

ABOUT iSNAP

The **iSNAP Water Quality Education Project** is a cooperative effort of Oregon State University (OSU), Washington State University (WSU), University of Idaho (UI), US EPA and Natural Resources Conservation Service (NRCS).

The primary objective of the project is to provide educational programming and supporting resources to agricultural professionals and growers on innovative nutrient and pest management practices that can protect water quality, improve farm profitability and comply with environmental regulations. The challenge for the project is to enable participants to learn how to integrate within crop issues, including economics, pesticide safety, pesticide efficacy and resistance, with off crop issues, such as water and air quality and wildlife protection. Developing these state of the art skills this is not an easy task and requires the understanding and use of decision tools and models.

The iSNAP Project has two technical teams and a regional NRCS advisory group.

Nutrient Management Team

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Pest Management Team

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ABOUT THIS POSTER

The purpose of this poster is to present an approach to educational program design that results in increased capacity of learners to make cutting-edge IPM decisions that incorporate environmental protection.

This project is funded by:



OUTPUTS

Integrated Nutrient and Pest Management Workshops in 2004-05

The objective of these two-day workshops in was to provide educational resources to agricultural professionals that enable them to produce the following outcomes for pest and nutrient management:

1. Assess and communicate potential water resource benefits
2. Determine effective and viable management alternatives
3. Locate appropriate tools and resources
4. Inform growers of NRCS programs

Weather and Climate Impacts on IPM Workshops in 2006

These workshops will focus on how weather information can be more fully utilized to improve application efficiency and product efficacy, reduce environmental impacts and increase farm profits. Includes design considerations for edge-of-field buffers as a means of reducing losses and increasing natural enemy populations.

Target audience includes growers and agricultural professionals, including pesticide applicators, certified crop advisers (CCAs) and consultants.

Extension Publications and Online Education

Members of the pest management team are developing a drift management extension publication and a chapter on conservation planning and pesticide risk mitigation for the Pacific Northwest Pest Control Handbooks.

The nutrient management team and other specialists are currently developing two multi-state extension publications, *Using Irrigation Water of Varying Qualities* and *Managing Saline and Sodic Soils*.

Online proficiency testing modules for Certified Crop Advisor (CCA) credit will be produced and available for \$12 per credit through the University of Idaho website in late 2005.

Online educational modules from the weather and climate workshops will include with video and will be used to extend the program beyond face-to-face meetings.



Acknowledgements

National Integrated Water Quality Program
Western Region IPM Center
US Environmental Protection Agency
Natural Resources Conservation Service

EVALUATION

The iSNAP Project has a strong emphasis on the development and use of evaluation tools that allow for continuous improvement of the educational programs and materials. The results below are encouraging given the challenging goal for the learners to integrate knowledge across disciplines to build state of the art of skills for IPM decision making.

Nutrient and Pest Management Workshops

Three of the four nutrient and pest management workshops have been completed with a total attendance of 125. A post-then-pre, or retrospective pretest, approach was used at the end of each workshop to allow participants to comparatively assess their knowledge after the workshop with their knowledge prior to the workshop. Using this design we are able to:

1. Compare learning approaches used at the workshops
2. Determine participant intentions for using new knowledge
3. Improve workshop design and delivery over time

At-event evaluation showed that 56% of attendees succeeded in gaining or improving the specific skills or abilities they desired as a result of attending the pest management session and 49% did so as a result of participating in the nutrient management session. The largest gains in skills resulted from the sessions on tissue testing, drift management, evaluating pesticide fate and recommending pesticide risk mitigation options to protect water quality.

Example participant intentions:

"I want to teach farmers more about protecting water."

"Better irrigation practices."

"Do a better job of farm plan evaluation."

In the workshops we used a mix of lecture, posters and a case exercise. The evaluation results showed the participants found similar value in the three presentation formats, on a scale of 1 (not useful) to 7 (very useful):

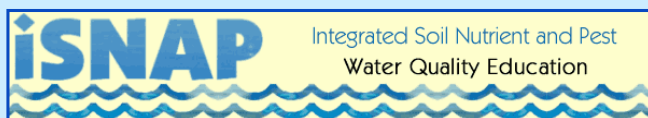
Lectures 5.7
Posters 5.2
Case exercise 5.0

The case study exercise has evolved considerably between iSNAP events to address the specific concerns of the participants. An example is that we started with a general scenario and have made it more crop and site specific to provide the feel of real world problem solving. Feedback from the evaluation process will allow us to continually improve the participatory methods used at iSNAP events.

Impact Assessment for the Weather and Climate Impacts on IPM Workshops

Impact evaluation will be conducted in late 2006 to document the effectiveness of project activities and determine impacts on participant behavior related to pest management practices. Key questions this evaluation is designed to answer include:

- What knowledge and abilities have workshop participants gained?
- What do they intend to do differently as a result of what they learned?
- What new or improved practices have been or will be implemented as a result of the project?
- What barriers do participants face in implementing new practices?



For more information on the iSNAP Project go to
isnap.oregonstate.edu

ADDRESSING EDUCATIONAL COMPLEXITIES

To better address the complexity of IPM and nutrient management education the project has adopted an outcome-based education (OBE) approach. This approach, including evaluation, ensures that the project provides learning experiences that are relevant to the work the participants do and support the focus on water quality.

A SIX STEP PROCESS

Figure 1 shows the steps of developing an OBE curriculum that acknowledges the interconnectedness of different disciplines and takes a long-term perspective. The project uses a team approach to include expertise from across the region in designing useful programs for professionals and growers.

