

Map Modernization Business Plan - 2005

Washington State



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Olympia, Washington

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Introduction to the Washington State 2005 Business Plan

This plan was prepared to assist in the development of a comprehensive national strategy for modernizing FEMA's inventory of Flood Insurance Rate Maps (FIRMs). This plan has the following main objectives:

- Summarize changes or redirection from the 2004 Business Plan
- Specify the Role of the State
- Highlight the State's current resources, capacities, and efforts
- Identify concerns or potential shortfalls
- Detail the State's plans for future Map Modernization activities

Key Functions of the State:

- The State has existing processes and/or systems in place to support the management of mapping or data collection activities that contribute to flood hazard identification. These processes and/or systems are supported by non-Federal funding
- The State has the capability to perform all management activities for which it is applying.
- The State is capable to perform all financial management activities required as part of it's Cooperative Agreement (i.e., account for Federal funds, prepare financial reports)
- The State has demonstrated its ability to leverage funding received from FEMA at or above the National Goal of 20%.
- The State has in-house staff capabilities in the appropriate technical areas sufficient to perform the specified management activities.
- The State has in-house staff capable of monitoring the contractor(s) and assist in approving the products developed by it's contractor(s)
- The State is committed to existing, and continued management in support of flood hazard identification and mapping activities conducted with and by FEMA
- The State will adhere to all standards for timeliness and completeness of reports submitted to the FEMA Regional Office
- The State has demonstrated the ability to cooperate and coordinate with the all necessary FEMA staff and organizations as needed

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I. ROLE, VISION, AND OVERALL GOALS OF THE STATE

1. Role - Strong Participation in Management and Map Production

Given continued support for a Flood Mapping Coordinator, the State of Washington will dedicate staff for administrative support to Map Modernization. The State continues to be a fully managing state performing all activities identified in the 'MMMS Business Plan Eligibility Scoring Table' (see table 1 on page 8). The State will continue to focus on determining the mapping needs of the State, outreach activities, restudies, digital conversions, and map adoption. The State's goals continue to strive for statewide completion of digital products for every county with parallel objectives spotlighting the integration of new and improved data where inundation areas demonstrate the need for improvement. Although the State plans to provide map maintenance and data repository activities, details for how map maintenance will function remain a concern.

The State's Vision for Supporting Flood Map Modernization

The Washington State Department of Ecology (the State) is the designated agency with floodplain management authority and houses the NFIP State Coordinator. For all activities in which the State is a participating partner, it will be responsible for implementing the FEMA Map Modernization initiative, including the writing and execution of the State Mapping Plan. The State's vision for supporting Map Modernization has all intended elements and capacities in-place. The State's ability to achieve its goals will be primarily driven by budget constraints, leveraging capabilities, regional priorities, and funding for a Flood Mapping Coordinator (FMC).

State's Overall Goals

- New and complete county-wide DFIRMS for every community
- New DFIRMS for all counties within the program budgets and timelines
- New and improved Study Information for all high priority areas
- Maximize State and Local Contributions and Participation
- Build capacities leading to local ownership of new maps and mapping products

2. Critical Functions and Concerns

The State of Washington has the following primary concerns:

1. Continued funding for a Flood Mapping Coordinator. This position is critical to performing most of the Map Modernization activities described in the 2004 and 2005 plans. The State will continue to provide regional and administrative staff to fulfill the State's objectives.
2. Although the State plans to provide a data repository for new digital products, details for how map maintenance will function remain a concern.
3. The State has demonstrated its effectiveness in cost and implementation. However, CTP mapping funds dedicated to the state to perform mapping activities has been less than anticipated.
4. The State fully understands how Region X ranks in comparison with other regions for national mapping dollars in this new program. Nevertheless, the State has definite concerns about the level of funds that will be available for new restudies. The State reiterates the concerns of local

governments in Washington that the new DFIRM mapping products will contain outdated and ineffective data due to limited funding. The State continues to offer its Flood Hazard Grants Program as cost share in hopes it will bridge the gaps between FEMA restudy dollars and local contributions. However, the State must continue to express this as a significant concern in the 2005 plan.

5. Emphasis on Scoping activities early in both pre-scoping and scoping activities is desired. Funding emphasis on activities such as: multi-hazard mapping, demonstrated needs that meet performance measures, leveraging opportunities, budget constraints/shortfalls, and sequencing should be pursued. The State developed it's contract with the consultant team to manage such issues and partitioned it's grant applications with FEMA to address this concern.

6. Local Agency Concerns and Needs

Local jurisdictions where floodplain maps need revision should be partners in the process regardless of whether they are contributing funds to the effort. In order for local agencies to make proper use of new floodplain maps in their ongoing floodplain management work, they will need to understand how the maps were developed, the data behind the map, and specifically, the limitations of the data and mapping products. Local agencies should be engaged in the process from the beginning stages of data gathering through review of updated mapping documentation, prior to FEMA initiating its review (i.e., at a point where their comments can make a difference). Local agencies will likely be attuned to information sources that may not be evident to others involved in modeling work. These agencies can also play an important role in communicating the intent, progress, and results of remapping efforts to their constituents.

Through the outreach program, the State intends to address these issues with upfront communication, detailed guidance, and technical and policy assistance throughout the mapping program.

An important consideration in the involvement of local agencies is availability of computer resources. To take full advantage of new floodplain maps, and to efficiently participate in their development, local agencies must have sufficient computer capabilities and resources to effectively work with data files, display and plot maps, and communicate with those preparing and maintaining the maps. Local agency staff or their consultants must be trained in the use of DFIRM's and supporting technologies to maximize on their ability to take ownership of these new products.

The State's Mapping Coordinator has taken the lead to ensure that jurisdictions with technical assistance requirements will have that assistance provided for them until such capabilities are acquired.

Washington State's Proposal

The State proposes that FEMA provide annual funding for one Mapping Coordinator and expenses to perform mapping coordination and administrative activities as defined in this plan for years 2005 – 2009 as outlined in 'Budget Overview' below.

The State proposes FEMA dedicate resources towards improved strategies and guidance on map maintenance and long-term care of these new mapping products and data.

The State proposes a broader focus on state-wide completion of Map Modernization by dedicating larger allocations of funds to the State. This will enable the State to take full advantage of its capabilities and improve its effectiveness.

In light of Washington State’s vulnerability to various types of hazards including volcanic, seismic, fire, and tsunami risks, the State proposes increased scoping funds leading to identification of such hazards and integrated multi-hazard product development. The State Department of Ecology in partnership with the State Department of Emergency Management is poised to take on such tasks.

3. The State’s Eligibility Scoring

The State’s suitability to MMMS activities is summarized below in the MMMS Business Plan Eligibility Scoring table. Washington State activities are highlighted and a total score is tallied at the bottom of the table.

table 1. MMMS Business Plan Eligibility Scoring

Minimal Participation / Minimal funded plan (Activities providing useful information, but not providing service)	
Activities	Suggested Weight (0 - 4)
Provide State's population	2
Provide percent of insurance policy base	4
Provide vision for implementation	4
Coordination with Region's support for Map Mod	3
Recognizing gaps and shortfalls	3
Soft Support (Heavy participation without map production management)	
Activities	Suggested Weight (5 -10)
Outreach efforts	5
Assessment of community mapping needs in support of MNUSS	10
Digital base map inventory	10
Digital base map data sharing	10
Training efforts to State and local officials	8
Coordination and effort in building partnerships	8
Information Technology Systems	10
Staffing	5
Project Scoping participation	8
Compliance / Map Adoption management	10
Management and Map Maintenance (Strong participation in Map production and/or maintenance)	
Activities	Suggested Weight (11 - 15)
Program management planning for multiple flood mapping projects	15
Hydrology and Hydraulics Review	15
DFIRM maintenance	14
Technical standards agreement for State and/or local efforts	14
Performing metrics and goals; planned v.s. actuals	12
Overall Total	141

II. CURRENT RESOURCES & CAPACITIES

Existing Resources and Capacities

The State has existing processes and/or systems in place to support the management of mapping or data collection activities that contribute to flood hazard identification. These processes are supported by non-Federal funding. In Addition, the State's capacity to provide leveraging and cost sharing will meet or exceed the national goal of 20%.

1. The State's Primary Resources include:

Three regional floodplain specialists and one mapping coordinator with roughly 100 combined years of experience in floodplain management in Washington State including the NFIP, ordinance and policy expertise, information technology, geology and geography, and extensive knowledge of the State's flood-prone communities (see appendix A. State Contributions).

- A contract with a multi-disciplinary team of consultants that provides the State with complete capacities in hydrologic and hydraulic engineering, digital data conversions, LIDAR technology, GIS and IT Systems Technology, and many years of experience with FEMA flood hazard mapping projects.
- On-going partnership development with several state and federal agencies including: WA State Dept. of Transportation, WA Dept. of Fish and Wildlife, US Army Corps of Engineers, US Geological Survey and others that provide coordination and resources on flood hazard reduction projects, multi-hazard data, engineering applications, and leveraging capabilities.
- Resources to perform several due process and outreach activities including scoping, workshops, interim and final meetings, web-based guidance materials, in-house technical and policy expertise, and extensive knowledge of the issues and concerns of Washington's NFIP communities.
- Washington's Flood Control Assistance Account Program (FCAAP). Washington has had this legislatively established flood control maintenance program for over 50 years and it continues to provide the State with and local jurisdictions with funding dedicated to flood hazard reduction. Beginning in July of 2005, the State intends to use this grants program to leverage federal, state, and local funding that hopes to bridge the gaps in limited regional funding and provide a cost sharing aspect to the mapping program (see appendix B. WA State Flood Map Modernization FCAAP Contributions).

