Flood Management - Workshop Objectives

Today’s Workshop
- Characterize common flood problems/sources
- Identify key flood location / issues
- Existing flood control masterplans
- Existing needs / priorities / constraints for implementing flood hazard mitigation

Future Workshops
- Regional opportunities / goals / alternative strategies
- Draft Planning Guidance Document

Presentation Program Outline

IRWM Program Background
San Diego IRWM Planning
2013 IRWM Update
Integrated Flood Management
Flood Management Planning Study
Workshop Forum Discussion
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

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

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

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
Addressing Regional Flood Management Constraints / Issues

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/environ
- Watershed plan integrating other water resource programs foundation for focused stakeholder advocacy assists in funding

Integrated Approach Focus on Entire Watershed System

- Entire hydrologic cycle considered
- Watershed system not political boundaries
- Requires effective communication across institutional boundaries

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

- **Drainage channel** modification
- **Beaver dam** removal
- **Dike erosion** repair
- **Waterway channelization**
- **Pond management practices**
Statewide Floodplain Management Planning - DWR

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 risk 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 IRWM by region to address flood risk.
4. Identify challenges and opportunities for improving flood management.
5. Develop a finance strategy for IRWM improvements and continuing operations and maintenance.
6. Develop recommendations to guide flood risk management strategic policies and investment decisions.

Statewide Floodplain Management Planning Study

San Diego Flood Management Planning Study Program
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 a 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
1st – 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

- GIS Database
- Integrate Flood Hazards and landuses
- Define opportunities and constraints
Study Work Program – Phase 2
Stakeholder Planning Process

2nd – 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
3rd – 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
Summary of Landuse Based Flood Hazard Inventory

### AREA 1 - General Land Use Acres

- **OTAY**: 4,389
  - Agriculture: 18
  - Commercial and Services: 170
  - Industrial: 1,238
  - Open Space and Recreation: 2,318
  - Residential: 267
  - Transportation, Communications, and Utilities: 317
  - Water: 61
- **SAN DIEGO BAY**: 5,981
  - Commercial and Services: 488
  - Industrial: 99
  - Open Space and Recreation: 85
  - Residential: 8
  - Transportation, Communications, and Utilities: 31
  - Water: 5,271
- **TIJUANA**: 7,761
  - Agriculture: 800
  - Commercial and Services: 188
  - Industrial: 23
  - Open Space and Recreation: 4,758
  - Residential: 852
  - Transportation, Communications, and Utilities: 319
  - Water: 821

**Grand Total**: 18,132

### AREA 2 - General Land Use Acres

- **PUEBLO SAN DIEGO**: 1,594
  - Commercial and Services: 217
  - Industrial: 165
  - Open Space and Recreation: 330
  - Residential: 306
  - Transportation, Communications, and Utilities: 555
  - Water: 22
- **SWEETWATER**: 5,336
  - Agriculture: 273
  - Commercial and Services: 1,204
  - Industrial: 371
  - Open Space and Recreation: 1,815
  - Residential: 825
  - Transportation, Communications, and Utilities: 751
  - Water: 97

**Grand Total**: 6,931

### AREA 3 - General Land Use Acres

- **OCEANSIDE 48K**: 1,090
  - Commercial and Services: 227
  - Industrial: 589
  - Open Space and Recreation: 580
  - Residential: 589
  - Transportation, Communications, and Utilities: 595
  - Water: 22
- **THE NATIVE**: 5,130
  - Agriculture: 274
  - Commercial and Services: 1,352
  - Industrial: 635
  - Open Space and Recreation: 1,051
  - Residential: 325
  - Transportation, Communications, and Utilities: 785
  - Water: 22

**Grand Total**: 6,516

### AREA 4 - General Land Use Acres

- **A11**: 1,000
  - Commercial and Services: 227
  - Industrial: 589
  - Open Space and Recreation: 580
  - Residential: 589
  - Transportation, Communications, and Utilities: 595
  - Water: 22
- **THE NATIVE**: 5,130
  - Agriculture: 274
  - Commercial and Services: 1,352
  - Industrial: 635
  - Open Space and Recreation: 1,051
  - Residential: 325
  - Transportation, Communications, and Utilities: 785
  - Water: 22

**Grand Total**: 6,516
1. Characterize common flooding problems/sources

**Common Watershed Flood Problems / Sources**

- ALLUVIAL PLAIN EROSION
- URBAN PONDING
- LATERAL FLOODPLAIN ENCROACHMENT
- URBAN FLOODED ROADS
- FLASH FLOSTEN EVENTS
- FLUVIAL CONVEYANCE CAPACITY
- EROSION PRODUCTION

---

**Summary of Landuse Based Flood Hazard Inventory**

### AREA 3 - General Land Use Acres

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>38</td>
</tr>
<tr>
<td>Commercial and Services</td>
<td>1,310</td>
</tr>
<tr>
<td>Industrial</td>
<td>275</td>
</tr>
<tr>
<td>Open Space and Recreation</td>
<td>1,272</td>
</tr>
<tr>
<td>Residential</td>
<td>1,272</td>
</tr>
</tbody>
</table>

