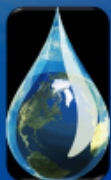


## What is IRWM?

- Collaborative effort to manage all aspects of water resources in a region
- Differs from traditional approaches by integrating all facets
  - Water supply
  - Water quality
  - Waste water treatment
  - Stormwater management
- Crosses jurisdictional, watershed and political boundaries
- Involves multiple agencies, stakeholder, and groups for mutually beneficial solutions



## Why is the IRWMP Important?

- Fosters coordination, collaboration and communication among agencies
- Supports efficient and effective management of regional water supplies, watershed, and habitat protection
- Enables stakeholder participation
- Positions stakeholders to compete for future funding opportunities



## San Diego IRWM Program



**SAN DIEGO**  
Integrated Regional  
Water Management

## Timeline of San Diego IRWM Program

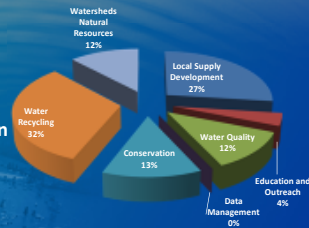
- ✓ **2005:** Regional Water Management Group (RWMG) formed
- ✓ **2006:** Regional Advisory Committee (RAC) established
- ✓ **2007:** San Diego IRWM Plan adopted
- ✓ **2008:** DWR awarded \$25 million to the region (Prop 50 Implementation Grant)
- ✓ **2009:** Tri-County Funding Area Coordinating Committee (FACC) formed with San Diego, Upper Santa Margarita, and South Orange County
- ✓ **2010:** DWR awarded \$1 million to the region to prepare an IRWM Plan Update (Prop 84 Planning Grant)
- ✓ **2011:** DWR awarded \$8 million to the region (Prop 84 Implementation Grant)



## Program Areas/Projects Grant Funding

### Example: Watershed/Natural Resources

- San Vicente Reservoir source water protection
- El Capitan watershed acquisition and restoration program
- Northern San Diego County Invasive non-native species control
- Chollas Creek integration project



## SD IRWM Projects Grant Funding



## 2013 IRWM Update

## IRWM Plan Update

- Update 2007 IRWM Plan with existing plans and information from planning studies
- Integrate program objectives established at the RWMG Retreat
  - E.g., focus priorities and facilitate project integration
- Meet 2010 DWR IRWM Plan Requirements



## Schedule for IRWM Plan Update

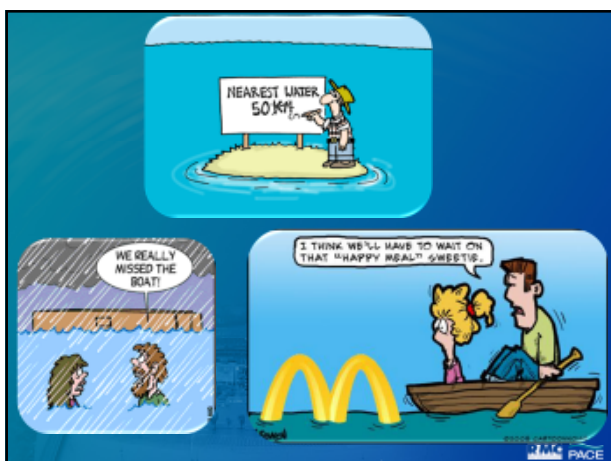
- Four Planning Studies - October 2012
- Updated Admin DRAFT IRWM – April 2013
- Updated Plan Adopted - September 2013
- Round 3 Prop 84 Grant – July 2013



PACE



## Integrated Flood Management-IFM



## What is Integrated Flood Management?

### Holistic approach for dealing with flood risks:

- Interconnection flood management actions within water resources management and land use planning
- Value of coordinating across geographic and agency boundaries
- Need to evaluate opportunities and impacts from a "system" perspective
- Importance of environmental stewardship and sustainability