The State's Primary Capacities

Washington State has in-place the capacity to perform many activities dedicated to Map Modernization including:

- Project planning and Scoping – The State has dedicated it's full resources to the planning phases of Map Modernization and given adequate funding will continue to dedicate staff towards individual project scoping.
- Contract Management – The State has secured a team of consultants to perform mapping and study related activities and has capacity to manage the consultant in all facets required by FEMA's mapping program guidelines and specifications.

- Digital Data Sharing – The State’s current GIS framework has compiled the vast majority of base map components required under the current DFIRM guidelines and specifications and has mechanisms in-place for distribution to the public. Where agency data is insufficient, the State’s program plan and project management team will acquire any such existing data during scoping and outreach activities.
- Assessment of Community Mapping Needs - The State has performing detailed community assessments of both flood hazard data and mapping needs and has populated MNUSS with results. The State is staffed is currently moving onto a refinement and completeness phases of the assessment.
- Outreach – the State has capacity and is performing several outreach strategies including scoping workshops, web-based guidance materials, in-house technical and policy expertise, and extensive knowledge of the issues and concerns of Washington’s flood prone communities. In addition, the state has integrated CAP/SSSE activities into Map Modernization outreach components such as: Community Assistance Visits (CAVs), the State’s Flood Control Assistance Account Program (FCAAP), and attendance at public and final meetings.

Washington State can also provide the following services to advance the Map Modernization Objectives if funding levels are adequate and interest is high.

- Services to communities focused on improving CRS rankings and credits.
- Workshops and training sessions on items such as: Map Modernization, DFIRM preparation and maintenance, and LIDAR topography applications. Utilization of DFIRMs, map reading, coordination of DFIRMs with local GIS platforms, explanation of additional benefits of Map Modernization for all hazard identification, hazard mitigation planning and response and recovery. Coordinate the collection of historic data, particularly for calibration or mapping of unmapped areas.
- Provide new and highly accurate spatial coordinate information of areas such as: repetitive loss properties, high water marks, flood scars, erosion areas, groundwater flooding, and other floodplain structures for use in multi-hazard mapping using Global Positioning System technology.
- Multi-agency coordination for improved flood hazard mapping that will foster mutually beneficial outcomes and enhance the delivery of risk management applications and operations.
- Providing direct GIS/mapping expertise to communities focused on building capacity and map ownership at the local level.

2. Washington State Organizational Outline

The State of Washington, Department of Ecology (DOE) is the State's NFIP coordinating agency. The Shorelands and Environmental Assistance Program (SEA) within the department of Ecology is the program responsible for the administration of floodplain management activities in the agency. The department of Ecology, SEA program, will assume a primary role as the lead entity in the Map Modernization Program.

Management Support - DOE

Gordon White, SEA Program Manager
Page Boule, Interim SEA Program Section Manager

Flood Mapping Coordinator/Contract Officer - DOE

Jerry Franklin- Information Technology Application Specialist

Budget Officer - DOE

Bev Huether – Environmental Planner

State Regional Officers - DOE

Dan Sokol – NFIP Coordinator, SW Regional Floodplain Management Specialist
Ted Olson – NE Regional Floodplain Management Specialist, Engineer
Chuck Steele – NW Regional Floodplain Management Specialist
Kevin Farrell – SW Regional Floodplain Management Specialist (UPDATED)
In hiring process – Fluvial Hydrogeologist (UPDATED)

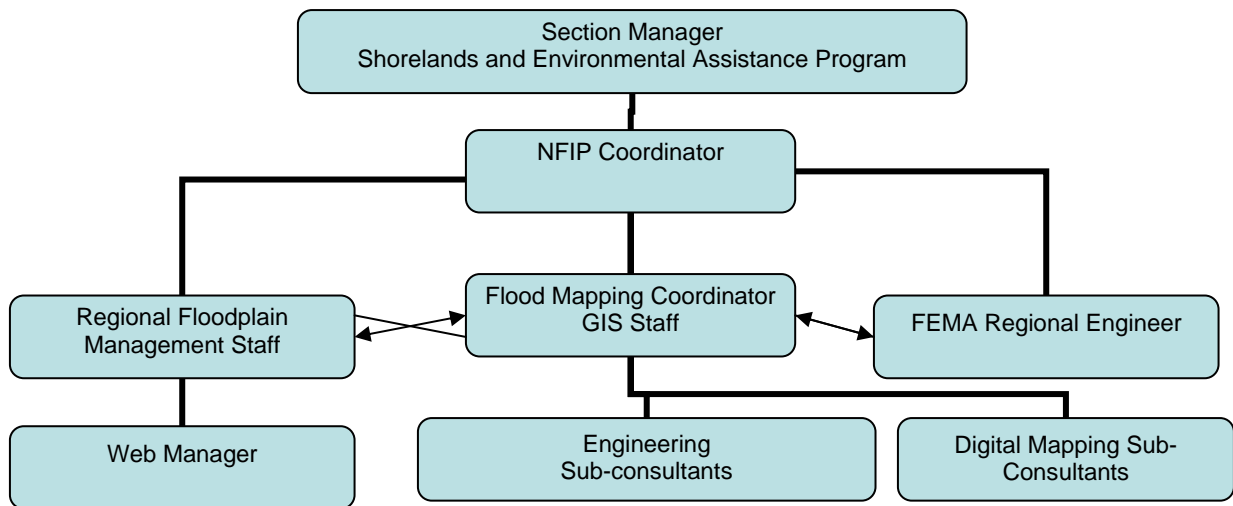
Partnerships

WA Dept. of Transportation - Jim Park, Floodplain Management Specialist
WA Dept. of Fish and Wildlife – Alan Wald, Hydrogeologist
WA State Emergency Management Division – Allen Jakobitz
US Army Corps of Engineers – Lori Morris, Project Manager Seattle Office
US Geological Survey – Lee Case, Physical Scientist
FEMA – Dave Carlton and Joseph Weber, Regional Engineers

Contractor/Consulting Team

Tetra Tech/KCM, Inc.	Ch2MHill
Titan Systems Corp.	Phillip Williams & Assoc.
West Consultants	GeoEngineers
AquaTerra	Golder & Assoc.
David Smith & Assoc.	Harper, Hauf, Righellis
Spencer B. Gross	Moffatt Nichol

Map Modernization - Organizational Structure



3. Flood Mapping Coordinator (FMC) and Regional Staff

The principal resource directing the mapping program is the State's Flood Mapping Coordinator (FMC). The FMC has 20 years experience in mapping and information technology and practical experience in areas such as: geographic information systems, physical geography, remote sensing, global positioning systems and surveys, technical standards development, computerized drafting and mapping applications. The Mapping Coordinator is necessary to perform all activities defined in table 2, pages 19-21, 'MMMS Administration and Management'. The budget necessary to maintain this position is outlined below in part 5. 'Budget Overview.'

Regional Staff

The regional floodplain management staff for the WA Dept. of Ecology that work on the CAP/SSSE grant have extensive experience in the field or related fields. Our Northwest regional staff person has nearly thirty seven years of experience working in flood hazard management. He was a federal employee with HUD when the NFIP was first conceived and continued to work in the NFIP when FEMA was created in 1977. He has been intimately involved in the development of policies and procedures for the NFIP, including flood hazard mapping. He worked in a variety of roles at the federal level, including eighteen years as Mitigation Director for FEMA Region X, before he joined Ecology three years ago. Our Eastern regional staff person has thirty nine years of experience working in the water resources and floodplain management field. He is a licensed professional engineer and geologist with experience in hydraulics and hydrology. He has done extensive work delineating floodplains and conducting floodway assessments. Our NFIP Coordinator has twenty eight years experience as a planner working with local governments at the state level. He has also had experience in emergency preparedness and response and recovery. He has served in seven federally-declared disasters, including earthquakes and hurricanes as well as floods. His experiences in the allocation of resources and budgeting provide the program with broad capabilities.

4. Consultant Profile - Tetra Tech/KCM (Tt/KCM)

Founded in Seattle in 1943 and now a subsidiary of Tetra Tech, Inc., Tt/KCM has provided service to clients ranging from large metropolitan cities, counties, and state and federal agencies to small communities, districts and businesses. Typical projects include watershed plans; water quality management plans; lake management and restoration studies; environmental studies, including wetland and fish restoration studies; utility rate studies; drainage system design, and municipal engineering.

Tt/KCM has specialized in surface water management, watershed water quality management, stream restoration, fisheries enhancement and the design of facilities for local governments.

Over 85 percent of our work is for public agencies. Our clients include cities, counties, special districts, state agencies, and the federal government.

