

# Delta Flood Risk Management Assessment District Feasibility Study: Findings and Recommendations

October 12, 2016

The Delta Flood Risk Management Assessment District Feasibility Study (DFRMADFS or the Study) identified the most feasible finance mechanisms that could be deployed to generate revenues to pay for maintenance, repair, rehabilitation and improvements (or more generically, levee “work”) or other means of reducing flood risk. These mechanisms would help move towards a levee funding system based on the “beneficiary-pays” principle—levee beneficiaries should pay for the share of flood protection costs that matches their received benefits.

The current financing system does not collect funds from all beneficiaries in proportion to the benefits conferred and tends to obscure those relationships to costs. This study characterized the challenges associated with implementing a beneficiary-pays-based approach to funding Delta levees.

Our analysis<sup>1</sup> demonstrated that the *existing* approach to paying for Delta levee work can effectively recover associated costs from most—but not all—beneficiaries in rough proportion to the benefits and/or costs of providing flood risk reduction and protecting California’s interests (such as supporting the State’s economy and ecosystem restoration). The existing approach relies primarily on:

- Reclamation districts, which cumulatively cover most of the Delta, that assess Delta property owners based on their proportionate share of flood risk reduction benefits; and
- State and federal funding that reflects the general public benefits of all flood risk reduction, as authorized by various California and federal statutes. Because California relies mainly on General Obligation bonds, funding for levee work has been episodic, varying with the provisions in each bond act.

However, existing mechanisms do not generate revenues from beneficiaries that receive significant private benefits and that are located primarily outside of the Delta—namely, water exporters and linear infrastructure owners and users. The beneficiary-pays principle indicates a need to collect revenues from these two groups, which would necessitate implementing *new* financing mechanisms. In addition, the current approach lacks revenue stability and reliability,

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<sup>1</sup> These findings resulted from the analytical approach described in several previously published project memoranda, which may be found at [http://www.delta.ca.gov/Flood\\_Risk\\_Assessment.htm](http://www.delta.ca.gov/Flood_Risk_Assessment.htm)

which should motivate further exploration of potential financing strategies to reduce the uncertainty of levee funding.

## GENERAL OBSERVATIONS

1. The universe of benefits and beneficiaries from Delta levees *includes many entities and individuals that are located outside the Delta*. In some settings, the sum of the benefits to those outside the Delta exceed benefits to in-Delta entities. This implies that no single “stand alone” mechanism will be applicable in all situations, which was the initial assumption behind the desire to examine the feasibility of a Delta-wide assessment district.
2. Assessments, used by reclamation districts to pay for levee work, are based upon the benefits provided to the affected property. California law constrains the use of property-based assessments, and limits their application to only those beneficiaries that own property within the district. The most important constraints are embedded in the State constitution, making significant changes highly unlikely for a single issue such as levee financing. Therefore, by definition *assessments cannot and will not reach the full array of Delta levee beneficiaries*.
3. *A Delta-wide assessment district is likely infeasible without significant legislative, and perhaps constitutional, changes* for two reasons:
  - a. It cannot capture revenues from all flood protection beneficiaries in the Delta because many of them do not control significant taxable property to be assessed in the Delta,<sup>2</sup> and
  - b. It would face significant legal and political hurdles to cross jurisdictional boundaries, such as counties and special districts, in order to apply to all Delta property owners. Moreover, benefits vary significantly across geography and beneficiaries, making assignment of cost responsibility so complex as to be unachievable under State law. The San Francisco Bay Restoration Authority rejected a regional assessment district approach for this reason.
4. *No single financial mechanism can meet the requirements of a beneficiary-pays approach* to address the full range of beneficiaries and financing needs. Consequently, a portfolio of mechanisms will be needed. However, no existing agency has the full governance capacity or authority to guide and administer the comprehensive range of finance mechanisms that may be needed.

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<sup>2</sup> Publicly-owned property (by local, state, or federal agencies) is tax exempt and does not pay assessments unless agencies explicitly agree to pay fees in lieu of assessments, when funding is available.

