Appendix 6B

Economic Analysis of Demand Management and Conceptual Allocation Approaches

Technical Memorandum

To: Glenn and Colusa County Groundwater Authorities

From: ERA Economics

Date: July 1, 2021

Subject: **Economic Analysis of Demand Management and Conceptual Allocation Approaches**

Introduction

A total of 33 projects and management actions (PMAs) are included in the Colusa Subbasin GSP to achieve and maintain sustainable groundwater management. Five projects are on track for implementation, which are all groundwater recharge projects that use surface water for direct and/or in-lieu recharge. Recognizing that projects can take several years to develop, and in light of the current severe drought conditions across the Colusa Subbasin and state, the GSP includes two "backstop" demand management actions that could be implemented relatively quickly, primarily because they do not require construction of new infrastructure. These management actions include a targeted demand management program that would incentivize temporary pumping reductions (and/or local water transfers) in periods of extreme drought, and a broader demand management program that would incentivize pumping reductions if necessary due to future groundwater conditions in the Subbasin.

Demand management can be implemented fairly quickly and can be included as part of a cost-effective mix of PMAs to achieve and maintain sustainable groundwater conditions. This appendix describes the direct economic costs of demand management in the Colusa Subbasin. It also describes considerations for, and the process of setting, a groundwater allocation. It is noted that a groundwater allocation is not required to implement the demand management programs included in the GSP, but it does generate incentives to manage demand, and increase supply. To provide some context for the costs of demand management, a general summary of agricultural water use, economic values, and Subbasin conditions is presented first. This is followed by a summary of an economic analysis of the direct costs associated with two example demand management programs: one targeted to specific areas with groundwater sustainability concerns, and another targeted more broadly across the Subbasin. The allocation discussion is presented last.

Economic Value of Agriculture in the Colusa Subbasin

Glenn and Colusa County agriculture includes a diverse mix of rice, nut crops, seed, feed, and other field and row crops. Farming activities to raise these crops support jobs, income, and economic activity for a range of transportation, processing, manufacturing, and retail industries in the Subbasin. These activities support the local tax base as well as jobs and income in businesses not directly related to agriculture. Changes in the cost and availability of water under the PMAs included in the GSP, as well as potential demand management programs, can have important implications for the local economies and communities in the Subbasin.

The Colusa Subbasin spans most of Glenn and Colusa counties. The annual economic activity, measured as value-added, across all industries (including agriculture) in the counties is around $7.4 billion. These industries support around 26,000 full time equivalent (FTE) jobs, mostly for individuals that both live and work in the counties. Table 1 summarizes the top ten industry sectors by value, and the direct jobs associated with each industry. Eight of the top 10 industry sectors are agriculture and related industries. Notable exceptions include local government industries and the wholesale trade sector. However, wholesale trade includes warehousing and storage industries that are closely linked to the agricultural sector.

