

- ▶ **5:30 : Doors Open**
- ▶ **5:45 : Presentation**
- ▶ **6:15–7:30 : Open House**

RiskMAP
Increasing Resilience Together



Update of King County Communities' FEMA Flood Insurance Rate Map Open House

March 20, 2018



FEMA

Agenda

- Background of the National Flood Insurance Program
- Flood Study Map Update
- Process and Schedule
- Open House Layout



King County Communities

Background of the National Flood Insurance Program



FEMA

Purpose of the National Flood Insurance Program (NFIP)

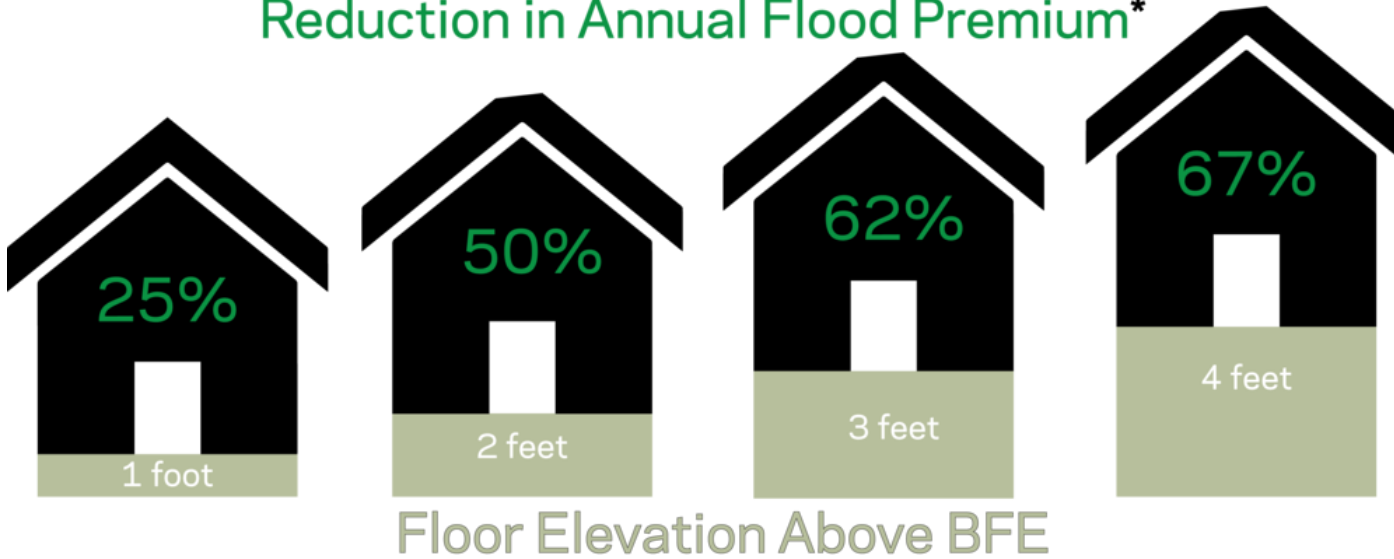
The NFIP is a Federal program **enabling property owners in participating communities to purchase insurance as a protection against flood losses** in exchange for **State and community floodplain management regulations that reduce future flood damages.**

...If a **community adopts and enforces a floodplain management ordinance to reduce future flood risk to new construction in floodplains**, the Federal Government will make flood insurance available within the community as a financial protection against flood losses.

Program started in 1968.

Purpose of the National Flood Insurance Program (NFIP)

Reduction in Annual Flood Premium*



Floor Elevation Above BFE

* Example: V-Zone building with an open foundation. \$250,000 building coverage, \$100,000 contents coverage. Reductions compared to lowest flood at BFE. Note: This does not include recent rate increases. (FEMA Home Builder's Guide to Coastal Construction)



1% Annual Chance Flood (“100-year”) Standard

1,125,000 Miles of River are mapped for the National Flood Insurance Program – on average 11,250 miles of river are seeing the 1% flood or greater every year.

Purpose of the National Flood Insurance Program

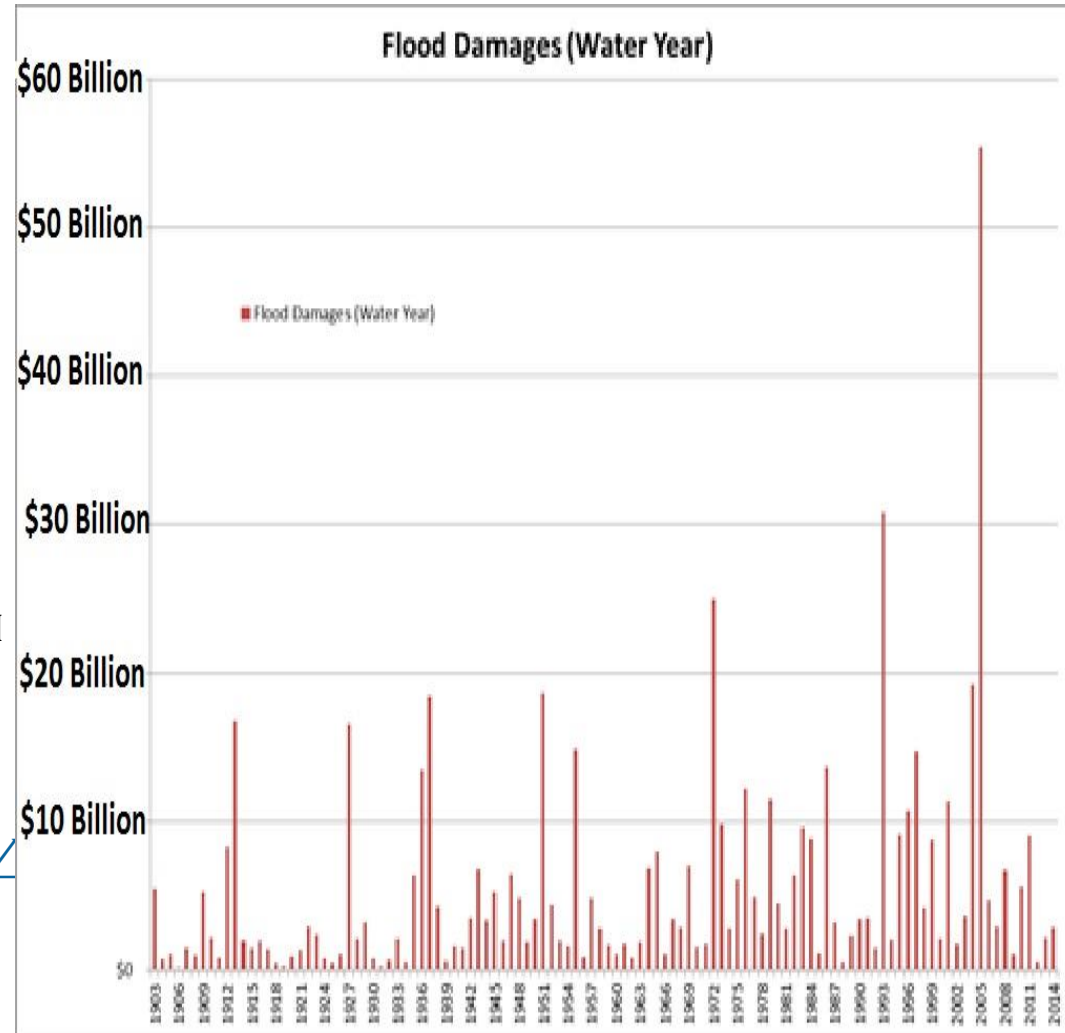
Reduce economic loss caused by flood events

- BETWEEN 1980 AND 2013, THE UNITED STATES SUFFERED MORE THAN \$260 BILLION IN FLOOD-RELATED DAMAGES.
- FLOODING ACCOUNTS FOR APPROXIMATELY 85% OF ALL DISASTER DECLARATIONS.
- ON AVERAGE, MORE PEOPLE DIE ANNUALLY FROM FLOODING THAN ANY OTHER NATURAL HAZARD.

