



FEMA

FEMA's Digital Vision and Benefits of Digital Flood Hazard Data

IAFSM Annual Conference ~ March 11, 2009 ~ Champaign, IL
Suzanne K. Vermeer, P.E., CFM
FEMA Region V – Chicago, IL

“Risk MAP--Foundation, Transition, Integration”

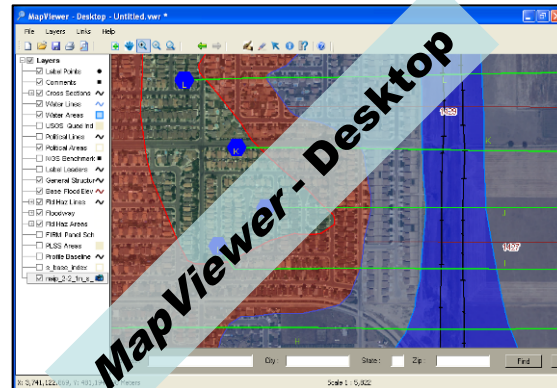
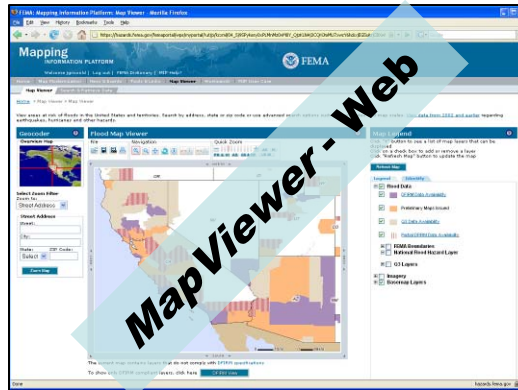
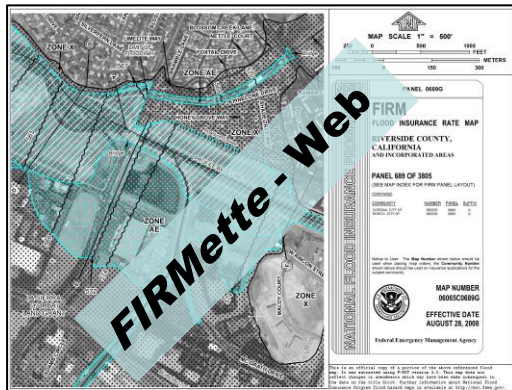
Digital Map Distribution

Risk Analysis
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- Beginning on October 1, 2009 customers may order only digital flood hazard reports and data
- Notice was posted in Federal Register October 23, 2008
- FEMA will continue to provide free digital data to NFIP stakeholders
- Overview:
 - NFIP and Map Modernization
 - What is FEMA's "Digital Vision"?
 - What are the advantages of digital flood hazard data?
 - FEMA's policy on the use of digital flood data
 - What is a DFIRM and the National Flood Hazard Layer (NFHL)?
 - What FEMA tools are available to access/view the data?

Preview of FEMA Tools

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National Flood Insurance Program (NFIP)

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**The primary goal of the NFIP is to
reduce the loss of life and property**



National Flood Insurance Program (NFIP)

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- NFIP is voluntary based on mutual agreement between the Federal government and a local community
- If a community adopts and enforces a floodplain management ordinance, Federally-backed flood insurance is available to property owners in the community
- NFIP Facts as of 4/30/08 (nationwide)
 - Flood policies in force: 5.6 million
 - Participating communities: 20,556
 - Coverage: \$1.1 trillion

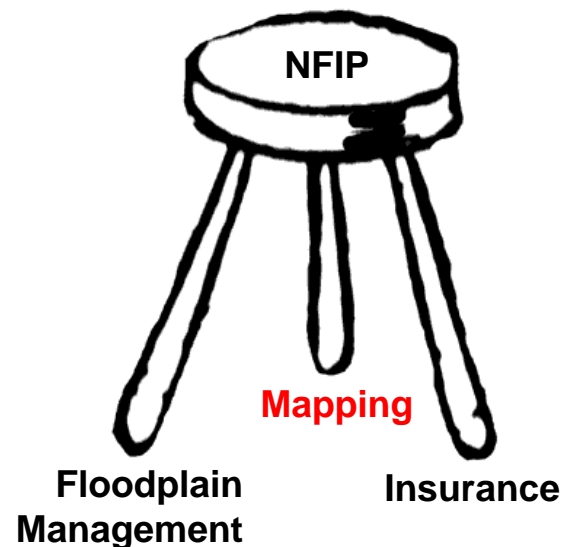


National Flood Insurance Program (NFIP)

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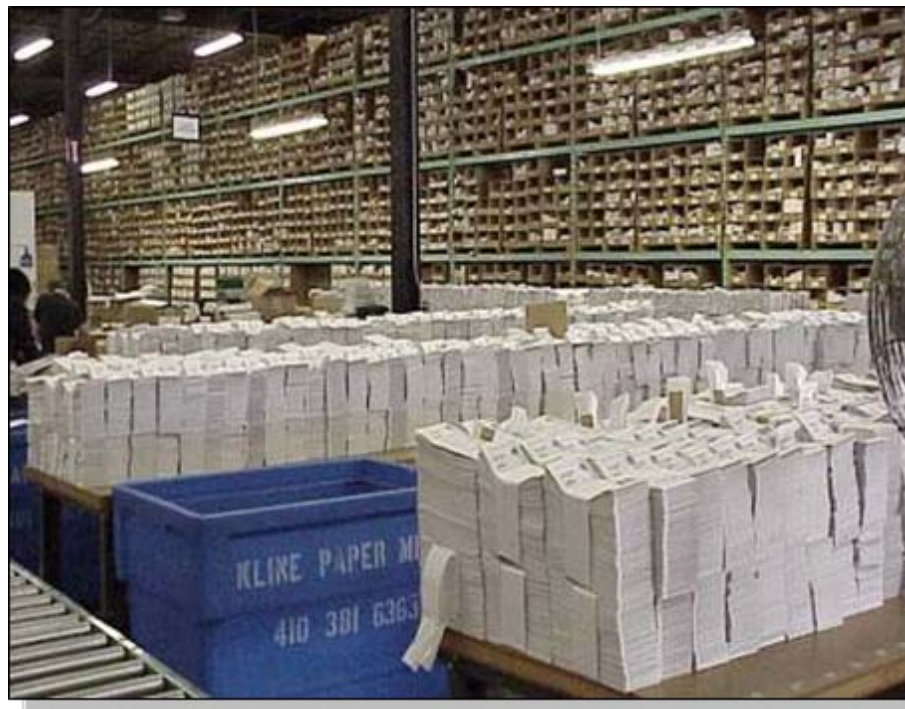
The NFIP has 3 Main Parts

- **Mapping:** identification of flood hazards
 - Floodplain Management: building practices aimed at reducing flood damage
 - Insurance: reduce economic impacts
-
- **Mapping:** Flood Insurance Rate Maps (FIRMs) identify areas with at least a 1-percent-annual chance of flooding



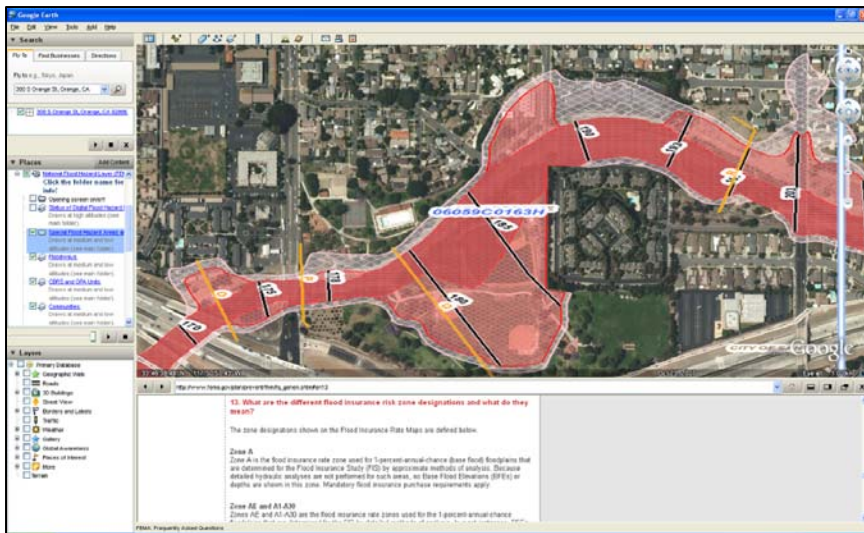
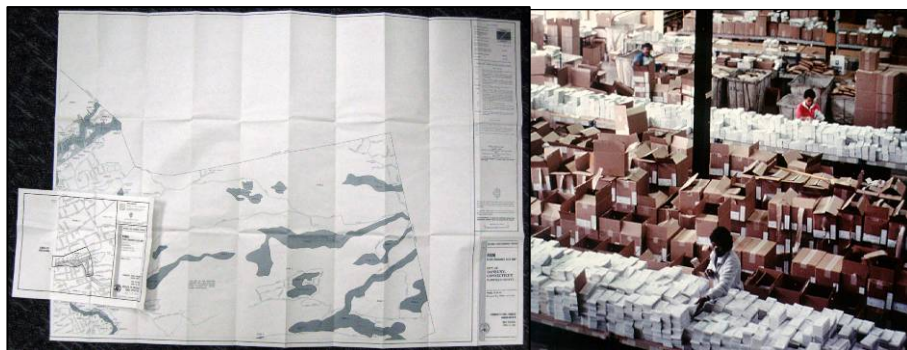
Need for Map Modernization

- Flood hazards need to be accurately identified
- Most existing FIRMs are
 - Based on 70's paper mapping technology
 - Single layer of map information
 - Separate maps for individual communities
 - Difficult and costly to change and distribute
 - 20-30 or more years old



What is Map Modernization?

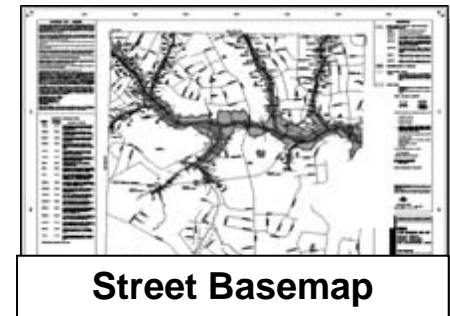
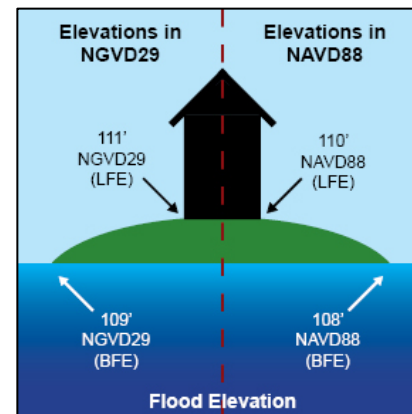
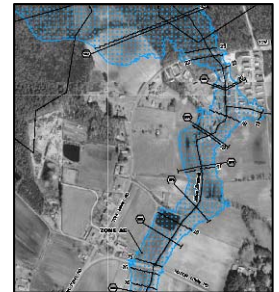
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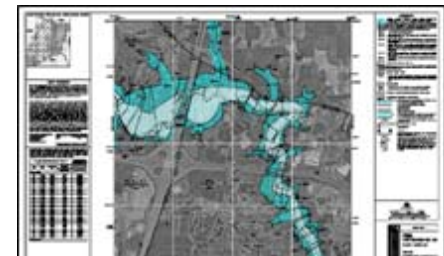
- **5-Year program to modernize FIRMs for:**
 - 92% of population nationwide
 - 65% of land area nationwide
- **Map Modernization was funded in Federal fiscal years 2004 – 2008**
- **2008 is the last funding year for Map Modernization**

What is Map Modernization?