Whether in scientific investigation, planning, design or implementation, we take pride in producing high quality work in the most cost effective manner. The key to our success and growth has been the commitment of our professionals to acquire an in-depth understanding of the client's needs, objectives, and concerns, as well as a high level of technical competence.

Tt/KCM has more than 20 years of experience supporting FEMA's NFIP and other natural disaster prevention and mitigation programs. Our experience includes:

- Assisting FEMA to develop the original coastal storm surge model
- Producing over 1,000 flood maps / FIRMs
- Preparing more than 250 Flood Insurance Studies (FIS)

Our local experience includes floodplain mapping for many communities in Washington and authoring over 20 Comprehensive Flood Hazard Management Plans since 1990. Of the 282 Washington Communities in the NFIP we have performed relevant work in over 100 of them.



CFHMP Work throughout Washington

Hydrologic and Hydraulic Modeling

Tt/KCM is recognized as a leader in the development and use of hydrologic/hydraulic models. We developed the FLO-2D model to analyze two-dimensional flow on alluvial fans and map the resulting hazard zones. Models commonly used include:

- EPA-SWMM
- HEC-1
- HSPF
- WWHM
- HEC-2
- HEC-RAS
- FEQ
- UNET
- FESWMS
- FLO-2D

5. Budget Overview

Budget Decisions

The State's 2004 Business Plan included three budget scenarios. This plan refines that scenario into one that hopes to be more realistic as FEMA regional guidance has continued to stress very limited funding options.

Guidance collected during the meetings in Atlanta in February 2003 outlined what factors FEMA should consider when targeting areas for mapping activities continues to be the primary factors driving budget decisions.

These criteria included:

- High population density
- High growth areas
- High risk areas: history of repetitive loss/claims/disasters
- NFIP policy base
- Leverage existing data
- Accuracy and adequacy of products
- Comprehensive watershed approach

However, considering the regional limitations, the State's budget priorities will be more focused on leveraging state and local funding to pursue restudies that would have formerly been deemed a low or medium priority.

MMMS Budget

MMMS budget requirements are largely for maintaining the State's Flood Mapping Coordinator and expenses to assist regional staff in attending and participating in MMMS activities such as scoping meetings and due process activities (see Salaries and Expenses below).

Salary and Expenses - \$125,000 - \$150,000 per year for each year of the mapping program. This position is vital in all phases of the mapping program. Early in the program the FMC will be required to accomplish planning and outreach activities and will become more critical in years to come as FEMA's goals for CTP funding increase and due process activities are implemented.

Expenses will include activities such as:

- Outreach Activities – Approximately \$70005000 per year to cover the costs of workshops, multi-media promotional activities, and/or training sessions
- Travel - \$7,000 per year for FMC and Regional Specialists to attend meetings, workshops, and conferences
- Website Support - \$5,000 per year for web application development and maintenance
- IT Systems - \$5,000 per year for repository development and maintenance.

III. PAST EFFORTS & ACCOMPLISHMENTS

1. Mapping Needs Assessment

Mapping Needs Assessments – Beginning with a CTP agreement signed in June of 2001, Washington State started assessing its NFIP communities for mapping needs. The assessment was initiated from State legislation aimed at improving floodplain management across the State. Substitute House Bill (H.B. 3110) called for the creation of the Committee on Floodplain Management Coordination and tasked the committee with several missions, including the development of cooperative efforts towards improved data and strategies for proactive floodplain management.

The assessment used the standard FEMA questionnaire, guidance documents, and a supplemental questionnaire developed by Ecology (see appendix C. MNA News Letter 2003). The resulting information was then entered in MNUSS by Ecology staff. The results of this initial assessment are as follows:

Washington State Community Results

- All 257 NFIP communities have been contacted.
- 70%, or 185 communities have responses in the State-wide survey.
- 80% responded with Map Maintenance Needs.
- 80% responded with Flood Data Update Needs.
- Less than 20% exceed the FIRM by the types of information they maintain.
- Of 72 %, less than half have GIS capacity.
- 30% expressed a need for GIS funding to perform the updates.
- Less than 10% use FEMA's Q3 digital data.

2. Contracting Support

In June of 2002 the State began the contractor selection process by releasing a Request for Proposals (RFP) to public media. Several consultants familiar with FEMA mapping and restudy operations responded including former MCCs URS Corporation and Dewberry & Davis, Inc. and several other leading consultants in the field. After several months of awaiting FEMA's remapping program to come to fruition, the State executed its RFP and awarded a contract to Tetra Tech to support the State in Map Modernization. Tetra Tech clearly demonstrated the experience and capabilities necessary to fulfill the State's objectives and the local presence sought after by the interview team.

3. 2004 Business Plan Development – Phase I

Phase I Business Plan development began on October 1, 2002. That plan is the precursor to this plan and remains the guiding document for the States involvement in Map Modernization. Much of that initial plan was designed to emphasize why the State should be a managing State and to demonstrate its capabilities. That plan was delivered to FEMA within timeline and budget.

4. State Mapping Priorities and Community Ranking

The State spent considerable time and effort in identifying and prioritizing its mapping needs. Several iterations were explored from the Atlanta criteria to individual jurisdiction-by-jurisdiction assessments. Due to realistic Regional budgets, the current priorities for map updates target only high and select medium-ranked flooding sources.

A summary of the State's prioritizing and ranking process follows:

WA State Criteria for Ranking Map Updates

1. HIGH RANK
 - a. Decile 1 or 2 community and Populations
 - b. Known problems that need to be addressed before DFIRM conversion
 - c. Pipeline Projects
 - d. Ready for DFIRM conversion
 - e. Good Leveraging Opportunities

2. MEDIUM RANK
 - a. Decile 3 – 5 community and Populations
 - b. No major immediate flood risk
 - c. Need for partnerships (WSDOT, WDFW)
 - d. Possible Leveraging Opportunities

3. LOW RANK
 - a. Decile 6-10 community and Populations
 - b. Very little immediate flood risk
 - c. Little GIS capacity
 - d. Little Leveraging Opportunities

Criteria for DFIRM Conversions

- High populations per panel
- High ranking jurisdictions
- Few restudies needed before conversion
- Available data and ready for conversion
- In-kind contributions
- Quality of local GIS system

5. CAP/SSSE Related Mapping Efforts

In addition to Ecology's usual technical assistance, the State increased mapping support efforts in conjunction with our CAP-MAP business plan currently under development. Assistance on data sharing and applications, including digital topography (LiDAR), was provided to communities and other agencies. Outreach was aimed at the collection and use of digital data and digital mapping products. These outreach efforts were offered in a workshop environment (see Mapping Workshops below). Ecology also offered assistance on Global Positioning System (GPS) technology with the equipment and training purchased with state funds.

Ecology expanded coordination efforts with other agencies involved in land use planning and hazard mitigation. A Memorandum of Understanding with the State Emergency Management Division remains in effect calling for joint participation in each agency's grant application

review processes (HMGP, FMAP, PDMP), the State's Flood Control Assistance Account Program (FCAAP) and sharing of information about mutually related activities on an ongoing basis. The State is an active participant in the development and refinement of the State Hazard Mitigation Plan.

6. Mapping Workshops

The State hosted two workshops designed to bring together local officials, floodplain managers, and technical expertise to highlight the State's involvement in Floodplain Management. A primary focus of these workshops was to promote the Map Modernization Program. Summaries of those workshops follows:

Workshop 1: Floodplain Mapping, Modeling, and Policy Workshop
March 7-8, 2001 at St. Placid's Priory in Olympia, WA

Speakers and presenters included experts in the field of flood hazard modeling, GIS, and mapping. The focus of the workshop was to discuss new developments in improving floodplain mapping/modeling technology and the implications of these innovations for the policy issues of floodplain management.

This workshop presented an excellent opportunity to explore the relationship between the technical and policy facets of floodplain mapping, modeling, and management.

Workshop 2: Floodplain Mapping Workshop
June 6 – 7, 2002 at C.I. Shenanigans in Tacoma, WA

The purpose of this workshop was to share methods, ideas, and applications related to floodplain mapping. Material was presented on Channel Migration Zones, Floodplain Modeling, Multi-Hazard Mapping, and more. There was a second full day dedicated to guidance for future floodplain mapping activities, assessing the status of local flood information, converting to digital formats, and utilizing new technologies.

7. Floodplain Mapping White Paper

The following is the executive summary of a Floodplain Mapping White Paper developed through an interagency effort on Floodplain Management. This document detailed the guiding principles for why Washington State's FIRM panel update needs, why the State should take the lead, and outlined a two tier approach to implementation, very much as is the process in Map Modernization. The executive summary of that document follows. The entire document is in the appendix to the 2004 Business Plan and is available on the State's website.

Executive Summary

This report was developed at the direction of the Floodplain Management Task Force, an interagency group-guiding cooperative and coordinated floodplain management decisions in Washington State. The task force was formed in 1998 as a result of the state legislature's passage of Substitute House Bill 3110, temporarily codified as Chapter 181, Laws of 1998.

