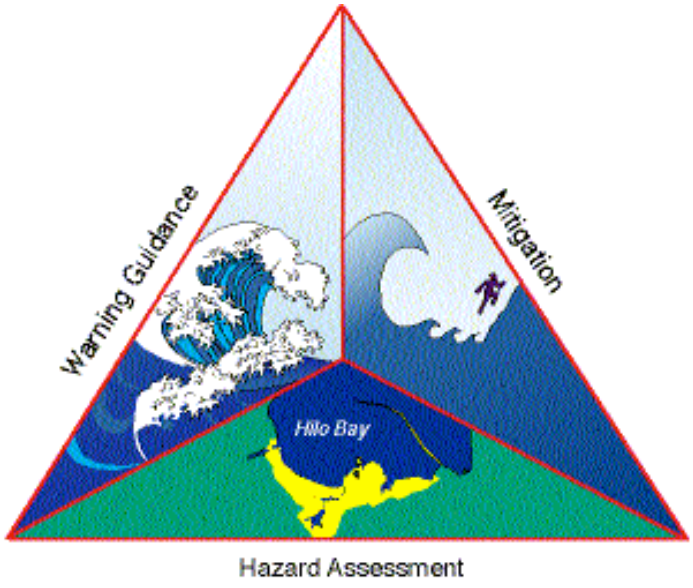
DRAFT

NTHMP EDUCATION PROJECT

IMPLEMENTATION PLAN



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EXECUTIVE SUMMARY

Congress has mandated by Public Law 109-42, known as the ***Tsunami Warning and Education Act***, that the National Tsunami Hazard Mitigation Program (NTHMP) shall "improve and increase education and outreach" and provide for "certification of prepared communities." In response, the NTHMP Strategic Plan calls for the establishment of a Public Education Project and the development of this Educational Implementation Plan.

This Implementation Plan recognizes the challenge presented by the scope of improving tsunami Public Education in many hundreds of U.S. coastal communities that reside in more than 500 U.S. coastal counties of 29 State, Territorial, and Commonwealth (STC) Partners of the NTHMP. The plan therefore focuses on the full utilization of existing NTHMP infrastructure and, especially, the expertise in tsunami science and preparedness of NTHMP Partner States, Territories and Commonwealths in a "bottom up" approach that starts with the concept of high quality, local, Community-Specific Public Education. This approach is reflected in the following Educational Goals and Objectives:

Educational Goals

- All NTHMP Partners will develop and adopt NTHMP Educational Standards
- All U.S. coastal communities will be provided with Tsunami Public Education that meets NTHMP Educational Standards
- All communities that meet NTHMP Public Education standards will receive formal recognition by the TsunamiReady Program

Educational Objectives

- *Focus on NTHMP Strategic Plan Performance Measures* that identify specific educational issues
- *Fully utilize the existing NTHMP infrastructure* – especially the existing Educational Projects and TsunamiReady Programs in each Partner STC jurisdiction
- *Fully engage Partner STC expertise and talent* – especially professional Emergency Managers and Scientists

In the context of these Educational Goals and Objectives, this Implementation Plan adopts the following specific Implementation Goal, Objective, Plan Components, and Schedule

Implementation Goal

- *Establish Train the Trainer Programs* in Partner STCs to graduate qualified Tsunami Public Education Instructors that will provide every Partner coastal community with frequent offerings of Community-Specific Tsunami Public Education Workshops that meet NTHMP Educational Standards.

Implementation Objective

- *Establish Templates for Community-Specific Educational Workshops and Train the Trainer (T^3) Programs* that can be adapted to the special needs and requirements of each Partner State, Territory and Commonwealth.

Implementation Plan Components

a. *Organizational Structure* that supports and sustains the effort
b. *Educational Standards* developed and adopted by all NTHMP Partners
c. *TsunamiReady Program supports and encourages* communities' NTHMP educational activities
d. *Community-Specific Public Education Workshops* conducted on a regular basis in every coastal community

e. *Train the Trainer (T^3) Programs* established and maintained in each of the 10 NTHMP Region jurisdictions, to train Tsunami Public Education Instructors qualified to develop and offer Community-Specific Workshops

f. A *Web-based Educational Resources System (WERS)* to provide Partner STCs with up-to-date general and Community-Specific educational material and tools in support of their Train the Trainer Programs and Tsunami Public Education Workshops.

Implementation Schedule

Year 1: Multi-State Pilot Project that will focus on the goal of establishing the feasibility and effectiveness of the Train the Trainer Program concept, as the logical follow-up to the successful Pilot Project that developed and conducted a Community-Specific Tsunami Public Education Workshop (see Report to the NTHMP, Appendix A).

Years 2-Completion of Implementation: Project Expansion and Maintenance that brings to bear the experience gained during the Year 1 Multi-State Pilot Project on establishing the required infrastructure for Train the Trainer Programs and Community-Specific Tsunami Public Education Workshops in the remaining NTHMP STCs.

Washington State Pilot Project Report

Appendix A presents the results of a Pilot Project initiated by the NTHMP to develop and conduct a Community-Specific Tsunami Public Education Workshop. A major, unanticipated benefit of the process was identified – the process of developing this community-specific workshop was tantamount to a *de-facto* review of individual community preparedness components (warning dissemination, evacuation routes, etc.), and specific shortcomings were uncovered that were subsequently addressed. This opportunity was exploited during workshop development and documented as a formal ***List of Community Needs & Recommended Action Items.***

0. NEED AND AUTHORITY FOR THE NTHMP EDUCATIONAL PROJECT

A. Congressional Mandate and Guidance

Congress, by passage of ***Public Law 109-424, the "TSUNAMI WARNING AND EDUCATION ACT,"*** mandates that NOAA " … improve and increase education and outreach activities …", assigns primary responsibility for this task to the National Tsunami Hazard Mitigation Program (NTHMP), and provides the following mandate and guidance (U.S. Congress, 2006):

> CONGRESSIONAL MANDATE: *"The program under this section [Sec. 5. NATIONAL TSUNAMI HAZARD MITIGATION PROGRAM] shall – …*
>
> CONGRESSIONAL GUIDANCE: *"… promote and improve community outreach and education networks and programs to ensure community readiness, including the development of comprehensive coastal risk and vulnerability assessment training and decision support tools, implementation of technical training and public education programs, and providing for certification of prepared communities; …"*

The NTHMP response to this Congressional mandate is reflected in the NTHMP Strategic Plan and other guiding documents described next.

B. NTHMP Strategic Plan Guidance

The ***NTHMP Charter*** (NTHMP, 2008a) cites the Congressional Mandate and Guidance in establishing the NTHMP Mission, Purpose and Goals. Those directly related to education include:

> NTHMP MISSION: *"Provide scientifically accurate assessments of tsunami hazard, mitigate the threat through public outreach, planning and education, and lend guidance to optimize real-time warnings to communities on all U.S. coastlines."*
>
> NTHMP PURPOSE: *"… to improve and increase education and outreach activities and ensure that those receiving tsunami warnings and the at-risk public know what to do when a tsunami is approaching"*
>
> NTHMP GOALS: *"Promote and improve community outreach and education networks and programs to ensure community readiness."*

The ***NTHMP Strategic Plan*** (NTHMP, 2008b) is based on the NTHMP Charter and expands on these fundamental principles with additional guidance on the educational strategy to be adopted, stating that

> *"The **Mitigation and Educational Subcommittee** (MES) … will take the lead for and actions necessary to complete the strategies, measures and milestones …"* related to the following outcomes:
>
> ***Outcome:*** *Reduction of Loss of Life and Property Damage from Tsunamis*
> ***Outcome:*** *A Culture of Tsunami Preparedness and Response*

In particular, specific ***NTHMP Strategic Plan Performance Measures*** include:

- Develop an NTHMP education implementation plan by 2009
- Develop Educational Standards by 2010 (These standards will address items such as education of the teacher, curriculum content, frequency of offerings, and testing/follow-up procedures, consistent with previous NTHMP work documented in the Strategic Implementation Plan for Mitigation

Projects (Dengler, 1998), with consideration also given to using standards in the TsunamiReady program educational requirements)
- Support tsunami outreach efforts to coastal residents, media, coastal businesses, and tourism
- Develop an instructor training program and conduct a pilot training program by 2010
- Conduct annual tsunami table-top exercises
- Establish an accessible web-based repository for NTHMP-related products *(hereafter, the "NTHMP Repository").*
- Conduct evaluations to determine the effectiveness of tsunami education products and programs
- Integrate tsunami information into K-12 education

We note that the NTHMP Strategic Plan and this NTHMP Education Project Implementation Plan focus on the individual roles and contributions of Partner States, Territories, Commonwealths (STCs), and the Federal agencies that comprise the NOAA-led NTHMP; both plans thus complement, and are consistent with, the overall ***NOAA Strategic Plan*** (U.S. Department of Commerce, 2005) and the ***NOAA Tsunami Program 2008-2017 Strategic Plan*** (U.S. Department of Commerce, 2008).

