Needs Assessment to Improve Data Discovery, Access, and Use of Oregon Hazard Themes

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Executive Summary

Communities often identify a 'lack of data or access to data' as an obstacle in their natural hazard mitigation planning. However, many agencies and organizations at all levels of government are creating data sets and are conducting analyses relevant to specific hazards. Despite these data and technology development efforts, statewide GIS and community hazard data needs remain unclear.

The purpose of this needs assessment is to improve the ability of the state and local communities to better facilitate the *discovery* (identifying, locating and collecting hazard related geospatial data), *access* (obtaining and using existing hazard related geospatial data), and *utilization* (incorporating, analyzing and managing hazard related geospatial data) of data in community natural hazard risk assessments.

Project Partners

The needs assessment combines interrelated efforts by the Oregon Natural Hazards Workgroup (ONHW) at the University of Oregon's Community Service Center, Oregon Geospatial Enterprise Office (GEO), United States Geological Survey (USGS), and Department of Land Conservation and Development (DLCD). The findings of this report will be used by the various project partners in the following ways: (1) assist ONHW in refining and improving community risk assessment development support; (2) assist the Oregon Geospatial Enterprise Office in developing a standardized hazard related geospatial dataset for the Oregon GIS Utility; (3) provide USGS with increased understanding of community needs regarding hazard data; and (4) provide DLCD with Flood Map Modernization Program outreach strategies.

Project Methodology

The project partners used a number of research methods to develop this needs assessment. The project partners worked together to collect information to assist in identifying the issues communities face when developing risk assessments. The project inputs included:

- An analysis of previous efforts related to natural hazard mitigation risk assessments;
- An analysis of existing hazard data;
- Statewide hazard risk assessment survey;
- Stakeholder interviews;
- Community focus groups; and
- Statewide GIS Utility survey.

Key Findings

The project inputs yielded key issues related to local community's abilities to discover, access and use geospatial data to complete natural hazard risk assessments. The following is a brief summary of those issues.

Lack of knowledge about what types of hazard data to collect and data collection programs

The analysis of existing hazard data indicated that there are a multitude of data owners at the local, regional, state and federal levels. However, awareness of such data is not well documented, making data discovery difficult for the local governments or potential data end-users. The stakeholder interviews indicated that 66% of interviewees were not familiar with digital Flood Insurance Rate Maps (FIRM), a common hazard overlay used to identify the flood hazard.

Lack of statewide hazard data standards

Various project inputs indicated that local communities are not aware of how to collect hazard related data or why it is important. Communities have indicated that they commonly experience compatibility issues integrating hazard data sets into their local GIS systems. Barriers related to data standards impede a community's ability to meet state and federal hazard mitigation planning requirements.

Missed opportunities for data collection at the local level

Focus group participants identified that in many instances, different departments within a jurisdiction may collect data without talking to other departments about their data needs. This method of operation creates missed opportunities to collect data locally that meets multiple local government objectives. Geospatial data used in natural hazard risk assessments is best at a fine scale developed at the local level so that parcel specific issues can be addressed.

Available hazard data is in an inconsistent format

The analysis of existing hazard data and the focus groups identified that existing data is often available in inconsistent and incompatible formats. Communities with limited staff resources face barriers when data is not in the projection that the community already uses as it takes additional time to re-project the data. Communities also face barriers when trying to incorporate neighboring jurisdiction's data when it is not maintained in a compatible format.

Secure or sensitive hazard data is blocked or has limited access

Focus group participants indicated that a common barrier they face is lack of access to sensitive data such as utility lines and natural gas pipelines. Another issue raised was that some sensitive data is only available to be viewed and/or used by pre-approved staff and is not readily available to the public.

Lack of local capacity to acquire datasets

Communities lack the capacity to acquire datasets due to a number of factors including cost, staff time, and political directives. Some communities are working on developing both formal data sharing and licensing agreements to ease data acquisition among neighboring jurisdictions.

Communities need methodologies to develop hazard overlays

The research indicates that in general, hazard related geospatial data is available and that communities have the technical capabilities to complete the basic level hazard identification and vulnerability assessment steps. What is missing are state accepted methodologies for using the data elements to create hazard overlays for the risk assessment. The GIS utility survey indicated that most communities have the technical capabilities to complete a risk assessment and in the past have completed GIS tasks related to planning and public works that would be similar to the tasks needed in the risk assessment process.

Communities lack capacity to complete risk assessment work locally

The stakeholder interviews indicated that there is miscommunication among GIS technicians, planners, and emergency managers about what a risk assessment entails and who should be involved. Communities also indicated that two of the biggest barriers they face are a lack of staff and lack of money to fund the development, maintenance and update of community risk assessments.

Most risk assessment data are not integrated into local GIS systems

Many communities have used consultants to develop and use risk assessment data sets in conjunction with the development of their mitigation plans. Often, this data is not integrated into the local GIS system, but is held separately.

Recommendations

Data Discovery: identifying, locating and collecting hazard related geospatial data
• Coordinate with State GIS Utility project to complete an annual analysis of existing hazard data • Increase flood map modernization outreach to local governments • Review current data standards and establish new standards where needed for data collection • Develop a statewide users guide for appropriate geographic scales for hazard related geospatial data and end products • Create a data collection guidance document aimed at assisting community's collect data that is multi-objective in nature.
Data Access: obtaining and using existing hazard related geospatial data
• Promote the Oregon Geospatial Enterprise Office's statewide standard for data projection • Establish statewide hazard protocol for sharing GIS data produced through state agency reports and studies. • Investigate legal ramifications of accessing data and using for hazard planning. • Work with State partners and USGS to develop one-stop data portal for hazard related data • Create and implement training on completing hazard risk assessments for planners, emergency managers, and GIS technicians.
Data Use:- incorporating, analyzing and managing hazard related geospatial data
• Develop new risk assessment training focused on the use of hazard related geospatial data • For the earthquake hazard, investigate the use of HAZUS and develop protocols for using it in Oregon • For the flood hazard, develop and implement an outreach strategy to make communities aware of the Flood Map Modernization program as a means to update out-of-date FIRMs. • For the wildfire hazard, finalize and disseminate the Oregon Department of Forestry Wildland Urban Interface Risk Assessment Methodology. • Explore the potential for the state to complete certain risk assessment tasks for local communities • Provide recommendations and local examples of how to integrate, maintain, and update Risk Assessment data

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Section 1
Introduction

Project Purpose and Partners

Repeatedly, communities identify a 'lack of data or access to data' as an obstacle in their natural hazard mitigation planning, however, many agencies and organizations at all levels of government are in the process of creating data sets and are conducting analyses relevant to specific hazards. Despite these data and technology development efforts, there has not been a needs assessment of statewide GIS activities and community hazard data.

