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Delta Levee Investment Strategy Update

Summary: This is a progress report on the Delta Stewardship Council's (Council) activities to update the Delta Plan's priorities for State investment in Delta levees (DLIS). For this meeting there are three major elements for the Council to engage in. These elements include: (1) a set of staff proposed alternatives addressing goals and objectives for State investments in Delta levees and for identifying the State interests these investments should further, including a discussion with representatives from State agencies that have responsibilities related to levee improvements in the Delta; (2) an introduction to the risk analysis element of the levee investment strategy methodology; and (3) general updates on progress related to public outreach and communication, overall methodology development, and the independent peer review process.

Background

The Delta Reform Act states, "The Delta Plan shall attempt to reduce risks to people, property, and state interests in the Delta by promoting effective emergency preparedness, appropriate land uses, and strategic levee investments" (Water Code section 85305(a)). In addition, "The Council, in consultation with the Central Valley Flood Protection Board, shall recommend in the Delta Plan priorities for State investments in levee operation, maintenance, and improvements in the Delta, including both levees that are a part of the State Plan of Flood Control and non-project levees" (Water Code section 85306).

The Delta Plan established interim priorities for State investment in Delta levees (RR P1 and 23 CCR Section 5012). The Council is now engaged in updating the Delta Plan's priorities for these Delta levee investments, as the Delta Plan recommends (RR R4). In December, the Council accepted a staff issue paper, *State Investments in Delta Levees: Key Issues for Updating Priorities*, that provided background information on key questions to be addressed as the Council considers updating the Delta Plan's levee investment priorities.

A next step in this update is to begin answering these questions, including what State interests these investments should further and how to integrate consideration of those State interests with reductions in risks to people and property.

Past State Expenditures for Delta Levees

At the January meeting, Council members requested additional information about State and local levee investments in the Delta.

Levee Maintenance Subventions Program. The Department of Water Resources (DWR) provided State and local expense data for the Delta Levee Maintenance Subventions Program for the period 1987 through 2013. Seventy-six reclamation districts participated in the program at least once during that time span. In that period, the State expenses totaled about $165 million and local expenses totaled about $106 million. The median State contribution to participating districts was 67 percent of their qualifying annual maintenance and rehabilitation expenditures. The median local contribution was 33 percent (see Figure 1 below). Attachment 1 maps the location by Delta island or tract of Delta Levee Maintenance Subventions program State expenditures over time.