The report describes shortcomings of floodplain maps and associated data currently used for floodplain management in Washington State; recommends a two-tier approach for state-wide

improvements to floodplain maps; and provides information on data formats, data resolution, and hydraulic models necessary for the state-wide improvements. The recommended improvements could significantly reduce the extent of flood damage in Washington State, help avoid unnecessary impacts to critical habitat, provide better protection of transportation infrastructure and allow more accurate planning, engineering, and natural resource decisions.

The majority of floodplain maps used in Washington State are flood insurance rate maps (FIRMs) developed several decades ago by the Federal Emergency Management Agency (FEMA). In addition to use for flood insurance purposes, the maps are now used for land use and zoning decisions, natural resource management decisions, transportation planning, hazard management, and riparian habitat planning. FEMA has acknowledged that the maps are inaccurate and should be updated, but federal funding is limited. The maps are inaccurate for several reasons:

- They were based on outdated engineering methods and limited topographic data, vegetation data, planimetric information, and hydrologic data.
- Depicted features such as roads and buildings are now out of date, particularly in basins where significant development has occurred.

Flooding causes extensive damage in Washington State. Damage estimates for the floods of 1990 reached approximately \$250 million, while region-wide (Washington, Oregon, Idaho) damage estimates from the February 1996 flood reached approximately \$800 million. The FIRMs frequently under-represent the floodplain area and flood flow depths. Land use decisions based on the maps frequently result in development in flood-prone areas, increasing the likelihood of flood damages.

This report recommends that the Departments of Ecology, Transportation, Fish and Wildlife, and Natural Resources lead the statewide effort to improve floodplain mapping accuracy. These lead agencies should form partnerships with local agencies, some of whom may already be involved in FEMA programs. These lead State agencies should also involve floodplain management stakeholders, including diking districts, Native American tribes, and other state and federal agencies, such as the U.S. Army Corps of Engineers. The State legislature should support this multi-agency effort to the maximum extent possible by creating funding mechanisms and eliminating impediments to inter-agency coordination and information sharing.

Tier one improvements involve using readily available digital aerial photos and digital files of floodplain areas to enable computer rectification of stream alignments and approximate 100- and 500-year floodplain boundaries. This method would provide some improvement in the accuracy of floodplain information and floodplain management decisions during the interim period required to implement tier two improvements. Tier two improvements would involve thoroughly updating the floodplain maps, including data collection, hydraulic modeling, and generating new maps. The current goal for gathering topographic data should be to obtain 2-foot elevation contour data for the floodplains of the entire state using airborne light detection and ranging (LiDAR) technology or global positioning system (GPS) technology.

IV. CURRENT EFFORTS

MMMS and CTP Activities

1. Map Modernization Management Support Activities

Activities performed under the MMMS agreement are designed to provide a means to ensure that the State can support Map Modernization through activities that do not directly result in a Flood Insurance Rate Map. These activities include administration and management activities and are found in the following table.

table 2. Administration and Management Activities

Description of MMMS Activities	
ACTIVITY	DESCRIPTION
Digital Base Map Inventory	The State in coordination with the NSP performs an investigation and provides an inventory of base maps meeting FEMA specifications for NFIP communities in a Washington State at or prior to project scoping meetings for jurisdictions in which the State is conducting Map Modernization activities.
Digital Base Map Data Sharing	The State will provide DOQQ's, and some vector data such as political boundaries, USGS quadrangle boundaries, etc. as needed. The State is pursuing partnerships with the Washington Geographic Information Council and sister State agencies on other vector data layers such as transportation and hydrography. All layers meet or exceed FEMA minimum accuracy requirements and will be distributable by FEMA to the public in hard copy and electronic formats.
DFIRM Maintenance	The State will provide long-term data repository functions and maintenance of flood hazard information and will coordinate with FEMA Region X, local agencies, and other parties in concepts/applications of associated data such as the use 'Portals' for data uploading to the MHIP.
Hydrologic and Hydraulic Review	The State has and will continue to manage the reviews of hydrologic and hydraulic studies prepared for FEMA-funded flood data updates and/or map revisions processed under Part 65 of the NFIP regulations. The reviews focus on compliance with the technical and regulatory requirements contained in <i>Guidelines and Specifications for Flood Hazard Mapping Partners</i> , the pertinent NFIP regulations, as well as standard accepted engineering practices.
Assessment of Community Mapping Needs (to support FEMA's Mapping Needs Update Support System - MNUSS)	The State has performed a detailed community-by-community assessment of mapping needs for every mapped and unmapped NFIP community within its jurisdiction. The State is currently performing a second round of assessments in coordination with the RMC for non-responding communities and those with Flood Data Update Needs. The State has and will continue to submit the results of the assessment to FEMA for inclusion in the MNUSS database.
Technical Standards Agreement	The State has and will continue to work with FEMA to adopt specific technical standards or processes appropriate for local conditions for NFIP flood mapping purposes.

<p>Information Technology Systems</p>	<p>The State has information technology systems dedicated to archive, organize, distribute, and otherwise manage effective DFIRMs.</p> <p>IT systems for preliminary DFIRMs and underlying backup data is being coordinated through NSP, FEMA Region X, DOE, and other stakeholders such as the USGS. The State’s system will distribute this data in an electronic format (e.g., web-based, CD-ROM, etc) to the public.</p>
<p>Outreach</p>	<p>Informational Mailing – The State has identified all necessary recipients of mass mailing (all participating NFIP communities state-wide).</p> <p>Community Meetings – The State determines when and where the meeting will be held for counties in which the State is conducting mapping activities. The State identifies staff roles and responsibilities; advertises the meeting; prepare agendas and other handout and presentation materials to explain the purpose of the meeting and the mapping project. The State provides on-site meeting support to explain the purpose of the mapping project, opportunities for involvement, how to provide comments, provides opportunity for the public to submit comments, on-site logistics and meeting support; and has directed evaluation procedures to assess results.</p> <p>Website Posting – The State has significantly enhanced its website to provide information geared towards the general public, technical audiences, and other stakeholder groups (such as the FEMA website which guides users based on their interest in the maps such as one button for property owners, one for lenders, insurers, etc.), provides an overview of the mapping project, access to digital data., and contacts and links for further information on FEMA, State, and other local websites. The site will provide (or link to) preliminary and final FIRMs.</p> <p>Multi-Media Promotional Activities – The State has developed and distributed a press release and bulletins via local media. The State will follow up with media contacts periodically to encourage them to use press releases in articles, cover key events through live footage of community meetings or other key events. The State has and will continue to write articles and publish in trade journals, newsletters, fact sheets, and websites that are available to the public and professionally- sponsored events.</p>

<p>Minimal Support Activities</p>	<p>The State has and will continue to work with FEMA and the NSP to provide support and information useful for map modernization efforts such as population, percentage of insurance policy base, the Partner’s vision for implementation, coordination with the FEMA Regional office, recognizing and calling attention to gaps and shortfalls.</p>
<p>Managing Updates to National Management Information System</p>	<p>The State has assumed responsibility for ensuring that required updates to National Management Information System are made in an accurate and timely manner.</p>
<p>Training Efforts to State and Local Officials</p>	<p>The State aggressively participates in the development and deployment of training in subjects that will encourage the use of digital flood mapping products. These activities have been underway in Washington State over the last four years in preparation for Map Modernization activities.</p>

Washington State 2005 Business Plan

<p>Coordination and Effort in Building Partnerships</p>	<p>The State has aggressively surveyed State and Federal agencies, community officials, and stakeholders to determine if they intend to actively contribute to, and participate in, flood map modernization or flood map maintenance activities. The State's Partnership Plan is detailed in the 2004 Business Plan and the State will continue to pursue this primary effort.</p>
<p>Staffing</p>	<p>The State has an established team of staff and consultants dedicated to activities that promote the flood mapping process and the adoption of effective maps by NFIP communities.</p>
<p>Compliance / Map Adoption</p>	<p>Washington State's model ordinances HAVE BEEN evaluated by the State Attorney General's Office to ensure that the automatic adoption of maps is legal in Washington State. Currently, over 90% of the States counties have rollover provisions in place and The State is aggressively pursuing such provisions for all participating NFIP communities.</p>

a. Scoping Emphasis and Activities

The State identified a concern in Part I. of this document that scoping and pre-scoping should have an early and a significant emphasis on activities such as: demonstrated needs that meet performance measures, leveraging opportunities, budget constraints/shortfalls, and sequencing. That State developed it's contract with the consultant team to manage such issues and partitioned it's grant applications with FEMA to address this concern. Below are examples of actual MMMS activities directly related to State managed mapping projects and are included in quarterly reports to FEMA.

b. Initial Community Contact Documentation – below is an example of Initial Community Contact documentation developed prior to scoping meeting activities.

