trade-offs. These consequences are real, and people respond to them.

**Display Slide 17.** For example, the issue of breaching dams for salmon is fraught with uncertainty. Dams are only one of several factors contributing to the decline of the salmon fishery in the Pacific Northwest. Scientists are uncertain about how salmon populations might respond to the breaching or removal of dams along their spawning

reaches. Without reductions in other factors leading to population declines, the costs of dam removals and breaching may outweigh the benefits. When many uncertainties exist, competing theories and solutions predominate. This can create an arena in which any decision may be questioned, debated, and negated.

#### **Training Tip**

*Initiate a group discussion: Uncertainty is a fact of life, and stakeholders often find themselves faced with uncertainty. They are just not going to get all the information they would like to make a decision. What issues have you dealt with where uncertainty was a factor? Where were the problems?*

**Time required:** 5 minutes

**Handouts:** None

### Visuals

#### On Research and Information Gathering

- Stakeholders often face a need or desire for more information than is available. However, too much data can be overwhelming.
- Credible information commissioned or produced by some parties may be distrusted by others.
- The presumption that people implicitly trust scientists is not necessarily true.
- Information and research cost money, usually a lot of money.

slide 18

#### Too Much, Too Little



slide 19

### Background and Discussion Points

**Display Slide 18.** Stakeholders often face the need or desire for more information than is available. Too much data, however, can overwhelm decision-makers. Credible information commissioned or produced by some stakeholders may be distrusted by others.

- ▶ The process of generating, compiling, and analyzing technical information is often not coordinated with the public issues education effort. Information gathering can get too far ahead of decision-making or be seriously delayed by it.

**Display Slide 19.** Information and research cost money, usually a lot of money. Stakeholders are faced with the need to balance their desire for information with their ability to pay for it.

#### Training Tip

*Initiate a group discussion: Stakeholders often face difficulties in gathering information. How much information is enough; what's credible and what is not; how do stakeholders trust what is available? What issues have you worked on where information gathering became part of the controversy itself?*

**Time required:** 5 minutes

**Handouts:** None

### Visuals

#### On Modeling


- The promise of modeling may seduce stakeholders into believing models are infallible.
- Models may appear to be in opposition, when in fact they are designed with different assumptions. They are not comparable.

slide 20

#### Watch What You Compare

Sunlight + Photosynthesis + Water + DNA =  
Red Delicious

Sunlight + Photosynthesis + Water + DNA =  
Macintosh



They are both apples, but they differ in taste, color, and shape.

slide 21

### Background and Discussion Points

**Display Slide 20.** The promise of modeling may seduce stakeholders into believing models are infallible. All models contain some elements of uncertainty. The real world that they mimic is extremely complex, while the model is built on simplified assumptions. A number generated by a model is a singular value; it cannot predict a future state with absolute certainty. Stakeholders must understand that any output from a model is based on a range of different quantities, with each quantity having its own probability of being true.

- ▶ Although models are excellent illustrative tools, they are rarely predictive.
- ▶ Sometimes scientists use models to refute claims supported by another model. The models may appear to be in opposition, when, in fact, they are not comparable because they are designed with different assumptions or because they are based on different theoretical foundations. For example, geologic and atmospheric models are both used as predictors of global climate change, but the results of the two models may yield different conclusions.

**Display Slide 21.** Even though these two “models” of how apples are made appear identical, each results in a different outcome – a Red Delicious apple or a Macintosh apple. Stakeholders sometimes fail to inquire about the assumptions and objectives of the modeler, and they confuse model results with real-world consequences.

#### *Training Tip*

*Initiate a group discussion: Modeling can help stakeholders understand systems, but they cannot replicate “Mother Nature.” Who has had experience using models in a controversy? How effective were they for the stakeholders?”*

**Time required:** 5 minutes

**Handouts:** None

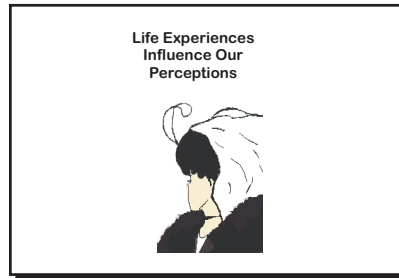
### Visuals

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**On Stakeholders, Experts, and Other Third Parties**

- ON SCIENTISTS
  - Uncertainty and division exist even among scientists, but disagreements may be less intense than you think.
  - Scientists with a stake in the issue may not be sufficiently impartial.
- ON STAKEHOLDERS
  - Some are unable or unwilling to do their homework.
  - People's tolerance for complexity and ambiguity varies.
- ON ALL OF US
  - Life experiences influence our view of the issues.

slide 22



slide 23

### Background and Discussion Points

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#### ON SCIENTISTS

**Display Slide 22.** Uncertainty and division exist even among scientists. However, scientists with apparent disagreements among themselves often are in less disagreement than others may perceive.

