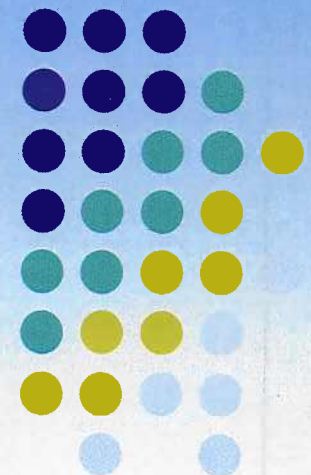


FEMA'S Map Modernization Program and Levee Certification

An Introduction and Overview of
Map Mod and Procedural Memorandums
on Levees



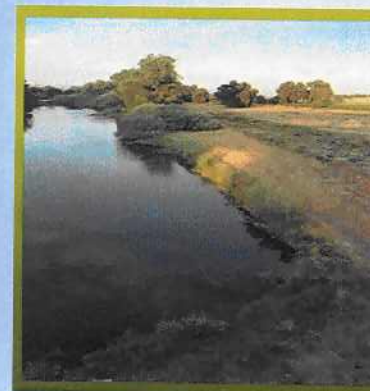
November 2,
2006



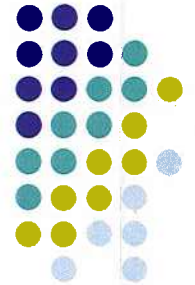
*Ray Lenaburg, CFM
and
Lee Frederiksen, PE*



HDR



Presentation Agenda



Map
Modernization
Update

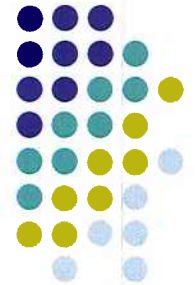
Map Modernization Program

Countywide DFIRM/FIS Production

44 CFR Part 65.10

Procedural Memo 34 and 43

Presentation Agenda



Map
Modernization
Update

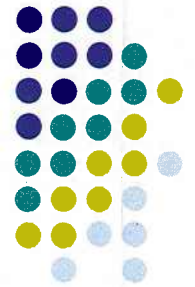
Map Modernization Program

Countywide DFIRM/FIS Production

44 CFR Part 65.10

Procedural Memo 34 and 43

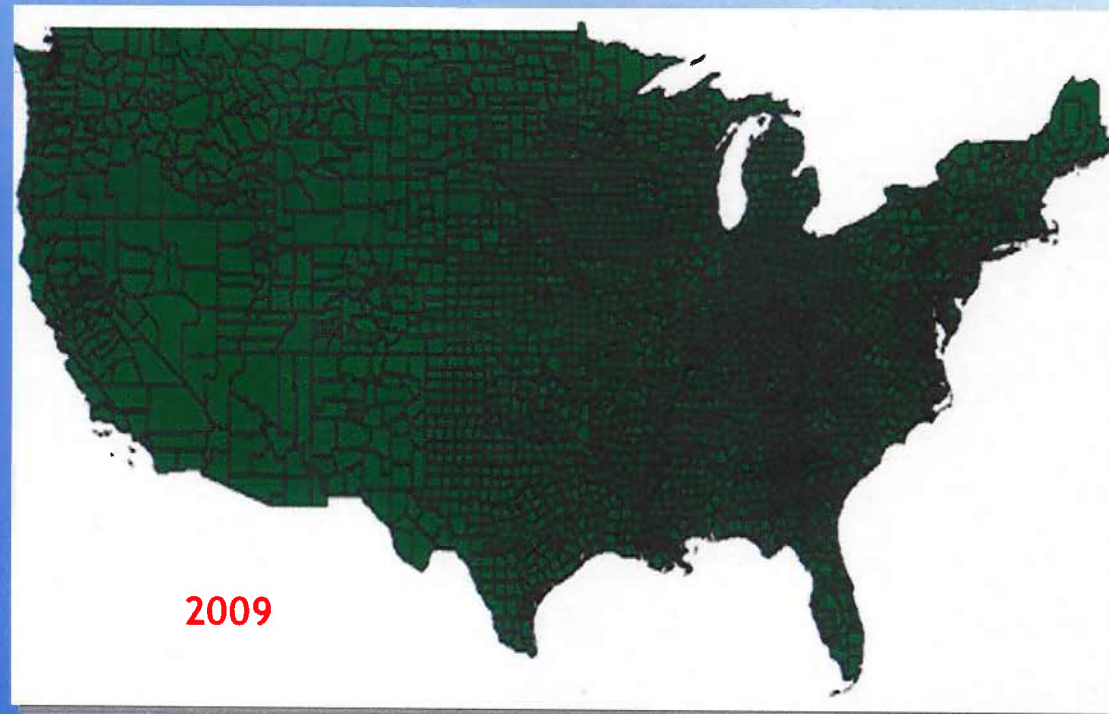
FEMA's Map Modernization Program



Map
Modernization
Update

Purpose and Schedule:

To update all of the nation's flood hazard maps
Complete update with five years



Map Modernization Program



Map Modernization will:

- Create a countywide FIRM & FIS for each county
- Convert to new vertical datum, if using old datum
- Incorporate all effective, map-able LOMCs
- Perform new studies for some areas, if funding allows
- Upgrade all FIRMs to digital GIS format (DFIRMs)
- Make the data publicly available online
- Maintain current data online

Map Modernization Program Metrics

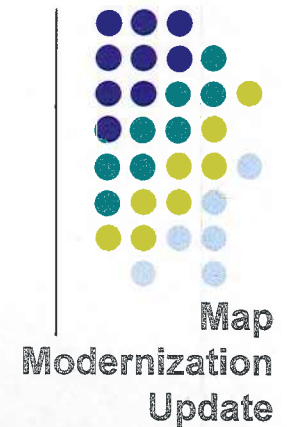


Map
Modernization
Update

National Performance Goals

Key Performance Indicator (KPI)	FY04	FY05	FY06	FY07	FY08	FY09	FY10
KPI 1: Population with Digital GIS Flood Data Available Online (Preliminary DFIRMs)	20%	40%	50%	60%	70%	80%	92%
KPI 2: Population with Adopted Maps that Meet Quality Standards (Effective DFIRMs)	10%	20%	25%	35%	50%	70%	85%
KPI 3: Leveraged Digital GIS Flood Data	20%	20%	20%	20%	20%		
KPI 4: Appropriated Funds Sent to CTPs	20%	25%	33%	33%	33%		

Pace of Development in California



Population Growth in California

	1960	1970	1980	1990	2000
Population (millions)	15.72	19.97	23.67	29.76	33.87
Change (millions)		4.25	3.70	6.09	4.11
Percent Change		27.07%	18.51%	25.74%	13.82%

Growth – Flood Hazards are dynamic!

- Changes in watershed = increased flows (i.e. NEW HYDROLOGY)
- Increase in stream crossings = NEW HYDRAULICS
- Development in Floodplain = NEW TOPOGRAPHIC MAPPING
- Need for updated Flood Hazard Mapping (esp. in Zone A areas)

Pace of Development in California

- Top 20 Counties by 2000 Population



Map
Modernization
'90 to '00
ate

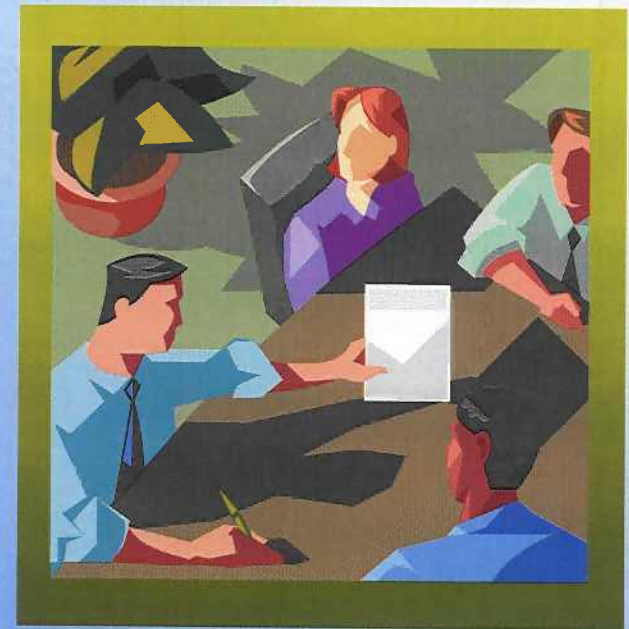
RANK	REGION	STATE	COUNTY	POP 2000	% Change
1	9	California	Los Angeles	9,519,338	7%
2	5	Illinois	Cook	5,376,741	
3	2	Puerto Rico	Puerto Rico	3,808,610	
4	6	Texas	Harris	3,400,578	
5	9	Arizona	Maricopa	3,072,149	45%
6	9	California	Orange	2,846,289	18%
7	9	California	San Diego	2,813,833	13%
8	2	New York	Kings	2,465,326	
9	4	Florida	Miami-Dade	2,253,362	
10	2	New York	Queens	2,229,379	
11	6	Texas	Dallas	2,218,899	
12	5	Michigan	Wayne	2,061,162	
13	0	Washington	King	1,737,034	
14	9	California	San Bernardino	1,709,434	21%
15	9	California	Santa Clara	1,682,585	12%
16	4	Florida	Broward	1,623,018	
17	9	California	Riverside	1,545,387	32%
18	2	New York	New York	1,537,195	
19	3	Pennsylvania	Philadelphia	1,517,550	
20	1	Massachusetts	Middlesex	1,465,396	

Map Modernization Mid Course Adjustment

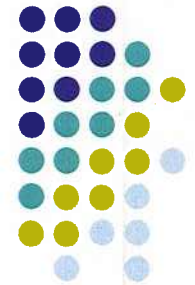


Map
Modernization
Update

- Originally, Map Mod focused on creating a digital flood layer for ALL communities at risk of flooding
- Recommendations from stakeholders to:
 - Focus on developing flood maps that meet higher standards of mapping
 - Greater allocation of resources to those communities at greater risk (i.e. delay in new flood maps for lower risk communities)