Map Modernization; Initial Community Contact– Kitsap County, WA	
Date: December 16, 2004	Case No.: 2004-10-002WA
Leading Agency: Washington State Dept. of Ecology	Jerry Franklin Flood Mapping Coordinator PO BOX 47600 Olympia, WA 98504-7600 Ph. (360-407-7470) Fax. 360-407-6902 Jfra461@ecy.wa.gov
Participating NFIP Communities <u>Kitsap County</u> David A. Tucker, P.E., Manager Surface and Stormwater Mgt. Program (360) 337-7292 David Greetham Department of Community Development (Planning) (360) 337-4603 Craig Adams Department of Community Development (GIS) (360) 337-7232 Mike Barth Building Official (360) 337-4968 <u>City of Bremerton</u> Dri Ralph Department of Community Development (360) 473-5275 Mike Mecham City Engineer (360) 473-5270	<u>City of Pt. Orchard</u> Alan Lobdel Public Works Director (360) 876-4991 Deanna Cole Asst. Dir. Public Works (360) 876-4991 JoAnn Long-Woods Planning Director (360) 876-4407 <u>City of Poulsbo</u> Jeff Lincoln Public Works Director (360) 779-4078 Barry Berezowsky Planning Director (360) 779-3006 <u>City of Bainbridge Island,</u> Larry Frazier Dir. Planning and Community Development (206) 842-2552

c. Scoping Meetings – Agendas and Reports

Below are examples of an agenda and a scoping meeting report on one of the State’s current mapping projects.

Scoping Meeting Agenda

Kitsap County Flood Map Revision Project		
Scoping Meeting AGENDA		
Thursday, December 16, 2004 Kitsap County Public Works Annex 8600 Imperial Way SW Port Orchard, WA		
8:30 – 9:00	Introductions Overview of Scoping Meeting Agenda State Role in Map Modernization State Restudy Priorities Kitsap County and the NFIP	Jerry Franklin, Ecology Chuck Steele, Ecology
9:00 - 10:15	Discussion of Available from Communities Report on Existing Information Digital Conversion Format & Tiling Scheme	Mark Riebau, RMC10 Michael Morgan, RMC10
10:15 – 10:30	Break	
10:30 – 11:30	Preliminary SOW for Kitsap County Discussion of Areas Needing New/Revised Study Identification of Existing data for each study area	Tony Melone, Tetra Tech
11:30 – 12:00	Summary of Action Items & General Discussion	Jerry Franklin, Ecology
12:00	Adjourn	

Scoping Meeting Report

**DEPARTMENT OF ECOLOGY
Northwest Regional Office**

December 17, 2004

TO: File

FROM: Charles L. Steele
Floodplain Management Specialist

SUBJECT: Kitsap County FIS Scoping Meeting
December 16, 2004, Public Works Annex

The Flood Map Revision Scoping Meeting for Kitsap County and its cities was held on December 16, 2004 at the Kitsap County Public Works Annex. Those in attendance included:

Jerry Franklin, Ecology	Dave Dickson, Kitsap Co Asst. PW Director
Dan Sokol, Ecology	Craig Adams, Kitsap Co SSWM
Chuck Steele, Ecology	Mike Barth, Kitsap Co Building Official
Dave Carlton, FEMA	Dave Greetham, Kitsap Co DCD
Tony Melone, TT/KCM, Study Contractor	David Nash, Kitsap Co DCD/GIS
Tom Spangenberg, TT/KCM	Mike Michael, Kitsap Co SSWM
Mark Riebau, FEMA RMC, Region X	Mark Hinkley, Bainbridge Is. Bldg Official
Mike Morgan, FEMA RMC, Region X	Steve Morse, Bainbridge Is. Planning
Tim Witten, FEMA RMC, Region X	Edie Berghoff, Poulsbo Planning/GIS
Mike Mecham, Bremerton City Engineer	Alan Lobdell, Pt Orchard PW Director
Maryellen Babbitt, Bremerton Engineering	
Dri Ralph, Bremerton Planning	

The Agenda for this meeting is attached. There was considerable discussion at the meeting that would not be possible to capture in this memorandum. However, below are a few random observations from the discussions at the meeting:

Clear Creek Topo. The County has 2' contour interval topo maps for the Clear Creek area to just past Waaga Way, beyond which there is LIDAR information available. The topo was prepared by Walker and Associates.

Additional Study, Lake Symington. Local officials were told that it would be unlikely that funds would be available for any work beyond the DFIRM preparation (digitizing the County) and completing the H&H work on Clear Creek that will be incorporated on the DFIRMs. However, they were asked to suggest areas where they felt new study was needed, on the hope that funding would be available through FEMA at a later date. Dave Greetham suggested that BFEs should be revisited on Lake Symington, in view of a dam that was rebuilt which could possibly lower the BFE on the Lake.

Additional Study, Point No Point. Additional study was suggested by Dave Greetham for the Point No Point (Hansville) area. He indicated that the SFHA appeared to be okay near the water, but that it continued into upland areas that clearly were not subject to flooding. This probably will not require new study but, rather, will be corrected with the new topography that will be used in the new DFIRMs.

Additional Study, Annapolis Creek. Dave Dickson suggested that Annapolis Creek in the Port Orchard Area be studied by the detailed method. The Creek does have a drainage basin greater than one square mile, but had not been included in the original FIS.

Additional Study, Chico Creek. Mike Barth suggested that lower Chico Creek be restudied, in view of work that had been done on the Erlands Point Road bridge over the Creek. The new bridge, near the Fairwood (?) development, has a significantly larger opening than the old bridge which probably would lower flood levels upstream. While the developer, through Chuck McLarensberry, produced flood information in hopes of obtaining a LOMR from FEMA (which never happened), the information is not for a large enough reach to be used by itself.

Dave Dickson specification of Additional Areas for Study. In response to FEMA's inquiry to all communities in 1997 (the so-called Marie Britt letters), Dave Dickson responded with a May 2, 1997 letter asking for additional study on four creeks and four lakes. Two of the streams, Clear Creek and No Name Creek #6, have already been studied; he also asked for study on Gorst Creek from Sam Christopherson Road to Sinclair Inlet, and Chico Creek from Leber Lane to Dyes Inlet. The lakes he suggested for study were Carney and Linder Lakes; Wye and Island Lakes were suggested for restudy (lake BFEs were exceeded in the 1996-97 Winter Storm).

Base Map. Discussions at the meeting concluded that the best base map would be from the County GIS section, even though there were some shortcomings regarding this data.

Digital Conversion Timing. Funds for completion of the Clear Creek H&H work are available now, but funding for the digital conversion work will not be available until around May. Bremerton is flying the City for aerial topography this Spring, which should be available in the August-September timeframe. It is hoped this work can be dovetailed with the digital conversion work for the Bremerton area taking advantage of the new topo from the City.

Orthophotography. The County has orthophotography for areas of the County, but not for the entire County. It was determined that this work will be used wherever it exists.

FEMA Mapping Standards. FEMA requires that the data it uses for mapping be current within seven years. FEMA's base map standards are in Appendix L of the Guidelines and Specifications. There were questions regarding whether or not Kitsap County's LIDAR information would be usable for the study, in view of the fact that it was some of the earliest LIDAR work and might not meet FEMA's specifications at this time. Dave Carlton, however, said that it may still be used if it is the best information available. Also, the Puget Sound Consortium that did the LIDAR did not do it for Bainbridge Island. The City does have LIDAR, but it is older than that prepared for the rest of Kitsap County (but is the best available information according to the City).

Corps of Engineers Activity. The Corps is currently doing some modeling in the County that is related to water quality, the TMDLs. Brian Skahill is the Corps person in charge of this work.

Clear Creek upstream of Silverdale Way. The new modeling work for Clear Creek was only done by TT/KCM up to the Silverdale Way crossing, whereas the original detailed study continued upstream for about another mile. This area, observed from the CAV field work I performed in 2002, is dedicated wetland, has buffers that are significant and in some areas even exceed the width of the floodplain, and there is little to no development potential. After much discussion, Dave Carlton said the old (Tudor) model should be used with TT/KCM's new hydrology plugged into the model to complete work in this area. This is reasonable for an area that has little or no development potential.

The meeting ended around 11:15 and it was concluded that the same group should meet when Draft maps are available for review. This would be akin to FEMA's Intermediate Coordination Meetings (ICCO). It was also agreed that I will visit with Tribes in Kitsap County that have Reservation lands to discuss the NFIP and determine whether or not they want to be mapped after becoming knowledgeable about the effects the maps will have on them.

d. MNAs

MMMS – Mapping Needs Assessments

The State performed Mapping Needs Assessments (MNAs) of local governments beginning in May 2000, and continues this work in 2005. This phase of MNAs is coordinated with the RMC’s MNA activities. The RMC was tasked to perform MNA’s for all communities reporting needs in the Biennial Report to FEMA. The State obtained a list of those communities targeted by the RMC and synchronized that list with the States database on all NFIP communities. The State then extracted those communities not targeted by the RMC and developed a distribution list of the remaining jurisdictions. In December 2004, the State electronically distributed MNAs to the States targeted list. Upon completion of this latest MNA activity the State enter the responding community’s needs into the Mapping Needs Update Support System (MNUSS) and summarize the responses to FEMA and the RMC.

The following table is an example of a Mapping Needs Assessments tracking tool. This tool reflects the roles and progress of Mapping Needs Assessments (see appendix D. MNA documents).

