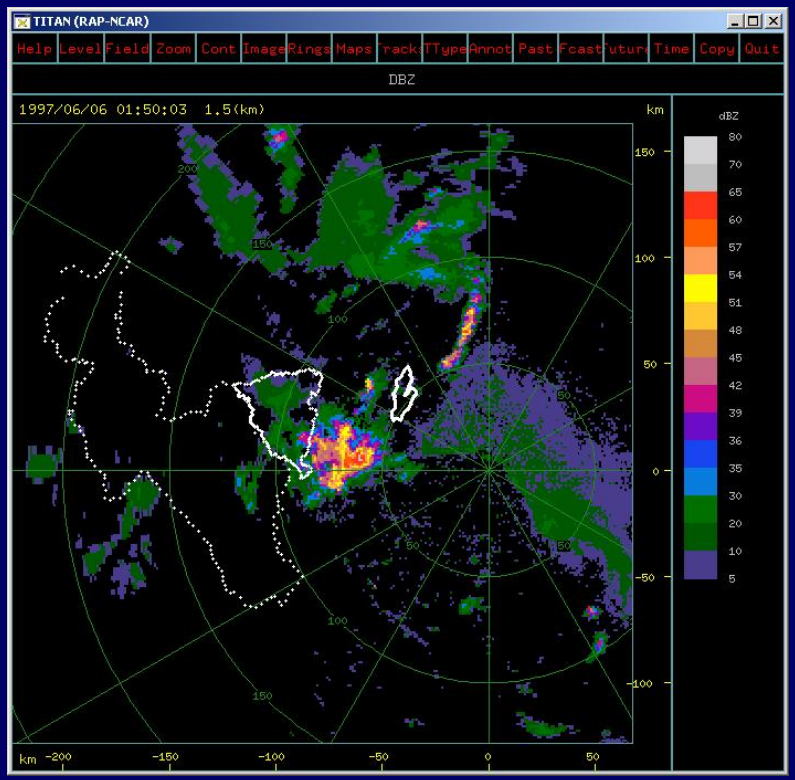
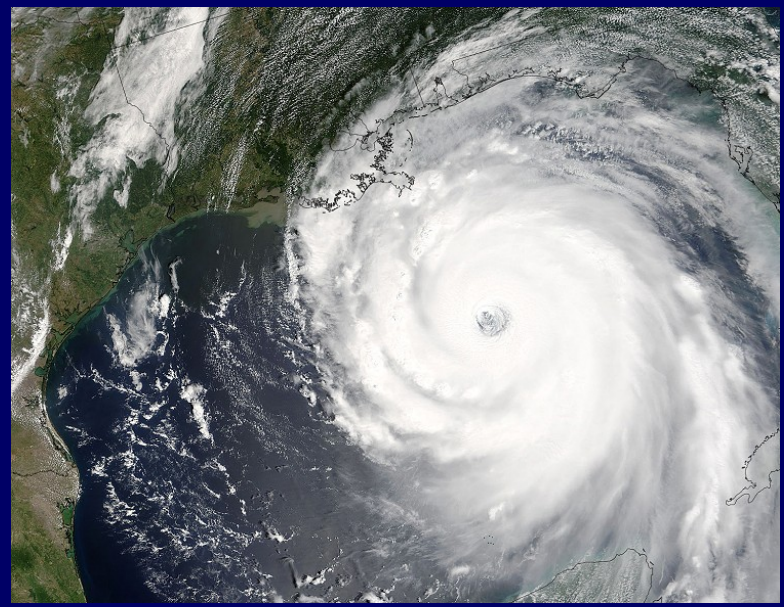
Subcommittee on Hydrology/ACWI

New Extreme Storm Work Group

Status and Plans





U.S. DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION

UNITED STATES NUCLEAR REGULATORY COMMISSION

NATIONAL WEATHER SERVICE

USGS science for a changing world

Outline of Presentation

- Background, Need and Recent Workshops
- Proposal Presented to SOH – October 2007
- Task Force – January-April 2008
- Draft Work Plan – April 2008