- Upgrade paper FIRMs to new GIS-based DFIRM format
- Create 1 seamless countywide FIS report and DFIRM
- Refit the floodplain and floodway data to more current basemap
- Incorporate Letters of Map Revisions (LOMRs)
- Convert the vertical reference datum for flood elevation data (NGVD 29 to NAVD 88)



Street Basemap

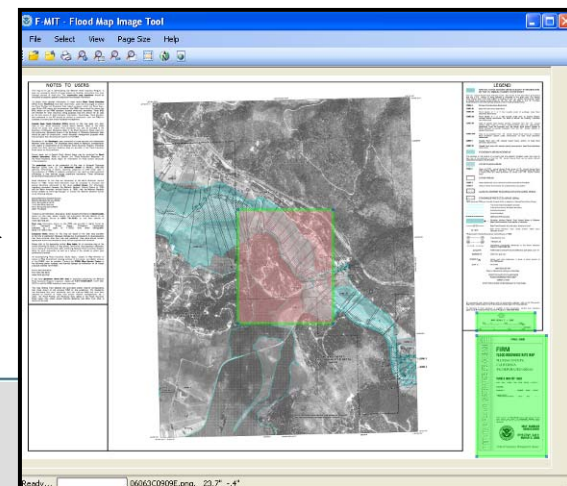


Orthophoto Basemap

FEMA's Digital Vision

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- Digital flood products are available and easy to use
- Stakeholders are aware of the digital products and understand the advantages of the new products
- FEMA's production processes are updated to benefit from and focus on digital products
- Digital Vision is enabled by FEMA Policy on the *Use of Digital Flood Hazard Data*



■ Benefits

- Reduce the need and demand for paper
- Provide more outreach to citizens
- Better integration of data across jurisdictions

■ Goals

- Streamlines production of high-quality digital data
- Updates mapping process
- More timely data available to customers

For more info, read “Increasing Options with Digital Flood Data” fact sheet

FEMA's Policy on Use of Digital Flood Data

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- **The horizontal location of the special flood hazard area is defined by geographic coordinates shown on a printed FIRM or stored in the DFIRM database**
- **The horizontal location of the flood hazard information is not defined by its relationship to base map features**
- **If there are conflicting interpretations of the precise horizontal location of the areas of special flood hazard, the conflict shall be resolved using the grid coordinates**

No More Paper ...

- Beginning on October 1, 2009 customers may order only digital flood hazard reports and data
- FEMA's MSC will not produce or distribute paper maps or reports on or after this date, other than a single paper copy provided to communities when their maps are updated
- Users of paper maps should start planning now to make a transition to digital flood hazard maps and reports
- FEMA will convert orders for paper products to the digital equivalent starting on October 1, 2009
- No change is anticipated for the distribution of LOMCs
- FEMA expects to save \$3 to \$5 million annually

MSC DFIRM Distribution

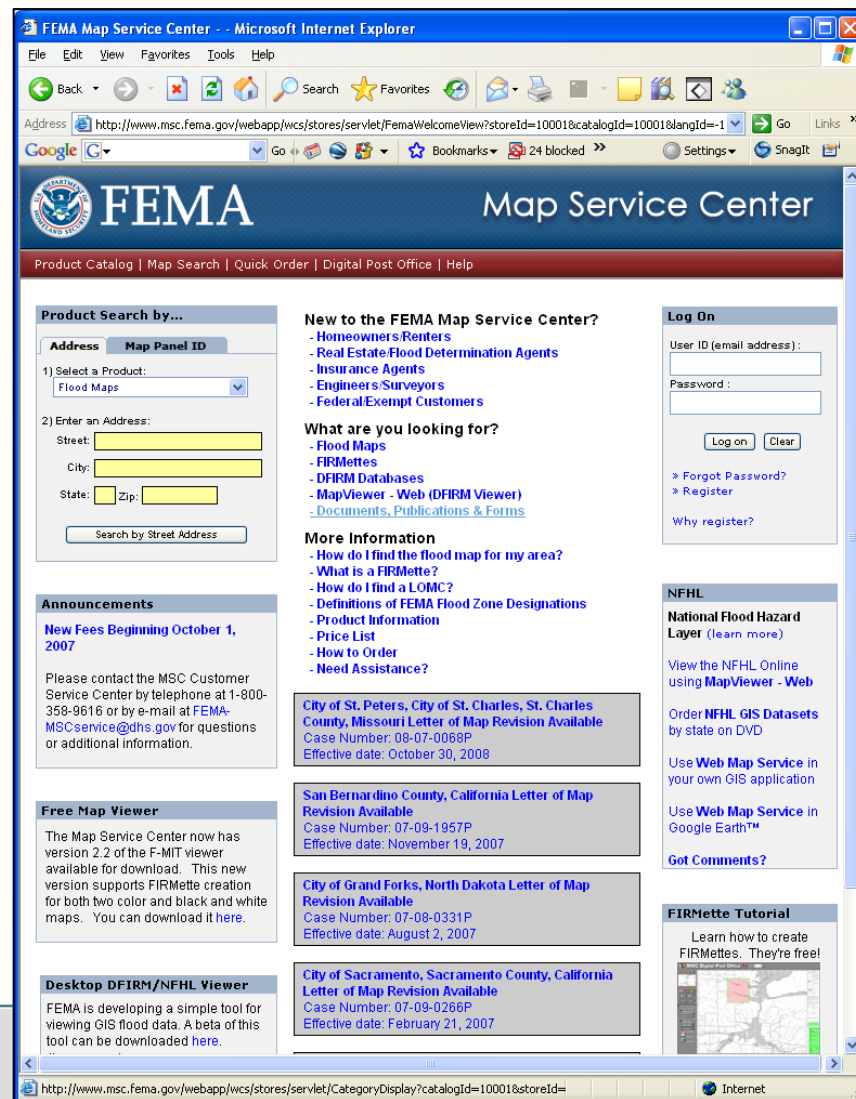
- **Prior to DFIRM effective date, the Chief Elected Official (City/Town Mayor or County Council President) of each community receives:**
 - Hard copy of community FIRM panels
 - Hard copy of countywide FIS text/report
 - CDs containing:
 - Digital copy of countywide FIS text/report (.pdf)
 - Digital images of community panels (.png)
 - DFIRM database (GIS data)

- **Digital products will also be uploaded to the MSC**

Map Service Center (MSC)

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- <http://msc.fema.gov>
- Distribution mechanism for
 - Current & Historic Flood Maps (DFIRMs & FIRMs)
 - FIS Texts/Reports
 - DFIRM & NFHL Databases
 - Letters of Map Change (LOMC)
 - Letters of Map Amendment (LOMAs)
 - Letters of Map Revision (LOMR)
 - Other Data and Documents
- Download tools for viewing DFIRM/NFHL data



MSC Website

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The screenshot shows the FEMA Map Service Center website. At the top is the FEMA logo and the title 'Map Service Center'. Below this is a navigation bar with links: 'Product Catalog | Map Search | Quick Order | Digital Post Office | Help'. The main content area is divided into several sections:

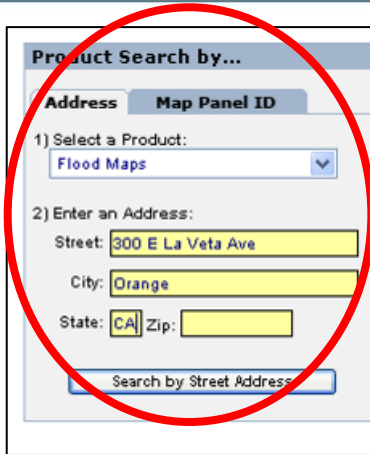
- Product Search by...**: A search form with tabs for 'Address' and 'Map Panel ID'. Under 'Address', there are fields for '1) Select a Product:' (a dropdown menu with 'Flood Maps' selected), '2) Enter an Address:' (fields for Street, City, State, and Zip), and a 'Search by Street Address' button.
- New to the FEMA Map Service Center?**: A list of links for new users: Homeowners/Renters, Real Estate/Flood Determination Agents, Insurance Agents, Engineers/Surveyors, and Federal/Exempt Customers.
- What are you looking for?**: A list of links: Flood Maps, FIRMettes, DFIRM Databases, MapViewer - Web (DFIRM viewer), and Documents, Publications & Forms.
- More Information**: A list of links: How do I find the flood map for my area?, What is a FIRMette?, How do I find a LOMC?, Definitions of FEMA Flood Zone Designations, Product Information, Price List, How to Order, and Need Assistance?
- Log On**: A login form with fields for 'User ID (email address):' and 'Password:', and buttons for 'Log on' and 'Clear'. There are also links for 'Forgot Password?', 'Register', and 'Do you want to register?'.
- Announcements**: A section titled 'New Fees Beginning October 1, 2007' with a paragraph of text and a link to 'FEMA-MSCSERVICE@dhs.gov'.
- Free Map Viewer**: A section titled 'The Map Service Center now has version 2.2 of the F-MIT viewer available for download. This new version supports FIRMette creation for both two color and black and white maps. You can download it [here](#).'
- Desktop DFIRM/NFHL Viewer**: A section titled 'FEMA is developing a simple tool for viewing GIS flood data. A beta of this tool can be downloaded [here](#). (learn more)'
- NFHL**: A section titled 'National Flood Hazard Layer (learn more)' with links for 'View the NFHL Online using MapViewer - Web', 'Order NFHL GIS Datasets by state on DVD', 'Use Web Map Service in your own GIS application', 'Use Web Map Service in Google Earth™', and 'Got Comments?'.
- FIRMette Tutorial**: A section titled 'Learn how to create FIRMettes. They're free!' with a small image of a map and a link 'Click here to learn how to create a FIRMette.'

Red callout boxes with arrows point to the following features:

- Product Search/Catalog**: Points to the 'Product Search by...' section.
- DFIRM Database**: Points to the 'What are you looking for?' section.
- Login**: Points to the 'Log On' section.
- National Flood Hazard Layer (NFHL)**: Points to the 'NFHL' section.
- FIRMette - Desktop Download**: Points to the 'Free Map Viewer' section.
- MapViewer - Desktop Download**: Points to the 'Desktop DFIRM/NFHL Viewer' section.
- FIRMette - Web Tool**: Points to the 'FIRMette Tutorial' section.

Let's Get Started with the MSC

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Product Search by...






Address Map Panel ID

1) Select a Product:
Flood Maps

2) Enter an Address:
Street: 300 E La Veta Ave
City: Orange
State: CA Zip:

Search by Street Address

- To view MSC products available for a specific address, use the “Product Search by Address” feature
- Panels and LOMCs are listed
- Click the link in the View column to view panels and create a FIRMette

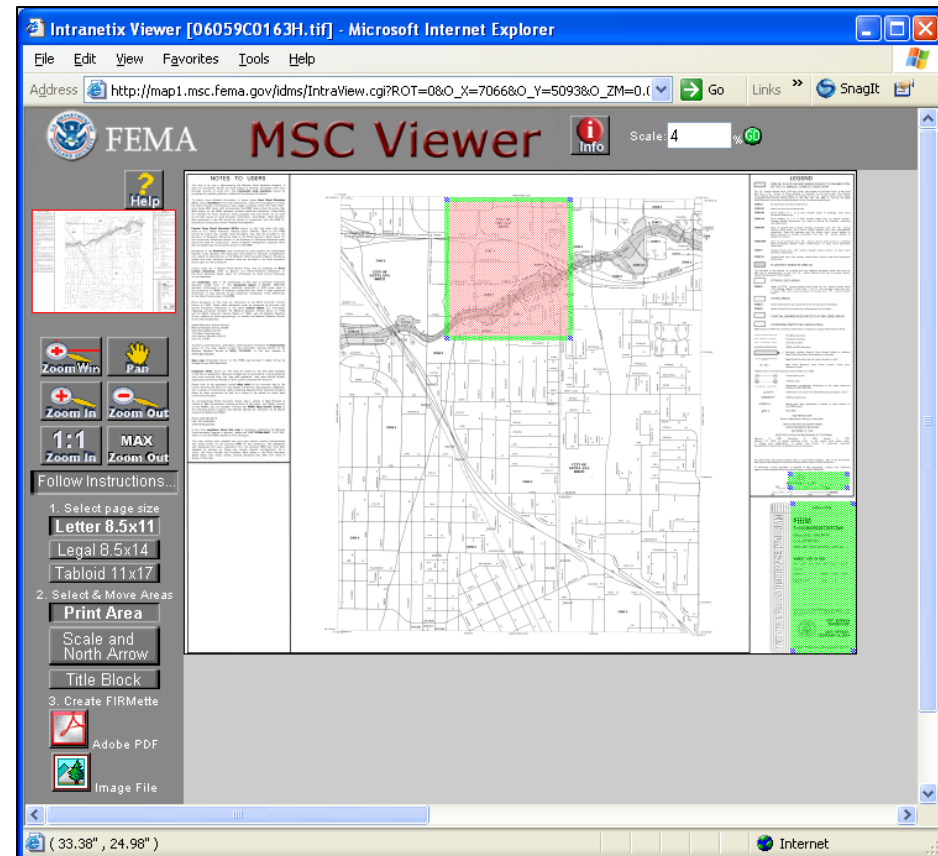
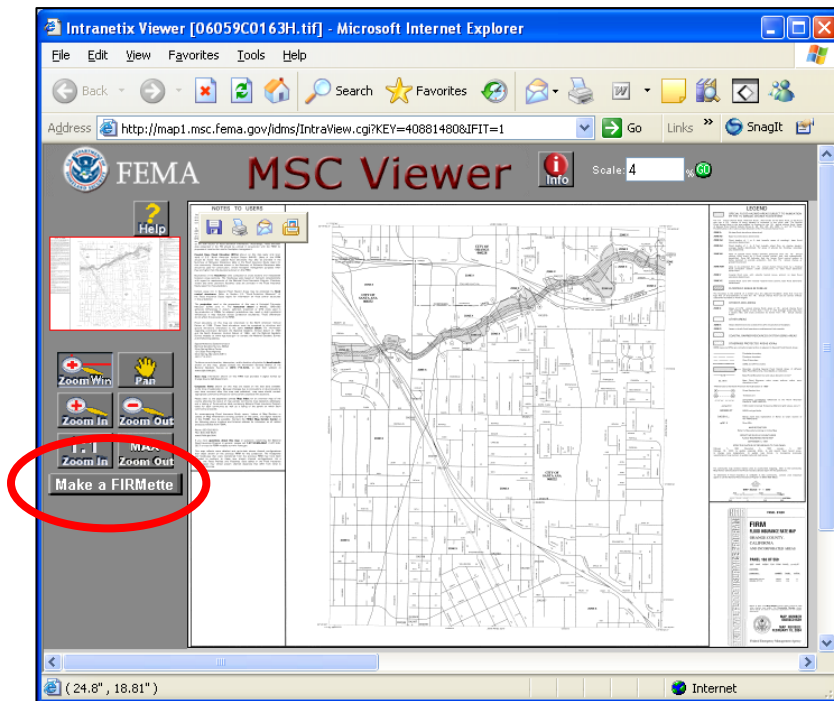
Map Panel Search Results					
Map Item ID	Description	Effective Date	Show LOMC	View	Buy
06059C0443H	ORANGE CO., UNINC&INC AREAS	02/18/2004	-		
LOMC	05-09-0346P-060764	05/05/2005			
LOMC	07-09-0740A-060231	04/12/2007			
LOMC	05-09-0793P-060231	08/31/2006			