Table 1. Top 10 Industries, Glenn, and Colusa Counties

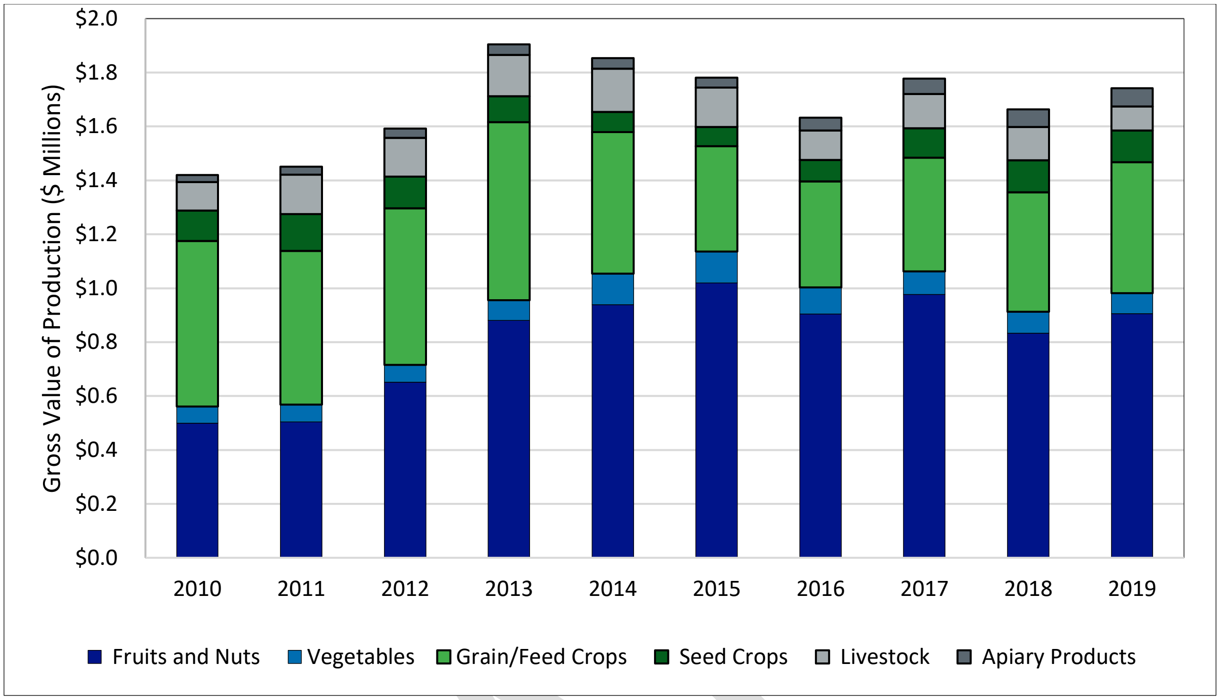
Rank	Industry	Annual Value Added ($ in Millions)	Direct FTE Jobs
1	Tree nut farming	$965	2,790
2	Rice milling	$750	450
3	Local government	$625	3,750
4	Grain farming	$500	405
5	Wholesale trade	$475	1,620
6	Canned fruits and vegetables manufacturing	$470	695
7	Vegetable and melon farming	$180	630
8	Dairy cattle and milk production	$160	155
9	Support activities for agriculture and forestry	$145	1,690
10	Other animal food manufacturing	$145	70

Source: IMPLAN 2014 R3 data calculations, current 2021 dollars

A substantial share of local economic activity is directly or indirectly related to farming. A conservative analysis using the IMPLAN model data shows that at least one in three jobs depend on farming activities in the Subbasin. Similarly, a substantial share of local wage income for employees, value added, and gross output are a result of farming-related industries in the Subbasin.

The primary crops produced in the Subbasin include rice, walnuts, and almonds. The total rice acreage footprint has been largely steady for several years, with annual fluctuations in planted acreage based on rice market conditions and water availability in the Sacramento and San Joaquin Valleys. On average, Colusa and Glenn counties produce around 45 percent of California's annual rice crop. The share of acreage planted to almonds and walnuts has been steadily increasing, driven by favorable market conditions and consistent with trends across the state. Relative to annual crops, these permanent plantings require a substantial capital investment to establish and require consistent irrigation in all years. This has led to hardening of irrigation water demand in areas with increasing permanent plantings.

Figure 1 illustrates recent trends in the gross value of production by crop type in Glenn and Colusa Counties. The gross output value of the crops produced in the Subbasin is around $1.75 billion per year, with fruit and nut crops accounting for more than half of the total value in recent years. Fruit and nut crops accounted for around 30 percent of gross value in 2010, increasing to nearly 60 percent by 2015.



Source: Glenn and Colusa County Crop Reports

Figure 1. Trends in Gross Value of Crop Production, 2010 – 2019

The trends in crop acreage and value in Glenn and Colusa counties are consistent with trends in other parts of the state. Robust export demand for California almonds and walnuts through the mid-2010's supported strong prices and profitability. This led to increasing plantings that are continuing across the state. However, new plantings of nut trees have slowly leveled-off in response to softer prices caused by increasing supply (production) in California and other regions (e.g., Australia) and a weaker export market (e.g., tariffs and macroeconomic conditions including a stronger U.S. dollar). Groundwater concerns in Critically Overdrafted subbasins in the San Joaquin Valley may continue to push permanent plantings north into the Sacramento Valley, and as such this general trend appears likely to continue in Glenn and Colusa Counties for the next several years.

The agricultural industries in the Subbasin create a substantial share of local jobs, business, and economic activity. Demand management programs can be structured in ways to minimize the economic costs to growers and the regional economy. The following section quantifies the direct costs of potential demand management programs in the Subbasin.

Demand Management Costs

Demand management generally refers to actions that reduce the net consumptive use of water, which in turn reduces net groundwater pumping[1] in the Subbasin, or selected areas of the Subbasin. Areas selected for demand management would be determined by the GSAs in consideration of local groundwater conditions and sustainability indicators.

[1] Net groundwater pumping would be defined as part of the demand management program. In general, it would include crop ETAW plus any unrecoverable return flows.

