

# Coastal No Adverse Impact Approach Workshop

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Applying No Adverse Impact in Northwestern  
Indiana



*Office of the Surveyor*



Workshop Report  
6/25/2015

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## Introduction

The *No Adverse Impact* approach to floodplain management was developed by the Association of State Floodplain Managers (ASFPM) in 2001. This managing principal was the product of a realization; that despite the progress made nation-wide as a result of the National Flood Insurance Program's minimum standards and billions of dollars spent on structural flood control projects, flood damages have continued to increase. Since 1990 flood damage losses have increased five-fold, costing the nation \$10 billion annually on average. The No Adverse Impact (NAI) approach to floodplain management was designed to help reverse this trend by providing communities with the tools to reduce the frequency and severity of flood events, and to protect their citizens now and in the future. In general, these tools prevent the actions of one property owner or even a community from adversely impacting other property owners or neighboring communities. When applied at the watershed or regional level, this approach creates a network of resilient communities each of which is free to develop and thrive sustainably.

Since the publication of the NAI Toolkit in 2003, staff from professional organizations, non-profits, federal and state agencies, ASFPM members and interested individuals have used the toolkit to learn about and spread the message of NAI. In addition, ASFPM has been invited to host workshops on NAI and how to implement it by leaders at every echelon of government. Across the nation more than 50 NAI workshops have been held. The demand for these workshops has increased steadily over time as a result of super-storms Sandy and Katrina, and in the Great Lakes region, as a result of an unprecedented federal investment in the rehabilitation and protection of region called the Great Lakes Restoration Initiative.

To date, the most frequently posed questions in response to ASFPM's NAI Workshops and Toolkit have been related to the legality of zoning ordinances, land acquisition, and the implementation of new permitting requirements **in flood hazard areas**. As a result, ASFPM has developed a series of white papers and fact sheets in an effort to answer these questions. In addition, ASFPM has made the legality of the NAI approach the focal point of its NAI workshops. Recognizing that each state or community has different concerns, these workshops were designed to provide ample time to discuss unique regional issues, case studies, and best practices for integrating NAI into on-going efforts to reduce flood losses.

Planning for the *Coastal No Adverse Impact Workshop* began in the winter of 2015 when staff from Wisconsin and Illinois-Indiana Sea Grant expressed interest in coordinating two additional workshops modeled on the "Great Lakes Community Resilience: A No Adverse Impact Approach" workshop delivered in Milwaukee Wisconsin in August 2014. With funding from the Federal Emergency Management Agency (FEMA) and the National Oceanic and Atmospheric Administration's Coastal Storms Program (NOAA CSP), ASFPM and Illinois-Indiana Sea Grant partnered with representatives from the Lake Michigan Coastal Program, Northwest Indiana Regional Planning Commission, and the Porter County Survey to develop a target audience, objectives and agenda for this day-long event.

Specifically this workshop was designed to provide participants with an opportunity to:

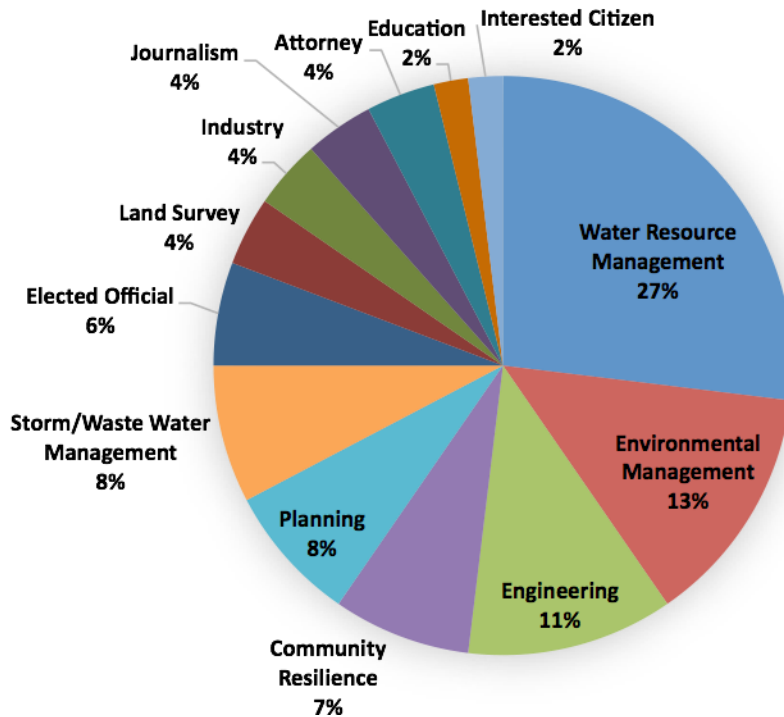
1. Learn from regionally-renowned experts and boots-on-the ground managers about the legal constructs that are central to floodplain management, planning, and hazard mitigation,
2. Build relationships with practitioners who represent a variety of different professions: floodplain, stormwater, and coastal resource managers, land use and hazard mitigation planners, attorneys, health department staff, and local decision makers, and
3. Discover how flooding has impacted Indiana’s municipalities and novel solutions individuals and organizations across the state are implementing to increase their resilience.

This report is a summary and evaluation of the Coastal No Adverse Impact Workshop. This event was held on June 25<sup>th</sup> at the Hammond Marina in Hammond, Indiana.

### Participant Demographics

The Coastal No Adverse Impact Workshop planning team defined their target audience as: certified floodplain managers, planners, attorneys, coastal resource managers, health department staff, stormwater managers, and local officials. In an effort to draw this target audience to the workshop and to deter individuals from registering for the event but failing to attend, the planning committee offered continuing education credits for the following organizations and certification programs: Indiana Commission for Continuing Legal Education, Continuing Legal Education Credits; ASFPM, Certified Floodplain Manager credits; and Indiana Professional Licensing Agency, Professional Engineers and

**Figure 1. Number Participants by Profession**

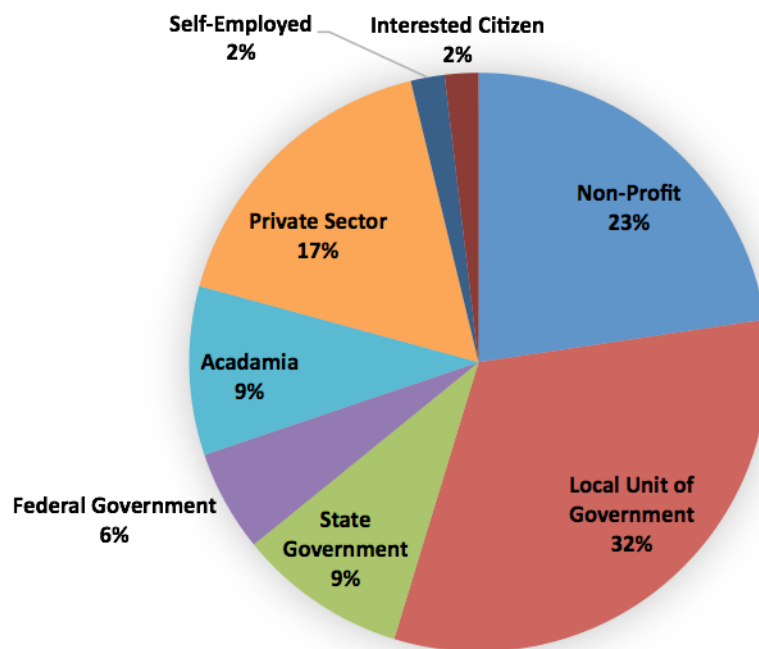


Professional Surveyor credits. This technique proved to be fairly successful. Out of the, 53 participants

(including workshop planning staff and presenters) who registered (Appendix D), approximately 30% applied to receive some type of continuing education credit.

In sum, approximately 64% of total workshop registrants were identified as part of the target audience (Figure 1). Overall, water resource managers (individuals who identified as managers of floodplain, coastal, and riverine water resources) made up the vast majority of our target audience. In addition, engineers, most of which reported working on the local level, had the third highest representation at the workshop. Combined, planners, stormwater managers, local officials, and attorneys made up an additional 25% of total workshop registrants. When broken down by sector, public (local, state, and federal government) and non-profit sector staff, represented 70% of all attendees (Figure 2). This statistic also supports the claim that the workshop target audience was reached because many of the employers who hire individuals for the occupations that this workshop catered to, are government agencies and environmentally focused non-profit organizations.

**Figure 2. Participants by Sector**



At the Coastal No Adverse Impact workshop planners, stormwater managers, local officials, and attorneys were highly underrepresented in the total population of workshop registrants when compared to water resource managers and engineers. This may be as a result of four factors: 1. the communication and outreach channels used to disseminate information about the workshop, 2. underrepresentation of these professionals in the total environmental management population, 3. the workshop programming did not appeal to or was not relevant to this subset of the target audience, or 4. time constraints did not permit these professionals to attend. The only subset of the workshop’s identified target audience that was not represented was health department staff.

