5th Management Plans Work Group

Safe-Yield Technical Subgroup Meeting

April 20, 2020

Agenda

I. Welcome
II. Continue Discussion of Annual Safe-Yield Calculation
    A. Agricultural Incidental Recharge
    B. Streambed Recharge
III. Discuss Strategies for the Long-Term Analysis of Management Goals
IV. Closing Remarks

Timeline

4MP

- Phoenix AMA Adoption
- Pinal AMA Adoption
- Santa Cruz AMA Adoption

2019 — 2021 — 2022 — 2023

- MPWG
- Drafting Plans
- Adopting Plans

5MP

MANAGEMENT PLANS WORK GROUP

A.R.S. § 45-563 (A)

"The director shall develop a management plan for each initial active management area for each of five management periods... and shall adopt the plans only after public hearings... The plans shall include a continuing mandatory conservation program... designed to achieve reductions in withdrawals of groundwater."

ADWR-led stakeholder forum for the development of the 5th Management Plans

Goals:

* Assess existing conservation programs
* Update existing management strategies
* Develop new management strategies

5MP Safe-Yield Technical Subgroup

Goals

* Consensus on methodology and definitions
  * Assessing each component
  * Identifying a general approach for assessing long-term status
  * Consistency across AMAs
* Clear communication of status of each AMA

Strategy

* Annual Calculation
  * Consensus on treatment of components
  * Consensus on annual calculation
* Long-Term Analysis
  * Approach(es) for "Long-Term" Analysis
  * Assessing "Progress toward goal"
* Best Practices for Communicating Status

Data Availability

AMA Data Page: https://new.azwater.gov/ama/ama-data

NEW

Safe-yield Dashboard

Safe-Yield Dataset

* Reported data is compiled and updated on an annual basis.
* Page also contains AMA Water Supply & Demand Dashboard and Dataset

Annual Safe-Yield Calculation

Management Goals (A.R.S. § 45-562)

Safe-yield:

"A groundwater management goal which attempts to achieve and thereafter maintain a long-term balance between the annual amount of groundwater withdrawn in an active management area and the annual amount of natural and artificial recharge in the active management area."

(A.R.S. § 45-561(12))

Prescott, Phoenix, and Tucson AMAs:

Safe-yield by the year 2025

Pinal AMA:

To allow development of non-irrigation uses and to preserve existing agricultural economies in the AMA for as long as feasible, consistent with the necessity to preserve future water supplies for non-irrigation uses.

Santa Cruz AMA:

To maintain a safe-yield condition in the AMA and to prevent local water tables from experiencing long term declines

Annual Calculation

Inflows

* Natural
  * Groundwater Inflow
  * Streambed Recharge
  * Mountain-front Recharge
* Artificial
  * Incidental Recharge
    * Agricultural
    * Municipal
    * Industrial
  * Canal Seepage
  * Cut to the Aquifer
  * CAGRD Replenishment

Outflows

* Natural
  * Groundwater Outflow
  * Riparian Demand
* Artificial
  * Sector Demands
    * Agricultural
    * Municipal
    * Industrial
    * Indian
  * Remediated Groundwater
  * Poor Quality Groundwater

Outstanding Items

* Natural
  * Streambed Recharge
* Artificial
  * Agricultural Incidental Recharge
    * "Water Budget Approach"
* Anything else?

Agricultural Incidental Recharge

* Inflow
* Artificial
* Current Method:
  * Output of ADWR's regional groundwater models
    * Method of lagging may differ between AMAs
* Current method differs from other sectors
  * Municipal & Industrial Incidental Recharge are calculated as a percent of total sector demands
    * Demands are compiled from AMA Annual Reports
    * Not lagged

* Items to resolve:
  1. Is there general consensus that we should move to calculating this as a percent of total sector demands?
     - Provides consistency with other sectors
     - Fits with "water budget" approach by removing lagging

Agricultural Incidental Recharge

* Inflow
* Artificial
* Current Method:
  * Output of ADWR's regional groundwater models
    * Method of lagging may differ between AMAs
* Current method differs from other sectors
  * Municipal & Industrial Incidental Recharge are calculated as a percent of total sector demands
    * Demands are compiled from AMA Annual Reports
    * Not lagged

