



COLUSA AND GLENN GROUNDWATER AUTHORITIES

Colusa Subbasin

Joint Technical Advisory Committee

GSP Development

June 22, 2020

Discussion Topics

- GSP Development Overview
- Projected Water Budgets
- Well Monitoring Pilot Program
- Funding Mechanisms Evaluation
- Project and Management Action Brainstorming
- Groundwater Dependent Ecosystem (GDE) Identification
- Next Steps

GSP Development Overview

Knowledge Building

- **Basin Setting**
 - Hydrogeologic Conceptual Model (HCM)
 - Historical and Current Groundwater Conditions
 - Draft Water Budgets
- **Existing Monitoring Network Evaluation**
- **Integrated Hydrologic Model Development and Calibration**
- **Sustainable Management Criteria Approaches**

Initial GSP Development

- **Basin Setting**
 - Groundwater Dependent Ecosystems
 - Updated Water Budgets
 - Management Area Overview
- **Draft GSP Monitoring Network**
- **Draft Sustainable Management Criteria**
- **Initial Projects and Management Actions**

GSP Refinements

- **Basin Setting**
 - Draft Management Areas
- **Draft GSP Chapters**
- **Updated GSP Monitoring Network**
- **Updated Sustainable Management Criteria**
- **Projects and Management Actions (PMAs) Evaluation and Analysis**
- **Draft Funding Mechanisms**

GSP Prep and Adoption

- **Basin Setting**
 - Updated Management Areas
- **Data Management System**
- **Updated PMAs**
- **Updated Funding Mechanisms**
- **Complete Draft GSP**

GSP Adoption and Submittal

Stakeholder Engagement and Outreach

4.b. Projected Water Budgets

Projected Water Budgets

- Must Consider:
 - 50 Years Historical Hydrology (precipitation, evapotranspiration, streamflow)
 - Most Recent Land Use and Evapotranspiration
 - Climate Change
 - Most Recent Water Supply Information
 - Projected Population and Per-Capita Urban Water Use
- Other Potential Considerations:
 - Potential Changes to Surface Water Supplies

Bay-Delta Process

- Update to Bay-Delta Water Quality Control Plan
- Driven by SWRCB
- Objective of Improving Habitat for Salmon and Other Species
- Separated into Phases:
 - Phase 1: San Joaquin River Tributaries and Southern Delta Salinity Objectives
 - Adopted February 2019
 - Challenged by US DOJ and DOI in State and Federal Court in March 2019
 - Phase 2: Sacramento River and Delta Objectives
 - SWRCB Staff Proposed 55% Unimpaired Flow
 - Opposed by USBR and Local Water Suppliers
 - Currently under Negotiation in the Context of Voluntary Agreements

Voluntary Agreements

- Negotiations Led by CNRA and CalEPA
- Objective of Protecting Agricultural, M&I, and Environmental Objectives
- Increased Flows (Sacramento River Basin) by Year Type:
 - Critical – 37 TAF
 - Dry – 276 TAF
 - Below Normal – 256 TAF
 - Above Normal – 281 TAF
 - Wet – 45 TAF

Sacramento River Proposal

- February 28, 2019 Proposal to SWRCB
- Updated Framework Presented to SWRCB on February 4, 2020
- Combination of Flow and Non-Flow Measures
- Flow Measures
 - Provide instream flows above existing conditions
 - Avoid conflict with SGMA
 - Maintain reliability of water supply for other beneficial uses
- Non-Flow Measures
 - Spawning and rearing habitat
 - Reduced predation by non-native species
 - Removal of passage barriers
 - Hatchery operations

Sacramento River Proposal (continued)

- Flow Increases
 - 100,000 Acre-Feet in Spring or Summer in Dry, Below Normal, and Above Normal Years
 - Land fallowing
 - Limited groundwater substitution
 - 30,000 Acre-Feet in March through Reservoir Reoperation in Critical Years
 - Lower Peak Diversion Rates for Rice Straw Decomposition in October and November

Potential Colusa Subbasin Impacts

- Overall Reduction in Surface Water Supplies, Potentially Spread among CVP Contractors, Settlement Contractors, Riparian Users, etc.
- Increase in Idle Acreage
- Potential Increase in Intrabasin Water Transfers
- Potential Increase in Groundwater Reliance

Challenges to Incorporating in 2022 GSP

- Voluntary Agreements Remain under Negotiation; Timeline Uncertain
- Little Publicly Available Information/Detail on Impacts to Surface Water Availability and Land Use
- Potential for Long Process to Reach Resolution, Including Potential Litigation
- Schedule Constraints Related to Jan. 31, 2022 GSP Deadline

Key Questions

- Include Projected Water Budget Scenario Associated with Reduced Surface Water Availability?
- If So,
 - What are the anticipated changes in surface water availability and timing?
 - What are the anticipated changes in land use?
 - What other changes should be considered (e.g. irrigation efficiency, etc.)?

