



# Disaster Risk Reduction (DRR) Ambassador Curriculum Plan

DISASTER  
RISK REDUCTION  
Ambassador Curriculum

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## BACKGROUND

The Natural Hazard Mitigation Association (NHMA) is a national organization of practitioners committed to natural hazard disaster risk reduction (DRR) in the context of climate adaptation and mitigation. NHMA members are dedicated to helping our nation achieve the goal of reducing the devastating costs and impacts of natural hazards. Such a reduction improves public safety and health as well as community well-being, while reducing government expenditures, human misery, and environmental harm. NHMA emphasizes the whole community approach to addressing natural hazard mitigation, and places a special emphasis on protecting underrepresented populations from disaster damage.

The NHMA membership has determined they can best leverage their limited resources by building a peer-to-peer network designed to encourage and promote local efforts to build a safer, more resilient future for the nation; this initiative is called the Resilient Neighbors Network (RNN). RNN leaders and others in the NHMA leadership have also recognized the need for information, knowledge of best practices, and analytic tools to enable better-informed decisions about the many facets of DRR.

With support from its membership and a Federal Emergency Management Agency (FEMA) Cooperating Technical Partners Grant, NHMA initiated a development and review process consistent with the Department of Homeland Security (DHS) Preparedness Directorate's Office of Grants and Training Course Development Specifications. The methodology and results are described in the Final Report for FEMA CTP 2014-15 Task 3 NHMA Ambassador Curriculum. Approximately 50 interviews were undertaken with RNN leaders, NHMA Board and Advisory Committee members, and other experts to identify needs and opportunities for curriculum content. NHMA then performed a wide-ranging review of other organizations' resources, webinars, and training already available to communities in support of risk reduction programs, to avoid redundancy of effort. The result indicated that the NHMA DRR Ambassador Curriculum could provide effective and meaningful information, resources, and training to community staff and volunteer and stakeholder groups, essential to the vision of whole community engagement in DRR and community resilience.

In 2016, under a 2015-2016 CTP Grant, NHMA's Project Management Team inventoried its existing educational material to determine which of the essential topics were already developed, and identified the gaps that would require new design and development. They hired a contractor, Wightman & Associates, LLC, in September of 2016, to advance the development of the existing curriculum, and to assist the volunteer authors to develop modules consistent with the NHMA's intent, delivery methods, and standards. A pilot delivery of nine of the DRR-A modules was conducted on April 17-18, 2017, in Harrisburg, Pennsylvania, co-sponsored by NHMA and the Pennsylvania Emergency Management Agency.

## GOAL AND OUTCOME

The goal of the DRR Ambassador Curriculum is to facilitate the DRR efforts of community representatives by:

- 1) Engaging in discussion of how disasters can be reduced through local action
- 2) Having exposure to other local leaders and technical experts to enable the development of cross functional solutions
- 3) Acquiring the best-available information, knowledge of best practices, and analytic tools to enable better-informed decisions before, during, and after disasters

Individuals who have completed the DRR Ambassador Curriculum will have greater knowledge and improved tools, and be better able to advocate for and support effective DRR in their local communities.

## TARGET AUDIENCE

The audience for this curriculum includes local community staff, and volunteer and stakeholder groups engaged in efforts to achieve natural hazard DRR and to enhance community resilience.

## CURRICULUM DESIGN

The DRR Ambassador Curriculum is designed:

- With a multi-hazard approach that encourages shared management strategies and unified responses in DRR plans and action
- To build a strong legal, ethical, and equitable basis for safe and effective development, redevelopment, and adaptation
- To be custom-tailored and updated for local needs to facilitate community progress
- As an initial set of self-study and training media that can be extended as new topic options are identified and developed

The Curriculum consists of a series of stand-alone modules, each approximately 1-2 hours in duration; they may be completed consecutively, or as needed and available. There are no prerequisites but recommendations for completing related modules may be offered. Each module:

- Consists of PowerPoint slides, a Facilitator Guide, and a Participant Guide
- Cites key references, typically two to three citations for each module
- Includes a set of study questions intended for assessment of achievement of learning objectives

The Curriculum is organized into five parts:

- I. Disaster Risk Reduction for a Safe and Prosperous Future
- II. Forming a Community's Vision for Disaster Risk Reduction
- III. Realizable, Practical, and Affordable Approaches to Implementing the Disaster Risk Reduction Vision
- IV. Resources and Tools for Community Disaster Risk Reduction
- V. Resources for Hazard-Specific Disaster Risk Reduction

## **CURRICULUM DELIVERY**

The DRR Ambassador Curriculum modules can be delivered:

- Via webinars presented by NHMA or partner organizations
- In a classroom training environment
- Through a combination of webinar and classroom training
- In materials downloadable from the NHMA website for self-study or reference

## **CERTIFICATION AND CREDENTIALING**

### **NHMA DRR-A Curriculum Certificates**

Due to the modularized nature of the DRR-A Curriculum, there are multiple options available for the target audience (community leaders and stakeholders who wish to achieve disaster risk reduction in their communities) to meet their needs and to be recognized for their achievement.

1. "DRR Ambassador" Certificate for Completion of the Full DRR-A Curriculum
  - Requires completion of all 24 modules planned for the curriculum, and demonstrated achievement of learning objectives through a consistent testing procedure, leading to a DRR-A certificate issued by NHMA.
  - Modules can be completed in either multiple single offerings or as a "package" program.
  - Testing procedure will consist of pre- and post-tests administered directly at in-person offerings of the curriculum modules. A system for electronic submission and grading of tests will have to be developed to support participants who complete the modules remotely.
2. Certificate(s) of Successful Completion of Selected DRR-A Curriculum Modules
  - Entails completion of one or more modules without intent to complete the credential requirements

- Requires demonstrated achievement of learning objectives through testing as described above
- Separate certificate(s) of completion are given for each module

3. “Tailored” DRR-A Modules

- Refers to participation in a face-to-face DRR-A module presentation or a webinar delivery of one or more DRR-A module(s), tailored to meet specific needs or interests of the audience (e.g., with a geographic or hazard-specific focus).
- Tailored modules may or may not count toward the credential; revised materials will be submitted for review by the NHMA Project Management Team (PMT) or other NHMA DRR-A training authority.

### **Partners for Advancing NHMA’s DRR-A Curriculum**

NHMA already has relationships with several professional organizations that allow members to apply NHMA training toward maintenance of professional certifications. NHMA has begun the process of introducing the DRR-A Curriculum modules to those organizations to ensure the new modules are similarly recognized. As the DRR Ambassador Curriculum modules are completed, NHMA will continue to seek CE credit pre-approval and/or partnering with organizations such as:

- American Bar Association (ABA)
- American Planning Association (APA)
- American Society of Adaptation Planners (ASAP)
- Association of State Floodplain Managers (ASFPM)
- International Association of Emergency Managers
- International Network of Women in Emergency Management
- International Public Safety Association (IPSA)
- National Association of Counties

The long term goal is for NHMA or a partner organization to offer a DRR Ambassador credential. This will require, at a minimum, completion of all of the modules and demonstrated mastery of all learning objectives through a secure and consistent testing procedure.

## DRR AMBASSADOR CURRICULUM AT-A-GLANCE

<b>I. Disaster Risk Reduction for a Safe and Prosperous Future</b>	
1	Introduction to the Natural Hazard Mitigation Association and Disaster Risk Reduction Ambassador Curriculum
2	Introduction to Disaster Risk Reduction as a Foundation of Community Resilience
3	Leadership for Disaster Risk Reduction
4	Community Disaster Risk Reduction and Adaptation
5	Approaching the Challenge of Disaster Risk Reduction: NIST Community Resilience Guide
<b>II. Forming a Community’s Vision for Disaster Risk Reduction</b>	
6	Risk Assessment through Storytelling: An Asset-Based Approach
7	Achieving Community Buy-in for Disaster Risk Reduction: Win-Win Approaches
8	Leveraging Resources to Improve Disaster Risk Reduction
<b>III. Realizable, Practical, and Affordable Approaches for Moving from a Vision for Disaster Risk Reduction to a Strategy</b>	
9	Selecting and Implementing a Strategy for Addressing Community Disaster Risk Problems
10	Integrating Hazard Mitigation into Local Planning
11	Beyond Codes and Low-Impact Development
12	Creating the Plan: A Sustainable Floodplain Management Process Model
<b>IV. Resources and Tools for Implementing a Community’s Disaster Risk Reduction Strategy</b>	
13	Climate and Weather Tools and Trends
14	Risk Assessment Basics
15	Legal and Policy Opportunities for Disaster Risk Reduction
16	Linking Catastrophe Insurance to Disaster Risk Reduction
<b>V. Resources for Hazard-Specific Disaster Risk Reduction</b>	
17	Living with Water: Inland and Coastal Flooding
18	Design for Flood Resilience: Part I: Floodplain Management and Flood Resistant Design
19	Design for Flood Resilience: Part II: Green Infrastructure / Low Impact Development
20	Overcoming Impediments to Flood Resilience: Paths Forward
21	Wildfire Mitigation
22	The Wildfire-Flood Connection
23	Severe Thunderstorm/Tornado Safe Rooms
24	From Policy to Engineering: Earthquake Risks