The purpose of this needs assessment is to improve the ability of the state and local communities to better facilitate the *discovery (*identifying, locating and collecting hazard related geospatial data), *access* (obtaining and using existing hazard related geospatial data), and *utilization* (incorporating, analyzing and managing hazard related geospatial data of existing geospatial data) of data in community natural hazard risk assessments. Specifically, this needs assessment will:

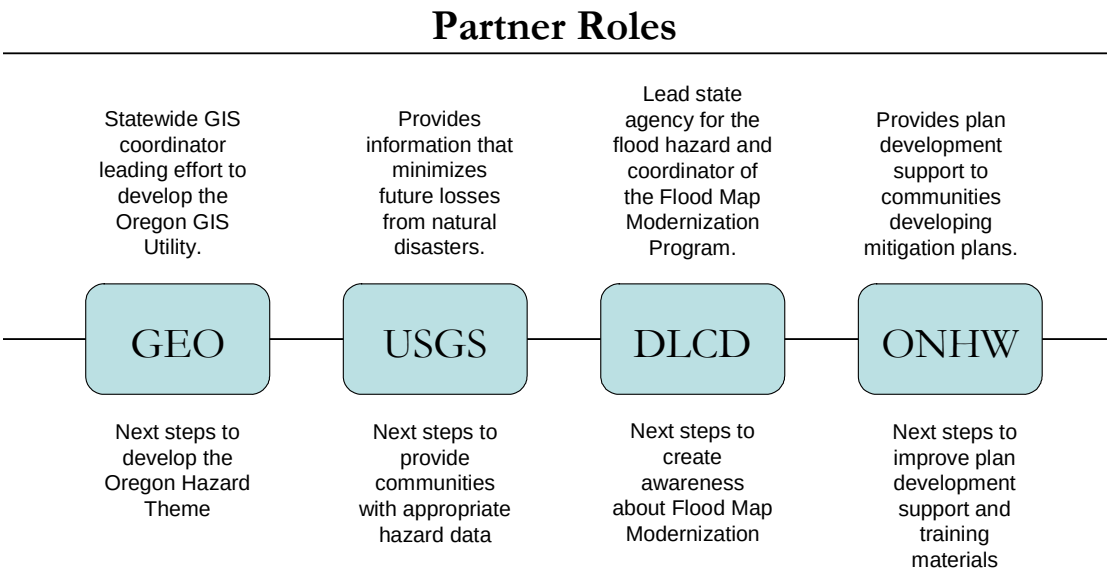
(1) Identify agencies/organizations that compile GIS data pertaining to hazards and catalogue their activities;

(2) Identify the GIS needs of local communities and the state; and

(3) Evaluate the capacity of the state and local agencies/organizations to use GIS to plan for hazards events.

The needs assessment combines overlapping efforts by the Oregon Natural Hazards Workgroup (ONHW) at the University of Oregon's Community Service Center, Oregon Geospatial Enterprise Office (GEO), United States Geological Survey (USGS), and Department of Land Conservation and Development (DLCD). The findings of this report will be used by the various project partners in the following ways: (1) assist ONHW to refine and improve community risk assessment development support, (2) assist the Oregon Geospatial Enterprise Office in developing a standardized hazard related geospatial dataset for the Oregon GIS Utility, (3) provide USGS with increased understanding of community needs regarding hazard data, and (4) provide DLCD with Flood Map Modernization Program outreach strategies. Figure 1.1 below illustrates why each partner became involved in the effort and also describes how the partners will use the conclusions and recommendations of the assessment.

Figure 1.1: Partner Roles and Outcomes



Project Context

This project was funded through grants and contracts provided by the 2004 National Spatial Data Infrastructure – Cooperative Agreement Program (NSDI-CAP), the Department of Administrative Services – Oregon Geospatial Enterprise Office, the United States Geological Survey, and Department of Land Conservation and Development.

The NSDI-CAP is a federal effort that funds projects aimed at building the infrastructure necessary to effectively discover, access, share, manage, and use digital geographic data. In Oregon, the Oregon Geospatial Enterprise Office, within the Department of Administrative Services (DAS) is taking the lead to develop such geospatial infrastructure, called the Oregon GIS Utility. The Oregon GIS Utility is an effort to develop a system and program to support consistent, efficient statewide geographic information sharing, maintenance, and GIS services supporting the business needs of the government and non-governmental community in Oregon.[i]

The Oregon GIS Utility is composed of fourteen Framework Implementation Teams, (FIT), each taking the lead to develop categorized datasets called Framework Themes. Currently, the FIT coordinates 14 framework themes, including seven themes recognized by the Federal Geographic Data Committee. The FIT and its 14

committees include over 300 participants from all levels of government, academia, and the private sector in Oregon. The Oregon Framework themes are:

- Geodetic Control
- Elevation
- Cadastral
- Administrative Boundaries
- Hydrography
- Transportation
- Orthoimagery
- Bioscience
- Geoscience
- Cultural
- Climate
- Utilities
- Landcover/Landuse
- Hazards[ii]

Each theme listed above is composed of individual data layers called data elements. The proposed Hazard Theme is different from other themes in that it is based primarily on overlays (or zones) that are derived from various data elements. For example, the wildland urban interface overlay is composed of several individual data elements including, but not limited to: slope, aspect, vegetation type, historic fire occurrence and population density. The following are the proposed hazard overlays for Oregon:

- Avalanche zone
- Coastal erosion areas
- Debris flow hazard zone
- Drought areas
- Dust Storm
- Earthquake
- Floodplain
- Landslide zones
- Tsunami Inundation Zone
- Wildland/Urban Interface boundary
- Volcano hazard overlay
- Windstorm overlay
- Winter Storm overlay

Project Methodology

The Oregon Natural Hazard Workgroup at the University of Oregon's Community Service Center, Oregon Geospatial Enterprise Office (GEO), United States Geological Survey (USGS) and Department of Land Conservation and Development (DLCD) all served as members of the project steering committee. The project steering committee guided development of the needs assessment and to ensure coordination among the partners. The steering committee held monthly meetings via teleconference to update the

partners on the project's progress. Documentation of the monthly teleconferences is in Appendix A.

We used a number of research methods to develop this needs assessment. Previous efforts related to addressing hazard mitigation and/or completing risk assessments were analyzed to identify relevant conclusions that were applicable to this research. The project partners worked together to collect information to assist in identifying the issues communities face when developing risk assessments. The project inputs included:

- An analysis of existing hazard data,
- Statewide hazard risk assessment survey,
- Stakeholder interviews;
- Risk assessment focus groups, and
- Statewide GIS Utility survey.

These efforts are described in more detail in Section 4: Project Input Summaries and in individual appendices.

Report Outline

This needs assessment is organized into the following sections.

Section 1: Introduction

The Introduction explains the purpose of the project, the project partners, and briefly describes the methods used to develop the needs assessment.

Section 2: Community Risk Assessment

This section defines the risk assessment process as it relates to natural hazard mitigation planning and also describes the connection between this effort and state and federal risk assessment requirements.

Section 3: Previous Efforts

This section describes previous efforts related to addressing hazard mitigation and/or completing risk assessments that were analyzed to identify issues related to local capacity to address risk assessment requirements.

Section 4: Project Input Summaries

This section describes the purpose, methods, and conclusions of the various project inputs used to develop the needs assessment including:

- Summary of existing hazard data,
- Summary of statewide hazard risk assessment survey,
- Summary of stakeholder interviews;
- Summary of risk assessment focus groups, and

- Summary of statewide GIS Utility survey.

Section 5: Conclusions and Recommendations

This section outlines key conclusions and recommendations for the Oregon Hazard Framework Implementation Team (FIT) to pursue as it develops the Oregon Hazards Theme. The conclusions and recommendations are categorized by data discovery, access and use.