This appendix summarizes the results of an analysis that establishes the potential costs of demand management in the Colusa Subbasin. The results of the analysis can be used for multiple purposes. Demand management costs can be compared to the cost of potential projects to support developing a cost-effective portfolio of PMAs. In addition, demand management costs are interpreted as the minimum willingness to accept payment to forgo irrigation, which can be used to structure potential incentives to reduce groundwater pumping under applicable PMAs.

To illustrate the cost of demand management two scenarios are developed. The cost of a specific demand management program will ultimately depend on the location, scale, and market conditions at the time the program is implemented. The outputs summarized in this report are intended to support PMA development for the GSP, and comparison of demand management with other projects and management actions. These cost estimates would be refined in the future and would be specific to each PMA. The final section in this appendix describes the general steps for this future analysis.

The cost of demand management depends on the location, scale, and timing of the program. For the purposes of this analysis, it was assumed that the timing of the program would be the GSP implementation period (2022 – 2042). The scale of the program (i.e., total volume of demand management achieved in each year) was developed over a range consistent with preliminary changes in groundwater storage shown in the initial GSP water budgets (see Chapter 3). Lastly, two alternatives were developed for the location of the program. The first alternative would apply Colusa Subbasin-wide and the second would target demand management to specific areas of concern near the Orland and Arbuckle areas in the Subbasin (as generally defined below).

The direct cost of demand management is estimated here as the loss of net return to irrigated lands and is expressed on a per acre-foot (AF) basis for comparison to other PMA costs. Costs were established in the Colusa Subbasin using a standard economic analysis that considers the water budget (e.g., quantity of water applied and consumed by Subbasin crops), costs and returns to farming, and current market conditions for major Colusa Subbasin crops. The results of the analysis show how the cost of demand management changes over an increasing scale of a potential program, and how those costs vary across different areas.

Reduced net return from crop production may, in turn, lead to secondary losses to other sectors within the local economy. The extent of such losses would depend on how irrigated agriculture on other lands changes. For example, if production shifts to other lands within the same regional economy (e.g., the broader Sacramento Valley), then regional secondary effects on input suppliers, trucking, processing, farm labor, and other businesses may be small. But if this does not occur, then secondary economic impacts may warrant more analysis and quantification. These secondary impacts have not been quantified in this appendix. In addition, this analysis does not quantify any additional administrative costs for the GSAs to develop and administer a demand management program. These indirect costs would be assessed as part of demand management program design in the future.

Results of the Analysis

The cost of demand management fundamentally depends on supply and demand for irrigation water. Examples of factors that affect supply include annual water year conditions, carry-over storage, CVP allocation, GSA costs, water supply costs, and other GSP implementation (e.g., PMAs). Examples of factors that affect demand include export and domestic market conditions for California crops that affect returns to farming and willingness to pay for water.

An economic model of the Colusa Subbasin was applied to evaluate the supply and demand for water and establish the cost of demand management. It reflects the local water supplies and uses, financial data on returns to farming, and current crop market conditions for Sacramento Valley crops. It is calibrated to the GSP water budget and geospatial land use data.

The analysis reflects average water supply conditions. That is, the results of the analysis are the incremental cost of demand management in an average water supply year, not under critical drought conditions, or conversely, years with above-average supplies. The framework can be extended to evaluate these factors as part of future program design.

The economic model is developed on a geospatial scale that can be refined to evaluate Subbasin-wide demand management and demand management in specific areas. Two "areas of concern" were defined in the model. Figure 2 illustrates areas of concern and crop types[2] in the economic model for the Colusa Subbasin. Areas of concern are more precisely defined based on hydrogeologic conditions that are described in Chapter 3 of the GSP. Areas shown below include two broad regions: North (around Orland) and South (between Williams and Arbuckle).

Colusa Subbasin Demand Management Costs

This section summarizes the direct cost of demand management for the following alternatives:

- **Colusa Subbasin-wide demand management**. This assumes demand management would occur across the entire Subbasin. That is, demand management is not targeted to specific areas. The implicit assumption is that water can be moved (exchanged, conveyed, in-lieu) across the Subbasin.
- **Targeted demand management**. This assumes demand management would occur in specific areas defined as the North and South areas of concern.