What is a FIRMette? (*FIRMette* – Web)

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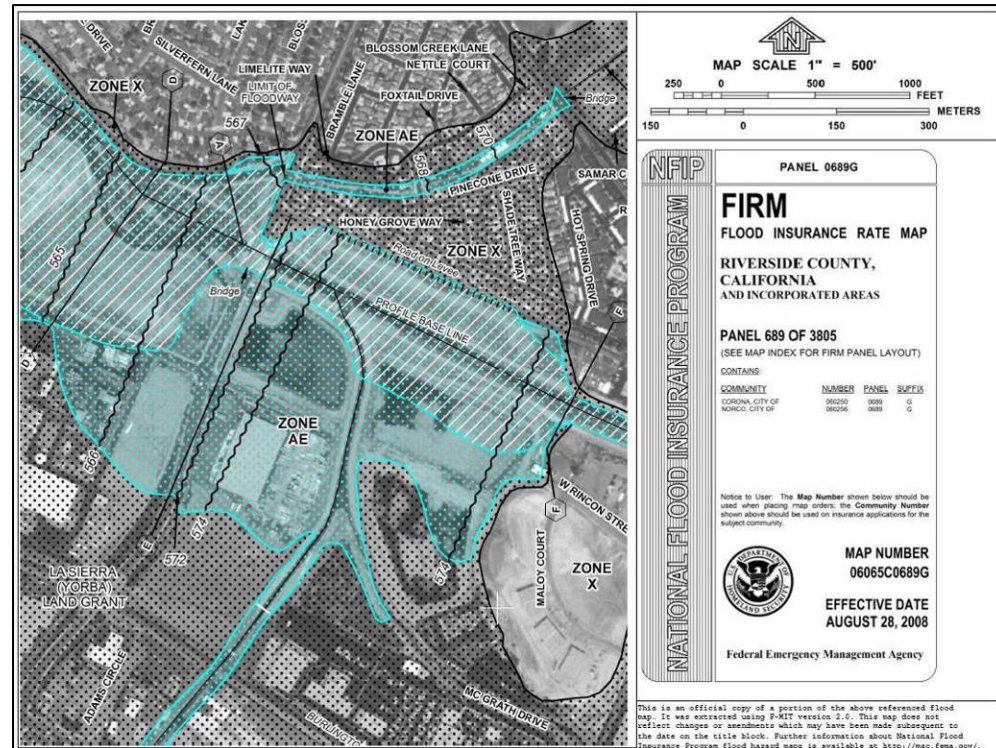
- Select “Make a FIRMette”
- Adjust boxes accordingly
- Choose output size



FIRMette – Web

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- Existing Tool
- FIRMettes are official
- 1.1 million FIRMettes downloaded each year
- Internet connection required
- Most recent **FIRM** panels in the MSC product catalog are used



Creating a FIRMette from Saved DFIRM Images

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- **FIRMette – Desktop** can be downloaded
 - <http://msc.fema.gov>

FEMA Map Service Center

Product Catalog | Map Search | Quick Order | Digital Post Office | Help

Product Search by...

Address | Map Panel ID

1) Select a Product:
Flood Maps

2) Enter an Address:
Street:
City:
State: Zip:
Search by Street Address

New to the FEMA Map Service Center?

- Homeowners/Renters
- Real Estate/Flood Determination Agents
- Insurance Agents
- Engineers/Surveyors
- Federal/Exempt Customers

What are you looking for?

- Flood Maps
- FIRMettes
- DFIRM Databases
- MapViewer - Web (DFIRM Viewer)
- Documents, Publications & Forms

More Information

- How do I find the flood map for my area?
- What is a FIRMette?
- How do I find a LOMC?
- Definitions of FEMA Flood Zone Designations
- Product Information
- Price List
- How to Order
- Need Assistance?

Announcements

New Fees Beginning October 1, 2007

Please contact the MSC Customer Service Center by telephone at 1-800-358-9616 or by e-mail at [FEMA-
MSCservice@dhs.gov](mailto:MSCservice@dhs.gov) for questions or additional information.

Free Map Viewer

The Map Service Center now has version 2.2 of the F-MIT viewer available for download. This new version supports FIRMette creation for both two color and black and white maps. You can download it [here](#).

Log On

User ID (email address) :
Password :
Log on Clear

[» Forgot Password?](#)
[» Register](#)
[Why register?](#)

NFHL

National Flood Hazard Layer (learn more)

View the NFHL Online using [MapViewer - Web](#)

Order **NFHL GIS Datasets** by state on DVD

Use **Web Map Service** in your own GIS application

Use **Web Map Service** in Google Earth™

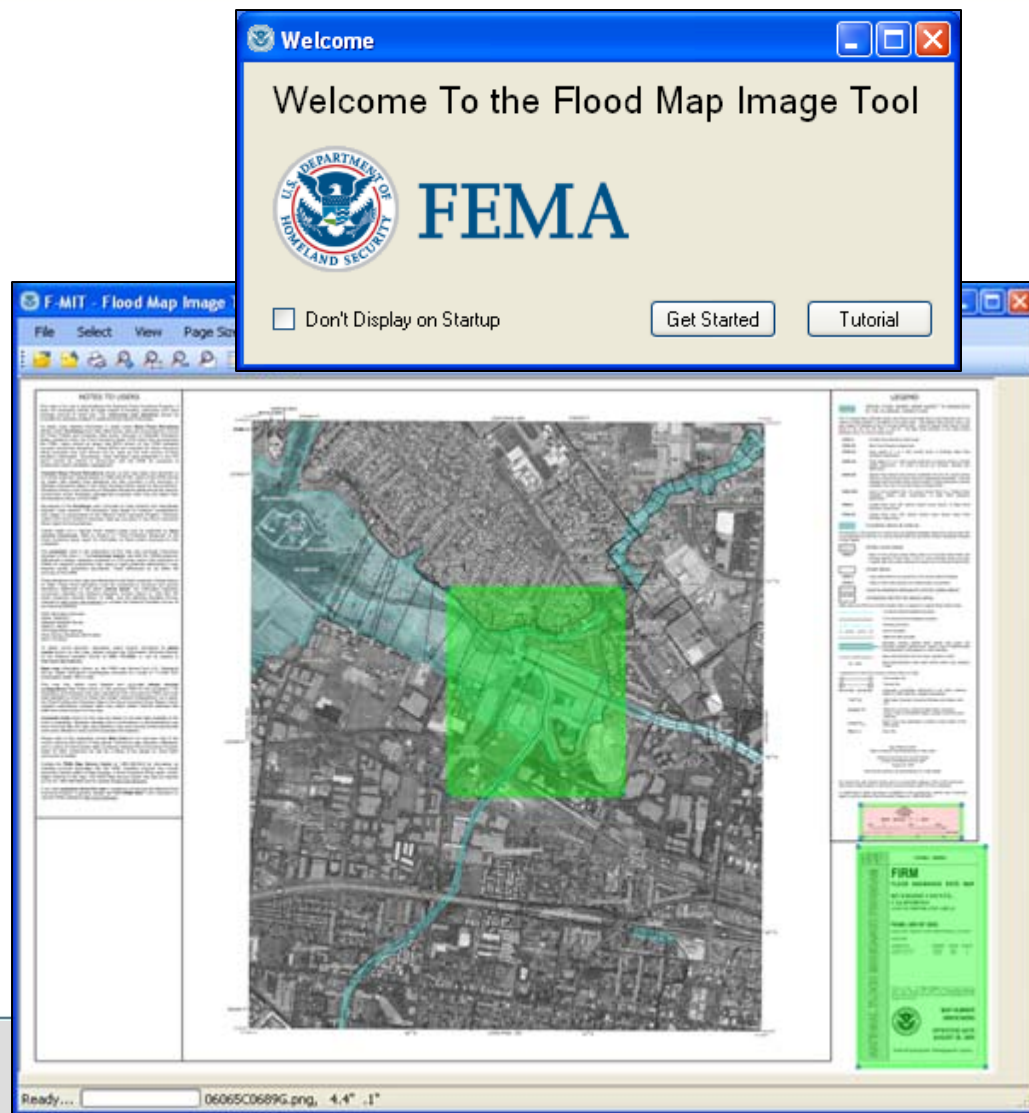
[Got Comments?](#)

FIRMette Tutorial

***FIRMette* - Desktop**

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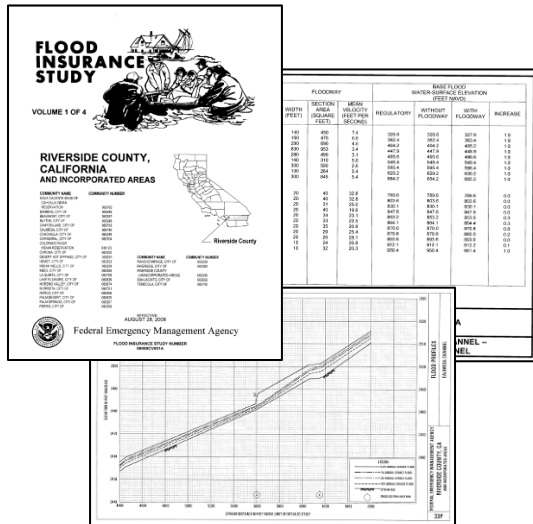
- Desktop application for *FIRMette* creation
- Uses locally saved PNG and TIF images
- Faster than *FIRMette* – Web
- Cannot search by address
- Must know DFIRM panel number



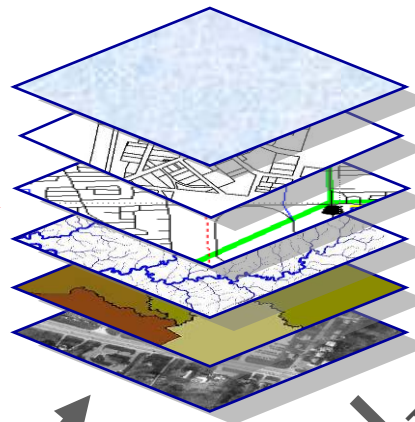
What is a DFIRM?