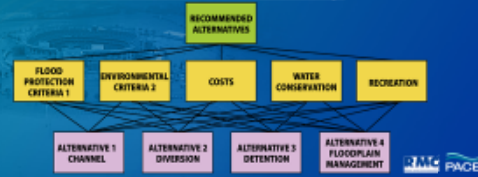
PACE



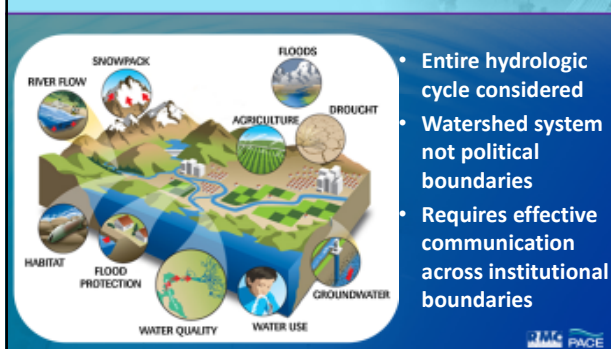


### Comprehensive Flood Management Integrates Multiple Water Resource Benefits

- Challenge is to provide flood protection while capturing multiple water resource benefits
- Flood management cannot be performed separately from decisions on landuse/water supply/safety/enviro
- Watershed plan integrating other water resource programs foundation for focused stakeholder advocacy assists in funding



### Integrated Approach Focus on Entire Watershed System



### Integrated Flood Management Principles Guide Approach

- Manage water cycle as a whole
  - Groundwater and floodwater linked resources
  - Sustainability
- Integrate land and water management
  - Water quantity / quality / erosion and deposition
- Adoption of flexible strategies
  - Tailored to different constraints



### Traditional Flood Protection Approach Created Variety of Issues and Limitations

- Single focus of public safety with conventional flood control measures
- Environmental, fiscal, and management issues
- Flood risk reduction strategies constrained by previous landuse and development decisions
- Ignored water conservation opportunities/benefits



### Common Failures of Flood Management Plans

- One time study rather than long term management process
- Stakeholder involvement and local ownership lacking
- Did not address landuse/management issues in watersheds
- Planning activities were not conducted at appropriate level
- Incorporate regulatory limitations and environmental permitting constraints
- Address watershed problems at appropriate scale

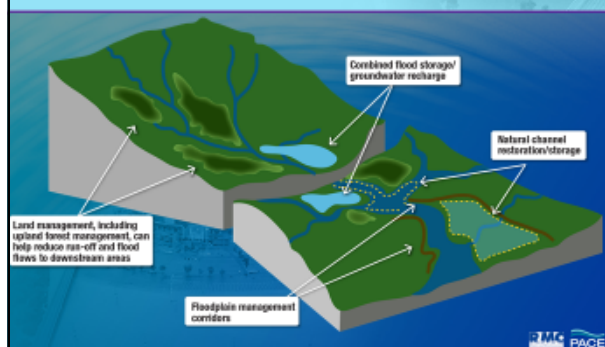


### IFM Introduces Key Watershed Planning Principles

- Respect the natural hydrologic processes
- Focus on the cause of the damage not the symptom
- Consider the entire watershed not just local condition
- Public participation and interagency coordination
- Embrace other water resource protection goals



### Common Examples Integrated Flood Management (IFM) Strategies



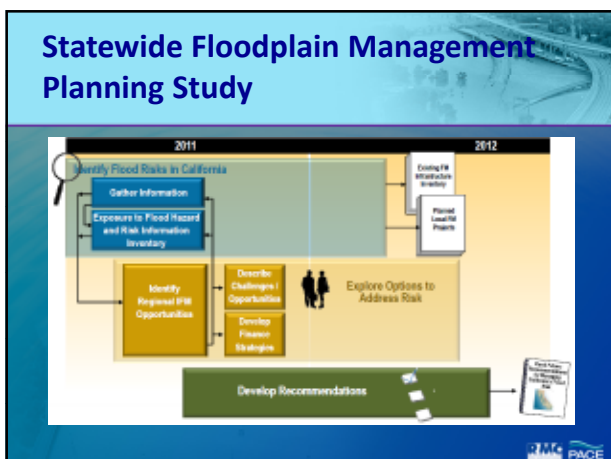


## Key Goal of SFMP Program Aligned with IRWM Study

1. Inventory and describe the status of existing flood management infrastructure.
2. Characterize current and future flood risks throughout California based on best available information (e.g., key population centers, floodplains, status of flood infrastructure, economic assets, and natural and cultural resources).
3. Identify opportunities for IFM by region to address flood risk.
4. Identify challenges and opportunities for improving flood management.
5. Develop a finance strategy for IFM improvements and continuing operations and maintenance.
6. Develop recommendations to guide flood risk management strategic policies and investment decisions.