5. In most settings represented by the archetypes employed in this Study, *the majority of benefits accrue and as a result costs should be allocated either to public beneficiaries for ecosystem purposes or statewide economic benefits, and/or to infrastructure owners and water users outside the Delta.* The exceptions are urban developments in the Secondary Zone, where high property values generate substantial benefits from flood risk reduction investments relative to the benefits that accrue to external interests.
6. *State funding for levee work over the last four decades has shifted from the General Fund to voter-approved bonds which are episodic or erratic,* typically occurring after a flood disaster. The current bond funds will be exhausted within the next decade. Further, California has not developed a transparent and consistent policy for allocating funding for levee work equitably among beneficiaries.<sup>3</sup>
7. *State and federal law and accompanying guidelines yield mutually exclusive, and in some cases, contradictory cost allocation protocols.*<sup>4</sup> This is particularly apparent in settings where there are large State interests (such as extensive publicly-owned habitat within a reclamation district) and this embedded contradiction creates distorted outcomes, including inequitable allocations among beneficiaries. For example, the separable-cost / remaining-benefits allocation method used by California agencies may not arrive at the same cost-sharing as the benefits-based method required to be used by reclamation districts under Proposition 218.
8. As a related matter, *other fiscal considerations, such as revenue capacity<sup>5</sup> and revenue-generating potential,<sup>6</sup> relative tax burdens on affected taxpayers, and debt-to-income or assets ratios, can limit property owners' ability to pay their state- or federally-determined cost share.* This Study does not address the additional issue of solving this ability-to-pay conundrum, but we raise it for further consideration by stakeholders and decision makers.<sup>7</sup>
9. Because some of the financial mechanisms explored in this study require a benefit-cost analysis, we calculated benefit-cost ratios for hypothetical investments in each of the five archetypes. While we caution readers against interpreting these results as endorsements of specific investments in particular levees, *we found that we could not*

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<sup>3</sup> See Project Memorandum #1 for a description of current and historic financing.

<sup>4</sup> See Project Memorandum #7 on cost allocation issues.

<sup>5</sup> *Revenue capacity* is the ability of the targeted beneficiary group to sustain and absorb the levy or charge given its income and wealth. This is an important dimension of assessing ability to pay for a particular beneficiary group.

<sup>6</sup> *Revenue generating potential* is the amount of funds that can be produced by the mechanism relative to total costs and as a relative share among beneficiaries. This dimension reflects on whether sufficient funds will be generated to cover costs, and whether a particular mechanism generates sufficient funds to justify overcoming political opposition and subsequent transaction costs of collecting the revenue.

<sup>7</sup> A separate report is being prepared for the Delta Protection Commission addressing application of ability to pay provisions under existing law. That report will cover these issues in more detail.

*reject the premise that net benefits could justify further levee work in most of the archetypes, with the following caveats:*

- a. For agriculturally-dominated islands and tracts, benefits exceed costs when meeting Bulletin 192-82 / PL84-99 standards, but not for higher flood risk reduction levels. This outcome suggests that for these settings other public benefits would need to be identified to justify investments beyond Bulletin 192-82 standards to protect against seismic failure or sea-level rise.
- b. For tracts or islands encompassing linear infrastructure or water conveyance corridors, the benefit-cost analysis (BCA) ratios are large even for the higher cost scenarios. This suggests that investments in enhanced flood risk reduction are economically justified in these situations.
- c. For islands with small or urban communities, whether or not the island already has sufficient protection significantly influences the BCA ratio. For small communities, the archetype BCA ratio is similar to that found by the U.S. Army Corps of Engineers in its 2014 report, which could not justify federal spending on these levees.<sup>8</sup> For tracts in the Secondary Zone with significant urban development, the BCA ratio appears to be many times greater than the costs, implying that the economic benefits clearly justify investment in structural flood risk reduction.

## **FINDINGS: FEASIBLE MECHANISMS—EXISTING AND NEW**

No single mechanism can reach all Delta levees beneficiaries in a manner that reflects the proportion of benefits they receive. Consequently, multiple mechanisms could apply to each category of beneficiaries. The following mechanisms are most feasible based on application of a beneficiary-pays approach to paying for Delta levee work: *assessments, and public funding (both state and federal)*—which already exist; and *water use fee, water conveyance fee, and flood prevention fee*—which would be new. The project team envisions that these mechanisms would be implemented as a portfolio—each mechanism would apply to specific beneficiaries depending on whether and where the benefits are received, with the intent to cover all significant beneficiaries in any setting. Implementation of any of the new mechanisms—water use, water conveyance and flood prevention fees—will require further research and discussion among stakeholders.

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<sup>8</sup> U.S. Army Corps of Engineers, “Appendix B: Economics for Delta Islands and Levees Feasibility Study, California,” Sacramento District, Water Resources Branch, Economics Risk Analysis Section, April 2014. Note, however, that this conclusion applied only to the costs of proactively managing flood risk through levee improvements. The USACE report includes inundation repair costs as an upper bound on at least a portion of the benefits as an alternative cost. The authors have not compared the benefits in this archetype against the costs to rehabilitate a flood damaged structure in order to determine if after-the-fact compensation by USACE or FEMA is likely to be economically justified. Note, no funding is paid out by USACE if the BCA is too low or if the project is not meeting the current inspection criteria (i.e., are currently ineligible).

The descriptions we present here provide a sketch of each mechanism sufficient to identify the beneficiaries that are covered and the legal avenue used for each mechanism. A more detailed discussion of implementation issues for each mechanism will be included in the final report that will be delivered to DWR. Nevertheless, further study is required to fully develop implementation plans for the new mechanisms, and to determine how to integrate these mechanisms into a comprehensive portfolio to fund levee work.