- ▶ In some instances, the role of expert and the role of stakeholder may be synonymous. Scientists become stakeholders when the issue is also the subject of their professional work or when they have a personal stake in the issue. In these cases, the impartiality of their advice may be questionable.

#### ON STAKEHOLDERS

- ▶ Some stakeholders may not trust the scientist, the science, or both.
- ▶ People enter issue discussions with unequal scientific and technical resources. This condition, called *information asymmetry*, can lead to distrust among stakeholders.

- ▶ Some stakeholders are unwilling or unable to do their homework. This may result in some stakeholders remaining poorly informed and holding up the progress of the rest of the group.
- ▶ People's tolerance for complexity and ambiguity varies.

#### ON ALL OF US

**Display Slide 23.** Life experiences influence each party's view of the issues. Your life experiences may influence how you perceive this drawing. Does the illustration evoke an image of a young woman facing away or an old woman in profile?

#### ***Training Tip***

*Initiate a group discussion: The people directly involved in a controversy may cause their own problems. If stakeholders don't do their homework, they become ineffective negotiators. Scientists may be so attached to their research that they lose their objectivity. Have you run into any of these situations? What was the problem, and how did the group handle it?*

## Module 3.6. On Information and Conflict

Time required: 5 minutes

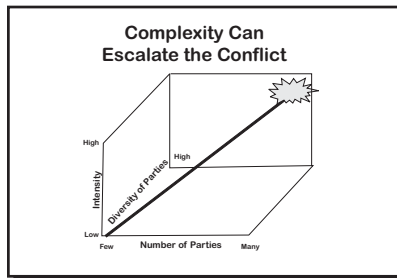
Handouts: None

### Visuals

#### On Information and Conflict

- Politics and underlying values often affect political decisions, even when a profusion of scientific information is available.
- Information that is usable by all stakeholders requires trust in the information and the methods by which it is produced.
- Scientific and technical complexity can escalate conflict, alarming and overwhelming people with too many counter-ideas or unclear options.

slide 24



slide 25

### Background and Discussion Points

**Display Slide 24.** Politics and underlying values often affect political decisions, even when a profusion of scientific information is available. Scientific information is not a substitute for value choices.

- ▶ Information that is usable by all stakeholders requires trust in the information and the methods by which it was produced. When people perceive that the science has been generated from a particular point of view or with a particular outcome in mind, their trust is diminished.
- ▶ It is often the quality of the communication, not the technical information itself, that stands in the way of finding common ground.
- ▶ If scientists or technically oriented stakeholders do not understand the real concerns of the other stakeholders, then science – no matter how well applied – will not solve the problem.
- ▶ Reductionist thinking—as in “Here is the problem, these are the options”—doesn’t deal with the potential for unintended consequences.

**Display Slide 25.** Scientific and technological complexity can play a role in escalating conflict by creating “mystery,” by obfuscating options, or by alarming or overwhelming people with too many countervailing ideas. As the number of stakeholders, diversity of stakeholders, and intensity of the issues increase, additional technological complexity can be the flame that ignites the powder keg.

#### Training Tip

*Initiate a group discussion: Stakeholders’ decisions, even though they are grounded in “good science,” have been stopped cold by a political decision based on a different set of values. Sometimes scientific and technical complexity just overwhelms people, making a conflict worse. Have you been involved in a controversy where one of those dynamics took place? What happened?*

## Module 3.7. On the Educator's Role

**Time required:** 5 minutes

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**Handouts:** None

### Visuals

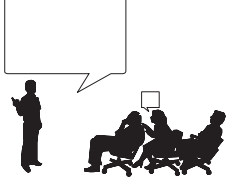
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**On the Educator's Role**

- We tend to think in terms of agreements, solutions, and decisions. In many complex problems, it may not be possible for stakeholders to find a solution.
- The educator's biases can infiltrate the process – for example, when framing the issue.

slide 26

**Maintaining Neutrality**

An illustration showing a person standing on the left, facing a group of four people seated around a table on the right. A large speech bubble is positioned above the standing person, and a smaller one is above the group. This represents a facilitator or educator interacting with a group.

slide 27

### Background and Discussion Points

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**Display Slide 26.** When we work with groups dealing with a vexing public issue, we tend to think in terms of agreements, solutions, and decisions. When we are unable to reach a solution we may consider the effort a failure.