PACE



## Importance of Integrated Floodplain Management in IRWM Update

- DWR guidelines emphasize importance of integrated flood management (IFM)
- Scoring on recent Prop 84 grant proposal included focus on IFM
- IFM must be addressed in IRWM update to ensure ability to secure maximum funding
- Competitive IFM projects incorporated into the IRWM project database



## Flood Risk Management Most Effective Through a Watershed Planning Process



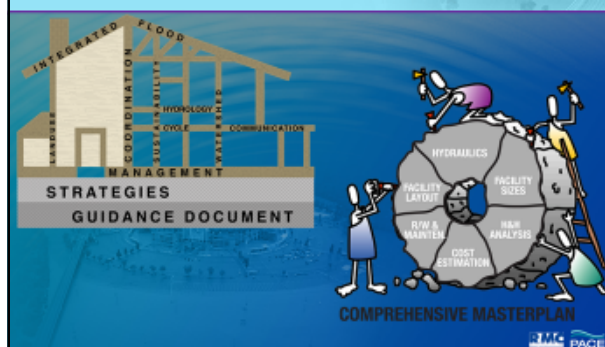
## Flood Management Planning Study Objectives

Watershed Planning is dynamic process requiring "adaptive management" adjusting to changing conditions so must be flexible

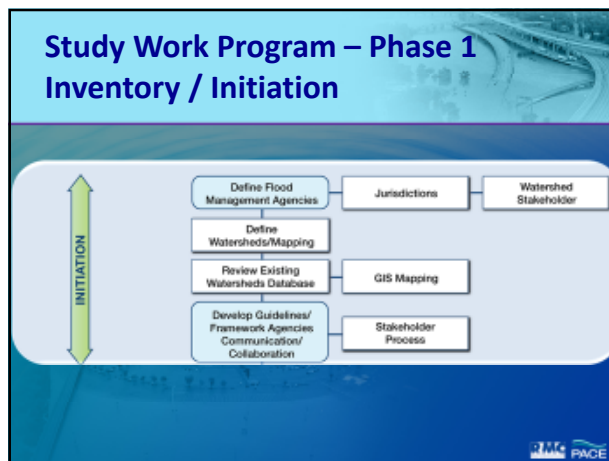
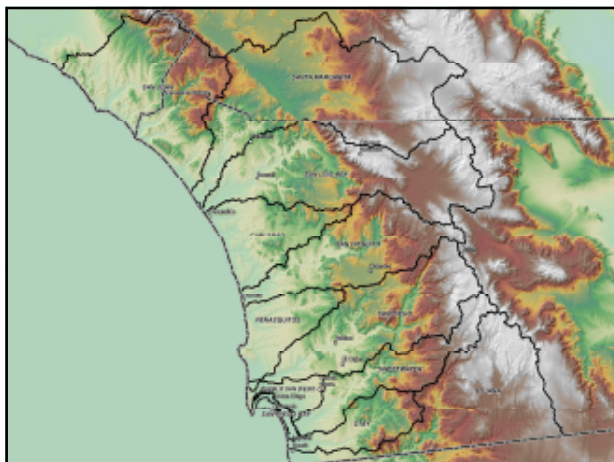
- Development of planning level tools
- Guidance framework for regional collaborative planning
  - Forum for improved regional flood /watershed planning
  - Communication with regional floodplain managers
- Define global strategies to form basis in developing prospective projects for funding



## Framework of IFM Watershed Specific Strategies to Develop Projects







## 1<sup>st</sup> – Characterization of Flood Issues through Flood Managers Forum

- Develop a culture of communication for flood management agencies through “forum”
  - Sharing information / strategies / benefits and costs discussions are the “norm”
  - Decision-making process
- Provide a standard approach to coordination with major land use planning agencies in watersheds
- Understanding actual problems requiring solutions
  - Existing and future flood risk
  - Level of Risks
  - Sources of Flooding
  - Priorities