GRAPHS FROM

[HTTP://WWW.NWS.NOAA.GOV/HIC/](http://www.nws.noaa.gov/hic/)

WITH ADJUSTMENT FOR KATRINA



King County Flood Insurance Claims 1977-Present

Community	Claims Paid	Building	Contents	Total
Auburn	6	\$ 44,223.24	\$ -	\$ 44,223.24
Bellevue	35	\$ 642,502.31	\$ 119,102.93	\$ 761,605.24
Burien	10	\$ 75,323.02	\$ 8,730.57	\$ 84,053.59
Carnation	21	\$ 634,440.21	\$ 122,206.47	\$ 786,646.68
Des Moines	5	\$ 216,514.76	\$ 4,237.18	\$ 220,751.94
Duvall	4	\$ 136,708.84	\$ 9,802.75	\$ 146,511.59
Enumclaw	3	\$ 56,801.50	\$ 12,699.15	\$ 69,500.65
Federal Way	3	\$ 17,532.90	\$ 2,132.60	\$ 19,665.50
Issaquah	125	\$ 3,089,181.06	\$ 892,651.36	\$ 3,981,832.42
Kenmore	1	\$ 14,697.30	\$ -	\$ 14,697.30
Kent	15	\$ 148,628.44	\$ 1,205.06	\$ 149,833.50
Unincorporated King County	1000	\$18,654,592.46	\$3,045,796.34	\$ 21,818,494.17
Kirkland	4	\$ 40,083.87	\$ 4,434.97	\$ 44,518.84
Lake Forest Park	1	\$ 1,886.44	\$ -	\$ 1,886.44
Mercer Island	2	\$ 20,830.35	\$ -	\$ 20,830.35
Milton	4	\$ 70,379.73	\$ -	\$ 70,379.73
Normandy Park	3	\$ 13,978.43	\$ -	\$ 13,978.43
North Bend	61	\$ 826,087.52	\$ 159,679.81	\$ 985,767.33
Pacific	35	\$ 579,145.56	\$ 19,864.30	\$ 599,009.86
Redmond	5	\$ 22,290.75	\$ -	\$ 22,290.75
Renton	10	\$ 71,134.89	\$ 13,840.03	\$ 84,974.92
Sammamish	2	\$ 41,996.22	\$ -	\$ 41,996.22
SeaTac	1	\$ 1,319.24	\$ -	\$ 1,319.24
Seattle	122	\$ 1,692,480.66	\$ 358,460.87	\$ 2,050,941.53
Shoreline	1	\$ 4,021.74	\$ -	\$ 4,021.74
Skykomish	23	\$ 362,992.17	\$ 11,247.47	\$ 374,239.64
Snoqualmie	872	\$15,570,635.09	\$2,300,850.94	\$ 18,114,839.26
Tukwila	1	\$ 1,309.89	\$ -	\$ 1,309.89
Total	2375	\$43,051,718.59	\$7,086,942.80	\$ 50,530,119.99



Flood Definition

From FloodSmart.com:

A flood is a general and temporary condition where two or more acres of normally dry land or two or more properties are inundated by water or mudflow.

Mandatory Purchase Requirement

Two federal statutes mandate purchase of flood insurance

- The Flood Disaster Protection Act of 1973
- The National Flood Insurance Reform Act of 1994

► Applies to properties in the 1% Chance Floodplain

- Insurance is a prerequisite to receive a loan from Federally regulated and insured lenders.
- The requirement is triggered when a loan is:
 - Made
 - Increased
 - Renewed
 - Extended
- The insurance must be in effect for the life of the loan.
- Monetary penalties on lenders for non-compliance, requires escrow accounts for other insurance purposes, and requires that lenders review flood maps and map changes.

How the National Flood Insurance Program (NFIP) Works

Three disciplines of the NFIP:

- **Mapping – Flood Studies**
- **Regulations**
- **Insurance**



King County Communities

Review of the Flood Study Map Update



FEMA

Map Modernization Process

- ▶ New maps are digital county-wide
- ▶ Follows a USGS Quad layout – countywide coverage with no city “cut-outs”
- ▶ Re-delineation of flooding sources where better topography was available
- ▶ Vertical Datum change (NGVD 1929 to NAVD 1988)

What's new

Vertical Datum Change

▶ **NGVD 29**

- Based on a mean sea level from 21 tidal stations in the US & 5 stations in Canada

▶ **NAVD 88**

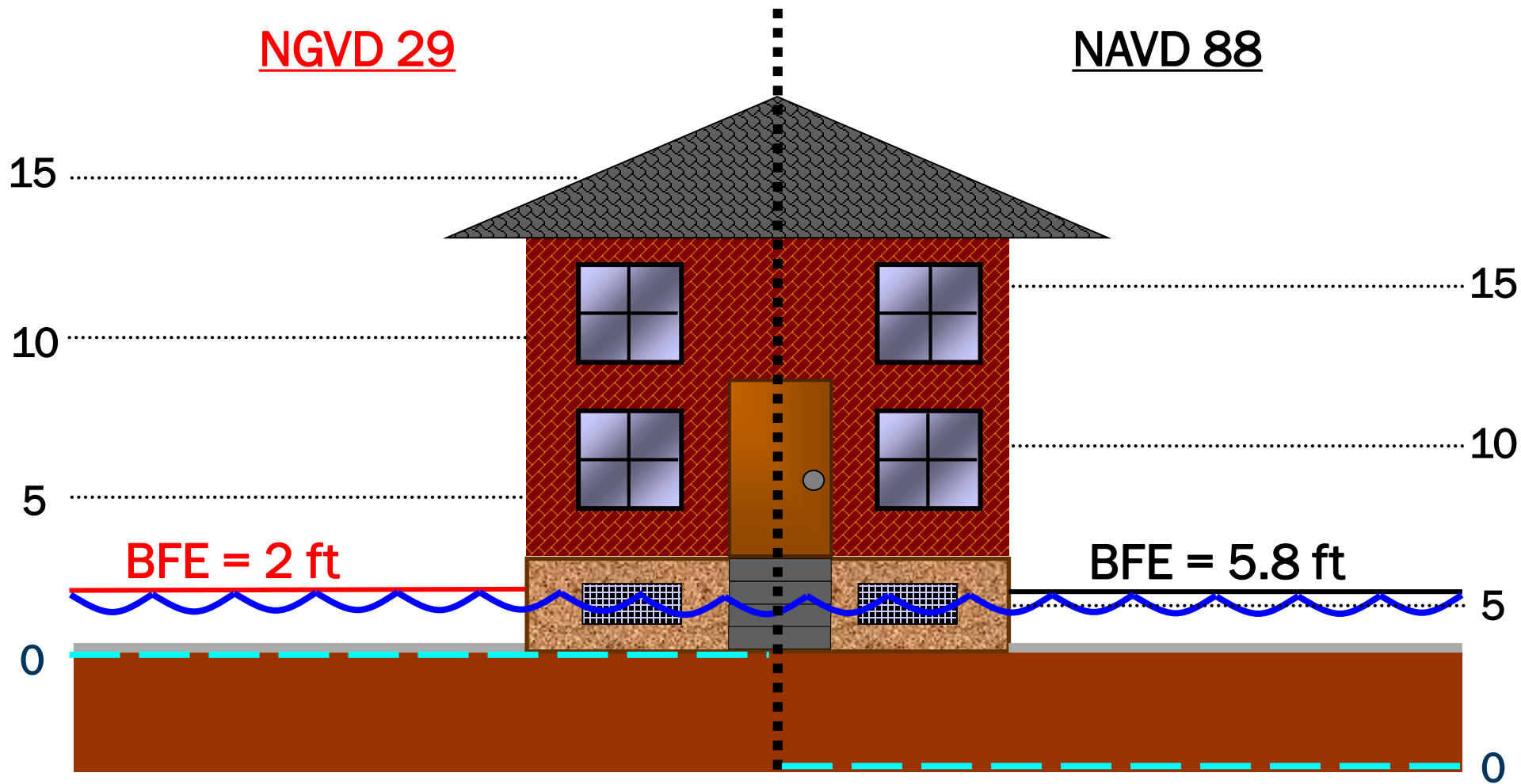
- Based on the density of the Earth instead of varying values of sea heights
- More accurate

▶ **Conversion for King County Varies**

- $\text{NGVD} + (\text{vertical adjustment}) = \text{NAVD}$
- Conversion factor for County for FIS ranges from 3.5 to 4.1 feet

Digital Flood Insurance Rate Maps

Vertical Datum and FIRMs (e.g. uses 3.8' conversion)



King County DFIRM Timeline

History

- **Scoping Meeting – July 27, 2005**

Discuss proposed scope of work, identify available data and update needs, 25 Attendees