Appendices

Appendix A – Project Coordination

This appendix includes documentation of project coordination between the various project partners.

Appendix B – Flood Map Modernization Outreach Strategy

This appendix includes an education and outreach strategy for the Department of Land Conservation and Development aimed at raising awareness of the Flood Map Modernization program among planners, emergency managers, elected officials, GIS technicians, and building officials.

Appendix C – Existing Hazard Data Summary

This appendix summarizes existing hazard data and specifically addresses data elements. The summary includes a description of the purpose, methods, findings and conclusions regarding existing hazards data.

Appendix D – Natural Hazard Survey Summary

This appendix includes the full report of the hazard risk assessment survey. The report includes a description of the purpose, methods, findings and conclusions of the survey.

Appendix E – Interview Summary

This appendix is the full report from stakeholder interviews conducted as part of this project. The report includes a description of the purpose, methods, findings and conclusions from the interviews.

Appendix F – Focus Group Summary

This appendix is the full report from focus groups conducted as part of this project. The report includes a description of the purpose, methods, findings and conclusions from the focus groups.

Appendix G – GIS Utility Survey Summary

This appendix includes the full report of the hazard GIS utility survey. The report includes a description of the purpose, methods, findings, and conclusions of the survey.

Appendix H - Oregon Department of Forestry Wildland-Urban Interface Identification Methodology

This appendix features the wildland-urban interface identification methodology developed by Oregon Department of Forestry (ODF) and is provided as an example of a hazard overlay methodology.

Section 2
Community Risk Assessment

The use of Geographic Information Systems (GIS) can greatly enhance planning for natural and human caused hazards. However, the ability to find good data about hazards and analyze it is not always easy tasks for communities. GIS data is especially useful when developing natural hazard mitigation plans to comply with regulations such as the Federal Disaster Mitigation Act of 2000(DMA2K)[1], Oregon's Land Use Planning requirement Goal 7: Natural Hazards, and Oregon's SB 360: Wildland/Urban Interface Requirements.

This needs assessment identifies conclusions and recommendations to improve data discovery, access, and use of the Oregon Hazards Theme. The Oregon Hazards Theme, a series of hazard-related geospatial datasets, will be an important data resource for communities developing natural hazard mitigation plans, specifically, the risk assessment components. The outcomes of this report will assist communities in discovering, accessing, and using hazard data more effectively to produce better and more accurate risk assessments. Better risk assessments will help communities better prioritize mitigation projects thus ensuring that limited mitigation dollars are spent effectively.

What is a Risk Assessment?

Understanding the impacts that natural hazards have on a community is essential to reducing the community's risk to that hazard. Risk assessments determine how a hazard or hazards may affect a community. Specifically they describe:

- Each hazard to which the community is susceptible;
- How these hazards affect physical, social, and economic assets;
- Identify the areas that are most vulnerable to damage from the hazards; and,
- The resulting cost of damages or costs avoided through future mitigation projects.

One way to think about the development of a risk assessment is to relate it to baking a cake. To bake a cake you need *ingredients*, a *recipe*, and an *oven*. The following paragraphs describe the risk assessment process using a cake baking analogy.

[1] DMA2K requires all communities in the United States to develop and maintain mitigation plans to be eligible for federal mitigation funding both pre- and post-disaster after November 1st 2004.

First let's examine the *ingredients*. Cake ingredients include such things as flour, sugar, baking soda, etc. Each one is vital, and the better the ingredients, the better chance your cake will taste good. In our case, for the risk assessment, the ingredients include data elements, such as soils layers, hydrology, and slope. The better the data the more accurate the risk assessment will be.

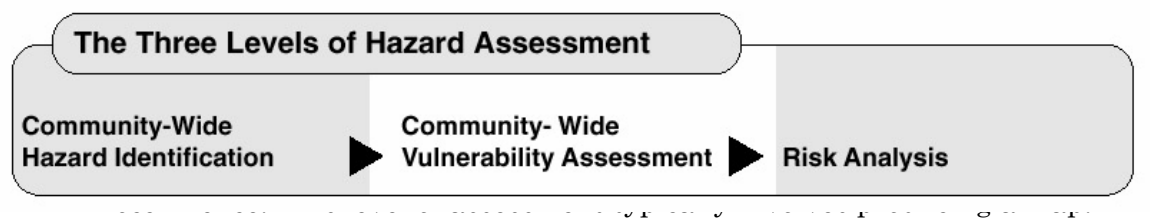
The second component we need to make our cake is a *recipe*. We need to know the quality and quantity needed for each ingredient. The recipe also defines when each ingredient is added to the mixture and if certain ingredients need to be mixed separately. The recipe for the risk assessment describes how to conduct a risk assessment (as defined on the next page), including a step-by-step process, or methodology of how to combine data elements to make hazard overlays or zones.

The third and final step in baking a cake is an *oven*. The ingredients and recipe can only go so far, without an oven, we have no cake! On the risk assessment side, we need geographic information systems (GIS) and/or technical analysis to combine the data elements (e.g., ingredients), hazard overlays (e.g., recipe) to produce a risk assessment. The risk assessment identifies the location and potential impact of natural hazards and the community assets at risk, which enables the community to develop appropriate solutions to the problems they face.

The Three Phases of a Risk Assessment

A risk assessment consists of three phases: hazard identification, vulnerability assessment, and risk analysis, as illustrated in the following graphic.

Figure 2.1: The Three Phases of a Risk Assessment



The outputs from this phase can also be used for: land use planning, management, and regulation; public awareness; defining areas for further study; and identifying properties or structures appropriate for acquisition or relocation.[iii]

The second phase, vulnerability assessment, combines the information from the hazard identification with an inventory of the existing (or planned) property and population exposed to a hazard, and attempts to predict how different types of property and population groups will be affected by the hazard. This process can also assist communities to justify: changes to building codes or development regulations, property acquisition programs, policies concerning critical and public facilities, taxation strategies for mitigation risk, and informational programs for members of the public who are at risk.[iv]

The third phase, risk analysis, involves estimating the damage, injuries, and costs likely to be incurred in a geographic area over a period of time. Risk has two measurable components: (1) the magnitude of the harm that may result, defined through the vulnerability assessment, and (2) the likelihood or probability of the harm occurring.

The three-phased approach to developing a risk assessment should be conducted sequentially because each phase builds upon data from prior phases. However, gathering data for a risk assessment need not occur sequentially.

Risk Assessment Requirements

At both the state and federal levels, there are requirements for communities to conduct risk assessments as part of a broader natural hazard planning process. The following describes the risk assessment requirements for the State of Oregon's Goal 7 and the Federal Disaster Mitigation Act of 2000 (DMA2K).

Oregon Statewide Planning Goal 7 – Areas Subject to Natural Disasters and Hazards

The general purpose of Goal 7 is to protect life and property from natural disasters and hazards. Goal 7 calls for the use of comprehensive planning and hazard inventories to reduce risks to people and property. This goal is related to the risk assessment process because it requires communities to: assess the frequency, severity and location of the hazard, the effects of the hazard on existing and future development, the potential for development in

the hazard area that may increase the frequency and severity of the hazard, and the types and intensities of land uses to be allowed in the hazard area.