* Items to resolve:
  2. If consensus on changing: Need to establish rate for each AMA.
     - Suggestion: Total demand * (10% transmission losses + ___% application losses)
       - Application losses = 100% - ___% irrigation efficiency

Streambed Recharge

* Inflow
* Natural component
* Output of ADWR's regional groundwater models

* Variable year to year
* Exactly methodologies may differ between AMAs

* Items to resolve:
  1. Open questions re: differences between AMAs and lagging
     - Clarification
     - Recommendation to continue obtaining this data from ADWR's models

Strategies for the Long-Term Analysis of Management Goals

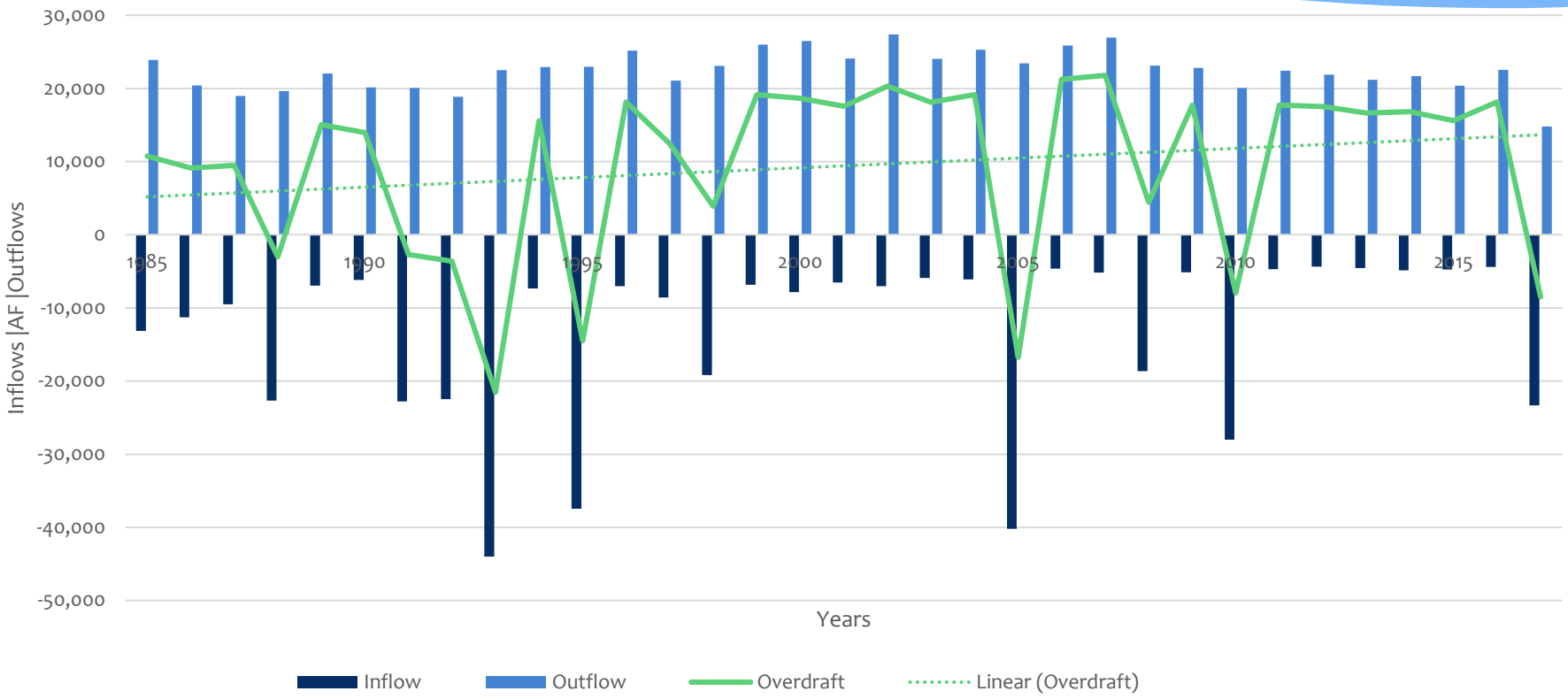
Long-term Analysis

"A groundwater management goal which attempts to achieve and thereafter maintain a ***long-term balance*** *between the annual amount of groundwater withdrawn in an active management area and the annual amount of natural and artificial recharge in the active management area."*