One notable difference between the Coastal No Adverse Impact workshop and other previously executed events in the great lakes region the number of practitioners who registered for the event. Approximately 75% of all workshop registrants were practitioners, this is a staggering increase compared to the only other workshop that has been held in the region, the Great Lakes Community Resilience: A No Adverse Impact Approach workshop held in Milwaukee, WI in the summer of 2014 where only 30% of attendees were practitioners. After the Great Lakes Community Resilience Workshop, it was suggested the observed decline in the number of practitioners attending may have been caused by two factors 1. A Digital Coast Partnership meeting happening in conjunction with this workshop, and 2. The length of the workshop. The return to a normal trend in practitioner attendance at the Indiana Coastal No Adverse Impact workshop indicates that workshop length was likely not a casual factor in the trend observed at the Milwaukee workshop and evidences the appropriateness of a day-long workshop duration.

Out of the 53 participants who registered, 41 attended. Although this is a significant no-show rate, it has been suggested that many of our target audience members may not have been able to attend as a result of significant flooding which was impacting Indiana at the time of the workshop. In addition, it was also suggested that because the workshop was offered for free, there was no disincentive for not attending, resulting in an increase in the no-show rate. In the future, disincentives for failing to attend these events may need to be developed in order to discourage this behavior. Another technique for reducing the no-show rate may be to email all registrants a week prior to the event, asking them to confirm if they still plan on attending.

## Workshop Presentations – Overview and Feedback



*The view of Lake Michigan from Hammond Marina. Image courtesy of: Bridget Faust, ASFPM.*

Over the course of the day, seven 30-45 minute presentations were given (Appendix B). The venue for this event was located on the shore of Lake Michigan and this set the stage for discussion about the Great Lakes and the unique challenges managers in the region face. The beginning of the day focused heavily on No Adverse Impact, while the second half of the day highlighted flooding case studies

and other special topics. The workshop was organized in this way to ensure that all participants had a strong understanding of No Adverse Impact and common legal concerns associated with floodplain management, prior to exploring specific applicable examples and topics in further detail.

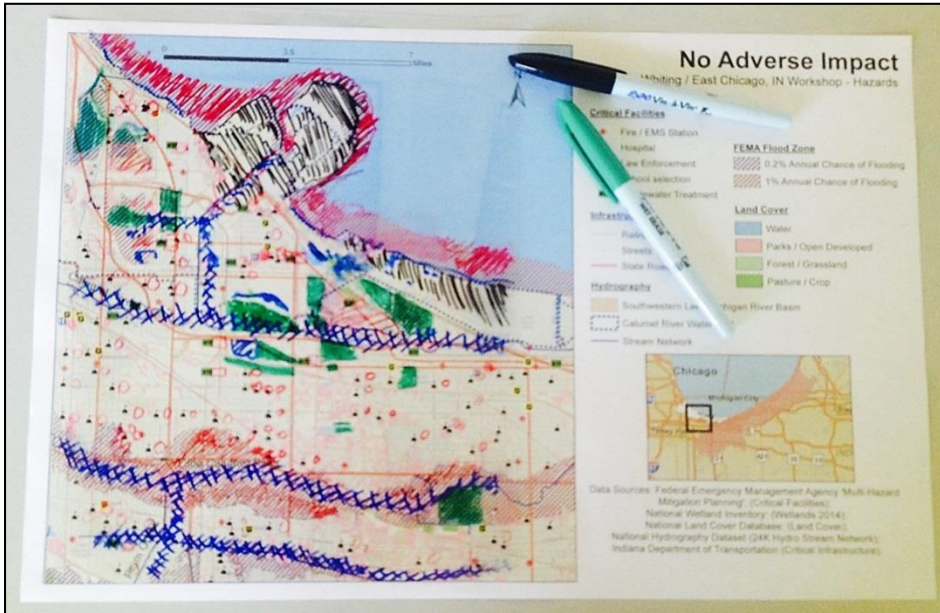
The Association of State Floodplain Managers' Executive Director, Chad Berginnis gave the first presentation of the day. His presentation touched on many of the different legal concerns associated with floodplain and landuse management, including: takings, nuisance, and liability. Berginnis was followed by Rodney

Renkenberger, Executive Director of the Maumee River Basin Commission who presented on the core tenants of No Adverse Impact and how it applies to many of the flooding challenges faced by the state of Indiana. Each of the 5 remaining presentations featured specific topics each of which had been identified by the managerial community as a high priority or a topic of interest. These topics included: application of NAI in the



*Rodney Renkenberger, presents on No Adverse Impact. Image courtesy of: Bridget Faust, ASFPM.*

coastal zone, the Great Lakes Coastal Flood Study, wetland regulations and fill restrictions, green infrastructure and associated valuation methods, and local case studies which highlighted specific floodplain management solutions. Detailed notes on each presentation were taken throughout the day, a complete copy can be found in Appendix G of this document.



Example Completed Mapping Exercise. Image Courtesy of: Bridget Faust, ASFPM.

In addition to the previously mentioned presentations, a one-hour mapping exercise was conducted at the end of the day (Appendix E). For the purpose of this exercise participants were divided into groups of 5-7 and each group was given two maps, a set of directions, a piece of Mylar, and colored

markers. This exercise asked participants to look at two maps, one displaying the “hazards” present in the multi-jurisdiction area including Hammond, IN, and another map showing the “natural resources” the same area has to offer. After comparing these maps, participants were asked to identify and map key geographic areas to conserve, protect, restore, or place green infrastructure, and areas suitable for future residential and/or commercial growth on a piece of Mylar. This mapping exercise allowed participants to leverage the information that was presented on NAI, green infrastructure, wetlands, etc. and apply it to a hypothetical land use planning scenario. Through this mapping exercise participants were also given the opportunity to learn about one another’s perspectives on conservation and development, as well as the different challenges that are faced when planning future land use.

## Workshop Evaluation

Upon arriving at the workshop, all participants and presenters were given a 2-page evaluation to complete after presentations had ended (Appendix F). This evaluation solicited feedback on a variety of topics including the degree to which the workshop achieved its advertised learning objectives, individual presenters’ performance, and topics that participants would have liked hear more about. The response rate for this brief evaluation was 39%. Overall, the feedback gathered through this evaluation was very positive. 100% of evaluation respondents felt that they could apply



the information presented at this workshop to their work and that presenters had given them the tools to implement the knowledge that was shared. In addition, 100% of survey respondents noted that they would recommend this workshop to others. These statistics are reinforced by comments that were collected in response to an open ended question regarding how participants planned to use what they learned at the workshop. Respondents noted that they would use/incorporate the information presented at the workshop into various on-going projects and initiatives, and that they planned to pass it along to others who were not able to attend through technical assistance programs or interpersonal communications.

In addition, 100% of evaluation respondents noted that the workshop's advertised learning objectives, activities, opportunities for discussion, and information presented met or exceeded their expectations. Overall, respondents were satisfied with the quality of the presentations as well as the mapping exercise. 100% of participants who completed workshop evaluations noted that the workshop presentations and mapping exercise met or exceeded their expectations. Many respondents noted that they would like to see additional workshops in Indiana, and that the content shared was relevant and of critical importance to the state. In the future, respondents noted that they would like more of an emphasis on: practical application of green infrastructure (ex: model ordinances and data from examples that have been implemented previously) and real-world examples of NAI (how it connects to real-world projects and examples of how to communicate this principal to decision-makers), as well as additional interactive activities like the mapping exercise.

Although the general response to the workshop was very positive, through this evaluation participants have identified many opportunities for future development. Participants' evaluations of the Indiana Coastal No Adverse Impact Workshop revealed one common critique. With respect to the presentations given throughout the day, respondents noted that they would have liked to see real world examples integrated into more presentations. Of particular interest to many participants were real world examples of cities that had successfully implemented green infrastructure and collected data on its ability to capture nutrients and attenuate flooding. Participants also requested to see examples of communities that had integrated green infrastructure into their code of ordinances.

## **Conclusions and Next Steps**

### **Conclusions and Next Steps**

The Indiana Coastal No Adverse Impact Workshop provided participants with the opportunity to learn about the core tenants of ASFPM's *No Adverse Impact* approach to floodplain management, common legal issues faced by floodplain managers and planners in the region, specific actions that have been taken in Indiana to enhance flood resilience, the value of green infrastructure, and benefit of wetlands and how they are regulated in the United States. Through this workshop, the

workshop planning committee was also presented with the invaluable opportunity to learn from participants about the local challenges and concerns that they encounter regularly.

This workshop was the second in a series of three that will be completed in the Great Lakes region. ASFPM will work to adapt future workshops based on the comments received during and after this event. This is done in an effort to ensure that each iteration of this workshop improves upon the last, further meeting the needs and expectations of participants. Next steps for continuing this workshop series include: executing the third and final NAI workshop in the great lakes region in Chicago, IL on July 8, 2015, debriefing on the effectiveness of the workshop planning and execution process as well, and sharing the workshop proceedings reports from both events.