Disaster Mitigation Act of 2000

In 2000, the Federal Government enacted the Disaster Mitigation Act of 2000, commonly known as DMA2K. Under this Act and rules[2], states, communities, and tribal governments must complete FEMA approved natural hazard mitigation plans to be eligible for certain federal assistance programs such as the Hazard Mitigation Grant Program (HMGP) and Public Assistance. DMA2K sets forth planning criteria that must be met in order to be FEMA-approved. DMA2K includes requirements for risk assessment. Specifically, DMA2K requires that communities:

- Describe the type of hazards that can affect the jurisdiction
- Describe the location and extent of all hazards that can affect the jurisdiction
- Describe any previous occurrences of hazard events
- Describe the probability of future occurrences of hazard events
- Describe the community's vulnerability to the identified hazards
- Describe the overall impact the hazard has on the community

In addition to these requirements, DMA2K also recommends that communities:

- Identify the types and numbers of buildings, infrastructure and critical facilities in hazard areas
- Estimate potential dollar losses to vulnerable structures
- Describe future land use and development trends

Conclusions

The risk assessment process is an important component of mitigation planning because it results in the identification of the hazards that can affect the community, describes how and where hazards may impact the community, and estimates the potential losses expected. The use of GIS systems and technology can greatly enhance the risk assessment process by allowing the end user to spatially visualize the risks. The risk assessment outputs ultimately assist communities to direct limited mitigation dollars to the most vulnerable areas, ensuring that mitigation dollars are being spent effectively. More accurate risk assessments can also assist communities make better decisions about where future development should take place, which is a key objective of both Goal 7 and the DMA2K.

[2] 44CFR Part 201.6

Section 3
Previous Efforts

In addition to defining what a risk assessment is and what the state and federal requirements are, this needs assessment also looks at previous studies and reports related to natural hazard mitigation. The following section outlines several efforts previously completed that assist in identifying issues related to local capacity to discover, access, and use geospatial data for natural hazard mitigation planning. These efforts include a review of Goal 7, Flood Map Moderation Business Plan, Oregon Enterprise Office's map projection standards, the Oregon HAZUS Users Group goals and standards, the Titan Survey, and research documented in *Cooperating with Nature*. The issues identified in this section serve as background documentation for Section 5: Conclusions and Recommendations. While some issues may not directly relate to the use of geospatial data to complete the risk assessment, they can provide insights on obstacles and opportunities communities may face when addressing natural hazards in general.

Goal 7

In 1996 and 1997 Oregon was hit by devastating floods and landslides caused by heavy rain and melting snow, which led to several fatalities and $280,000,000 in damage[v]. Following this series of events, Governor John Kitzhaber looked to state agencies to find ways to reduce the state's vulnerability to natural hazards. Kitzhaber specifically called on the state's Department of Land Conservation and Development (DLCD) to review the Statewide Land Use Planning Goal 7—Areas Subject to Natural Disasters and Hazards.

In 1998, the Community Planning Workshop at the University of Oregon's Community Service Center completed a study of Statewide Land Use Planning Goal 7: Areas Subject to Natural Hazards for the Department of Land Conservation and Development. The focus of the study was to evaluate how effectively local governments were implementing the requirements of Goal 7.

A number of findings from the Goal 7 report help shed light on issues related to local capacity to discovery, access and use geospatial data to complete natural hazard risk assessments. They include:

- Community hazard inventories, the predecessor to the DMA2K risk assessments, were lacking.
- The scarcity of information, money, and expertise is a significant obstacle to improved hazard planning.
- Communication between agencies and local jurisdictions could be improved.

- A hazards information "clearinghouse" would improve dissemination of data and research.

Flood Map Modernization Business Plan

As the lead state agency for the flood hazard, the Department of Land Conservation and Development created a Flood Map Modernization Business Plan in 2004. The Business Plan outlines the State's role in Flood Map Modernization and identifies the necessary financial and human resources needed to implement the plan. The plan also identifies potential partners, existing resources, documents how the state will meet the Flood Map Modernization program objectives, and identifies flood mapping priorities in the state. This plan acknowledges that a majority of the Flood Insurance Rate Maps in the state are out of date and that there is a lack of financial and staff time available locally to address the flood map problem.

Oregon Geospatial Enterprise Office Map Projections

The Oregon Geospatial Enterprise Office (GEO) has taken steps to develop a statewide map projection standard for data created by state agencies. The creation of statewide projection standards can assist local communities develop risk assessments more effectively. A project standard is important considering that state agencies use up to ten different map projections. This standard would benefit entities using state agency-developed geospatial data for risk assessment because: data publishing and transfer would be simplified; it would normalize projection errors found in different parts of the state, and would make the display and analysis of statewide data easier. Re-projecting data can be difficult for communities with limited human resources.

A representative committee evaluated the multiple projection issue and submitted a recommendation to the Oregon Geographic Information Council to use the Oregon Lambert Projection for the use and transfer of spatial data by state agencies. Creating and maintaining a statewide standard creates a number of advantages including:

- Statewide analysis is easily accomplished with base data
- Data from varied agencies will be readily usable
- Most GIS, CAD, and GPS software can project data into Oregon Lambert
- Computers can be programmed to convert data for a one time conversion
- Total area error for the entire state is 0.0045% (2,900 acres out of 64 million)
- Average length error for the entire state is 0.0176% (1.76 in 10,000).

Oregon HAZUS Users Group Standards and Goals

The Oregon HAZUS Users Group (ORHUG) is made up of local, state, regional and federal agency representatives in Oregon that use HAZUS, a loss estimation software program. ORHUG has created a set of standards and goals to achieve as a group related to data collection, training, using HAZUS, and developing a HAZUS data clearinghouse. Many of the standards and goals directly align with recommendations of this needs assessment.

Titan Survey

Conducted by Titan Geospatial Services in 2003. Respondents included 23 cities and 17 counties. The survey instrument was on paper, and the responses were handwritten. Data compilation was accomplished by the consultant, and results were entered into a series of spreadsheets, one for each major base data theme. Estimates of quality are possible based on responses for accuracy, currency, completeness, and metadata.

Cooperating with Nature

Cooperating with Nature, edited by Raymond Burby, includes two key discussions about issues pertinent to evaluating local capability to complete risk assessments. The first discussion is related to the appropriateness of geographic scale in conducting risk assessments. This discussion identifies that data at varying levels of geographic scale can be useful for a variety of reasons, but for risk assessments, and specifically analysis at the parcel level, scales from 1:2,000 to 1:200 are needed.

The authors also identify numerous constraints on the use and enhancement of local risk assessments that include:

- Uneven knowledge of the probabilities, magnitudes, and locations of some types of extreme natural events.
- Limited parcel specific data on relevant attributes of land use such as the type, design and construction of buildings.
- Lack of empirically validated damage functions that are accurate at the building or infrastructure component level for some natural hazards.
- Lack of professional expertise to incorporate sophisticated risk assessment models into land use decision making.
- Lack of understanding and confidence in those models by appointed and/or elected officials.

Small scale data (e.g., 1:120,000) covers a larger ground area in less detail than **large-scale** data (e.g., 1:20,000), which depicts a small ground area in considerable detail.

Avery, T. and G. Berlin. 1992. Fundamentals of Remote Sensing and Airphoto Interpretation. New York: Macmillian Publishing Company. Pg 71.