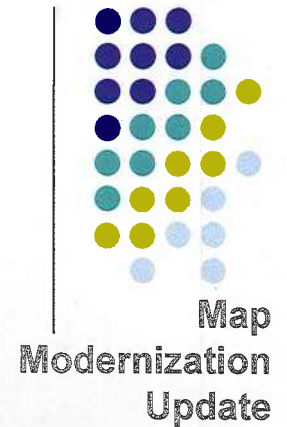
Map Modernization Mid Course Adjustment



Map
Modernization
Update

- **Delay 100% digital coverage- 92% of population and 65% of land areas will have digital maps by the end of the five-year plan**
- **30% of mapped stream and coastal miles and 40% of population will have new, updated, or validated engineering analysis**
- **75% of stream and coastal miles will meet the 2005 Floodplain Boundary Standard (aka "Section 7")**
- **Go back and check DFIRMs already done to see if they meet the 2005 Floodplain Boundary Standard and perform "touch ups" where necessary**

Presentation Agenda



Map Modernization Program

Countywide DFIRM/FIS Production

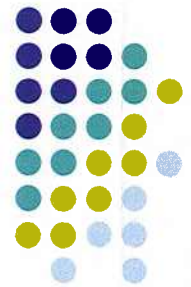
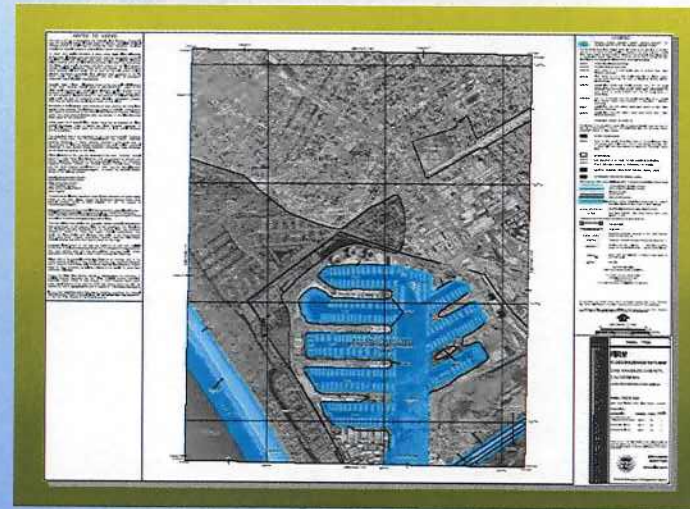
44 CFR Part 65.10

Procedural Memo 34 and 43

Countywide DFIRM/FIS Production

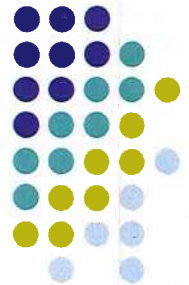
Primary Tasks:

- Update Paneling Layout and Scale
- Base Map Acquisition
- DFIRM Production (Non-Revised Areas)
- DFIRM Production (Merge Revised and Non-Revised Information)
- Preliminary DFIRM and FIS Report Preparation
- Preliminary and Post-Preliminary Processing



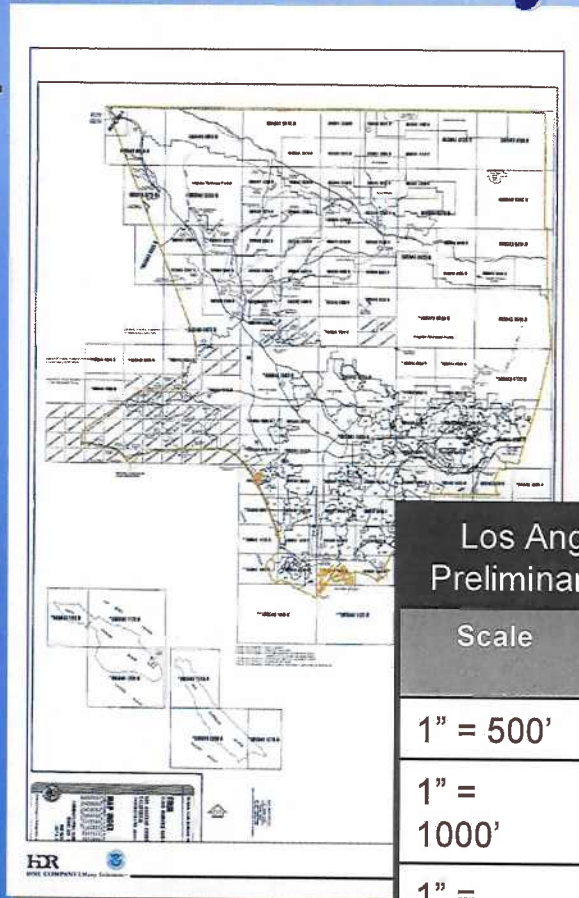
Map
Modernization
Update

Countywide DFIRM/FIS Production Update Panel Layout and Scale

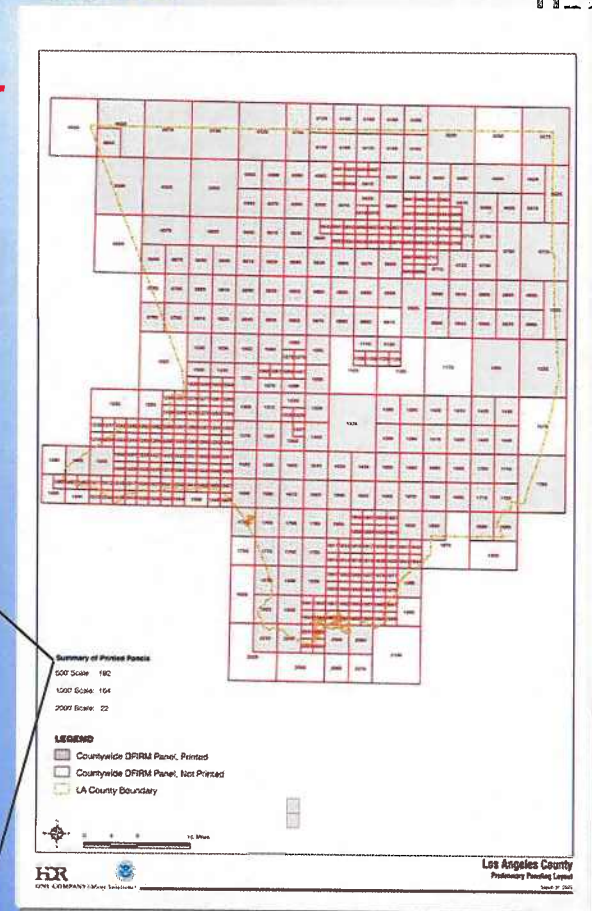


Map
Modernization
Date

Original ...



PROPOSED...



Los Angeles County, CA
Preliminary DFIRM Paneling

Scale	Printed	Not Printed
1" = 500'	124	21
1" = 1000'	86	16
1" = 2000'	41	27
Total	251	64

Summary of Printed Panels
500' Scale: 182
1000' Scale: 164
2000' Scale: 22

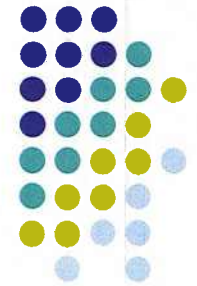
LEGEND

 Countywide DFIRM Panel, Printed
 Countywide DFIRM Panel, Not Printed
 LA County Boundary

HR
 ONE COMPANY Many Solutions

Los Angeles County
 Preliminary Paneling Layout
 June 17, 2013

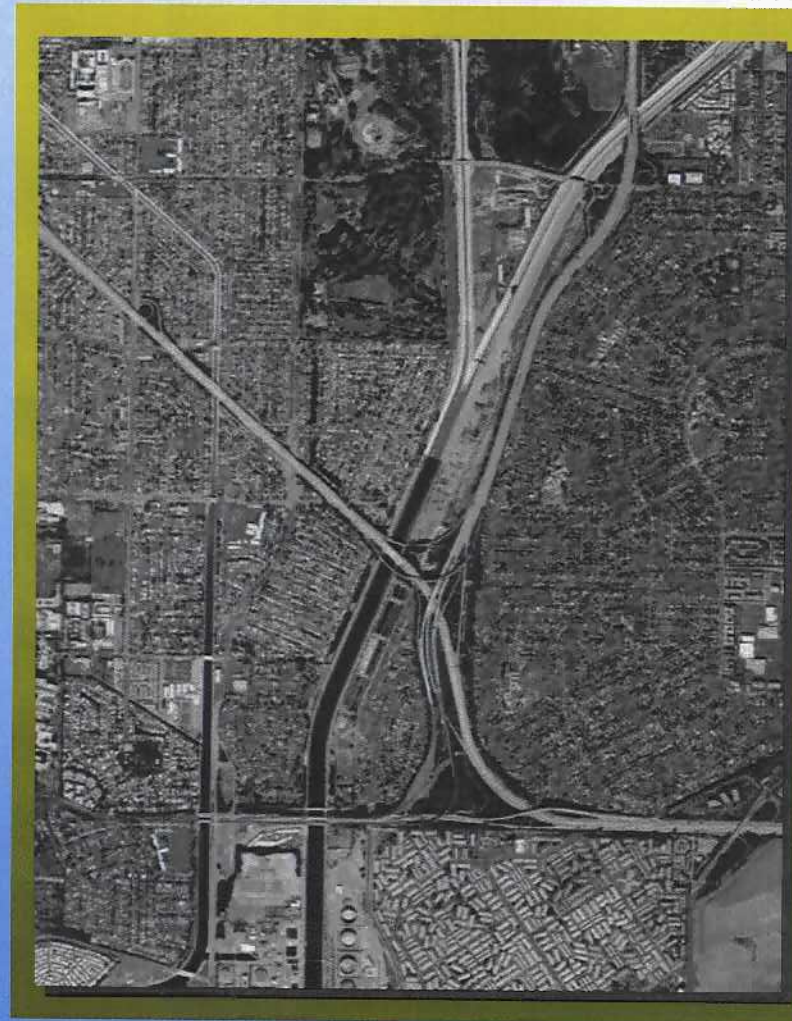
Countywide DFIRM/FIS Production



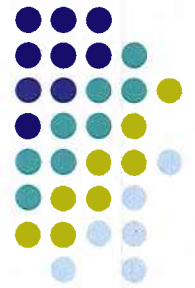
Map
Modernization
Update

Base Map Acquisition

- Scanned FIRM and floodway maps
- Latest orthoimagery
- Latest roads data
- Land ownership and corporate limits