## Tools for Standardizing and Assessing Level of Risk to Provide Most Benefit



## Study Work Program – Phase 2 Stakeholder Planning Process



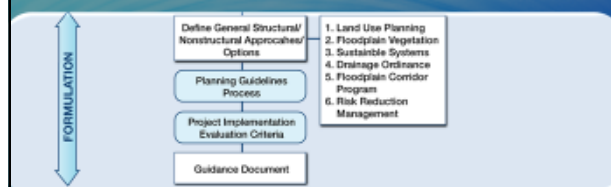
## 2<sup>nd</sup> – Planning Process Define Global Management Strategies

- Identification of global **opportunities and constraints**
  - Watershed “beneficial uses”
- Formulate global management **strategy approaches**
  - Structural / Nonstructural
  - Application of watershed **planning principles**
    - Landuse planning
    - Floodplain vegetation management
    - Regional runoff storage / infiltration
    - Risk management

## Global Strategy Formulation / Approaches

- Global solution **planning process**
  - Watershed basis (specific regional watersheds)
  - Similar geographic regions (i.e. coastal plains, valley) or watershed characteristics
- Typical IFM **Strategies**:
  - Regional flood storage / infiltration
  - Floodplain management
  - Watershed landuse planning
- **Inventory** of Flooding Issues / constraints / sources on same basis

## Study Work Program – Phase 3 Strategy Formulation Process



### 3<sup>rd</sup> – Regional Guidance Documenting Comprehensive Flood Management Program

- **Planning Guidance Document**
  - Formalized watershed / flood management planning process
  - Adaptive plan flexible to changes – watershed/regulatory
  - Defines control and communication process for agency collaboration
  - Standard protocols for data sharing and common language for understanding watershed
- **Projects Implementation Prioritization Evaluation**
  - Screening process to prioritize projects for funding
  - Specialized “Analytical Hierarchy Process” numerically rank alternative projects on achieving multiple objectives



### Collaboration Stakeholder Workshop Planning Process

- Opportunity to engage stakeholders through workshops / technical forums participating in plan development
- Workshop No. 1** - Background and Inventory of Watershed Flooding / Constraints / Priorities
- Workshop No. 2** - Define Opportunities / Goals / Strategies
- Workshop No. 3** - Review DRAFT Planning Guidance Document



### Regional IFM Guidance Document

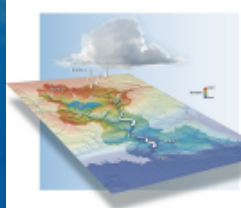
- Define generalized regional IFM **planning program**
- Guidance on **integrated global strategies** to maximize funding
- Basic framework of **categories for strategies** based on specific watersheds or characteristic type of watershed or target constraints
- Floodplain **managers forum** and communication structure to improve collaboration and planning activities