- **Levee Certification Documentation Needs Identified – April 2006**

- **Preliminary Map Release – September 2007**

- **King County Appeal – February 2008**

- **Revised Preliminary Map Release – November 8, 2010**

- **FEMA Letter to Senators on Levee Policy– March 2011**

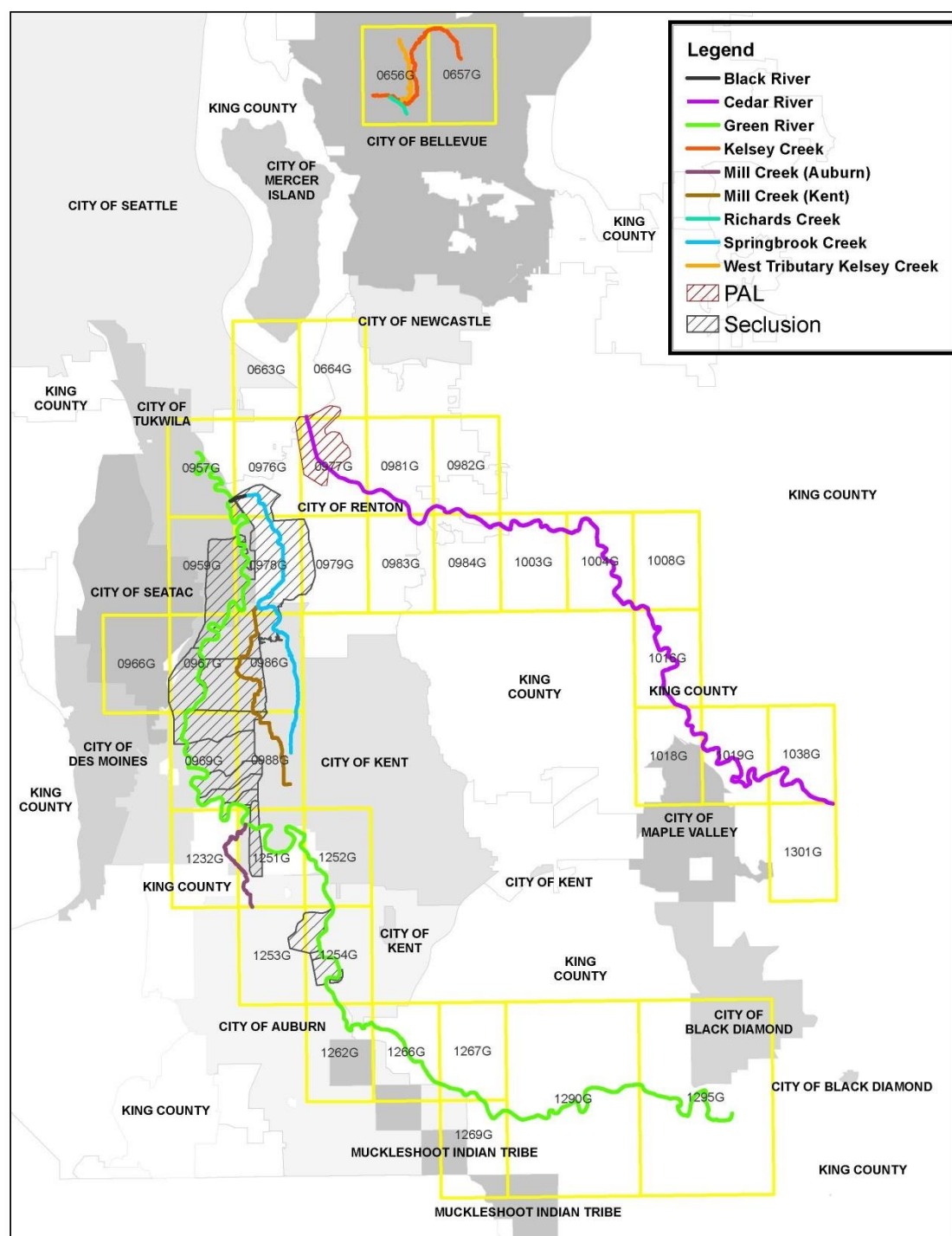
King County DFIRM Study Timeline History

Project Name	Led By	Preliminary release	CCO Meeting	Public Meeting	End of Appeal Period	Current status
Countywide DFIRM (Cedar, Snoqualmie and Green Rivers, Paterson and Springbrook Creeks)	King County, FEMA	9/28/2007 + 3 rounds of revised preliminaries in 2010			7/5/2011	On-hold
Sammamish/White River	King County	2/1/2013	6/6/2013	7/29/2013 8/14/2013 8/21/2013	12/10/2013	On-hold
Coastal PMR	King County	2/1/2013	5/6/2013 5/7/2013	8/12/2013	12/10/2013	On-hold
Thornton Creek PMR	City of Seattle/ Seattle Public Utilities (SPU)	9/3/2013	9/12/2013	10/2/2013	7/16/2014	On-hold
Seclusion (incl. portion of Green River; Cedar and Black Rivers; Kelsey, West Tributary to Kelsey, Richards Creeks; and Horseshoe Bend levee area - Springbrook and Mill Creeks per 316-PMR)	FEMA	9/15/2017	11/20/2017			Active

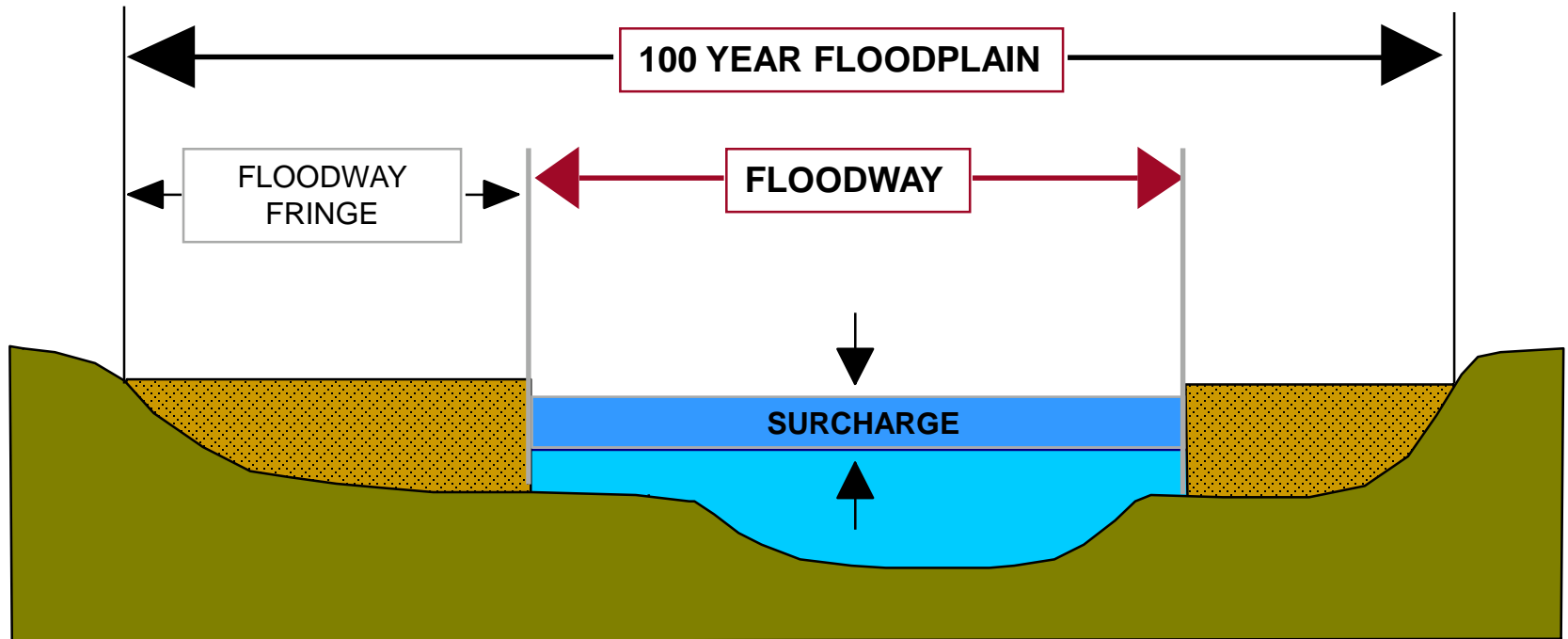
Seclusion (2017)

Seclusion and appealable areas

38 map panels



Riverine Floodplain and Floodway Definitions



FLOODWAY + FLOODWAY FRINGE = 100 YEAR FLOODPLAIN
SURCHARGE NOT TO EXCEED 1.0 FEET

Survey Collection

For Cedar River

- 12 bridges
- 192 cross sections
- 16.8 miles of stream

For Green River

- Survey Collected in 2006
- 42 bridges
- 282 cross sections
- 40.5 miles of stream