The Congressional mandate and guidance stresses (a) improved *"community outreach and education"* and (b) a process for *"certification of prepared communities."* Noting that effective Tsunami Public Education is only one of many critical aspects of *"prepared communities,"* this Educational Implementation Plan adopts the following Educational Goals and Objectives.

C. NTHMP Educational Goals and Objectives

To guide this Implementation Plan, the following Educational Goals and Objectives will be adopted.

Educational Goals

- All NTHMP Partners will develop and adopt NTHMP Educational Standards
- All U.S. coastal communities will be provided with Tsunami Public Education that meets NTHMP Educational Standards
- All communities that meet NTHMP Public Education standards will receive formal recognition by the TsunamiReady Program

The sheer scope of this task is a major challenge, since it encompasses many hundreds of U.S. coastal communities; more than 500 U.S. county jurisdictions include one or more coastal communities with a total estimated population in 2003 of 153 million citizens (Crosset, et al., 2004). A further complication is that these communities are located in 29 individual NTHMP Partner States, Territories and Commonwealths, each a sovereign entity with individual needs, priorities, resources and tsunami risk levels. Thus, to meet the challenge of achieving these goals, the NTHMP Educational Project sets the following specific Objectives.

Educational Objectives

- *Focus on NTHMP Strategic Plan Performance Measures* that identify specific educational issues
- *Fully utilize the existing NTHMP infrastructure* – especially the existing Educational Projects and TsunamiReady Programs in each Partner STC jurisdiction
- *Fully engage Partner STC expertise and talent* – especially professional Emergency Managers and Scientists

1. IMPLEMENTATION GOAL, OBJECTIVE AND PLAN COMPONENTS

Here we provide an overview of the primary goal and objective that drives this Implementation Plan, the individual components of the Plan, the specific operational process by which the goal and objective will be met, and an outline of the Implementation Schedule.

A. Primary Goal and Objective

Implementation of an effective plan to meet the above NTHMP Educational Goals and Objectives requires, in turn, the adoption of a specific Implementation Goal and an associated Objective that guides the overall effort. These are as follows.

Implementation Goal

- *Establish Train the Trainer Programs* in Partner STCs to graduate qualified Tsunami Public Education Instructors that will provide every Partner coastal community with frequent offerings of Community-Specific Tsunami Public Education Workshops that meet NTHMP Educational Standards.

Implementation Objective

- *Establish Templates for Community-Specific Educational Workshops and Train the Trainer (T^3) Programs* that can be adapted to the special needs and requirements of each Partner State, Territory and Commonwealth.

We note that redundant effort can be reduced by taking advantage of similarities in Partner STCs that create overlaps in their respective educational needs.

B. Initial Scope

This Implementation Plan does not attempt to address each and every Tsunami Public Education issue and problem in Year 1. Rather, this plan provides a strong, focused, starting point – i.e., a strategy for improving NTHMP educational efforts through full utilization of existing NTHMP resources to develop a more solid foundation and infrastructure for delivering high quality educational products to the public. Thus, the plan is tightly focused on a few initial, high priority objectives – developing NTHMP Educational Standards, developing Public Education Curricula, training qualified Tsunami Public Education Instructors, and formalizing the infrastructure needed to reach every U.S. coastal community with high quality Tsunami Public Education. In the future, as experience is gained and lessons are learned, the scope of the NTHMP Educational Project will be broadened to develop additional components for targeted outreach efforts to special demographic groups such as transient tourist populations, K-12 students and other community youth (see the 5-Year Schedule, below).

C. Educational Project Components

To meet the educational and implementation objectives, the NTHMP Tsunami Educational Project includes the following components:

a. *Organizational Structure* that supports and sustains the effort
b. *Educational Standards* developed and adopted by all NTHMP Partners
c. *TsunamiReady Program supports and encourages* communities' NTHMP educational activities
d. *Community-Specific Public Education Workshops* conducted on a regular basis in every coastal community
e. *Train the Trainer (T^3) Programs* established and maintained in each of the 10 NTHMP Region jurisdictions, to train Tsunami Public Education Instructors qualified to develop and offer Community-Specific Workshops
f. A *Web-based Educational Resources System (WERS)* to provide Partner STCs with up-to-date general and Community-Specific educational material and tools in support of their Train the Trainer Programs and Tsunami Public Education Workshops.

These components are discussed in more detail in the sections that follow.

a. Organizational Structure and Responsibilities

To meet the Congressional mandate that the NTHMP " … improve and increase education and outreach activities …" (U.S. Congress, 2006a), a well-defined organizational structure within the NTHMP is needed to clarify day-to-day responsibility for the development and implementation of an NTHMP Educational Project.

Recommendation 1. Establish an organizational structure for development and implementation of a nationwide NTHMP Educational Project in which primary responsibilities are assumed by:

i. NTHMP Mitigation and Education Subcommittee
- Subcommittee members, and
- Educational Project staff

ii. NTHMP States, Territories and Commonwealths
- Emergency Management agency expert, and
- Scientific/Technical agency expert

iii. NWS TsunamiReady Program
- Warning Coordination Meteorologists (WCMs), and
- Science and Operations Officers (SOOs)

iv. NWS Tsunami Warning Centers
- TWC staff members

Further recommendations on the functions and responsibilities of each are provided below.

i. NTHMP Mitigation and Education Subcommittee

The NTHMP Rules of Procedure (NTHMP, 2008c) state that the Mitigation and Education Subcommittee, subordinate to the NTHMP Coordinating Committee, must "develop and agree to actions and recommendations relating to products and activities that will provide increased education, outreach, and training to the public and other stakeholders." The M&E Subcommittee is thus tasked with improving tsunami outreach activities, hazard mitigation planning, evacuation planning and exercises, educational material development, public education, tsunami workshops, land-use planning and the NOAA/NWS TsunamiReady Program. But the scope of the Congressional mandate to raise nationwide tsunami public education to the next level of quality and effectiveness is a challenge that will require dedicated NTHMP Educational Project staff whose primary responsibility is to coordinate, facilitate, and support the efforts of the four NTHMP groups with primary development responsibility – i.e., the M&E Subcommittee, Partner STCs, TsunamiReady Program, and Tsunami Warning Centers. It is therefore recommended that the role of the NTHMP M&E Subcommittee be as follows.

Recommendation 1a. M&E Subcommittee responsibilities will include oversight of (1) NTHMP Educational Standards development, (2) NTHMP Educational Project development and implementation, and (3) NTHMP Educational Project staff support activities.

We further recommend that the specific responsibilities of the NTHMP Educational Project staff focus on the following Plan Components:

- *STC Train the Trainer Programs:*
  - *Curriculum Template* – development of content common to STCs
  - *STC-specific Curriculum* – development of content, based on STC guidance
  - *First Offering* – assistance in implementing initial T^3 Program by each STC
- *Community-Specific Public Education Workshops:*
  - *Curriculum Template* – development of content on tsunami science and preparedness
  - *STC-specific Curriculum* – assistance with content development

  - *First Offering* – assistance in implementing initial Workshop by each STC
- *Web-based Educational Resources System:*
  - *Develop initial version of each STC WERS*
  - *Transfer STC WERS to the NTHMP Repository*
  - *Assist NTHMP in updating STC WERS content*

ii. NTHMP State, Territory and Commonwealth Staff

This Implementation Plan recognizes that some Partner STC jurisdictions maintain Public Education programs that include the tsunami hazard. The scope and depth of such programs varies but the responsibility for these efforts typically resides in STC agencies responsible for Emergency Management and/or Scientific and Technical issues, with agency staff that are expert in both universal and STC-specific tsunami science and preparedness issues. Congress has mandated that the NTHMP Educational Project support the improvement of existing STC educational efforts and expand this effort to include all STC jurisdictions. If this Congressional mandate is to be met, the existing STC expertise and educational infrastructure is critically important, and must be fully utilized and brought to bear on essential tasks. In particular, Partner STC expertise is needed to provide guidance for

- Development of NTHMP Educational Standards
- Development of Curricula for *Community-Specific Tsunami Public Education Workshops* and for *Train the Trainer Programs* that meet NTHMP Educational Standards
- Improvement of existing Partner Educational Projects
- Establishment of additional Partner Educational Projects in jurisdictions that lack them

To this end, we make the following recommendation.