Conclusion

Previous efforts to analyze local and state capacity to address natural hazard risk assessments provide insights on some of the barriers communities face when developing mitigation plans. The findings and conclusions of the previous efforts help to form conclusions and recommendations to overcome the barriers identified in both previous efforts and this needs assessment. The key issues identified in these efforts include: lack of financial and human resources; access to data; and the appropriateness of geographic scale.

Section 4:
Project Inputs Summaries

The following summarizes the research efforts made in conjunction with this needs assessment. These various inputs were developed and implemented in an effort to gain insight on issues that communities face when discovering, accessing, and using geospatial data to complete risk assessments. The purpose of this section is to document the purpose, methodologies, and key conclusions from the five primary project inputs used to develop the conclusions and recommendations. The project inputs include:

- An analysis of existing hazard data,
- Statewide hazard risk assessment survey,
- Stakeholder interviews;
- Risk assessment focus groups; and
- GIS utility survey.

Full reports and findings from the inputs can be found in the appendices of this report.

Existing Natural Hazards Data Summary

Purpose

Public and private organizations at the local, regional state and federal levels have invested considerable time as well as financial and human resources into developing hazard related geospatial data and technology. Examples of data and technology development projects vary in scale from local to national. Examples range from Hood River and Wasco County's efforts to collection structural data as it relates to wildfire risk, to the USGS's efforts to build a national interactive map service called The National Map. To develop a risk assessment a community must first understand what data is available to assist them in better identifying risks natural hazard pose to there jurisdiction. This analysis aims to document the hazard data currently available, and is intended only to be a snapshot in time.

Methods

The Oregon Natural Hazards Workgroup reviewed and analyzed the Oregon Framework Implementation Team's themes geospatial data database to gain an understanding of how existing data elements may be useful in the risk assessment process. This database documents all the current data elements under construction to develop uniform data

standards through the FIT process. This database includes detailed information on the data's type, scale, ownership, and next steps to completion. Each data element in the database was assessed for its potential use in the risk assessment process. Elements were categorized into the following three categories: 1) not useful in a risk assessment, 2) useful in identifying the geographic extent of the hazard, or 3) useful in assessing vulnerability.

The full report on this existing data analysis can be found in Appendix C.

Conclusions

Upon completion of this investigation of existing hazard data, a number of conclusions became apparent.

- There is a wealth of data available; for example, there are a total of 238 existing data elements in the Oregon Framework Implementation Team's database.
- Data ownership is spread over a number of local, state, and federal entities. For example, the 238 data elements in the Oregon Framework Implementation Team's database are maintained either solely or jointly between 53 different local, state, and federal entities.
- The majority (53%) of data elements in the FIT database were applicable to the vulnerability assessment phase of the risk assessment, while 23% were useful for hazard identification and 23% were not useful to any phase of the risk assessment.
- In most cases, the scale of the data is too small to produce accurate risk assessments or to support refined mapping of hazards.

Hazard Survey Summary

Purpose

ONHW and the Department of Land Conservation and Development (DLCD) worked together to develop a hazard survey targeted to planners and GIS professionals that focused on community's efforts to develop risk assessments and community needs related to FEMA Flood Insurance Rate Maps (FIRM). Questions in the survey specifically asked about community efforts to identify hazards and to conduct vulnerability assessments. The survey questionnaire and a complete summary report are located in Appendix D.

Methods

The online survey was sent to 222 City and County planners and GIS professionals around the state in March and April 2005. A total of 38 city and county representatives responded to the survey (17% response

rate). Due to the limited number of responses, this survey was used for scoping purposes only.

The survey questions fell into the following categories:

- Natural hazards affecting the community
- Mapping and vulnerability assessment actions
- Flood Insurance Rate Maps & Flood Map Modernization Program
- FEMA HAZUS software

ONHW conducted a secondary analysis of the survey data provided by PlanGraphic, Inc.

Conclusions

The survey yielded information on the ability of local governments to develop risk assessments and local issues regarding FEMA FIRMS. The following are key conclusions.

- Most communities have made efforts to complete at least the hazard identification portion of the risk assessment.
- Different agencies within jurisdictions do not have a consistent understanding of the risks hazards pose within the community.
- Flood hazard has been addressed by most communities because of existing federal data standards and mapping methodologies.
- The majority of FEMA FIRMS in Oregon are out of date.
- Staff and funding are obstacles for community involvement in the Flood Map Modernization Program.

Stakeholder Interview Summary

Purpose

The purpose of the stakeholder interviews was to gain a better understanding of how GIS is used to support local government efforts to complete the risk assessment component of natural hazard mitigation plans and Flood Map Modernization Program. A full stakeholder interview report can be found in Appendix E.

Methods

In March and April of 2005, ONHW conducted telephone interviews with 27 communities across Oregon. ONHW identified communities across the state based on geographic dispersion, population, specific

hazard vulnerability, the status of mitigation planning in the community, and project steering committee input.

Conclusions

The stakeholder interviews provided candid information on local community's ability to complete risk assessments and their ability to participate in FEMA's Flood Map Modernization program. The following are key conclusions gleaned from the interview process.

- Communities lack accurate data, such as up-to-date Flood Insurance Rate Maps, for phase one of the risk assessment (Hazard ID) but generally have the data needed to conduct phase two (Vulnerability Assessment)
- Communities identified staff, funding, and training as obstacles to completing risk assessments and participating in FEMA's Flood Map Modernization program.

Focus Group Summary

Purpose

In July 2005, Oregon Natural Hazards Workgroup held targeted focus groups aimed at identifying the issues that local governments encounter while developing the risk assessment component of natural hazard mitigation plans. The focus groups specifically examined the obstacles and opportunities that local governments experience in discovering, accessing, and using geospatial data to develop their risk assessments. A full report of the focus groups can be found in Appendix F.

Methods

The project steering committee identified two communities for the focus groups – one urban and one rural. The first focus group was held on July 20, 2005, with the City of Beaverton and Washington County employees. The second focus group was held on July 26, 2005 with Umatilla County employees. Participants included members from the emergency management, planning, and GIS departments.

Participants completed worksheets identifying any technical, administrative, economic, and legal issues related to the discovery, access, and use of hazard geospatial data. An open discussion followed in which participants reported their top issue from each issue category to the group. Participants discussed the importance of data collection standards and hazard overlay methodologies as well.

Conclusions

The findings from the issue identification worksheet exercise and the discussion questions are summarized below.

- There is a lack of knowledge of what data is available

- Capacity issues at the local level stem from a lack of staff and funding rather than a lack of technical capacity
- Discovering, accessing, and using hazard geospatial data is complicated by the lack of standardized data formats
- There is a lack of communication between internal departments on what GIS activities are taking place and opportunities are being missed to collect and acquire multi-objective datasets.
- Both data collection standards and hazard overlay methodologies are equally important because one cannot be accomplished without the other.

GIS Utility Survey Summary

Purpose

The purpose of the GIS Utility survey was to collect information about spatial data, information technology investments, and institutional aspects of GIS use of local jurisdictions. This baseline information will serve as the essential foundation for the design and creation of a GIS utility that maximizes benefits and makes the best use of available resources across all levels of public agencies. While this survey does not specifically address natural hazards, it does provide insights on the technical capacity of local jurisdictions to deal with geospatial data. The survey questionnaire and additional analysis are available in Appendix G.