**Display Slide 27.** Public issues educators often play a critical role in framing or reframing scientific and technical issues. The educator's biases can infiltrate the process.

#### ***Training Tip***

*Initiate a group discussion: The potential for an educator or facilitator to bias the discussion of a controversial issue is always present. Have you been in a situation where you thought that had occurred or where a stakeholder accused the facilitator of bias? What happened?*

## Module 4: Tools and Techniques

**Time required:** 2 hours and 30 minutes

30 minutes for this introduction

5 minutes each for Modules 4.1 through 4.3.

45 minutes for Module 4.4

30 minutes for Module 4.5

30 minutes for Modules 4.6 and 4.7

### Handouts

Case Scenario 1, "Hog Heaven"

(p. 37-38, *Learner's Resources*)

Case Scenario 2, "Feet and Inches" (p. 39)

Case Scenario 3, "Knowledge Is Power"

(p. 40-41)

Handout 4, "Tools and Techniques for Public Issues Educators" (p. 30-33)



### Visuals

## Tools and Techniques

Working with Scientific and Technical Information in Contentious Public Issues

slide 28

### Introduction

- The setting we work in can be chaotic. Our focus should be to help people proceed thoughtfully through a decision-making process.
- Group process strategies should be considered more as "rules of thumb" rather than hard and fast techniques.
- Guidelines are not applicable to every case.
- Multiple discussions of the legal, social, economic, and technical issues are often required.

slide 29

### Tools and Techniques: When

- Assessing an issue
- Designing a process
- Defining the problem
- Working with experts
- Negotiating and problem-solving
- Making and implementing agreements

slide 30

### Objectives

1. Participants become familiar with "best practices" – the tools, techniques, methods, and procedures they can use to help decision-making groups grapple with the challenges posed by disagreements over scientific and technical information.
2. Participants learn that best practices can be applied at different times during the decision-making process.
3. Participants learn to discern practices that may be situation-specific and to understand how they might apply those practices.
4. Participants learn to appreciate the "art" of public issues education.

### Background and Discussion Points

**Display Slides 28 and 29.** Group-process strategies tend to be tacit, reactive, and improvisational. They are developed and refined through experience and should be considered more as "rules of thumb" than hard and fast techniques.

- ▶ There is no recipe for every situation. Applying these practices in specific situations requires familiarity with the techniques and professional judgment that is learned through experience.
- ▶ None of these practices is infallible or applicable to every situation.

- ▶ The setting in which Extension educators work can be chaotic. Assisting people to proceed thoughtfully through a decision-making process is an integral part of what we do.
- ▶ Educators must be prepared to guide a group through multiple discussions of the legal, social, economic, and technical issues at hand to ensure that people understand the issues and can effectively evaluate the information and the challenges surrounding its use and application.
- ▶ Educators must recognize that situations vary from case to case.

**Display Slide 30.** The tools, techniques, methods, and procedures used by a public issues educator can be categorized by *when* they are applied during a decision-making process. The stages of the process are:

1. Assessing the issue
  2. Designing the process
  3. Defining the problem
  4. Working with experts
  5. Negotiating and problem-solving
  6. Making and implementing agreements
- ▶ *Assessing the issue.* This is the initial phase of both the decision-making process and any educational effort associated with it. At this stage, examine and evaluate the problem and its potential for educational intervention.
  - ▶ *Designing the process.* Once you have decided that you can effectively develop and carry out a public issues education effort, take the time to design methods for doing so. This should be done before convening a group of stakeholders, but with the ideas and assistance of some group members. After officially convening the group, work with the stakeholders to establish the procedures and protocols that will govern their interactions and decision-making. You also need to consider

appropriate educational techniques and interventions as you prepare the agenda and day-to-day activities of the group.

- ▶ *Defining the problem.* In this stage, you can help the group focus on the problem and work to establish common definitions of the issues to address and resolve.
- ▶ *Working with experts.* This is the stage in which you use methods and techniques to encourage the flow of information among the experts and the group participants.
- ▶ *Negotiating and problem-solving.* This is the deliberation stage. The stakeholders are actively discussing the issues and seeking workable options.
- ▶ *Making and implementing agreements.* In this final phase of the decision-making process, the stakeholders agree on a course of action, put it in writing, ratify the agreement, assign responsibilities for carrying it out, and maintain avenues for renegotiation, if necessary.