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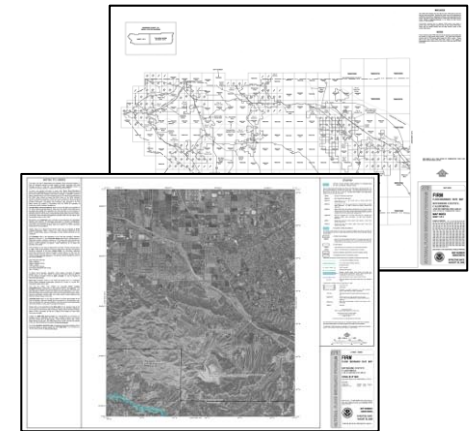
Flood Insurance Study (FIS) Text/Report (digital & hard-copy)



DFIRM Database

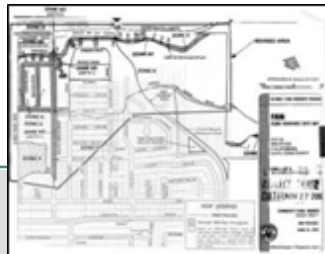


FIRM Panels (digital & hard-copy)



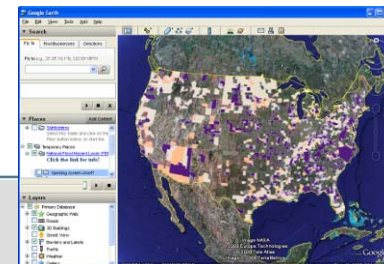
Effective LOMRs sewn
into DFIRM prior
to effective date

Letters of
Map Revision
(LOMRs)



Future LOMRs
sewn into
NFHL daily

Flood Hazard Layer



National
Flood
Hazard
Layer (NFHL)

FEMA's Policy on Use of Digital Flood Data

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- **Paper maps, FIRMettes and DFIRM database are interchangeable and equivalent (digital as official)**
 - Flood zones are defined precisely by geographic coordinates

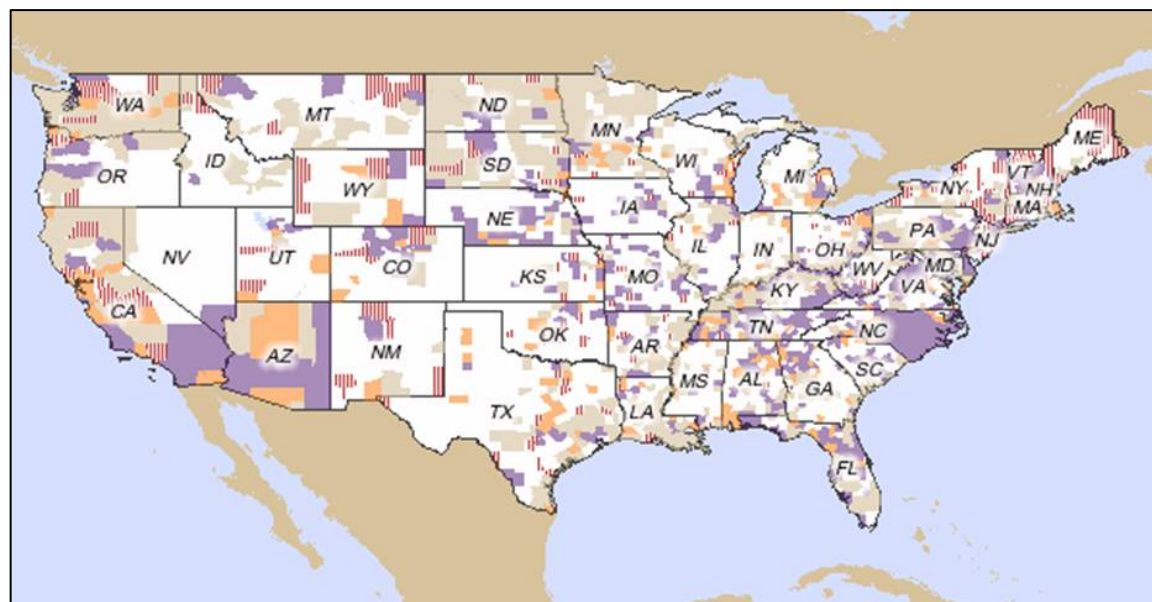
- **Allows use of local data with FEMA flood data**
 - Communities can integrate FEMA flood hazard data with local data without FEMA approval
 - Additional responsibility on communities to verify their data meets FEMA's accuracy requirements

- **Allows for the creation of a National Flood Hazard Layer (NFHL)**





National Flood Hazard Layer (NFHL)

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- All **effective** digital flood hazard data for the entire U.S.
- New DFIRM and LOMR data sewn in as they go **effective**
- FEMA's online tools for viewing NFHL data always reflect the most current NFHL data



Flood Data

-  [DFIRM Data Availability](#)
-  Preliminary Maps Issued
-  [Q3 Data Availability](#)
-  [Partial DFIRM Data Availability](#)

How Do I View the NFHL?

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- Go to the MSC web site:
 - <http://msc.fema.gov>
- Click hyperlink for *MapView - Web*

FEMA Map Service Center -- Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites

Address <http://www.msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-> Go Links

FEMA Map Service Center

Product Catalog | Map Search | Quick Order | Digital Post Office | Help

Product Search by...

Address Map Panel ID

1) Select a Product:
Flood Maps

2) Enter an Address:
Street:
City:
State: Zip:
Search by Street Address

New to the FEMA Map Service Center?

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- Real Estate/Flood Determination Agents
- Insurance Agents
- Engineers/Surveyors
- Federal/Exempt Customers

What are you looking for?

- Flood Maps
- FIRMettes
- **DFIRM Databases**
- **MapView - Web (DFIRM Viewer)**
- Documents, Publications & Forms

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Log On

User ID (email address) :

Password :

Log on Clear

» Forgot Password?

» Register

Why register?

NFHL

National Flood Hazard Layer (learn more)

View the NFHL Online using **MapView - Web**

Order **NFHL GIS Datasets** by state on DVD

Use **Web Map Service** in your own GIS application

Use **Web Map Service** in Google Earth™

Got Comments?

FIRMette Tutorial

City of St. Peters, City of St. Charles, St. Charles County, Missouri Letter of Map Revision Available
Case Number: 08-07-0068P
Effective date: October 30, 2008

San Bernardino County, California Letter of Map Revision Available
Case Number: 07-09-1957P
Effective date: November 19, 2007

City of Grand Forks, North Dakota Letter of Map Revision Available
Case Number: 07-08-0331P

MapViewer – Web

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- Search by address or community name

FEMA: Mapping Information Platform: Map Viewer - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address https://hazards.fema.gov/femaportal/wps/portal/tut/p/!ccxml/04_5f95Pykssy0xPLMnMz0vM0Y_Qj2KLd4PMAT3mMLbxBub6keijjCBXw98nTY9OAEPhmQAIDz_9q3zU9MTK5v1gW_9AP2C3NC1cr Go Links SnagIt

Mapping INFORMATION PLATFORM

Log in | Need an Account? | FEMA Dictionary | MIP Help?

Home | Map Modernization | News & Events | Tools & Links | **Map Viewer** | MIP User Care

Home > Map Viewer

View areas at risk of floods in the United States and territories. Search by address, state or zip code or use advanced search options such as coordinates and map scales. [View data from 2002 and earlier](#) regarding earthquakes, hurricanes and other hazards.

Geocoder

Overview Map

Select Zoom Filter
Zoom to:

Street Address

Street Address

Street:

City:

State: ZIP Code:

Select

Zoom Map

Flood Map Viewer

File Navigation Quick Zoom

PR & VI AS GU & IP US 48

Map Legend

Click "+" button to see a list of map layers that can be displayed
Click on a check box to add or remove a layer
Click "Refresh Map" button to update the map

Refresh Map

Legend Identify

- ☒ Flood Data
 - ☒ FIRM Data Availability
 - ☒ Preliminary Maps Issued
 - ☒ Q3 Data Availability
 - ☒ Partial DFIRM Data Availability
- ☐ FEMA Boundaries
- ☐ National Flood Hazard Layer
- ☐ Q3 Layers
- ☐ Imagery
- ☒ Basemap Layers

The current map contains layers that do not comply with DFIRM specifications
To show only DFIRM compliant layers, click here [DFIRM View](#)

Done

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National Flood Hazard Layer Point Location Report

Point Location Coordinate-Based (Latitude-Longitude)

Latitude: 33.77827 Longitude: -117.84910 (North American Datum of 1983)

Community

Community Name:	CITY OF ORANGE
NFIP Community Identification Number:	060228
County:	Orange County
State:	California

Flood Hazard Zone

For more information about flood hazard zones see http://www.fema.gov/plan/prevent/fhm/fq_gen13.shtm

Zone:	AE
Is this Zone a Special Flood Hazard Area (SFHA)?	Yes

To calculate the Base Flood Elevation (BFE), use the information about BFEs and cross-section elevations on the map and in the Flood Insurance Study (FIS) report. The report is available through FEMA's Map Service Center at <http://mssc.fema.gov>.

Is this location a floodway?	Yes
Floodway Type:	FLOODWAY

For more information about floodways see <http://www.fema.gov/plan/prevent/floodplain/nfipkeywords/floodway.shtm>

Coastal Barrier Resource System (CBRS) or Otherwise Protected Area (OPA) Unit

No CBRS or OPA unit at this location.

For more information about CBRS and OPA units see <http://www.fema.gov/plan/prevent/floodplain/nfipkeywords/cbrs.shtm>

National Flood Insurance Program (NFIP) Map

Map Panel Number:	06059C0163H
Effective or Revised Date:	February 18, 2004
Panel Type:	COUNTY-WIDE, PANEL PRINTED
Initial FIRM Date:	December 4, 1979
Date of FIRM Index Map:	February 18, 2004

To view the flood hazard map or order the map or flood hazard data please visit FEMA's Map Service Center at <http://mssc.fema.gov>.

Letter(s) of Map Revision (LOMRs)

No LOMRs at this location.

Remarks

(1 item remaining)

- 

Can I get information on a LOMA or LOMR-F? (*MapView* – Web)

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- Use Identify tool to select a LOMA
- Click hyperlink in legend (if LOMA is online)

Flood Map Viewer

File Navigation Quick Zoom

PR & VI AS GU & MP US 48

Map Legend

Click "+" button to see a list of map layers that can be displayed
Click on a check box to add or remove a layer
Click "Refresh Map" button to update the map

Refresh Map

Legend Identify

☒ Flood Hazard Zones
☒ LOMA and LOMR-F (incomplete data before 2000; locations approximate)

CASENUMBER	00-09-217A
CID	060228
COMMUNITYNAME	ORANGE, CITY OF
DATEENDD	01/06/2000
DATEENDDSTR	
DETERMINATIONTYPE	
LAT	33.78787
LOH	-117.8504
OBJECTID	0200
PDFLINK	Retrieve Amendment Determination Document (final)
PROJECTCATEGORY	LOMA

To help navigate through the maps on this page call (877) FEMA MAP ((877) 336-2627); Email: MIPHelp@mapmodteam.com

AREA 0
LEN 0

☒ Political Jurisdictions
☒ DFIRM Panels
☒ Streets

Road data from 1984-2008 TeleAtlas, Rel. 05/2007



Federal Emergency Management Agency

Washington, D.C. 20472

JAN 06 2000

LETTER OF MAP AMENDMENT
218-70-OS-RS

Community: City of Orange, California
Community No.: 060228
Map Panel Affected: 06059C0022 F
Map Effective Date: November 11, 1993

REFER TO CASE NO. 00-09-217A

A request dated November 29, 1999, for a Letter of Map Amendment. All required information for this request was received on December 7, 1999. Using the information submitted and the effective National Flood Insurance (NFI) map, we determined portions of the property described below are in a Special Flood Hazard Area (SFHA) that would be inundated by the flood having a 1-percent chance of being equalled or exceeded in any year (base flood); however, Buildings 1 through 14 on the property are not in the SFHA.

Property Description: Buildings 1 through 14, Tract 10949, as shown on the Plat recorded as Instrument No. 82-287985, in Book 52, Pages 48, 49, and 50, in the Office of the Recorder, Orange County, California

Mapping Source: El Modena - Irvine Channel

Buildings 7 and 10 through 13 are correctly shown outside the SFHA on the above-referenced NFIP map. Buildings 1 through 6 are in Zone X (unshaded), an area of minimal flooding outside the SFHA.

Buildings 1 through 6 are correctly shown outside the SFHA on the above-referenced NFIP map. Buildings 1 through 6 are in Zone X (unshaded), an area of minimal flooding outside the SFHA. Flood insurance coverage may be available under a low-cost policy (see enclosed document). Because portions of the property are in the SFHA, any future construction or substantial improvement on the property remains subject to Federal flood insurance regulations for floodplain management.

This document provides additional information about Letters of Map Amendment. If you have any questions or, please contact the Federal Emergency Management Agency Map Assistance Center toll free at 1-877-FEMA-MAAP or by letter addressed to the FEMA LOMA DEPOT, 3601 Eisenhower Avenue, Suite 600, Alexandria, VA 22304-6439.