Recommendation 1b. Each NTHMP Partner STC will identify two officials – one each from the Emergency Management and the Geotechnical/Scientific agencies of the Partner jurisdiction – to provide expert guidance for the development and implementation of the NTHMP Educational Project. The individuals identified should have existing responsibilities in public education, outreach or training thereby minimizing any additional duties.

iii. TsunamiReady Program

It is critical that the TsunamiReady Program guide all aspects of NTHMP Educational Project development, to ensure that TsunamiReady educational criteria are met. Thus, essential guidance and assistance must be provided by TsunamiReady Program personnel and we therefore recommend that

Recommendation 1c. In each STC, the NWS should identify TsunamiReady Program staff to work with the NTHMP Educational Project staff on the development and implementation of the NTHMP Educational Project.

In particular, specific tasks that will greatly benefit from TsunamiReady expert guidance and assistance include:

- Curriculum development for Train the Trainer Programs and Community-Specific Tsunami Public Education Workshops – especially general and Community-Specific content on achieving TsunamiReady status
- Implementation and First Offerings of T^3 Programs and Community-Specific Tsunami Public Education Workshops
- Recognition of communities that have met TsunamiReady educational criteria
- Updating content of Regional WERS material in the NTHMP Repository
- Updating content of Regional Tsunami Educational Project Administrative Databases in the NTHMP Repository, including information on offerings and evaluations of T^3 Programs, rosters of

qualified Tsunami Public Education Instructors, offerings and evaluations of Community-Specific Workshops, etc.

iv. Tsunami Warning Centers

A thorough understanding of the Tsunami Warning System is essential to Public Education and community preparedness, and each TWC engages in public education and outreach activities. It is therefore critical that these TWC personnel participate in Educational Project development, to ensure the quality and accuracy of public education regarding the warning system.

Recommendation 1d. Each NWS Tsunami Warning Center should identify a scientific staff member with public education and outreach responsibilities to provide expert guidance and assistance in the development of the NTHMP Educational Project.

In particular, specific tasks that will greatly benefit from Tsunami Warning Center expert guidance and assistance include:

- Curriculum development – especially content related to the Tsunami Warning System – for Train the Trainer Programs and Community-Specific Tsunami Public Education Workshops
- Implementation and First Offerings of T^3 Programs and Community-Specific Tsunami Public Education Workshops
- Updating content of WERS, especially content related to the Tsunami Warning System

b. Educational Standards

The Congressional requirement for "certification of prepared communities" clearly requires the establishment of Educational Standards to guide the process and ensure a high level of NTHMP Educational Project quality (U.S. Congress, 2006). Quality Assurance (QA) is therefore a key concept that must be an integral part of the NTHMP process for recognizing communities that meet NTHMP Educational Standards. We recommend that the Mitigation and Education Subcommittee lead the development of such standards, with the input and participation of NTHMP Partners and adoption by the NTHMP.

i. Consistency with Mitigation Projects Plan.

On 14 April 1998, the NTHMP Mitigation Subcommittee approved the Strategic Implementation Plan for Tsunami Mitigation Projects (Dengler, 1998). This plan explicitly identified Education as a critical component of Mitigation and provided a list of critical steps in the development of a successful Tsunami Education Program:

Why Education is essential to Mitigation:

> "There is no time for coordinated response after the earthquake occurs and individuals must be able to take appropriate action on their own. Tsunami education is further complicated by the diversity of audiences and, in many cases, the inadequacy of the technical information available. Much of the information about tsunamis is highly technical and not easily accessible to emergency managers, local decision makers, and the public."

Essential steps in developing a successful Tsunami Education Program:

"A tsunami education program needs to:

- Define the audiences
- Determine what the audience needs to know
- Define how to convey the message
- Assess existing materials and resources

- Select appropriate vehicles to reach targeted audiences
- Develop needed materials
- Define a dissemination mechanism
- Define a strategy for sustained support"

The Mitigation Projects Plan also discusses the need for (a) local-level knowledge of tsunami science and technology, warning systems, and preparedness topics, as well as (b) a Resource Center to provide information exchange and coordination.

This Educational Implementation Plan discusses educational components that are consistent with the Mitigation Projects Plan. However, although the Mitigation Projects Plan provides guidance, it does not establish Educational Standards, *per se*. Thus, Educational Standards must be developed that are consistent with both the

(a) Implementation Plan for Mitigation Projects (Dengler, 1998), and
(b) U.S. Congress (2006) requirement for "certification of prepared communities"

Assessment of an Educational Project is most efficient and effective when criteria are quantitative. An example of an existing, quantitative NTHMP Educational Standard is the "TsunamiReady Guideline 4: Community Preparedness," which explicitly specifies that the "Number of annual tsunami awareness programs" to be conducted each year should be 1 to 4 for communities with populations less than 2500, 15000, 40000 and greater than 40000, respectively (http://www.tsunamiready.noaa.gov/guidelines).

ii. Categories of Educational Standards

Standards may be categorized a number of ways. Here we categorize in the context of specific Implementation Plan components identified in this plan.

- **Standards for Train the Trainer Programs**
  - Qualifications of Instructor
  - Qualifications of Participants to be trained as Tsunami Public Education Instructors
  - Curriculum topics and content
  - Quality Assurance measures
    * Documentation of program evaluation by participants, observers, NTHMP reviews, …
    * Requirements for graduation
- **Standards for Community-Specific Tsunami Public Education Workshops**
  - Qualifications of Instructor
  - Curriculum topics and content
  - Frequency of offerings
  - Quality Assurance measures
    * Documentation of Workshop evaluation by participants, observers, …
    * Community Surveys of community awareness and knowledge
- **Standards for Web-based Educational Resources Systems**
  - Content
  - Accessibility
  - Reliability
  - Quality Assurance measures

* Documentation of user evaluation
* Expert review of material to ensure it is accurate and up-to-date

c. Recognition by TsunamiReady Program

Congress tasks the NTHMP with "providing for certification of prepared communities" (U.S. Congress, 2006), and Tsunami Public Education is one of many important criteria that "prepared communities" must meet. The educational aspect of this Congressional requirement can be met by the TsunamiReady Program of NOAA's National Weather Service, which formally recognizes individual communities that have met TsunamiReady criteria for preparedness. The goals and public education criteria for TsunamiReady recognition and renewal of TsunamiReady status can be found at the TsunamiReady website (http://www.tsunamiready.noaa.gov/), and in the StormReady®/TsunamiReady Organization and Operations Manual (National Weather Service, 2004).

TsunamiReady Goal. The TsunamiReady Program, developed by the National Weather Service, is designed to help cities, towns, counties, universities and other large sites in coastal areas reduce the potential for disastrous tsunami-related consequences.

TsunamiReady Public Education Criteria.

- Promote public readiness through community education and the distribution of information
- Develop a formal tsunami plan, which includes holding emergency exercises.
- Conduct or sponsor Tsunami awareness programs (The number of presentations per year is based on population)
- Provide written Tsunami hazard information to the populace, including: hazard zone maps, evacuation routes, basic tsunami information

TsunamiReady Renewal. TsunamiReady recognition is valid for 3 years from the date an official recognition letter is signed by the Meteorologist in Charge (MIC) of the appropriate NWS office.

But achieving and sustaining prepared communities is a difficult task, as described by the NWS:

> "Tsunamis are quite rare compared to hazardous weather events in the United States. As a result, tsunami hazard awareness and preparedness in some locations along the U.S. West Coast, Caribbean, Alaska, and within the Pacific Region (Hawaii, American Samoa, Guam, Republic of Palau, Federated States of Micronesia, and Republic of the Marshall Islands) is inconsistent and, in many cases, insufficient. Even in locations with a history of deadly tsunamis, an adequate level of awareness and preparedness is difficult to achieve and sustain over time." (NWSI 10-1802, Section 1.2)

Therefore, to assist and strengthen the TsunamiReady Program, a key strategic objective of this Implementation Plan is the establishment of strong, explicit links to the NTHMP Educational Project by developing NTHMP Educational Standards, T^3 Programs and Tsunami Public Education Workshops that are designed to satisfy criteria for TsunamiReady Community status.

Two specific types of NWS positions bear responsibility for outreach and the TsunamiReady Program, and are therefore critical to the success of the NTHMP Educational Project. They are:

Warning Coordination Meteorologist (WCMs) are responsible for "… planning, coordinating, and carrying out the WFO area-wide public awareness program designed to educate the public to ensure the mitigation of death, injury and property damage or loss caused by severe natural hydrometeorological events" (http://www.weather.gov/om/wcm_jobaid/), " … area-wide preparedness planning and citizen education effort with and through various local and state agencies and organizations" (http://www.nws.noaa.gov/om/wcm_jobaid/job_description.shtml), and are charged with the responsibility to coordinate with emergency management groups on issues related to the TsunamiReady Program, public education and outreach (NWS, 2003).