Community	County	2002 Response	Map Maint. Needs	Flood Data Needs	2004 Source	Progress
Aberdeen	Grays Harbor	Yes	Yes			Complete
Adams Co.	Adams	Yes	Yes	Yes	WA State	In Progress
Albion	Whitman	Yes	Yes			Complete
Algona	King	No			WA State	In Progress
Almira	Lincoln	Yes	Yes	Yes	WA State	In Progress
Arlington	Snohomish	Yes		Yes	RMC	Not Complete
Asotin	Asotin	No			WA State	In Progress
Asotin Co.	Asotin	Yes	Yes	Yes	RMC	Not Complete
Auburn	King	Yes	Yes	Yes	WA State	In Progress
Binbridge Is.	Kitsap	No			WA State	In Progress

2. Cooperating Technical Partner Efforts

Activities the State is performing under it's CTP agreement with FEMA are below in table 3.
table 3. Fundable CTP activities

Activity	Partner	Description
Refinement or Creation of Approximate Zone A Boundaries	State Agency	The State works with FEMA to perform analyses to refine Zone A boundaries shown on the effective Flood Insurance Rate Map (FIRM) or create new Zone A areas to be included on the FIRM.
Hydrologic and Hydraulic Analyses and Floodplain Mapping		The State develops digital engineering data and floodplain mapping using Geographic Information System (GIS)-based or traditional hydrologic and hydraulic modeling.
Coastal Flood Hazard Analyses and Floodplain Mapping		The State develops digital engineering data and floodplain mapping using GIS-based or traditional coastal flood hazard analysis methods.
Digital Flood Insurance Rate Map (DFIRM) Preparation		The State digitizes information from the effective hardcopy FIRM and prepares a DFIRM that meets FEMA specifications.
Redelineation of Detailed Floodplain Boundaries Using Updated Topographic Data		The State redelineates the effective floodplain boundaries shown on the FIRM using more up-to-date topographic data.
Digital Topographic Data Development		The State develops digital topographic data for flood hazard identification purposes as necessary
Scoping up to 10%		Up to 10% of the total estimated funding should be provided to do broad project scoping that leads to the development of the Mapping Activity Statement.
Post Preliminary Processing	State Agency	The State processes the DFIRM product from Preliminary stage through adoption.
Outreach	State Agency	The State performs outreach to stakeholders to improve the acceptance of the maps into the community.

There are two primary mapping CTP mapping efforts underway in the State of Washington through the CTP agreement with FEMA Region X. They are detailed below in sections ‘Spokane County Mapping’ and ‘Kitsap County Mapping’ (see appendix E. CTP documents).

a. Spokane County Mapping

The general objectives for this Flood Map Revision Project are to:

1. convert Spokane County FIRM panels to the GIS-based digital format;
2. update the floodplain and floodway delineations for Forker Draw, Argonne Road, Saltese Ponding, Glenrose Ck., Deadman Creek, Latah Ck, Dartford, and Belle Terra Ave. to reflect new hydrologic and hydraulic analyses.
3. incorporate complete updated planimetric map features, including previously approved Letters of Map Correction.

Description of mapping project. This Flood Map Revision Project will include the entirety of Spokane County, including the Cities of Spokane, Spokane Valley, Fairfield, Cheney, Rockford, and Spangle. Mapping activities will be based on data developed in the original FIS for Spokane County prepared by FEMA. New detailed studies may be provided for Chester Creek, Forker Draw, Argonne Road, Saltese Ponding, Glenrose Creek, Deadman Creek, Latah Creek, Dartford area, and Belle Terre Ave.

Outreach Strategy. A Press Release was issued by the Department of Ecology in August, 2004. Press Releases may be issued by Spokane County at that time, for the Final Meeting and once the data is finalized. Each City will be encouraged to provide similar press releases through their local media. The County’s Emergency Management Office will be used for publicizing the study, in view of this agency’s prominence in the community. Unincorporated communities will be targeted with special mailings to notify residents of the start, progress and finish of the project, in view of the impact of the restudies on that community.

The following table is the Spokane County panel/restudy tracking tool.

County	Streams	Panels	P. Remain	Date Funded	detail study approx. miles	Completed or contracted	Remarks
SPOKANE		88	88	2004			
	Chester Creek				5.11	5.11	Underway by FEMA
	Forker Draw				1.5		
	Argonne Road				1.5		
	Saltese				0.75		
	Glenrose Creek				2.25		
	Deadman Creek				3.1		
	Latah Creek				5.4		
	Dartford				3.6		
	Belle Terre Ave.				1		
Total miles					19.1		

b. Kitsap County Mapping

The general objectives for this Flood Map Revision Project are to:

1. convert Kitsap County FIRM panels to the GIS-based digital format;
2. update the floodplain and floodway delineations for Clear Creek to reflect new hydrologic and hydraulic analyses from the Clear Creek Comprehensive Flood Hazard Management Plan; (CFHMP); and
3. incorporate complete updated planimetric map features, including previously approved Letters of Map Correction.

Description of Mapping Project. This Flood Map Revision Project will include the entirety of Kitsap County, including the Cities of Bainbridge Island, Poulsbo, Port Orchard and Bremerton. It will be based on data developed in the original FIS for Kitsap County prepared by Tudor Engineers and made effective in the early 1980s for all jurisdictions. New detailed study will be provided for 2 miles of Clear Creek and .25 miles on an unnamed tributary, based on H&H information developed in the Clear Creek CFHMP and related studies (see appendix B. for State contributions to this project).

Outreach Strategy. A Press Release was issued by the Department of Ecology in August 2004. Press Releases can be issued by Kitsap County at that time, for the Final Meeting and once the data is finalized. Each City will be encouraged to provide similar press releases for their local (mostly weekly) papers. The County’s Emergency Management Office will be used for publicizing the study, in view of this agency’s prominence in the community. The unincorporated community of Silverdale will be targeted with special mailings to notify residents of the start, progress and finish of the project, in view of the impact of the Clear Creek restudy on that community.

The following table is the Kitsap County panel/restudy tracking tool.

County	Streams	Panels	P. Remain	Date	detail study	Completed
				Funded	approx. miles	or contracted
KITSAP		46	46	2004		
	Clear Creek				2	2

Other Mapping Activities

Yakima County, Washington

Yakima County is currently a CTP and is updating some of their maps with their consultant. The county has access to digital elevation data (LIDAR), digital orthophotos, and quadrangle base maps for the Yakima and Naches river valleys. The State is currently pursuing partnership opportunities with the county to restudy several West Valley streams with State and local funding.

The following table is the Yakima County panel/restudy tracking tool.

County	Streams	Panels	P. Remain	P. Complet	detail study approx. miles	Completed or contracted
Yakima		109	109			
FEMA & State Priority	Naches River				18	18
Other Potential Study Reaches						
	Ahtanum Creek				15	
	N.F. Ahtanum Creek				10	
	Ahtanum Creek Overflow				10	
	Bachelor Creek				12	
	Hatton Creek				10	
	Wide Hollow Creek				15	
	Spring Creek 1				2	
	Spring Creek 2				13	
		109	109		87	18
		Total	Remains	Done		

V. THE STATE'S PLANS FOR FUTURE MAP MODERNIZATION ACTIVITIES

1. Program Plan

Project Timeline

Project timeline began in 2003 with FEMA funding to develop the plan (Phase I) and will extend through the year 2009 when all of Washington State's communities will have completed or preliminary DFIRMs with priority restudies incorporated. This plan details the timeline in a County Conversion table tailored by the Multi-Hazard Implementation Plan (MHIP) (see appendix F. County Conversion Schedule).

The State will ensure effective program management in all phases and activities by working closely with Region X staff and the RMC to develop aggressive yet achievable timelines for each phase of the Map Modernization effort; including fast-track opportunities and quarterly reporting. The State has assisted the program by providing up-front details of the State's priority flood hazard areas.

Proposed Approach to Map Production

The State's consultant, FEMA, a consultant selected by a local CTP and/or a federal partner such as the U.S. Army Corps of Engineers (Corps), could perform flood studies, mapping, and/or digital conversions. The Corps is currently performing studies on several major western Washington river systems, including the Skagit River in Skagit County, and is expected to continue these studies during the mapping period covered by this plan (2003-2009). The State's consultant has been contracted directly by the State and has all the necessary expertise and experience to perform flood studies, digital conversions, and project management. The consultant and the local community will collect all necessary data and submit to FEMA for approval. In addition to the work being contracted by the State, it is anticipated that FEMA Region X will continue to direct some work being performed in Washington State using an IDIQ, NSP, or coordination with the Corps. Mapping activities performed by the State are directed in two separate work assignments; Scoping and Implementation. Implementation is also phased into two directives; Mapping Activities and DFIRM Activities. This will conform to FEMA phased approach to funding and allow the State to manage these activities separately (see appendix G. Spokane Kitsap SOW Work Assignment #1').

The Scope of Services to complete all activities outlined in the MAS will be undertaken in two Work Assignments as follows:

Work Assignment #1

- Phase I Project Scoping Activities (Activities 1 and 2 in the MAS)

Work Assignment #2

- Phase II Floodplain Mapping Activities (Activities 3 through 12 in the MAS)
- Phase III DFIRM Activities (activities 13 through 16 in the MAS)

DFIRM Conversion

Department of Ecology acquired information on the cost of creating DFIRMs, per FEMA specifications, to assist the State in compiling the Washington Map Modernization Business Plan. The following assumptions are draft estimates from our consultant and will be further developed as needed.