## 1. Assessments

As used by reclamation districts, assessments can continue to be the primary means of collecting revenues from local property owners who benefit from in-Delta activities and purposes, e.g., farming behind levees or owning property in local communities. Subject to Proposition 218 and associated case law, assessments must be based on the value of the special benefit provided to each parcel.

Beneficiaries currently assessed include: *residential, commercial and agricultural properties within those districts (but excluding public safety beneficiaries, i.e., reduced mortality), in-Delta water users with property within the reclamation district, and privately-owned infrastructure located in the district.*<sup>9</sup> These groups benefit from reduced flood damage risk to their property.

Further analysis is needed to determine whether owners of infrastructure within those reclamation districts pay sufficient amounts, given benefits accruing to outside-of-Delta activities and purposes. This group of infrastructure owners could be covered by an alternative mechanism, such as the Delta Flood Prevention Fee discussed below.

Assessments do not reach beneficiaries that are not local property owners. Consequently, local property owners alone pay for the “local” share of state-sponsored projects, as well as the entire cost of any other levee construction and maintenance efforts.

## 2. Public Funding

The beneficiaries covered by public funding mechanisms include: public safety (reduced deaths from flooding), the local and State economy, the ecosystem, recreational users, upstream dischargers, and indirectly, government agencies. Other beneficiaries (Delta water users, utilities and infrastructure users, national economy) contribute to public funding of levees (through general taxes) but in very small proportion relative to their individual benefits from Delta levees.

Public funds pay for levee work that provides three types of *public benefits*<sup>10</sup> specific to the Delta—habitat services, use of ecosystem resources, and the ongoing existence of the Delta as

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<sup>9</sup> Beneficiaries who do not own or rent property within an existing district and most public agencies fall outside of this group. This distinction is the basis for identifying alternative mechanisms that cover these other beneficiary groups.

<sup>10</sup> Broadly speaking, public benefits are those that cannot be assigned explicitly to individuals or entities. The beneficiaries cannot be easily excluded from enjoying those benefits, so they cannot be charged a price or an entry fee to enjoy them. A classic example of a public benefit is the enjoyment of a sunset—no one can sell tickets to the event.

a distinct place. Additional state interests—avoiding disruptions to economic activity and maintaining the Delta as a hub of water and energy infrastructure networks—further justify spending public funds on Delta levees.<sup>11</sup>

**State General Fund:** This mechanism is an appropriation from the General Fund to qualifying local maintaining agencies (LMAs), just as the State makes direct contributions to school districts or counties for their ongoing operations on a continuing basis. This funding is authorized by the Legislature in the annual Budget Act.

**State Bonds:** Although California used to pay for its share of levee work with its General Fund, it has relied largely on General Obligation bonds to pay for this work since 2002. State General Obligation bonds require voter approval.<sup>12</sup> Consequently, funding for flood risk reduction (which is typically a small portion of each bond act) depends on public support for other issues, such as safe drinking water, water supply infrastructure, parks, and open space. The transition from General Fund to episodic bond funding has undermined the perceived reliability of State funding for local levee projects. Existing funding from available General Obligation bonds for Delta levees will last approximately seven to 10 years, at current expenditure rates.

**Federal Funds:** Federal money pays for a portion of Delta project levee work. The U.S. Army Corps of Engineers (U.S. ACE) administers these funds,<sup>13</sup> which reflect the national interests in the Delta, including *public safety, the national economy, the ecosystem, and recreation*. To receive funding, levee construction projects must pass a benefit-cost test or have ecosystem benefits that merit national attention,<sup>14</sup> though recently, the U.S. ACE found that the flood risk reduction benefits did not exceed the costs of most Delta levee improvements.<sup>15</sup> To obtain federal funding for non-project levees would require new Congressional authorization and appropriations.

### 3. Water Use Levy

*Agricultural and municipal water users, both in-Delta and exporters,* receive significant benefits from the Delta levees on the tracts or islands that convey fresh water to the pumps or provide a salinity barrier. The potential benefits of flood protection measures to Delta water users take the form of avoided economic damages, improved water quality, and/or mitigating overdrafting

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<sup>11</sup> These benefits are delineated in the supporting appendix to Project Memorandum #5. DLIS Technical Memorandum 3.1 describes how it estimates benefits for terrestrial habitat protection in Section 3.5. The DLIS Peer Review panel describes the broader economic impacts outside of the Delta in James Mitchell, et al, “Methodology and Scientific Basis to Support the Delta Levee Investment Strategy,” Report of the Independent Science Panel Review To the Delta Science Program, July 2, 2016.

<sup>12</sup> Although the state repays the bonds with General Fund dollars, the cost is put off into the future.

<sup>13</sup> This process is described in Project Memorandum #1 on historic funding.

<sup>14</sup> See discussion of historic financing in Project Memorandum #1 and cost allocation methods in Project Memorandum #7.