Methods

The online survey was sent to 203 City and County planners and GIS professionals around the State in March and April 2005. A total of 117 city and county representatives responded to the survey (58% response rate).

The survey questions fell into the following categories:

- Organizational information
- GIS technology infrastructure
- Geographic data development, use and maintenance
- GIS applications and users
- GIS organizational structure and staffing
- GIS program collaboration and sharing of GIS data

ONHW conducted a secondary analysis of the survey data provided by PlanGraphic, Inc.

Conclusions

While the GIS utility survey did not directly address natural hazards, it did provide insight on the technical capability of local communities to complete risk assessments. The following are key conclusions from this survey.

- Current GIS activities address land use planning, natural resources planning, and roads and highways, which all have direct connections to the risk assessment process.
- The majority of responding communities have the technical capabilities required to complete GIS based activities related to the risk assessment process.
- Without realizing it, many communities have already developed or are developing local data sets required for completing risk assessments through other department plans, programs, and policies.
- The majority of communities have data sharing agreements in place.

Section 5
Conclusions and Recommendations

Overview

This section outlines conclusions, and recommendations for the Oregon Hazard Framework Implementation Team (FIT) to consider as it develops the Oregon Hazards Theme. The creation of this theme will aid communities in the development of their risk assessments. The findings are based upon the research presented in the previous sections of this report. The conclusions and recommendations are organized into four categories.

- **Data Discovery** –relates to increasing local capacity to identify, locate, and collect hazard related geospatial data.
- **Data Access** –relates to increasing local capacity to obtain and use existing hazard related data.
- **Data Use** –relates to increasing local capacity to incorporate, analyze, and manage hazard related data.
- **General Conclusions**–includes broad conclusions that cut across all three categories above. These overarching conclusions are aimed at increasing local capacity to better address the risk assessment components of natural hazard mitigation plans in general.

The conclusions and recommendations are organized around these categories of issue statements. These broad issue statements identify key barriers related to local capacity to complete natural hazard mitigation risk assessments. For each issue statement, there is a background statement and a recommendation. The background statement documents the fact-base for the issue based on the various project inputs and research. The recommendations are action statements that describe the recommended action for addressing the issue statements. Each recommendation also includes a paragraph explaining in more detail the ideas for implementing the action.

Data Discovery

Data discovery (DD) is defined as the process of identifying, locating, and/or collecting geospatial data. Examples of data discovery include field collection and data development. The analysis of existing hazard data indicated that there are a multitude of data developers and owners at the local, regional, state, and federal levels. Current efforts seem to

lack sufficient coordination or communication, making data discovery difficult. At the core of this statement is the fact that data end-users (e.g. local, state, or federal) have a difficult time simply determining whether the data they seek already exists or needs to be developed. The results of the stakeholder interviews and focus groups highlighted several conclusions related to this issue.

The three primary issues identified are as follows.

- First, a lack of local knowledge about what data already exists. Local communities lack the human and financial resources to be able to stay current on the availability of hazard related geospatial data.
- Second, a need for data collection standards. Often communities are unaware or unsure of what data they should be collecting for risk assessment outside of the general hazard information. This issue has a direct connection to DLCD's land-use planning Goal 7 as it related to the incorporation of new data in to local policies.
- Third, missed opportunities for data collection due to insufficient inter and intra-governmental communication about what data exists and what data is being collected.

The following issue statements and recommendations focus on increasing local capacity to discovery hazard related geospatial data.

DD Issue #1. Lack of knowledge of what types of data to collect and data collection programs

Background

The analysis of existing hazard data indicated that there are a multitude of data owners at the local, regional, state and federal levels. However, awareness of such data is not well documented, making data discovery difficult for the local governments or potential data end-users. The stakeholder interviews indicated that 2/3 of interviewees were not familiar with digital Flood Insurance Rate Maps (FIRM), a common hazard overlay used to identify the flood hazard.

Recommendations

DD-Rec #1.1 Coordinate with State GIS Utility project to complete an annual analysis of existing hazard data

Because there are so many sources of state hazard related geospatial data and because locals lack the resources to seek out data, it will be important to maintain up to date records of what data exists. The Oregon Hazard Framework Implementation Team should work with the Oregon Geographic Information Council (OGIC) to complete an annual data sweep to identify new data sets that may be of use to complete natural hazards risk assessments. OGIC could partner with the Oregon Natural Hazard Workgroup at the University of Oregon's

Community Service Center to fund a graduate student to complete the annual sweep of hazards data. The outputs of this analysis should be shared with the DLCD to evaluate for the relevance for Goal 7.

DD-Rec-1.2 Increase flood map modernization outreach to local governments

The Oregon Hazard Framework Implementation Team should work with the DLCD to increase awareness about the Flood Map Modernization program. The team should use the Flood Map Modernization outreach strategies found in Appendix B to formulate a work plan to increase awareness about hazard related geospatial data sources. The Oregon Hazard Framework Implementation Team should also partner with the Oregon Natural Hazards Workgroup and the *Partners for Disaster Resistance and Resilience* to tap into outreach and awareness related resources already developed through the *Partnership*.

DD-Issue #2. Lack of statewide data standards

Background

Various project inputs indicated that local communities are not aware of how to collect hazard related data and why it is important. State and federal hazard mitigation planning requirements have placed greater emphasis on completing risk assessments using hazard geospatial data. Communities have indicated that they commonly experience compatibility issues integrating new data sets into their local GIS systems.

Recommendations

DD-Rec #2.1 Review current data standards and establish new standards where needed for data collection

The Oregon Hazard Framework Implementation Team (FIT) should take the lead in reviewing current Oregon GIS utilities data elements to assure they meet the needs of local risk assessments. Additionally, during this review the team should determine if there are any new element standards that need to be developed for hazard related geospatial data. The team can start with the conclusion and findings in appendix C of this report that list the current set of data elements. The current data elements are divided into two main categories hazard identification and vulnerability assessment. Additionally, the Oregon Hazard Framework Implementation Team should coordinate its efforts with the DLCD's Goal 7 review committee.

DD-Rec #2.2 Develop a statewide users guide for appropriate geographic scales for hazard related geospatial data and end products

The analysis of existing hazard data and the research documented in *Cooperating with Nature* both indicate that geographic scale is an extremely important factor in completing risk assessments. Different

scales are appropriate for different efforts. For instance, course scales may be appropriate for public education and awareness, while fine scales are required for parcel specific land use or policy decisions. Developing a guide for local communities will help planners, emergency managers, and GIS technicians make decisions about the appropriate geographic scales for their needs.

DD-Issue #3. Missed opportunities for data collection at the local level

Background

The participants of the focus group identified that in many instances, different departments within a jurisdiction may collect data without talking to other departments about their data needs. This method of operation creates missed opportunities to collect data locally that meets multiple local government objectives. Geospatial data used in natural hazard risk assessments is best at a fine scale developed at the local level so that parcel specific issues can be addressed.

Recommendations

DD-Rec #3.1 Create a data collection guidance document aimed at assisting community's collect data that is multi-objective in nature.