## Appendix

### Appendix A. Workshop Planning Committee

<b>First Name</b>	<b>Last Name</b>	<b>Position</b>	<b>Organization</b>	<b>Email</b>
Kara	Salazar	Sustainable Communities Extension Specialist	Illinois-Indiana Sea Grant	<a href="mailto:salazark@purdue.edu">salazark@purdue.edu</a>
Leslie	Dorworth	Aquatic Ecology Specialist	Illinois-Indiana Sea Grant	<a href="mailto:dorworth@purduecal.edu">dorworth@purduecal.edu</a>
Mike	Molnar	Program Manager	Lake Michigan Coastal Program	<a href="mailto:mmolnar@dnr.in.gov">mmolnar@dnr.in.gov</a>
Jody	Melton	Senior Planner	Northwestern Indiana Regional Planning Commission	<a href="mailto:jmelton@nirpc.org">jmelton@nirpc.org</a>
Kevin	Breitzke	Porter County Surveyor	Porter County Surveyor	<a href="mailto:kbreitzke@porterco.org">kbreitzke@porterco.org</a>
Jeff	Stone	Project Manager	Association of State Floodplain Managers	<a href="mailto:jeff@floods.org">jeff@floods.org</a>
Bridget	Faust	Project Research Specialist	Association of State Floodplain Managers	<a href="mailto:bridget@floods.org">bridget@floods.org</a>

# Appendix B. Workshop Agenda

## Coastal No Adverse Impact Approach Workshop

THURSDAY, JUNE 25, 2015  
Hammond Marina, Clipper Room  
701 Casino Center Drive Hammond, IN 46320

### CONFERENCE COMMITTEE

Association of State  
Floodplain Managers  
Jeff Stone  
Bridget Faust

Illinois-Indiana Sea Grant  
Luisa Derworth  
Kara Salazar

Lake Michigan Coastal Program  
Mike Mohr

Northwestern Indiana Regional  
Planning Commission  
Jody Malton

Porter County Surveyor  
Kevin D. Brutske

### SPONSORS

Association of State  
Floodplain Managers

Indiana Association for Floodplain  
and Stormwater Management

NOAA Coastal Storms Program  
(Courtesy of Wisconsin Sea Grant)

### AGENDA

- 8:00 am  
Registration Opens and Continental Breakfast
- 9:00 am  
Welcome | *City of Hammond Mayor Thomas M. McDermott Jr. (Invited)*  
Overview of the Day | *Kara Salazar, Illinois - Indiana Sea Grant and Purdue University*
- 9:15 am  
Floodplain Management Legal Issues |  
*Chad Berginis, CFM, Executive Director, Association of State Floodplain Managers*
- 10:00 am  
No Adverse Impact Overview – Indiana Perspective |  
*Rodney Renhanberger, PLS, CFM, Executive Director, Maumee River Basin Commission*
- 10:45 am  
Coastal NAI and the Great Lakes Coastal Flood Study |  
*Alan Lulluff, P.E., CFM, Association of State Floodplain Managers*
- 11:30 am  
Lunch  
Hammond Beach Shoreline Stabilization Project Guided Hike (20 minutes) |  
*Milan Kruszynski, Hammond Port Authority Director*
- 12:15 pm  
Call Before You Fill: A Federal Perspective on Wetland Regulations |  
*Andrew Blackburn, Army Corps of Engineers*
- 12:45 pm  
2008 NW IN Flooding Case Study |  
*Dan Rapay, Director of the Little Calumet River Basin Development Commission*
- 1:15 pm  
Valuation of Ecosystem Services for Lake, Porter and LaPorte Counties  
Provided by the Chicago Wilderness Green Infrastructure Vision |  
*Jazmin Varela, The Conservation Fund*
- 2:15 pm  
Break
- 2:30 PM  
Green Infrastructure Mapping and Flood Risk Planning Exercise |  
Bridget Faust, Association of State Floodplain Managers  
Kara Salazar, IL-IN Sea Grant and Purdue University
- 3:30 PM  
Final Remarks, Feedback Evaluation
- 4:00 PM  
Conclude and Gathering at Bulldog Brewing Company (cash bar)

## Appendix C. Speaker and Facilitator Biographies

### **Chad Berginnis, CFM, Executive Director, Association of State Floodplain Managers**

Mr. Berginnis became Executive Director of ASFPM in July of 2012, after joining the Association staff as Associate Director in 2011. Since 2000, he served the Association as Insurance Committee Chair, Mitigation Policy Committees' Coordinator, Vice Chair, and Chair. He has a Bachelor of Science in natural resources from Ohio State University. Since 1993, his work has focused on floodplain management, hazard mitigation, and land use planning at the state, local and private sector level. As a state official, Mr. Berginnis worked in the Ohio Floodplain Management Program and was Ohio's State Hazard Mitigation Officer. As a local official, Mr. Berginnis administered planning, economic development and floodplain management programs in Perry County, Ohio. In the private Sector, Mr. Berginnis was the national Practice Leader in hazard mitigation for Michael Baker Jr. Inc.

### **Rodney Renkenberger, PLS, CFM, Executive Director, Maumee River Basin Commission**

Rod is serving his 19<sup>th</sup> year as Executive Director of the Maumee River Basin Commission, a six-County Regional entity established by the Indiana Legislature charged with mitigating flood damages in northeastern Indiana. Prior to becoming MRBC Executive Director, Rod served three (3) terms as the elected County Surveyor for Noble County, IN. Rod currently serves on the Association of State Floodplain Managers Board (ASFPM) of Directors as the Regional Director for Region V. He previously served as the ASFPM Flood Insurance Committee Co-Chair. He has served on FEMA's Elevation Certificate Revision Task Force and FEMA's Pre-Disaster Mitigation/Hazard Mitigation Assistance Review Panel. Mr. Renkenberger is a Registered Professional Land Surveyor in Indiana and a Certified Floodplain Manager. He is a Charter Member of the Indiana Association for Floodplain and Stormwater Management, Inc. (INAFSM) and served as INAFSM Chair in 2001-2002 and again in 2010-2011. He is a member of the Indiana "Silver Jackets" Team, Indiana Society of Professional Land Surveyors.

### **Alan Luloff, P.E., CFM., Science Services Program Manager, Association of State Floodplain Managers**

Alan Luloff is Science Services Program Manager for the Association of State Floodplain Managers (ASFPM) managing research and outreach projects for the association since 2005. In addition to ASFPM's published reports, ASFPM's Science Services program also has developed training materials for one-day workshops on Coastal No Adverse Impact and has conducted ten Coastal No Adverse Workshops over the past three years on the Atlantic Coast and the Gulf of Mexico. Mr. Luloff previously spent 32 years with the Wisconsin Department of Natural Resources (WDNR) in floodplain and water quality management. Early in his career, he worked in wastewater, water supply and groundwater management with the last 15 years in floodplain management, coastal engineering and dam safety. Mostly recently he was the Floodplain Mapping Coordinator and Coastal Engineer for the WDNR. Mr. Luloff holds an Environmental Engineering degree from the University of Wisconsin - Milwaukee, is a registered professional engineer in Wisconsin and a Certified Floodplain Manager. Graduate studies have included remote sensing and Geographic Information Systems - Certified ARC/INFO Instructor - ESRI (expired).

### **Andrew Blackburn, US Army Corps of Engineers**

Andrew has a B.S. from Purdue University and a M.S. from Oregon State University. He is a Professional Wetland Scientist and also a Certified Wetland Scientist in Lake County, Illinois and has worked in the natural resources field in the private and public sectors for about 15 years. He joined the Chicago District Corps in October 2009 at which time their regulatory boundaries were expanding into northwest Indiana to include most of Indiana's 1st Congressional District.

### **Dan Repay, Little Calumet River Basin Development Commission**

Graduated from Ball State University with a BS in Political Science and an AA in Public Service. He has extensive public sector experience. Past work focused on property related issues including brownfield redevelopment and real estate taxation. He served two terms on the Hammond City Council representing the Little Calumet area in the 5<sup>th</sup> district. Dan experienced firsthand the flood of 2008 and the government response.

Dan currently works as Executive Director of the Little Calumet River Basin Development Commission, started in 2010. He is responsible for the ongoing Operation and Maintenance of the \$270,000,000 Federal Flood Control and Recreation Project. Permanent funding source established in 2012 for the ongoing Operation and Maintenance of the Little Calumet River as well as corrective actions to address rain water throughout the watershed in Lake County, IN.

**Jazmin Varela, The Conservation Fund**

Jazmin Varela works as TCF's Strategic Conservation Planning Information Manager since 2007. Ms. Varela has served as the lead green infrastructure network designer for Green Infrastructure Plans in Angelina County, TX, Central Indiana, Chicago, and Columbia and Boone County, MO. She has worked as part of the design team for plans in the Houston-Galveston region, Los Angeles County, fifteen state-wide plans and on multiple ecosystem services valuation projects.