### ***Training Tip***

*Divide the class into three groups and distribute the three case scenarios by assigning a different scenario to each group. Ask three participants (one from each group) to take turns reading the cases aloud so everyone is familiar with all three cases. Let participants know that the case scenarios will be used throughout Module 4 to illustrate tools and techniques.*

**Time required:** 5 minutes

**Handouts:** None

### Visuals

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#### Substantive Knowledge and the Educator

- Get immersed in the issues and language of the topic.
- Use self-restraint if you have expertise in the area.
- Prepare to manage different kinds of expertise.

*slide 31*

### Background and Discussion Points

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- ▶ Before beginning any educational effort, public issues educators should assess their own knowledge of the issue to be addressed.
- ▶ In addition to applying tools and techniques over the life of the process, we also need to consider approaches relative to the level, amount, type, and scope of substantive knowledge that we and our publics possess.

**Display Slide 31.** Although we needn't be experts in the technical field with which we are working, to be effective "process people" we need to be sufficiently grounded in the issues and language of the topic. This will help sharpen our insights, ask better questions, and keep up with the group.

- ▶ If you are a technical expert in the field at hand, don't become the science advisor – leave that role for someone else. Otherwise, your impartiality could become jeopardized. Use self-restraint. If you feel compelled to share your knowledge, ask the group for permission first.

- ▶ Be prepared to manage the different kinds of substantive expertise the stakeholders bring to the table. It's useful to remember that different professions are schooled in different kinds of problem-solving. Find ways that each can contribute to the solution, building on each other's knowledge and disciplines without negating the expertise of the other.
- ▶ If you lack experience or knowledge, don't hesitate to partner with someone who has it.

**Time required:** 5 minutes

**Handout:** None

### Visuals

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**Assessing the Issue**

- Identify key players; consider their level of scientific and technical sophistication.
- Identify and assess the issues:
  - Potential information needs and data conflicts
  - Kinds of data the parties are relying on
  - Sources of information
  - Potential impacts, risks, precautions, and benefits that are likely to emerge

*slide 32*

**Assessing the Issue**

**Question assumptions that science-related issues are actually at the core of the controversy. A narrow scientific focus may miss or distort the issues or process.**

*slide 33*

### Background and Discussion Points

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**Display slide 32.** Complete a preliminary issues assessment to identify key players and determine their level of scientific and technical sophistication.

- ▶ Form a coordinating committee early with key stakeholders represented. Have the committee identify potential scientific and technical issues.
- ▶ Identify potential information needs and data conflicts, the kinds of data the stakeholders are relying on, the sources of their information, and the potential impacts, risks, and benefits that are likely to emerge (Carpenter and Kennedy).
- ▶ Discuss the stakeholders' various perceptions of "risk" and "precaution." Find out how their ideas apply to the case. Risk preferences can vary widely among stakeholders, so it's useful to know.

Perceptions about risk and precaution have to do with how people feel about the uncertainty of potential harmful activities and where their tolerance for risk begins and ends.

**Precaution**, in a public issue decision-making process, is based on the principle that we should not expose humans and the environment to hazards if it is not necessary. Advocates of "precautionary principles" believe that when an activity creates threats to human health or the environment, precautionary measures should be taken even if cause-and-effect relationships are not fully established scientifically (Tickner, Raffensperger, and Myers). The precautionary principle says that decision-makers have a general duty to take preventive action to avoid harm before scientific certainty [of harm] has been established ([www.rachel.org](http://www.rachel.org)). The mindset is "better safe than sorry."

**Risk** is the degree of probability of a loss or negative impact. Risk assessment is a process in which hazards and expected hazards are evaluated to determine their harm to human health and the environment. Cost-benefit analyses are often included with risk assessment.

**Reasonable risk** is a concept that accepts some level of risk for an activity. When there is an issue of risk, decision-makers consider how much damage or harm is tolerable. People and policymakers are willing to accept a certain level of risk. Policymakers may determine whether the damage and potential damage

are great enough to regulate via government intervention (Raffensperger and de Fur). The mindset is this: “How much harm is tolerable before it becomes intolerable?”

**Display Slide 33.** Question your own assumptions that data-related issues are actually at the core of the controversy. It’s important not to reduce or trivialize institutional racism, power relationships, risk preferences, and economics. A narrow scientific focus may miss or distort the issues or process. For example, in conflicts that involve the location of resources, people may use science to thwart the location of unwanted land uses. The issue is not science, *per se*, but equity and justice.

- ▶ Coach the stakeholders during the initial meetings phase on different approaches they might use to resolve information-intensive issues. As much as possible, get them to think about how information will be jointly gathered and examined.