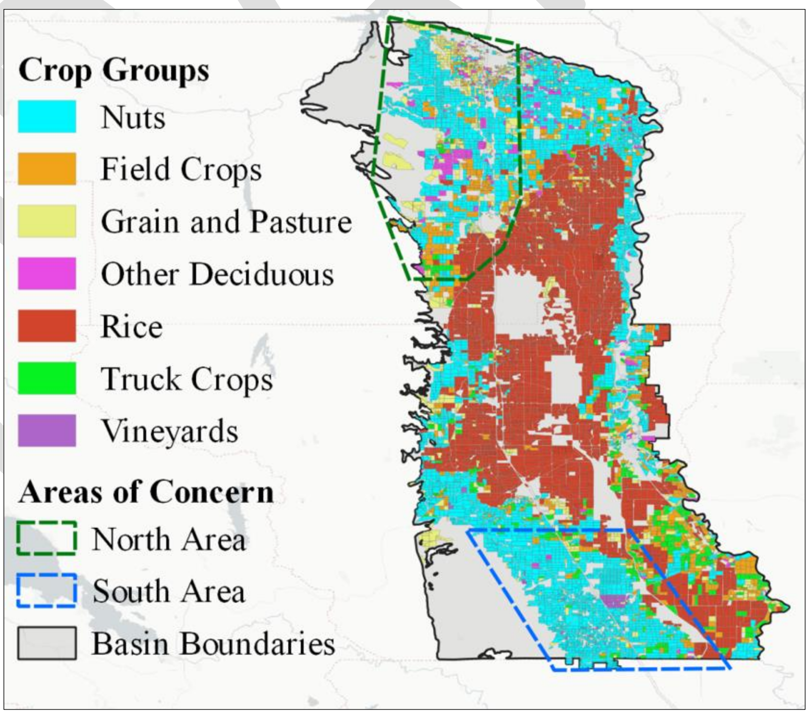


Figure 2. Colusa Subbasin Crops

[2] Crop types are aggregated into seven groups for map display purposes. The economic analysis has 20 crop types that better reflect the unique costs, returns, and markets for each crop.

For each alternative, the cost of demand management was estimated as the mix of crops that could be idled at the lowest loss in net return. This is based on the aggregate supply of the crops produced in the Subbasin evaluated as part of the economic analysis (i.e., the lowest net return is not a static accounting measure of the least profitable crop). This is the minimum cost of the demand management program, defined by the opportunity cost of water for the crops that would be idled (the net return that the water would have provided on those crops).

Costs of Demand Management Applied to Entire Colusa Subbasin

This section summarizes the results of the demand management costs for the scenario where demand management is applied broadly to the entire Colusa Subbasin.

Figure 3 illustrates the range of demand management costs over a program scale of 2,500 and 25,000 AFY reduction in irrigation water demand. The cost ranges from around $120 per AF at 2,500 AFY of demand management to $210 per AF at 25,000 AFY. These are the direct cost of idling land, inclusive of groundwater pumping cost. The analysis estimates that the lowest net return lands and crops would idle first (hence the low cost for the smallest scale program), with higher net return lands included as the program scale increases.

Costs of Demand Management Targeted to Areas of Concern

This section summarizes the results of the demand management costs for the scenario where demand management is targeted to two areas of concern. The specific lands are not identified. Rather, the demand management program is broadly defined for the general region.

