

Developing Impact Statements for OARDC Programs

INTRODUCTION

Each January, departments/schools in OSU's College of Food, Agricultural, and Environmental Sciences are asked to provide quantitative and qualitative **Impact Statements** as a part of a performance-based resource allocation process. The U.S. Department of Agriculture also asks land-grant universities to collect and submit information on "impacts" of teaching, research, and Cooperative Extension programs. At the federal level, impact statements are shared with members of Congress and other key decision makers. In Ohio, impact statements are used to highlight the value of our work to the Congressional delegation, members of the Ohio General Assembly, and other supporters and stakeholders.

WHY IMPACT STATEMENTS?

Impact statements demonstrate how our work makes a difference in the lives of people, communities, local economies, and the environment. We must concisely describe problems, how we addressed the problems, and what and who was impacted as a result of our actions to our stakeholders and to our funders. Well-written impact statements are our single most important reporting activity. A clear articulation of impacts is the base from which we can be accountable for dollars that we currently receive and present strong justification for resources for future projects and programs at local, state and federal levels.

Documenting the results of our efforts is also increasingly expected by funders and stakeholders. Those of us in the public sector identify and illustrate how our work makes a difference in our clientele's economic, environmental, and social well-being through impact statements and impact reports.

An impact statement is a brief summary, in lay terms, of the economic, environmental, and/or social impact of our efforts. It states accomplishments and their payoff to society by answering the questions:

- *Who cares?*
- *So what?*

Impact reporting is important because it:

- Illustrates the importance of the land-grant effort.
- Helps us reflect on and improve our work.
- Demonstrates the difference we make in people's lives, communities, and the environment.
- Improves visibility of programs (local, state, national).
- Generates support.
- Helps us focus on issues, initiatives, and program themes.
- Builds greater understanding of our programs by the public.

Impact reporting is important to land-grant faculty and staff because:

- Provides public accountability.
- Stakeholders are asking for it.
- It lessens urgent requests for program examples, etc.
- Your work receives more visibility.
- Your work is exposed to potential funders.
- It can summarize and celebrate a job well done.

Our impact audiences include:

- State officials, federal officials, local governing bodies, the general public, peers, external funding sources, industry representatives, alumni, and students.
-

These audiences have:

- Some influence and control over our programs.
- Want information for decision-making.
- Want quantifiable differences brought about by investments in our programs.

Impact Statements are not:

- General, long-range goals.
- Description of a process or activity.
- Count of people participating in something.
- Detailed, scientific report.

FORMAT/FIELDS TO BE COMPLETED

Given that both scientists and lay audiences read impact statements, the language used should be straight forward, devoid of jargon, and brief.

- **Title:** The project/activity title. (300 character limit)
 - **Investigator (s):** Name, title, of the primary and secondary faculty involved in this activity. (500 character limit)
 - **Funding Sources:** Identify the sources of funding for this activity, both private and public. (Checkbox)
 - **Summary:** Brief description of the situation and/or objective. (500 character limit)
 - **Situation:** Brief description of the issue/problem/need, in layman terms, and why is it relevant? (1000 character limit)
 - Why are we doing this teaching/learning, research/discovery, and extension and outreach/engagement program?
 - What needs were expressed?
 - What was the situation/problem, and why was it a problem?
 - What is the issue/problem/need and why is it relevant? Who cares (target audience) and why?
 - **Response:** Provide an action statement (response). (1000 character limit)
 - What did you do?
 - What were the key elements?
 - Who was the target audience?
 - What resources were expended?
 - **Impact:** Describe the impact (results). The impact of your work is in the answer to the question "What is the payoff socially, economically, and environmentally?" (1500 character limit)
 - What happened to the audience as a result of the work described?
 - What knowledge was gained?
 - What skills were increased?
 - What practices/behavior changed?
 - How much money was saved or produced?
 - Were policies changed as a result?
 - What were the end results (quantitative and qualitative)?
 - What was the economic impact?
 - What was the scope of the impact (campus, regional, statewide, national, international)?
-

Example 1:

REPORT YEAR: 2013

DEPARTMENT: Food, Agricultural, and Biological Engineering

IMPACT FOR: OARDC

IMPACT TOPIC: Scientific Discipline or State, National or International Issue

SIGNATURE AREA(S): Environmental Quality and Sustainability

TITLE: Evaluating Factors That Influence Dynamic Equilibrium and the Ecology of Headwater Channel Systems

INVESTIGATORS: Andrew Ward, Jonathan Witter

FUNDING SOURCE(S): NIFA Hatch, NIFA Non Formula, Ohio Water Development Authority, SEEDS: OARDC Research Enhancement Competitive Grants Program

SUMMARY: Historically, agricultural ditches have had a trapezoidal shape and needed periodic maintenance. Public perception of a “good” ditch is thoroughly grounded in this image. We have developed an alternative design that is more self-sustaining and provides benefits to farmers and water resources. This work has led to global initiatives that show how ditches can be a conservation best practice and are changing long held perceptions of what constitutes a “good” drainage ditch.

