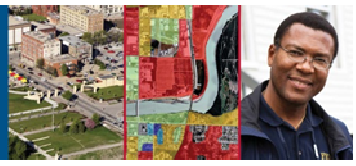


Project Name:	*FEMA Region X Discovery*
Meeting:	*Valdez Coastal Project Area, Discovery Meeting*
Date and Time:	*July 11th 2011, 9 am – 12:30 pm AKST*
Place:	*Valdez City Hall, 215 Chenega Avenue, Valdez, AK 99686*

Discovery Meeting Notes

Attendees

George Keeney, Fire Chief/Emergency Manager, City of Valdez
Laura Robertson, Floodplain Administrator/GIS Technician, City of Valdez
Lisa Von Bargen, Community Development Director, City of Valdez
Larry Weaver, Public Works Director, City of Valdez
Sally Cox, Alaska Risk MAP Coordinator, Division of Community and Regional Affairs
Taunnie Boothby, Alaska State NFIP Coordinator, Division of Community and Regional Affairs
Mark Roberts, Alaska State Hazard Mitigation Officer, Alaska Division of Homeland Security and Emergency Management
Jennifer Meyer, Risk Assessment, FEMA RX
James Fountain, Project Manager FEMA RX/Accenture
Matt Johnson, Discovery Watershed Lead/Engineer, STARR

Introductions

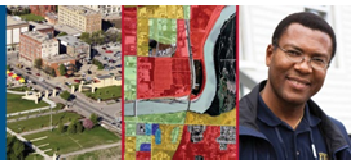
Jen Meyer opened the meeting and all attendees introduced themselves. A pre-populated sign-in sheet was distributed for attendees to initial their attendance and check and correct contact information. Jen then reviewed the meeting objectives: to provide an overview of Risk MAP and Discovery, present known and best available data, discuss local flood risk and management, discuss the responsibility for communicating about risk to the public, discuss mitigation planning and projects, and identify the most high-risk areas in the watershed.

Introductions to Coastal Study Methodology

Matt Johnson presented an overview of the coastal methodologies set forth in FEMA guidelines emphasizing that digital data is essential in development of the coastal models, in addition to getting on the ground and experiencing firsthand the topography and structures that influence the results. Matt presented a flow chart to illustrate the steps in coastal model building and described those steps. The steps presented were:

- Determine coastal setting
- Perform Flood Frequency Analysis
- Determine Waves and Water Levels
- Calculate Setup, Runup and Overtopping
- Define Coastal Erosion
- Analyze Coastal Structures
- Map Hazard Zones

Each step in the process was briefly described. The definition of wave seiching was discussed and the group agreed that this is an important aspect of wave action in Port Valdez.



Lisa Von Bargen asked if this project was exclusive to coastal flooding or if riverine environments were also being considered. The community indicated that their major flooding issues are related to the riverine environments, as the nature of the rivers here are highly migratory and unpredictable. One major flooding concern is when glacier supra lakes break and sudden pulses flow from the glaciers. James Fountain asked if there were any gages or sensors to provide warning. George Keeney stated there is not a warning system established for glacier supra lake breaks. The city of Valdez officials stated that they know the areas that flood and when they can expect these events based on the weather patterns and local conditions.

The Flood Insurance Rate Maps (FIRMs) were then discussed. The Flood Insurance Study (FIS) and FIRMs for Valdez are dated December 1, 1983. All the riverine flood studies described in the FIS may be considered outdated. The riverine systems are extremely dynamic and in all cases have migrated outside the Special Flood Hazard Areas (SFHAs).

Lisa asked when the city will know if a Risk MAP project will be funded. Jen indicated that budgeting for FY11 has allowed for LiDAR collection, which is scheduled to be flown soon. The funding for FY12 has yet to be defined and although no guarantees were made, the continuation of the Risk MAP project with performing new studies should proceed in that budgeting. Jen described current complications with the dynamic and unsettled levee policy that FEMA is currently drafting. The upcoming revised levee policy is suspected to impact many ongoing projects and a portion of the FY12 funding will be allocated to address those levee issues.

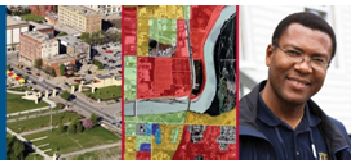
Laura Robertson commented that the LiDAR has already been funded and will be available for use. She asked if the city of Valdez may perform the work if future funding through FEMA is not available. Jen indicated that is a viable option and the community could proceed under the Cooperating Technical Partner program (CTP). She also expressed concern in that many communities follow this route and become held up in the production from cartography standards and non-familiarity in the process. Jen suggested contacting David Ratté (david.ratte@dhs.gov), FEMA Regional Engineer, for information about becoming a CTP.