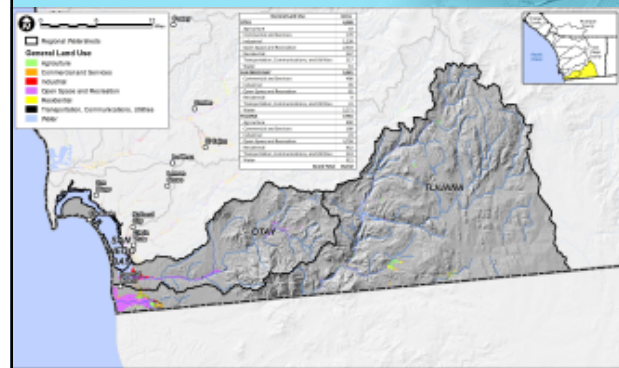
### Workshop Discussion Forum

## Watershed and Flood Hazards Understanding

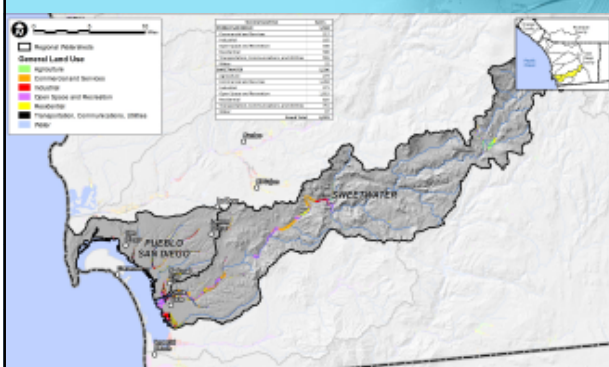
- Understanding **actual problems** requiring solutions
  - Existing and future flood risk
  - Level of Risks
  - Sources of Flooding
  - Priorities
- **Constraints** related to flood management
  - Regulatory
  - Physical