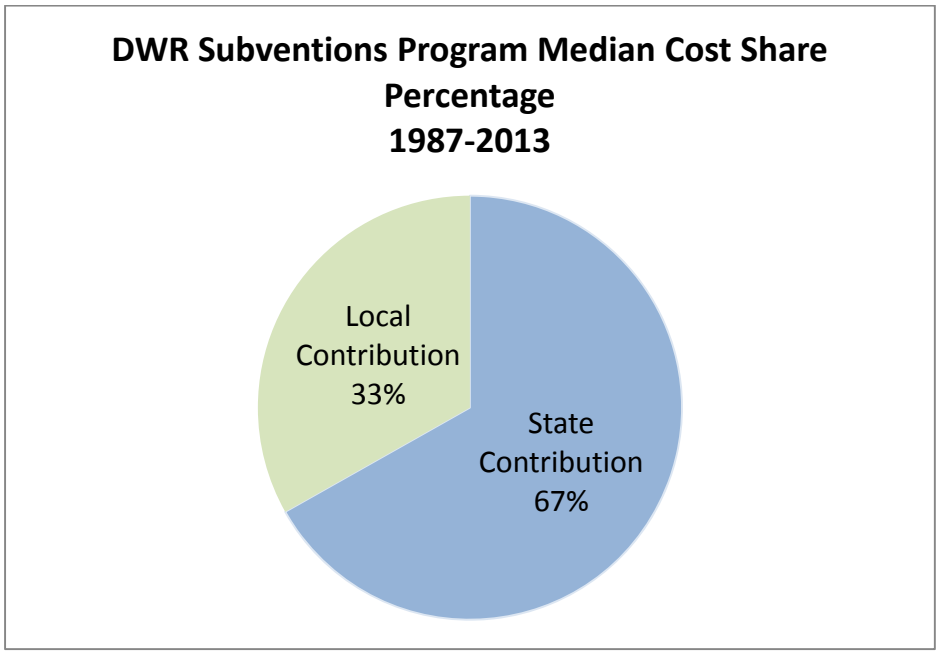

Figure 1: Subventions Program Cost Share Percentage

Special Projects. DWR estimates that State expenses for the Delta Levees Special Flood Control Projects program, which funds levee improvements, total about $338 million for the period 1992 through 2012. The available records show State contributions average about 96 percent of project costs, with a range from 75 percent to 100 percent. Attachment 2 maps expenditures for the Delta Levees Special Flood Control Projects program over the reporting period. The data about expenditures through the Delta Levees Special Flood Control Projects program that DWR provided is partly based on anecdotal information and should, therefore, be used with caution.

Identifying the Goals and Objectives for State Investments in Delta Levees and the State Interests those Investments Should Further

At the January meeting, staff initiated a discussion with the Council on the following three questions:

1. What goals and objectives should State investments in Delta levees further?
2. What are the State's interests in the Delta that levee investments should further?
3. How should the levee priorities address the risk of State liability for levee failures?

In addition, staff provided a list of potential goals and objectives, State interests and other criteria related to Delta flood risk management for the Council's consideration in addressing these questions. This list was derived from key legislation as well as information from the programs, plans, reports, and grant guidelines of key implementing agencies.

The Council requested that staff return with alternative approaches to address the State's goals and objectives related to levee investments and the State interests that should be furthered through these investments. The alternative approaches included in this report (Attachment 3) reflect the discussion at the January Council meeting, public comments received at that meeting, and consultation with other agencies in the interim. The Council suggested that the alternatives could range from a business-as-usual approach to a more focused goal-oriented approach.

Attachment 3 identifies four separate approaches to identifying State goals and interests that could guide prioritization of levee investments. The attachment also includes a brief description of the potential State liability under the different alternatives. Each approach is briefly described here:

Alternative 1: Business as Usual
This approach is most similar to current practices. In this recommendation, numerous goals are considered important and funding would be distributed among them. Categories for investments would include; urban and urbanizing areas, rural or small communities, water supply reliability, ecosystem-related goals, economic and other Delta as Place type goals. This approach seeks to balance the achievement of goals over time to attain necessary levels of protection (e.g., 200-year protection for urban and urbanizing) or desired (e.g., HMP or better, depending on the benefits to be provided, for non-project levees).

Alternative 2: Business as Usual 2.0
This approach would modify existing practices described in the Business as Usual approach above. Projects that further multiple objectives (e.g., flood management and habitat restoration) would be preferred over projects that further a single objective. There would be more focus on cost-sharing.

Benefit/cost considerations would affect investment decisions. This approach may not identify a State interest in making levee investments to protect some values, such as aesthetic and recreational resources.

Alternative 3: Economic Sustainability Plan/Delta as Fortress
This alternative reflects the recommendations of the Delta Protection Commission's *Economic Sustainability Plan* and the "Delta as Fortress" alternative of the 2007 Public Policy Institute of California report *Envisioning Futures for the Sacramento-San Joaquin Delta.*

The focus of investments under this alternative would be to protect lives and property, water supply reliability, and Delta as Place values. Recommended levee improvements could be much more substantial than the first two alternatives. Every island would be protected to at least the standards of the Army Corps of Engineers' PL 84-99 program. In addition, most rural non-project levees would be improved to wider "fat levee" configuration to reduce seismic and other hazards to levees that protect infrastructure and water quality. Setting back levees to improve migratory corridors for salmon, steelhead, or other fish would not be considered.

Alternative 4: Goal-oriented Prudence
This alternative would be the most selective in terms of what the State seeks to achieve with levee funding. Protecting lives and achieving the coequal goals would be the primary purpose. Delta as Place resources (cultural, recreational, agricultural, etc.) and protecting private property would be secondary purpose or not considered at all. An emphasis would be placed on improving project levees to reduce State liabilities and improving only selected non-project levees that protect the narrower range of State goals, objectives and interests.

The stipulation of the Central Valley Flood Protection Act that urban and urbanizing areas must achieve 200-year protection would be consistent among all four alternatives.