Oregon Hazard Framework Implementation Team (FIT) should create a guide for local communities that would assist in taking advantage of multi-objective data collection opportunities. The guide may include a checklist of the internal and external organizations to talk to before collecting data, a checklist of appropriate data attributes. This guide should also reference any relevant data collection standards (DD-Rec 2.1). The FIT could also partner with ONHW and the Partners for Disaster Resistance and Resilience to develop this guide as ONHW and the Partnership have developed similar resources.

Data Access

Data Access (DA) is defined as the ability to obtain and use current geospatial data. Examples of sources used to access data include federal, state, or local jurisdictions. Common data access issues and barriers identified through the project inputs included inconsistent data formats, access to sensitive data, and lack of local capacity to access data.

The three primary issues identified are as follows.

- First, data is available in inconsistent formats. Data is often available in inconsistent formats because hazard related geospatial data is held by so many different agencies at all levels of government.
- Second, communities are concerned about the use of sensitive or secure datasets. Following September 11th and the

implementation of Measure 37, communities question the potential legal liabilities of using and publishing sensitive data.

- Third, local communities lack the human and financial resources to be able manipulate data so that it can be integrated into local GIS systems.

If communities are unable to access hazard related geospatial data, the task of completing an accurate risk assessment becomes difficult. Potential methods of overcoming the data access barriers identified include developing a one stop data portal, establishing GIS format standards for state produced data, exploring the legal ramifications of using secure and sensitive datasets, and providing training to better assist local community staff to access data in a more effective and efficient manner. The following issue statements and recommendations focus on increasing local capacity to access hazard related geospatial data.

DA-Issue #1. Available data is in an inconsistent format

Background

The analysis of existing hazard data and the focus groups identified that existing data is often available in inconsistent and incompatible formats. Communities with limited staff resources face barriers when data is not in the projection that the community already uses as it takes additional time to re-project the data. Communities also face barriers when trying to incorporate neighboring jurisdiction's data when it is not maintained in a compatible format.

Recommendation

DA-Rec #1.1 Promote the Oregon Geospatial Enterprise Office's statewide standard for data projection

Focus group participants indicated that data comes in a number of different projections and that it takes considerable staff time and financial resources to re-project the data source to match their local GIS system. Despite the Oregon Geospatial Enterprise Office's development of statewide projection standards for state developed data, communities continue to indicate that data projection is a barrier to completing risk assessments. The Oregon Hazard Framework Implementation Team should work with the Geospatial Enterprise Office to better promote the projection standards to both state data producers and local community end users.

DA-Rec #1.2 Establish statewide hazard protocol for sharing GIS data produced through state agency reports and studies.

Some data produced by state agencies are not available in a format that allows communities to incorporate the data into their local GIS systems. For instance, some state-created data is only available in the form of paper maps rather than digital files that could be integrated into local systems. Creating statewide digital data format protocols would allow

communities to be able to access state created data that currently isn't available in a plug and play format such as a shapefile.

DA-Issue #2. Secure or sensitive data is blocked or has limited access

Background

Focus group participants indicated that a common barrier they face is lack of access to sensitive data such as utility lines and natural gas pipelines. Another issue raised was that some sensitive data is only available to be viewed and/or used by pre-approved staff and is not readily available to the public.

Recommendation

DA-Rec #2.1 Investigate legal ramifications of accessing data and using for hazard planning.

Communities have concerns about accessing and using certain secure data sets due to legal issues. An investigation is needed to identify the implications and legal liabilities communities may face related to private property rights, measure 37, influence over property values and insurance rates, eminent domain, and secure data post September 11th.

DA-Issue #3. Lack of local capacity to acquire dataset

Background

Communities lack the capacity to acquire datasets due to a number of factors including cost, staff time, and political directives. Some communities are working on developing both formal data sharing and licensing agreements to ease data acquisition among neighboring jurisdictions.

Recommendation

DA-Rec #3.1 Work with State partners and USGS to develop one-stop data portal for hazard related data

Because there are so many sources of federal hazard related geospatial data and because locals lack the resources to seek out data, creating a one-stop portal for hazard related data is an important task. The review of Goal 7 discussed in Section 3: Previous Effects also concluded that a one-stop data clearinghouse was needed. The Oregon Hazard Framework Implementation Team should work with the United States Geological Survey as they are the primary federal source for data. In 2004, the USGS developed a strategic plan entitled: A Science Strategy for the Geographic Research of the United States Geological Survey, 2005-2015. Goals 4 and 8 in this strategic plan support the USGS's involvement in the development of a one-stop data.

DA-Rec #3.2 Create and implement training on completing hazard risk assessments for planners, emergency managers, and GIS technicians.

It is important for both emergency managers and planners to have access to hazard related geospatial data as both play a role in hazard mitigation. Planners and emergency managers can have a direct impact on ensuring that future development occurs in a more disaster resistant manner. Providing training to community staff members beyond just GIS technicians is an important step in assisting communities better integrate mitigation into other existing programs, which is a requirement of the Disaster Mitigation Act of 2000.

Data Use

Data use is defined as the incorporation, analysis, and management of community risk assessment geospatial data into local systems. Data use issues and barriers identified through the project inputs include a lack of hazard overlay methodologies and a lack of local human and financial resources and capacity.

The two primary issues identified are as follows.

- First, is a lack of methodologies for the development of hazard overlays. The project inputs and research indicate that the data and technical capabilities to develop risk assessments are intact. But communities need detailed methodologies describing how the data elements are used together to create the hazard overlays.
- Second, lack the human and financial resources to be able to use and maintain hazard related geospatial data. Creating a hazard risk assessment and maintaining the data and end products takes dedicated staff and financial resources at the local level.

A community's ability to use hazard related geospatial data would be enhanced by the development of hazard overlay methodologies. Overcoming local funding and staff barriers is not a task that the Oregon Hazard Framework Implementation Team can directly take on; however, the state may be able to complete some portions of the risk assessment for communities that lack financial and human resources. The following issue statements and recommendations focus on increasing local capacity to use hazard related geospatial data.

DU-Issue #1. Communities need methodologies to develop hazard overlays

Background

State and federal hazard mitigation planning requirements have placed greater emphasis on completing risk assessments using hazard geospatial data. As was stated in the Introduction, the hazard theme is unique because it is made up of overlays of individual data elements.

The research indicates that in general, hazard related geospatial data is available and that communities have the technical capabilities to complete the basic level hazard identification and vulnerability assessment steps.

What is missing are state accepted methodologies for using the data elements to create hazard overlays for the risk assessment. The GIS utility survey indicated that most communities have the technical capabilities to complete a risk assessment and in the past have completed GIS tasks related to planning and public works that would be similar to the tasks needed in the risk assessment process.

Recommendation

DU-Issue #1.1 Develop new risk assessment training focused on the use of hazard related geospatial data

This training should focus on the steps necessary to integrate, manipulate, and maintain hazard related geospatial data for natural hazard risk assessments. The project inputs indicate that local GIS technicians have the skills necessary to complete the tasks associated with the risk assessment, but may lack the knowledge of how to use the hazard data. These trainings would better assist communities remain in compliance with the Disaster Mitigation Act of 2000 and the requirements of Goal 7.

DU-Rec #1.2 For the earthquake hazard, investigate the use of HAZUS and develop protocols for using it in Oregon

HAZUS is loss estimation software that can be used to complete the risk assessment for the earthquake hazard. The default data used in the program is fairly course and does not allow for very accurate or site specific results.