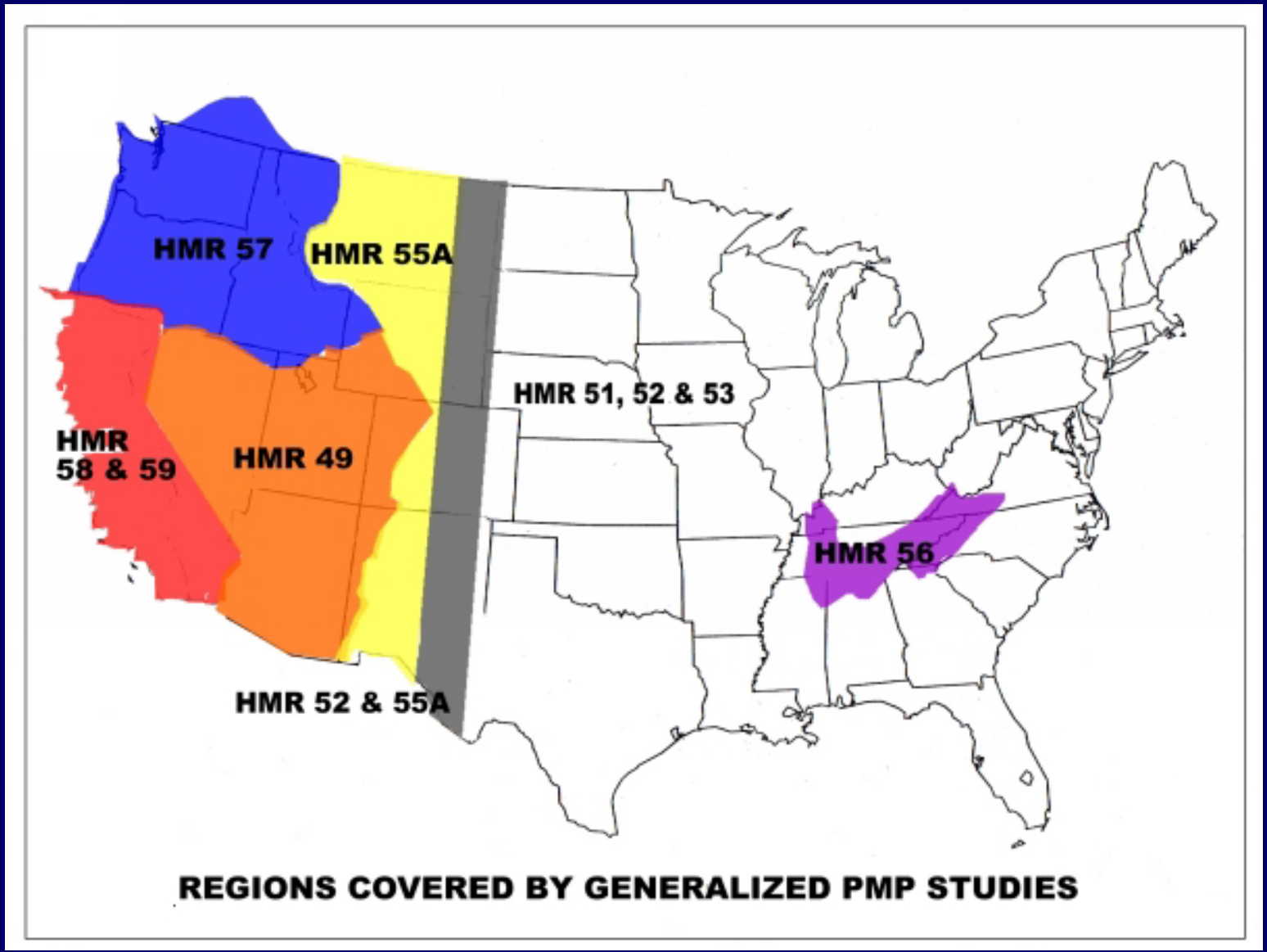
Extreme Storm Events Background

- Federal Agencies developed cooperative Probable Maximum Precipitation (PMP) studies beginning in 1940s
- National Weather Service (USWB) developed Depth-Area Duration (D-A-D) storm data analysis techniques, followed by storm transposition and maximization
- Cooperating agencies Corps of Engineers and Bureau of Reclamation, for design of large Federal dams
- Generalized PMP studies began in 1960s and used today
- Cooperative PMP Methods summarized in papers by Stallings et al. (1986) and Hansen (1987)