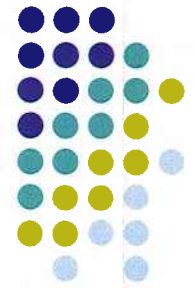
Conversion of FISs & FIRMs to NAVD 88



Map
Modernization
Update

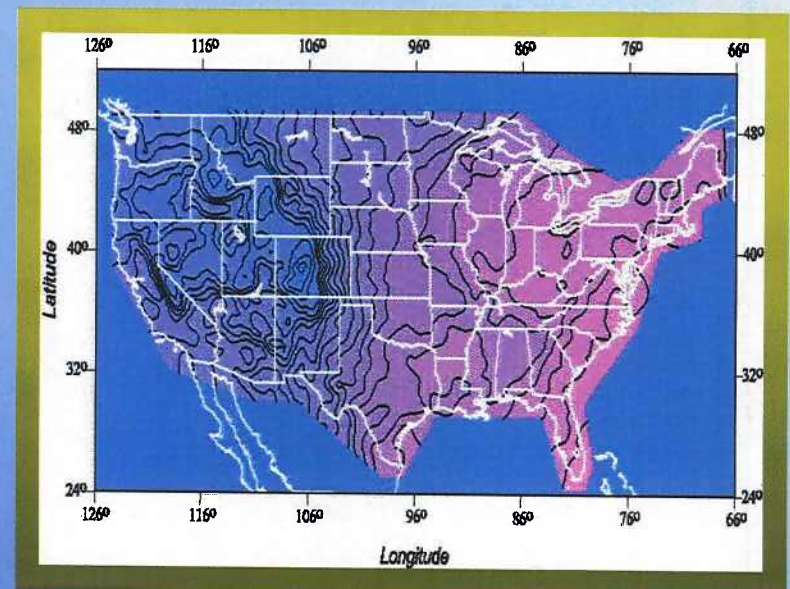
- National Geodetic Vertical Datum - 1929
 - Based on observed mean sea level
 - Historically most common vertical datum used by FEMA
 - Obsolete and no longer supported by the National Geodetic Survey (NGS)
- North American Vertical Datum - 1988
 - Established by adjustment of Canadian-Mexican-U.S. leveling observations
 - Supported by NGS

Conversion of FISs & FIRMs to NAVD 88



Map
Modernization
Update

- Difference in Datum Varies, Dependent upon Location on Earth
- Since Change is Relative, No Real “Shift” in Location
 - “Zero reference” has changed for not only flood elevations, but also ground elevations, etc.



Countywide DFIRM/FIS Production

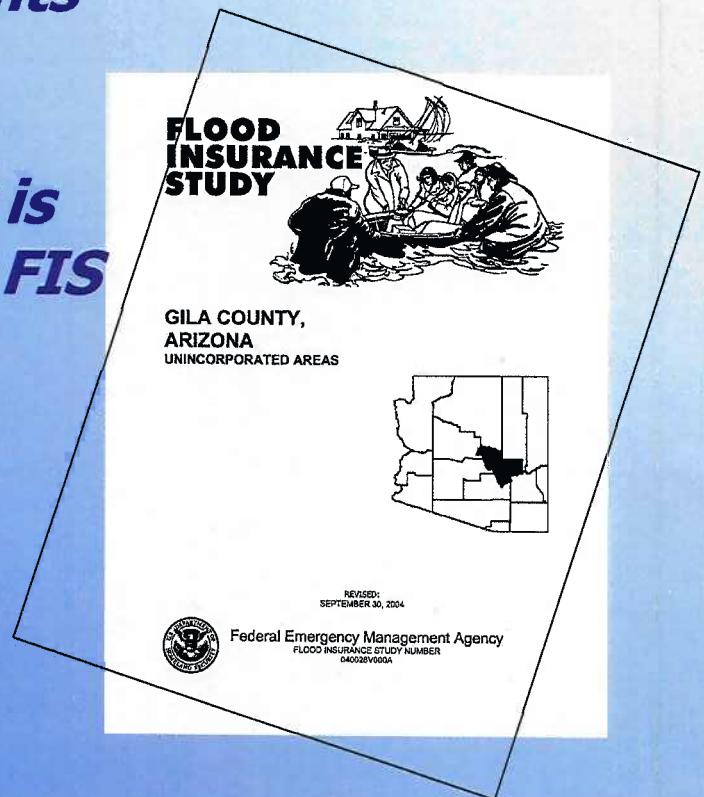
FIS Report

Floodway Data Tables and Flood Profiles must be revised if vertical datum adjustments (NGVD29 to NAVD88) are applied

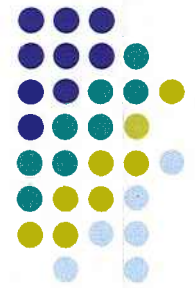
A seamless Countywide FIS report is created by merging all community FIS reports into one



Map
Modernization
Update



Preliminary and Post – Preliminary Processing



Map
Modernization
Update

FEMA issues new DFIRM and FIS report to officials of the affected communities in preliminary form for review and distribution

FEMA provides the communities the opportunity to comment on the Preliminary FIS report and DFIRM



Preliminary and Post – Preliminary Processing



Map
Modernization
Update

When required FEMA will initiate a 90-day appeal period to provide community officials and citizens a formal opportunity to appeal any new or modified flood elevations

If the review requires making significant changes in the base maps and flood hazard data, FEMA will issue a Revised Preliminary DFIRM

Preliminary and Post – Preliminary Processing



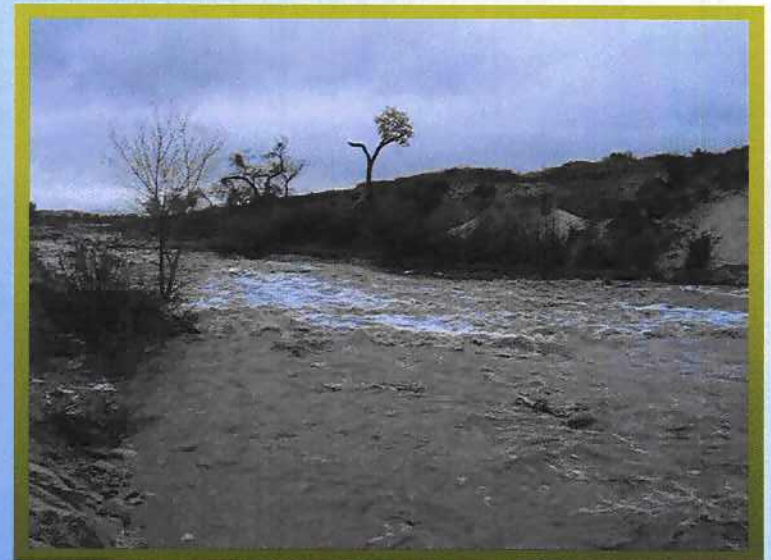
- Consider and resolve all appeals and protests in consultation with community
- Provide a six month compliance period
- Conduct final QA/QC review of map products
- Print and distribute FIS report and DFIRM

Background – Levees



Pre-1981

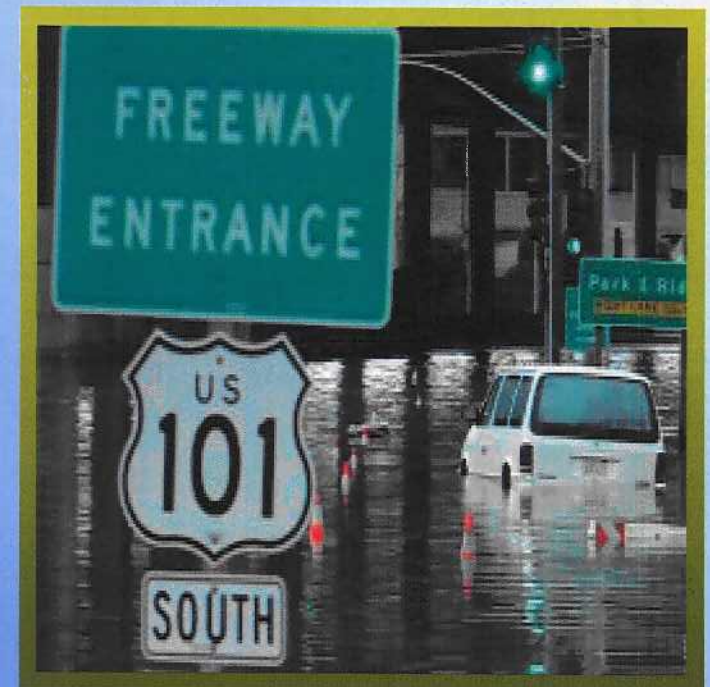
- No regulatory standards or written guidance for evaluation/mapping acceptance of levees
 - Assessment of levees left to study contractor
- Levees with crown elevation above 100-yr flood levels typically credited with providing protection
 - No consideration to freeboard, structural stability and maintenance
- Roads, railroads, and natural embankments often mapped as “de facto” levees