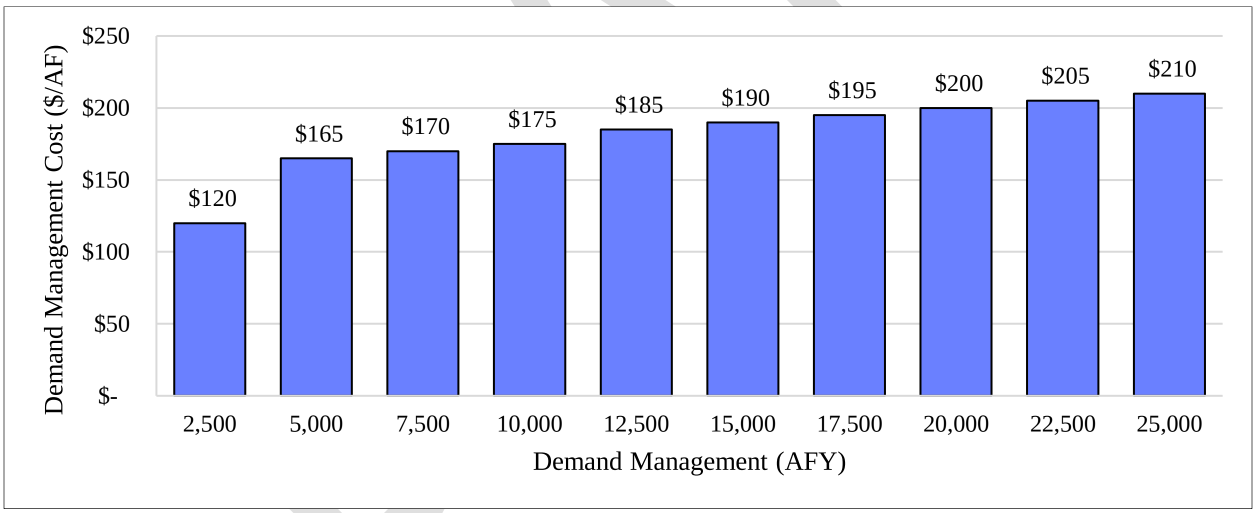


Figure 3. Costs of Demand Management Applied to Entire Subbasin

Figure 4 illustrates the range of demand management costs for a demand management program between 1,250 and 12,500 AFY. The demand management volumes are specific to each region (e.g., 1,250 AFY in the north area and south area, separately). A smaller scale program for each region (up to 12,500 rather than 25,000 AFY) is shown because the total level of demand management is independent in each region. The cost ranges from $115 to $185 per AF in the north area of concern and $115 to $250 per AF in the south area of concern. These higher values reflect the crop mix in these areas – more permanent crops with less flexible water demand and higher-value annual crops. These are the direct cost of idling land, inclusive of groundwater pumping cost.

Groundwater Allocation Concepts

Demand management can be achieved without a groundwater allocation, so long as the program is able to quantify and verify the program demand management targets are achieved. However, an allocation can support implementation of a demand management program. It can also provide incentives for other PMAs (e.g., recharge) by defining the amount of groundwater available, and the additional quantities that would be associated with the development of new projects.

This section provides an overview of concepts and approaches related to allocation of groundwater in a Subbasin with diverse water users, water rights, and sources of recharge. It is not an allocation plan for the Colusa Subbasin, it is a discussion of the analysis that would be completed to set an allocation at a future date, if the GSAs decide to do so, either separately or together.