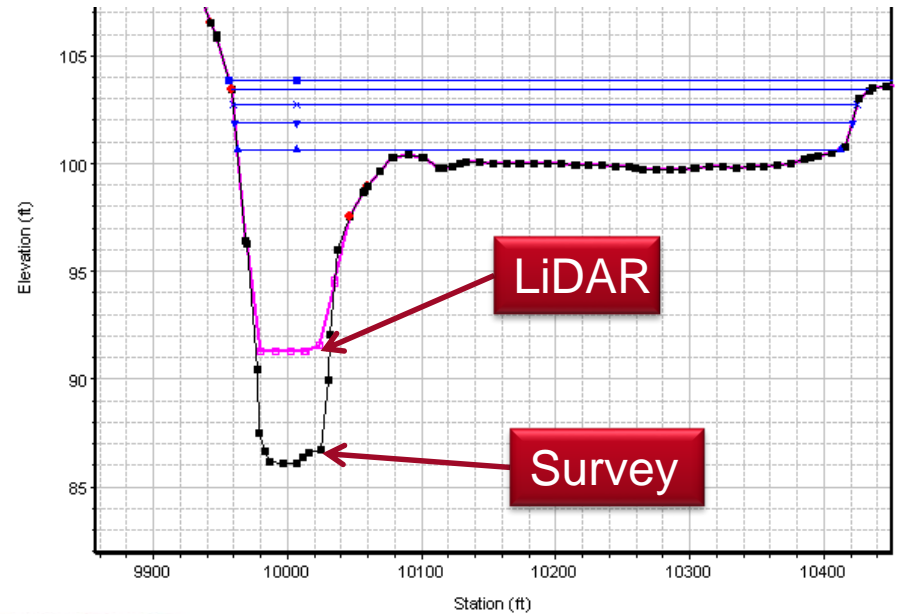
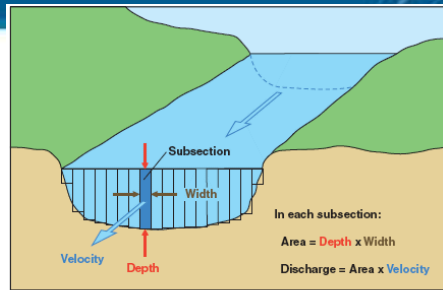


Fig. 1 RTK GPS survey.



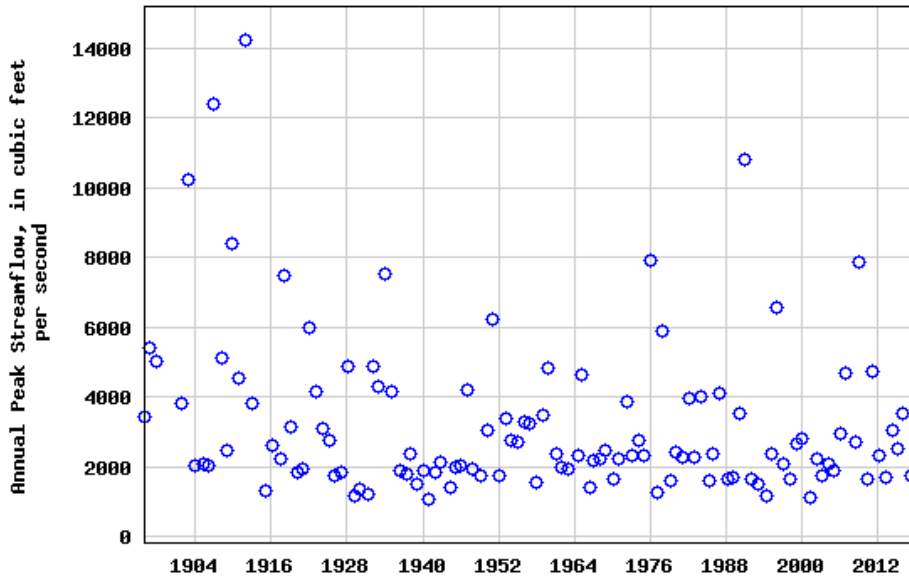
Fig. 2 Hydrographic survey equipment.

Hydrologic Methods



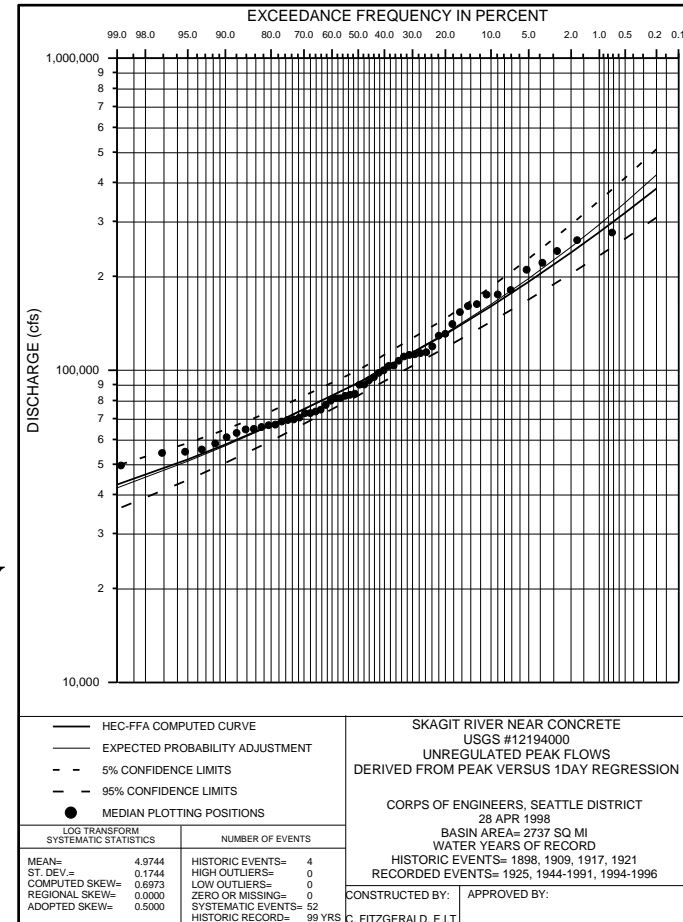
Current-meter discharge measurements are made by determining the discharge in each subsection of a channel cross section and summing the subsection discharges to obtain a total discharge.

USGS 12117500 CEDAR RIVER NEAR LANDSBURG, WA



FLOW

FREQUENCY



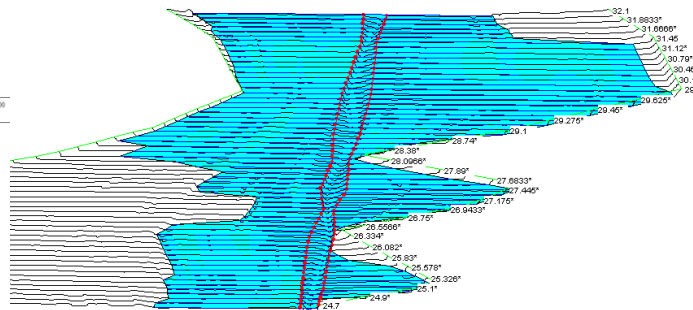
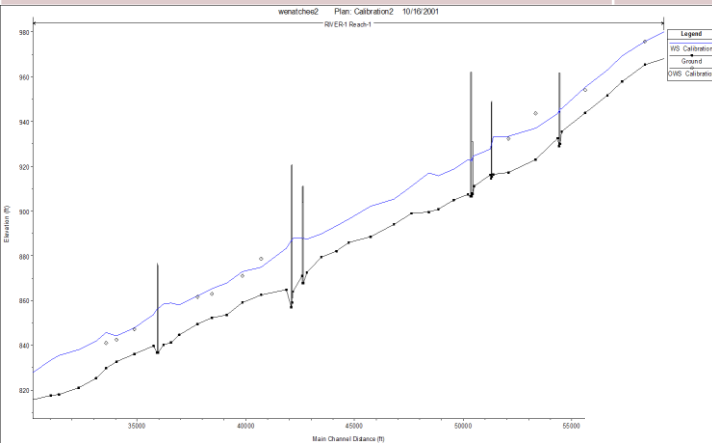
Cedar River Hydraulic Methods

Method

Description

Detailed
(Zone AE)

- Steady State HEC-RAS model
- Roughness is examined closely (calibrated to gages)
- Calibrated to November 24, 1990 and November 30, 1995 high water mark data
- Floodway Analysis