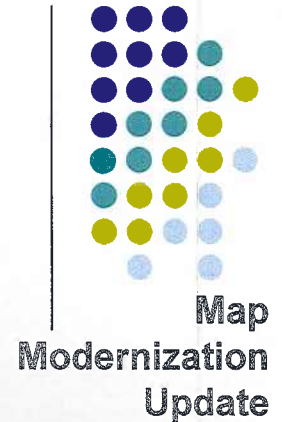
Background – Levees

Pre-1981

- Many levees credited with providing protection would not meet current levee standards of 44 CFR 65.10
- In subsequent remapping:
 - For restudied areas, mapping many levees were re-evaluated
 - For areas not re-studied – FIRMs continue to show levees as showing protection (“grandfathered”). These levees may NOT provide protection from the 100-yr flood



Background – Levees

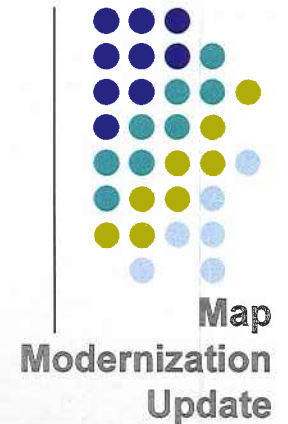


Interim Levee Policy (1981)

- Freeboard – 3 ft (with exceptions)
- Study contractor must evaluate levee or obtain levee certification
- Closure systems must be integral to levee design
- Protected areas shown as Zone B (shaded Zone X)
- Use of USACE manual “*Design and Construction of Levees*” (EM 1110-2-1913) to be used in conjunction with policy
- Standards on seepage, surface erosion, and settlement
- Private levees

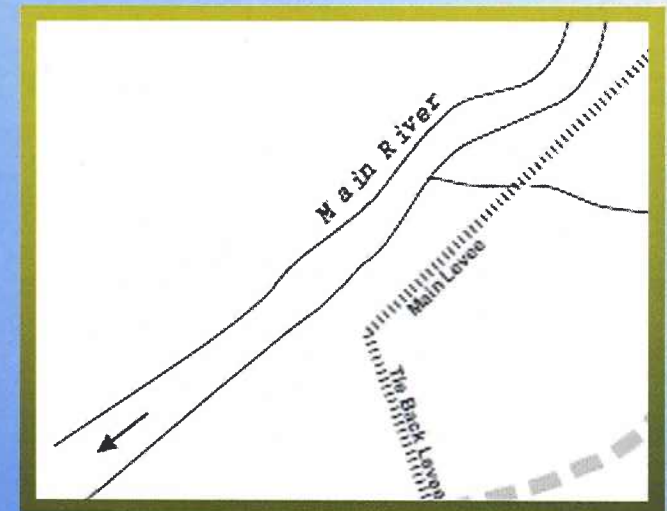


Background – Levees

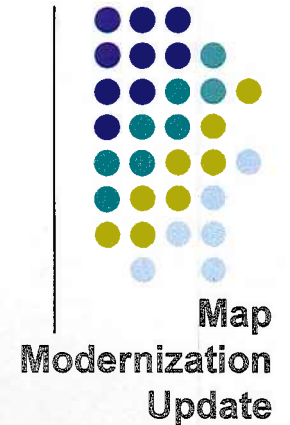


44 CFR 65.10 *Mapping of Areas Protected by Levee Systems*

- Based on Levee Policy Study by National Academy of Sciences
- Effective August 1986
- Contains many key elements of the 1981 interim policy
- Establishes that FEMA will only recognize levee systems that meet and continue to meet criteria under this part of the regulations



Presentation Agenda



Map Modernization Program

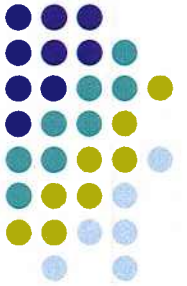
Countywide DFIRM/FIS Production

44 CFR Part 65.10

Procedural Memo 34 and 43

Overview of 44 CFR

Part 65.10 Structural Design Criteria



Map
Modernization
Update

Freeboard

**Embankment &
Foundation
Protection,
Stability, and
Settlement**

Closures

**Interior
Drainage**

Other Requirements for Unique Situations

Overview of 44 CFR Part 65.10

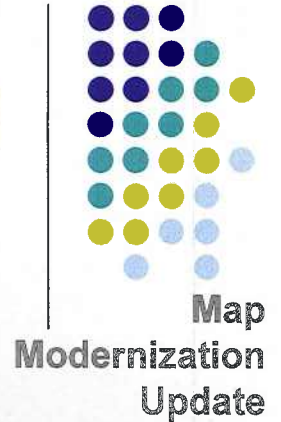


Map
Modernization
Update

Freeboard

- Provide a minimum of three feet above base flood water-surface elevation
- Provide additional one foot within 100-feet either side of structure
- Provide additional one-half foot at upstream end of levee system tapering to not less than minimum at the downstream end

Overview of 44 CFR Part 65.10

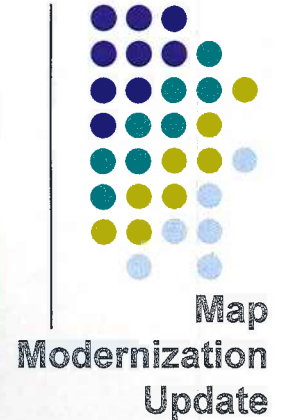


Closures

- All openings must have closure structures
- Structures must be integral part of system during operation

Overview of 44 CFR Part 65.10

Embankment and Foundation



Protection

- Engineering analyses demonstrating no appreciable erosion during base flood due to currents or waves

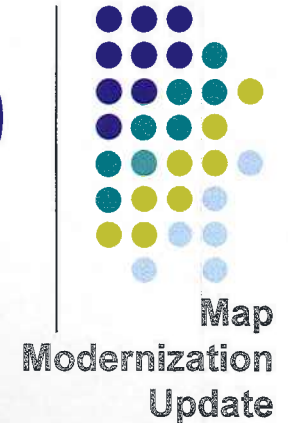
Stability

- Engineering analyses demonstrating levee stability reflecting base flood duration, loading, and seepage

Settlement

- Engineering analyses demonstrating freeboard will meet minimum standards reflecting future losses due to settlement

Overview of 44 CFR Part 65.10



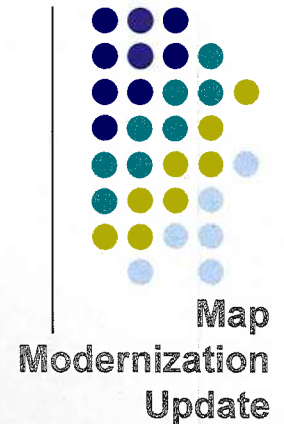
Interior Drainage

- **Engineering analyses identifying source and extent of interior flooding**
- **Analyses will reflect the joint probability of interior and exterior flooding and the capacity of facilities**

Overview of 44 CFR Part 65.10

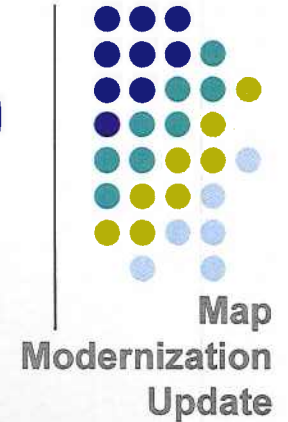
Other Requirements for Unique Situations

- **FEMA may require additional analyses for unique situations such as high vulnerability (seismic, sedimentation, and vegetation)**
- **FEMA will provide the rationale for requiring additional analyses**



Overview of 44 CFR Part 65.10

Operations Plans and Criteria

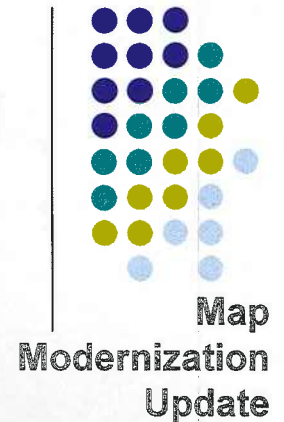


- All closure devices and mechanical systems for interior drainage must be operated in accordance to an adopted operations manual, a copy of which must be provided to FEMA
- Documentation that the flood warning system provides sufficient time to operate all closure structures
- Provisions for periodic operations of closure structures, not less than one-year intervals
- All operations must be under the jurisdiction of federal, state or private agency participating in the NFIP

Overview of 44 CFR Part 65.10

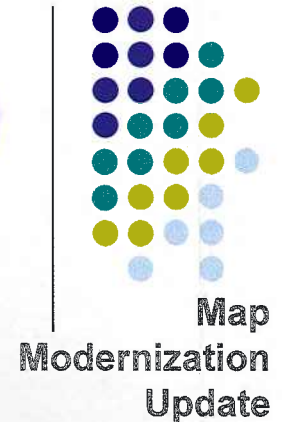
Maintenance Plans and Criteria

- **Levee systems must be maintained in accordance with an adopted maintenance plan, a copy of which must be provided to FEMA**
- **All maintenance must be under the jurisdiction of a federal, state or private agency participating the NFIP**