Science and Operations Officers (SOOs) serve as the "… senior scientific advisor … with a primary focus on the assurance of the technical and scientific integrity of all hydrometeorological products and service" (NWS, 2002). Outreach activities that an SOO might conduct include helping science coordinators for local school districts and acting as a resource person for any community projects (NWS, 1999). As such, the SOO is uniquely qualified to work with the WCM, NTHMP Educational Project staff, and Regional Partner State, Territory or Commonwealth staff to ensure the quality and accuracy of scientific and technical content of Regional WERS and the curricula for Train the Trainer Programs and Tsunami Public Education Workshops.

In general, these and other NWS personnel already participate in Public Education activities, and are excellent candidates for the T^3 Program which, on successful completion, qualifies them to be Tsunami Public Education Instructors of Community-Specific Tsunami Public Education Workshops.

d. National Template for Community-Specific Public Education Workshops

A National Template that meets NTHMP Educational Standards for Community-Specific Education Workshops will be prepared as part of the Multi-State Pilot program in Year 1, discussed below. In particular, a Workshop Curriculum Template will be developed, based on that of the Washington State Pilot Project, by incorporating lessons learned and the evaluations provided by participants, community and State officials, and the workshop developers and instructors.

The Workshop Template will streamline the process of developing workshops that target the specific educational needs of individual communities. Thus, the addition of educational material that is specific to each community will result in Community-Specific Workshop Curricula that are tailored to meet the educational needs of individual communities in an efficient and cost-effective manner.

Further efficiencies and cost-effectiveness can be achieved by exploiting commonalities in the educational needs of multiple communities. By definition, the curricula for community-specific workshops will vary from community to community; however, *Tsunami-Similar Community Clusters* can be identified which share similar characteristics – e.g., the nature and level of the threat – which will allow these communities to share essentially the same Workshop curriculum. For example, the Washington State Pilot Project held a Workshop for two neighboring communities that shared similar threat and preparedness issues (Appendix A).

Community-Specific Workshops are consistent with the emphasis on Public Education by both Congress and the Mitigation Projects Plan (U.S. Congress, 2006; Dengler, 1998). Graduates of T^3 Programs in each Partner STC jurisdiction will be qualified Tsunami Public Education Instructors that will develop and conduct Community-Specific Tsunami Public Education Workshops. These Workshops will integrate hazard assessment, warning guidance, and risk reduction concepts with educational material that includes content that is *specific* to the community. Instructors will be assisted in the development of Workshop curricula and in conducting the first Workshop by T^3 Program staff of each Partner STC and NTHMP Educational Project staff.

Community-specific public education increases the probability of residents surviving a tsunami event, creates an atmosphere that promotes community commitment and planning for tsunami risk reduction, and helps officials develop support for the long-term sustainability of community preparedness programs. In particular, Community-Specific Tsunami Public Education Workshops will provide residents with a basic understanding of

- Community hazard level
- Community preparedness for the hazard
- Community risk reduction methods and tools available for this effort

In this section, we discuss several components of the National Workshop Template.

i. Workshop Curriculum Template

The Workshop Curriculum Template will include a significant amount of general tsunami educational material applicable to all communities, since the Washington State Pilot Program curriculum was based on a framework of general topics common to most, including:

- Earthquake Scenario and Impact
- Tsunami Generation and Coastal Impact of Inundation
- Tsunami Hazard Assessment Tools and Products
- Tsunami Warning Center Operations and Message Dissemination
- Effective Community Response
- Community Preparedness & Exposure
- Social Sciences principles and tools that relate to community risk reduction
- Evaluation by participants, officials, observers and instructors, in order to assess and improve the effectiveness of the Workshop

ii. Inventory and De Facto Assessment of Community Preparedness

Proper development of a Community-Specific Workshop must include an inventory of community capabilities and needs, thereby resulting in an automatic, *de facto* assessment of Community Preparedness. This unanticipated benefit was discovered during the Washington State Pilot Project to develop and conduct a Community-Specific Tsunami Educational Workshop in Washington State (Appendix A). To exploit this opportunity, an assessment of Community Preparedness should be formally documented as an integral part of the Workshop development process. This assessment resulted in a *List of Community Needs and Action Items* that was included as part of the Washington State Pilot Project Report (Appendix A).

iii. Workshop Format

The Washington State Pilot Project found that a 1-day Workshop format was enthusiastically embraced by the two communities involved, i.e., the Shoalwater Bay Indian Tribe and Tokeland, Washington (see Appendix A). But other Partner STCs may find other formats more effective – e.g., multiple evening sessions, or Friday evening/Saturday morning sessions, etc., or perhaps a combination of various formats for different demographic groups. STCs must try different options, then relate their experience and pass suggestions on to other STCs.

iv. Workshop Frequency

TsunamiReady educational criteria provide population-based guidance on the frequency of community educational activities. It is also anticipated that NTHMP Educational Standards will address the appropriate frequency of Workshop offerings as a function of other factors, such as the level of risk. As a practical matter, however, the frequency of Workshops may well be determined by two factors: (1) the response of the community and (2) the number of qualified Tsunami Public Education Instructors available. These two factors are clearly related; i.e., a high demand for Workshops will increase the need for more Instructors and, thus, more offerings of Train the Trainer Programs.

e. National Template for Train the Trainer Programs

The purpose of Train the Trainer Programs is to establish a State-led mechanism whereby State, Territory and Commonwealth Emergency Management and Scientific/Technical experts will train a cadre of professionals that are qualified to serve as Tsunami Public Education Instructors of Community-Specific Workshops. A National Template that meets NTHMP Educational Standards for Train the Trainer Programs will be prepared as part of the Multi-State Pilot Project in Year 1, discussed below.

In particular, NTHMP Educational Project staff will develop a T^3 Program Curriculum Template, based on the guidance of Partner STC professionals and officials, TsunamiReady Program staff, and Tsunami Warning Center staff. A draft T^3 Curriculum Template will be critically reviewed by State, Territory and Commonwealth experts, and NTHMP Educational Project staff will revise as needed. The T^3 Curriculum Template will be focused on instruction that will provide participants with a basic understanding of fundamental principles and concepts in

- Tsunami Science
- Tsunami Warning
- Tsunami Risk Reduction and Preparedness
- Developing and conducting community-level Tsunami Public Education Workshops

Successful completion of the State-led T^3 Program will qualify each graduate as a Public Education Instructor. Testing as a graduation requirement for each participant, and documentation of the results, is essential to monitor and ensure quality. Similarly, each program offering must include evaluation by participants, officials, observers and instructors, in order to assess and improve Train the Trainer Program effectiveness.

A critical educational resource for this effort is the program for professional development in Tsunami Science and Preparedness (TSP) offered by the University of Washington in collaboration with NOAA's Pacific Marine Environmental Laboratory (PMEL) (http://nctr.pmel.noaa.gov/education/). This international educational program has trained seventy participants from Indian Ocean nations in two highly successful offerings, each 2 weeks in duration: July 2007 in Seattle, WA, and March 2008 in Bangkok, Thailand. Just as important to this Implementation Plan, the USAID-funded project also resulted in the creation of a massive database of tsunami educational content, consisting of lectures and exercises contributed by more than 30 tsunami science and preparedness experts.

Train the Trainer Programs are consistent with Congressional guidance that the NTHMP shall implement "technical training" programs (U.S. Congress, 2006), and with the Mitigation Projects Plan (Dengler, 1998) that identifies "an inadequacy of technical information available." Train the Trainer Programs will address Professional Development, as distinct from, but critically essential to, a successful Public Education program (U.S. Congress, 2006, Section 5). Thus, Tierney (2005) focuses on the importance of training professionals responsible for public education by posing the question: "when new dangers are identified, or when new scientific information on hazards becomes available, why are decision-makers, and even the general public, often unresponsive to that new information?" The general answer to this question is, in part, a lack of successful information transfer to professionals engaged in public education; thus, training professionals is often neglected in public education programs when, in fact, professional training is essential. In particular, inadequate transfer of new knowledge in tsunami science and preparedness to emergency managers and planners at varying jurisdictional levels (i.e., Federal, State, tribal, county, etc.), will decrease the quality and value of community-level Public Education programs.