## Module 4.3. Designing the Process

**Time required:** 5 minutes

**Handout:** None

### Visuals

**Designing the Process**

- Design a process strategy that anticipates and intentionally incorporates the scientific and technical issues.
- Timing is critical. Pace the data gathering and flow so information is available when needed.
- Ensure the proper level of confidentiality through documents, contracts, or ground rules.

slide 34

**Designing the Process**

- Develop a process that allows the stakeholders as a group to:
  - Define the information they need.
  - Decide where they will get it.
  - Decide what they will do with it.
  - Determine how it will be incorporated in their decision-making process.

slide 35

**Designing the Process**

- Examples of information and learning strategies:
  - Technical study team appointed by parties
  - Science summit
  - Moderated panel discussion
  - Poster sessions
  - Jointly created background papers
  - Facilitated “fish bowl” science discussion
  - Session where experts are invited to draft proposed language for a negotiating document

slide 36

### Background and Discussion Points

**Display Slide 34.** Design a process strategy that anticipates and intentionally incorporates the scientific and technical issues. Anticipate and help organize the roles of the experts. Strategies that work include a technical committee that reports to the whole group and a moderated panel discussion where the participants can ask the experts questions.

- ▶ Timing is critical. Actively coordinate the gathering and analysis of scientific and technical information. Pace the data gathering and flow so information is available when it’s needed.

**Display Slide 35.** Develop a process that allows the stakeholders to define the information they need, where they will get it, when they need it, and what they will do with it.

- ▶ Determine how much of the process needs to be behind closed doors versus in the public eye – the political balancing of public input versus private deliberation. Know the legal requirements. Ensure the proper level of confidentiality for scientific and technical discussion through documents, contracts, or ground rules.

**Display Slide 36.** Support the flow of information by using design strategies:

1. Advise stakeholders to appoint a technical study team. The team can be composed of outside experts, process participants, or both.
2. Organize a “science summit” wherein the experts isolate disagreements, clarify what does not need to be contested, and search for areas of agreement.
3. Organize a moderated panel discussion wherein the stakeholders can ask questions of the experts.
4. Develop poster sessions that provide opportunities for stakeholders and experts to exchange views.
5. Ask experts and stakeholders to create background papers together and make presentations to the group.
6. Facilitate a “fish bowl” science discussion wherein a panel of scientists discusses the issues while being observed by an audience of stakeholders.
7. Organize a session wherein experts are invited to draft proposed language for a negotiating document.



**Display Slide 38.** Use *situation mapping* (Daniels and Walker) to identify data needs. Situation mapping is a visualization process that helps people graphically represent a situation to create a shared and systemic understanding of it. It is particularly useful in the early stages of defining the problem and can be used to help participants pinpoint data and information needs.

**Display Slide 39.** The process begins with a “map chassis” – a core fragment that gets people thinking and involved in editing and adding to the map

- ▶ Elements are parties, issues, and activities – nouns that are represented by polygons.
- ▶ Relationships are verbs on lines that connect elements.

**Display Slide 40.** The facilitator asks the participants some prompting questions to stimulate responses for editing and adding to the draft map:

- ▶ What are the central issues in the situation?
- ▶ Who are the key stakeholders in this situation? How do they interact?
- ▶ What actions, behaviors, or practices should be included?
- ▶ What connects with what? In what way or direction?

**Display Slide 41.** Situation mapping is creative, not evaluative. The purpose of situation mapping is to understand the situation, not to jump to generating new solutions or debating potential changes. It is a brainstorming exercise in which the rule of thumb is to separate the process of generating ideas from the process of evaluating them.

- ▶ Situation mapping can be used to reflect individual perspectives. It can also be used to map the shared viewpoints that make up a group’s perception of a situation. For example, representatives of one

stakeholder group can develop their own situation map and compare it with the maps of other stakeholder groups to learn how others see the situation differently. Alternatively, a diverse group of stakeholders can work together to develop a single, composite view of the situation. In the latter case, no participants should be expected to necessarily hold the complete view, but they should be able to see their particular viewpoint represented in it.

- ▶ The objective of situation mapping is not to accurately depict a particular situation in all its detail and minutiae. Rather, situation mapping should be used to capture the dynamics that give rise to the particular situation. According to Daniels and Walker, situation maps should “seek to portray the fundamental forces that drive, reinforce, and constrain the choices that the stakeholders might be interested in pursuing.”

### Creating a Map

Engage the participants in an exercise to create a map that represents the situation presented in the Cameron County video, focusing on the information needs of the stakeholders.