Proposed Action (Agenda Item 4.b)

The TAC recommends approval to proceed with the development of projected water budget scenarios based on recent historical surface water supplies.

OR

The TAC recommends development of one or more water budget scenarios considering potential reductions in future surface water supplies.

4.c. Well Monitoring Pilot Program

Well Monitoring Pilot Program

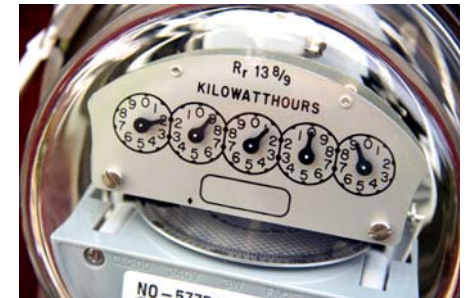
- Program Background and Objectives
- Measurement Options
- Data Collection Options
- Selection Process
- Environmental Permitting (CEQA)

Program Background and Objectives

- Background
 - Funded through DWR Proposition 68 Grant
 - Estimated Budget \$66,120
- Encourage Stakeholder Engagement/Involvement
- Collect Groundwater Extraction Volumes
- Collect Water Levels
- Incorporate Available Data into GSP Development Process
- Identify and Evaluate Options for Basin-Wide Implementation

Measurement Options: Groundwater Extraction

- Indirect
 - Power Consumption
 - Consumptive Use
 - Textbook Methods
 - Remote Sensing
- Direct
 - Propeller Meters
 - Magnetic Meters



Measurement Options: Groundwater Levels

- Manual Measurements
 - Well Sounder
- Continuous Measurements
 - Pressure Transducers
 - Sonic Meters

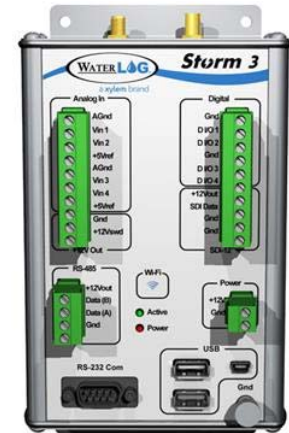


Data Collection Options

- Periodic Field Visits
- Grower Reported
- Telemetry (Cellular Modems)
 - Proprietary Systems
 - Open Systems



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Selection Process

- Willing Growers Apply to Participate in the Program
- Review Applicants Based on
 - Are wells already equipped with monitoring equipment?
 - Is equipment installed according to manufacturer specifications?
 - Is there telemetry installed?
 - Are growers willing to self-report meter totalizer readings?
 - Location in basin?
 - Others?

Environmental Permitting (CEQA)

- Exempt from CEQA
 - Section 15306 (Class 6) – Information Collection
- Notice of Exemption Filing
 - Counties
 - State Clearinghouse
 - 35-Day Appeal Period

Discussion Questions

- Importance of both groundwater extraction and water level data?
- Preference for measurement options/technologies?
- Preference for data collection methods?
- Privacy considerations?
- Selection criteria and process?

4.d. Funding Mechanism Evaluation

Funding Mechanism Evaluation

- Background and Objectives
- Evaluation Description
- Estimated Budget

Background and Objectives

- Background
 - Optional Task in GSP Development Contract
 - Funded through DWR Proposition 68 Grant
 - Estimated Budget \$75,600
- Objectives
 - Compare available funding mechanisms for GSP implementation activities, including projects and management actions.
 - Evaluate economic and financial implications of different ways of allocating groundwater pumping

Potential Funding Mechanisms

- Grants
- Loans
- Bonds
- Extraction Fees
- Permit Fees
- Regulatory Fees
- Other Property-Related Fees
- Benefit Assessments
- Special Taxes