Ms. Varela is interested in large landscape conservation and engaging communities as active participants of conservation outcomes. She has helped implement a diversity, equity and inclusion effort at TCF. Her work also includes partnering with Google StreetView Trekker program; helping organizations identify Heirs property as a way to prevent further land loss in the South; and multiple mapping projects to help organizations be more strategic. Ms. Varela earned a Master of Environmental Management from Duke University's Nicholas School of the Environment and Earth Sciences with a certificate in geospatial analysis. She earned her Bachelor of Science degree in Geography from Appalachian State University. She resides in Chapel Hill, NC with her daughter and cat.

**Bridget Faust, Project Research Specialist, Association of State Floodplain Managers**

Bridget Faust joined the Association of State Floodplain Managers (ASFPM) in January 2014. As a Project Research Specialist, her responsibilities include outreach and composition of content for the Great Lakes Coastal Resilience Planning Guide, planning and coordination of workshops on ASFPM's No Adverse Impact approach to floodplain management, as well as research on federal programs and policies including the National Flood Insurance Program and the Community Rating System. Prior to joining ASFPM, she completed a fellowship in the National Oceanic and Atmospheric Administration's Great Lakes Regional Office as well as internships for U.S. Senator Al Franken and Governor Mark Dayton. Bridget has a Bachelor of Science in Environmental Science Policy and Management from the University of Minnesota – Twin Cities.

**Kara Salazar, Sustainable Communities Extension Specialist, IL-IN Sea Grant and Purdue University**

Kara joined the Purdue University Department of Forestry and Natural Resources and Illinois-Indiana Sea Grant as Sustainable Communities Extension Specialist in 2012. Working with multidisciplinary teams throughout Purdue University, Extension, and the Sea Grant college network, Kara develop products, programs, and resources that engage decision makers in evaluating, prioritizing, and implementing sustainability strategies for their communities. Focus areas include placemaking and enhancing public spaces, lawn and landscaping conservation practices and natural resources management. Kara has a B.S. in public affairs and environmental science and a M.P.A. in natural resources management and nonprofit management from the Indiana University School of Public and Environmental Affairs. She also received a M.S.Ed. degree from the IU School of Education at Indiana University-Purdue University Indianapolis (IUPUI) with concentrations in community building and science education. Kara holds a Certificate in Fundraising Management from IU and the LEED Green Associate credential. She came to Sea Grant and Purdue Extension from the Center for Earth and Environmental Science at IUPUI where she was the Assistant Director for Education and Outreach.

## Appendix D. Workshop Attendance List

First Name	Last Name	Email	Job Title	Company	Work State
Taghi	Arshami	tarshami@arshgroup.com	Principal	The Arsh Group Inc.	IN
Steve	Barker	sbarker@nisource.com	NRP Coordinator III	NIPSCO	IN
Nicole	Barker	nicole@savedunes.org	Executive Director	Save the Dunes	IN
Chad	Berginis	cberginnis@floods.org	Executive Director	Association of State Floodplain Managers	
Mitchell	Bishop	mbishop@laportecounty.org	County planner	La Porte County	IN
Andrew	Blackburn	Andrew.J.Blackburn@usace.army.mil	Project Manager	Army Corps of Engineers	
Kevin	Breitzke	kbreitzke@porterco.org	Porter County Surveyor	Porter County Surveyor	IN
Richard	Budziak	budzira@lakecountyin.org	MS4 Coordinator	Lake County Surveyors Office	IN
Rex	Burton	rburton923@sbcglobal.net	Sanitary Commissioner	Highland Sanitary Board	IN
Maggie	Byrne	mbyrne@dnr.in.gov	Grant Specialist	DNR Coastal Program	IN
Peter	Byvoets	pbyvoe@gmail.com	councilman	Councilman, Long Beach, Ind	IN
Michelle	Caldwell	mcaldwel@idem.in.gov	Lake Michigan Beach Program Manager	Indiana Dept of Environmental Mgmt	IN
Dorreen	Carey	dcarey@dnr.in.gov	Special Project Coordinator	Indiana Lake Michigan Coastal Program	IN
Thomas	Davenport	davenport.thomas@epa.gov	National NPS Expert & Regional Agriculture Advisor	USEPA	IL
Leslie	Dorworth	dorworth@purduecal.edu	Aquatic Ecology Specialist	Illinois-Indiana Sea Grant	
Jeff	Edstrom	jeff.edstrom@cardno.com	Water Resources Policy Coordinator	Cardno	IL
Bridget	Faust	bridget@floods.org	Project Research Specialist	Association of State Floodplain Managers	
Jennifer	Gadzala	jpgadzala@chestertonin.org	MS4 Coordinator	Town of Chesterton	IN
Arlene	Hickory	a23h23@yahoo.com	Sierra Club	Sierra Club	
David	Hoppe	davidhoppe6@gmail.com	Contributing Editor	NUVO Newsweekly	IN
Natalie	Johnson	natalie.johnson@purduecal.edu	Urban Waters Coordinator	Urban Waters Partnership	
Jeffrey	Katz	j4katz@comcast.net	Attorney	Jeffrey Katz	IN
Lauri	Keagle	lauri.keagle@nwi.com	Staff Writer	The Times of Northwest Indiana	IN
Tim	Kingsland	tkingsland@cityofhobart.org	HSD Coordinator	Hobart Sanitary/Storm Water District	IN

Jovana	Kobb	jkobb@purduecal.edu	Vice President/Research Assistant	Purdue University Calumet Environmental Club/Urban Waters Partnership	IN
Milan	Kruszynsk	KruszynskiM@HammondMarina.com	Director	Hammond Port Authority	
Lynda	Lancaster	Lynda_Lancaster@nps.gov	National Park Service	National Park Service	
Angela	Larsen	alarsen@greatlakes.org	Community Resilience, Program Manager	Alliance for the Great Lakes	IL
Alan	Lulloff	alan@floods.org	Science Services Program Manager	Association of State Floodplain Managers	
Kathy	Luther	kluther@nirpc.org	Director of Environmental Programs	NIRPC	IN
James	Mandon	jmandon@reltd.com	Project Manager	Robinson Engineering	IN
Patrick	Manship	pmanship@MadisonCounty.IN.Gov	Madison County Surveyor	Madison County Surveyor	
Carolyn	Marsh	cmarshbird@prodigy.net			
Mayor Thomas M.	McDermott Jr.	gohammond@tv.com	Mayor	City of Hammond	
Jody	Melton	jmelton@nirpc.org	Senior Planner	Northwestern Indiana Regional Planning Commission	
Mike	Molnar	mmolnar@dnr.in.gov	Program Manager	DNR LMCP	IN
Kenneth	Purze	kmpurzecfm@hotmail.com	Vice Chairman	Kankakkee River Basin Commission	IN
Rodney	Renkenberger	rodr@mrbc.org	Executive Director	Maumee River Basin Commission	
Dan	Repay	drepay@littlecalumetriverbasin.org	Director	Little Calumet River Basin Development Commission	
Kara	Salazar	salazark@purdue.edu	Sustainable Communities Extension Specialist	Purdue University / IL-IN Sea Grant	IN
Brenda	Scott Henry	bhenry@ci.gary.in.us	Green Urbanism Director	City of Gary	IN
Denise	Sejna	dsejna@whitingindiana.com	City Attorney	City of Whiting	IN
Chaunce	Sprouse	cre.sprouse@gmail.com	Instructor	Brown Mackie College South Bend	IN
Frank	Stewart	fstewart@dlz.com	Engineer	DLZ Indiana LLC	IN
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Pat	Walter	patbund@comcast.net	Sierra Club	Sierra Club	IL
Gina	Weilbaker	gaweilbaker@gmail.com	Project Engineer	American Structurepoint	
Leanne	Whitesell	lwhitese@idem.in.gov	Watershed Specialist	IDEM	
Mingyan	Zhou	mzhou@valpo.us	Deputy Engineer	City of Valparaiso	
Ethan	Brown	ebrown@greatlakes.org		Alliance for the Great Lakes	
Stan	Dostatni		Engineer	City of Hammond	
Mark	Gordish			City of Hammond	

## Appendix E. Mapping Exercise Overview

### Mapping Exercise Instructions

#### Applying Tools and Strategies for Planning and Conservation

##### Identifying Lands to Conserve and Develop

As a planner you must deal with issues related to growth, conservation and restoration. You need to assess the various natural resources, natural hazards, areas of development and areas that need to be protected. Communities near or in the Great Lakes coastal zone take on additional complexities, run off from urban areas can adversely impact water quality and persistent flooding in these areas can cost small municipalities tens of thousands of dollars each year. For this assessment you make recommendations identifying priority conservation and growth areas for a regional comprehensive plan.

Many small communities in Indiana are interested in using green infrastructure to attenuate coastal and inland flooding in a cost effective way. For the purpose of this exercise we will use Whiting, Hammond, Munster, East Chicago, and Gary Indiana as examples. These communities are interested in supporting growth and attracting new residents and businesses while maintaining the integrity of their natural resources and without significant upgrades to their stormwater infrastructure. To accomplish this end, these cities are seeking to use green infrastructure and open space preservation to increase the capacity of their stormwater infrastructure system and improve water quality.