Jen described that if funding is approved for the Valdez Risk MAP project, the typical timeline extends about five years. Jen mentioned that the project starts with Discovery and then there will be another meeting in four months, where FEMA will describe what work will be done and a project charter will be presented.

Introductions to Risk MAP and Discovery

Jen provided an overview of Risk MAP. She explained the difference between Map Modernization and Risk MAP and acknowledged that Valdez has not yet had a digital conversion project. She described how Risk MAP will emphasize the importance of community involvement in this process to not only supply local information, but to be engaged in what types of additional products may aid in their hazard mitigation efforts. She introduced the Standard Risk MAP Products and the Non-Regulatory Risk MAP Products. She introduced the "Changes Since Last Map" layer and table which shows what has changed from the effective map, including a summary on number of structures and residents impacted. She stated that this tool will be useful in addressing questions that arise during the preliminary phase and to plan for outreach ahead of the effective date.

Jen discussed the Multi-Frequency Depth Grids layer and how it is a useful tool to show that folks can still be seriously flooded in more frequent events than the 1% annual chance flood event, and that the "magic" line of the 1% annual chance event can be misleading because there is still a risk of flooding



during the 0.2% annual chance event, it just has a lower probability. The flood depth tool can allow for visualization of multiple storm events. Most people may not understand the meaning of the 1% annual chance event, but are far more likely to have witnessed a 10- or 30-year event in their lifetime and can therefore relate. Jen asked the group as to whether they thought these tools would be useful for the city of Valdez and Laura indicated these tools would be useful to communicate and educate roughly 200 homes. Jen then informed the group that this type of analyses can be performed for earthquake, tsunami, and wildfire, in addition to flooding.

Jen then introduced Hazus Risk Assessment and the National Flood Risk Layer. She stated it is a loss estimation tool developed by analyzing flood depth information with the built environment and its value. She illustrated that if this information is developed with local information, such as building footprints assessor's data, these tools can be very accurate and useful to illustrate risk and losses. She described how all the flood frequencies are aggregated to produce the annualized loss figures. Jen asked if the city of Valdez had building information and footprints available in Geographic Information Systems (GIS) format. Laura indicated they do have that information and most of it has already been added to the Discovery Geodatabase.

Jen then informed that the Flood Insurance Study (FIS) and Digital Flood Insurance Rate Maps (DFIRMs) are still produced and used for regulation in the Risk MAP program.

Jen then described Discovery and that funds were made available to collect information about communities through the interview process and hold the Discovery Meeting. During this Discovery phase of the Risk MAP project, information about flood studies, flood risk assessments, and mitigation planning and technical assistance projects are collected and flood risk projects are identified and prioritized.

Risk MAP Needs Conversations

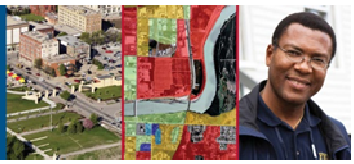
Matt displayed the Discovery data and described the data collected and the symbology used on the displayed Discovery Meeting Map. The meeting agenda was used as a guide to discuss the Areas of Concern that were identified during interview. Each flooding source was discussed in detail.

Lowe River

The Lowe River is glacier-fed with a wide, highly migratory floodplain. Along the Lowe River there are several dikes that protect subdivisions and the Richardson Highway. The city maintains dikes that protect residents while the Alaska Department of Transportation (AK DOT) maintains the state owned levees that protect the highway. There are several issues along the Lowe River that a Risk MAP project should address.

The Lowe River is highly migratory and is now outside the Special Flood Hazard Area (SFHA). The effective study is outdated and potentially invalid due to the extreme migratory nature of this braided river. The city of Valdez requested a new *detailed study* for the *Lowe River* from the estuary area upstream to the new LiDAR boundary with a high priority. This river has the most visible flood hazard of the area.

The Alpine Woods Subdivision is currently being protected by a dike system. This system is currently undergoing an expansion and improvement project due to observations made during the floods of 2006. Another issue with this subdivision is that hillside runoff has a tendency to collect and pond behind the dikes. This has caused flooding to residents in the past. The city of Valdez requested a *detailed study* for the *Alpine Woods* Subdivision. Another need for this area is non-regulatory Risk



MAP products. *Depth grids and a risk assessment* are desired and should be developed for the *Alpine Woods Dikes* area. Also, *training* on levee accreditation requirements of 44 CFR 65.10 would highly benefit this community since they are currently improving this dike system. The city requested this assistance with a high priority.

The Sixmile area and Rainbow Apartments area are protected by state owned dikes. The Rainbow Apartments regularly experience flooding within one foot of the road and it is suspected that a large flood will impact properties and potentially cut off residents from the main road. The Sixmile area also experiences flooding and in the 2006 flood, the water was over the road. Both *Rainbow Apartments* and *Sixmile* areas were requested for *Non-regulatory Risk MAP products* to provide *preparedness outreach and risk assessments* with a medium priority.