Sincerely,

Matthew B. Miller

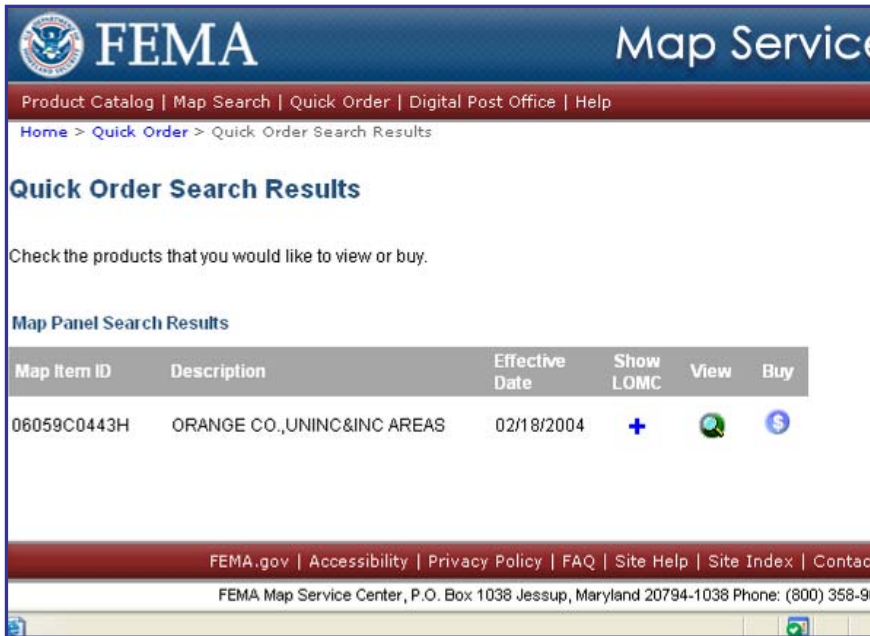
Matthew B. Miller, P.E., Chief
Hazards Study Branch
Mitigation Directorate

Community Map Repository

Digital LOMRs are Current and Seamless in the NFHL

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Risk MAP



FEMA Map Service Center

Product Catalog | Map Search | Quick Order | Digital Post Office | Help

Home > Quick Order > Quick Order Search Results

Quick Order Search Results

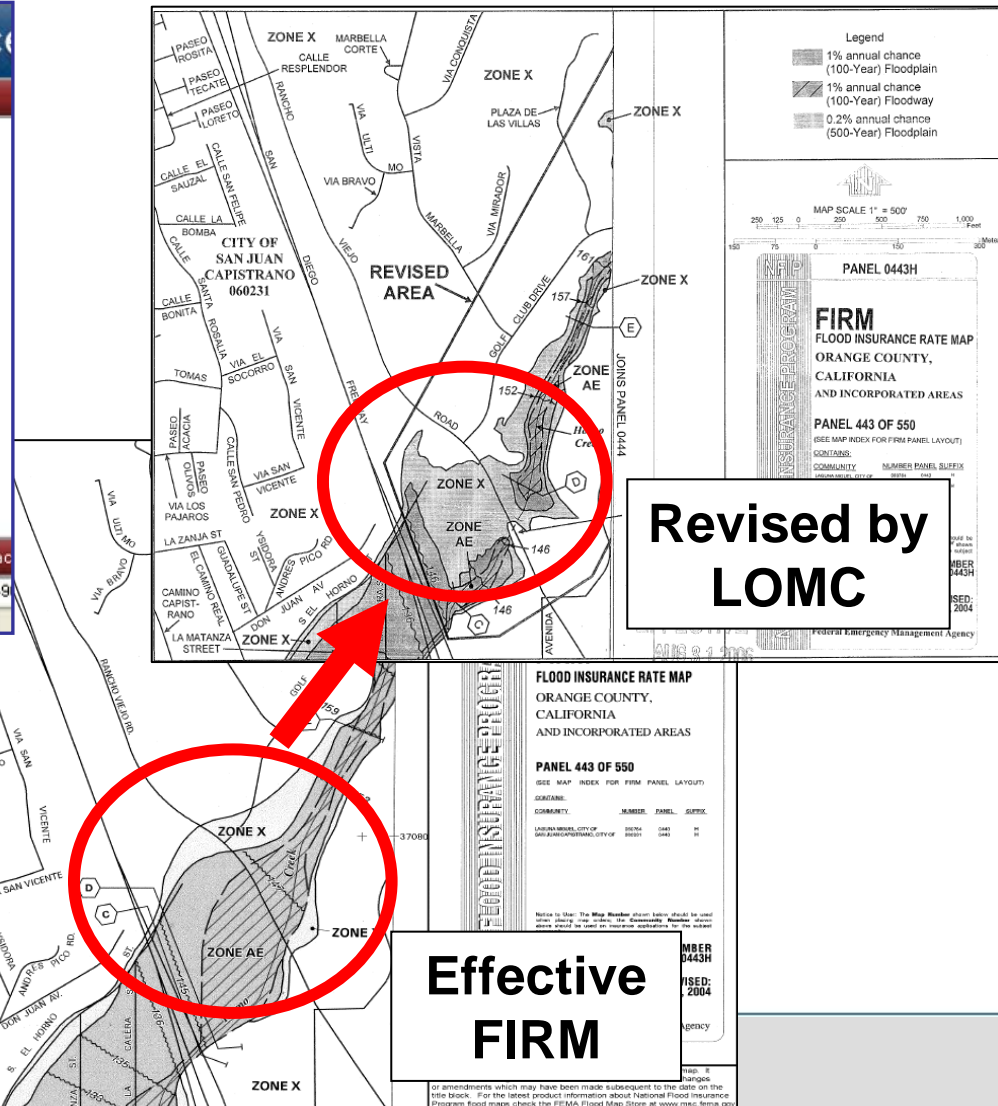
Check the products that you would like to view or buy.

Map Panel Search Results

Map Item ID	Description	Effective Date	Show LOMC	View	Buy
06059C0443H	ORANGE CO., UNINC&INC AREAS	02/18/2004	+	View	Buy

FEMA.gov | Accessibility | Privacy Policy | FAQ | Site Help | Site Index | Contact Us

FEMA Map Service Center, P.O. Box 1038 Jessup, Maryland 20794-1038 Phone: (800) 358-9434



- Revised study
- Need to look at two maps using paper FIRM

■ **Advantages**

- View seamless layer of all effective DFIRM data
- Address search to point on map
- Can produce a simple report to determine if a clicked point is in a SFHA

■ **Considerations**

- NFHL not available until effective date
- Does not show local data

MapViewer - Desktop

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- Downloading
MapViewer - Desktop
 - <http://msc.fema.gov>
- Click on the hyperlink
for Desktop
DFIRM/NFHL Viewer

The screenshot shows the FEMA Map Service Center website in a Mozilla Firefox browser window. The address bar displays <http://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView>. The page header includes the FEMA logo and the text "Map Service Center". Below the header is a navigation bar with links: "Product Catalog | Map Search | Quick Order | Digital Post Office | Help".

The main content area is divided into several sections:

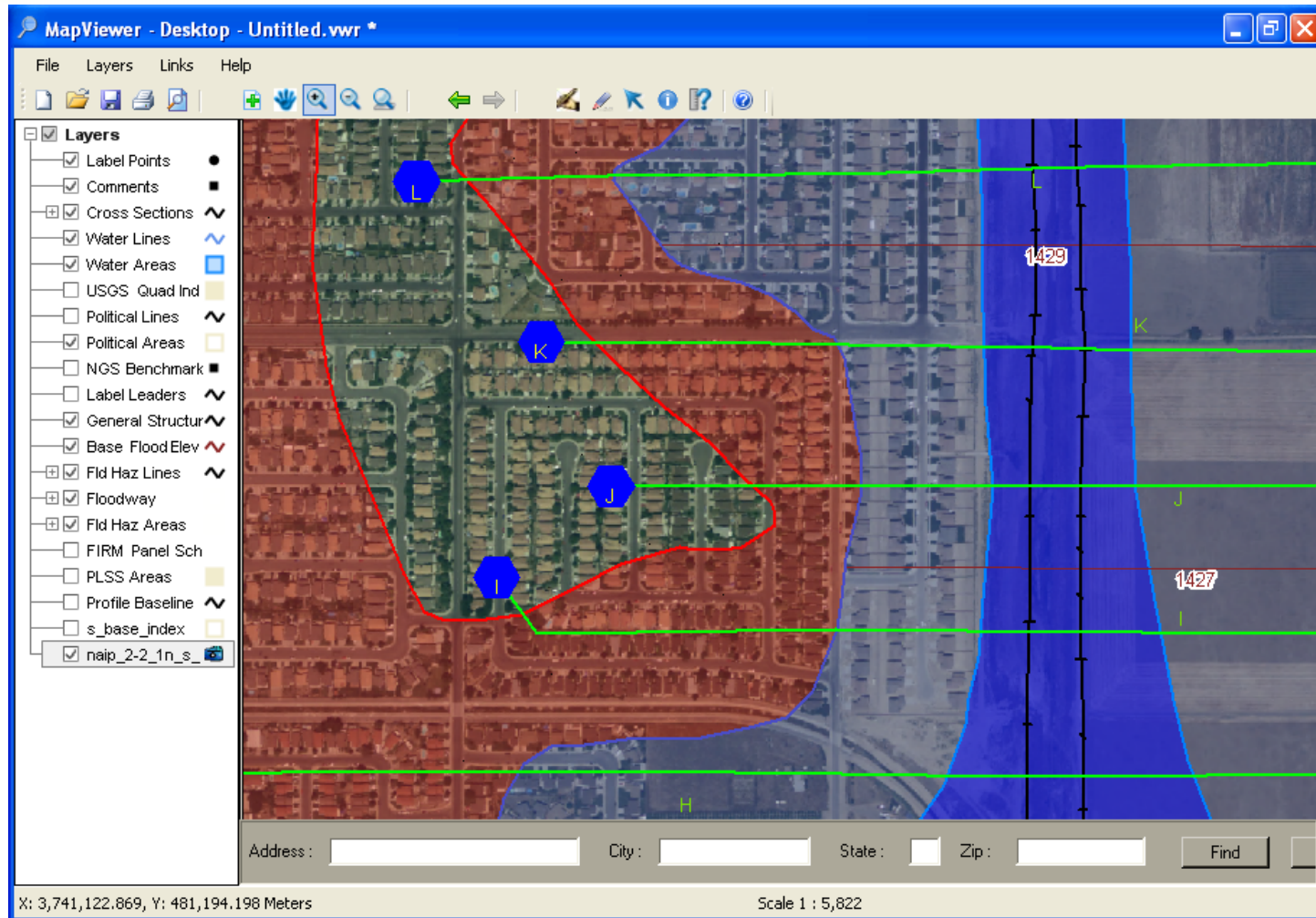
- Product Search by...**: Includes a "Map Panel ID" tab and a "Select a Product:" dropdown menu with "Flood Maps" selected. Below this is a form to "Enter an Address:" with fields for Street, City, State, and Zip, and a "Search by Street Address" button.
- New to the FEMA Map Service Center?**: Lists links for Homeowners/Renters, Real Estate/Flood Determination Agents, Insurance Agents, Engineers/Surveyors, and Federal/Exempt Customers.
- What are you looking for?**: Lists links for Flood Maps, FIRMettes, DFIRM Databases, MapViewer - Web (DFIRM Viewer), and Documents, Publications & Forms.
- More Information**: Lists links for How do I find the flood map for my area?, What is a FIRMette?, How do I find a LOMC?, Definitions of FEMA Flood Zone Designations, Product Information, Price List, How to Order, and Need Assistance?
- Announcements**: Titled "New Fees Beginning October 1, 2007", it contains text about contacting the MSC Customer Service Center and a link to FEMA-MSCService@dhs.gov.
- Free Map Viewer**: States that the Map Service Center now has version 2.2 of the F-MIT viewer available for download, supporting FIRMette creation for both two color and black and white maps. It includes a link to [here](#).
- Desktop DFIRM/NFHL Viewer**: This section is circled in red. It states: "FEMA is developing a simple tool for viewing GIS flood data. A beta of this tool can be downloaded [here](#). (learn more)".
- NFHL**: Titled "National Flood Hazard Layer (learn more)", it includes links for "View the NFHL Online using MapViewer - Web", "Order NFHL GIS Datasets by state on DVD", "Use Web Map Service in your own GIS application", and "Use Web Map Service in Google Earth™".
- Got Comments?**: A link to provide feedback.
- FIRMette Tutorial**: Titled "Learn how to create FIRMettes. They're free!", it includes a link to [Click here to learn how to](#).