##### Specific goals include:

- **Protect or restore freshwater wetlands, natural areas and open space to better manage sediment runoff for water quality and to mitigate flooding due lake level change, heavy precipitation and storms.**
- **Identify areas where green infrastructure may be able to help attenuate flooding.**
- **Direct new development toward existing developed lands and infrastructure.**

##### Assignment:

**Identify possible areas for conservation and growth, set priorities, and explain reasons for selecting them. Specifically, identify:**

- **Key geographic areas to conserve, restore, maintain, or place green infrastructure**
- **Areas suitable for future residential and/or commercial growth**
- **Are there other risk or vulnerability factors that should be considered?**

Before you get started **review the paper maps**. You have two paper maps to work with while developing your plan. These represent most of the available geographic (GIS) datasets for the area.

##### Mapping Guidelines:

- **Select a color for each type of use, recommended colors:**

- **Green:** currently protected land (existing parks and natural areas)
- **Blue:** land recommended for conservation (wetlands, forest, flood prone areas, etc.)
- **Red:** areas for restoration or placing green infrastructure (be sure to designate which)
- **Black:** currently developed land
- **Orange:** land recommended for development
- **Use patterns to indicate intensity/importance.** Use different patterns (dots, crosshatch, etc.) to show intensity of resource/land use. Establish a legend on your map to track what colors and symbols represent.

### Process Steps:

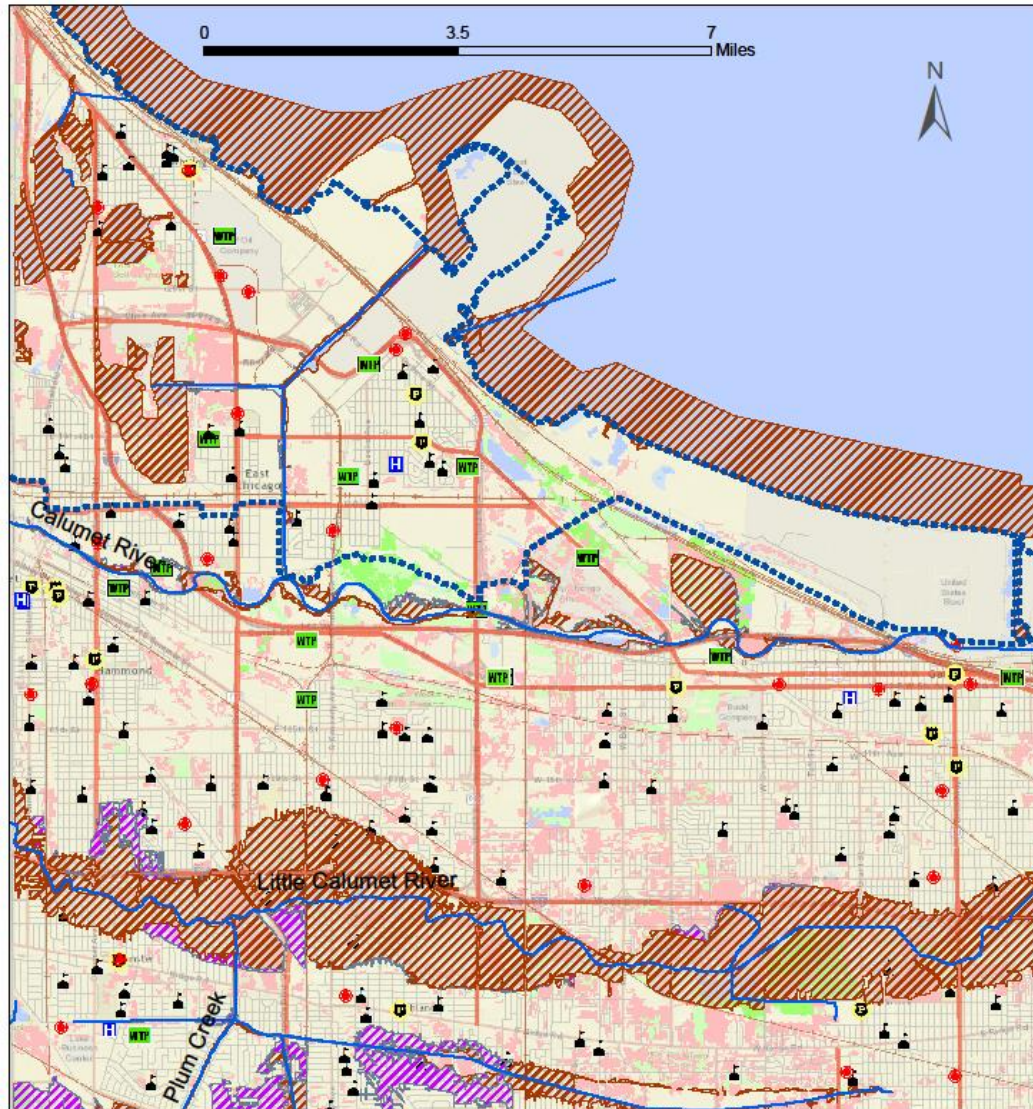
1. First identify currently **Protected Land**: start by placing the clear worksheet (Mylar) over the “Natural Resources” map showing wetlands, landcover, etc. **Draw** in the currently protected lands, parks, and/or lands that have been designated as conservation management areas. If you’re familiar with the area, add any additional protected land that may not be on the map.
2. Next identify the currently **Developed Land** by using the same map and showing where the cities and towns are located. In this case, unless the lands is designated as a park, open space, forest, or pasture, assume that it is developed. **Draw** these areas on the Mylar.
3. On the “Hazards” map, reference the FEMA Flood Zone, Parks, Forests and Flood Hazard Areas map layers to identify **Land to be Conserved**. Remember that establishing forested stream buffers, limiting impervious surfaces, protecting open spaces are very important to maintaining the health of streams and lakes. Add any additional land, such as areas that can be used for flood storage, green infrastructure, or stormwater capture/conveyance. **Draw** these areas on the Mylar - and indicate their importance.
4. Next, identify the **Land to be Developed**. Compare the “Hazards” and “Natural Resources” maps and use the “Natural Resources” map to identify ways in which you could adjust future development plans to reduce socio-economic risk. Think about directing growth to locations near existing development infrastructure, protection of critical drainage areas and wetlands and any other factors, which will help maintain the character of the area and protect critical resources. **Draw** these areas on the Mylar.
5. Finally, consider **Lands to be Restored or Revitalized** - these areas could currently be developed lands, existing open spaces, or parcels in flood hazard areas. These areas may be prime locations for green infrastructure in urban landscapes or wetland restoration in rural landscapes.

### Results and Report

Identify your top three geographic areas for conservation and/or development. Circle them on your Mylar overlay and label them.

1. **Start** by placing your Mylar over the Natural Resources map. Determine your top three priority areas by considering such factors as:
  - Importance in meeting your goals
  - Size (larger is better for conservation lands)
  - Linkage (contiguous) to other protected lands (for hydrological, wildlife and recreation functions)
  - Risk - from flooding, storm surge, imminent development, etc.
  - Attainability - willing landowners, financial resources, etc.
2. **List other data** that would be helpful and/or needed to guide your analysis.
3. **Record the reasons** for selecting each.
4. **Select a spokesperson** to present your plan.

## Hazards Map



# No Adverse Impact

Whiting / East Chicago, IN Workshop - Hazards

### Critical Facilities

- Fire / EMS Station
- Hospital
- Law Enforcement
- School selection
- Wastewater Treatment