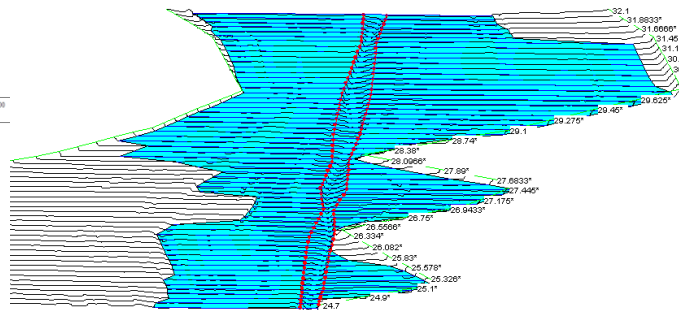
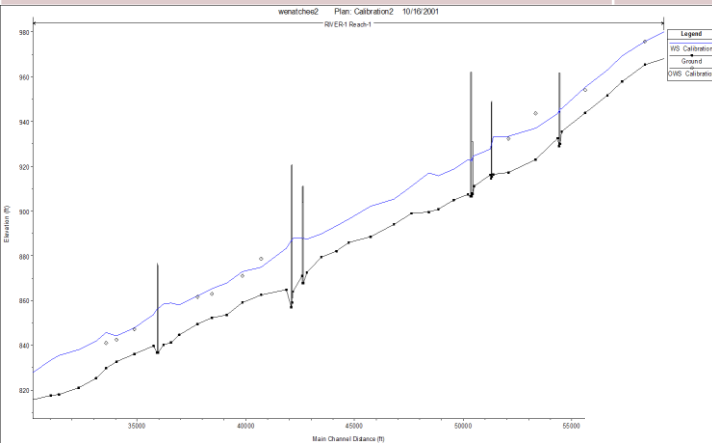
Green River Hydraulic Methods

Method

Description

Detailed
(Zone AE)

- Steady State HEC-RAS model
- Roughness is examined closely (calibrated to gages)
- High water mark data were collected by **nhc** and MGS for the high flow events of January 7, 2006, November 11, 2006, and March 25, 2007
- Floodway Analysis



Provisionally Accredited Levee (PAL)

Letter of Agreement and Request for Provisionally Accredited Levee (PAL) Designation and Agreement to Provide Adequate Compliance with the Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10)

We, the undersigned, have received the letter from FEMA dated November 1, 2015 and the enclosed document entitled "Requirements of 44 CFR 65.10". We understand that FEMA is in the process of providing updated flood maps for King County and that the area behind the lower Cedar River Levee will be remapped to reflect that the levee has been designated as a PAL.

To the best of our knowledge, the lower Cedar River Levee meets the requirements of 44 CFR 65.10. We hereby submit to FEMA, within 90 days (before February 1, 2016) our agreement to provide FEMA with all the necessary information to show that the lower Cedar River Levee complies with 44 CFR 65.10. We understand that this documentation will be required before February 1, 2018. This information will allow FEMA to move forward with the flood mapping for King County. We fully understand that if complete documentation of compliance with 44 CFR 65.10 is not provided within the designated timeframe of 24 months, FEMA will initiate a revision to the Flood Insurance Rate Map to redesignate the area as flood-prone.

City of Renton Chief Executive Officer: _____ (signature)
_____ (print)

Date: _____

Levee Owner Representative (if applicable): _____ (signature)
_____ (print)

Date: _____

Levee Owner Representative (if applicable): _____ (signature)
_____ (print)

Date: _____

Other (if applicable): _____ (signature)
_____ (print)

Date: _____



Provisionally Accredited Levee (PAL) criteria

- ▶ **Levee system needs to currently show accreditation by FEMA but the documentation needs updating**
- ▶ **A PAL is a process to provide a community seeking re-accreditation of a levee system with additional time to submit the necessary documentation**
- ▶ **This process can only take place if the levee owner and a representative of each impacted community sign and return an enclosed agreement within 90 days of a letter to be sent shortly**

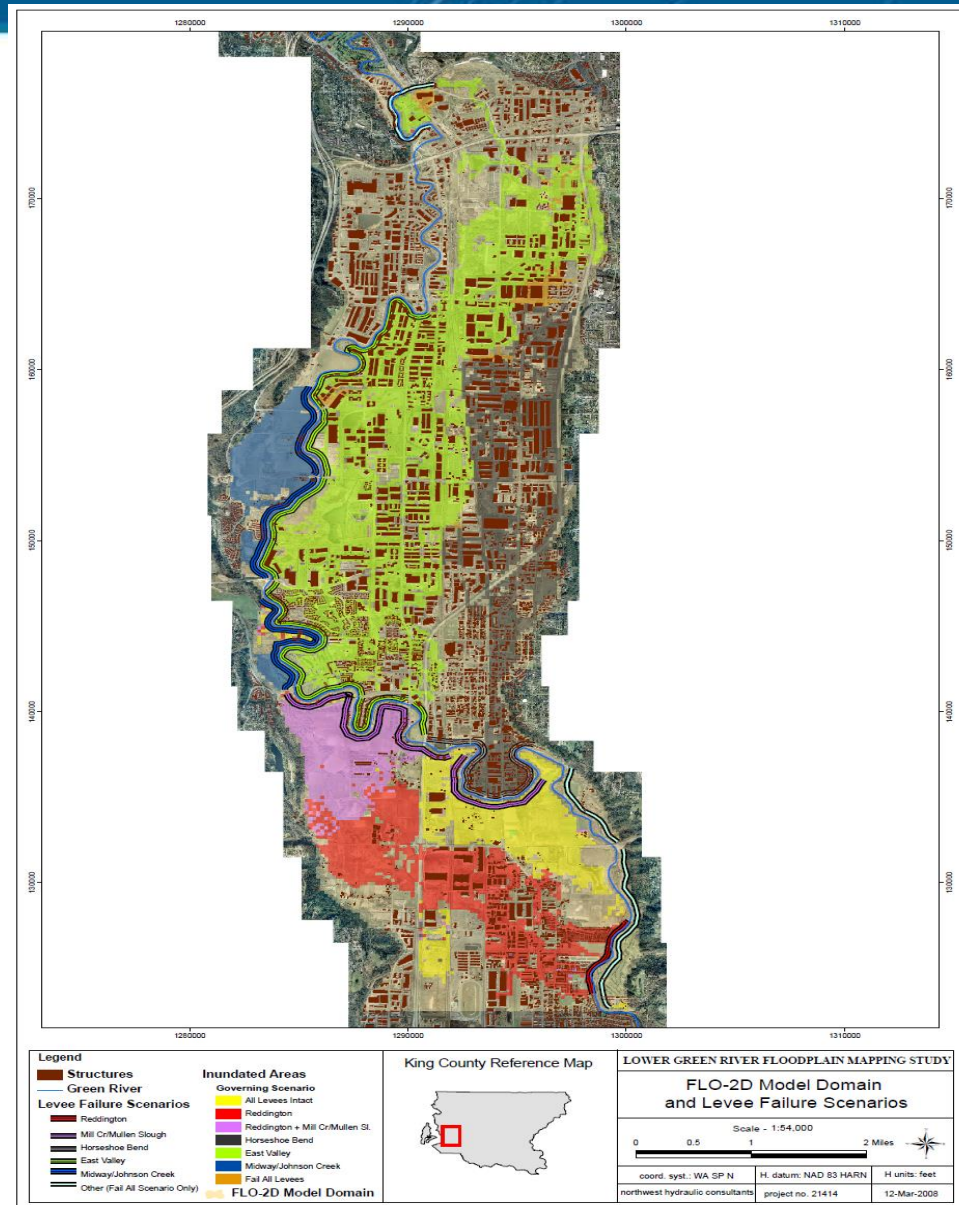
Provisionally Accredited Levee (PAL)

Lower Cedar River Levee (right and left banks)

- Signed by City of Renton on 10/14/2016
- Valid from 11/1/2016 to 11/1/2018

If levee certification is not provided by that time, then this area will be put in the queue for a future flood study using the new Levee Analysis and Mapping Procedure.

Green River Scope of Work (2010)



Why Modify our Current Approach?

- ▶ Throughout Map Modernization, stakeholders expressed concern on the “without-levee” procedures used to map non-accredited levees
- ▶ In February 2011, a group of U.S. Representatives and Senators wrote to FEMA requesting a revision to the current practice of mapping levees and their associated flood risk.
- ▶ Stakeholders and Congress felt the historical mapping approach did not reflect the hazard reduction that some non-accredited levees may still afford.