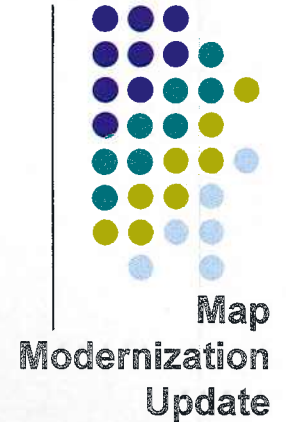
Overview of 44 CFR Part 65.10

Levee Certification Requirements



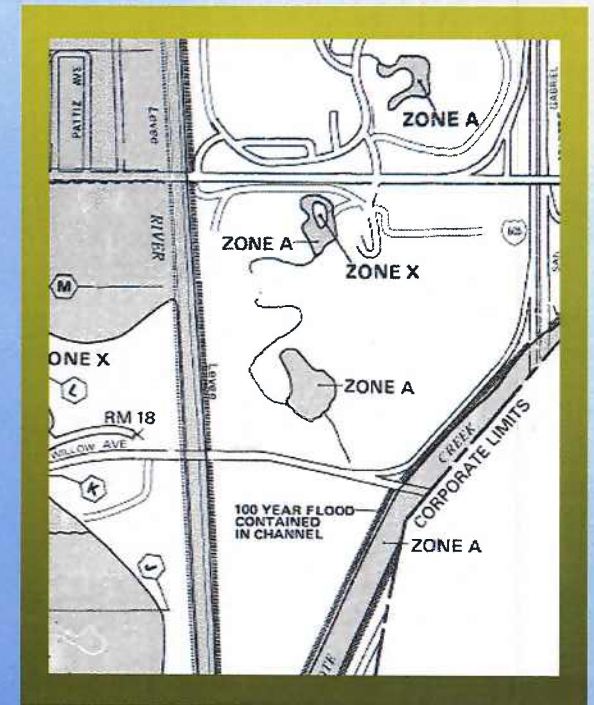
- Analyses submitted to support that a levee system meets the structural design criteria/requirements, must be certified by a registered Professional Engineer
- In lieu of structural design requirements, a federal agency with responsibility for levee design may certify that the levee provides protection against the base flood
- Certified as-built plans of the levee system must be submitted
- Operations and maintenance plans must be submitted

Background – Levees

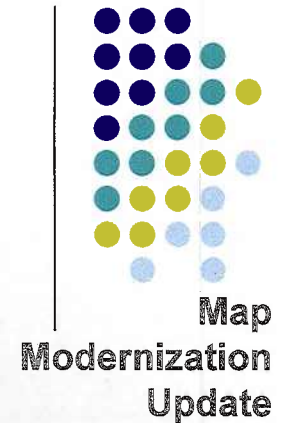


What is the difference between Certification and Accreditation?

- **Certification-** statement and documentation by a PE or Federal Agency responsible for levee design that a levee system has been designed and constructed to meet structural requirements of 44 CFR 65.10
- **Accreditation** – when a levee system is depicted on NFIP maps as providing protection from the 1% annual chance flood

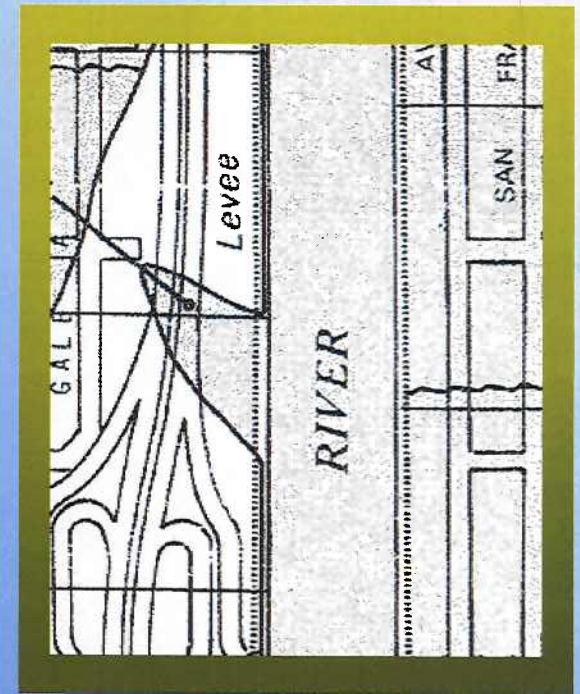


Background – Levees

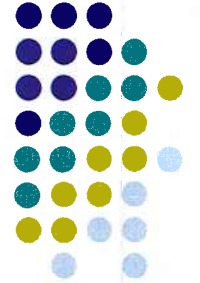


What is the difference between Certification and Accreditation?

- FEMA does not certify levee systems; FEMA makes a determination as to whether a levee should be accredited
- Only levee systems certified to meet structural requirements by registered PE or responsible Federal Agency AND having adequate documentation of operation and maintenance by a Federal, state, or local government agency can be accredited



Presentation Agenda



Map
Modernization
Update

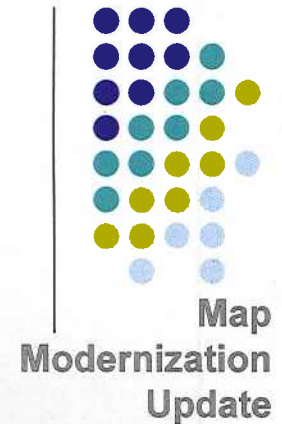
Map Modernization Program

Countywide DFIRM/FIS Production

44 CFR Part 65.10

Procedural Memo 34 and 43

PM 34 - *Interim Guidance For Studies Including Levees*

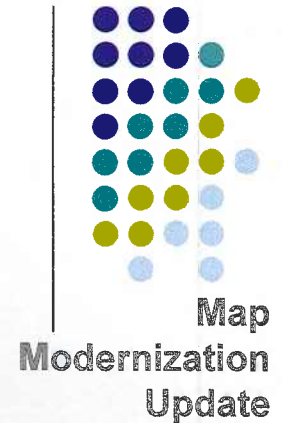


Background

- **Levees constructed before 1986 grandfathered into the NFIP**
- **Levee integrity and certification information outdated or missing**
- **Levee Coordination Committee developing long-term levee policy**
- **NFIP and its Map Modernization Program continuing**
- **PM 34, August 22, 2005 - provides guidance until new levee policy developed**

Procedural Memorandum 34

Interim Guidance For Studies Including Levees

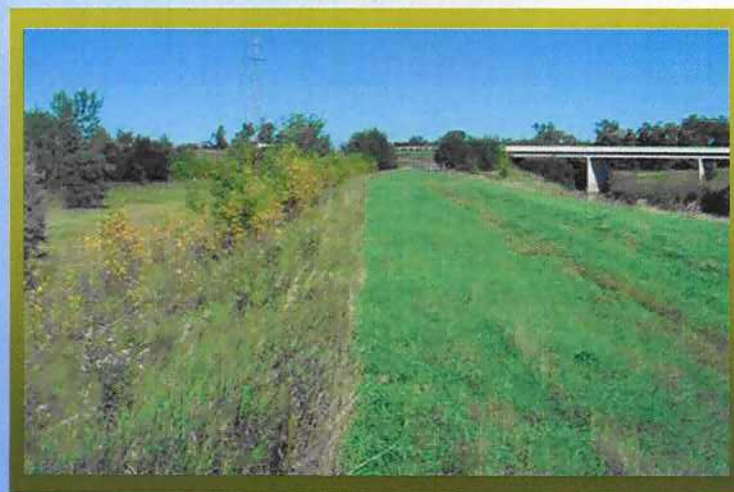


- 1 Identify all levees within the study area**
- 2 Inform community of data required for levee to be recognized as providing protection in accordance with 44 CFR Section 65.10**
- 3 Responsibility of the community or party seeking recognition of a levee providing protection to provide required data**
- 4 Provide community or party seeking levee recognition with a deadline for submitting required data**
- 5 If data not submitted on time, levee cannot be recognized as providing protection as part of the current mapping effort**
- 6 Map revision can be initiated once data is received and approved**

FEMA PM 34

Rationale for Policy

- **Public Safety - Risk to human life, public safety & potential financial consequences if levees fail or are overtopped**
- **Many levees pre-date the 44 CFR 65.10 levee requirements (e.g., they were “grandfathered”)**
- **Many levees are deteriorated, suffered significant erosion, or not maintained and therefore no longer provide adequate protection**

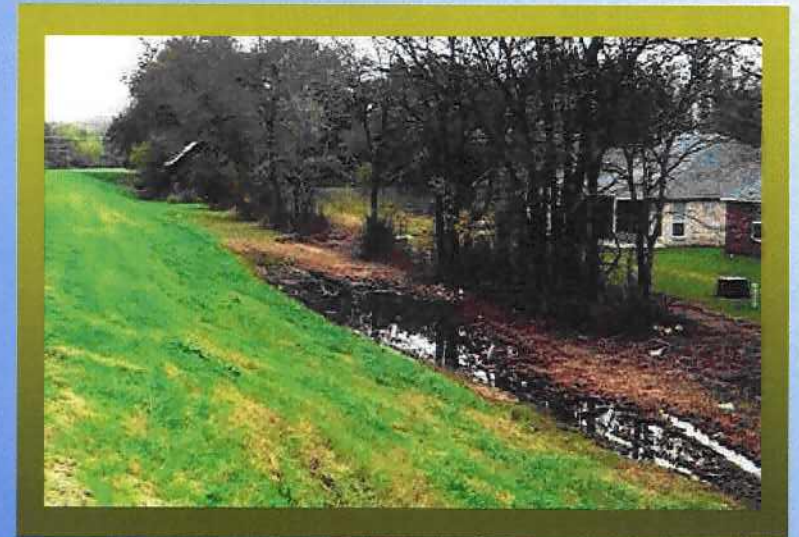


Map
Modernization
Update

Implementation of PM 34 in California

Overview

- Levees shown as providing protection but which actually do not, can fail or be overtopped
- FEMA is working with water management and flood control districts, counties, & communities to develop strategies to determine whether levees can be certified/re-certified
- FEMA coordinating other Federal agencies (USACE, BOR) in certification/recertification of federally constructed levees

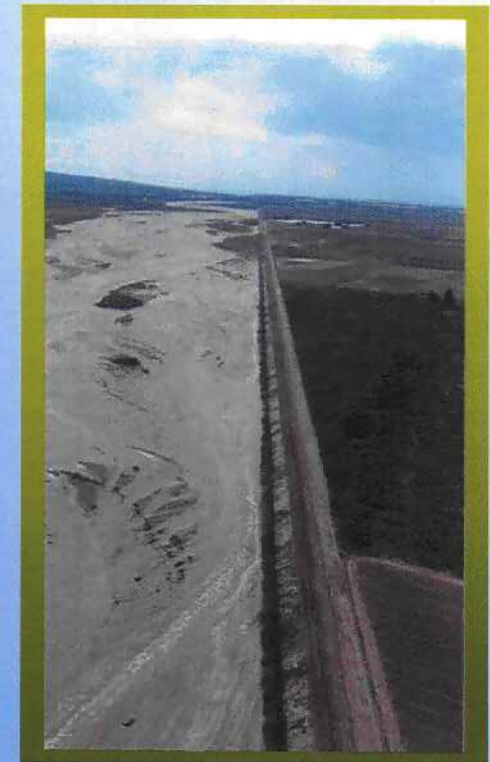


Map
Modernization
Update

Implementation of PM 34 in California

Overview

- For levees which cannot be certified
 - FEMA will prepare preliminary DFIRMs which will depict “without levee” flooding based on approximate levee failure analysis
 - This will communicate the risk to communities and residents