### FEMA Flood Zone

- 0.2% Annual Chance of Flooding
- 1% Annual Chance of Flooding

### Infrastructure

- Railroad
- Streets
- State Road

### Land Cover

- Water
- Parks / Open Developed
- Forest / Grassland
- Pasture / Crop

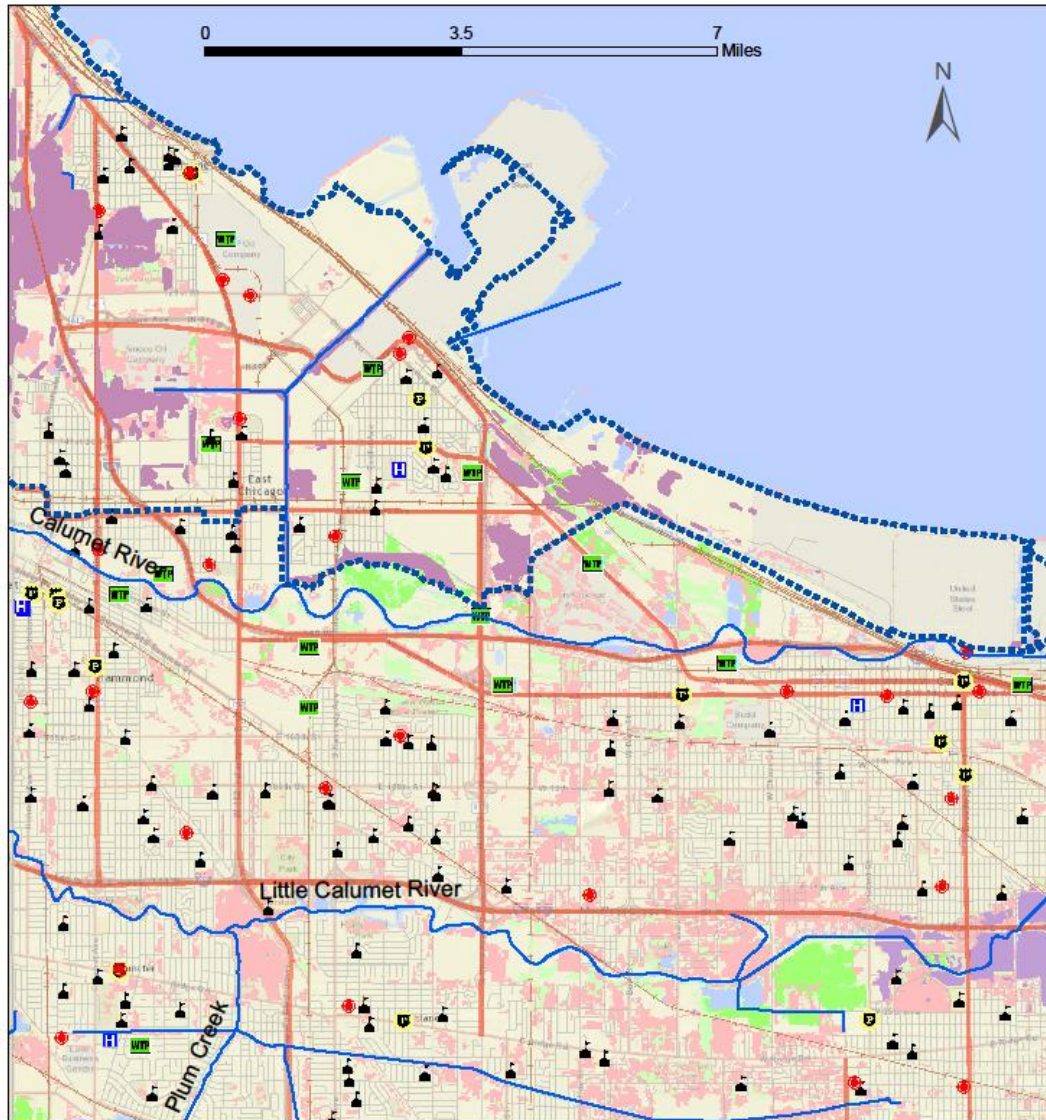
### Hydrography

- Southwestern Lake Michigan River Basin
- Calumet River Watershed
- Stream Network



Data Sources: Federal Emergency Management Agency 'Multi-Hazard Mitigation Planning'; (Critical Facilities); National Wetland Inventory: (Wetlands 2014); National Land Cover Database: (Land Cover); National Hydrography Dataset (24K Hydro Stream Network); Indiana Department of Transportation (Critical Infrastructure).

## Natural Resources Map



# No Adverse Impact

Whiting / East Chicago, IN Workshop - Natural Resources

### Critical Facilities

- Fire / EMS Station
- 🏥 Hospital
- 👮 Law Enforcement
- 🎓 School selection
- ♻️ Wastewater Treatment

### Critical Wetland Habitat

- 🟪 Wetlands 2014

### Land Cover

- 🟦 Water
- 🟪 Parks / Open Developed
- 🟩 Forest / Grassland
- 🟨 Pasture / Crop

### Infrastructure

- 🚂 Railroad
- 🛣️ Streets
- 🛣️ State Road

### Hydrography

- 🟫 Southwestern Lake Michigan River Basin
- 🔵 Calumet River Watershed
- 🔵 Stream Network



Data Sources: Federal Emergency Management Agency 'Multi-Hazard Mitigation Planning'; (Critical Facilities); National Wetland Inventory: (Wetlands 2014); National Land Cover Database: (Land Cover); National Hydrography Dataset (24K Hydro Stream Network); Indiana Department of Transportation (Critical Infrastructure).

## Appendix F. Evaluation Results

### Workshop Evaluation Results

Total Participants: 41

Response Rate: 39%

#### 1. Attendee's Name/Agency (Optional): Data Withheld.

#### 2. How did you hear about this workshop?

Check all that apply in the columns below:

Answer	Response	%
ASFPM	1	7%
Illinois - Indiana Sea Grant	0	0%
INAFSM	1	7%
Lake Michigan Coastal Program	7	47%
Northwestern Indiana Regional Planning Commission	5	33%
Porter County Surveyor's Office	1	7%
Press Release	0	0%
Social Media	0	0%
Word of Mouth	0	0%
Other	1	7%

**3. Indicate which professional associations you are affiliated with: Check all that apply in the columns below:**

Answer	Response	%
AICP Certified	0	0%
APA Member	0	0%
ASFPM Member	2	13%
Attorney	0	0%
CFM Certified	4	27%
Professional Engineer	3	20%
Professional Surveyor	1	7%
Other:	6	40%
None	5	33%

Other:
councilman
municipality
ACE, UTA, ITA, Elected Official
CMS4s

**4. How useful was this program in providing new knowledge to help you make future decisions and take action to apply the No Adverse Impact approach in your community? Mark one rating per item (row).**

Question	Not Useful	Somewhat Useful	Useful	Total Responses
1. Make decisions	0	7	9	16
2. Take action	0	7	8	15



**5. Check one response per item (row).**

Question	Yes	No	Total Responses
1. Do you feel you can apply this information to your work?	16	0	16
2. Have we given you the tools to implement this information in your work?	16	0	16
3. Would you recommend this workshop for others to attend?	16	0	16

**6. Describe how you plan to use what you learned from this program.**

Text Response
?
As a CFM we need to promote NAI as a methodology to administer NFIP in our communities. This info help us do that.
I am going to try to combine the No Adverse Impact approach with ecosystem services avoidance cost
Inform by boss
Incorporate info for watershed planning
Data and model information used in project proposals and program development.
Provide information to township board for consideration.
Working with communities to value GI in stormwater management.
Utilize GIV to drive decisions / decision making process.
Discussing ground water discharge
I have a project that includes some planning.
I plan to communicate the knowledge to others.
Offering technical assistance to the communities we work with, understanding where to
Allocate grant funding in most effective ways
Share NAI with watersheds / partners
Great info to build more resilient communities

**7. What are the most important legal issues you face as a Coastal Resource Manager, Floodplain Manager, Planner, Attorney, etc.?**

Text Response
Takings
Mandatory flood insurance for mapped SFHA with federally backed mortgage loans; Knowledge and implementation of floodplain ordinances at local level.
N/A
not sure cause not any of these and don't' make these decisions
Limits on existing authorities.
Approximate studies / making sure 2' freeboard
N/A
Integrating federal / state / local regulatory requirements.
none

**8. Workshop Content & Delivery: Please tell us how the workshop met or did not meet your expectations in the areas listed below. Check one rating per item (row).**

Question	Did Not Meet Expectations	Met Expectations	Exceeded Expectations	Total Responses
1. Learning Objectives Achieved	0	12	4	16
2. Course Topics Covered as Advertised	0	12	3	15
3. Presentation of Information	0	10	6	16
4. Facilitation of Activities	0	10	5	15
5. Encouragement of Discussion	0	11	5	16
6. Building Connections to Resources	0	7	8	15
7. Workshop Facilities	0	6	9	15
8. Overall Rating	0	8	7	15

**9. Additional comments for workshop content & delivery:**

**Text Response**

Please schedule more in NW Indiana.

Many interesting presentations - I learned a lot.

Great workshop, morning speakers were amazing!

**10. Workshop Materials & Information: Please tell us how the workshop met or did not meet your expectations in the areas listed below. Check one rating per item (row).**

Question	Did Not Meet Expectations	Met Expectations	Exceeded Expectations	Total Responses
Activities / Exercises	0	9	3	12
Handout Materials	0	7	6	13
Visual Aids	0	12	2	14
Amount of Information	0	11	3	14
Level of Information	0	11	3	14

**11. Additional comments for workshop materials & information:**

**Text Response**

Very good; Related to the region.

I like the thumb drive.

**12. What would make this workshop better to help you implement practices related to the No Adverse Impact approach in your work?**

**Text Response**

Structure of legal resources and information of administrative bodies.

More examples of what small communities have done.

Communicating NAI to local officials.

More discussion with policy makers.

I'm not sure

More exercises.

**13. Are there additional topics you would be interested in learning about in future workshops related to No Adverse Impact, green infrastructure, coastal or floodplain management, etc.?**

**Text Response**

Why is the state department of health not represented; representation by IDNR? Where is it? Floodplain management, related issues for local implementation; i.e. How did X community effect the decision makers to pay attention and hold development standards to comply with NFIP.

No development options.