<sup>15</sup> See U.S. Army Corps of Engineers, Delta Islands and Levees Feasibility Study <http://www.spk.usace.army.mil/Missions/Civil-Works/Sacramento-San-Joaquin-Delta/>

of groundwater supplies. Both hydrologic modeling<sup>16</sup> and real-world events such as the Jones Tract levee failure in 2004 indicate that the benefits of avoiding economic losses are large relative to the benefits to agricultural operations or habitat values on these particular islands. In addition, upstream flood control agencies and other dischargers benefit by having a downstream place to move their excess waters.<sup>17</sup> The magnitude of the potential benefits should be further evaluated with specific analysis of the different ways that levees affect water conveyance and water quality before determining the amount of any fee or charge to water users or dischargers.

Currently, the out-of-Delta beneficiaries, including upstream dischargers and water exporters, do not pay directly for Delta levee work. Because water exporters and dischargers generally do not own property within reclamation districts,<sup>18</sup> they do not contribute to assessments. (Most in-Delta water users own property within the Delta and are covered by existing assessments. Conforming with Proposition 218 should ensure that these beneficiaries are paying proportionately where they have property, but they may escape paying for levees elsewhere that deliver water supply benefits.) Although certain islands and tracts are critical to water quality, there is not yet a thorough understanding of the water quality benefits of levees for both in-Delta users and exporters. Instead, the State has relied on the General Fund and general obligation bonds to contribute amounts that reflect some measure of the benefits conferred to these groups. However, these mechanisms do not collect revenues in proportion to benefits, and there is no distinction within the General Fund cost share between the benefits to water users and other public benefits, such as habitat or recreation. For this reason, we propose several options for new levies or charges to collect funds from these beneficiaries.

**Delta Water User Fee:** Users of Delta water could be charged a fee based on the amount of water diverted from or discharged into Delta waters.<sup>19</sup> The fee revenues would be disbursed to the islands and tracts where levees benefit water quality and conveyance. This fee would reflect benefits received by *in-Delta water users, water exporters, and upstream dischargers*.

**Water Conveyance Fee:** A Delta Water Conveyance Fee could be collected from both the State Water Project (SWP) and Central Valley Project (CVP) to cover this specific category of water

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<sup>16</sup> The project team both reviewed Delta Levee Investment Strategy modeling results and tested cases in its archetype using DWR's Delta Emergency Planning Tool. Further modeling is required to substantiate these and other analyses, but the results to date have been consistent in direction and magnitude.

<sup>17</sup> We describe all stressors as "beneficiaries" as well because these stressors generally benefit by not paying to control their activities that damage the Delta.

<sup>18</sup> With the exception of Metropolitan Water District's recent purchase of four Delta islands; some of these islands provide significant benefits to conveyance or act as salinity barriers.

<sup>19</sup> This mechanism is similar to Bay-Delta Financing Plan user fee proposed in 2004, which identified levee financing as one component. The 2004 Plan proposed that SWP/CVP fund 15% of levee costs throughout the Delta without targeting specific islands that provide these benefits. See the California Bay-Delta Authority, "CALFED Bay-Delta Program Finance Plan," December 2004.

exporters outside of the Delta. We focus on this particular set of water users because data from the Delta Levee Investment Strategy indicates that these users divert over 90% of Delta water supplies. This fee or charge could take one of two forms— a user fee or a lease payment:

**User fee:** A user fee is a state-imposed charge for the use of a resource. As a user fee it would be subject to Proposition 26, which would require it to be based on the cost-of-service basis, rather than on relative benefits (as with assessments).

**Lease payment:** A lease payment is a rental payment specified in a contractual agreement—for use of a resource—for the Delta channels and the supporting levees in this case. The rationale is that both the SWP and the CVP paid for their upstream reservoirs and the downstream California Aqueduct, but they have not directly invested in the essential conveyance infrastructure in between, namely the Delta channel levees.<sup>20</sup> The Proposition 26 restrictions on fees do not apply to the use of government property. As a lease payment, property-use rates would be based on fair market value.<sup>21</sup>

Creating the user fee form of a Water Use Levy would require a two-thirds majority vote by the Legislature. The legal requirements for the lease payment are less clear as none of the constitutional provisions added since 1978 apply. In addition, the federal and state water contracts may need to be amended to collect the fee. These significant challenges notwithstanding, the revenue capacity and generating potential would be large given the economic value associated with water exports.

#### 4. Delta Flood Prevention Fee

In some areas of the Delta, owners and users of linear infrastructure (e.g., pipelines, railroads, shipping channels, and highways) benefit from Delta levees in the form of service reliability and avoided infrastructure downtime. The loss of product or service revenues is potentially a larger consequence to infrastructure owners than the direct loss of the physical infrastructure. Because these facilities typically span several islands and tracts, local reclamation districts may not capture the full value of benefits in their assessments.