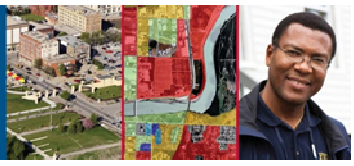
The *Lowe River Subdivision* has been plotted and is located in the Lowe River floodplain. The subdivision is currently undeveloped but the city expects that in the future someone will attempt to build here. The city has declared they will not provide any infrastructure services to these parcels. *Non-regulatory Risk MAP products to provide outreach, depth grids, and risk assessment tools* would greatly benefit the city's outreach efforts to discourage potential development in this area. The city requested these tools at a low priority.

Valdez Glacier Stream

The Valdez Glacier Stream has presented several issues for the city of Valdez. The stream has a large levee that protects the Richardson Highway, the city landfill, three or four homes, and a cemetery with historical significance. This levee requires annual maintenance and significant resources to maintain its integrity after large flow events. A major flooding issue for this stream is glacier supra lake breaks that release large pulses of water without much warning. As its name implies, the steam is glacier-fed with a massive amount of material deposition and frequent migration.

The city has pursued US Army Corps of Engineers (USACE) permits to dredge the streambed to reduce the erosiveness and damage caused during high flow events and to relieve pressures on the levee system. The USACE has resisted issuing a permit without a hydrologic study of the system that establishes how much material is annual conveyed through the system, where the city should dredge, and where that material should be placed. To illustrate magnitude, Larry Weaver indicated that if 3 million cubic yards of material was removed from Valdez Glacier Stream a noticeable improvement would not likely be observable. Taunnie Boothby suggested following a similar effort as the city of Seward where pre-event LiDAR elevations were compared to post event field survey elevations to quantify the rate of deposition. The community then used this information as support to receive post disaster mitigation funding from FEMA.

The LiDAR footprint for the Valdez Glacier Stream was reviewed during the meeting and it was observed that the glaciers upstream were not covered. The city requested that this area be included in the LiDAR footprint so a hydrologic study could commence. Jen Meyer indicated that the scope and budget for this LiDAR acquisition has already been approved but that the city should contact Aerometrics to entertain the possibility of expanding the footprint. The city indicated that the hydrologic study is the highest priority for this stream. The city stated that they may be able to provide the hydrologic component of the study that would feed into a detailed flood study. If the hydrologic study is completed by the city, a *detailed flood study* for the *Valdez Glacier Stream* is desired with high priority from the confluence with the Lowe River upstream to the city limit.



Another potential solution to the *Valdez Glacier Stream Dike* issue of annual dike maintenance, erosion, and severe migration of the Valdez Glacier Stream is the creation of another opening under the Richardson Highway. It was suspected that a lot of pressure would be relieved if an additional opening were created. Larry pointed to the aerial photography of the stream where the active floodplain has formed an hourglass shape up and downstream of the sole opening through the Richardson Highway. The city desires the creation of another opening as a *mitigation project* with low priority. It was discussed that this project is suitable to be incorporated into the city's hazard mitigation plan.

Mineral Creek Loop Road

This area has development immediately adjacent to the tidal flats. There is at least one home here that regularly floods due to the combination of swells at high tide. A *detailed coastal flood study* was requested for the developed tidal flat area along *Mineral Creek Loop Road* with a medium priority.

Avalanche Hazard Areas

Several areas in Valdez have been mapped for high avalanche hazard. A risk assessment is desired with a low priority for these areas.

Robe River and Robe Lake

There is a subdivision along the Robe River that is at risk of flooding. There are not many issues along this river but a detailed flood study is desired with low priority from the outlet of Robe Lake to Port Valdez. Robe Lake's inlet has been modified from its natural configuration. Corwin Creek has formerly flowed into Robe Lake but a diversion was created to flow into Valdez Glacier Stream. As a result, flooding has likely increased on Valdez Glacier Stream and Robe Lake is gradually deteriorating. A contributing flood factors Non-Regulatory Risk MAP product is desired by the city of Valdez. Additionally, restoring the *Robe Lake Inlet* is the number one *mitigation project* desired by the city of Valdez and is a high priority.

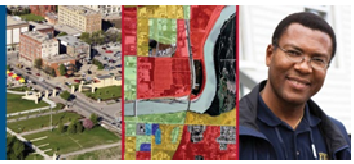
Mineral Creek

Mineral Creek is an existing detailed flood study with development along its banks. This area holds significant recreation and historic value for the city of Valdez. There are city owned and operated levees on both sides of the creek that do not have 44 CFR 65.10 documentation but do provide protection to residents. The city had constructed these levees in 1994 and a LOMR was issued. The city officials indicated they can provide the USACE data and analysis for these levees. The city requested a *detailed study* for *Mineral Creek* from Port Valdez upstream to the LiDAR extent with a high priority. Furthermore, the city requested 44 CFR 65.10 *training and outreach assistance* for the *Mineral Creek Dikes* with a high priority.