## OVERVIEW OF CURRICULUM MODULES

### I. Disaster Risk Reduction for a Safe and Prosperous Future

Part I of this curriculum describes and illustrates how communities with internal leadership, support from the NHMA Resilient Neighbors Network and DRR Ambassadors, and using a systematic approach, can achieve a safe, healthy, and prosperous future by reducing disaster risks.

#### **Module 1: Introduction to the Natural Hazard Mitigation Association and Disaster Risk Reduction Ambassador Curriculum**

*Author: Edward Thomas, Esq., President, NHMA*

This module defines disaster risk reduction and introduces the NHMA. It describes NHMA local initiatives that include; publications to assist communities to navigate the programs and resources for disaster risk reduction, the RNN, outreach to non-traditional DRR partners, and the DRR Ambassador Curriculum.

#### **Learning Objectives**

1. Name the local initiatives of the NHMA.
2. Describe the purpose of the DRR Ambassador Curriculum.

**Duration:** 0.50 hour

#### **Module 2: Introduction to Disaster Risk Reduction as a Foundation of Community Resilience**

*Authors: Edward Thomas, Esq., President, NHMA, and Erin Capps, JD, Vice President, NHMA and VP Operations, H2O Partners Inc.*

This module introduces the basic concepts of community resilience, mitigation, and adaptation from a whole community perspective. It provides a rationale for disaster risk reduction as a foundation of community resilience, introducing the concept of Four Circles of Resilience and Sustainability. Module 2 also discusses trends in damages, liability, and costs of natural disasters. It includes suggested solutions, publications that promote resilience and disaster risk reduction, and important considerations for plotting a path forward toward a resilient future.

#### **Learning Objectives**

1. Define community resilience and disaster risk reduction.
2. Define mitigation and climate adaptation from a community perspective.
3. Explain the role of disaster risk reduction as a foundation of community resilience.

**Duration:** 1.00-1.50 hours



### **Module 3: Leadership for Disaster Risk Reduction**

[TO BE DEVELOPED]

This module will discuss the role of leaders/champions for DRR in the community; how to be effective change agents for DRR, leadership challenges, and best leadership practices to address them.

### **Module 4: Community Disaster Risk Reduction and Adaptation**

*Authors: Rebecca Joyce, Community Program Manager, Central Shenandoah Planning District Commission; Barbara Miller, CEM, CFM, Director Jefferson County Homeland Security and Emergency Management; Timothy J. Trautman, P.E., CFM, Program Manager, Engineering & Mitigation Program, Charlotte-Mecklenburg Storm Water Services*

This module discusses the concepts of whole community and climate adaptation. It provides a lens into what various communities, with unique hazards and challenges, have undertaken in order to achieve disaster risk reduction. It includes lessons learned from the RNN and the Rockefeller Foundation's 100 Resilient Cities Challenge in three different regions of the United States. The module also describes how each of the communities in these examples faces unique hazards and their own physical, social, and economic challenges, but share the common goal of reducing risk and vulnerability to become more disaster-resilient.

#### **Learning Objectives**

1. Describe the trends changing the make-up of U.S. communities.
2. Identify themes of the whole community approach.
3. Recall mitigation types and provide hazard-specific examples.
4. Recognize lessons learned from RNN community success stories.