**Materials needed:** A drawing surface, such as a white board, chalk board, flip chart paper, or a blank overhead transparency and overhead projector; colored markers, chalk, or pens. This exercise can be carried out in one of two ways:

- ▶ *Small group mapping.* Ask the participants to work in small groups and develop situation maps that can then be compared and discussed.
- ▶ *Composite mapping.* Work with the entire group to develop a composite map.

Both methods are described on pages 29-30.

Begin by introducing a map chassis such as that illustrated on **Slide 42** or one you develop on your own. Remind the group that map elements – such as parties, issues, and activities – are drawn as polygons and labeled with nouns (for example, “cotton farming” or “U.S. EPA”). Relationships are represented by lines and can have arrows that indicate the direction of the relationship. The lines are labeled with verbs (for example, “supports,” “bans,” “is responsible for”). Lines can be solid or broken to represent relationships of differing strengths.

Remind the group that the map chassis is merely a way to get started. The objective is to edit and revise the map so that it reflects the participants’ views of the Cameron County situation.

### ***Small-Group Mapping***

1. Divide the participants into small groups of three or four people. Hand a half-sheet of flip chart paper and colored markers to each group. Ask the group to appoint a reporter who will present their finished product to the other groups.
2. Instruct each group to develop a situation map that represents what they saw and heard on the video clip about the Cameron County cotton-falcon issue. Give them 15 minutes to create their map.
3. Display **Slide 40**, “Situation Mapping Prompting Questions.” Repeat the questions to stimulate their thinking:
  - What are the central issues?
  - Who are the key stakeholders? How do they interact?
  - What actions, behaviors, or practices should be included?
  - What connects with what? In which way or direction?
4. Remind the groups that this is a brainstorming process. The rule of thumb is to generate ideas and get them on

paper, then evaluate and refine those ideas. Remind them also to focus on capturing the dynamics that give rise to the situation, and not to worry too much about capturing every detail.

5. When the participants have completed their group map, introduce the map chassis with additional *information linkages* (display **Slide 43**). The red lines in Slide 43 indicate information linkages between the “human” elements (such as people, organizations, and interest groups) and the “nonhuman” elements (such as places, actions, and resources).
6. Ask the participants to identify and draw information linkages in their maps.
7. Next, ask them to identify the following data and information parameters (display **Slide 44**):

*For each element that describes a person, organization, or interest group:*

- ▶ What data and information does this entity provide?
- ▶ Are the data viewed as credible by all stakeholders?

*For each “nonhuman” element (a thing or an action):*

- ▶ Is information complete?
- ▶ What additional information is needed?

*For each relationship:*

- ▶ Is more or better information needed to understand the interaction between elements?

*Establish priorities for collecting information and data.*

8. Instruct the participants to present their completed situation maps identifying the key elements, the relationships among them, and the information parameters that characterize the situation.
9. Debrief the exercise with a short discussion of how the maps differed among groups and why.

### Composite Mapping

1. Your role will be to facilitate the development of the composite situation map. The map chassis should be displayed on a format that is large enough to be easily seen by all participants. A large white board, chalkboard, flip chart paper (tape 3 or 4 pages together), or overhead projector are suggested formats. (If you use an overhead transparency, write small. If you want to use **Slide 42**, you will need to redraw it since it is too large in its original form).
2. Beginning with the map chassis, ask the group to edit and refine the map to reflect what they know about the Cameron County situation.
3. Display **Slide 40**, "Situation Mapping Prompting Questions." Repeat the questions to stimulate their thinking:
  - What are the central issues?
  - Who are the key stakeholders? How do they interact?
  - What actions, behaviors, or practices should be included?
  - What connects with what? In what way or direction?
4. Add new elements and relationships as the group responds. Before committing any new items to the drawing, ask for confirmation by the group members.
5. If controversial elements or linkages are proposed, denote them with a question mark. Record tangential or crosscutting remarks in the margins. When in doubt about how to represent an issue on the map, ask the participants to guide you.
6. Continue to add and modify elements and relationships until no more additions or modifications are offered.
7. Next, introduce the new map component of *information linkages* (display **Slide 43**). Ask the participants to identify information linkages between the "human" elements

(people, organizations, and interest groups that possess information) and the "nonhuman" elements (places, actions, and resources) that are the subject of the information.

8. Next, ask them to identify the following data and information parameters (display **Slide 44**):

*For each element that describes a person, organization, or interest group:*

- ▶ What data and information does this entity provide?
- ▶ Are the data viewed as credible by all stakeholders?