A Delta Flood Prevention Fee would capture the broader range of benefits that accrue to the owners and users of linear infrastructure, as well as other beneficiaries. This state-administered and property-based charge would apply to a very broad set of beneficiaries including *property owners in local Delta communities, all Delta water users and exporters, and infrastructure owners*. The Flood Prevention Fee could be implemented in a manner akin to the existing Fire Prevention Fee in the State Responsibility Area.<sup>22</sup>

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<sup>20</sup> This is analogous to a natural gas utility buying gas from various wells in Texas or Alberta and delivering that gas through its distribution system in California, but not paying the pipeline owners (who are separate corporations) who ship the gas.

<sup>21</sup> Determining the value of a channel basin lease would be akin to gas pipeline pricing. The cost allocation method would need to be determined—it could use a Federal Energy Regulatory Commission pricing model for pipelines as this is an analogous situation.

<sup>22</sup> The Fire Prevention Fee (FPF) is charged to property owners in the rural foothills that are considered to be particularly vulnerable to wildfires, but often do not have sufficient local resources to fight these fires effectively. The FPF was adopted in *Delta Flood Risk Management Assessment District Feasibility Study*

However, significant variation in ownership and regulation of linear infrastructure facilities could require a different form of user fee for each. Implementation challenges include imposing comparable fees across different forms of linear infrastructure (i.e., electricity transmission lines, natural gas pipelines, roads, shipping channels, and railroads); using commensurate metrics (e.g., is a mile of railroad equal to a mile of electrical transmission?); and coordinating among agencies (including Caltrans, the California Public Utilities Commission, the Ports of Stockton and West Sacramento).

For publicly-owned facilities such as highways and shipping channels, there would be a significant challenge in collecting fees from the millions of individual users. Consequently, it may be more cost-effective to use additional State funding to cover these beneficiaries. For privately-owned infrastructure, further research is needed to determine the flood risk, and examine the additional revenue from a user fee (compared to a standard assessment), as well as an evaluation of the transaction costs of developing and administering such a fee by a public agency.

The Legislature would need to enact a Delta Flood Prevention Fee by either a majority or two-thirds vote, depending on the outcome of ongoing litigation related to the Fire Prevention Fee.<sup>23</sup> Whether fee legislation can pass will depend on the motivation of all Delta stakeholders—property owners, all water users, and users of infrastructure—to protect themselves and their investments. The June 2016 passage of the San Francisco Bay Restoration Authority parcel tax demonstrates that broad political support for regional parcel taxes is possible.

## **FLOOD MANAGEMENT FUNDING: IMPLEMENTATION ISSUES**

Other efforts<sup>24</sup> have documented the major issues and challenges to implementing a long-term funding strategy for flood risk reduction, not only in the Delta, but throughout the state. Recent studies—DWR’s *Water Plan*, the *Central Valley Flood Protection Plan*, and DWR’s *California’s Flood Future Report*—identified the need for more than \$50 billion to complete flood management improvements and projects. However, these studies have not delved into the details of how to finance these investments or how to maintain what already exists.

This Feasibility Study demonstrates that no single financing mechanism is likely to generate sufficient revenues to pay for the Delta’s flood risk management needs consistent with the beneficiary-pays principle. It also illustrates the complex challenges of developing revenue-raising approaches within California’s existing web of legal and regulatory constraints on fees, taxes, and assessments.

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2011 after several destructive fires. The fee currently is \$152.33 per habitable structure. See “About the Fire Prevention Fee,” <http://www.firepreventionfee.org/>

<sup>23</sup> See <http://firtaxprotest.org/>.

<sup>24</sup> See California Bay-Delta Authority, “CALFED Bay-Delta Finance Plan,” January 2005, and Public Policy Institute of California, “Paying for Water,” March 2014.

These conclusions echo the statewide flood management concerns found in DWR’s “Flood Management Resource Management Strategy” (RMS) for the 2013 Water Plan, which concluded that there are four main challenges to improving flood management in California. We refer to these as “RMS Issues,” and discuss our findings in relation to those issues below:

### **RMS Issue 1: Inadequate and Unstable Funding and Incentives**

The RMS discussion of this issue anticipated the findings of this Feasibility Study—“current funding for flood management is inadequate and unreliable because it is dependent upon agency user fees, assessments, bond funding, and earmarking.”<sup>25</sup> The RMS also notes the constraints of Propositions 13 and 218 on local agencies, and that assessments cannot reach beneficiaries outside of the geographic boundaries of an assessment district—both of these significant findings were addressed in this study. In particular, the RMS asserts that floods that disrupt water supplies can trigger significant statewide economic losses,<sup>26</sup> reinforcing this study’s findings that out-of-Delta beneficiaries receive significant benefits from Delta levees in the form of reduced risks of flood-related supply disruptions.

### **RMS Issue 2: Inadequate Data/Information and Inconsistent Tools**

The RMS calls for improving the quantity, quality, and accessibility of data related to flood risk, floodplain mapping, hydrologic information, flood infrastructure integrity, ecosystem mapping, flood forecasting, flood readiness, and climate change. The RMS notes that California lacks a consistent methodology to assess flood risk and measure associated project benefits; different methods used across the state to assess flood risk yield inconsistent results. And some types of benefits are difficult to quantify, such as related ecosystem restoration, which can lead to under-valuation.