Funding Mechanism Evaluation Process

- Compare mechanisms to identify which may be appropriate, acceptable, and well-suited for different GSP activities.
- Develop and apply criteria to compare mechanisms:
 - How the fee or assessment is charged (e.g., per acre, per parcel, per acre-foot, or per well)
 - Kinds of costs it could be used to fund
 - How the charged amount might vary across areas and users
 - Required process to develop, justify, and approve
- Identify any important differences that might be relevant to the CGA versus the GGA

Pumping Allocation Evaluation Process

- Evaluate separately for each GSA
- Considerations
 - Perceived equity and fairness
 - Historical groundwater use
 - Economic impacts
 - Potential effects on achieving sustainable conditions
 - Carryover of credits across years
 - Rules for exchange of credits between users
- Include discussion of how groundwater allocation decisions may affect the distribution of costs, benefits, and funding

Estimated Budget

| Subtask | Engineering | Economics | Outreach | Total |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|
| Funding Mechanisms Review | \$3,500 | \$15,100 | \$5,300 | \$23,900 |
| Groundwater Pumping Allocations | \$13,300 | \$24,100 | \$14,300 | \$51,700 |
| Total | \$16,800 | \$39,200 | \$19,600 | \$75,600 |

Proposed Action (Agenda Item 4.d)

The TAC recommends approval to proceed with the funding mechanisms evaluation as described in the Proposition 68 grant agreement.

4.e. Projects and Management Actions

Overview

- GSP Requirements
- Proposed Approach

GSP Requirements

- Projects and Management Actions (PMAs) required to meet the sustainability goal over the planning and implementation horizon must be included.
- Information Required:
 - Measurable objective that will benefit
 - Criteria triggering implementation and termination
 - Process to determine conditions requiring implementation
 - Process for notice to public and other agencies
 - Quantification of demand reduction or other methods for the mitigation of overdraft

GSP Requirements

- Information Required (Continued):
 - Summary of required permitting and regulatory process
 - Status, including time-table for expected initiation, completion, and accrual of expected benefits
 - Explanation of the source and reliability of additional water outside GSA jurisdiction
 - Description of legal authority required
 - Description of estimated cost and how costs will be met
 - Description of management of groundwater extraction and recharge to ensure drought is offset during wetter periods

Proposed Approach

- Conduct preliminary stakeholder engagement related to PMAs and develop an initial inventory for further discussion and evaluation
- Conduct hydrologic, engineering, and economic analysis to inform additional stakeholder discussions and screen initial PMAs
- Create and assess combinations of PMAs and evaluate impacts on groundwater conditions
- Rank, select, and perform final assessment of proposed PMAs

Initial Assessment

- Inclusive inventory of PMA ideas
- Emphasis on potential areas of concern
- Categorization based on project type, management mechanism, supporting information, etc.
- Compilation of available information to support screening analysis
 - Location
 - Costs
 - Benefits
 - Status (reconnaissance, feasibility, 30% design, etc.)

Initial Ideas

- Recharge projects
 - Direct
 - In-lieu
- Supply augmentation projects
 - Storage (e.g. Sites)
 - Water transfers (in-basin)
- Water conservation projects
 - Recycling
 - Reuse
 - Other

Initial Ideas (continued)

- Projects to reduce non-beneficial consumptive use
 - Arundo eradication
- Groundwater pumping allocations
- Monitoring programs
 - Groundwater pumping
 - Groundwater levels
 - Stream flows

Draft Template to Gather PMA Ideas

- Requested Information
 - Project Name and Contact Information
 - Project Description and Status
 - Supporting Information

Discussion Questions

- Comments on Proposed Approach?
- Comments on Draft Template?
- How Best to Distribute?
- Timeline to Request Responses?

4.f. Groundwater Dependent Ecosystems

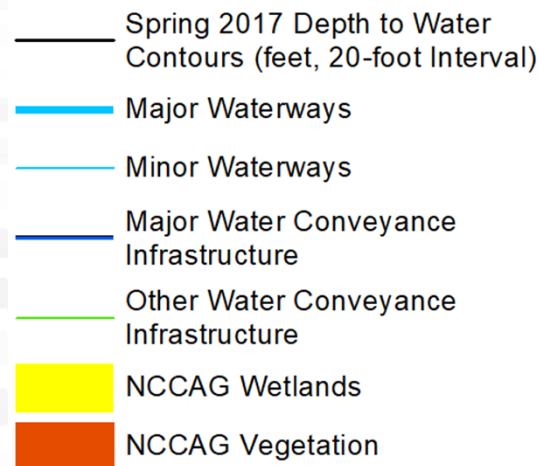
Groundwater Dependent Ecosystems (GDEs)

- Ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface
- Must be identified in Basin Setting chapter of GSP
- Preliminary identification based on Natural Communities Commonly Associated with Groundwater (NCCAG) dataset from DWR/TNC
- Additional refinement included in Proposition 68 grant

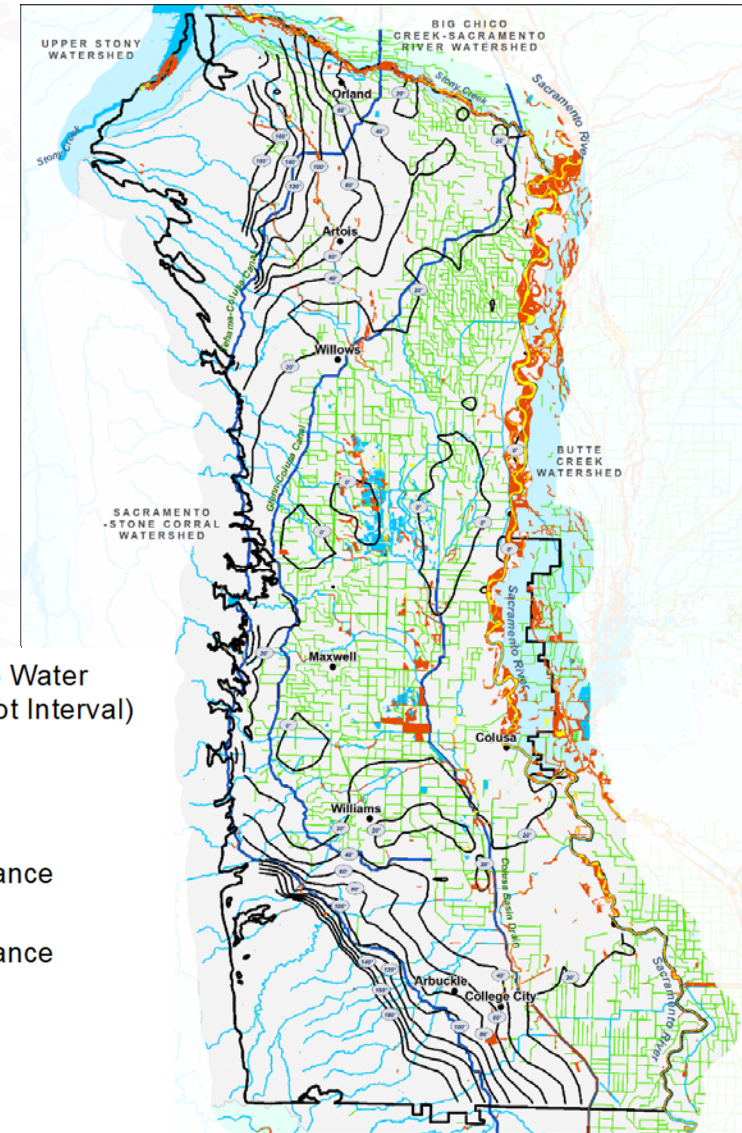
Preliminary GDE Mapping

- Relatively few wetlands mapped
 - mostly in riparian corridors
- 2,794 polygons
- Major vegetation categories
 - Cottonwood ~ 31%
 - Bulrush ~22%
 - Willows ~15%
 - Valley Oak ~13%
 - Others ~18% (including Arundo ~4%)