Components of the National Train the Trainer Program Template may include curriculum, format, and frequency. The Community-Specific Workshops experience demonstrates that a Pilot should precede Template establishment. Thus, the National Train the Trainer Program Template is not yet defined. A Multi-State Pilot Project is proposed, see 5-Year schedule below.

f. Web-based Educational Resources Systems

As pointed out in the Mitigation Projects Plan (Dengler, 1998), Educational Projects such as T^3 Programs and Community-Specific Tsunami Public Education Workshops will require up-to-date educational material that is both general and community-specific. The NTHMP Educational Project staff will develop a Web-based Educational Resources System (WERS) as part of the NTHMP Repository, to develop, archive and distribute tsunami educational material in a reliable and easily accessible manner, including the content of Train the Trainer Programs and Community-Specific Public Education Workshops.

The starting point for development of the WERS is the existing, massive, database of educational material on Tsunami Science and Preparedness, consisting of lectures and exercises contributed by more than 30 experts as part of a NOAA/USAID educational project led by the Pacific Marine Environmental Laboratory. However, we note that the goal of this Tsunami Science and Preparedness (TSP) project, which was initiated soon after the 2004 Indian Ocean mega-tsunami disaster, was to build professional capacity in that region to establish and maintain a comprehensive, end-to-end Tsunami Warning System. Therefore, the structure and content of the database necessarily reflects the goal of developing a relatively long (2- to 3-week) training program for diverse groups of Indian Ocean professionals – i.e., scientific and technical personnel, government officials, emergency managers, etc. – with a focus on issues specific to the Indian Ocean region.

Thus, the content and format of this rich educational database does not currently meet the somewhat different needs of the NTHMP Educational Project – i.e., shorter professional development and public education programs (multi-day T^3 and 1-day Workshops) focused on U.S. national, regional, state, tribal, territorial and community-specific issues. Nonetheless, the TSP database is an important source of content for WERS development. Each T^3 Program Curriculum Development effort will be accompanied by WERS updates by the NTHMP Educational Project Staff.

i. Educational Modules

Distinct educational modules will be developed with content that is tailored to the needs of each NTHMP Partner STC. The development of each educational module will benefit from the development of previous modules, by exploiting commonalities and applying lessons learned. Review and revision to ensure a module is up-to-date will be performed periodically, in conformance with NTHMP Educational Standards. This WERS design – i.e., a web-based system populated by STC- and Community-specific educational modules – will contribute to the continuity and sustainability of the NTHMP Educational Project in the face of inevitable changes in Partner STC personnel.

ii. Online Courses

A logical step in the evolution of WERS is the development of online courses based on individual education modules. Such courses are valuable teaching tools that will support and supplement participation in both the T^3 and Tsunami Public Education Workshops, and will provide individuals and small, remote communities with easy access to training in fundamental concepts and principles of tsunami science and preparedness topics. Completion of online courses that meet NTHMP educational standards might also be incorporated into TsunamiReady educational criteria.

2. IMPLEMENTATION CYCLES

The operational process of development and implementation of the NTHMP Educational Project will proceed in an Implementation Cycle, described below for single and multiple STCs. Note that, here, implementation is focused on coastal community *residents*. Targeted efforts for other demographic groups, such as *tourists* and the *K-12 student* population, can be developed as experience is gained, lessons are learned, and the educational content of the STC-Specific WERS is enriched (see the 5-Year Schedule, below).

A. Single STC

a. *STC identifies T^3 Program Instructors*

STC T^3 Program Instructors will include at least one expert from each of the STC agencies responsible for Emergency Management issues and Scientific/Technical issues (see discussion, above).

b. *Curriculum Development Meeting* is conducted

STC T^3 Program Instructors will provide guidance to the NTHMP Educational Project staff for the development of a T^3 Program that will serve the needs of the STC – i.e., the curriculum and the educational material content that the STC requires.

c. *Draft STC-Specific T^3 Program Curriculum* is developed

NTHMP Educational Project staff will modify the National Template for T^3 Program Curricula to develop a draft of the STC-specific T^3 Program Curriculum (a) based on the guidance of STC Instructors, and (b) drawing on the TSP database and other sources for content.

d. *STC Review* of the T^3 Program Curriculum is conducted and revisions are made, as needed.

STC experts will critically review the Curriculum and educational material, and identify revisions required, if any. NTHMP Educational Project staff will revise, as needed.

e. *Initial STC T^3 Program* is conducted, graduating qualified *Tsunami Public Education Instructors*.

STC T^3 Program Instructors, assisted by NTHMP Educational Program Staff, will organize and conduct this initial offering. Participants will include Federal, State, Territory, County, tribal and community officials with experience in Emergency Management and/or Science/Technology. Qualified community residents – perhaps active or retired academics or other professionals with appropriate backgrounds in emergency management, science or engineering, etc. – might also participate. Testing as a graduation requirement for each participant and documentation of the results is essential to ensure quality. Graduates are *Tsunami Public Education Instructors* that have been trained to conduct Community-Specific Tsunami Public Education Workshops.

f. *Initial Community-Specific Tsunami Public Education Workshop* is developed and offered.

STC T^3 Program Instructors and graduates, i.e., qualified Tsunami Public Education Instructors, will collaborate on the development and offering of a Community-Specific Tsunami Public Education Workshop. A development process used successfully in the Washington State Pilot Project (Appendix A) is a "Bottom-up Development Cycle" that begins at the community level:

i. Identify *Tsunami-similar Community Clusters*, characterized by similarities in geography, threat type, threat level, infrastructure, available resources, etc., and prepare a draft curriculum

ii. Meet with community leaders to and assess educational needs and discuss the draft curriculum, format and other workshop issues.

iii. Develop final version of Community-Specific Tsunami Public Education Workshop curricula and material

iv. Conduct and evaluate the Workshop, with participants that include

- Community residents
- Community officials
- Potential Instructors of Community-Specific Tsunami Public Education Workshops for this *and other* communities
- Observers: STC T^3 Program Instructors, TsunamiReady staff, etc.

g. *WERS is updated in the NTHMP Repository.*

NTHMP Educational Project Staff and STC T^3 Program staff, will work closely with the IT Specialist responsible for the NTHMP Repository to update WERS with the STC T^3 Program and Workshop content.

h. *Offerings continue* of T^3 Programs and Community-Specific Tsunami Public Education Workshops.

At this point, the ***Implementation Goal*** and the ***Implementation Objective***, above, have been achieved in this Partner STC. That is, an STC-Specific Train the Trainer Program has been established and this T^3 Program graduates qualified Tsunami Public Education Instructors that, over time, will provide every STC coastal community with frequent offerings of Community-Specific Tsunami Public Education Workshops that meet NTHMP Educational Standards.

B. Multiple STCs

We simply note here that *Tsunami-Similar STCs* can form regional partnerships that result in a more efficient and cost-effective Implementation Cycle. Thus, for example, a single offering of a *Regional T^3 Program* could graduate 20-30 Public Education Instructors to serve the Regional STC Partners. This approach is discussed in the schedule and budget section, below.

3. IMPLEMENTATION STAFFING

If Regional partnerships are to be effective, it is essential that the NTHMP Educational Project, NHTMP States, Territories and Commonwealths, and the NWS TsunamiReady Program and Tsunami Warning Centers identify key staff responsible for representing their respective organizations and contributing to the success of the partnership.

A. NTHMP Educational Project

A full-time Project Manager will be required to coordinate individual STC activities and ensure that the Educational Project is implemented in an efficient, cost-effective, and integrated National effort.

- **Project Manager**

  Overall Responsibility: Guide and manage the development, maintenance and continued expansion and improvement of the NTHMP Educational Project.

  This will include: (1) Consulting closely with all NTHMP partner States, Territories and Commonwealths to determine educational priorities and needs; (2) Coordinating with the TsunamiReady Program to ensure guidelines are met; (3) Establishing productive partnerships with other educational activities and programs, to reduce unnecessary redundancy and improve cost-effectiveness; (4) Development of the National Templates for T^3 Programs and Community-Specific Workshops; (5) Development and initial offering of STC-Specific T^3 Programs; (6) Providing Progress Reports to the NTHMP, as required.

Additional staff will be required for development of T^3 Programs in the following instances:

Year 1: Development of the National Templates for T^3 Program and Community-Specific Workshops, as part of the Multi-State Pilot Project to Conduct a Train the Trainer Program.

Years 2-Completion: If T^3 Program development efforts include more than two STCs, then additional NTHMP staff will be required.

These efforts will require additional specialists in the fields of Emergency Management, Tsunami Science, and Information Technology. Brief descriptions of the duties and responsibilities associated with these positions follow.

- **Emergency Management Curriculum Specialist**

  Overall Responsibility: Lead the development of Train the Trainer Program Curricula focused on Emergency Management, and assist STC T^3 Program Instructors in developing and conducting the initial offerings of T^3 Programs and Community-Specific Tsunami Public Education Workshops.