Again, the RMS foreshadowed the findings of this Feasibility Study. Although data was not readily available to conduct a Delta-wide analysis of benefits to all beneficiaries, the study team was able to estimate relative benefits using constructed examples, or “archetypes” which provided a framework for allocating costs to beneficiaries. The study also revealed the

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<sup>25</sup> DWR, California Water Plan Update 2013, Vol. 3, Chapter 4, pp.4-28. Available at <http://www.water.ca.gov/waterplan/topics/rms/index.cfm>

<sup>26</sup> “These flood management projects include maintenance projects and other identified actions. The Flood Future Report also indicated the need for substantial additional funding to complete flood risk assessments throughout the state, and to conduct flood management improvements based on those assessments. Therefore, the total estimated capital investment needed for flood management projects could easily top \$100 billion (California Department of Water Resources 2013). These estimates do not include the broader regional economic impacts or ripple effects of flooding, such as the costs resulting from rerouting traffic and closing businesses, and from compromised services of water and wastewater treatment plants, as well as critical facilities such as hospitals. These losses of function have a wider impact that can range from regional to statewide, nationwide, or even international. For example, if flood damages disrupted the delivery of water for a significant amount of time, the economic impacts would be substantial, with the effects reaching far beyond California. Specifically, if water supply were disrupted in the Delta, impacts would affect not only agricultural production, but also commercial businesses in the San Francisco Bay Area and Southern California.” (DWR 2013 Water Plan Update, Flood Management RMS, page 4-26.)

inconsistent results caused by the different mandatory cost allocation methods associated with various funding sources (federal, state, and local), and the challenges of implementing a beneficiary-pays approach given existing legal constraints. However, the archetypes also demonstrated that it is possible to quantify most of the significant benefits and use a portfolio of financial mechanisms to collect revenues from the various beneficiaries in proportion to their level of benefit.

### **RMS Issue 3: Inadequate Public and Policy-maker Awareness**

The RMS stated that policy-makers and the public have varying levels of understanding about the risks and consequences of flooding. According to the RMS, lack of awareness and understanding can increase risks to people and property and make it difficult to achieve sustainable, long-term planning and investment that supports flood management.

Several projects are underway that will help educate the public and policy-makers about flood risk and needed investments in flood risk reduction. Concurrently with this study, the Delta Stewardship Council undertook the Delta Levee Investment Strategy (DLIS) to identify state investment priorities for the Delta.<sup>27</sup> The DLIS created a decision-support tool that uses a variety of risk measurements to identify tracts and islands that are most critical to state interests: protecting lives and property, ensuring a reliable water supply, protecting and enhancing the environment, and protecting the unique values of the Delta. In addition, the 2017 update of the *Central Valley Flood Protection Plan* is underway, which also describes flood risks and identifies priorities for investments in flood management. Discussions are underway among the staffs of the Delta Protection Commission, Delta Stewardship Council, and the Central Valley Flood Protection Board (CVFPB) to determine how to integrate their study results, determine next steps, and convey that information to the public and decision-makers in a coordinated fashion.

### **RMS Issue 4: Complex and Fragmented Governance Structure Impeding Agency Alignment and Systems Approach**

According to the RMS, more than 1,300 agencies share the responsibility for flood management in California. Each of these agencies has “unique objectives, authorities, roles, responsibilities, and jurisdictions. The fragmentation of flood management responsibilities results in poor agency alignment, which in turn results in projects that are narrowly focused, missed opportunities for integration and funding maximization, and projects with unintended negative impacts on downstream or upstream communities and the ecosystem. Another consequence of improper agency alignment is inconsistent regulatory requirements, permitting processes, and enforcement practices.”<sup>28</sup> That observation aptly describes conditions in the Delta, with more than 80 reclamation and flood control districts, as well as several federal, state, and local agencies with interests in flood management.

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<sup>27</sup> As directed by Water Code Section 85306.

<sup>28</sup> DWR, *California Water Plan Update 2013*, Vol. 3, Chapter 4, Flood Management, pp 4-30 to 4-31.

Although this Feasibility Study does not address Delta governance issues, any effort to move forward with developing new fees or funding strategies should include critical Delta stakeholders: the reclamation districts, flood districts, Delta water agencies, cities and counties, as well as state and federal agencies. Whether investigating a Delta water user fee or a flood prevention fee, the jurisdictional challenges will need to be examined in more detail. Any subsequent work on beneficiary-pays based funding for flood management will require strong coordination among regulatory, land use, flood management, financial, and other entities. Ultimately, one or more agencies will need to be authorized to develop and collect any new levies or charges, and to disburse those funds.

## RECOMMENDATIONS

This study evaluated the feasibility of several financial mechanisms that would move towards a beneficiary-pays-based system for funding Delta levees. The next step should be to study the details of the candidate fees, and determine how they could be implemented. The implementation study should be conducted as a collaborative effort, which is further described below.