*For each "nonhuman" element (a thing or an action):*

- ▶ Is information complete?
- ▶ What additional information is needed?

*For each relationship:*

- ▶ Is more or better information needed to understand the interaction among elements?

*Establish priorities for collecting information and data*

9. Review the map with the group to be sure that all members are satisfied with their product.

**Note:** If time does not permit leading the group through the situation mapping exercise, you may display **Slide 45**, a "completed" situation map.

### Training Tip

*Use the case scenarios. After discussing the slides and guiding learners through mapping the Cameron County situation, ask each group to develop a situation map using its case scenario and to answer Question 1 in the case scenario.*

**Time required:** 30 minutes

### Handout

Handout 6, "Facilitating a Focused Discussion"  
(p. 36, *Learner's Resources*)

### Visuals

**Working with Experts and Information**

- Keep the scientists on target with what is relative to the group.
- Have scientists explicitly discuss the assumptions behind their data.
- Encourage scientists to use plain language and good visuals.
- Ask experts to state their understanding of the pertinent risks, benefits, and cautions.

slide 46

**Working with Experts:  
Focused Discussion Method**

- Level 1 – Clarification
  - "Are there any questions about points of fact or clarification?"
- Level 2 – Reflection
  - "How do you feel about what you just heard?"
- Level 3 – Interpretation
  - "How does the information just presented affect the issues at hand?"
- Level 4 – Action
  - "Based on what you just heard, what needs to happen?"

slide 47

### Background and Discussion Points

**Display Slide 46.** Keep the scientists on target with what is relative to the group. Meet with them ahead of time to find out what they are presenting and make sure it is relevant to the decisions that need to be made.

- ▶ When scientists present models, maps, or graphs, be sure to allow time for the scientists to clarify the assumptions behind the data and to explain how the stakeholders can understand or appreciate the maps or models.
- ▶ Encourage scientists to use plain language and good visuals, such as photos, maps, and cartoons.
- ▶ Politely interrupt the speaker when he or she slips into jargon or acronyms.
- ▶ Ask the experts to explain their understanding of the pertinent risks, benefits, and cautions, as well as how that information applies to the facts at hand.
- ▶ When access to scientific and technical expertise is unequal, discourage overly sophisticated presentations by just one side. PowerPoint presentations, slick graphs, and complex maps can create a sense that certain solutions are pre-

destined. Instead of or in addition to these kinds of presentations, try using jointly constructed visuals like flow charts that all the parties can understand.

- ▶ Encourage lay stakeholders to rely on the persuasiveness of evidence generated by good scientific methodology, not on quantity of information alone or on the personality of the scientist.

**Display Slide 47.** The purpose of a *focused discussion* (Stanfield) is to bring the participants together mentally: to get them "all on the same page." The discussion may be short or long, depending on the situation. Focused discussions are particularly appropriate after a presentation or a video or when the participants were asked to read something to prepare for the discussion.

- ▶ The value of a focused discussion is that it helps the participants identify and focus on the real significance of the issue being discussed. It helps them put events into perspective. And it gives participants common understandings of the issues. Each focused discussion is tailor-made for best results – questions have to be relevant to the subject and the group.

In a focused discussion, the facilitator leads a group from surface observations of a situation to in-depth understanding and a response to the situation. It works well with unsophisticated and anxious participants as well as with confident and strong-willed ones. The facilitator uses focused questions to engage participants in the discussion. The questions are designed to fit the situation and they are prepared in advance. It doesn't hurt to write more than you'll probably need.

The focused discussion moves the participants through four sequential levels of thought. Questions at Level 1 should be easy to answer as this introductory phase helps break the ice. Here are descriptions and examples of each level.

**Level 1 questions** focus the participants' attention, identify realities (what is directly observable), and clarify information. These first questions elicit facts. They ask what participants have heard, seen, read, or otherwise learned about the situation. These questions help to ensure that everyone deals with the same information:

1. "What caught your attention when you read the article?"
2. "What stuck in your mind?"
3. "What were the main points?"
4. "What points didn't you understand, or which ones need clarification?"

**Level 2 questions** bring out people's emotional responses. They are concerned with feelings, moods, memories, and associations. Questions at Level 2 help participants describe how they feel about something, whether they like it, whether it angers or excites them. The questions help reveal the participants' initial responses to the situation.

1. "What does it remind you of?"
2. "How do you feel about what you just heard; are you skeptical, intrigued?"
3. "What was your gut reaction?"