For these reasons, we request that you prohibit the use of such all-or-nothing modeling approaches when a community notifies you that it believes that it is negatively affected by “without levees” modeling. Even with such a prohibition in place, we are hopeful that FEMA will continue to use simpler, more cost-effective techniques when no community is harmed.

Thank you for your attention to this matter. Please do not hesitate to contact us if you have any questions about this request.

Sincerely,



RICHARD DURBIN
United States Senator



MARK PRYOR
United States Senator



TOM HARKIN
United States Senator



RON WYDEN
United States Senator



MARY LANDRIEU
United States Senator



CHARLES SCHUMER
United States Senator



THAD COCHRAN
United States Senator




ROGER WICKER
United States Senator



KAY BAILEY HUTCHISON
United States Senator



PAT ROBERTS
United States Senator



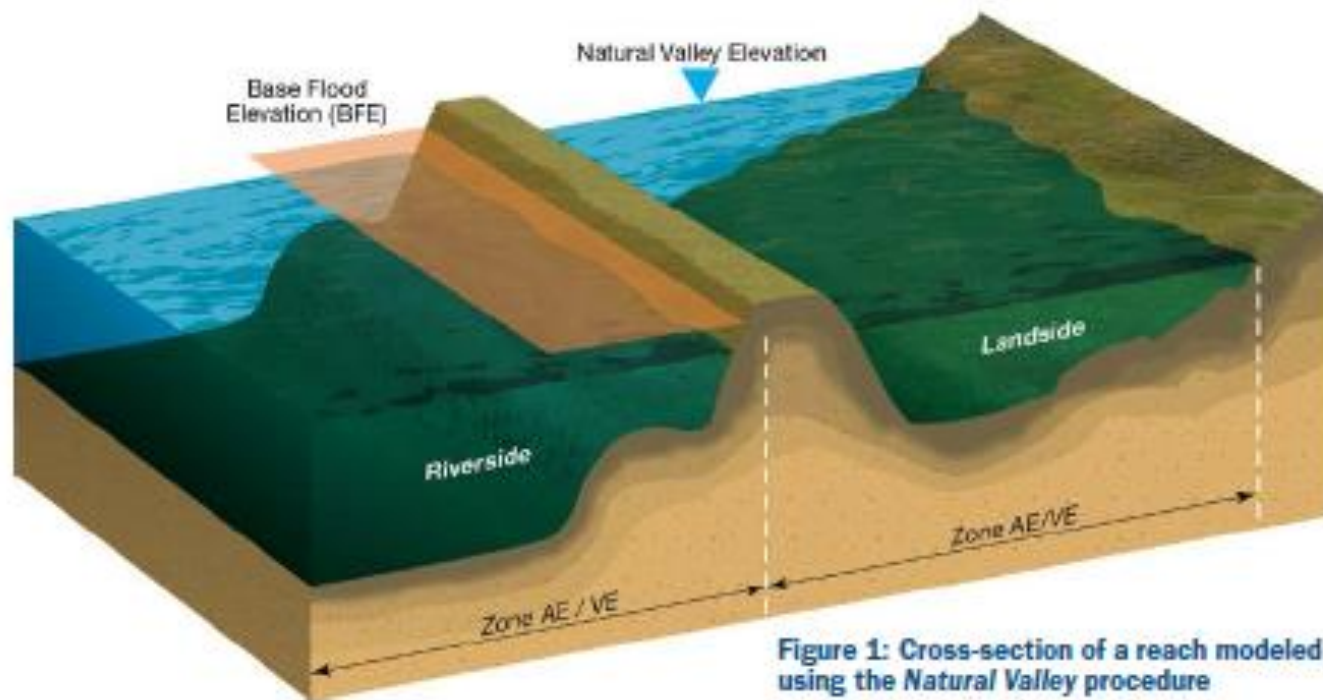
MIKE CRAPO
United States Senator



LAMAR ALEXANDER
United States Senator

Levee Policy Process

- ▶ **The King County Flood Insurance Study has been on hold as it waits for FEMA to finalize a new approach in showing floodplains on the landward side of levees that are not accredited to protect against the 1% flood.**



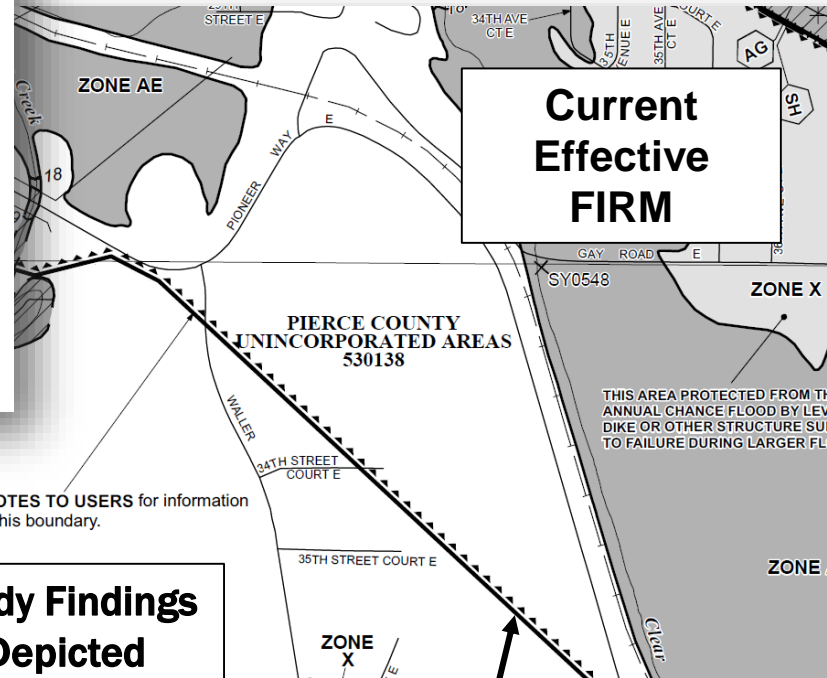
Seclusion criteria

- ▶ **The levee has not been shown to meet 44 CFR 65.10**
- ▶ **The levee is hydraulically significant during the 1% flood,**
- ▶ **The levee has an owner,**
- ▶ **The levee meets the definition of a levee as spelled out in 44 CFR 59, and/or,**
- ▶ **The flood hazards at the levee were updated with a new analysis in the King County flood study efforts.**

Seclusion Mapping Process

ATTENTION: The levee, dike, or other structure that impacts flood hazards inside this boundary has not been shown to comply with Section 65.10 of the NFIP Regulations. As such, this FIRM panel will be revised at a later date to update the flood hazard information associated with this structure.

The flood hazard data inside this boundary on the FIRM panel has been republished from the previous effective (historic) FIRM for this area, after being converted from NGVD 29 to NAVD 88.



Current Effective FIRM

Study Findings Depicted

Seclusion Boundary

Preliminary Map Format

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO FLOODING BY THE 1% ANNUAL CHANCE FLOOD
 The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR** Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently declassified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