This will include: (1) Consulting closely with officials of STC agencies responsible for Emergency Management to ensure acceptability of the T^3 Curriculum; (2) Assist T^3 Program Instructors and Tsunami Public Education Instructors (T^3 Program graduates) in the development of the initial offering of Community-Specific Tsunami Public Education Workshops; (3) Collaborate with Federal, State, academic and other Emergency Management experts of the global tsunami community to ensure that educational content is up-to-date, accurate and reliable; (4) Provide Progress Reports to the Project Manager, as required.

- **Scientific Curriculum Specialist**

  Overall Responsibility: Lead the development of Train the Trainer Program Curricula focused on Tsunami Science, and assist STC T^3 Program Instructors in developing and conducting the initial offerings of T^3 Programs and Community-Specific Tsunami Public Education Workshops.

  This will include: (1) Consulting closely with officials of Partner agencies responsible for Scientific/Technical issues, to ensure acceptability of the T^3 Curriculum; (2) Assist T^3 Program Instructors and Tsunami Public Education Instructors (T^3 graduates) in the development of the initial offering of Community-Specific Tsunami Public Education Workshops; (3) Collaborate with Federal, State, academic and other Tsunami Science experts of the global tsunami community to ensure that educational content is up-to-date, accurate and reliable; (4) Provide Progress Reports to the Project Manager, as required.

- **Information Technology Specialist**

  Overall Responsibility: Development and transfer of T^3 Program and Community-Specific Tsunami Public Education Workshop educational material to the WERS in the NTHMP Repository.

  This will include: (1) Design and implementation of web-based systems tailored to support T^3 Program Instructors and Tsunami Public Education Instructors; (2) Transfer of WERS to the NTHMP web-based repository; (3) Creation of educational modules, based on WERS content and the guidance of Curriculum Specialists and STC Instructors; (4) Development of Online Courses based on educational modules and the guidance of Curriculum Specialists and STC Instructors.

B. NTHMP Partner States, Territories and Commonwealths

Partner STC staff that represent the Emergency Management agency and Scientific/Technical agency of each Partner jurisdiction and have knowledge of specific issues and needs of that Partner jurisdiction will be especially critical to provide expert guidance to NTHMP staff during State-led T^3 Program Curriculum development. The individuals should have existing responsibilities in public education, outreach or training thereby minimizing any additional duties. The importance of this expert knowledge is reflected in the following brief staff descriptions.

- **Emergency Management Agency Representative**

  Overall Responsibility: Ensure that the State, Territorial or Commonwealth Educational Project meets the unique needs of that jurisdiction.

  This will include: (1) Identifying the educational needs of counties, communities and other jurisdictions of the State, Territory or Commonwealth; (2) Setting priorities for Educational Project development; (3) Implementing a State-led Train the Trainer Program to train qualified Tsunami Public Education Instructors, (4) Assisting Tsunami Public Education Instructors in developing and offering Community-Specific Tsunami Public Education Workshops; (5) Assisting NTHMP Educational Project staff in keeping the WERS up-to-date in the NTHMP Repository; (6) Providing Progress Reports to the NTHMP, as required.

- **Scientific/Technical Agency Representative**

Overall Responsibility: Ensure that the scientific/technical aspects of the tsunami threat are appropriately accounted for in the State, Territorial or Commonwealth Educational Project.

This will include: (1) Providing expert guidance on the nature and level of the tsunami threat in the Partner STC jurisdiction; (2) Implementing a State-led Train the Trainer Program to train qualified Tsunami Public Education Instructors; (3) Assisting Tsunami Public Education Instructors in developing and offering Community-Specific Tsunami Public Education Workshops; (4) Assisting NTHMP Educational Project staff in keeping the WERS up-to-date in the NTHMP Repository.

C. TsunamiReady Program

The TsunamiReady Program staff will work closely with NTHMP and Educational Project staff to ensure the needs of the TsunamiReady Program are met.

- **TsunamiReady Program Staff**

Overall Responsibility: Assist NTHMP Partner STCs in meeting NTHMP Educational Standards and TsunamiReady Educational Criteria

This will include: (1) Collaborating with NTHMP Educational Project staff and STC Emergency Management and Scientific/Technical agency representatives in the development of T^3 Program Curricula to train qualified Tsunami Public Education Instructors; (2) Assisting STC T^3 Program Instructors in the development and initial offering of a T^3 Program; (3) Assisting T^3 Program Instructors and Tsunami Public Education Instructors in developing and offering Community-Specific Tsunami Public Education Workshops; (4) Assisting NTHMP Educational Project staff and STC Partners in keeping the WERS up-to-date in the NTHMP Repository.

D. Tsunami Warning Centers

Tsunami Warning Center staff have long been active in Public Education and outreach and contribute particularly valuable expertise and knowledge of the NWS Tsunami Warning System. As with the NWS TsunamiReady staff, they will work closely with NTHMP and Educational Project staff to ensure the needs of the TsunamiReady Program are met.

- **Tsunami Warning Center Staff**

Overall Responsibility: Assist NTHMP Partner STCs in meeting NTHMP Educational Standards and TsunamiReady Educational Criteria, especially with regards to Tsunami Warning System issues.

As with the TsunamiReady Program, but with an emphasis on Tsunami Warning System issues, additional contributions will include: (1) Collaborating with NTHMP Educational Project staff and STC Emergency Management and Scientific/Technical agency representatives in the development of T^3 Program Curricula to train qualified Tsunami Public Education Instructors, (2) Assisting STC T^3 Program Instructors in the development and initial offering of a T^3 Program, (3) Assisting T^3 Program Instructors and Tsunami Public Education Instructors in developing and offering Community-Specific Tsunami Public Education Workshops; (4) Assisting NTHMP Educational Project staff and Regional Partners in keeping the Regional WERS up-to-date in the NTHMP Repository.

4. IMPLEMENTATION SCHEDULE

Year 1: Multi-State Pilot Project to Conduct a Train the Trainer Program

This first year will focus on developing the National Curriculum Templates for State-led T^3 Programs and Community-Specific Tsunami Public Education Workshops and establishing the feasibility and effectiveness of the Train the Trainer Program concept, as the logical follow-up to the successful development and offering of a Community-Specific Tsunami Public Education Workshop (see Report to the NTHMP, Appendix A).

The ***NTHMP Partner States of Washington and Oregon*** have expressed a strong interest in participating in this Year 1 Pilot Project; this is advantageous, since the substantial experience and the expertise of these States will increase the chances of success. In addition, this Year 1 Multi-State Pilot Project ***can be expanded to include any additional NTHMP Partner States, Territories and Commonwealths that choose to participate.***

Goals. The following set of goals will be pursued during this Year 1 Multi-State Pilot Project.

- ***An Implementation Cycle*** will be completed (Section 2, above), except that no WERS system development will occur. (WERS development will be initiated in Year 2.)
- ***A Train the Trainer Program*** will be developed and conducted by the State T^3 Instructors (State EM and Scientific experts) in either Washington or Oregon. On successful completion of the program, participants will be qualified Public Education Instructors that can develop and conduct Community-Specific Tsunami Public Education Workshops
- ***National Curriculum Templates*** will be completed for T^3 Programs and Community-Specific Tsunami Public Education Workshops
- ***A Community-Specific Tsunami Public Education Workshop*** will be developed and conducted in each State, primarily by the newly graduated Public Education Instructors (*with the assistance of the State T^3 Program Instructors and the NTHMP Educational Project staff).*

In addition, it is assumed that

- ***NTHMP Educational Standards*** will be developed by the M&E Subcommittee and adopted by the NTHMP. *(Note: Timely development and adoption of Educational Standards is desirable, but Curriculum Development and Implementation need not wait for the formal completion of this process; rather, both efforts can be initiated and proceed in parallel.)*

Responsibilities. This Year 1 Multi-State Pilot Project will require the basic NTHMP Educational Project infrastructure described above – i.e., the curriculum and instructors qualified to conduct State-led Train the Trainer Programs and Community-Specific Tsunami Public Education Workshops – in the NTHMP Partner States of Washington and Oregon, primarily through NTHMP, State, TsunamiReady and Tsunami Warning Center efforts to

(1) Develop the T^3 Program Curriculum

(2) Organize and conduct a Multi-State Pilot T^3 Program to train qualified Tsunami Public Education Instructors

(3) Develop National Curriculum Templates for T^3 Programs and Community-Specific Tsunami Public Education Workshops based on Pilot Programs

(4) Develop, organize and conduct a Community-Specific Tsunami Public Education Workshop in each State, taught by the State Tsunami Public Education Instructors

The responsibilities of each Pilot Project partner are as follows.