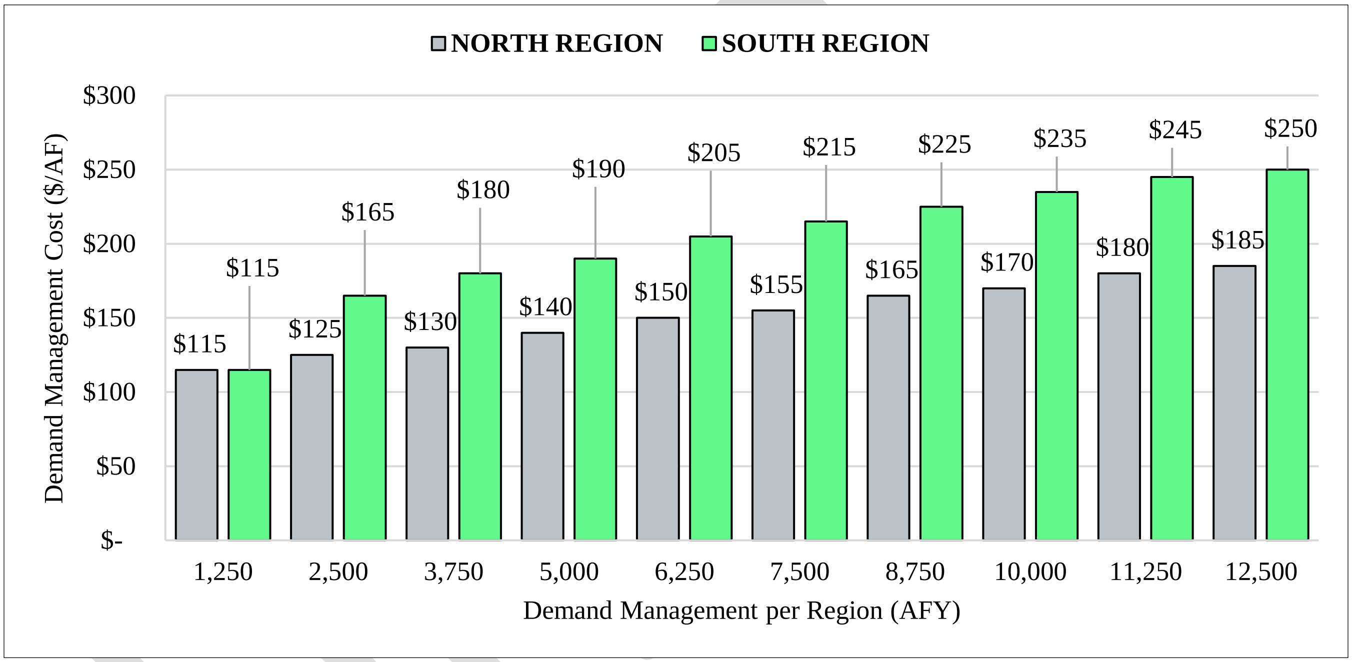


Figure 4. Costs of Demand Management Targeted to Areas of Concern

Introduction and Definitions

A groundwater allocation specifies quantities of groundwater available to groundwater pumpers, which for the purposes of GSP development would include irrigators in the Subbasin. According to the Sustainable Groundwater Management Act (SGMA) and its regulations, *de minimis* pumpers (defined as less than 2 AF per year) would not be limited by an allocation. This section provides a general overview of allocation approaches, technical considerations, and summary of economic implications of alternative approaches. It is not an allocation plan for the Colusa Subbasin and it does not address all necessary considerations for defining and implementing an allocation. Developing a specific allocation would require careful analysis of the legal, hydrogeologic, economic, and engineering implications, and would require vigorous and informed discussion with stakeholders.

Allocation involves setting an overall amount of permissible net groundwater extraction for the subbasin and the apportionment of that overall amount among pumpers. It is important to note that implementing an allocation does not necessarily result in reducing groundwater use. For example, if the allocation is greater than historical use and it is apportioned in a way that all pumpers receive more than their historical use, then the allocation would not constrain groundwater users and would not result in less consumptive groundwater use. In the context of GSP implementation, the first step – the overall allocation – is typically tied to the sustainable yield (defined below) of the Subbasin. The second step – apportioning the allocation among users – can be based on different factors related to, for example, land use, recent water use, location, and other policy goals. Apportionment of the overall allocation can be made to individual wells, parcels, farming operations, or other defined entities. When the sustainable yield (including yield of other PMAs like recharge projects) is less than current pumping, the effect of an allocation is an overall reduction in net groundwater use.

Allocation based on sustainable yield often considers the various components of the subbasin water balance that contribute to sustainable yield. This is useful because the components vary geographically across the basin, under future conditions, and PMAs may affect those components over time. Defining the different types of groundwater and components of sustainable yield typically involves substantial data, modeling, and stakeholder input. Sources of groundwater that can be included in the allocation can include native/natural recharge, percolation of water developed and imported into the basin, other intentional recharge, and net subsurface groundwater flow into the basin from/to adjacent areas. Some concepts used in discussing allocation are defined below:

- **Native/natural recharge**. Native or natural recharge is recharge that is from deep percolation of precipitation or losses through natural water ways and channels in the subbasin. These are sources of groundwater recharge that do not rely on the action of any individual entity within the basin, although certain actions (e.g., conversion of native land to urban uses) can affect their quantity.
- **Imported/developed water recharge**. Imported or developed sources of groundwater recharge are a result of investments by specific entities in the subbasin. For example, groundwater recharge from unlined canals developed, and paid for, by a district to import and deliver surface water rights. This is considered separately from native/natural recharge because it would not have contributed to groundwater recharge in the subbasin without the investments of the district. A substantial amount of the developed water recharge is percolation from applied irrigation of developed water supply, some occurs during conveyance of the developed water, and some is the result of projects designed specifically to recharge groundwater, either in dedicated recharge areas, spread over lands during uncropped or dormant periods of the season (Flood MAR)[3]. Another kind of recharge, in-lieu recharge, does not increase percolation but rather reduces or avoids the net extraction of groundwater by providing a replacement supply.
- **Net subsurface flow.** Groundwater flows laterally across the subbasin boundaries to and from adjacent areas outside the subbasin, driven by the gradients resulting from groundwater elevation differences. Many subbasins have groundwater flowing both in from some adjacent areas and out to other adjacent areas. The net flows change over time according to changes in precipitation, land use, and groundwater management both in the subbasin and in adjacent areas.

[3] These sources of developed recharge are typically part of GSP PMAs, which can be included as separate categories of recharge under an allocation, but are discussed jointly here.

- **Transitional pumping**. Transitional pumping is also referred to as planned depletion of groundwater storage. SGMA provides for GSAs to transition to sustainable yield over a period of twenty years. In areas where current groundwater extraction is greater than the sustainable yield, an allocation will need to be less than current groundwater use. PMAs typically require time to implement, during which time growers subject to an allocation must reduce pumping by, for example, switching crops or idling land. A gradual time path for adjustment helps lessen the economic costs of this type of adjustment. Transitional water is effectively an overdraft that, consistent with SGMA and the GSP, decreases to zero over time as extraction is brought into balance with recharge.