Green infrastructure - ordinances that work.

Ordinance revisions with respect to GI/LID.

Not at this time.

Green infrastructure is a pretty new tool and I'd like to see whether or not projects have been successful - especially if there are specific statistics that can demonstrate capacity and nutrient removal. Have they been able to demonstrate any improved water quality on nearby lakes / streams?

Examples of using green infrastructure to manage flooding, planning/implementation.

**14. Additional comments:**

**Text Response**

N/A - no comments.

Very long, needed break earlier.

## Appendix G. Expanded Presentation Notes

### 9:00 AM Welcome – Overview of the Day; Kara Salazar:

#### Overview:

- Professional education credits from the Indiana Land Surveyors, the Association of State Floodplain Managers (ASFPM), Professional Engineers, and Attorneys are available for the workshop. If you did not sign up at the workshop and would like to receive credit or were not aware that you could get credit please email: Bridget Faust ([bridget@floods.org](mailto:bridget@floods.org)) or Kara Salazar ([kara@perdue.edu](mailto:kara@perdue.edu)).
- Beginning of the day focused on the No Adverse Impact (NAI) approach, and how it is being applied in the State of Indiana.
- The second half of the day will focus on practical application and case studies that demonstrate NAI principles and/or best management practices.

### 9:15 AM Floodplain Management Legal Issues; Chad Berginnis, CFM:

#### Main Points:

- Most successful suits against communities result from actions such as inadequate maintenance of dams, levees, roads, and bridges which increase flood damages on other lands.
- “Act of God” defense is less and less defensible (See: *Kerr v. Harris County Flood Control District [2015]*).
- If you permit development in a known hazard area, your community may be held liable.
- You are more likely to be sued successfully for permitting risky development than for preventing it.
- Take a “No Adverse Impact” approach to flooding issues to reduce liability and minimize risk.

#### Common Floodplain Management Legal Concerns:

- Takings cases,
- Liability cases, and
- Nuisance cases.

#### Key Law Suits to Share with Legal Counsel that Support NAI:

- [\*Beverly Bank v. Illinois Department of Transportation \(1991\)\*](#);
- [\*Gove v. Chatham Zoning Board of Appeals \(2005\)\*](#);
- [\*Loretto v. Teleprompter Manhattan CATV Corp \(1982\)\*](#)
- [\*Lucas v. South Carolina Coast Council \(1992\)\*](#)

- [\*Penn Central Transportation co. v. New York City\* \(1978\)](#)
- [\*Koontz v. St. Johns River Water Management District\* \(2013\)](#)
- [\*Kerr v. Harris County Flood Control District\* \(2015\)](#)

Questions:

- Why have a community flood insurance program, if the community is not in a mapped floodplain? How do discuss this attitude with the community?
  - Some communities choose to intentionally not join the NFIP to discourage development.
- If there is a federally declared disaster don't you need to be in the NFIP to get funding? Isn't that an incentive to join?
  - Yes and no. It depends on the community. If the community in question or county is in an area that had a disaster declaration and they are not in the NFIP they cannot get disaster relief and they do not have a problem with that because it may not be worth their time and effort on an annual basis.
- If you are in an unincorporated area does the county ordinance cover them?
  - Yes, it does cover the unincorporated area.
- There is a large misconception about the NFIP – people think that they cannot get flood insurance if they are not in a mapped flood hazard area. There is a floodplain in every watershed. Anyone is eligible to participate in the NFIP – you do not need to be in a mapped flood hazard area to get insurance. We need resources to communicate this to citizens, insurers, and community leaders in order to change this perception.
  - Our maps are not even close to being complete. Our current flood mapping does a terrible job with urban stormwater flooding. Our maps also do not take into account our changing climate which has a direct impact on our hydrology. Finally, we have only mapped appx. 1/3 of all existing floodplain and flood hazard areas.
- Rebuilding in New Orleans and Mississippi after hurricane Katrina there has not been many restrictions on development – can you provide some comments on that?
  - The local elected officials did not want to personally take responsibility for addressing their flood risk. Their perspective was that the Army Corps of Engineers was responsible for building the flood walls higher and protecting the city. As a result, rebuilt areas of New Orleans have been built almost the exactly the same as they were before. Some of the levees are larger but those are subsiding at a faster rate than the old levees so their protection is getting less and less effective every day.
- Subdivision design has proved to be a significant challenge: please watch for a new publication on Subdivision Design in Flood Hazard areas (release spring 2016).

10:00 AM

## No Adverse Impact Overview – Indiana Perspective; Rodney Renkenberger, PLS, CFM:

### Main Points:

- Stop developing in the floodplain. Avoidance is the most effective way to prevent adverse impacts.
- Damages from flooding have increased over the last few decades despite the NFIP.
- Current policies promote intensification of development in high risk areas, ignore changing conditions, ignore adverse impacts to existing properties, and undervalue natural floodplain functions.
- Before building levees or other structural mitigation actions we need to think about potential upstream and downstream effects. Often times these flood control structures just move the flooding problem to another area.
- Floods are the most predictable hazard that occurs in the United States – we know when it is going to flood and we know where it is the most likely to flood.
- NAI Defined: *“Activities that could adversely impact flood damage to another property or community will be allowed only to the extent that the impacts are mitigated or have been accounted for within an adopted community-based plan.”*  
In short: NAI is the *“Good Neighbor Policy.”*

### Seven Building Blocks of NAI:

1. Flood Hazard Identification and Floodplain Mapping
2. Education and Outreach
3. Planning
4. Regulations and Standards
5. Mitigation Actions
6. Infrastructure
7. Emergency Services

### Three Levels of NAI Application:

1. Basic
2. Advanced
3. NAI

### NAI Roles:

- Local units of government will be the key adopters of NAI, to be successful the community officials must support their local floodplain administrator and their management program.
- States need to provide incentives to local communities in order to encourage higher regulatory standards.

### Questions:

- Many communities have their own regulatory standards for things like freeboard and compensatory storage, how many communities have higher regulatory standards and how do you convince those that do not to adopt them?
  - My first job in Indiana 20 years ago was to get all communities to adopt higher freeboard requirements. 10 years ago, communities in the Maumee River Basin had some of the highest freeboard requirements. In the last four years, however, most of those communities have reverted to the state standard in order to promote economic development. This is why elected officials are so important. We need elected officials to understand the importance of higher regulatory standards if we want them to be adopted broadly.
- Can you touch on what happened in Kokomo, IN in regards to the baseball stadium?
  - The property on which the city planned to build the baseball stadium was originally a FEMA buy-out after a federally-declared disaster. Although many spoke-out against building a large and expensive baseball stadium in a flood hazard area, the city proceeded anyways. When the Attorney General found out, an attempt was made to issue a stop-work order. Unfortunately, the Attorney General did not have the jurisdiction to issue that order. As a result, FEMA had to step-in; the only thing the agency could do to halt the construction of the baseball stadium was to withhold all disaster relief funding to the state of Indiana. This decision impacted 92 counties, who had to wait for months before receiving the 6.2 million dollars in funding they needed to begin the recovery process. A settlement between the city, the state, and FEMA was reached a few weeks ago, but the outcome has not been released publically.

### **10:45 AM Coastal NAI and the Great Lakes Coastal Flood Study; Alan Luloff, P.E., CFM:**

#### Overview:

- The Great Lakes were formed by the glaciers.
- Great Lakes' water levels are affected by three factors primarily: outflow, evaporation and precipitation.
- Lake levels in all lakes that are not moderated by a control structure have been at historic lows for the past 30 years, in the last three years lake levels have finally rebounded and are now approaching "normal" levels (levels that are very near the long-term average).
- Storms and flooding are the most common hazards in the Great Lakes region.
- Storms have unique effects on the Great Lakes because they are extremely large, closed bodies of water. Some of the phenomena that storms cause on the Great Lakes are: seiche events and coastal flooding.



- FEMA has been conducting a coastal flood study in the Great Lakes region for the last 2 years. This coastal flood study looks at storm impact on flooding including: wave set-up and wave run-up.
- [The Great Lakes Coastal Flood Study](#) is finished, but is currently under-going an external review before they are released to the general public.

Challenges Addressed in Updated Flood Study:

- “Gutters” or breaks between different coastal flood zones and elevations, are now placed in intuitive areas so properties are not divided.

Ways to Address Coastal Hazards:

- Structural mitigation (rip rap, sea walls, break waters, etc.)
- Non-structural mitigation (shoreline softening)
- Planning (zoning ordinances ex. St. Joseph, MI; setbacks)
- Higher regulatory standards (freeboard requirements)

Tools/Technical Resources Developed to Support the Great Lakes Coastal Flood Study:

- [U.S. Army Corps of Engineers Oblique Photo Viewer](#)
- [LiDAR Data shared via NOAA Digital Coast](#)
- [Great Lakes Shoreline Geodatabase](#) (zip file)
- [CSHORE](#)
- C-STORM

Tools that Provide Case Studies on Communities which have used Coastal Flood Study Products or have Addressed Coastal Hazards:

- [The Great Lakes Coastal Resilience Planning Guide](#)
- [NOAA Digital Coast](#)

Questions:

- How much power does a Congressman have on development regulations in their district?
  - None. Local development is regulated by local officials (Mayors, City Council, etc.)
  - If development is occurring on the coast, one way to halt its progress would be to file a law suit. Issues that could be raised:
    - Public Trust Doctrine
    - Development in flood hazard areas
  - Be sure to talk with your neighbors and your Mayor, it may be possible to gain support for your cause without filing a law suit.