The implementation study should generate principles for integrating existing funding sources and new financial mechanisms, as well as detailed descriptions of how to implement a beneficiary-pays-based approach to financing levee work. These descriptions would be the basis for the third step—negotiations aimed at generating agreement on a set of policy and legislative changes necessary to authorize and implement the beneficiary-pays approach. These changes might include:

- A legislative statement of policy and intent, and adoption of a similar policy statement by the California Natural Resources Agency; and
- A strategy for resolving conflicts between transparent and equitable cost allocation approaches and the cost allocation required by constitutionally imposed limits on fees and assessments (legislation will likely be needed).

Throughout the implementation study, the results of current policy efforts (the Delta Levee Investment Strategy and the Central Valley Flood Protection Plan) should be incorporated into the beneficiary-pays framework. This will ensure that the development of financing mechanisms aligns with priorities for levee improvements.

The implementation study should follow these guidelines:

1. The four State agencies that have statutory flood management, land use, or regulatory authority in the Delta related to flood protection—DWR, Delta Protection Commission, Delta Stewardship Council, and the Central Valley Flood Protection Board—should establish a collaborative process to further develop the candidate financial mechanisms and move toward a “beneficiary-pays” based approach to paying for levee work. These agencies should be in agreement on the levee work needed, how it is prioritized, and how to pay for it (see discussion under “Additional Considerations,” below).
2. The study should include a core group of participants, with representatives of the following organizations or stakeholder groups:
  - California Natural Resources Agency;
  - Delta property owners;
  - Water exporters;
  - Reclamation Districts;
  - Owners of linear infrastructure (railroads, EBMUD aqueduct, etc.);
  - Caltrans;
  - Fish, wildlife, and habitat interests (public and private owners of habitat lands);
  - State and Federal fish and wildlife agencies; and
  - State Lands Commission.
3. The implementation study should be structured as a collaborative fact-finding process that explicitly identifies the benefits and beneficiaries of Delta levees, including property owners, water supply, habitat, infrastructure owners, and public benefits. The process should be built on explicit assumptions, jointly developed data sets and methods, and pooled expertise. The process should include a clear statement of the intended distribution of results and links to implementation.

**Participants:** Participants should bring relevant expertise to the process. They should demonstrate past experience in reaching agreements with diverse parties, and commit to a constructive approach to deliberation and mutual gains bargaining. The aim is to create broad based agreements that can provide the foundation for implementation.

**Outputs:** The study should spell out the operational details of the candidate financial mechanisms (user fee, lease fee, flood prevention fee) in more detail. Key questions to address include:

- What are the strategies to comply with legal requirements and constraints (i.e., information needed, nexus tests, benefit-cost analysis, cost allocation, voter and/or legislative approvals, etc.)?

- What entity or entities would establish and collect the fees, and distribute the funds?
- How would each fee be calculated and apportioned to beneficiaries? The study should include:
  1. Developing standard methods for calculating benefits, and articulate principles for such standards, such the type of data to be used; and
  2. Developing cost allocation methods for each mechanism and recommending how to reconcile conflicts with cost allocations required by existing law.
- 4. The implementation study should include periodic briefings to policy-makers and outreach and engagement with the broader public to share interim results and gauge political feasibility of implementation.

## ADDITIONAL CONSIDERATIONS

Some observers may suggest that the development of a beneficiary-pays-based finance approach cannot reasonably precede a determination of the amount of money needed, the types of improvements, and the time frame.

In addition, some stakeholders have consistently mentioned the pressing need to address the effects of sea-level rise, continued subsidence, and seismic risk (the “3 S’s”)—all of which would bear on these key questions.

We recommend that before convening an implementation study, the proposed convening agencies—Delta Protection Commission, DWR, Delta Stewardship Council, and the Central Valley Flood Protection Board—should jointly deliberate and reach agreement as to how to address these questions and establish the scope of the implementation study.

Efforts are underway to develop credible estimates as to how much funding is needed. For example, as part of the *Central Valley Flood Protection Plan 2017 Update*, DWR and the CVFPB are investigating the total costs of improving *project levees*<sup>29</sup> within the *State Plan of Flood Control*<sup>30</sup> to state-preferred protection levels.<sup>31</sup> Local maintaining agencies (LMAs) were

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<sup>29</sup> Project levees are defined in Water Code Section 9110, as “any levee that is part of the facilities of the State Plan of Flood Control.” The State has committed to operating and maintaining these levees to federal standards; roughly one-third of Delta levees are project levees.