**Level 3 questions** build on the objective data and feelings from Level 1 and Level 2. They draw out the significance of the information and help build a story of what is happening. The "story" may answer some of the "why" questions within the situation and reveal the values held by members of the group. Level 3 questions may consider alternatives and options.

1. "How does the information presented fit with the topic at hand?"
2. "What do you see as strengths and weaknesses of what you just heard?"
3. "What is an insight here?"
4. "How will this affect our work?"
5. "What does all this mean?"

**Level 4 questions** make the discussion relevant for the future. The questions use the information discussed in Levels 1, 2, and 3 and lead the participants to make short- or long-term decisions or choices based on that discussion. Level 4 questions help bring the discussion to a close.

1. "What are some of the first steps we need to take to implement those changes?"
2. "What are some changes that can be made to resolve the problem?"
3. "What is our response?"
4. "What decision is called for?"
5. "What are the next steps?"

As a general rule, use three or more questions at Level 1 (perhaps more with an unsophisticated or anxious group). You need enough questions to get all the significant facts and data and enough basic questions to engage the participants in the discussion. Similarly, ask enough Level 2 questions to get at the emotions and feelings that the various participants are willing to share. Level 3 may take more questions than Level 1 or 2 simply to deal with all the information that has been discussed. It's a good idea to come prepared with more questions than you'll probably need. Level 4 will probably only need three or four questions to bring closure to the discussion.

***During the focused discussion, should the responses and information be recorded, yes or no?***

**NO**, if the primary purpose of the discussion is to get the group warmed-up and ready to work together. It's the conversation that's important. Recording adds an artificial element to a good conversation.

**YES**, if you are using the discussion as a lead-in and the group needs the information for further work. Facilitators often use Level 1 questions as a warm-up activity. No information is recorded. Then, because the other information is needed for the rest of the meeting, responses are recorded from the remaining focus questions.

### ***Training Tip***

*Use the case scenarios. Discuss Slide 46 briefly. Ask each group to answer Question 2 in the assigned case scenario. Ask each group to present its answer to Question 2. Discuss and record major themes and lessons. Discuss the Focused Discussion Method using Slide 47 and the handout.*

**Time required:** 5 minutes

**Handouts:** None

### Visuals

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**Negotiating and Problem-solving**

- Frame the discussion on how the stakeholders as a group can find a livable solution.
- The greater the uncertainty, the more adaptive the resulting solution should be.
- Explore the best and worst alternatives to a negotiated agreement to understand how each party proposes to handle scientific uncertainties if there is no agreement.

*slide 48*

### Background and Discussion Points

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**Display Slide 48.** Frame the discussion on how the group can find a livable solution. Discourage negotiation styles that imply “right” and “wrong.”

- ▶ Sometimes participants defend their own position not on its merits, but by the lack of others’ data: “Show me the data!” goes the cry. In these instances, remind participants that this is a joint search for common understanding and that the onus of proof should not be placed on any single participant or group.
- ▶ **Privately** explore the best and worst alternatives to a negotiated agreement to understand how each party proposes to handle scientific uncertainties if there is no agreement. This is a reality check for them.
- ▶ Work toward jointly producing and analyzing the technical information that will lead to developing criteria for evaluating options and eventually developing the options.
- ▶ Help the scientists, technical experts, and stakeholders understand that compromise solutions are not inherently bad.
- ▶ The greater the uncertainty, the more adaptive the solutions should be.

**Time required:** 25 minutes

**Handouts:** None

### Visuals

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**Making and Implementing Agreements**

- Help parties understand when they have enough agreement on technical issues to go ahead and negotiate solutions.
- When agreements are based on key scientific assumptions, make those assumptions as explicit as possible.
- Try to help craft an agreement that allows for change, so if the stakeholders are wrong about the science, they can revisit and renegotiate the issues.

*slide 49*

### Background and Discussion Points

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**Display Slide 49.** Help stakeholders understand when they have enough agreement on technical issues to go ahead and negotiate solutions.

- ▶ When agreements are based on key scientific assumptions, make those assumptions as explicit as possible. Explore how to monitor the assumptions and determine what to do if those assumptions turn out to be different or untrue.
- ▶ Try to help craft an agreement that allows for change, so if they are wrong about the science, they can revisit and renegotiate the issues.
- ▶ In many complex problems the right action may be no action – a well-informed public may be the best result of the process. Sometimes “some improvement” is all that can be attained, and that’s OK.

#### ***Training Tip***

*Use the case scenarios. After briefly discussing Slide 49, ask each group to discuss Question 3 in the assigned case scenario. Ask each group to present its answer to Question 3. Discuss and record major themes and lessons.*

## References

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