SITUATION: Since European settlement, more than 200,000 miles of waterways in the United States have been constructed or modified to trapezoidal-shaped drainage ditches benefiting more than 110 million acres of agricultural land at an estimated cost of \$56 billion dollars. Some of this investment has been to undertake ongoing maintenance of ditches that function poorly as a water collection system for subsurface drainage systems in agricultural fields. Besides being costly for landowners, ditch maintenance has severe impacts on the environment. Vegetation that establishes on the ditch banks is removed and can result in bank erosion. Ecological communities are disturbed and often times extirpated. Nearly a decade ago, our research team at OSU observed these deleterious impacts locally and throughout the region (i.e., in headwater regions of Lake Erie and the Gulf of Mexico) and set out to develop more sustainable drainage practices that could both benefit production agriculture and enhance and protect the environment. The result of that work is the novel two-stage ditch design approach.

RESPONSE: In 2013, we completed a study of the geomorphic evolution, sustainability and water quality benefits of 7 two-stage ditches in Ohio, Indiana, and Michigan. We compared the cost of the two-stage ditch to other N-removal best management practices. The team published 12 factsheets; delivered 5 invited presentations at state, national, and international scientific meetings; provided 5 presentations at extension/ outreach field days and/or workshops; developed an agricultural drainage website, and published 1 dissertation. A guidance document was prepared for the USDA-NRCS in Ohio, for use within the context of the NRCS Conservation Planning Process, that includes drainage channel management and the design of two-stage and self-forming channels. A flashboard rise weir system was constructed on the campus two-stage ditch at Waterman farm. It will be used to evaluate nutrient removal associated with saturating the benches for different time periods.

IMPACT: Development of the two-stage ditch design along with collaborative research and outreach throughout the region, is spurring a paradigm shift in the way agricultural drainage ditches are designed and managed in the United States. The Natural Resource Conservation Service (NRCS) in Indiana has made the two-stage ditch practice eligible for EQUIP funding. These methods are included in the NRCS Stream Restoration Design Guide. The concept is featured in The Nature Conservancy commissioned video To Build a Better Ditch (video at: <http://www.vimeo.com/7901535>). More than 100 two-stage ditches have been constructed in the United States, Sweden, Finland, and China. There is also interest in the concept in France, Poland, and New Zealand. To date, no two-stage channel that has been constructed has required traditional maintenance resulting in a substantial savings to landowners. Collaborative research with the University of Notre Dame suggest that the two-stage ditch reduces nitrate-nitrogen export at a cost of less than \$1/lb. In contrast, research by others has estimated that the cost to society of excess nitrogen is more than \$60/lb.

Example 2:

REPORT YEAR: 2013

DEPARTMENT: Food Science and Technology

IMPACT FOR: OARDC

IMPACT TOPIC: Mission-Related Activity

SIGNATURE AREA(S): Food Security, Production, and Human Health

TITLE: Providing Colorful Solutions to the Food Industry - Red, White and Blue

INVESTIGATORS: Monica Giusti

FUNDING SOURCE(S): Mars Chocolate North America

SUMMARY: Consumers and regulatory entities over the world are pushing the food industry to shift from synthetic colorants to natural food colorants. Synthetic colorants have been associated with hyperactivity in children and other negative connotations. Natural colorants may contribute health promoting properties in addition to color. Our research is providing solutions to the industry by investigating new sources of colorants, and a better understanding of the factors that affect their color characteristics and stability in food matrices as well as in the human body.

SITUATION: In March 2011 the FDA announced that the safety of all synthetic colorants will be re-evaluated. The European Union now requires that any product containing synthetic colorants must bear a warning stating that they may cause hyperactivity in children: "May have an adverse effect on activity and attention of children". Consumer demand for natural alternatives has been increasing over the last years, and has intensified after these announcements. This is an issue that affects all the population in this country and over the world. Finding natural alternatives is however challenging as many natural colorants will have low tinctorial strength and low stability in food matrices. In addition, natural colorants may contribute undesirable aromas or flavors. Even more, it is challenging to produce the desired hues, unmixed with other tones, many food products have a signature color and it is important for the brand to closely replicate the original color when transitioning from synthetic to natural dyes.

RESPONSE: The plant material with the highest stability and closest characteristics to FD&C Red No. 40 under acidic conditions is radish, but it has undesirable flavors and aromas. We have developed a novel process that employs abrasive action, water and steam to harvest pigments from cull radishes allowing the use of a waste material to generate a high value colorant, with reduced aromas or flavors. We have been working in the identification of anthocyanin-based blue colorants from red cabbage and sweet potatoes. We have shown how careful pH control can achieve the desired hues that resemble that of FD&C Blue 2. Another approach to achieve blue anthocyanin-based colors is by complexation of metals and anthocyanins and using different approaches that can be applied to a variety of food applications. We are also investigating anthocyanin microcapsulation to help protect and stabilize the pigments in food matrices. These microcapsules are being designed to attach to the intestines and slowly release anthocyanins in the GIT, enhancing delivery of these health enhancing components into target organs.

IMPACT: Food colorants are widely spread in foods, and this is an issue that affects the food industry as a whole. A company that previously dumped slightly imperfect radishes into fields is now starting a new line of business based on technology developed in our lab that will provide economic growth and a high value ingredient for food companies to use. The global food colorant market exceeds \$1 billion annually. Synthetic food coloring represents 65-70% of the market but will soon be replaced by colorants from natural sources. Finding the right pigment and understanding the proper ways to incorporating it into the food matrix are essential to remain competitive in the market. In addition these small changes in the source of colorant result on the replacement of an ingredient that provides no nutritional value with a phytochemical that has demonstrated antioxidant properties, anti-inflammatory properties and that may contribute to the prevention of chronic disease.