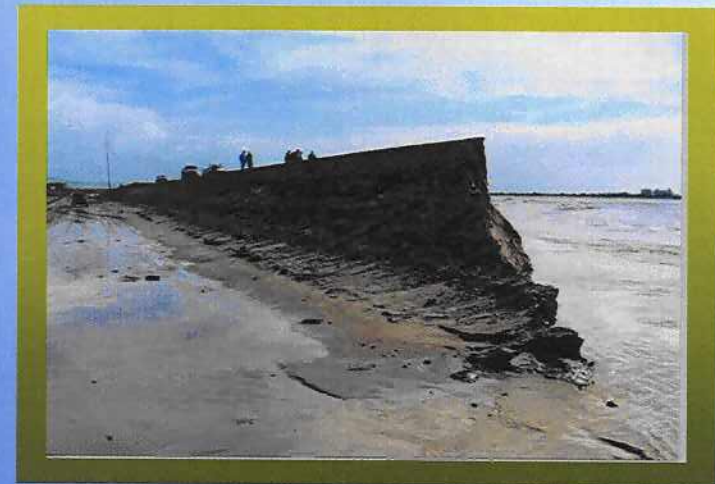


Implementation of PM 34 in California

Process for Developing Levee Certification Plans - 7 Steps

Step 1: Complete Levee Inventory

- Determine list of currently accredited levees in need of certification/recertification
- Establish ownership/responsible agency for accredited levees
- Distinguish between federal and non-federal constructed levees

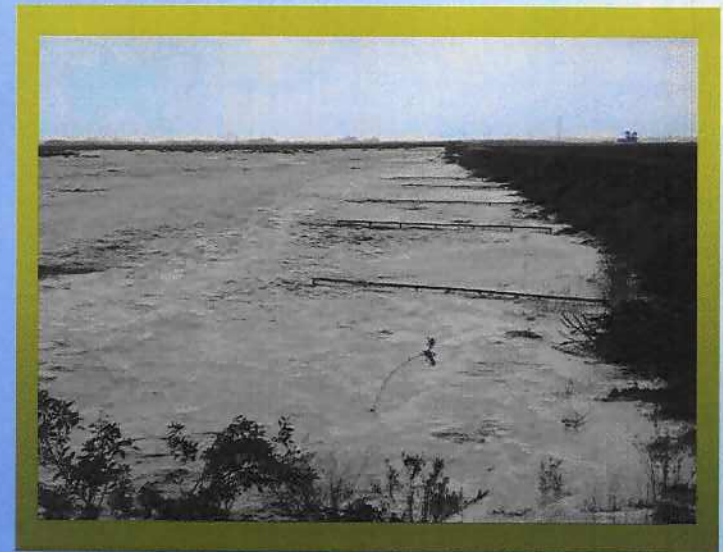


Implementation of PM 34 in California

Process for Developing Levee Certification Plans

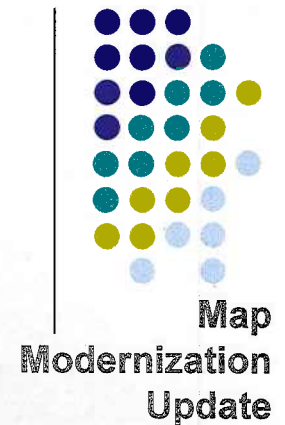
Step 2: Research Available Data

- FEMA library / archives and databases
- Community files
- Flood Control Districts
- Federal agencies



Implementation of PM 34 in California

Process for Developing Levee Certification Plans



Step 3A: Evaluate Current Levee Conditions & Performance

- Review inspection and maintenance reports
- Review levee performance records
- Perform field reconnaissance
- Identify level of development behind/upstream of levee

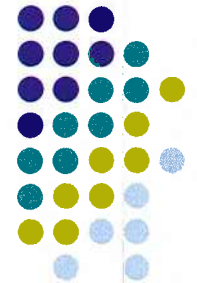
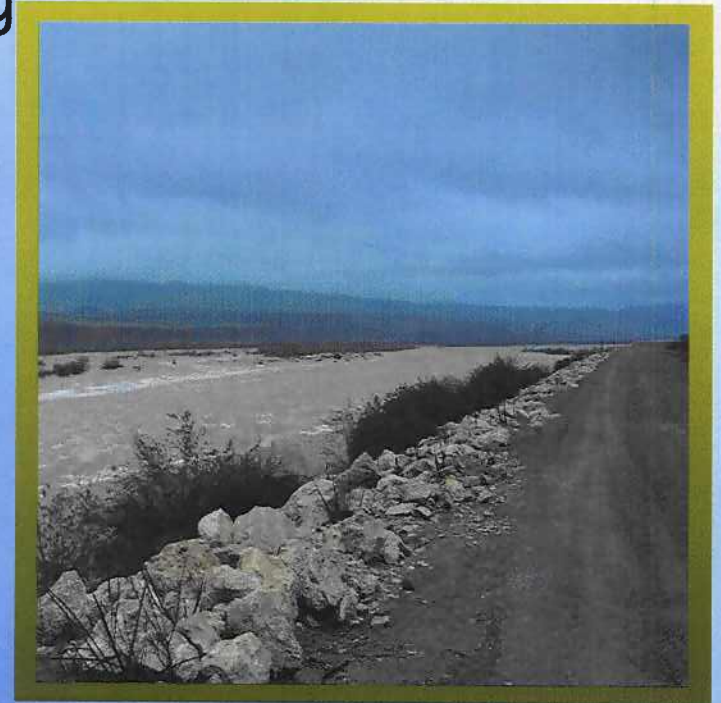


Implementation of PM 34 in California

Process for Developing Levee Certification Plans

Step 3B: Categorize Levees

- Assign levee to one of following categories
 - Category 1- Levees that meet 65.10 and all data and complete documentation is available
 - Category 2- Levees that may meet 65.10, but additional data or documentation is required
 - Category 3- Levees that do not meet 65.10 in existing condition



Map
Modernization
Update

Implementation of PM 34 in California

Process for Developing Levee Certification Plans

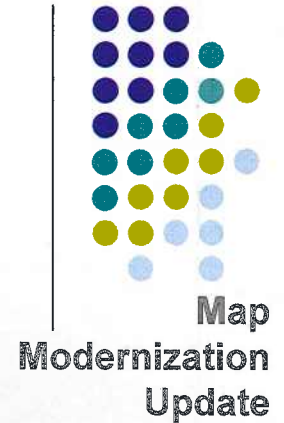
Step 4: Prepare an action plan & timeline

- Category 1
 - Compile certification package
 - Submit for FEMA review
- Category 2
 - Obtain the additional documentation/ data needed
 - Prepare certification package
 - Determination on upgrading / improving to 44CFR65.10
- Category 3
 - Levee owner/locals need to make determination as to whether or not they want to up upgrade / improve the levee to meet 44 CFR 65.10 standards



Implementation of PM 34 in California

Process for Developing Levee Certification Plans

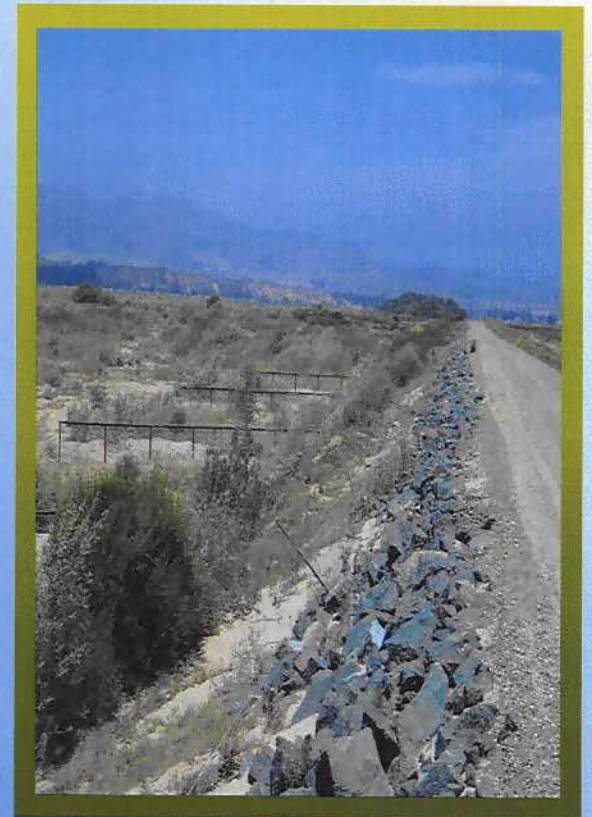


Step 5: Submit Levee Certification Documentation Package

Step 6: FEMA Review, Coordination and Response to Levee Certification Documentation Package