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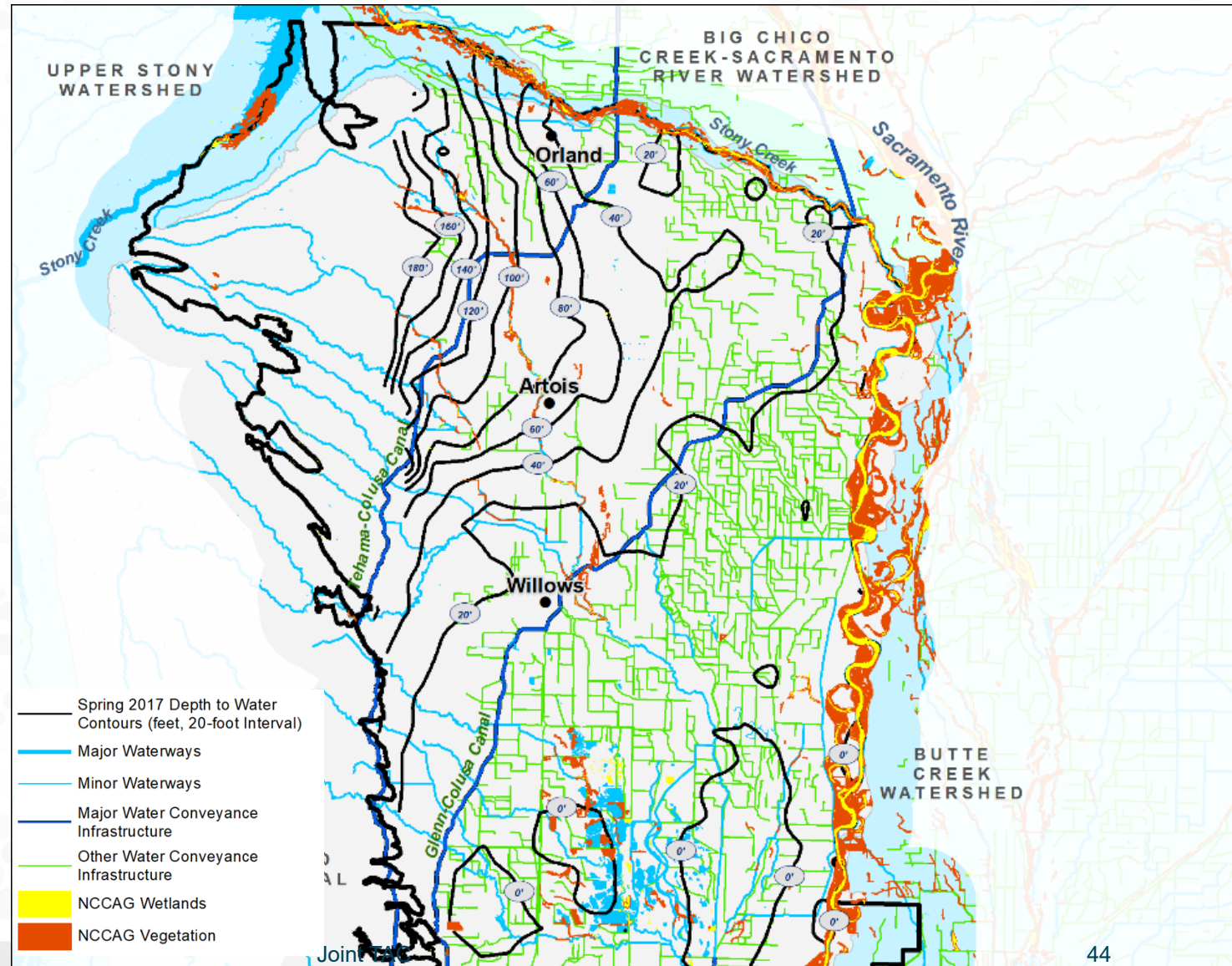