Time Dimension of Allocations

Allocation quantities are typically defined on an annual basis using long-run average components of the current and projected water balances. However, an allocation need not be the same every year. It can include transitional water that declines over time. It can be reduced or increased annually according to conditions, so long as on average it follows the path to sustainability laid out in the GSP. For example, the allocation can be increased in drought years to allow better conjunctive use of surface and groundwater, and then reduced in non-drought years to offset the increases in pumping in drought years. The yearly pattern of allocation could vary by subregion within the GSA (or subbasin) according to the situation. For example, lands fully dependent on groundwater may do better on a more consistent allocation, whereas lands with access to both ground and surface water might benefit from a variable allocation.

Another option to implement and manage a groundwater allocation is to allow growers to carryover some or all of their assigned allocation. The ability to carryover unused allocation may vary by different components. For example, unused natural recharge allocation may be carried over and used in subsequent years, but transitional pumping may not. In addition, carryover could be limited to a not-to-exceed amount each year, limited in the number of years an allocation carryover can be used, or even subject to annual "losses". The ability to "borrow" current pumping against next year's allocation could be considered. Essentially a carryover could be implemented like a bank account, where growers take responsibility to manage their account over time within the rules defined by the GSA.

The allocation can be and probably will be adjusted over time. Transitional allocation has already been described above. In addition, periodic reassessment of quantities will be made as more current data is acquired (e.g., as data gaps are filled), changes in hydrologic conditions (e.g., climate change) are observed, and PMAs are implemented.

Spatial Dimension of Allocations

An overall allocation is typically developed initially at a subbasin, or GSA-level based on the water balance. It is also possible to subdivide the GSA into smaller subareas or zones based on important variations in the components of an allocation, and with respect to groundwater conditions. For example, some zones may receive percolation from imported surface water that is included in their allocation, whereas other zones do not. Or some smaller areas may support and pay for a recharge project to boost their allocation while another zone does not need to do this. These kinds of differences can be easier to understand and manage if the allocation is built up from components rather than a single annual amount.

Another possible rationale for subregional differences can involve sustainability criteria other than groundwater elevation. Groundwater dependent ecosystems, streamflow effects, and subsidence are examples of other conditions that may be considered in subregional allocations.

Apportionment of the Allocation

After the components of groundwater are defined and the overall allocation is determined (either for the entire GSA or for subareas), the next step in groundwater allocation is defining how to apportion the allocation among the irrigators in the subbasin.

Some important considerations include:

- **Allocation eligibility**. Once the volume for different components of a groundwater allocation is defined, it is necessary to determine which lands and users are eligible for an allocation and how specific volumes are assigned. This could vary by groundwater component. For example, native recharge could be allocated on a per acre basis to all eligible parcels in the subbasin. Transitional water could be allocated in the same manner, or it could be allocated based on historical use. The yield from a recharge project could be assigned according to proportionate contributions to the cost of the project.
- **Non-irrigated parcels**. A topic of much discussion during development of many GSPs (and GSP implementation in Critically Overdrafted subbasins) is whether and how non-irrigated lands are included in the allocation. Non-irrigated parcels can include parcels that were never irrigated and parcels that were previously irrigated but are not currently irrigated. Never irrigated parcels may not be economically feasible to develop into irrigated agriculture, whereas currently unirrigated parcels may have been temporarily retired for various reasons. An allocation typically includes defining a point in time where a parcel is defined as non-irrigated (e.g., if it has not been irrigated since a specific date). Non-irrigated parcels may be eligible for some components of the groundwater allocation. This may include portions of the sustainable yield, but typically does not include any transitional water.

Additional Considerations and Analysis

Developing a groundwater allocation should include consideration of legal, economic, engineering, hydrogeologic, and political considerations. In areas with both ground and surface water supplies, the ability to use them conjunctively can provide sufficient water (from delivered surface water and groundwater allocation) during droughts.

In areas where the groundwater allocation is less (and in some cases substantially less) than current groundwater use, there can be important economic implications for different allocation design approaches. An analysis to inform allocation development typically includes quantifying the economic implications of alternative groundwater allocation design approaches. This includes evaluating financial impacts to individual groundwater users (e.g., growers) as well as the regional economic implications.