<sup>30</sup> Within the Resolution adopting the 2012 CVFPP, the CVFPB requested staff launch efforts to work with locals on Regional Flood Management Planning to estimate costs of improving levees and to study the maintenance, repair, and rehabilitation of existing flood management facilities, vs construction of new facilities. While some materials are available now, final reports will be posted in December 2016 at : <http://www.water.ca.gov/cvfmp/publications.cfm>

<sup>31</sup> In 2016, the evaluation of total costs for O&M of *project levees* in the Central Valley was estimated based on regional variation. Surveys of the LMAs indicated that non-urban LMAs spend \$11,400 per mile in the Sacramento River, and \$5,000 per mile in the San Joaquin River region. After considering what should be spent to keep the

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extensively consulted during this investigation to ensure a comprehensive analysis of levee improvement needs. Many have provided five-year projections of expected work and funding requirements to DWR, but there is no comprehensive Delta-wide plan for levee improvements.

## CONCLUSION

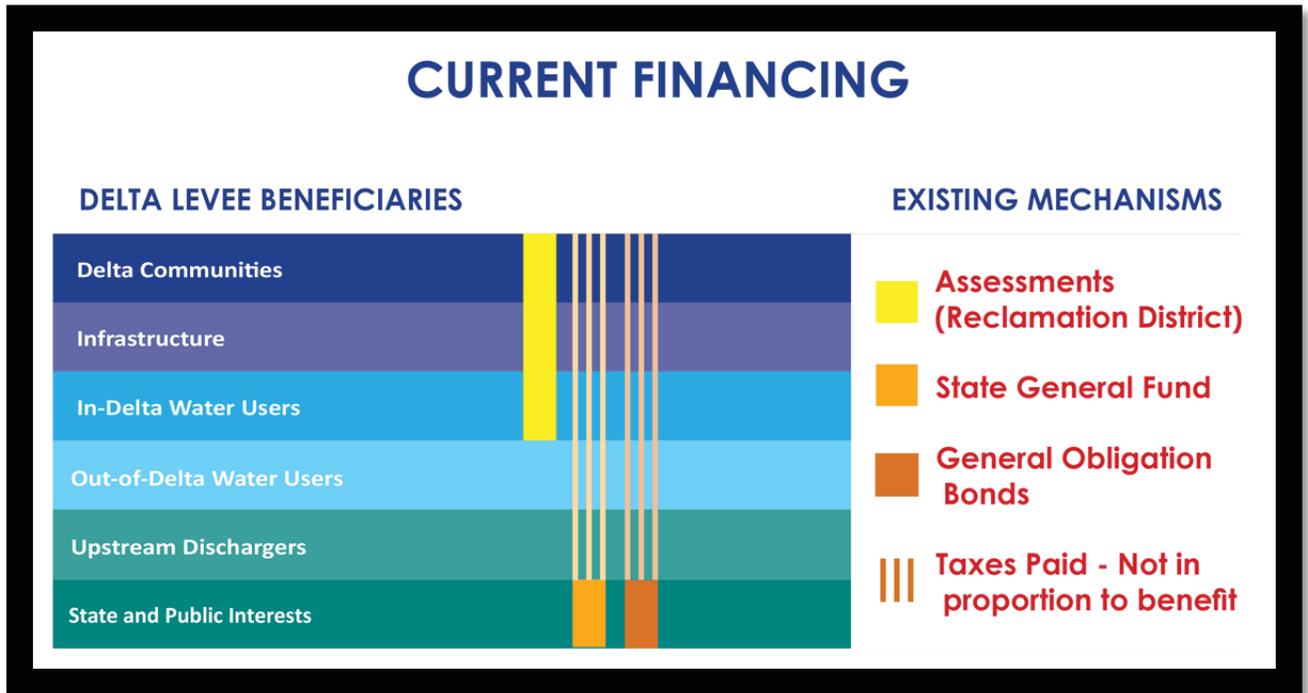
This Study found that the current suite of financial mechanisms is insufficient to reach the complete set of Delta beneficiaries, and that new mechanisms need to be created to do so. These new mechanisms would collect revenue from those beneficiaries of Delta levees who do not currently pay in proportion to their benefits. This is particularly important in light of the condition of some Delta levees and chronic underfunding of levee work.

This Study presents the mechanisms determined to be most feasible, based on a broad set of criteria. Figure 1 below shows the current financing approach with the existing mechanisms as they apply to the main categories of beneficiaries. Figure 2 shows how a new financing strategy would add one or more fees to the current financing approach. Under this new strategy, more beneficiaries would contribute to paying for levee work or other flood risk reduction measures, increasing the fairness and reliability of funding in comparison to the current financing approach. Further quantitative analysis and deliberation among stakeholders will be needed to determine the most appropriate portfolio of mechanisms and how they should be implemented.

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levees maintained, DWR estimated that the Lower Sacramento River/Delta North should spend \$46,000/levee mile annually, while spending in the Lower San Joaquin River/Delta South should be \$33,000/levee mile. The questionnaires indicated that the levee districts were spending what they could collect rather than what they need. (Source: Final OMRRR Technical Memo [http://www.water.ca.gov/cvfmp/docs/OMRRR\\_TM\\_May2016.pdf](http://www.water.ca.gov/cvfmp/docs/OMRRR_TM_May2016.pdf) ).

**FIGURE 1**



**FIGURE 2**