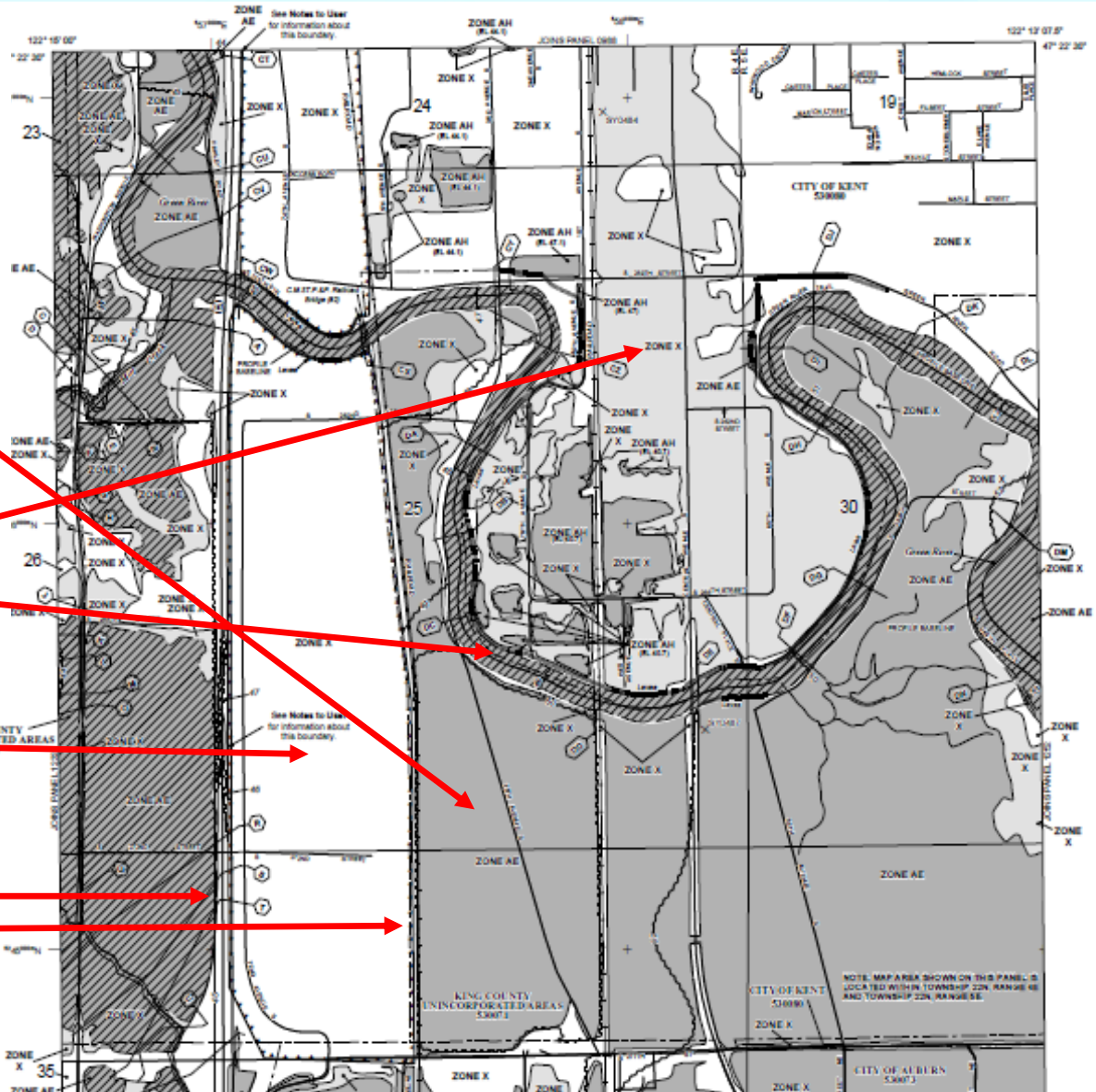
ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ATTENTION: The levee, dike or other structure that impacts flood hazards inside this boundary has not been shown to comply with Section 65.10 of the NFIP Regulations. As such, this FIRM panel will be revised at a later date to update the flood hazard information associated with this structure.

The flood hazard data inside this boundary on the FIRM panel has been republished from the previous effective (historic) FIRM for this area, after being converted from NGVD 29 to NAVD 88.



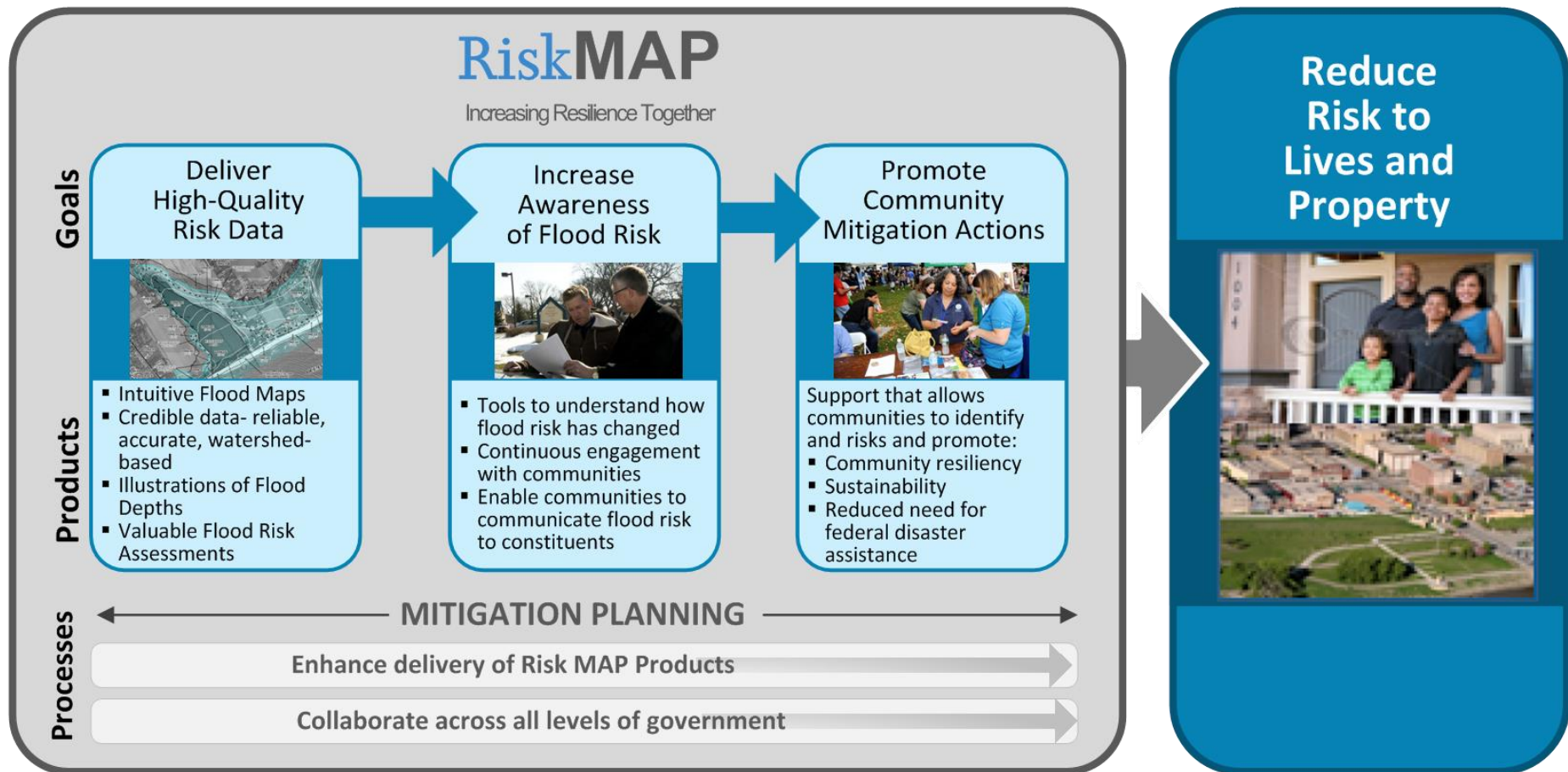
King County Communities

The Flood Mapping Process and Schedule



FEMA

RiskMAP, the NFIP and Hazard Mitigation Planning



WA State Risk MAP Website

<https://waecy.maps.arcgis.com/apps/MapSeries/index.html?appid=8451cb0db0c4461182e592eb5a43400a>