Additional Non-Regulatory Risk MAP Products Discussions

Additional topics related to Non-Regulatory Risk MAP products were discussed. Specifically, there is a new tsunami study approaching completion by the University of Alaska – Fairbanks (UAF). The city requested *inundation mapping, mitigation, and a risk assessment* for the new *UAF Tsunami Study* with the new LiDAR information for the entire city with a very high priority.

Another substantial potential risk topic of discussion was the Solomon Lake Dam. This dam is owned and operated by Copper Valley Electric Authority (CVEA). It was discussed that if this dam breaks, the road is likely to wash out and isolate people. In this area are a high occupancy campground, the pipeline terminal and refinery, and the fish hatchery. It was mentioned that the state owns a dam break analysis conducted by CH2M Hill and that information is readily available. *Inundation*



mapping, mitigation, and a risk assessment are desired for the *Solomon Lake Dam Break* scenario with a medium priority.

Summary of Mitigation Outreach and Non-Regulatory Risk MAP Products

Several mitigation projects, training, outreach needs, and other opportunities for Non-Regulatory Risk MAP Products to be developed were discussed during the Discovery Meeting. All the communities in the watershed are at risk from natural disasters and will benefit from further risk identification and communication to the residents. The specific mitigation discussions are summarized below:

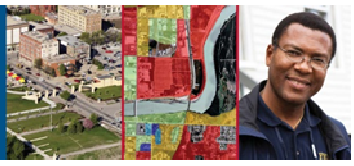
- Alpine Woods Dikes: Non-regulatory Risk MAP products to provide depth grids, a risk assessment, and training for levee accreditation
- Sixmile: Non-regulatory Risk MAP products to provide preparedness outreach and risk assessments
- Rainbow Apartments: Non-regulatory Risk MAP products to provide preparedness outreach and risk assessments
- Lowe River Subdivision: Non-regulatory Risk MAP products that provide outreach, depth grids, and risk assessment tools
- Valdez Glacier Stream Dike: Mitigation project to create another opening under the Richardson Highway
- Avalanche Hazard Areas: A Non-Regulatory Risk MAP risk assessment is desired for these areas
- Robe Lake Inlet: A contributing flood factors Non-Regulatory Risk MAP product and a mitigation project to restore the natural inlet to the lake
- Mineral Creek Dikes: training and outreach assistance
- UAF Tsunami Study: inundation mapping, outreach, mitigation, and a risk assessment
- Solomon Lake Dam Break: inundation mapping, outreach, mitigation, and a risk assessment

Summary of Mapping Needs

The major flooding sources in Valdez are the riverine environments. Due to the highly migratory character of the rivers and streams, the effective studies have become outdated and potentially invalidated. Several rivers and streams and one coastal area were identified as in need of a detailed study with the new topographic information and improved methodologies. The flooding sources discussed during the Discovery Meeting can be categorized into either detailed riverine or detailed coastal analysis, as no approximate studies were requested. The study areas are summarized and listed in decreasing priority in the table on the following page.

Desired Risk MAP Study Areas for Valdez from Discovery Meeting

PRIORITY	STUDY AREA	STUDY LENGTH (miles)	LOCATION DESCRIPTION	STUDY TYPE
High	Lowe River	13.3	From Port Valdez upstream to the LiDAR extent	Detailed Riverine
High	Mineral Creek	5.7	From Port Valdez upstream to the LiDAR extent	Detailed Riverine
High	Valdez Glacier Stream	6.6	From Port Valdez upstream to the LiDAR extent	Detailed Riverine
Medium	Alpine Woods	4.3	Small drainages behind Alpine Woods Subdivision	Detailed Riverine
Medium	Mineral Creek Loop Road	3.0	Coastline along Mineral Creek Loop Road	Detailed Coastal
Low	Robe River	3.0	From Port Valdez upstream to the outlet of Robe Lake	Detailed Riverine



Next Steps

Meeting notes and a Final Discovery Map will be prepared to reflect the identified Risk MAP needs from the meeting and will be provided for community review within a month. Based on the identified study needs, STARR will work with FEMA to determine a scope for a map update project, taking into consideration the other mapping projects requiring funding this year. Within four to six months, FEMA will contact the communities and hold another meeting to provide an update on the progress, and then once a project has been funded, to provide the scope of the project in a Project Charter. The Project Charter is a document that will define the data and timeframe for a project, and is to be signed by all affected communities and FEMA, to ensure all parties have detailed knowledge of the project. If there are any studies or data that communities will contribute, then deadlines for delivery will be included as well.