The browser window title is "FEMA Map Service Center - Mozilla Firefox". The status bar at the bottom shows "Done".

A Non-Proprietary GIS Tool (*MapView* - Desktop)

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- **Intended for communities to use to comment on a preliminary DFIRM during 30 day comment period**
 - View locally stored DFIRM data
 - Address search to point on map
 - Automatic symbology and labels
 - Add your own imagery

- **Considerations**
 - Was designed as a data review tool, not an analysis tool

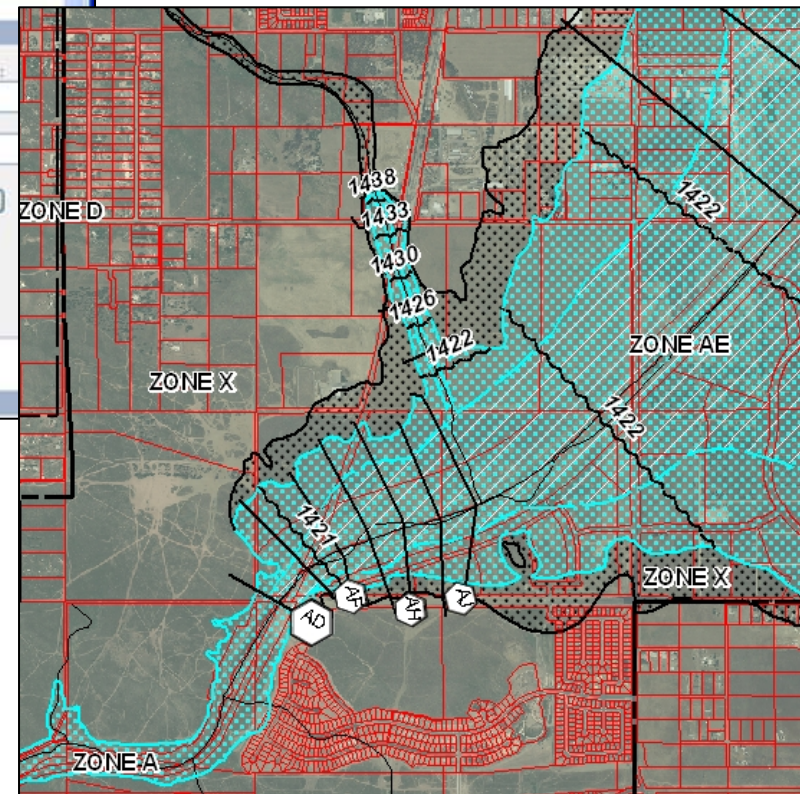
Back to the Basics: Getting the Data

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Risk MAP

The screenshot shows the FEMA Map Service Center (MSC) website. The header includes the FEMA logo and the text "FEMA Map Service Center". Below the header is a navigation bar with links: "Product Catalog | Map Search | Quick Order | Digital Post Office | Help". The main content area is divided into several sections:

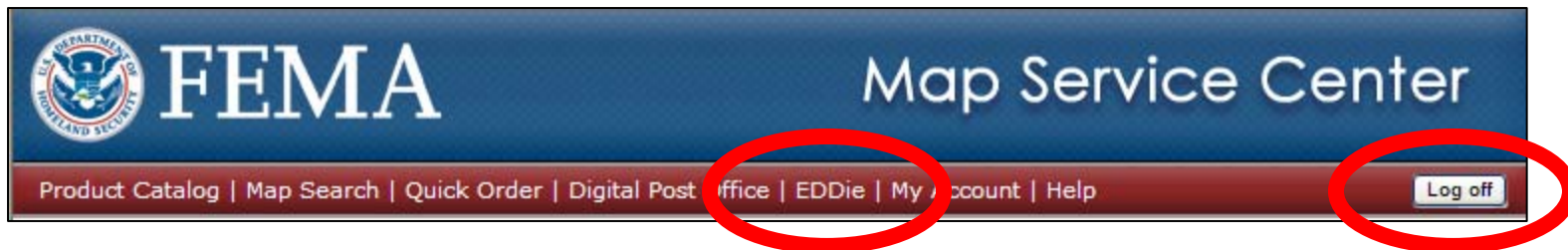
- Product Search by...**: A section with two tabs, "Address" and "Map Panel ID". Under "Address", there are fields for "1) Select a Product:" (a dropdown menu showing "Flood Maps"), "2) Enter an Address:" (fields for "Street:", "City:", "State:", and "Zip:"), and a "Search by Street Address" button.
- New to the FEMA Map Service Center?**: A section with links for "Homeowners/Renters", "Real Estate/Flood Determination Agents", "Insurance Agents", "Engineers/Surveyors", and "Federal Exempt Customers". Below this is a section titled "What are you looking for?" with links for "Flood Maps", "FIRM Databases" (circled in red), "FIRM Viewer (DFIRM Viewer)", and "Documents, Publications & Forms".
- Log On**: A section with fields for "User ID (email address):" and "Password:", and buttons for "Log on" and "Clear". Below these are links for "> Forgot Password?" and "> Register", and a link for "Why register?".
- More Information**: A section with links for "How do I find the flood map for my area?", "What is a FIRMette?", "How do I find a LOMC?", and "Definitions of FEMA Flood Zone Designations".



- Can be purchased on CD
- Also available for download on the MSC

EDDie: Express Document Delivery

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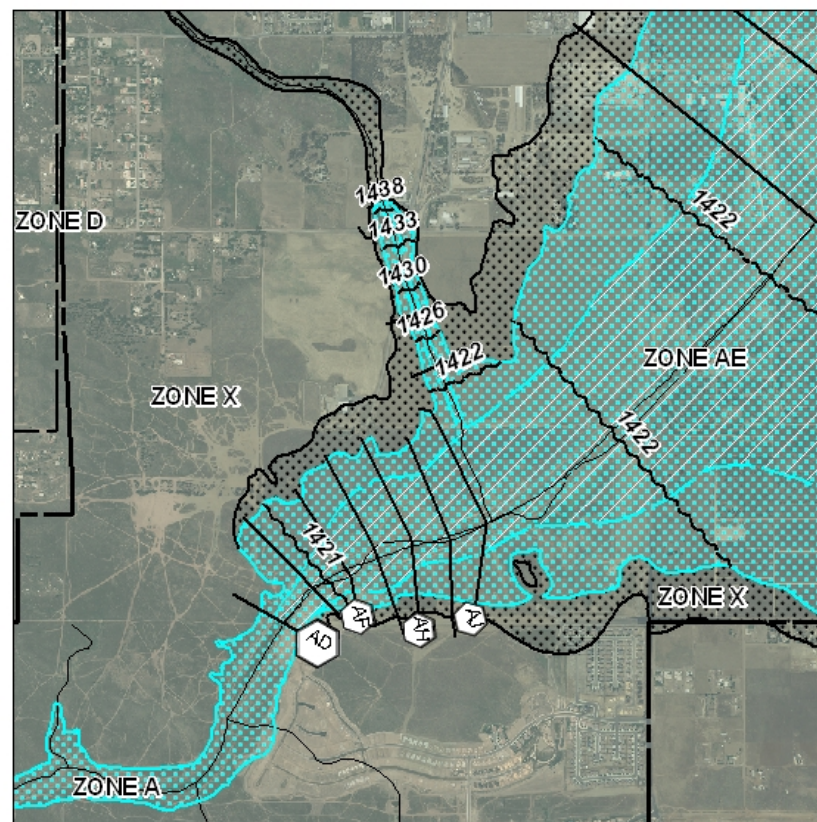
- For federal, state and local government employees
- One account per community
- Provides faster and easier access for download of
 - Flood Insurance Rate Maps (FIRM)
 - DFIRM Databases
 - Flood Insurance Studies (FIS)
 - Letters Of Map Change (LOMC)

A screenshot of the FEMA Map Service Center search interface. It shows a 'Search by Item Id' section with a text input field and a 'Go' button. Below this is a 'Search by Region' section with a 'Show FIPS/CID codes' link and three dropdown menus: 'CALIFORNIA', 'KERN COUNTY', and 'All Communities'. At the bottom, there is a list of search results: 'Flood Insurance Rate Maps (FIRM)', 'DFIRM Databases', 'Flood Insurance Studies (FIS)', and 'Letters Of Map Change (LOMC)'.

DFIRM Database Components

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- A DFIRM database is a collection of digital data required to produce a Flood Insurance Rate Map (FIRM)
- Important Layers
 - Base Flood Elevations
 - Cross Section Locations
 - **Flood Hazard Areas/Lines**
 - Political Boundaries
 - Water Areas/Lines
 - Basemap



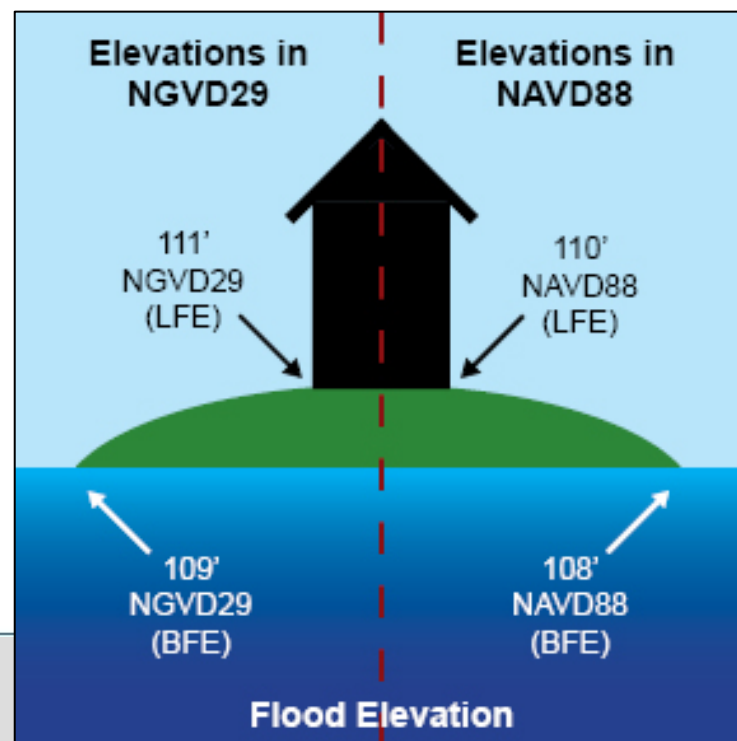
Projection and Datums

■ DFIRM Projection

- UTM or State Plane (projection is chosen by community during scoping)
- Reprojection required to use with other projections

■ Datums

- NAD83 (horizontal datum)
- NGVD29 to NAVD88 conversion (vertical datum)
 - Vertical datum elevation changes are relative to each other



- **Effective DFIRM databases are rolled into the NFHL**
 - DFIRM database is a snapshot of the information on the printed map product
- **THE NFHL is updated continually with LOMRs**
 - Updated NFHL GIS data are released monthly
- **NFHL GIS data are delivered on DVD**
 - Order through the MSC
 - No charge for the data
- **NFHL is available by State**
 - Order as many as you need