- The city may also be able to request new work maps being developed through the Great Lakes Coastal Flood Study. These maps will have more information on coastal hazards that could impact the type of development that can be legally permitted in a certain area.
- In the City of St. Joseph, MI who adopted the No Build Zoning Ordinance?
  - The City Council adopted the zoning ordinance.

12:15 PM

**Call Before You Fill: A Federal Perspective on Wetland Regulations; Andrew Blackburn:**

- USACE regulates Waters of the United States (WOUS) under the Clean Water Act: Oceans, rivers, streams, waterways (canals, ditches), lakes (including interstates), and wetlands (many different types).
  - Why? Important functions and values of waters need to be maintained, all of which are tied to commerce:
    - Navigation
    - Recreation
    - Water filtration/Purification
    - Wildlife Habitat
    - Erosion Control
  - USACE is responsible for two activities primarily under the Clean water Action:
    - Section 404: Permit required for discharges of dredged or fill materials into waters of the U.S.
    - Section 10 of the Rivers and Harbors Act: Permit required for work or structures in navigable waterways.
    - Ex: Seawalls, boat ramps, shoreline stabilization, piers. Transportation projects: Tollways, INDOT, and railroad projects. Utility projects. Commercial, residential, and institutional projects. Wetland and stream restoration projects. Recreation projects: golf courses, trials, sports fields, parks, and play grounds.
  - USACE's regulatory branch is a permitting agency – only 1% of all permits are denied. That said, violation investigations of unpermitted work or work that was not constructed as directed are time consuming and prevent the agency from effectively doing their job (permitting and inspecting on-going projects).
- USACE has to work with other Federal Statutes (main two are bolded):
  - **ESA**
  - Fish and Wildlife Coordination Act
  - **National Historic Preservation Act**
  - NEPA
  - Stormwater Ordinances

- Soil Erosion and Sediment Control Ordinances
- Federal Power Act
- Wild and Scenic River Act
- Common Violations that are Discovered:
  - Fill in wetlands
  - Fill in streams
  - Improper waste disposal

Questions:

- How much money does it cost to have the USACE to survey your and or issue a permit?
  - Land surveys are priced on a case by case basis – they have a list of environmental consultants available on their websites.
  - Permits are issued for free unless the project is more than 1 acre of land and the project is being completed by a private company.
- Why is a distinction not made between a naturally occurring wetland and a man-made wetland?
  - There is a distinction. Wetlands constructed for the purpose of stormwater control are exempt to WOUS regulations.
  - Incidental wetlands that are created by construction fall under a special review process to determine if it is a WOUS or something that was created.

**12:45 PM NW IN Flooding Case Study; Dan Repay:**

Overview:

- Case study analyzes the impacts and rebuilding process after a flood in 2008.
- Little Calumet River Basin regulated by a board: mix of Governor Appointees, Mayoral Appointees, and city council representatives.
- Long history of flooding in the Little Calumet River basin.
- 2007/2008 large floods inundated the highway near Hammond, IN.
- Munster and Hammond, IN were also inundated – in Munster houses were built on top of the levees. Hammond was spared because everything behind the levees was designated as park lands.

Challenges:

- Man hole covers being burst off and or tipped as a result of extreme floods;
- Culverts were completely blocked off as a result of debris;
- Beaver dams and other animal damage;
- Erosion and scouring;

- Operations and maintenance, and as a result lacking funding for maintaining flood control structures, stormwater infrastructure, and mitigation construction;

Solutions:

- An inter-city commission and volunteers that work to fund and coordinate maintenance;
- Regular monitoring; and
- Training of maintenance.

Questions:

- None.

1:15 PM

**Valuation of Ecosystems Services for Lake, Porter and La Porte Counties Provided by the Chicago Wilderness Green Infrastructure Vision; Jazmin Varela:**

Overview:

- The “green Infrastructure Vision” (GIV) GIV 2.3 is a spatial representation of Chicago Wilderness’s Biodiversity Recovery Plan but it also can provide a means to value other benefits of nature.
- NIRPC, The Conservation Fund, and CMAP are the critical partners who have joined the GIV project and helped to inform version 2.3.
- GIV covers coastal counties in Illinois and NW Indiana.
- The Conservation Fund has engaged in a valuation exercise of the ecosystems services provided by the areas identified through the GIV.
  - Ecosystems services are hard to value because they are not traded in the open market. Ecosystems services are public goods meaning everyone has access to them (without competition) and no one can be excluded from accessing them.
  - In the US we have created a few ways markets for ecosystems services:
    - Mitigation; often required by federal regulations (Clean Water Act, NEPA, etc.)
    - Business to Business; creating a business of ecosystems services (Perrier purchases a watershed to ensure that the water that originates there is pure and natural to protect their water sales.)
    - Government Payment Schemes; federal incentive program (Conservation Reserve Program, land acquisition).
  - To conduct this ecosystems services valuation The Conservation Fund identified critical ecosystems services, did research in order to determine if those services had ever been values, and then mapped them. Included in this analysis were the following ecosystems services: water flow regulation

and flood control, water purification, groundwater recharge, air purification, recreational land and ecotourism, and carbon storage.

- The valuation methods that were used:
  1. Avoided cost (Services allow society to avoid costs that would have been incurred in the absence of those services e.g., natural flood control preventing property damages or natural waste treatment preventing health costs),
  2. Replacement cost (how much does it cost to replace/restore an ecosystem like a wetland which provides a critical ecosystem service),
  3. Factor income (how much more of a product is produced as a result of an ecosystem service – purer water entering a lake results in larger the fishery),
  4. Travel cost (individuals WTP to visit a specific location, plus a multiplier based on dollars individuals spent in the surrounding area),
  5. Hedonic pricing model (comparing data between two properties one adjacent to an open space or a lake and another that is not next to that resources to determine the WTP to be near one of those natural areas), and
  6. Contingent valuations (a survey on individual’s willingness to pay for access to specific activities or services i.e. increased fishing and hunting opportunities).
- After the six ecosystems services were identified an extensive document review process was undertaken. The result of this process was a matrix that showed the value of an ecosystems service per acre, per year for each landscape type (woodland/forest, prairie/grassland, wetlands, natural floodplains, lakes).
- The results of this study in the GIV geography showed that the green infrastructure network would be produce:
  - 4 billion dollars of flood control services;
  - 393 million dollars of water purification services;
  - 1.4 billion dollars of groundwater-recharge services;
  - 319 million dollars of air purification services;
  - 4.3 million dollars of carbon storage services; and
  - 289 million dollars of recreation and ecotourism services.
- This valuation is being used to implement the Milwaukee Metropolitan Sewerage District’s Green Seams program and value the land acquisitions and restorations that they have done in the Menomonee watershed.

Questions:

- Is the literature review that was completed for the GIV valuation available for the general public? Also is the GIS file online?
  - Yes it is available online on NIRPC’s website.

2:30 PM

## Green Infrastructure Mapping and Flood Risk Planning Exercise; Bridget Faust, Kara Salazar:

### Introduction:

- The purpose of this mapping exercise is to allow participants to apply the No Adverse Impact approach and utilize some of the knowledge that they gained from presentations during the day.
- Task: You are planners working to design the redevelopment of Hammond, Whiting, East Chicago, Munster, and Gary Indiana. Through this redevelopment planning process these cities hope to collectively: 1. reduce flooding throughout the area, and 2. Improve the water quality of the Calumet and Little Calumet Rivers, as well as Lake Michigan by reducing run-off and erosion.
  - To attain these goals planners are responsible for:
    - Protecting or restoring freshwater wetlands, natural areas and open space to better manage sediment runoff for water quality and to mitigate flooding due lake level change, heavy precipitation and storms.
    - Identifying areas where green infrastructure may be able to help attenuate flooding.
    - Directing new development toward existing developed lands and infrastructure.
- Groups of 5-7 individuals were given 30 minutes to complete this mapping exercise.

### Report-Out:

- Group 1: Conservation around Little Calumet River; incorporating floodplain and restoring U.S. Steel property; green infrastructure overlay.
- Group 2: Infill in urban areas of Gary, East Chicago, Hammond, and areas that lost population; brownfield redevelopment; buffer edges in floodplains, including ship canal; terrestrial corridors between water bodies; and connect forest and grassland.
- Group 3: Corridor connections, wanted more information on real open space
- Group 4: Conserve and protect open areas near schools to promote education and green infrastructure implementation; relocate Waste Water Treatment Plant located in hazard area.