Extreme Storm Events Background

- National Research Council (1994) endorsed current operational PMP methods but suggested further research on radar data, storm-based probability methods and numerical modeling in mountainous regions
- U.S. PMP methods are basis for World Meteorology Organization (WMO) approach
- U.S. PMP methods are being challenged by some private consultants
- Private consultants conduct site-specific PMP studies with substantially reduced rainfall amounts; some studies accepted by regulatory agencies

Current Generalized PMP HMR Reports

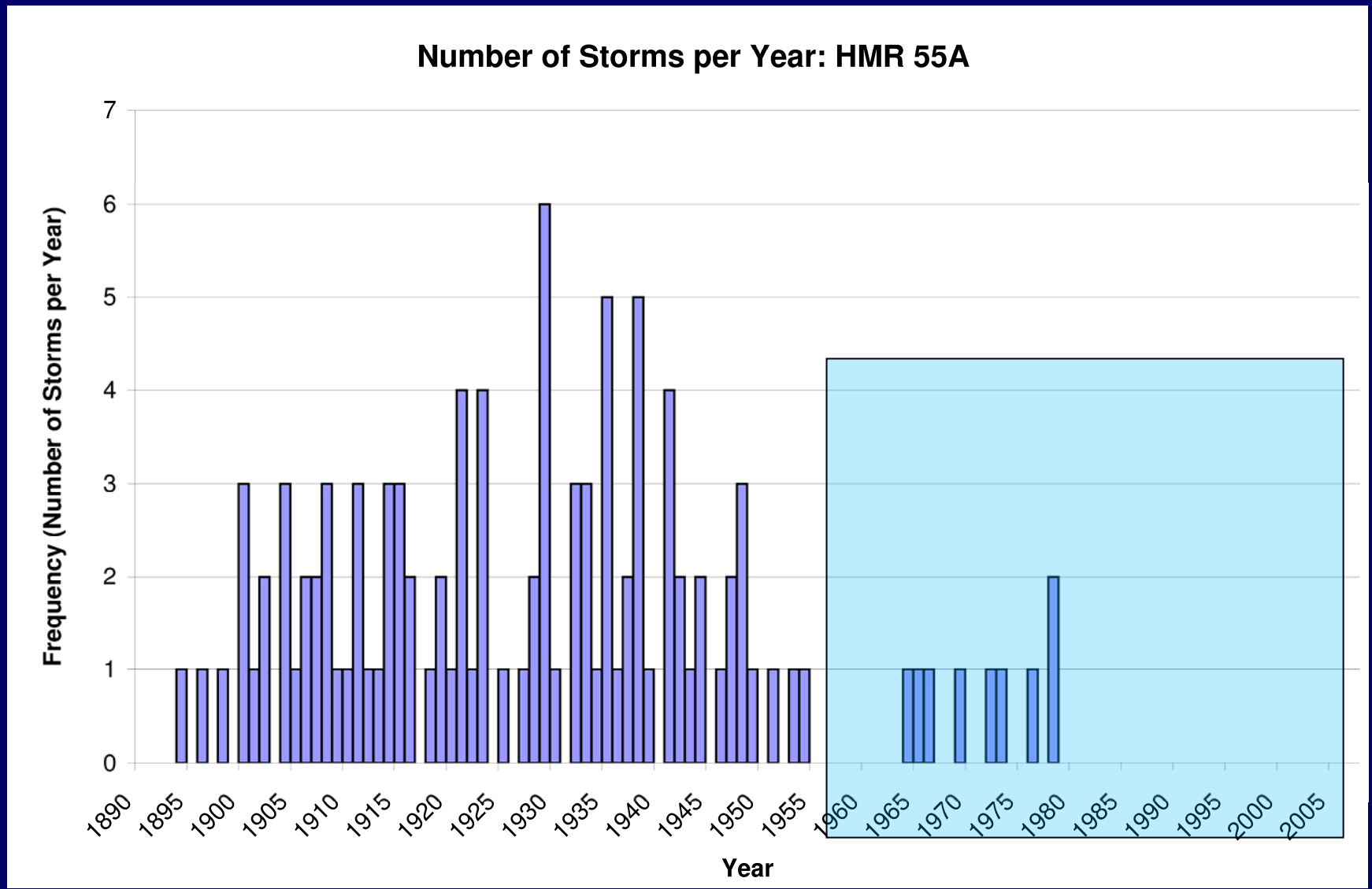


Generalized HydroMet Report Status

HMR No.	Report Publication Date	Latest Storm Used
49	1977	Sept. 3-7, 1970
51	June 1978	June 19-23, 1972
55A	June 1988	Aug. 1-4, 1978
57	October 1994	Dec. 24-26, 1980 (general) Aug. 16, 1990 (local)
59	February 1999	Feb. 14-19, 1986

over 20 to 40 YEARS more data since generalized reports!