Today's Panel

Representatives from the State agencies with Delta levee responsibilities have been invited to assist the Council in its deliberation of State goals and objectives for levee system investments as well as the State interests these investments should further. Panel members include:

- Gary Bardini, Deputy Director, Integrated Water Management, Department of Water Resources
- Leslie Gallagher, Chief Counsel/Interim Executive Officer, Central Valley Flood Protection Board
- Erik Vink, Executive Officer, Delta Protection Commission
- Carl Wilcox, Policy Advisor to the Director, Department of Fish and Wildlife

Specific questions the panel members were asked to address discuss include:

- From your agency's perspective, what are the most important goals, objectives and State interests that the State's Delta levee investments should further: life and property, water supply, ecosystem restoration, protection of the local landscape, economy, or cultural and heritage sites?
- Are there other alternative approaches to furthering achievement of State interests?
- What are the best approaches to consider when setting appropriate levels of protection?
- How can we best consider ecosystem functions?

Next Steps in this Process

In March, two Council events will relate to this ongoing discussion of investments to meet State goals and objectives and of the State's interests that these investments should further. The first is a half-day Council-expert workshop on March 11 focused on levees and risk management, strategies for State investments to reduce risk while meeting multiple objectives and issues related to liability. Experts from the region, as well as from around the country, will attend to engage the Council in a dialogue about these topics. Information gained from the workshop should provide guidance about objectives and State interests that Delta levee investments should further.

The technical experts invited to participate in this workshop include:

- Dr. Lewis E. Link, Research Professor, Dept. of Civil and Environmental Engineering, University of Maryland
- Dr. Dennis Mileti, Professor Emeritus of Sociology, University of Colorado Natural Hazards Center
- Dr. G. Paul Kemp, Associate Research Professor, Center for Coastal Energy and Environmental Resources, Louisiana State University
- Larry A. Larson, P.E. CFM, Director Emeritus, Senior Policy Advisor, Association of State Floodplain Managers
- Representatives from the U.S. Army Corps of Engineers, Sacramento District and the Public Policy Institute of California have also been invited to participate

The workshop will be structured as a conversation between the Council members and the invited experts, with opportunities for the Council and panelists to receive public comment at scheduled times. Information for the workshop will be posted on the Council's website.

Then, at the regularly scheduled March 26 Council meeting, staff will present a second iteration of alternatives related to State goals, objectives, and State interests. At this

meeting, staff will request that the Council provide guidance on which alternatives best capture their assessment of the State interests that warrant fuller consideration in the prioritization of State levee investments. The suite of goals and objectives included in this preferred alternative will help guide the technical elements of the Delta levee investment strategy (e.g., metrics, State interests to be defined in the strategy). This will be an action item on the Council's March agenda.

Introduction to Elements of the DLIS Methodology: Risk Analysis

At this meeting and again in March, staff will introduce the Council to key elements of the DLIS methodology that will be submitted to the independent peer review panel in April. Today's presentation will focus on the concept of tolerable risk and how this is incorporated into the methodology.

The Delta levees investment strategy will be based on the concept of tolerable risk. Tolerable risk helps identify risks that society is willing to live with to secure certain benefits. Tolerable risk is a prudent approach to reduce flood risks to people, property, and State interests (Water Code section 85305 (a)) and to update priorities for State investments in levee operations, maintenance, and improvements in the Delta (Water Code section 85306).

Tolerable risk provides guidance for informing actions to achieve State interests in the Delta – for example, reducing life loss and protecting property, improving water supply reliability, enhancing the ecosystem, or protecting Delta as a place. This approach enables a comprehensive look at probabilities and consequences and informs decisions about what flooding is tolerable. This in turn supports policy setting, enables evaluating trade-offs (e.g., structural vs. non-structural options, various methods to achieve State interests), and is useful in allocating scarce resources.

Applying tolerable risk recognizes that absolute protection is not possible and provides criteria for decision-making on risk reduction. Tolerable risk helps focus attention on the most serious risks or hazards and on taking actions commensurate with that risk; adopting similar approaches in similar circumstances; and provides for transparency in how decisions are made and clarity on who is accountable when things go wrong. It highlights risks that are not regarded as negligible or something to ignore, risks that society is confident are being properly managed, and helps ensure that risks are continuously reviewed and reduced when practicable.