Assigning quantities of groundwater available to individual pumpers can incentivize them to think about the costs and benefits of reducing their water use or developing new recharge opportunities. An allocation effectively creates a scarcity of groundwater, whereby the value of groundwater is driven by the economic value (net return) it can produce. Economic effects of an allocation depend on many factors, including: the size of the allocation relative to crop water demand (how limiting is the allocation); the sources, costs, and distribution of current and prospective surface supplies; and the flexibility allowed to growers in how they manage their allocation.

A strict allocation and apportionment are a rigid method for implementing demand management. They effectively limit water use on a well, parcel, or operation basis. Economic analysis can illustrate the advantages, both to individual growers and to the regional economy, of increasing the flexibility of allocations. Allowing growers to move their allocated groundwater freely (subject to some review) is one step to increase flexibility. Rather than allocating pumping to each well or parcel, a grower can make choices about distributing allocation among fields and crops in maximize return and reduce the costs of demand management. A more ambitious step is to allow growers to buy and sell allocation among themselves, using either short-term or long-term agreements. A number of other GSAs in California are currently evaluating and pilot-testing groundwater trading markets for this purpose.

Administering an Allocation

If a GSA, or subbasin, decides to adopt an allocation and defines the mechanism to calculate how to assign allocation to different individuals, entities, or wells, it must then monitor pumping and enforce the allocation. If carryover across years is allowed, the GSA must also track that and incorporate it in the annual water budget accounting. Most GSAs in the state and groundwater management entities outside the state use some form of measurement, usually wellhead meters, to track and enforce allocations. There are also examples of allocations that use crop type and/or ET calculations to estimate water use and groundwater pumping, but this approach is less common. Estimation versus measurement is a GSA policy decision that can have important effects on the cost and its ability to manage the allocation effectively.

Summary of Steps in Considering and Implementing an Allocation

1. Develop the key components of the GSP – baseline conditions, water budgets, criteria and thresholds, and PMAs.
2. Determine if an allocation is necessary and useful to achieve targets and implement PMAs, particularly demand management actions, effectively.
3. If an allocation is warranted, use data and analysis to evaluate, compare, and select allocation amounts and other characteristics that best meet the needs of the GSA.
4. Monitor conditions and pumping over time to verify the effectiveness of the allocation and to modify as needed.

Discussion

This appendix summarized an analysis of the cost of demand management for two hypothetical programs: one covering the entire Colusa Subbasin, and another targeted to two areas of concern. The cost of demand management is estimated as the loss in net return to farming. It does not include program administrative costs or any secondary impacts, and it does not consider what the market price for water would be under a local groundwater market. Secondary economic impacts may be considered in future iterations of this analysis to support implementation of PMAs.

Implementing an annual allocation can provide a strong impetus for growers to adopt demand management and may be a prerequisite for effective demand management in some cases. It is not clear that an allocation is warranted at this time for the Colusa Subbasin, though it may become more useful in the future. Developing a specific allocation would require careful analysis of the legal, hydrogeologic, economic, and engineering implications, and would require vigorous and informed discussion with stakeholders.

Future analysis of demand management program costs and allocation design would be specific to the program being considered in the Subbasin. For example, under the "targeted demand management" PMA summarized under Chapter 6 Section 6.5.2, the economic analysis would be developed for the regions that would participate in the program (both buyer and seller regions). This would define incentives to participate in the program. The general steps to define a demand management program costs include:

1. Define the location, scale, and timing of the program. Prepare economic data specific to the program areas and define any program-specific conditions that would affect participation.

2. If a groundwater allocation will be included, define the groundwater allocation approach and specify the allocation to lands/entities in the Subbasin. Prepare an economic analysis and hydrogeologic analysis of the impacts of alternative groundwater allocation designs.
3. Use the general method described above to quantify the direct cost of demand management in each area. The analysis would additionally consider the opportunity cost of water in other, non-farming, uses, such as a local or regional water transfer market. Market prices can exceed the values in irrigated agriculture in some years and would drive demand management program costs in these years.
4. Evaluate potential secondary economic impacts, and to whom those impacts may occur. Also consider any benefits associated with the program, and to whom those benefits accrue. For example, this may include broader groundwater level benefits in the area, and regions down-gradient. Monetize any anticipated secondary economic impacts and benefits.
5. Use the results of the steps above to develop an appropriate incentive structure (accounting of costs and benefits) that would support demand management program design. See Section 6.5.2 of GSP Chapter 6 for a summary of different types of potential demand management programs.