Example Data Gaps – HMR 55A



Recent Extreme Storm Workshops & Needs Identified

- National Research Council, 1988 "Estimating Probabilities of Extreme Floods" Nuclear Regulatory Commission Sponsor
- National Research Council, 1994 "Estimating Bounds on Extreme Precipitation Events" FERC Sponsor with Workshop
- Bureau of Reclamation, 1999 "A Framework for Characterizing Extreme Floods for Dam Safety" Report from 1997 Utah State Univ. Workshop, Reclamation Sponsor
- FEMA, 2001 "Hydrologic Research Needs for Dam Safety" Report from 2001 Workshop, Corps of Engineers and FEMA Sponsor

2001 FEMA Workshop Priorities

Meteorology

Number	Name	Weighted Value
1	Precipitation Analysis	43.9
2	Antecedent Storm Analysis	29.5
3	Real Time Storm Analysis	19.6
4	Rainfall Frequency Analysis to Return Periods > 1000 yr	26.0
5	Analysis of last 10 Yrs Data	31.6
6	Analysis of Older Storms	30.1
7	Manual for Orographic Areas	25.1
8	Standardize Storm Development	23.2

Top Ten Priorities

	SUBJECT	Weighted	Group
Number	Name	Value	
1	Historical Database of Storms and Floods	35.8	Risk
2	Extend Frequencies	20.6	Risk
3	Develop Regional Hydrology Parameters	12.4	Risk
4	Develop Paleo models and extend to Eastern US	11.4	Risk
5	Dam Break Parameters	13.6	Risk
6	Precipitation Analysis	12.4	Met
7	Rainfall Frequency Analysis to Return Periods > 1000 yr	21.1	Met
8	Improve Model Development and Training	19.8	Standards
9	Improve Technology Transfer of GIS, NEXRad and Meteorological Data	11.5	Standards
10	Regional Database of Storm Amounts, Durations and Patterns	24.8	Standards

Activities to Commence
Extreme Storm Events Work Group

- Presentation at SOH meeting on October 18, 2007 – Proposal and Terms of Reference
- SOH October, 2007 Decision: The SOH decided to pursue the formation of an Extreme Storm Work Group
- SOH, January 2008 meeting: revisited the Extreme Storm Work Group Proposal. Assigned a Task Force to the effort.
- Task Force commenced in February and held meetings on March 3, 2008 and April 16, 2008

Extreme Storm Events Task Force

Task Force Charge:

- Determine the need for and level of cooperation for updating databases and developing new methods for estimating extreme storm events.
- Focus should be on estimating various storm properties for assessing flood hazards.
- Task Force is to report back to the SOH on the feasibility of establishing a standing working group to update Federal guidelines on estimating extreme storm events and to utilize the estimates within in a probabilistic, risk-based approach.

Extreme Storm Events Task Force Results

Reached Consensus on:

- Federal Government sets the standards for Probable Maximum Precipitation
- National Weather Service should be lead agency in maintaining storm databases, estimating PMP and revising Hydromet. Reports
- Agencies have immediate, short-term needs in PMP and extreme storms
- Long-term commitment of funding for NWS to update the HMRs and to maintain capabilities needs to be addressed, with meeting Agencies long-term needs

Activities to Commence

Extreme Storm Events Work Group

Task Force Results:

- There is sufficient interest to proceed with a new Extreme Storm Events Work Group.
- A Draft Charter has been prepared. Includes Terms of Reference and a Statement of Work
- Consensus that it is a Federal Responsibility and NOAA/NWS is key to accomplishing the work.

Remaining Concerns

- Is there sufficient short-term resources and commitments to proceed with a new ***Extreme Storm Events Work Group***?
- Can a long-term commitment be developed to support NOAA/NWS obtaining more staff to do the work?