Tolerable risk enables clear communication of risk to policymakers and to those people actually at risk, management of risk using all available options, and reducing risk through an evaluation of potential investments to determine the most prudent investments.

Other Delta Levees Investment Strategy Activities

In addition to the activities above, staff has also been working on other tasks related to the Delta levees investment strategy. These include:

Communication Strategy and Outreach Efforts. Staff continues to meet with key stakeholders to provide an overview of the project and to solicit input on the information being assembled. Within the last month, staff met with representatives from San Joaquin Area Flood Control Agency, West Sacramento Area Flood Control Agency, and Sacramento Area Flood Control Agency.

Data Compilation and Review. Staff has reviewed two draft technical memoranda prepared by ARCADIS and provided comments. This baseline information in these reports will carry into subsequent project work. These technical memoranda are being distributed now to local reclamation district engineers and other technical experts for review.

Independent Scientific Review Panel (May-June 2015). Staff continues to prepare for the peer review of the project methodology starting in April 2015.

List of Attachments

Attachment 1: Map of Delta Levee Maintenance Subventions Program Expenditures by Island/Tract

Attachment 2: Map with Delta Levee Special Flood Control Projects Program Expenditures by Island/Tract

Attachment 3: Four Alternative Approaches to Addressing State Goals and Objectives through Levee Investments

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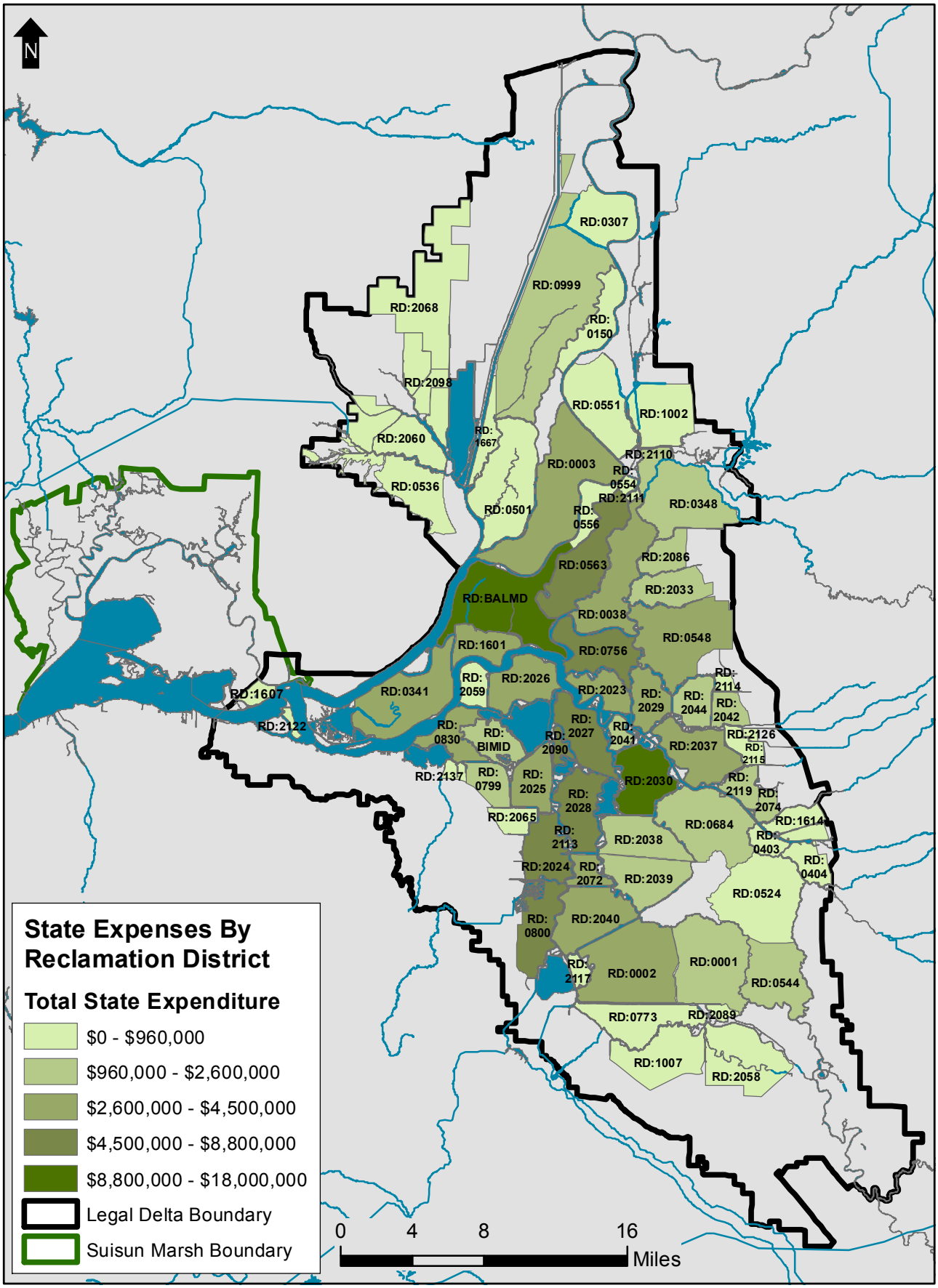
Delta Levees Maintenance Subventions Program Expense (1987 - 2013)