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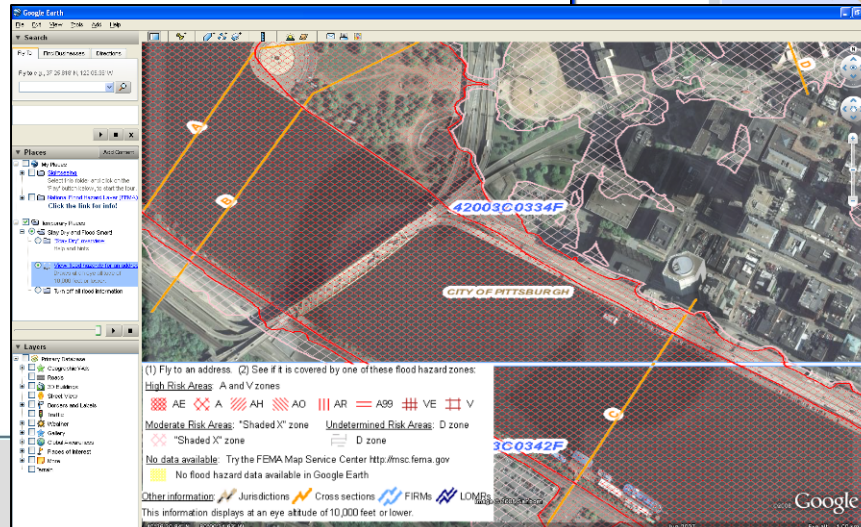
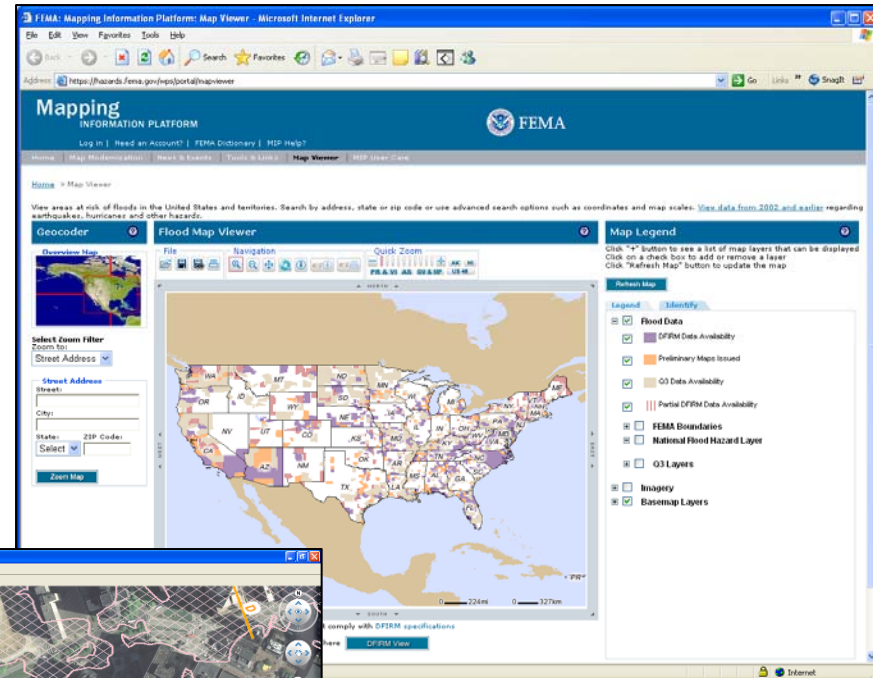
Got Comments?



NFHL Web Map Services (WMS)

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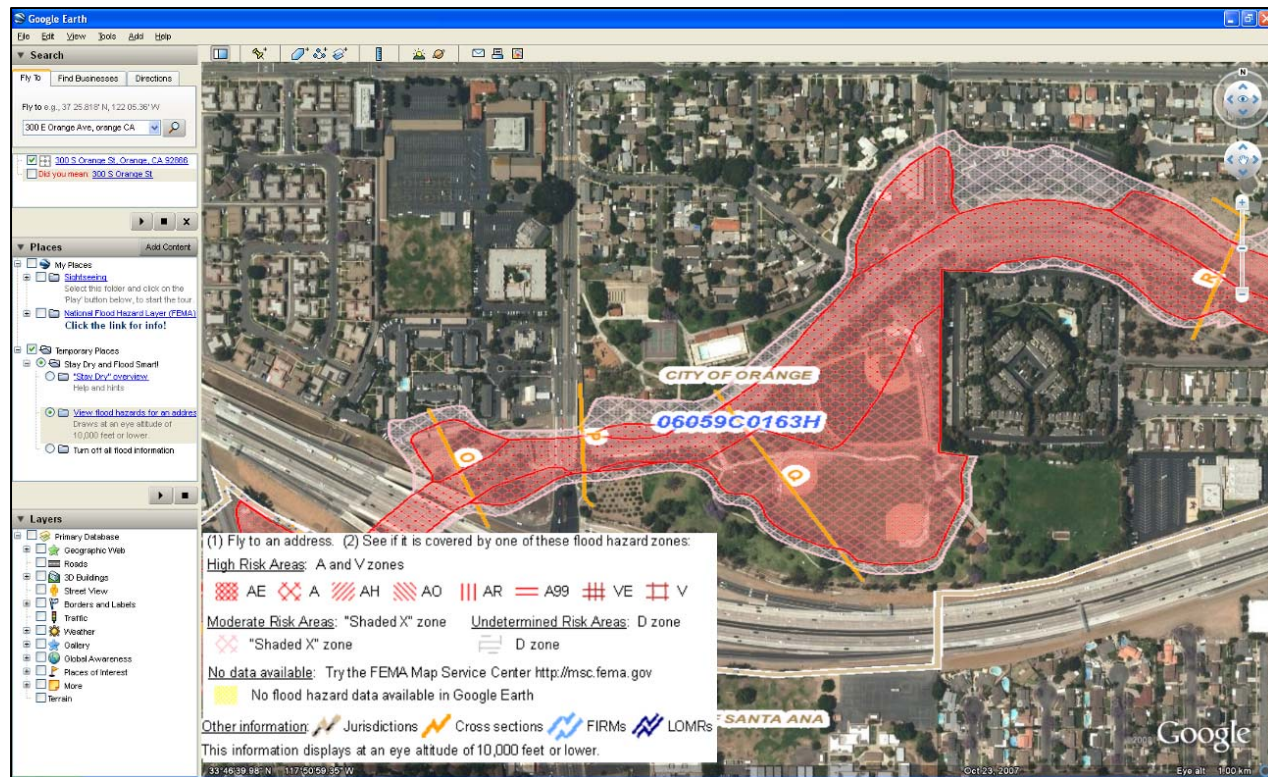
- Web Map Services (WMS)
- Google Earth
 - Two KMZ files available



Stay Dry KMZ: the Basics

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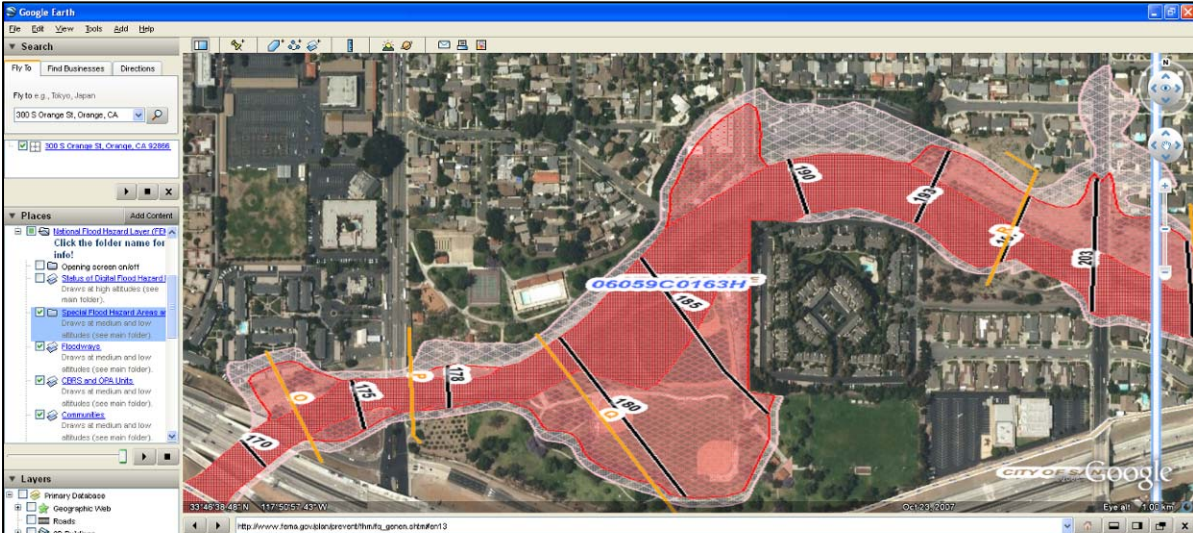
- Stay Dry KMZ shows
 - SFHAs
 - LOMRs
 - FIRM Boundaries
 - Cross Sections
 - Jurisdictions
- Can't reorder/hide specific layers
- Basic floodplain information
- Easy to understand



NFHL KMZ: Beyond the Basics

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- NFHL KMZ shows
 - Stay Dry layers +
 - BFEs
 - LOMA/LOMR-Fs
 - Floodways
 - Flood Control Structures
- Can reorder layers
- Can hide/show legends
- Hyperlinks to supplemental data




LOMA and LOMR-F
Draws at medium and low altitude (see main folder).

This layer is not part of the National Flood Hazard Layer and is provided for reference only.

A **Letter of Map Amendment (LOMA)** is an official determination by FEMA that a property has been inadvertently included in a Special Flood Hazard Area as shown on an effective National Flood Insurance Program map and is not subject to inundation by the 1-percent-annual-chance flood. Generally, the property is located on natural high ground at or above the Base Flood Elevation or on fill placed prior to the effective date of the first National Flood Insurance Program map designating the property as within a Special Flood Hazard Area. The two most common bases of LOMA requests are area limitations of map scale and development of topographic data more accurately reflecting the existing ground elevations at the time the maps were prepared.

A **Letter of Map Revision Based on Fill (LOMR-F)** is a letter issued by FEMA when FEMA determines that a legally defined parcel of land or structure has been elevated above the Base Flood Elevation based on the placement of earthen fill after the date of the first National Flood Insurance Program map.

LOMA and LOMR-F Symbol

 LOMA or LOMR-F 04-02- LOMA or LOMR-F Case Number (low altitude only)

The positions for LOMAs and LOMR-Fs are approximate, and are less accurate than those for other layers. Coverage is incomplete for LOMAs and LOMR-Fs issued before 2000.

Many LOMAs or LOMR-Fs are available for viewing and downloading over the Internet from the [FEMA Map Service Center](#). Use the case number to search for the item.

Special Flood Hazard Areas and Other Zones
Draws at medium and low altitudes (see main folder).

A **Special Flood Hazard Area (SFHA)** is an area delineated on a National Flood Insurance Program map as being subject to inundation by the base flood. A **base flood** is the flood that has a 1-percent chance of being equalled or exceeded in any given year (sometimes called the "100-year" flood). SFHAs are determined using statistical analyses of records of river flow, storm tides, and rainfall; information obtained through consultation with a community; floodplain topographic surveys; and hydrologic and hydraulic analyses. (Note that they are not a feature that you can see by looking at the ground, and so cannot be traced from an aerial photograph.)

Special Flood Hazard Area and Other Zone Symbols
Symbols labeled in **bold** text display at medium and low altitudes; all symbols display at low altitudes. (To read the symbols correctly, be sure that north is at the top of your screen.)

A and V zones			

Events Contained in Structures (channels, culverts, sewers)

Floodway in structure 1 pct event in structure 0.2 pct event in structure

Edges of Zones (low altitude only)

Limit of floodway Edge of floodway Limit of 1 pct annual chance flood Breaks among 1 pct annual chance flood zones

Apparent limit Limit of study Flowage encroachment

See [What are the different flood insurance risk zone designations and what do they mean?](#) to learn more about the zones.

FEMA officially revises these data through administrative procedures and documents the changes through **Letters of Map Revision**. These changes are included in this layer.

If data for an area are **not available** in this layer, try the "Older (Q3) Base Flood Data" layer. Also visit the [FEMA Map Service Center](#) to see if other flood hazard maps and data are available.

Google Earth NFHL Guidance

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- Start at the MSC
 - <http://msc.fema.gov>

NFHL

National Flood Hazard Layer (learn more)

View the NFHL Online using **MapViewer - Web**

Order **NFHL GIS Datasets** by state on DVD

Use **Web Map Service** in your own GIS application

Use **Web Map Service** in Google Earth™

Got Comments?

FEMA: Mapping Information Platform: NOPAGETAB_NFHLKMLZ - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <https://hazards.fema.gov/femaportal/wps/portal/NFHLWMSkmzdownload>

Mapping INFORMATION PLATFORM

Log in | Need an Account? | FEMA Dictionary | MIP Help?

Home | Map Modernization | News & Events | **Tools & Links** | Map Viewer | MIP User Care

Public Reports

Home > Tools & Links

Tools & Links

Using the National Flood Hazard Layer Web Map Service (WMS) in Google Earth™

Google Earth is a popular Internet application through which users can view maps. This web site provides zipped Keyhole Markup Language (.kmz) files through which users can view map overlays created from FEMA's National Flood Hazard Layer on Google Earth images.

You must already have the Google Earth application installed on your computer to use these files. The starting point for obtaining the software is <http://earth.google.com>. Information about the system requirements needed for your computer to run the software is available through <http://earth.google.com/support>. A user guide is available at <http://earth.google.com/userguide>.

FEMA offers two applications: "Stay Dry" and "FEMA NFHL." Each is described below, and each has its own .kmz file. For optimum performance, please do not open both, and do not have more than one copy of each, in Google Earth at the same time.