Extreme Storm Events Work Group

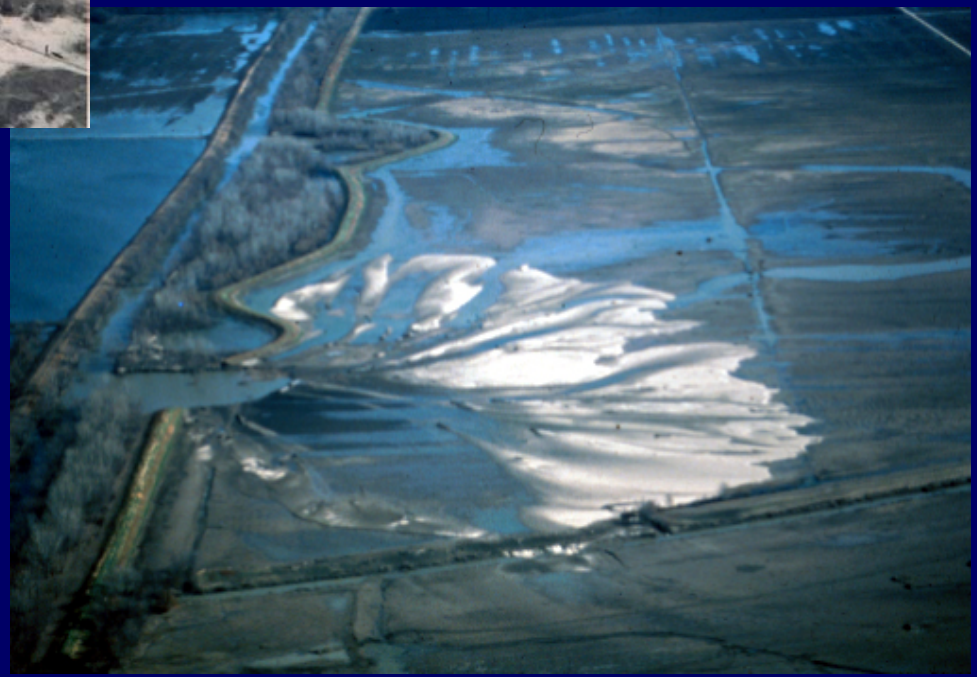
Next Steps

Prior to official formation of a Work Group, the Task Force has identified some interim steps:

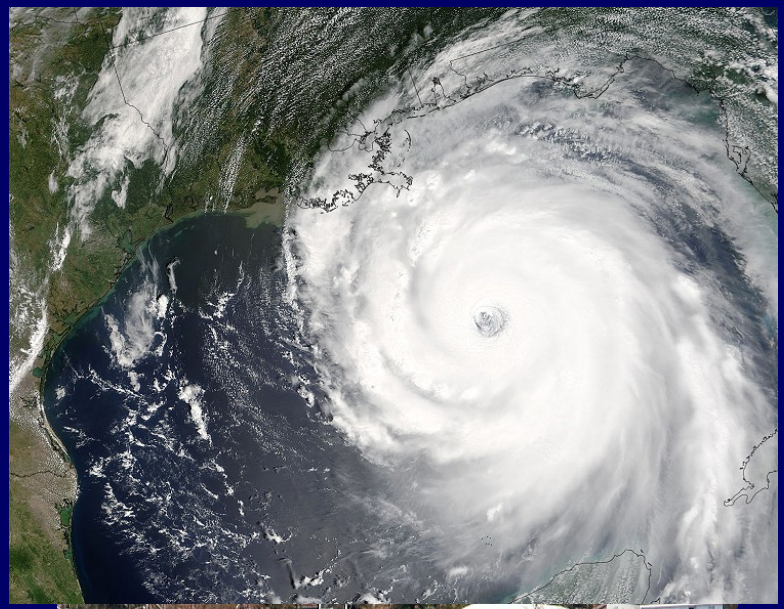
1. Complete draft charter and proposal using technical references and Task Force discussions.
2. Identify short-term and long-term agency needs.
3. Resolve NOAA/NWS availability to participate in PMP studies.
4. Present plan to SOH to include discussion of Dam Safety Act responsibilities.

Yuba City/Marysville, CA
February 1986

Mississippi River
1993



Levees and Floodplain Management



Louisiana/Mississippi 2005

Levees and Floodplain Management

Design Flows for Hydraulic Structures

Spillway Evaluations and Risk Analysis for Dams

Glen Canyon Flushing Flows

Environmental Studies

Folsom Dam, American River, Sacramento, CA 1997 flood