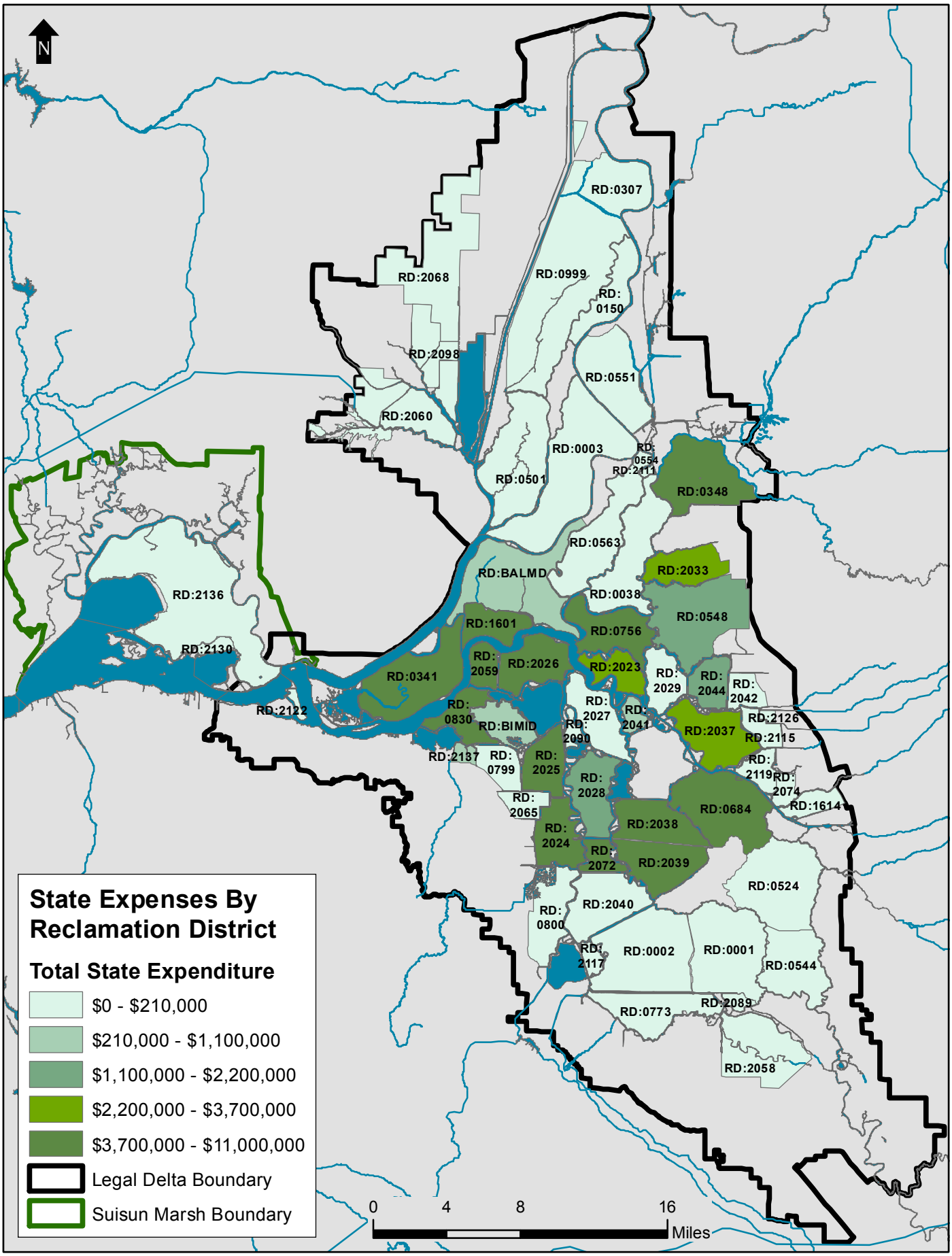


Delta Reclamation Districts

SOURCE: DSC - Delta Plan Atlas, Department of Water Resources - FESSRO, and Esri ArcMap 10.2

Delta Levees Special Flood Control Projects Program Expenses (1997 - 2014)

Agenda Item 8
Attachment 2



Delta Reclamation Districts

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Alternative Approaches for Guiding State Investments in Delta Levees

	Alternative 1: Business as Usual (No Project Alternative) *All goals important – balance over time approach. Attain the necessary levels of protection (e.g., 200-year protection for urban and urbanizing) and adequate or minimum levels (e.g., HMP or Bulletin 192-82)*	**Alternative 2: Business as Usual 2.0** *Projects that further multiple objectives are preferred over projects that further only a single objective. More focus on cost-sharing alternatives, benefit/cost ratio in investment decisions, may not consider certain interests such as aesthetic and recreational resources*	**Alternative 3: Economic Sustainability Plan/Delta as Fortress** *Protect lives and property, Delta as Place and co-equal goals*	**Alternative 4: Goal-oriented Prudence Approach** *Co-equal goals and protect lives (Delta as Place/Protect Property are secondary goals or not considered)*
Water Supply Reliability Goals	• Conveyance • Water quality for ag/urban exporters	• Conveyance • Water quality for ag/urban exporters	• Conveyance • Water quality for ag/urban exporters	• Conveyance corridors • Water quality for ag/urban exporters • Limit flooded accommodation space (greater than 500,000 AF)
Ecosystem Restoration Goals (Delta only)	• Water quality • Channel margin habitat esp. salmon migration corridors • Floodplain habitat • Wetlands • Working landscapes	• Water quality • Channel margin habitat esp. salmon migration corridors • Floodplain habitat • Wetlands • Working landscapes	• Water quality • Channel margin habitat esp. salmon migration corridors • Floodplain habitat • Wetlands • Working landscapes • No setback levees except for Paradise Cut/Lower San Joaquin	• Includes Suisun Marsh • Water quality • Salmon migration corridors • Freshwater wetlands, and key upland habitats • Yolo Bypass, Paradise Cut and other key floodplains