**Duration:** 1.00-1.50 hours

### **Module 5: Approaching the Challenge of Disaster Risk Reduction: NIST Community Resilience Guide**

*Author: Steve Cauffman, Research Engineer, Community Resilience Group, National Institute of Standards and Technology (NIST)*

Given the unique circumstances under which community leaders pursue DRR and resilience, a systematic approach is useful. This module introduces the 2015 NIST *Community Resilience Planning Guide for Buildings and Infrastructure Systems*, which provides a practical and flexible overall approach for setting priorities and allocating resources to manage risks for various hazards.

#### **Learning Objectives**

1. Define resilience in the context of an entire community.

2. Identify the six planning steps described in the NIST *Community Resilience Planning Guide for Buildings and Infrastructure Systems*.
3. State the purpose of the NIST *Community Resilience Economic Decision Guide for Buildings and Infrastructure Systems*.

**Duration:** 1.00 hour

## II. Forming a Community's Vision for Disaster Risk Reduction

These modules suggest and provide examples of strategies for developing and refining the community's DRR vision.

### Module 6: Risk Assessment through Storytelling: An Asset-Based Approach

*Authors: Bob Freitag, CFM, University of Washington Institute for Hazards Mitigation Planning and Research, and William John Siembieda, Ph.D., AICP, Professor, California Polytechnic State University*

This module explores a risk assessment and identification approach that builds on a community's assets. This "assets-based approach" engages community stakeholders in a positive interactive experience; it encourages outcomes that embrace future visions and focus less on past conditions.

#### Learning Objectives

1. Describe the advantages (and limitations) of a risk assessment process that builds on community assets.
2. Distinguish between existing risk assessment tools such as HAZUS, that are vulnerabilities-based, and RiskMap, which build on community assets.
3. List the community assets to include in an asset-based risk approach within your organizations.
4. Use the asset-based approach checklist for initiating an asset-based risk assessment in your communities.

**Duration** 1.00-1.50 hours

### Module 7: Achieving Community Buy-in for Disaster Risk Reduction: Win-Win Approaches

*Authors: Edward Thomas, Esq., President, NHMA and David Mallory, PE, CFM, Treasurer, NHMA*  
Developing a resilient society requires a new message that promotes a "win-win" approach to development practices based on sound economic, legal, and ethical principles, protection of the environment, and involvement of all stakeholder groups. This module describes the steps to craft and sell a local resilience program designed to create a safer future in an era of climate variability and change.

### Learning Objectives

1. List examples of harm prevention messages that would appeal to a variety of audiences.
2. Identify ways of “getting to yes” for safe development through principled negotiations.
3. Identify questions that help decide the best project choice to control floods or enhance water resources.
4. Identify ways to develop a well-thought-out, clear “no,” to avoid adverse impacts.

**Duration:** 1.00-1.50 hours

### Module 8: Leveraging Resources to Improve Disaster Risk Reduction

*Author: Edward Thomas, Esq., President, NHMA*

This module suggests a process, techniques, and strategies for cooperating and coordinating with multiple partners in a community’s disaster resilient future. It presents a process to: envision a disaster resilient future that meets the needs of the community; develop a plan that includes taking action now to control development; obtain technical assistance and locate funding sources; continue to pursue resilience during recovery from a disaster, and learn from examples of successes achieved by a wide array of communities. NHMA’s *Building Your Roadmap to a Disaster Resilient Future* is introduced as a reference for using this process.

### Learning Objectives

1. Summarize the elements of a community’s roadmap to a disaster resilient future.
2. Provide examples of resources to leverage for disaster risk reduction during normal times.
3. Describe how conditions, opportunities, and resources for disaster risk reduction change after a disaster.
4. Discuss options for leveraging resources in a hypothetical post-disaster community.

**Duration:** 1.50 hours

## III. Realizable, Practical, and Affordable Approaches to Implementing the Disaster Risk Reduction Vision

Part III of the DRR Ambassador Curriculum introduces processes for developing a strategy for making the DRR vision a reality; hazard mitigation planning, code development, and resolving conflicts between development and risk reduction.

### Module 9: Selecting and Implementing a Strategy for Addressing Community Disaster Risk Problems

*Author: Tom Hughes, Vice President, NHMA and State Hazard Mitigation Officer, Pennsylvania Emergency Management Agency*

Successful local mitigation efforts can happen at any time – not just after large disaster events. This module provides best practices for, and examples of, community hazard mitigation and

development in situations where residents wanted action and their local government didn't know where to start.