The ***NTHMP Educational Project*** staff will:

- Lead the development of National Curriculum Templates for T^3 Programs and Community-Specific Tsunami Public Education Workshops, including content on:
  - Tsunami Science and Preparedness
  - Developing and conducting Community-Specific Tsunami Public Education Workshops
  - Identification and training of "Tsunami Advocates," an essential component of an effective community preparedness program (Samant, et al., 2008; Appendix A, below).
- Assist State EM and Scientific experts in developing the Train the Trainer Program
- Assist State T^3 Instructors (EM & Scientific experts) in conducting the T^3 Program

- Assist State T^3 Instructors and Public Education Instructors (graduates of the T^3 Program) in developing and conducting Community-Specific Tsunami Public Education Workshops
- Develop a Report to the NTHMP that evaluates Pilot Project effectiveness and Lessons Learned

The ***NTHMP Partner States (WA and OR)*** will identify State EM and Scientific Experts to:

- Partner with NTHMP Educational Project staff to develop the National Templates and the curriculum for the Train the Trainer Program
- Conduct a Train the Trainer Program, with the assistance of the NTHMP Educational Project staff
- Assist Public Education Instructors (graduates of the Train the Trainer Program) in developing and conducting Community-Specific Tsunami Public Education Workshops
- Contribute to the NTHMP Report on Pilot Project effectiveness and Lessons Learned

The ***NWS TsunamiReady Program*** and ***Tsunami Warning Centers*** will identify staff to collaborate and contribute expert guidance and participation in all aspects of the effort

Years 2 - Completion: Project Expansion and Maintenance

In successive years, the experience gained during the Year 1 Multi-State Pilot Project will be brought to bear on establishing State-led Train the Trainer Programs and Community-Specific Tsunami Public Education Workshops in the remaining NTHMP STCs.

Goals. The following goals will be pursued:

- ***Lessons Learned*** will be incorporated into the NTHMP Educational Project, including Educational Standards and the Implementation Cycle
- The ***Implementation Cycle*** will be completed for the remaining NTHMP Regions, and
- Each ***NTHMP STC*** will
  - Participate in one or more ***Train the Trainer Program*** offerings
  - Develop and offer one or more ***Community-Specific Tsunami Public Education Workshops***
  - ***Update WERS*** in the NTHMP Repository
- A ***broadening of the scope*** of the NTHMP Educational Project will be undertaken, as feasible and appropriate, through new Program components aimed at specific community demographic groups – for example, targeted outreach and education of the ***tourist*** and ***K-12 student*** population.

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Appendix A. Washington State Pilot Project Report

A Report to the NTHMP
on the WA State Pilot Project

1. Objectives of the Pilot Project

The primary objective was to conduct a Pilot Project to develop, test, and refine a critical component that is essential to the NTHMP Educational Project – i.e., a curriculum for Community-specific Tsunami Public Education Workshops. The Shoalwater Bay Tribe in Pacific County, WA, hosted a Community-specific Tsunami Public Education Workshop, with participants that included officials and residents of both the Tribe and the neighboring communities of Tokeland and North Cove, WA.

2. Pre-Workshop Coordination Meeting

On 15 July 2008, a meeting was held at the Shoalwater Bay Tribal Center. The purpose of the meeting was to identify (1) the tsunami public education needs of the community and (2) possible participants. Local community officials, tribal leaders, personell of the Washington Emergency Management Division and Workshop facilitators identified the following Workshop topics, tailored to be community-specific:

- Earthquake Risk
- Tsunami Modeling
- Inundation Maps
- Community Exposure
- Community Resilience
- Tsunami Warning
- Evacuation
- Table-top Exercise

Additionally, it was agreed that instructors would provide a poster display to supplement their specific topic.

3. Community-specific Tsunami Public Education Workshop

a. Venue & Participants

On 6 September 2008, the Shoalwater Bay Tribe in Pacific County hosted and participated in a Community-specific Tsunami Public Education Workshop, with additional participants from the communities of Tokeland and North Cove, WA. A total of 32 individuals took part in the Workshop, of which seven were instructors or observers. Attendees included community residents and personnel from county and community organizations such as the Tribal Council, Emergency Management, Fire Department, Community Emergency Response Team (CERT), and Chamber of Commerce.

b. Results

The Workshop was preceded by a close examination and inventory of existing community-specific capabilities, which uncovered vulnerabilities in existing preparedness. Additionally, Workshop activities revealed opportunities for building and strengthening capacity in the future. Some general areas of potential and realized improvement included:

- Evacuation Map Update. The Workshop preparation process uncovered deficiencies in existing evacuation maps. The instructors were qualified and permitted to make permanent modifications to the evacuation maps, as shown in Figure 1. Consequently, Workshop planning strengthened existing preparedness tools.
- Warning System Analysis. In reviewing the community-level tsunami warning process, instructors identified email, text, and cellular tsunami bulletins from WC/ATWC that could strengthen existing warning capabilities.

- Inter-community Dialogue. The three communities (North Cove, Tokeland, Shoalwater Bay Tribe) were able to communicate throughout the Workshop. In particular, the "Table-top Exercise" allowed communities to exchange information on existing capacities to reduce tsunami risk. The distinct levels of preparedness between the communities made clear attainable community-level risk reduction activities to community members from the more vulnerable communities,.
- Community Needs Assessment & Action Items. The Table-top Exercise included mitigation, preparedness, response, and recovery phases of a tsunami event. The closing exercise had multiple purposes: (1) to aid in identifying "community needs," i.e., gaps and priorities within the community (see Table 1), (2) demonstrate knowledge gained in Workshop, and (3) promote discussion between active community members regarding tsunami risk reduction. Thus, community risk reduction actions are a direct result of this workshop, and resources from the State of Washington are being sought to complete the Action Items in Table 1.
- Improved Risk Knowledge. Tsunami themes were presented and discussed throughout the Workshop. As a result, participants improved their tsunami knowledge. Printed materials supplemented the discussions.

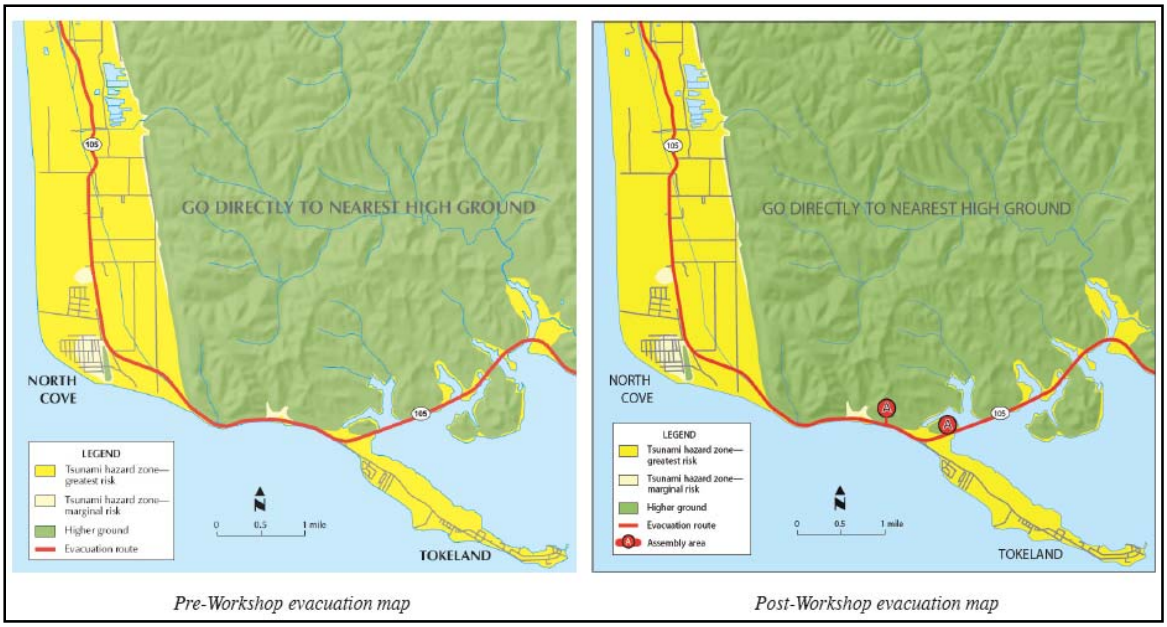

Figure 1. Pre-Workshop preparatory discussions uncovered an additional evacuation route that had not been identified in the original evacuation map. This route was added, and assembly areas were clearly marked on the revised, improved map.