Protecting Lives	• Urban areas – 200-year protection • Small communities	• Urban areas – 200-year protection • Small communities	• Urban areas – 200-year protection • Small communities • Most islands should be built to “fat levee” standard	• Urban – 200-year protection • Key evacuation routes identified and protected • Rural communities where benefits greater than costs • Focus on flood proofing

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Protecting Property Goals	• Agricultural lands • Critical infrastructure of statewide importance (very inclusive list)	• Agricultural lands • Critical infrastructure of statewide importance (very inclusive list)	• Agricultural lands • Critical infrastructure of statewide importance (very inclusive list) • Most island should be built to “fat levee” standard	• Property protected by project levees • Critical infrastructure with costs shared by beneficiaries
Delta as Place Goals	• Cultural, historic, aesthetic and recreational resources	• Cultural and historic	• Cultural, historic, aesthetic and recreational resources	• Not considered under this alternative
Liability as an Element of Alternative	• Project levees – State’s responsibility • Non-project levees – landowner’s responsibility • Pursue eligibility for federal post-disaster reimbursement	• Project levees – State’s responsibility • Non-project levees – landowner responsibility • Pursue eligibility for federal post-disaster reimbursement	• State to pay to recover flooded islands only	• Project levees – State’s responsibility • Non-project levees – landowner’s responsibility • Maintenance subventions only to districts participating in federal PL 84-99 post-disaster recovery program