### **Learning Objectives**

1. Describe ways to pick optimal DRR strategies for your community
2. Describe ways to effectively present information that helps local leaders, planners, and community members visualize what resilience looks like
3. Provide examples of how DRR strategies were developed and implemented in real communities

**Duration:** 1.00-1.50 hours

### **Module 10: Integrating Hazard Mitigation into Local Planning**

*Authors: Lawrence Frank, MRP, CFM, Resilience Program Manager, Atkins North America, and Shannon Burke, urban planning professional, Secretary, NHMA*

This module briefly reviews and provides resources for the local mitigation planning process. It discusses the benefits and provides guidance and references for integrating hazard mitigation planning into the local community's entire network of plans.

### **Learning Objectives**

1. List references for FEMA hazard mitigation plan requirements.
2. Describe the concept of a safe growth audit and how it can be applied in the local community.
3. Describe ways to integrate hazard mitigation throughout the community's planning process.
4. List common barriers to integration of hazard mitigation in the planning process.

**Duration:** 1.00-1.50 hours

### **Module 11: Beyond Codes and Low-Impact Development**

[TO BE DEVELOPED FY17]

Strong building and zoning codes and mitigation best practices are needed to achieve disaster risk reduction in building and community planning. The process of code development and the relationship between FEMA guidance and local building codes and zoning practices is reviewed in this module.

## **Module 12: Creating the Plan: A Sustainable Floodplain Management Process Model**

*Author: Timothy J. Trautman, P.E., CFM, Program Manager, Engineering & Mitigation Program, Charlotte-Mecklenburg Storm Water Services*

The Charlotte-Mecklenburg Storm Water Services (CMSWS) pioneered the “Future Conditions” approach to floodplain management, to resolve the conflict between the increased risk of flooding and the development and construction demands of a growing community. The module describes challenges and successes in achieving results.

### **Learning Objectives**

1. Describe the decision model behind floodplain management.
2. Explain the future conditions approach to floodplain mapping.
3. Explain the strategic planning approach to flood mitigation.

**Duration:** 1.00-1.50 hours

## **IV. Resources and Tools for Community Disaster Risk Reduction**

Part IV of the curriculum includes modules devoted to enabling DRR stakeholders to implement their DRR strategy effectively through the use of science, data, the law, and other relevant resources.

## **Module 13: Climate and Weather Tools and Trends**

[TO BE DEVELOPED FY17]

Climate and weather tools and trends define the challenges, needs, and opportunities for disaster risk reduction, no matter what the cause or consequences. This module addresses ways to mitigate and adapt to extreme weather impacts and risks.

## **Module 14: Risk Assessment Basics**

*Author: Steve Pardue, Antares Planning Group, LLC*

Risk assessment is assisted by new decision tools and shared community assessments that help prioritize costs and benefits of DRR plans and actionable projects. This module introduces the basic concepts of risk assessment in an uncertain or changing climate. It provides resources that drill deeper into the topic.

### **Learning Objectives**

1. Explain why risk assessment is an essential element in disaster risk reduction decision-making processes.
2. Identify the categories of risk.
3. Define risk in terms of probability, vulnerability, and value.
4. Explain the role of benefit-cost analysis (BCA) in risk assessment.

**Duration:** 1.00-1.50 hours

## Module 15: Legal and Policy Opportunities for Disaster Risk Reduction

*Author: Edward Thomas, Esq., President, NHMA*

This module integrates engineering, planning, policy, and legal research into a fundamental message; safe development, climate adaptation, and hazard mitigation provide the most resilient path for the whole community. It provides a community development approach for hazard mitigation, floodplain management, water quality and resources, design, and construction. This module is designed to fit into the FEMA RiskMAP vision of using the National Flood Insurance Program (NFIP) as the basis of future planning and hazard mitigation.

### Learning Objectives

1. State the ancient legal and equitable roots and concepts of safe or “do no harm” development decisions, including higher standards designed to protect the property and rights of everyone.
2. Explain how floodplain management, and other forms of regulation designed to prevent harm, generally avoid the “takings” issue.
3. Explain the evolving professional “Standard of Care.”
4. Identify important legal concepts discussed in this module, such as Variances.