The use of HAZUS can be greatly enhanced with the use of local data. The Oregon Hazard Framework Implementation Team should work with the Oregon HAZUS Users Group (ORHUG) to develop an Oregon specific users guide for incorporating local data to enhance the use of HAZUS to create earthquake risk assessments. ORHUG has established a set of standards and goals. One of the goals deals with standards for the use of HAZUS and calls for the identification of how communities can use HAZUS.

DU-Rec #1.3 For the flood hazard, develop and implement an outreach strategy to make communities aware of the Flood Map Modernization program as a means to update out-of-date FIRMs.

The majority of FIRMS in Oregon are at least 15 years old and are in need of updating to accurately reflect significant growth and development, which ultimately impacts the flood hazard. This report includes an outreach strategies developed for the Department of Land Conservation and Development aimed at making planners, emergency managers, elected officials, building officials, and GIS technicians aware of the Flood Map Modernization program. DLCD should take the

lead in implementing the actions identified in the Flood Map Modernization outreach strategy, (Appendix B).

DU-Rec #1.4 For the wildfire hazard, finalize and disseminate the Oregon Department of Forestry Wildland Urban Interface Risk Assessment Methodology.

The Oregon Department of Forestry has developed a methodology for developing wildland urban interface risk assessments using best available geospatial data. The methodology has been used statewide and has also been tested by several counties as they developed Community Wildfire Protection Plans. The Oregon Hazard Framework Implementation Team should work with the Oregon Department of Forestry to finalize and disseminate the wildfire methodology. This effort could also be linked with USGS Strategic Action 3.3 in A Science Strategy for the Geographic Research of the U.S. Geological Survey, 2005-2015. Strategic Action 3.3 calls for research leading to improved capabilities to assess wildfire conditions, predict wildfire potential, prioritize treatment areas, and monitor effectiveness of fire treatment areas to support risk reduction efforts in the urban-natural landscape interface.

DU-Issue #2. Communities lack capacity to complete risk assessment work locally

Background

The stakeholder interviews indicated that there seems to be a common miscommunication among GIS technicians, planners, and emergency managers about what a risk assessment entails and who should be involved. Communities also indicated that two of the biggest barriers they face are a lack of staff and money to fund the development, maintenance and update of community risk assessments.

Recommendation

DU-Rec #2.1 Explore the potential for the state to complete certain risk assessment tasks for local communities.

Communities commonly identified that the lack of staff and funding is a barrier to completing risk assessments. Other states have taken on the task of completing portions of risk assessment for local communities in an effort to overcome the staff and funding barriers. For example, in Florida, the Department of Community Affairs provided each county with outputs from a hurricane modeling program called the Arbiter of Storms (TAOS).

DU-Issues #3. Most risk assessment data are not integrated into local GIS systems

Background

Many communities have used consultants to develop and use risk assessment data sets in conjunction with the development of their mitigation plans. Often, this data is not integrated into the local GIS

system, but is held separately. Although the various project inputs did not directly identify this issue, it has been included as an observation by the Oregon Natural Hazard Workgroup, which has been involved in the development of a number of local natural hazard mitigation plans.

Recommendation

3.1 Provide recommendations and local examples of how to integrate, maintain, and update Risk Assessment data

Risk assessments and mitigation should not be seen as additional responsibilities for communities, but should be seen as an integral part of everyday government function. Mitigation can be incorporated into planning, public works, and financial operations within a jurisdiction. Anything that is mitigated today is one less thing that needs to be responded to when the disaster occurs. The integration of mitigation into everyday operations is also true for risk assessment related geospatial data.

General Conclusions

This needs assessment identified issues local communities face when developing the components of a risk assessment for a natural hazard mitigation plan, using the categories of data discovery, access and use. Several overarching issues are applicable across all three categories and include: (1) problems with data in general, (2) lack of staff and financial resources, and (3) insufficient communication and coordination.

The first overarching issue is that there are several different types of problems communities encounter when discovering, accessing and using data. The Goal 7 report completed in 1998 concluded that a key barrier communities faced in addressing hazards was a lack of data or access to data. The inputs of this needs assessment have helped better define this previous conclusion. According to our findings, the lack of data issue is related to the hazard identification phase rather than the vulnerability assessment phase of the risk assessment. There seems to be a wealth of vulnerability assessment data available at the local level. However, both phases of the risk assessment would benefit from better data standards and hazard overlay methodologies. Developing data standards will assist communities collect more robust data that will be useful in completing a risk assessment and will also have uses in other government functions such as planning and public works. Developing hazard overlay methodologies will assist communities by providing step-by-step processes for combining the hazard identification and vulnerability assessment data to complete the risk assessment.

The second overarching issue is a lack of staff and financial resources to complete the risk assessment phases. In all the various inputs, the two issues or barriers that communities continued to bring to the forefront were a lack of staff and funding for staff. The surveys and interviews, however, indicated that most communities do have the technical

capability to complete the steps necessary to complete risk assessments. While it is highly unlikely that the FIT could provide funding to local communities to address the hazard risk assessment components, this group may be able to complete portions of the risk assessment for local communities.

The third overarching issue is an insufficient level of communication and coordination to address common issues. The inputs, especially the focus groups, indicated that there is a lack of inter and intra-governmental communication about the best available data and data collection efforts. Increased communication between the various departments that collect, use and maintain data will result in more effective use of staff time and funding because it will result in multi-objective datasets. There also seems to be a lack of intra-departmental communication and coordination related to the general understanding of the hazards that have the ability to impact the community. In the stakeholder interviews, interviewees were asked to indicate which hazards affected their communities. The results were then compared to the State Natural Hazard Mitigation Plan's Regional Risk Profiles. A majority of communities participating in the survey failed to identify one of more high-risk hazards identified in the Regional Risk Profiles. The Oregon Geographic Enterprise Office and various GIS users groups are working to increase outreach efforts to overcome the communication and coordination obstacle.

The development and implementation of the recommendations identified in this needs assessment will assist in furthering the Oregon GIS Utility which will ultimately assist local communities more easily discover, access and use hazard related geospatial data to complete the three phases of the risk assessment. As risk assessments become more accurate and detailed, communities can better define their most vulnerable community assets and potential losses, and in affect, utilize limited mitigation dollars more effectively to create more disaster resistant communities. The conclusions and recommendations in this needs assessment can also be integrated into the State Natural Hazard Mitigation Plan to be implemented through the Inter-agency Hazard Mitigation Team, when possible.

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[i] Oregon Geospatial Enterprise Office. 2005. What is the Oregon GIS Utility? http://www.plangraphics.com/projects/Oregon_GIS_Utility/gisutility.htm

[ii] Oregon Geospatial Enterprise Office. 2004. Oregon Standard Development Effort. http://www.gis.state.or.us/coord/standards/Standards_Development_Effort.pdf

[iii] Burby, R. 1998. Cooperating with Nature. Washington, DC: Joseph Henry Press. Pg 126.

[iv] Burby, R. 1998 Cooperating with Nature. Washington, DC: Joseph Henry Press. Pg 133.

[v] Interagency Hazard Mitigation Team Report, FEMA-DR-1099-OR, 1996, p. 12.