4. EVALUATION

Separate evaluation forms were distributed to participants, instructors and invited observers. Instructors and observers included staff from the following agencies: NOAA, United States Geological Survey, National Weather Service, Washington State Emergency Management, Shoalwater Bay Tribe Emergency Management, and Washington State Department of Natural Resources. The evaluation form posed the following questions:

Question 1: How important were the topics discussed at the Workshop?
Question 2: Did attending the Workshop give you a better understanding of your community's tsunami risk?
Question 3: Were tsunami risk reduction activities for your community effectively identified and prioritized, at the Workshop?
Question 4: Overall, were the Workshop instructors responsive and effective?
Question 5: How useful were the Posters and Displays?
Question 6: How useful was the Workshop to your everyday life?
Question 7: Overall satisfaction with the Workshop.
Question 8: Would you recommend this Workshop to other communities?
Question 9: Additional comments.

Recipients chose one of three levels of approval for each of the first eight questions. These responses were normalized on a scale from 0 to 1, with 0 being the most negative and 1 being the most positive response. The average response to each of the first eight questions is presented in Figure 2.

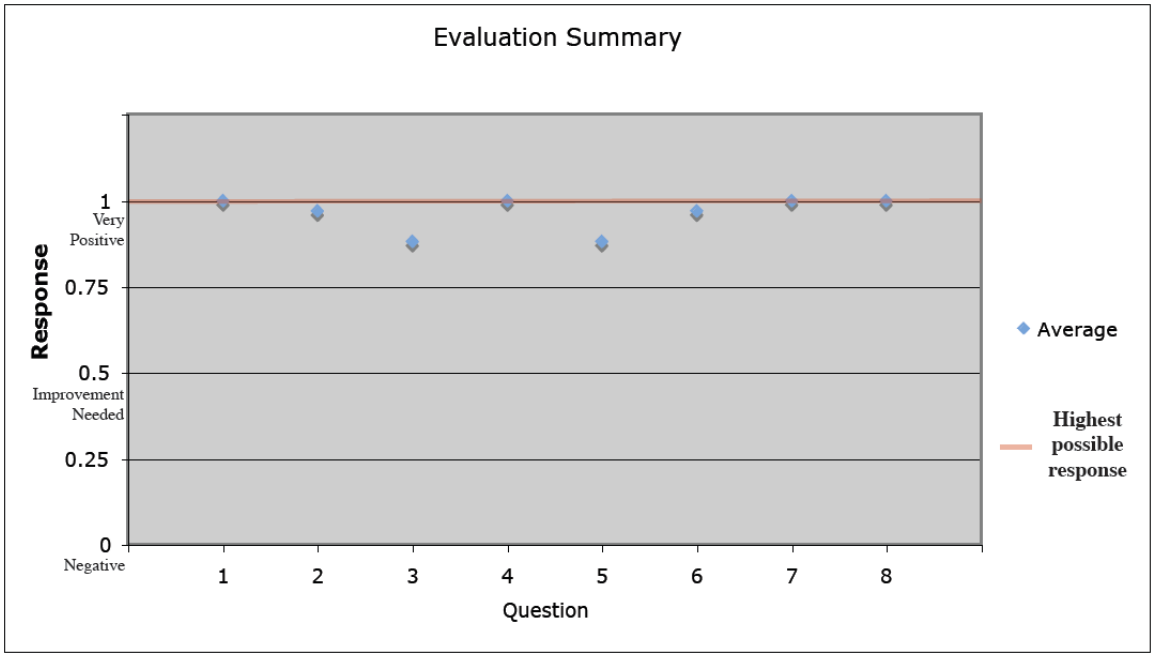

Figure 2. Average response to first eight Evaluation Form questions, based on 17 participant evaluation forms. The total number of community participants was 25, but only 17 were able to complete the entire Workshop.

Evaluation responses and other feedback were overwhelming positive. As expected, Question 9 also helped to identify needed improvements. These suggested improvements included

- Increase hands-on activities
- Define "Local Tsunami Advocate" role and support
- Minimize technical details
- Conduct pre- and post-Workshop knowledge assessments

Table 1. List of Community Needs & Recommended Action Items.

Residents and officials of two Washington communities in Pacific County – the Shoalwater Bay Tribal Reservation and Tokeland – participated in the one-day workshop. Two residents of Grayland, WA, in Grays Harbor County, also participated. ***General*** and ***Specific Needs*** of these communities, and potential ***Action Items*** were identified and discussed during the course of the workshop; these are organized below in two categories -- primarily Community-led or primarily County-led. The Washington State Emergency Management Division (EMD) will continue to assist as needed in these activities, and has already provided some information and assistance for a few action items, as noted below.

A. Primarily Community-led Needs and Action Items *(with County/State assistance)*

General Need: Improve preparedness of the entire area through increased collaboration between neighboring communities. In particular, Tokeland residents would like to increase their participation and contributions to disaster preparedness activities in closer coordination with the Shoalwater Bay Tribe.

Specific Needs and Recommended Action Items:

- Establish regular, routine, two-way communication and coordination between Emergency Management Officials of the Shoalwater Bay Tribe and Tokeland.
- Identify individuals willing to assume responsibility for leading the following efforts:
  - ***Prepare a Contact List.*** Tokeland Chamber of Commerce requested a contact list of individuals that can provide information on preparedness activities (i.e. preparedness kit information, evacuation route information, CERT program, etc.)
  - ***Identify Special Needs Population.*** Disabled and elderly residences should be identified by a "window ID", allowing community members to recognize individuals needing evacuation assistance.
  - ***Improve Emergency Supplies Plan.*** For example, residents expressed concern about carrying five-gallon water jugs to an evacuation site, and suggested an alternative be sought for this aspect of the evacuation procedure.
  - ***Acquire More Preparedness Literature.*** Shoalwater Bay Tribe library does not have preparedness information. (As a start on this issue, WA EMD sent material on September 12th, 2008.)
  - ***Establish Temporary Shelters.*** Residents would like a shelter in the assembly area, because appropriate shelter may be necessary in the case of an extended stay.
  - ***Improve Media Coverage.*** Participants feel they need more media coverage of community-specific information.
    a. Contact and engage local newspapers and television and radio stations that broadcast to the Tokeland area.
    b. Contact Tyree Wilde, National Weather Service-Portland, for local station information.

B. Primarily County/State-led Action Items *(with Community collaboration)*

General Need: Increase and improve the flow of Emergency Management information from Pacific County to the Shoalwater Bay Tribe, Tokeland and other communities. Participants feel uninformed about

county efforts in preparation for a possible tsunami event, and excluded from the decision–making process.

Specific Needs and Recommended Action Items:

- ***Develop County-Community Proposal*** to the State for a grant to the Shoalwater Bay Tribe, Tokeland and Pacific County to improve joint work on preparedness
- ***Provide more information on available resources and tools.*** An example cited by participants is the State-sponsored Map Your Neighborhood Program
- ***Conduct Additional Workshops.*** Grayland residents stated that they found this Community-specific Workshop very informative and felt their community would benefit from a similar event.
- ***Develop Step-by-step Guide to Establish and Maintain Community Preparedness***. Participants requested a list of specific steps needed to establish and maintain community preparedness. (TsunamiReady guidelines and criteria may fill this need; if so, this information may need clarification and improvement.)
- ***Assess Modeling Needs.*** An assessment of possible Pacific County modeling needs should be conducted. (The Shoalwater Bay Tribe can contact WA EMD directly to request such an assessment. Tokeland, whose residents expressed concern in this regard, must contact Pacific County to request an assessment. Community modeling and mapping efforts have, in the past, been funded by the National Tsunami Hazard Mitigation Program.)
- ***Improve Signage.*** Three specific suggestions by participants were:
  a. Install Interpretive Tsunami Hazard Zone signs in the area.
  b. Increase the number of tsunami evacuation route and hazard zone signs at hotels and motels (e.g., the Tradewinds and RV Parks), and on entering the communities.
  c. Add an explanatory note or small map under or near the evacuation route sign in front of the casino that points to tsunami-safe areas in two directions (i.e. east and west). Participants felt the sign needed clarification.
- ***Conduct Workshops for Tourist Industry.*** Hotel owners and other residents would like preparedness workshops for the tourist industry. (As a start, WA EMD will contact locals to set up a briefing.)
- ***Develop and Distribute Tourist-specific Evacuation Maps.*** Participants suggested a single page evacuation map for the hotels and RV parks in the area.
- ***Conduct a Recovery Planning Forum.*** Community members expressed concerns regarding the aftermath of a tsunami event, and feel they need an improved assessment and understanding of probable damage. Post-event scenarios should be clarified, allowing communities to prepare for relief and recovery phases. Specifically, community members would like to address the rebuilding/reconstruction stages, and feel that county planners must be involved in the recovery planning.
- ***Provide Vertical Evacuation Information.*** Tokeland requested vertical evacuation guidance – e.g., financing, design, etc. (A FEMA guidance document will be published by the end of September 2008 and a companion document for local government and others in the community is being developed and should be available by early 2009.)