**Duration:** 1.5-2.0 hours

## Module 16: Linking Catastrophe Insurance to Disaster Risk Reduction

*Author: Nicholas Lamparelli, Co-founder and Chief Underwriting Officer, reThought Insurance, Blogger & Podcaster at InsNerds.com*

This module describes the leading causes of catastrophe (CAT) losses globally, introduces the protection gap, and describes CAT models and new innovations that could solve the protection gap. The content is intended to provide community representatives with information that they can take away, evaluate, and implement in their own financial and economic practices to manage the risks in their communities.

### Learning Objectives

1. State the leading causes of catastrophe (CAT) losses in the US and globally.
2. Define the “protection gap.”
3. Describe the features of CAT models and why they are important.
4. Identify business models that could be implemented to solve the protection gap.

**Duration:** 1.00-1.50 hours

## V. Resources for Hazard-Specific Disaster Risk Reduction

Part V provides information and guidance to enable community leaders to more effectively reduce risk from specific hazards, using available tools, resources, and innovations.

### Module 17: Living with Water: Inland and Coastal Flooding

[TO BE DEVELOPED FY 17]

“Living with Water” is an approach to coastal, riverine, and regional planning that manages water quality and quantity as a resource from sky to soil to sewer to saving to sea. These innovations address the combined risks of flood, drought, soil, and ecosystem losses, and the benefits of water and food security as a combined planning and project benefit in both inland and coastal communities.

### Module 18: Design for Flood Resilience: Part I: Floodplain Management and Flood Resistant Design

*Author: Don Watson, FAIA, CIP, EarthRise design*

This module identifies the direct and indirect risks associated with different types of flooding and reviews watersheds, floodplains, aquifers and floodways. It describes floodplain management and watershed management planning based on future conditions for disaster risk reduction, and provides examples of flood resistant design measures for buildings and infrastructure.

#### Learning Objectives

1. Identify the risks associated with different types of flooding.
2. Explain the advantages of watershed management based on future conditions.
3. Describe flood resistant design measures for buildings and infrastructure.

**Duration:** 1.00-1.50 hours

### Module 19: Design for Flood Resilience: Part II: Green Infrastructure / Low Impact Development

*Author: Michele Adams, P.E., Meliora Environmental Design*

This module defines measures to maintain and improve healthy inland waterways and floodplains and describes how green infrastructure reduces stormwater costs and flood risk.

#### Learning Objectives

1. Describe how impervious surfaces alter the Hydrologic Cycle.
2. Identify design elements that are considered Low Impact Development or Green Infrastructure.

**Duration:** 1.00-1.50 hours

## **Module 20: Overcoming Impediments to Flood Resilience: Paths Forward**

*Author: Edward Thomas, Esq., President, NHMA*

This module continues to explore the unrelenting increase in flood losses and examines the impact of the NFIP on flood loss reduction. It addresses the limitations of current NFIP mapping in communicating current and future flood risk, and discusses the Community Rating System (CRS) and “Grandfathering” as part of a long term solution to flood loss.

### **Learning Objectives**

1. Describe higher standards, including the CRS, as part of a long-term solution to flood loss.
2. Explain the limitations of current NFIP mapping in identifying flood risk.
3. Explain common impediments to flood resilience and suggest ways to overcome them.

**Duration:** 1.00-1.50 hours

## **Module 21: Wildfire Mitigation**

[TO BE DEVELOPED FY17]

## **Module 22: The Wildfire-Flood Connection**

[TO BE DEVELOPED FY17]

This module will incorporate perspectives from the western U.S. for insights, best practices, and creative funding solutions to encourage communities in addressing the fire-flood connection, and reducing future damage.

## **Module 23: Severe Thunderstorm / Tornado Safe Rooms**

[TO BE DEVELOPED FY17]

This module will discuss lessons learned from severe storm events such as the tornado in Moore, Oklahoma. It addresses cost effective changes that can be made to building codes and construction practices that can minimize impacts, along with the economics of mitigating against these unique hazards. The module also describes the benefits of building safe rooms.

## **Module 24: From Policy to Engineering: Earthquake Risks**

[TO BE DEVELOPED FY17]

This module will review how alignment of policy and engineering guidelines can advance seismic resilience for both individuals and society. It presents a vision for strategic collaboration between the technical and policy worlds to better assist individuals, organizations, and communities in understanding and managing earthquake and related natural disaster risks.