Washington State RiskMAP Program 2017

A story map     **RiskMAP**
Increasing Resilience Together

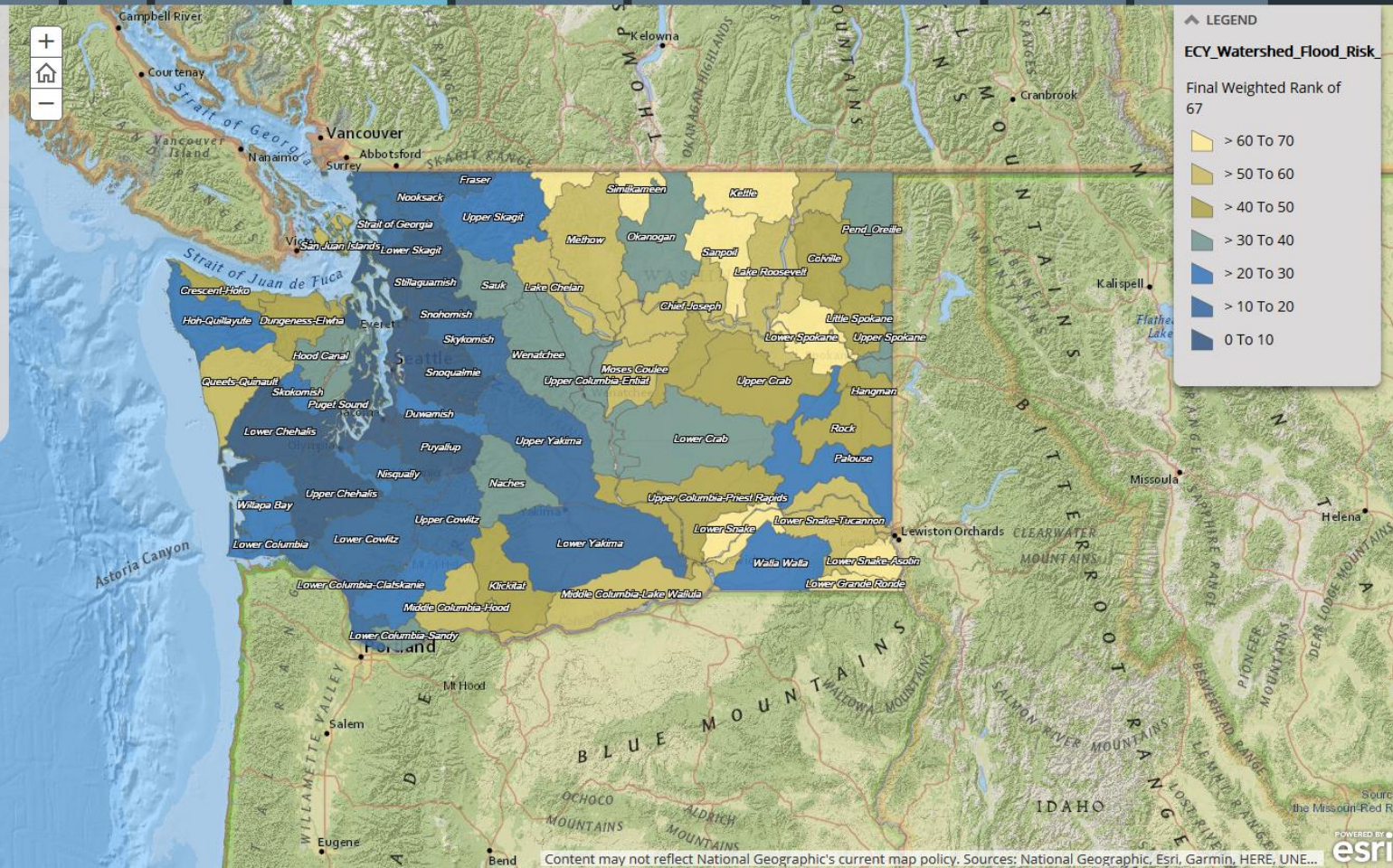
Washington State Partners RiskMAP Phases Projects Project Viewers Flood Risk Portfolio State Mapping Status RiskMAP Deliverables RiskMAP Applications Coastal Coalition Ecology Regions

WA State developed a watershed-based risk portfolio which ranks all 67 HUC8 watersheds in the State using three predominate risk factors:

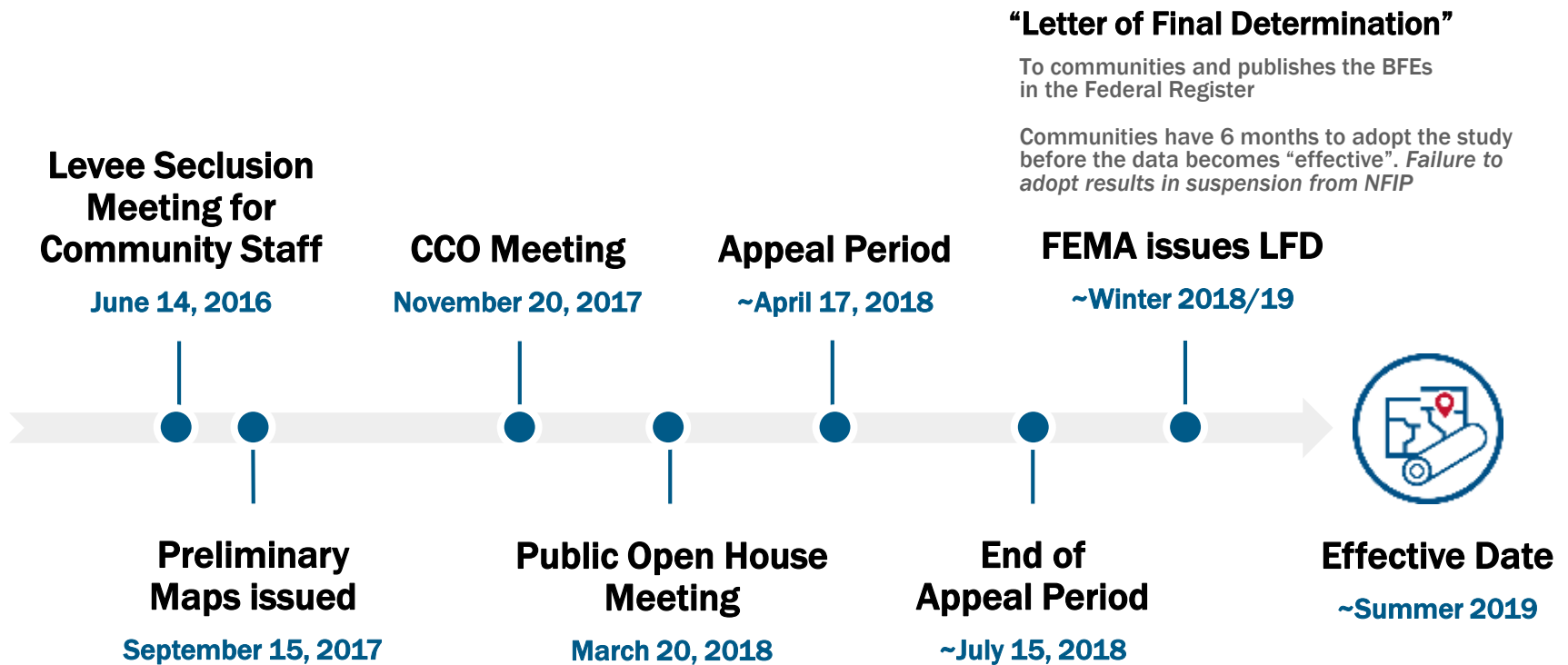
- Population's in the floodplain
- Percent Floodplain Extent
- Policies and Claims

This portfolio helps guide project sequencing as part of Washington's Business and Strategic Planning...

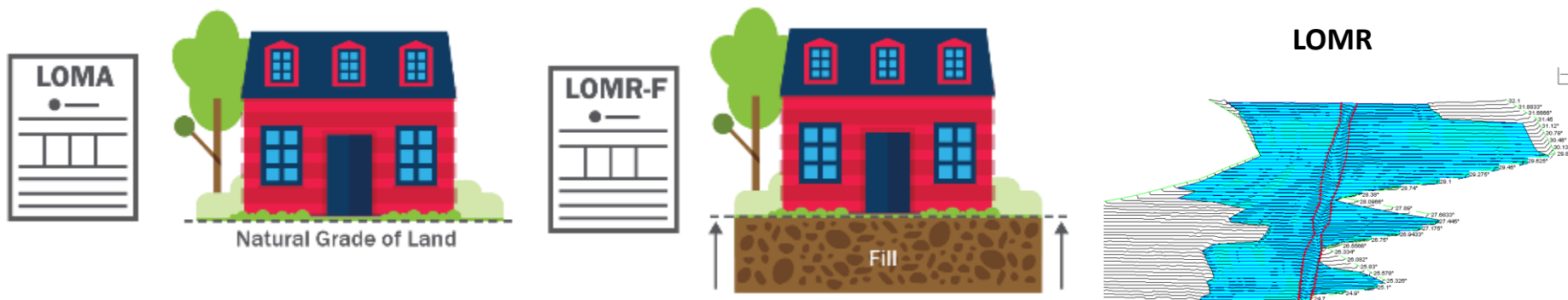
- [Risk MAP Business Plan update 2016 \(pdf\)](#)
- [Risk MAP Strategic Plan 2016 \(pdf\)](#)



Timeline



Letters of Map Change (LOMC)



Letter Of Map Amendment

(LOMA) – for property owners who believe a property was incorrectly included in a floodplain, primarily through showing that the lowest elevation of the structure is above the 1% flood elevation.

Letter Of Map Revision

(LOMR) – for communities to submit better technical information to change a floodplain or to reflect physical changes made to the floodplain.

(LOMA) Hotline – 1-877-FEMA-MAP

King County Communities
Open House Layout



FEMA

Information Tables

Property ID & Digital Mapping

Receive a printed map of your property and understand the flood zone

Flood Study / Engineering

Understand the methodology and technical specifications of the maps

Flood Insurance

Learn about your insurance policy options and rates

State Table

Gain insights into state floodplain mapping priorities

Community Table

Ask about city/county floodplain regulations and hazard plans

Floodplain Regulations

Gather information on specific building requirements / restrictions