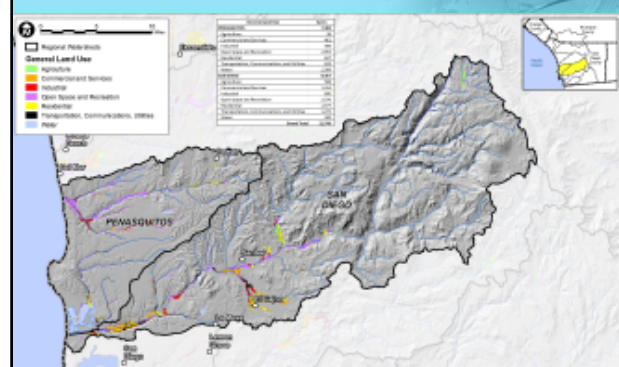
## Flood Hazards and Landuses – Area 1



## Flood Hazards and Landuses – Area 2

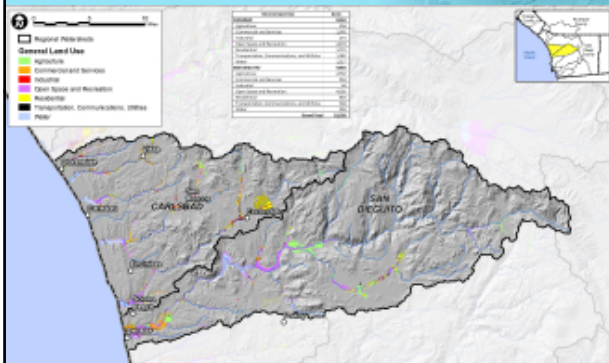


## Flood Hazards and Landuses – Area 3

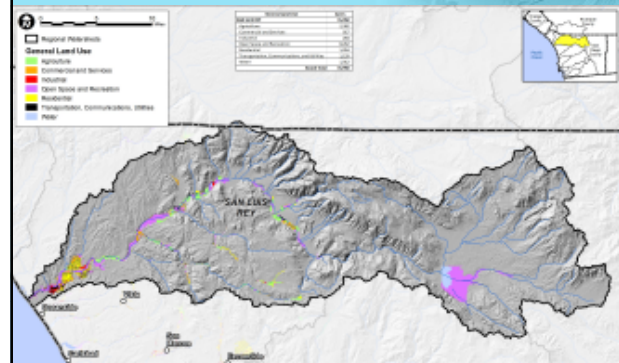




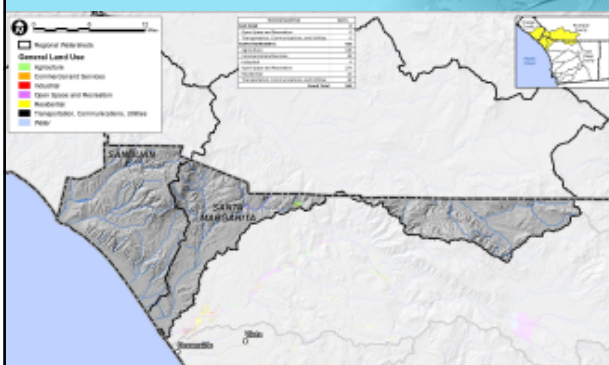
### Flood Hazards and Landuses – Area 4



### Flood Hazards and Landuses – Area 5



### Flood Hazards and Landuses – Area 6



### Summary of Landuse Based Flood Hazard Inventory

AREA 1 - General Land Use		Acres	AREA 2 - General Land Use		Acres
DTAY		4,389	PUEBLO SAN DIEGO		1,594
Agriculture		18	Commercial and Services		217
Commercial and Services		170	Industrial		165
Industrial		1,236	Open Space and Recreation		330
Open Space and Recreation		2,318	Residential		306
Residential		267	Transportation, Communications, and Utilities		555
Transportation, Communications, and Utilities		317	Water		22
Water		61	SAN DIEGO BAY		5,981
SAN DIEGO BAY		5,981	Commercial and Services		488
Commercial and Services		488	Industrial		99
Industrial		99	Open Space and Recreation		85
Open Space and Recreation		85	Residential		8
Residential		8	Transportation, Communications, and Utilities		31
Transportation, Communications, and Utilities		31	Water		5,271
Water		5,271	FUJANA		7,761
FUJANA		7,761	Agriculture		800
Agriculture		800	Commercial and Services		188
Commercial and Services		188	Industrial		23
Industrial		23	Open Space and Recreation		4,758
Open Space and Recreation		4,758	Residential		852
Residential		852	Transportation, Communications, and Utilities		319
Transportation, Communications, and Utilities		319	Water		821
Water		821			
Grand Total		18,132	Grand Total		6,931

## Summary of Landuse Based Flood Hazard Inventory

AREA 3 - General Land Use	Acres	AREA 4 - General Land Use	Acres
PENASQUITOS	7,382	CARLSBAD	8,464
Agriculture	38	Agriculture	354
Commercial and Services	461	Commercial and Services	1,345
Industrial	356	Industrial	271
Open Space and Recreation	2,953	Open Space and Recreation	2,474
Residential	637	Residential	1,721
Transportation, Communications, and Utilities	629	Transportation, Communications, and Utilities	1,082
Water	2,309	Water	1,217
SAN DIEGO	8,367	SAN DIEGO	9,864
Agriculture	508	Agriculture	2,352
Commercial and Services	1,414	Commercial and Services	953
Industrial	600	Industrial	44
Open Space and Recreation	2,576	Open Space and Recreation	4,326
Residential	1,577	Residential	853
Transportation, Communications, and Utilities	1,272	Transportation, Communications, and Utilities	344
Water	420	Water	993
Grand Total	15,749	Grand Total	18,328

## Summary of Landuse Based Flood Hazard Inventory

AREA 5 - General Land Use	Acres	AREA 6 - General Land Use	Acres
SAN LUIS REY	15,950	SAN JUAN	0
Agriculture	2,382	Open Space and Recreation	0
Commercial and Services	917	Transportation, Communications, and Utilities	0
Industrial	264	SANTA MARGARITA	544
Open Space and Recreation	8,262	Agriculture	146
Residential	1,953	Commercial and Services	38
Transportation, Communications, and Utilities	1,159	Industrial	4
Water	1,012	Open Space and Recreation	273
Grand Total	15,950	Residential	42
		Transportation, Communications, and Utilities	40
		Grand Total	544

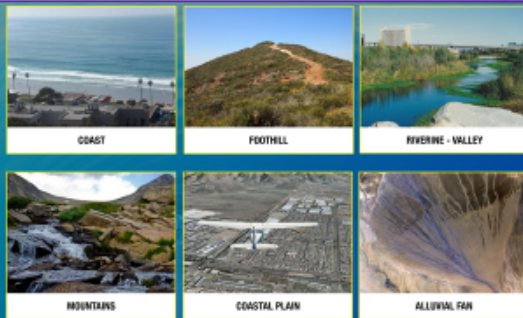
## 1. Characterize common flooding problems/sources



## Common Watershed Flood Problems / Sources



### Define Flood Characteristics Based on Major Watershed Landscape Type



### 2. Key flood locations /damage / Issues



### 3. Existing Flood Control Masterplans / Inventory Drainage Facilities



- Regional Plans
- Watershed Plans
- Municipal Drainage Plans
- Existing Facility Inventory

#### Discussion

- Issues / Implementation

### 4. Needs /priorities / constraints for flood management