To use the .kmz files, first save them to your computer. Do this by right-clicking on a hyperlinked file name below, choosing "Save Target as" (Internet Explorer) or "Save Link As" (Firefox), changing the file name if you wish (**be sure that the file name has the extension .kmz**), and clicking on save.

After saving the file, double-click on the file on your computer. This action should start Google Earth and provide the opening view for the application.

If you plan to use mapped flood information displayed in Google Earth for official purposes, insure that imagery and other map information displayed with the flood data meet FEMA's standards for map accuracy.

Some Geographic Information System (GIS) software can import GIS data encoded in the kmz format used for these applications. This technique is unlikely to work with the kmz files provided below. If you are interested in using the NFHL in GIS software, use the NFHL GIS data or NFHL Web Map Service. Both are available through the MSC at <http://msc.fema.gov>.

FEMA anticipates future improvements to the .kmz files, so please revisit this page occasionally to obtain the latest version.

Stay Dry

"Stay Dry" is a focused application that provides basic flood hazard map information from FEMA's National Flood Hazard Layer for an address. It allows you to view flood hazard zones, cross sections and their labels, community names and boundaries, Flood Insurance Rate Map numbers and boundaries, and Letter of Map Revision case numbers and boundaries.

For best performance please delete or turn off previous versions of the "Stay Dry" or "FEMA NFHL" folders that you have loaded in Google Earth before using the new version of "Stay Dry."

[Stay Dry v2.0.kmz](#)

Stay Dry Google Earth Application Instructions

How to use Web Map Services

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- In Google Earth

- Access either of the 2 KMZ files on the MSC web site

- In your own GIS application

- Guidance provided on MSC web site

NFHL

National Flood Hazard Layer ([learn more](#))

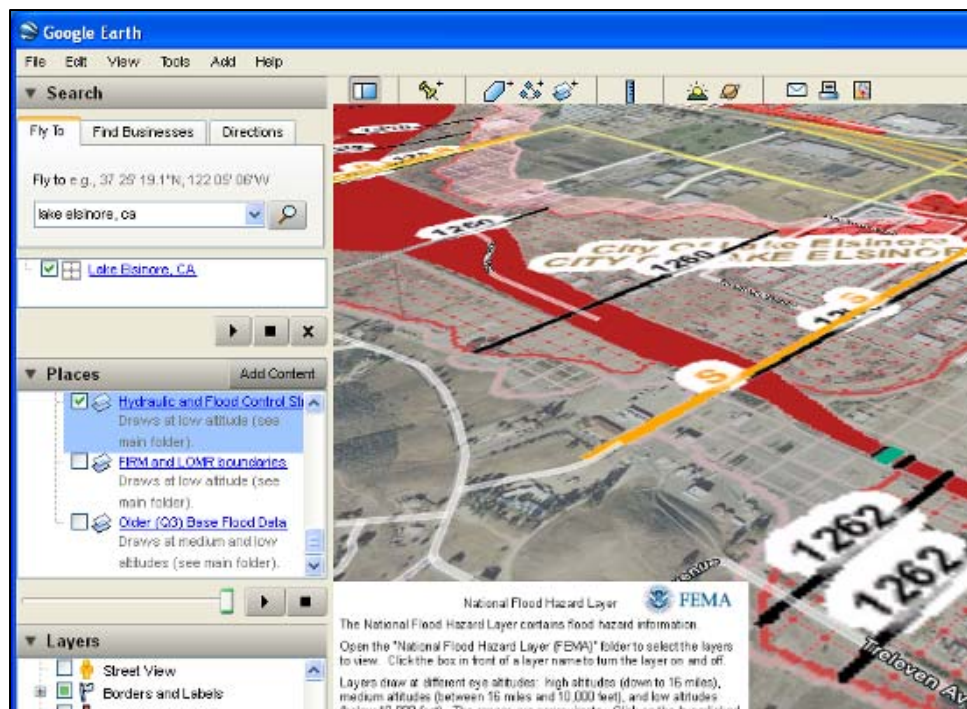
View the NFHL Online using [MapViewer - Web](#)

Order [NFHL GIS Datasets](#) by state on DVD

Use Web Map Service in your own GIS application

Use [Web Map Service](#) in Google Earth™

[Got Comments?](#)



How to use Web Map Services in ESRI ArcGIS

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- Use **Add Data → GIS Servers** within ArcMap to add the NFHL data
 - URL for the WMS's is on the MSC web site
 - As with all WMS's, the data are read-only

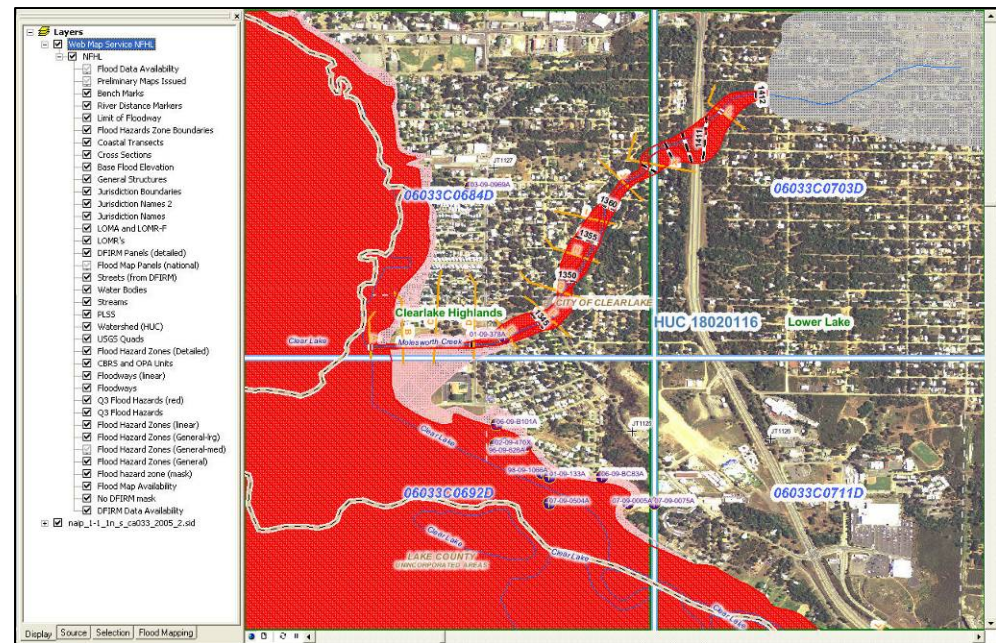
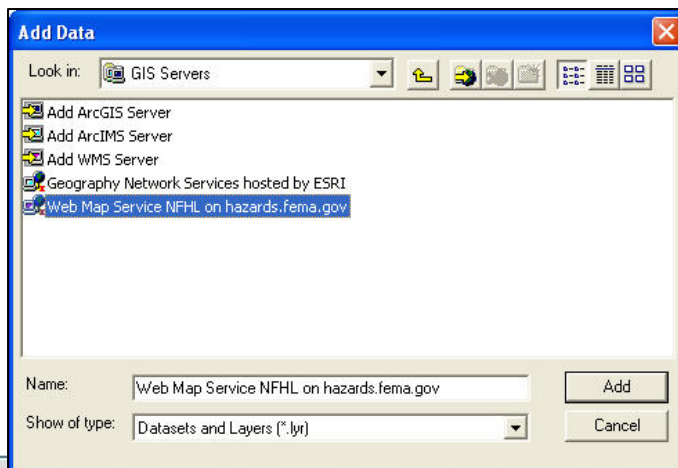
NFHL service

The "NFHL" service provides access to most features in the NFHL and has map symbols that highlight flood hazards.

NFHL WMS Instructions

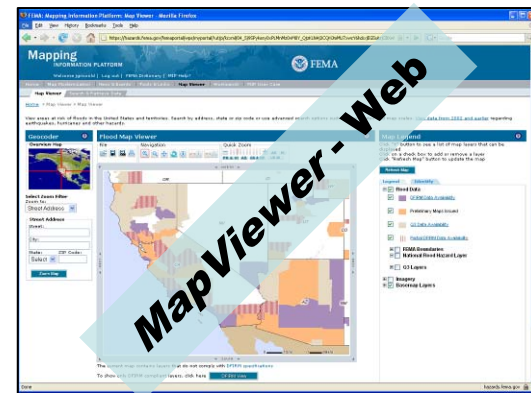
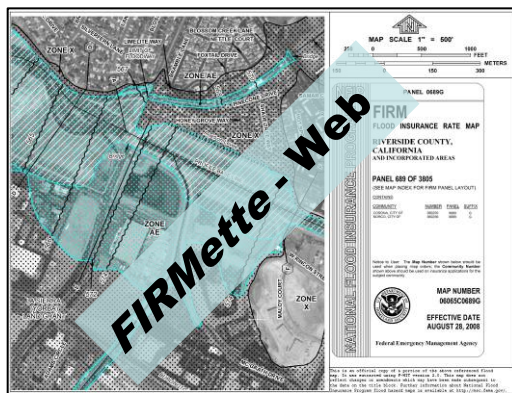
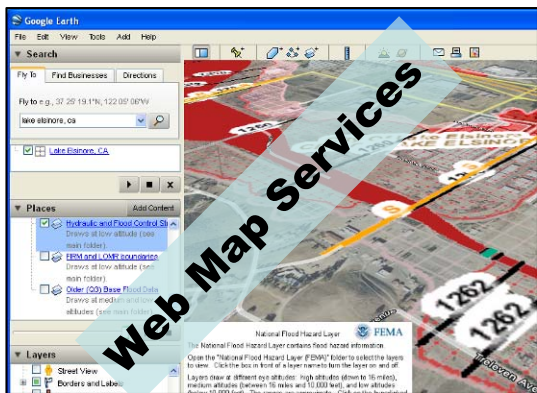
The URL for the WMS Capabilities file is:

<http://hazards.fema.gov/wmsconnector/wmsconnector/Servlet/NFHL?REQUEST=GetCapabilities&SERVICE=WMS>

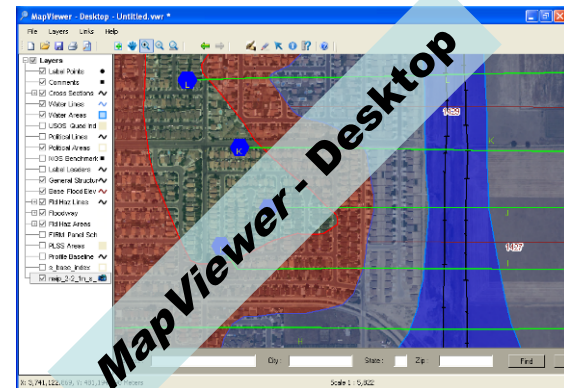
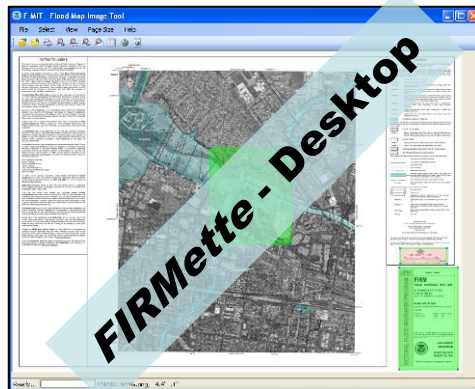


Use the Right Tool for the Job

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- Tools benefit Floodplain Administrators, the general public and other stakeholders
- Perform flood zone determinations, data queries/visualizations and more
- Both on-line and desktop tools are available
- Local installation of GIS software is not required



■ Risk Assessment: HAZUS-MH

- Analyzes potential losses from floods, hurricane winds and earthquakes
- Produces estimates of hazard-related damage before or after a disaster

■ Hydraulic Modeling:

- *HEC-GEO RAS, FLO-2D, MIKE* and other products

■ Planning:

- Zoning, land use, city planning with CAD and other GIS products like *AutoCAD, ArcGIS, MapInfo, GeoMedia, ...*

FEMA Map Assistance Call Center (FMAC)

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- 877-FEMA MAP (877-336-2627)
- FEMAMapSpecialist@mapmodteam.com
- FMAC provides info about DFIRMs, NFIP rules and procedures:
 - Requirements for Letters of Map Change (LOMCs), Physical Map Revisions, Appeals, Protests, and Community Compliance
 - Preliminary and Revised Preliminary FIS's and Maps
 - Requests for Technical and Administrative Support Data
 - LOMC Revalidation and Re-issuance Letters and Process
 - Map Change and Data Request Processing Fees
 - Letters of Determination Review (LODRs)



FEMA

Suzanne K. Vermeer, P.E., CFM
FEMA Region V – Chicago, IL
suzanne.vermeer@dhs.gov