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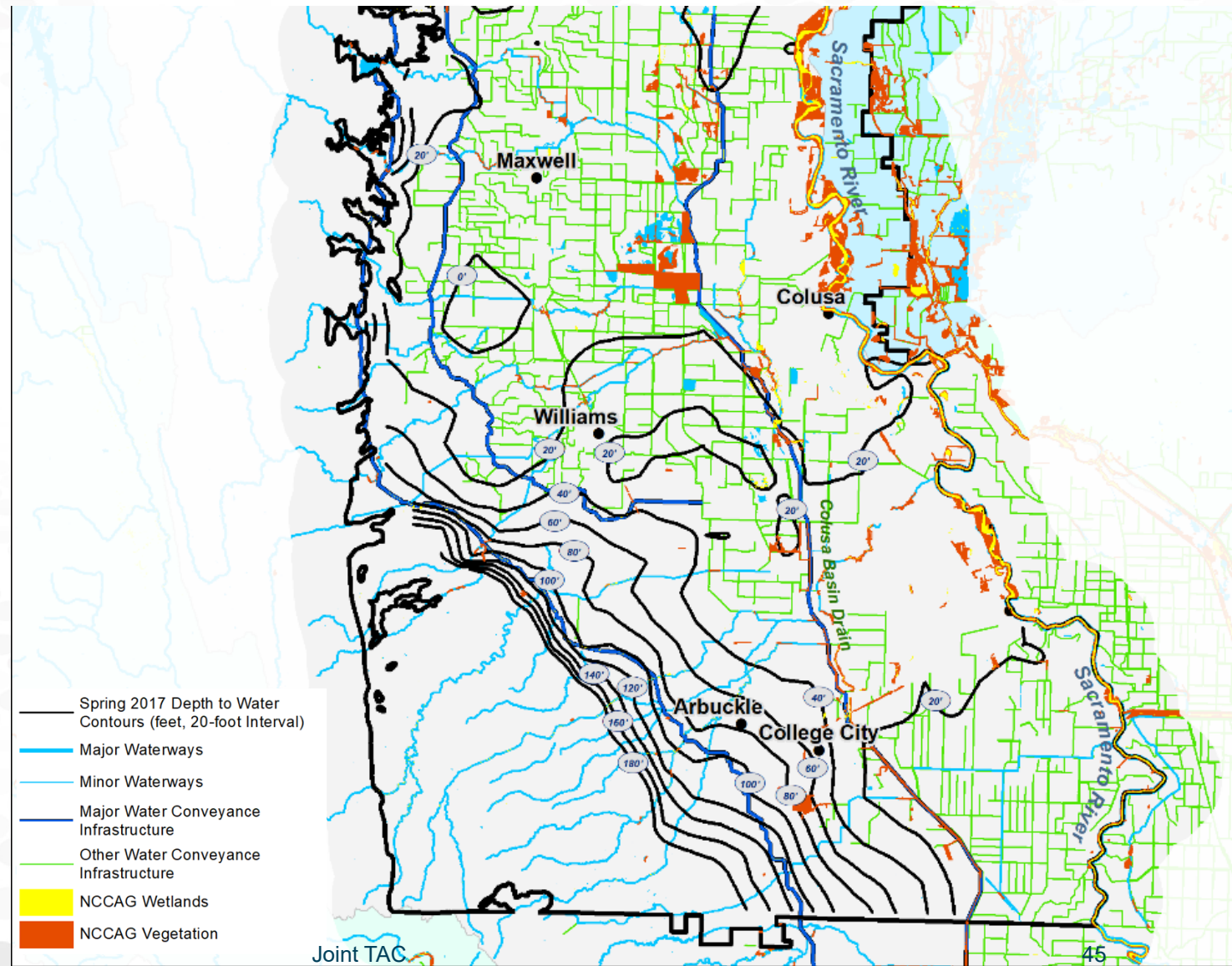
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Preliminary Mapping: North Basin



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Preliminary Mapping: South Basin



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Proposed Approach

- Compile additional data to identify potential GDEs, including depth to groundwater, presence of surface water, soil characteristics, etc.
- Prepare maps and other supporting data to support stakeholder engagement and further refinements.
- Refine characterization of potential GDEs, including susceptibility to changes in groundwater conditions.
- Incorporate refined GSP evaluation into appropriate sections of the GSP, including Basin Setting, Monitoring Networks, Sustainable Management Criteria, and Projects and Management Actions.

TNC Guidance Document

- Released January 2018
- Basic Process
 - Identify GDEs
 - Determine Potential Effects on GDEs
 - Establish Sustainability Criteria
 - Incorporate GDEs into Monitoring Network
 - Identify Projects and Management Actions

Groundwater Dependent Ecosystems
under the Sustainable Groundwater
Management Act

GUIDANCE FOR PREPARING GROUNDWATER
SUSTAINABILITY PLANS



The Nature
Conservancy 

Butte County Approach

- Formed GDE working group of GSA managers
- Phase I
 - Filter polygons within 150' of rice and 50' of other irrigated crops
 - Filter polygons within 1000' of primary streams (evaluate in Phase II)
 - Working group reviews individual polygons using Google Earth map layers and online form
 - Classify as “Likely a GDE”, “Possibly a GDE”, or “Not likely an GDE”
 - Identify and characterize adjacent surface water features
 - Identify monitoring wells near possible GDEs

Butte County Approach (continued)

- Phase II
 - Use monitoring well data to assess depth to groundwater compared to rooting depths
 - Evaluate gaining vs. losing reaches of surface waters using local groundwater model
 - Evaluate pumping impacts on shallow groundwater conditions using nested monitoring wells and varying distances from surface waters
 - Other data

Discussion Questions

- Comments on proposed approach?
- Desired role of TACs in identifying GDEs?
- Reliance on analysis vs. stakeholder review of individual polygons?

Additional Discussion