The basis for the following estimate is for current DFIRM work. The assumptions behind the cost information are as follows:

- The project encompasses an entire county
- Average number of panels per county is 70 to 120
- Vertical datum adjustments are not necessary
- A pilot project is not required
- Source materials are hard copy FIRM panels
- Countywide GIS base map layers are available

Conversion of FIRM panels to a digital format, edgematching and producing data layers and layer attributes to meet FEMA DFIRM specifications will be in the range of \$2800 - \$3200 per panel.

The above estimate reflects significant savings due to developing the DFIRM on a countywide basis. The cost of creating DFIRMS on a panel-by-panel basis vs. on a countywide basis could be significantly more. The difference is due to processing base map data for one panel vs. compiling the base map for 70 to 120 panels. Having countywide GIS base map layers also results in significant saving. The cost of creating the base map layers/attributes from digital orthophotos could cost more.

The State estimates the total dollar amount necessary to complete the state is approximately \$6.5 million (see appendix F. County Conversion Schedule and Cost Estimates).

Study Categories

Study categories have been revised to include two primary categories, restudies and conversions, and two optional restudy categories, revised detailed and redelineation using new topography. The FEMA regional engineer and the States staff deemed these categories the most appropriate in Washington State. However, other options will be explored as necessary.

How the State will fulfill the Cost-share Requirements

The State intends to use the FCAAP account to provide the 20% cost share for CTP activities directed by the State (see appendix A. for FCAAP contributions leading to new mapping products). This grants program is competitive amongst several fundable activities and entities. However, the State does intend to leverage 20% cost share through this grants program and associated funds. The State is also aggressively leveraging in-kind data and services towards the program and will itemize these contributions on a project-by-project basis.

Outreach Plan

The State of Washington perceived one of its primary roles in Map Modernization as one of outreach to its communities and partners and anticipated outreach activities would be in the forefront of the State's involvement. In the initial year of the program (2004) the State successfully completed two components of their strategy: A formal Press Release and statewide distribution of a bulletin that describes the program, the State's role, and how the communities can benefit from Map Modernization (see appendix H. Press Release and appendix I. Map Modernization Bulletin).

Workshops and Conferences

The State has planned two workshops in 2005 that will further promote the program and are directed to leverage local and state cost sharing into the program. The first of these workshops is slated for the Spring of 2005 in Yakima County, one of the state's priority areas in terms of restudies and flood map update needs. Future workshops will be tailored to the needs of the pending mapping activities as they are sequenced. The State anticipates workshops will cover other topics such as: partnering, new DFIRM products and tools, elevation certificates, and map adoption. The State continues its involvement with the Northwest Floodplain Managers Association (NORFMA) and annually presents material on Map Modernization to stakeholders and communities.

County-wide formats

A focus of the States outreach efforts is technical assistance to communities on county-wide formats and developing coordination avenues between counties and their respective jurisdictions. The State has performed several of these activities to date and will continue to carry out that strategy.

Website

Web-based outreach activities will continue to be provided by the State as supplementary and complimentary components of the Outreach Plan. The State's current Floodplain Management website has been enhanced to include the 2004 Business Plan, links to FEMA's Map Modernization Site, flood fact sheets, available data, and community specific contact information.

2. Performance and Program Management Goals

The State's in-house staff has over 100 combined years of experience and service to floodplain management in Washington State. This knowledge base has provided continuous support to FEMA's goals and objectives:

- Achieve Effective Program Management
- Build and Maintain Mutually Beneficial Partnerships
- Establish a Premier Data Collection and Delivery System
- Expand and Better Inform the User Community

Program Management Goals

The State intends to achieve effective program management by building on 2004 efforts and lessons learned in their initial phases of Map Modernization. The primary goals for 2005 are:

- Leveraging past contributions from the State's grants program (FCAAP) towards current and future Map Modernization activities
- Continued efforts to coordinate our current CAP/SSSE activities and grants programs with Map Modernization activities
- Continue to develop mutually beneficial partnerships
- Continue to learn and adapt to evolving business functions and coordination
- Continue to expand and better inform the user community

Partnership Goals

Partnership opportunities with sister state agencies have not culminated into desired outcomes primarily due to severe budget constraints on all state agencies. Future partnerships opportunities are continuing to be explored as management level discussions are being coordinated.

One partnership opportunity that continues to be promising is coordination with the Washington Geographic Information Council (WAGIC). This partnership is developing and anticipates enhanced consistency within base map layers and will promote free data distribution across agencies and communities.

Data Collection and Delivery

The State's Flood Mapping Coordinator and our consultant have extensive experience and training with FEMA data standards and product specifications. To date, all geo-spatial data collected and exchanged between the State, the Study Contractor, and the Regional Implementation Team has been consistent with FEMA guidelines and specifications. The State's future GIS and internet applications have proven to be effective in providing guidance and coordination of Map Modernization activities to the State's communities and partners.

Flexible Solutions

The State has relied on its flexible solutions to adapt to changing Map Modernization goals and activities. Example of the State's flexibility has been adoption of the MHIP sequencing tool, new scoping tools, and all new ways of doing business with FEMA NFIP mapping. The State outlined its priorities with flexibility in mind which allowed for MHIP sequencing without difficulty. Another example of flexibility and adapting to new ways of doing business is being pursued now as the State (a CTP) will try to partner with Yakima County (also a CTP) and combine resources in an attempt to expand mapping activities beyond the estimated FEMA funding goals. Yakima County has a developing area with several low-lying drainage areas that experience nuisance flooding and channel migration concerns. The hydrology is complex and interconnected with several canals, overflow channels, and sediment transport issues. The modeling of these areas may require sophisticated tools that could make funding these restudies costly and time consuming. By collaborating with the county and pooling resources, the State hopes to expand this restudy area beyond FEMA's currently budget limitations.

Flood Hazard Data

The State continues to provide flood hazard data freely to the public and local governments in several environments including quick-access internet viewers, downloadable flood hazard data, and planning tools. The State distributes flood hazard data in GIS based formats for detailed and extensive planning applications resulting in reduced vulnerability to natural, accidental or man-made hazards. The State data viewing and distribution systems have proven to be easy to use, flexible, and adaptable. This system allows for future technological advances and is formatted for public use. The State has utilized its existing digital mapping technologies effectively to provide FEMA with a premier data collection and delivery system for use in FEMA's Map Modernization Program and Multi-hazard Mapping Initiative.

Expand and Better Inform the User Community

The State's Map Modernization activities have made significant progress in expanding Map Modernization information to the public through an internally developed Press Release and a Map Modernization Bulletin (see appendices H. and I.) Along with enhanced web-based functionality and materials, the State's outreach program is certain to pay off when mapping activities are implemented. Moreover, technical assistance to local communities has sharply risen due to the State's dedicated Mapping Coordinator. The Mapping Coordinator has had dozens of technical assistance contacts with local officials, technical staff, State and Federal agencies, and stakeholders preparing for Map Modernization activities.

3. Tracking & Reporting Tools

A completeness plan is being developed using three tracking tools. The first tool is a spreadsheet that will track the individual mapping needs, by county, using the States predefined priorities (an example table is found below, full tables are found in appendix J. Mapping Needs Spreadsheets).

County	Streams	Panels	Panels Remain	Panels Complete	Date Funded	Detail study Approx. Miles	Completed or Contracted
CHELAN		29	29				
KING							
	Mill Creek					1	
	Cedar River					21	21
	Lower Snoqualmie R.					34	34
	Springbrook Creek					7	7
	Rolling Hill Creek					1.2	1.2

The second tool is a countywide conversion schedule that incorporates the MHIP sequencing tool and preferred mapping work prior to county conversion (an example table is provided below, full tables are found in appendix F. County Conversion Schedule and Estimated Costs for Conversion).

Grant	4	2006	53	1471	\$159,000
Lewis	1	2006	81	861	\$243,000
Yakima	2	2006	109	2063	\$327,000
Total					\$729,000
Adams	9	2005	35	470	\$105,000
King	1	2005	184	9563	\$552,000
Kitsap	2	2005	46	5134	\$138,000
Skagit	1	2005	75	1425	\$225,000
Spokane	1	2005	88	4858	\$264,000
Total					\$1,284,000

Washington State 2005 Business Plan

The third performance tool is extracted from the regional MHIP Sequencing Tool for Washington communities only. The State will utilize this tool to determine if adequate funding is being dedicated, to identify where shortfalls in funding necessary to complete ongoing or planned activities, and to determine where best to pursue leveraging and cost sharing (an example is provided below, full tables are found in appendix K. MHIP Sequencing Tool for Washington State).

BASE DATA			FEMA DISTRIBUTION OF FUNDS (\$ IN 1,000'S)							
County	FIPS	DECILE	FEMA FY03 AND PRIOR*	FEMA FY04	FEMA FY05	FEMA FY06	FEMA FY07	FEMA FY08	FEMA TOTAL	
Adams	53001	9			\$240				\$240	
Asotin	53003	7					\$75	\$25	\$100	
Benton	53005	2					\$165	\$100	\$265	
Chelan	53007	3				\$80	\$40		\$120	
Clallam	53009	3				\$180	\$40		\$220	
Clark	53011	1	\$291	\$783					\$783	
Columbia	53013	8						\$100	\$100	
Cowlitz	53015	2				\$190	\$100		\$290	
Douglas	53017	6					\$80	\$20	\$100	

CTP Agreements and Mapping Activity Statements (MAS)

The State will use the following table to help manage and track local CTP agreements and incorporate the prescribed data and products into the business plan and archive.