Step 7a: Re-accreditation of Levee Structures

Step 7b: Re-mapping of “Without Levee” Condition for Non-Certifiable Structures



Implementation of PM 34 in California

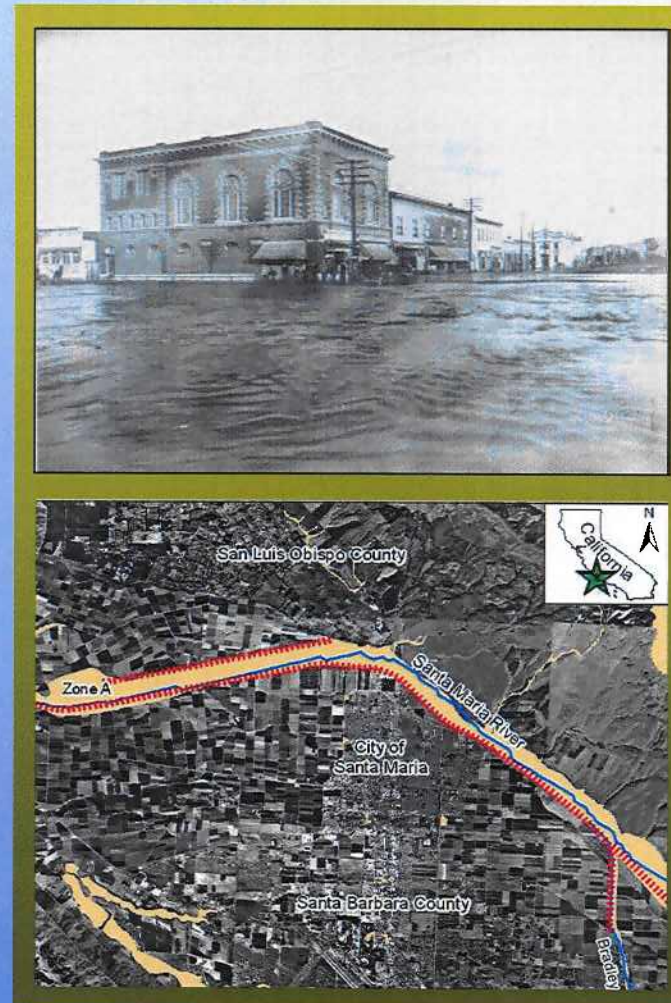
Case Study – Santa Maria Levee Failure Project

- **Background**

- City of Santa Maria on banks of Santa Maria River
- Major flooding in 1909, 1910, 1911, 1914, and 1938
- USACE completed Santa Maria Project in 1958 which included levees & Twitchell Dam
- FIRM shows levee provide flood protection

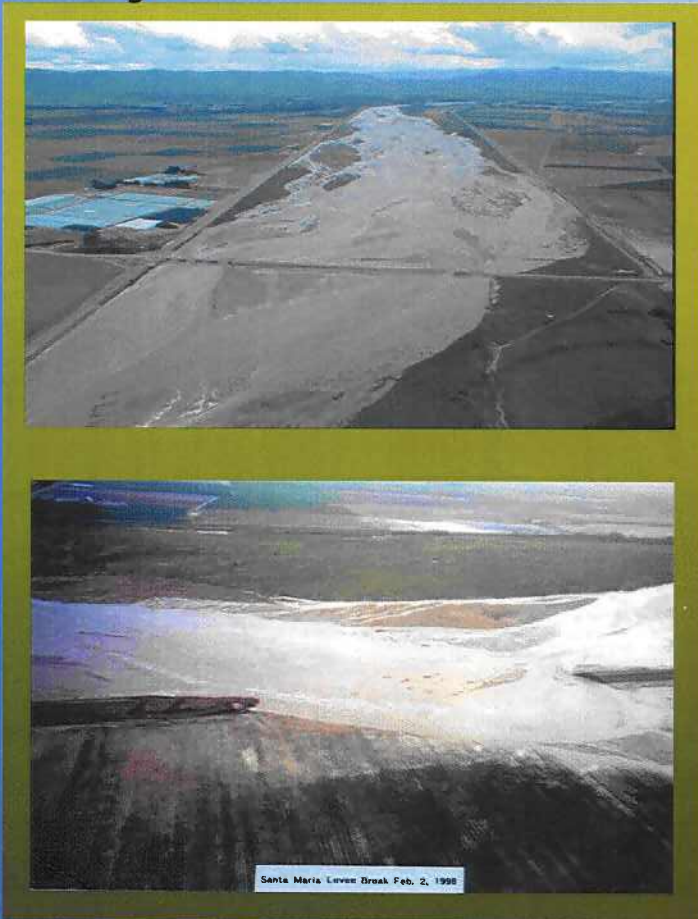
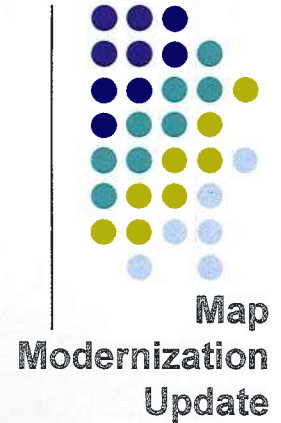


Map
Modernization
Update



Implementation of PM 34 in California

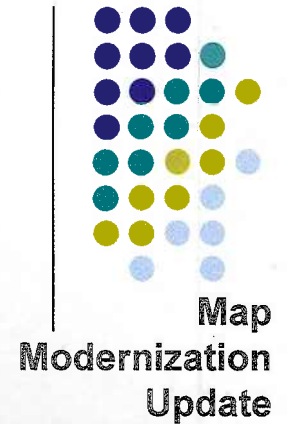
Case Study – Santa Maria Levee Failure Project



- Issue

- Levee designed for 150,000 cfs
- Levee Failure in 1998
- Max flow in 1998 = 29,500 cfs
- Levee eroded, not overtopped
- Embankment material deterioration

Current Role of PM 34



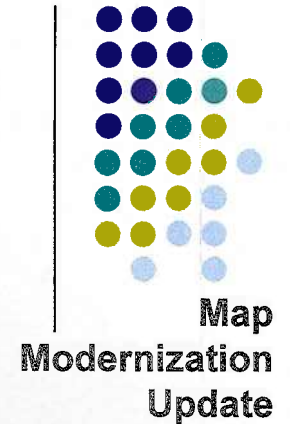
**Assigns responsibility to
Community Officials or
other Parties**

**Provide the required
information during a
study/mapping project**

**PM 34 sets a deadline to the community for
submitting the required documentation.**

Map Modernization Program

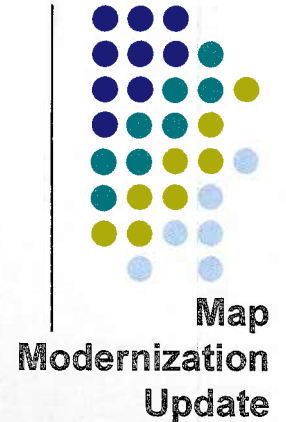
Addressing Levee Issues



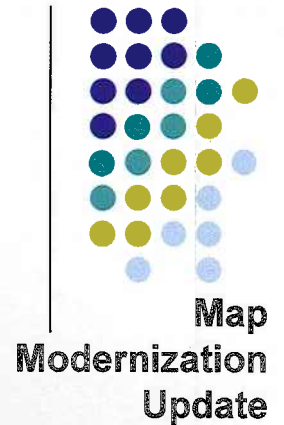
- Nationally, one quarter of the counties being mapped under the Map Mod program have levees shown on their currently effective FIRM.
- As a result, communities would potentially be using outdated flood hazard information to regulate floodplain development.
- In addition, with the existing flood maps still in effect, there may be no requirement for the purchase of flood insurance in areas that are flood prone.

PM 43 – Goal of the New Memorandum

- To minimize the impact on the Map Mod program and of the levee recognition and certification process
- Guidelines have been developed that will allow mapping partners to issue preliminary and effective versions of the DFIRMs while the levee owners or communities are compiling the full documentation required to show compliance with 44 CFR Section 65.10.



What is a Provisionally Accredited Levee (PAL)?



“A levee that FEMA has previously credited with providing 1-percent annual-chance protection on an effective FIRM or DFIRM, for which FEMA is awaiting data and/or documentation that will show the levee’s compliance with Section 65.10 of the NFIP regulations.”

PM 43 - Guidelines for PAL

Five scenarios for PAL designation

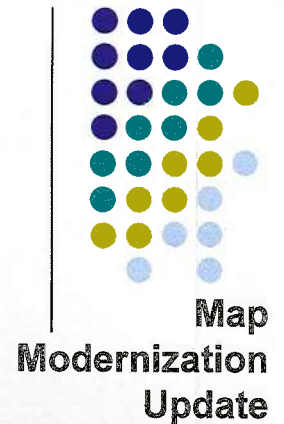
FEMA will designate a levee as a PAL when there is sufficient evidence to conditionally show that a levee will provide 1% annual chance flood protection

Timeframe set for collecting the remaining requirements for 44 CFR Section 65.10 before the levee is shown on the DFIRM as not providing base flood protection.



PM 43 – Scenario A

Levees Not in USACE Program that are shown as providing base flood protection

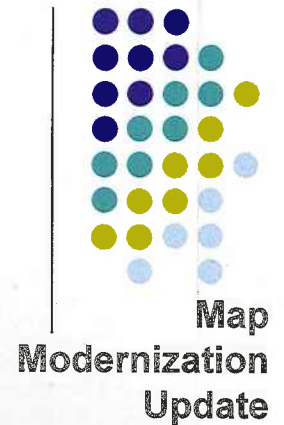


- In this scenario, a levee that is not in the USACE's Federal System (i.e., a non-Federal levee) is shown on the effective flood map as providing protection from the 1-percent-annual-chance flood

Non-Federal levees are defined to include the following:

- Levees not authorized by Congress or other Federal agency authority;
- Levees built by other (non-USACE) Federal agencies and not incorporated into the USACE Federal System;
- Locally built and maintained levees built by a local community; and
- Privately built by non-public organization or individual and maintained by a local community.

PM 43 – Process for Scenario A



FEMA sends letter to owner/community – requesting to sign agreement that to their best knowledge, the levee will meet requirements.

The owner/community will be given 90 days to return signed agreement and requirements must be submitted within 24 months of the date of the agreement.

If the signed agreement is not returned in 90 days, the community is no longer eligible for the PAL designation

If the full requirements are available, FEMA will request these documents within 30 days.