### AREA 4 - General Land Use Acres

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>354</td>
</tr>
<tr>
<td>Commercial and Services</td>
<td>1,082</td>
</tr>
<tr>
<td>Industrial</td>
<td>271</td>
</tr>
<tr>
<td>Open Space and Recreation</td>
<td>421</td>
</tr>
<tr>
<td>Residential</td>
<td>1,721</td>
</tr>
</tbody>
</table>

### AREA 5 - General Land Use Acres

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>2,382</td>
</tr>
<tr>
<td>Commercial and Services</td>
<td>917</td>
</tr>
<tr>
<td>Industrial</td>
<td>264</td>
</tr>
<tr>
<td>Open Space and Recreation</td>
<td>469</td>
</tr>
<tr>
<td>Residential</td>
<td>1,953</td>
</tr>
</tbody>
</table>

### AREA 6 - General Land Use Acres

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>146</td>
</tr>
<tr>
<td>Commercial and Services</td>
<td>38</td>
</tr>
<tr>
<td>Industrial</td>
<td>4</td>
</tr>
<tr>
<td>Open Space and Recreation</td>
<td>273</td>
</tr>
<tr>
<td>Residential</td>
<td>42</td>
</tr>
</tbody>
</table>

---

**Summary of Landuse Based Flood Hazard Inventory**

### AREA 3 - General Land Use Acres

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>7,382</td>
</tr>
<tr>
<td>Commercial and Services</td>
<td>461</td>
</tr>
<tr>
<td>Industrial</td>
<td>356</td>
</tr>
<tr>
<td>Open Space and Recreation</td>
<td>2,953</td>
</tr>
<tr>
<td>Residential</td>
<td>637</td>
</tr>
</tbody>
</table>

### AREA 4 - General Land Use Acres

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>508</td>
</tr>
<tr>
<td>Commercial and Services</td>
<td>1,414</td>
</tr>
<tr>
<td>Industrial</td>
<td>600</td>
</tr>
<tr>
<td>Open Space and Recreation</td>
<td>2,576</td>
</tr>
<tr>
<td>Residential</td>
<td>1,577</td>
</tr>
</tbody>
</table>

### AREA 5 - General Land Use Acres

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>2,309</td>
</tr>
<tr>
<td>Commercial and Services</td>
<td>629</td>
</tr>
<tr>
<td>Industrial</td>
<td>580</td>
</tr>
<tr>
<td>Open Space and Recreation</td>
<td>420</td>
</tr>
<tr>
<td>Residential</td>
<td>420</td>
</tr>
</tbody>
</table>

### AREA 6 - General Land Use Acres

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>0</td>
</tr>
<tr>
<td>Commercial and Services</td>
<td>0</td>
</tr>
<tr>
<td>Industrial</td>
<td>0</td>
</tr>
<tr>
<td>Open Space and Recreation</td>
<td>0</td>
</tr>
<tr>
<td>Residential</td>
<td>0</td>
</tr>
</tbody>
</table>

---

**Grand Total**

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>15,749</td>
</tr>
<tr>
<td>Commercial and Services</td>
<td>3,659</td>
</tr>
<tr>
<td>Industrial</td>
<td>971</td>
</tr>
<tr>
<td>Open Space and Recreation</td>
<td>3,592</td>
</tr>
<tr>
<td>Residential</td>
<td>3,592</td>
</tr>
</tbody>
</table>

---

**San Diego**

- Agriculture: 508 acres
- Commercial and Services: 1,414 acres
- Industrial: 600 acres
- Open Space and Recreation: 2,576 acres
- Residential: 1,577 acres

**San Diego County**

- Grand Total: 8,367 acres

---

**San Luis Rey**

- Agriculture: 2,309 acres
- Commercial and Services: 629 acres
- Industrial: 580 acres
- Open Space and Recreation: 420 acres
- Residential: 420 acres

**San Luis Rey County**

- Grand Total: 15,950 acres

---

**San Juan**

- Open Space and Recreation: 0 acres
- Transportation, Communications, and Utilities: 0 acres

**Santa Margarita**

- Agriculture: 146 acres
- Commercial and Services: 38 acres
- Industrial: 4 acres
- Open Space and Recreation: 273 acres
- Residential: 42 acres

**Santa Margarita County**

- Grand Total: 544 acres

---

**San Luis Rey**

- Agriculture: 2,309 acres
- Commercial and Services: 629 acres
- Industrial: 580 acres
- Open Space and Recreation: 420 acres
- Residential: 420 acres

**San Luis Rey County**

- Grand Total: 15,950 acres

---

**San Juan**

- Open Space and Recreation: 0 acres
- Transportation, Communications, and Utilities: 0 acres

**Santa Margarita**

- Agriculture: 146 acres
- Commercial and Services: 38 acres
- Industrial: 4 acres
- Open Space and Recreation: 273 acres
- Residential: 42 acres

**Santa Margarita County**

- Grand Total: 544 acres

---

1. Characterize common flooding 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

- Flood Hazard Mapping
- Key Flood spots
- Repetitive Flood Damage Events
- Existing Facility Inventory / Lifetime
- Regulatory Requirements

- Regulatory
- Stakeholder Conflicts
- Physical Limitations
- Environmental Permitting