1. Determining the **roles** that learners have provides the context for creating curriculum that is relevant in lives of the learners. For iSNAP the roles we see for learners are agricultural professionals providing pest management recommendations to growers and growers selecting and implementing IPM practices.
2. A design process that might seem backwards is used to develop each workshop program as we do not start with the content we want to cover. Instead we begin with envisioning **intended outcomes** for the participants with a group of educators and others. The idea is to determine what do the participants need to be able to DO beyond the classroom that we as educators are responsible for at the workshops (Steihl and Lewchuck, 2002).
3. **Concepts** are the ideas that learners need to understand achieve the outcomes. Concepts are similar to content except the intent is to move beyond knowledge to comprehension and application. Themes are threads that recur throughout the program and issues are dilemmas that need to be resolved through critical thinking.
4. Identifying the **skills** that are embedded in the outcomes allows the learners to performance the more complex tasks. Skills are actively developed through practice and feedback.
5. From the intended outcomes logical **performance or assessment tasks** are created that allow students to demonstrate that they are capable of producing the intended outcomes. Example tasks include developing a pest management plan and making a presentation on IPM.
6. Development of **standards** for the assessment tasks aids in aligning the expectations of the program with those in the learner's world.

The information from the above process was used to develop a **workshop outcome guide** (Table 1) for the upcoming *Using Climate and Weather Information in IPM Decision Making* workshops. This tool is used as a check as each workshop is developed. The result of this process have allowed the iSNAP Program to support learners to expand their capacity to identify and implement IPM practices that protect water quality. Ultimately, participants get beyond just knowing about IPM practices to analyzing and evaluating issues related to implementing IPM (Steihl and Lewchuck, 2005).

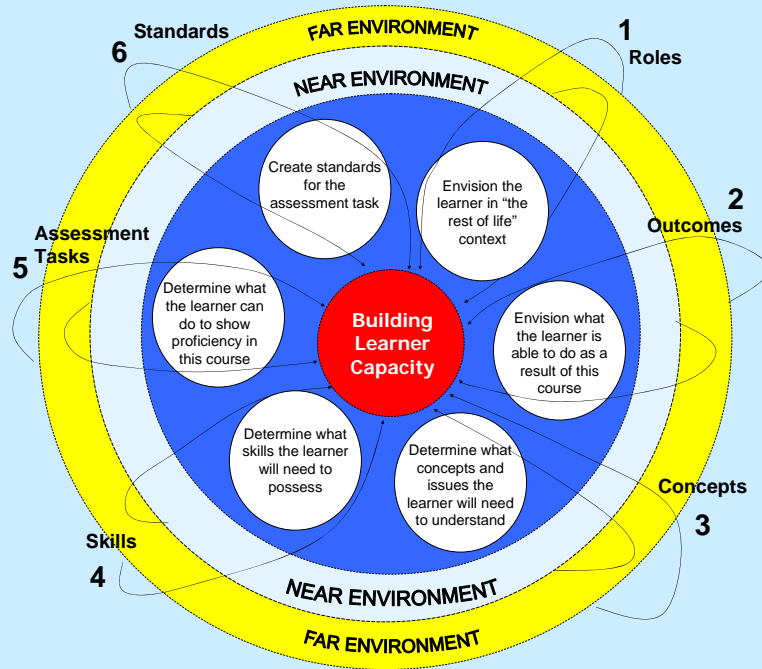


Figure 1. A learning-centered outcomes-based development process (adapted with permission from Steihl and Lewchuck, 2002).

Benefits and Challenges of a Regional Outcome-Based Project

- The process of designing education programs using a backward allows people to set aside their traditional content focus.
- Educators are more accountable to learners and for the student there is clear alignment of the topics that are covered.
- There is an obligation to support learners in being successful as a result of the emphasis on doing instead of just knowing.
- Having clear outcomes produces consistent teaching over time and across educators.
- There is significant time investment in the up front planning and development for each course. After this first phase less effort is required as the courses are refined over time.
- The fear of not including a given educator's content is real. Once it is clear that outcomes drive the selection of content, then what really matters is included.
- There are more people involved in an OBE process and there must be support of all involved or it will not work.

Table 1. Workshop Outcomes Guide: Using Climate and Weather Information in IPM Decision Making

Themes: weather and climate, pesticides

Prerequisites	Concepts and Issues	Process Skills	Performance Tasks	Intended Outcomes
<ul style="list-style-type: none"> • Experience in pest and/or nutrient management 	<p>Concepts:</p> <ul style="list-style-type: none"> • Weather and climate • Water resource protection • Watershed • Airshed • Vapor and gaseous pesticide transport • Buffers and barriers • Cost-share programs <p>Issues:</p> <ul style="list-style-type: none"> • Economics and risk • Air and water quality • Sensitive crops and biota • Systems thinking 	<ul style="list-style-type: none"> • Inventory farm within a landscape context to determine water resource concerns • Select appropriate sprayer nozzles to increase pesticide delivery to target • Recommend sprayer calibration and operation methods to reduce off-site losses • Research and design site-specific buffers and barriers • Determine USDA cost-share options to support specific practices 	<p>Given a case study, develop a farm-specific plan that includes:</p> <ul style="list-style-type: none"> • A list of practices that reduce the probability of aerial pesticide transport • An implementation plan with cost-share options 	<ul style="list-style-type: none"> • Assess the potential impacts of weather and climate to provide practical pest management guidance • Determine effective and viable mitigation strategies to reduce aerial transport of pesticides

References

- R. Stiehl and L. Lewchuk. (2002) *The Outcomes Primer: Reconstruction the College Curriculum*. 2nd ed. The Learning Organization, Corvallis, OR.
- R. Stiehl and L. Lewchuk. (2005) *The Mapping Primer: Tools for Reconstruction the College Curriculum*. The Learning Organization, Corvallis, OR.