Certification by a Professional Engineer must accompany the submitted requirements

If the full documentation of certification is not provided within 24 months, the area landward of the levee will be remapped

A progress report must be provided to FEMA after 12 months to document the progress toward obtaining Section 65.10 data

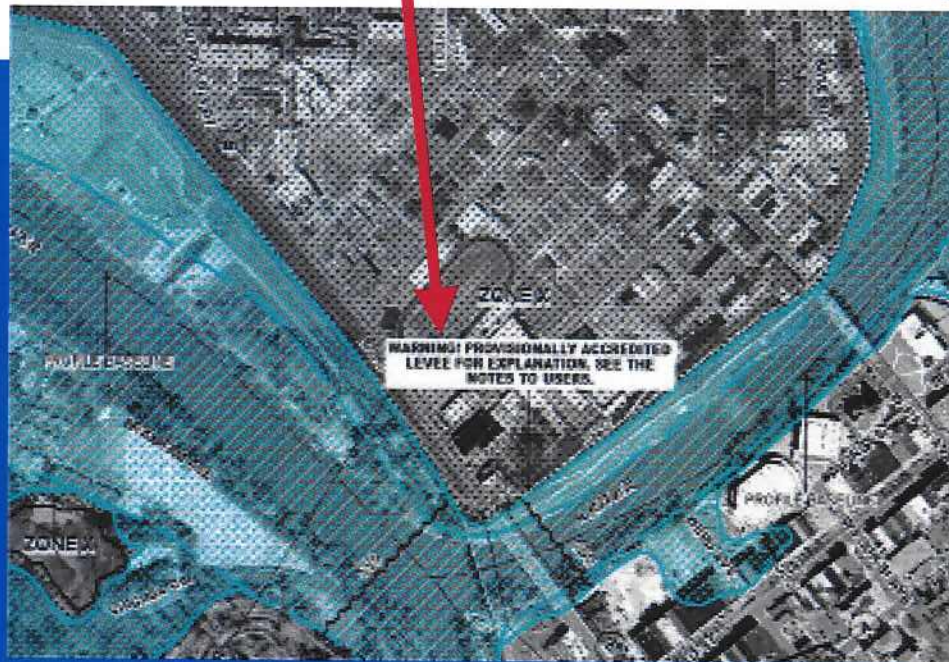
PM 43 – DFIRM Approved for Scenario A



PM 43 requires this note to be included on PAL designations

The following note will be shown at several locations in or near the Zone X (shaded) area on the landward side of the levee on the flood map:

WARNING: Provisionally Accredited Levee. For explanation, see the Notes to Users.



The following Note to Users will be added:

WARNING: This levee, dike, or other structure has been provisionally mapped as providing protection from the 1-percent-annual-chance flood. The levee owner or community is required to submit documentation necessary to comply with 44 CFR Section 65.10 by (_____, ____). Because of the risk of overtopping or failure of the structure, communities should take proper precautions to protect lives and minimize damages in these areas, such as issuing an evacuation plan and encouraging property owners to purchase flood insurance.

DFIRM Showing a PAL

PM 43 - Scenario B

Levees in the USACE Program that are eligible for PAL



Map

Modernization
date

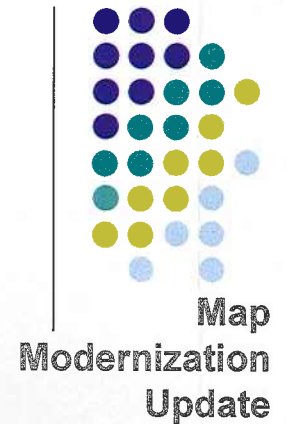
- In this scenario, the levee is in the Federal System and is shown on the effective flood map as providing protection from the 1-percent-annual-chance flood. Additionally, the project inspection rating is within an acceptable range (as defined by USACE).

Federal levees are defined to include:

- Levees built by the USACE that were authorized for construction by Congress or by USACE continuing authorities (e.g., Section 205);
- Levee projects constructed by non-Federal interests, or other (non-USACE) Federal agencies, and incorporated into the USACE Federal System by specific Congressional action;
- Federal projects that are either operated and maintained by the USACE or turned over to a local sponsor for operation and maintenance; and
- Non-Federal projects within the Rehabilitation Inspection Program (Public Law 84-99).

PM 43 – Scenario C

Levees in the USACE Program with known deficiencies that are shown as providing base flood protection



- In this scenario, the levee is in the Federal System and is shown on the effective flood map as providing protection from the 1-percent-annual-chance flood.

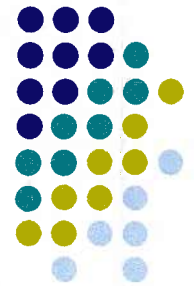


- However, the USACE has determined that the levee's recent inspection ratings are "Fair," "Poor," or "Unacceptable," and project was switched to "Inactive" in the USACE's Rehabilitation and Inspection Program.

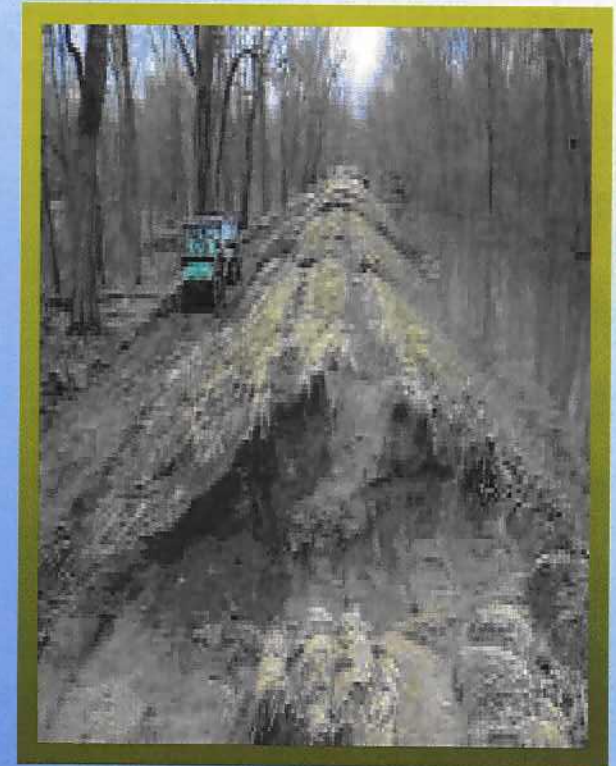
PM 43 – Scenario C

FEMA Regional Office will coordinate with USACE, who will:

- **Send letter to community, levee owner, or local project sponsor, stating that the area behind the levee has been switched from an active to an inactive status in the USACE Rehabilitation and Inspection Program and is no longer eligible for Rehabilitation Assistance because of maintenance deficiencies.**
- **These deficiencies will not allow the levee to meet the minimum requirements and, subsequently, does not provide 1-percent-annual-chance flood protection.**



Map
Modernization
Update



PM 43 – Scenario C (continued)



Map
Modernization
Update

FEMA Regional Office will coordinate with USACE, who will:

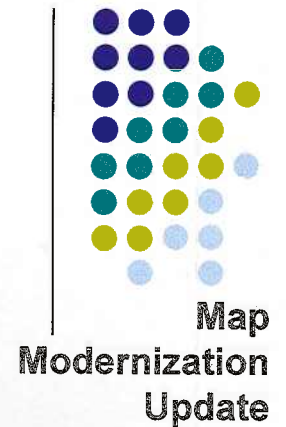
- The FEMA Regional Office then will send a letter notifying the community, levee owner, or local project sponsor that the area behind the levee will be remapped using Zone AE or Zone A if the levee does not provide 1-percent-annual-chance flood protection.
- Because the levee does not provide 1-percent-annual-chance flood protection, it does not qualify for the PAL designation.

PM 43 – Scenario D

Levees in the USACE Program that are shown as not providing base flood protection

- In this scenario, the levee is in the Federal System and is shown on the effective flood map as not providing protection from the 1-percent-annual-chance flood.

In this case, there is no issue with how to map the area behind the levee because it previously has been determined that the levee does not provide 1-percent-annual-chance flood protection. The flood map will continue to show the levee as not providing 1-percent-annual-chance flood protection unless it is determined that the levee actually does provide this level of protection.



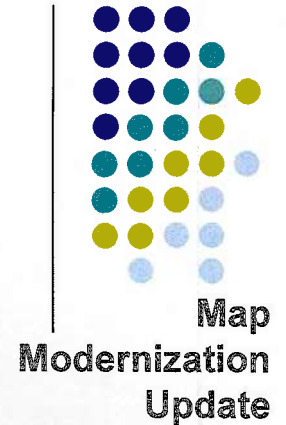
PM 43 – Scenario E

Levees in the USACE Program that do not meet an adequate level of protection as determined by the USACE and FEMA, but are shown as providing base flood protection



- In this scenario, the levee is in the Federal System and is shown on the effective flood map as providing protection from the 1-percent-annual-chance flood.
- However, USACE has determined that the levee shown as providing protection does not meet an adequate level of protection or that the levee has failed or experienced overtopping by less than the 1-percent-annual-chance flood. However, the local project sponsor has NOT received a letter from USACE identifying the known maintenance deficiencies with the levee.

PM 43 – Scenario E



- **The FEMA Regional Office will notify the community, levee owner, or local project sponsor that the levee no longer complies with Section 65.10. If the project sponsor cannot provide the documentation necessary to show compliance with Section 65.10, the area landward of the levee will be mapped as Zone A or Zone AE depending on the type of study performed for the area.**

For Additional Information



Map
Modernization
Update

Map Modernization

www.fema.gov/plan/prevent/fhm/mm_main.shtm

65.10

www.fema.gov/pdf/plan/prevent/fhm/lv_s6510.pdf

PM 34

www.fema.gov/plan/prevent/fhm/pl_memo34.shtm

PM 43

www.fema.gov/plan/prevent/fhm/pl_memo43.shtm

Questions & Answers