Name of Partner	Effective Date	Agreement Received by MCC	Mapping Activity	MAS Effective Date	MAS No.	MAS Received by MCC
WA State Dept. of Ecology	03/01/01	Yes	Assessment of Community Mapping Needs	03/01/01	1	Yes
			Digital Base Map Sharing	03/01/01	2	Yes
Clark County, WA	05/23/02	Yes	Hydrologic & Hydraulic Analyses & Floodplain Mapping		1	No
			Hydrologic & Hydraulic Analyses & Floodplain Mapping		2	No
			Hydrologic & Hydraulic Analyses & Floodplain Mapping		3	No
			Hydrologic & Hydraulic Analyses & Floodplain Mapping		4	No
Grays Harbor County		No				
City of Issaquah	03/15/00	Yes	Hydrologic & Hydraulic Analyses & Floodplain Mapping	08/30/01	1	Yes
King County	09/26/00	Yes	Hydrologic & Hydraulic Analyses & Floodplain Mapping	09/26/00	1	Yes
			Hydrologic & Hydraulic Analyses & Floodplain Mapping		2	No
Lewis County		No				
Pierce County	09/22/99	Yes	Redelineation of Floodplain Boundaries Using Updated Topographic Data	09/22/99	1	Yes
			Hydrologic & Hydraulic Analyses & Floodplain Mapping		2	No
City of Puyallup		No				
City of Renton		No	Hydrologic & Hydraulic Analyses & Floodplain Mapping		1	No
Skagit County		No				
Snohomish County		No	Hydrologic & Hydraulic Analyses & Floodplain Mapping		1	No
City of Tacoma		No				
Thurston County		No				
Whatcom County	08/31/00	Yes	Coastal Flood Hazard Analyses & Floodplain Mapping	07/30/01	1	Yes
Yakima Co.		No				

Mapping Needs Spreadsheets

Revised spreadsheets are located in the appendix detailing the States mapping activities in 2004, proposed activities in 2005 and beyond. The Following Spreadsheet reflects The State's Proposed 2005 Mapping Activities (see appendix J. Mapping Needs Spreadsheets).

County	Streams	Panels	P. Remain	P. Completed	detail study approx. miles	Completed or contracted
Adams		35	35			
Grant		53	53			
King		184	94	90		
Kitsap		46	46			
Spokane		88	88			
Yakima		109	109			
	Naches				18	18
	Ahtanum Creek and N.F.				15*	
					12*	
					10*	
	Wide Hollow Creek				15*	
		515	425	90	0	18
		Total	Remains	Done		
Est. Cost	Restudy				\$0	
Est. Cost	Conversions				<u>\$1,275,000</u>	
Total Est. Cost					\$1,275,000	
State Contributions						
		State	Local	Total		
Flood Hazard Mapping	King	\$92,500	\$30,833	\$123,333		
Clear Ck Modeling	Kitsap	\$60,000	\$120,000	\$180,000		
W. Valley CFHMP	Yakima Co.	\$165,000	\$124,800	\$289,800		
Naches River	Yakima Co.	\$112,000	\$37,333	\$149,333		
Total				\$742,466		
Estimated Costs for restudies and new studies are \$12,000/mile Estimated Costs for conversion to new DFIRMS is \$3000/panel * Proposed restudies with significant leveraging opportunities from State and Local sources. 52 approx restudy miles @ 15,000 per mile = \$780,000						

County Progress Funding Tool

The following tool provides the State with a tracking tool for appropriated vs. estimated costs

WA State	County	Fema Cont. (MHIP)	State '04 Funds	Est. Project Scoping Costs	Est. Conv. Cost	Est. Restudy Cost	Est. Total Cost	MNA Source/ Status	State Project Priorities	Scoping Meeting
Year			333,150	67,203	402,000		469,203			
'05	Adams	\$240						DOE/IP	C	
	Asotin	\$100						RMC/NC		
	Benton	\$265						DOE/IP		
	Chelan	\$120						DOE/IP		
	Clallam	\$220						DOE/IP		
	Clark	\$783						DOE/IP		C
	Columbia	\$100						RMC/NC		
	Cowlitz	\$290						RMC/NC		
	Douglas	\$100						DOE/IP		
	Ferry	\$130						RMC/NC		
	Franklin	\$256						DOE/IP		
	Garfield	\$98						DOE/IP		
'05	Grant	\$144						DOE/IP	C	
	Grays Harbor	\$488						DOE/IP		
	Island	\$0						DOE/IP		
	Jefferson	\$183						DOE/IP		
'05	King	\$710						RMC/NC	C	
'04	Kitsap	\$303	63,000	23,698	138,000	24,000	185,698	RMC/IP	C	C
	Kittitas	\$800						RMC/IP		
	Klickitat	\$120						DOE/IP		
	Lewis	\$600						RMC/IP		
	Lincoln	\$115						DOE/IP		
	Mason	\$100						RMC/NC		
	Okanogan	\$120						DOE/IP		
	Pacific	\$122						RMC/NC		
	Pend Oreille	\$98						DOE/IP		
	Pierce	\$556						RMC/NC		C
	San Juan	\$100						DOE/IP		
	Skagit	\$234						RMC/NC		
	Skamania	\$100						RMC/NC		
	Snohomish	\$452						DOE/IP		
'04	Spokane	\$914	270,150	43,505	264,000	229,200	536,705	RMC/NC	IP	C
	Stevens	\$166						DOE/IP		
	Thurston	\$333						DOE/IP		
	Wahkiakum	\$110						DOE/IP		
	Walla Walla	\$151						RMC/NC		
	Whatcom	\$0						DOE/IP		
	Whitman	\$302						RMC/NC		
'05	Yakima	\$613						RMC/NC	IP	

MMMS Activities Tracking Tool

County	Conversion Target Date	Press Release & Bulletin	Website	Initial Community Contact	Workshop Attendance	Scoping Meeting
Adams	2005	Complete	75%			
Asotin	2008	Complete	75%			
Benton	2008	Complete	75%			
Chelan	2007	Complete	75%			
Clallam	2007	Complete	75%			
Clark	2004	Complete	75%	Complete		Complete
Columbia	2008	Complete	75%			
Cowlitz	2007	Complete	75%			
Douglas	2008	Complete	75%			
Ferry	2007	Complete	75%			
Franklin	2007	Complete	75%			
Garfield	2008	Complete	75%			
Grant	2006	Complete	75%			
Grays Harbor	2007	Complete	75%			
Island	2003	Complete	75%	Complete		Complete
Jefferson	2007	Complete	75%			
King	2005	Complete	75%			
Kitsap	2005	Complete	75%	Complete		Complete
Kittitas	2008	Complete	75%		'05	
Klickitat	2007	Complete	75%			
Lewis	2006	Complete	75%	Complete		Complete
Lincoln	2008	Complete	75%			
Mason	2008	Complete	75%			
Okanogan	2007	Complete	75%			
Pacific	2008	Complete	75%			
Pend Oreille	2008	Complete	75%			
Pierce	2004	Complete	75%	Complete		Complete
San Juan	2008	Complete	75%			
Skagit	2005	Complete	75%	Complete		Complete
Skamania	2008	Complete	75%			
Snohomish	2007	Complete	75%			
Spokane	2005	Complete	75%	Complete		Complete
Stevens	2008	Complete	75%			
Thurston	2008	Complete	75%	Complete		Complete
Wahkiakum	2008	Complete	75%			
Walla Walla	2007	Complete	75%			
Whatcom	2003	Complete	75%	Complete		Complete
Whitman	2007	Complete	75%			
Yakima	2006	Complete	75%	In Progress	'05	

LEVERAGING TOOL and Cost Estimator

The State will utilize a Leveraging Tool to plan and document cost sharing potential and performance (see appendix L. Leveraging Estimator).

CTP Quarterly Report Template

The State will provide a quarterly report of both MMMS and CTP activities performed by the State and will use any templates designed by FEMA as guidance (see appendix M. CTP Quarterly Reporting Template and appendix N. MMMS Quarterly Report Template).

VI. Appendices

- Appendix A. WA State Staff Contributions
- Appendix B. WA State FCAAP Contributions
- Appendix C. MNA News Letter 2003
- Appendix D. MNA Documents
- Appendix E. CTP Documents
- Appendix F. County Conversion Schedule and Cost Estimates
- Appendix G. Spokane Kitsap SOW Work Assignment #1
- Appendix H. Press Release
- Appendix I. Map Modernization Bulletin
- Appendix J. Mapping Needs Spreadsheets and Tracking Tools
- Appendix K. MHIP Sequencing Tool
- Appendix L. Leverage Estimator Tool
- Appendix M. CTP Quarterly Reporting Template
- Appendix N. MMMS Quarterly Reporting Template