A.R.S. § 45-561(12)

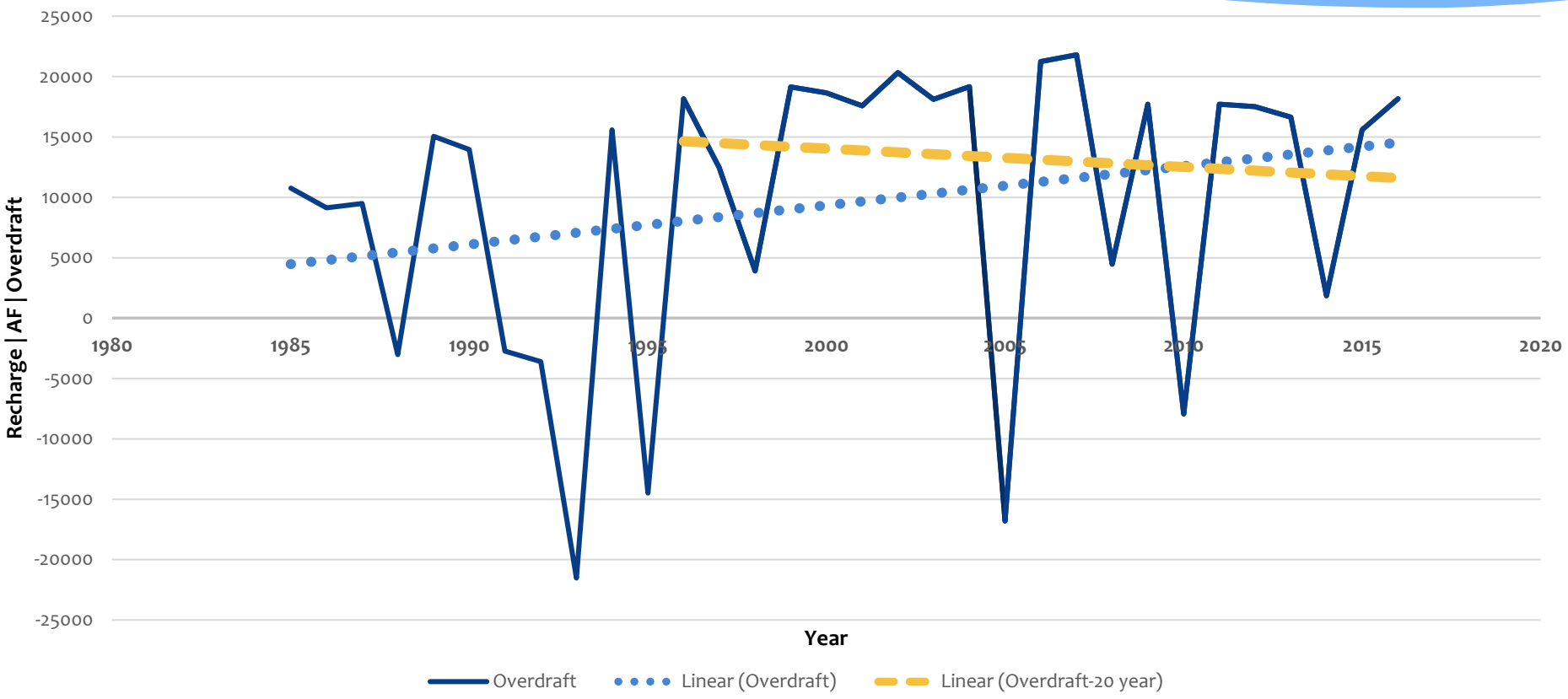
Safe-Yield Kick off Meeting:

Prescott Annual Overdraft



Safe-Yield Kick off Meeting:

Annual Overdraft and Trendlines



Long-Term Analysis

* Smooth specific components
* Choose a specific timeframe
* Safe-Yield by sector
* Communicating Safe-Yield

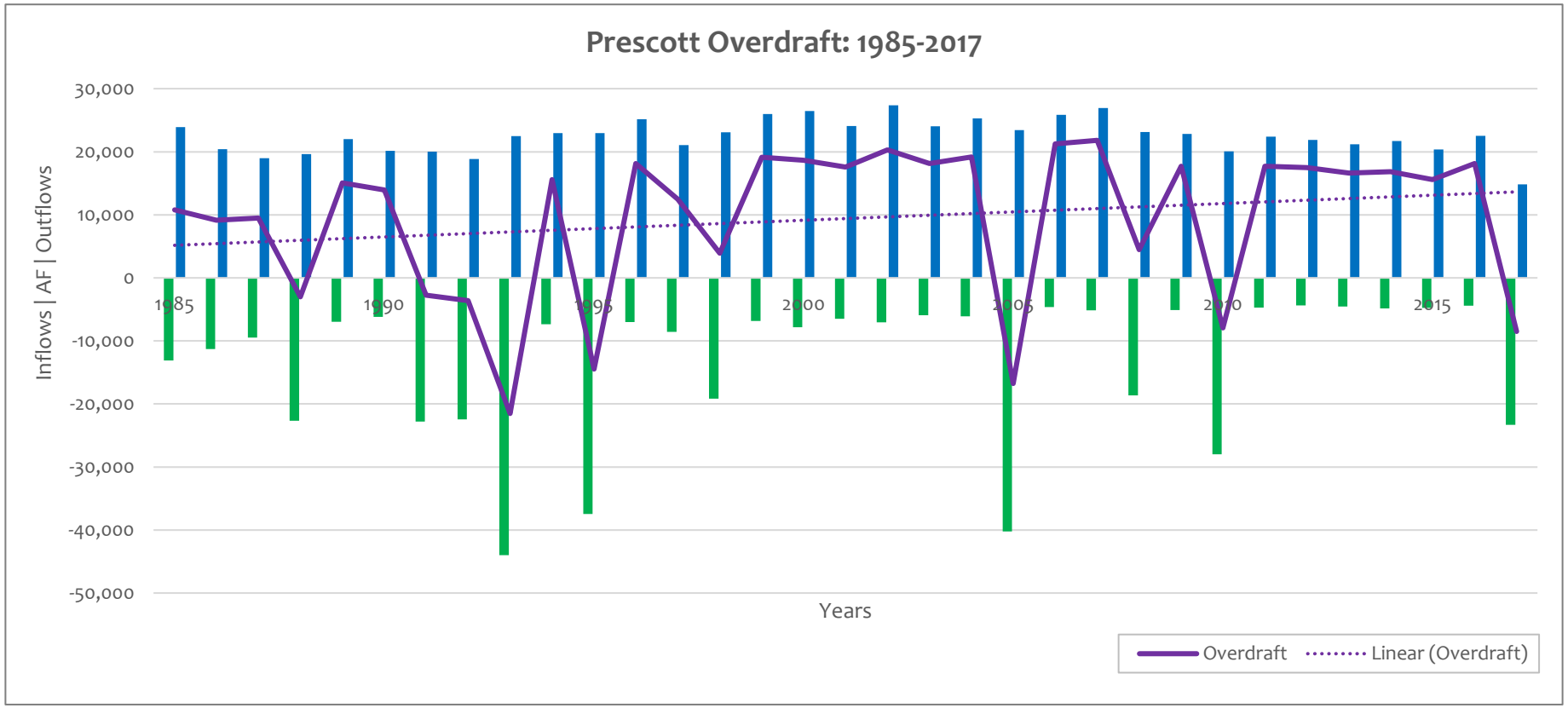
Smooth Components

* Smooth specific Components
  - Natural Recharge
  - Economic Factors
  - Availability of Imported or Renewable Supplies

* Potential Issues
  - Accuracy

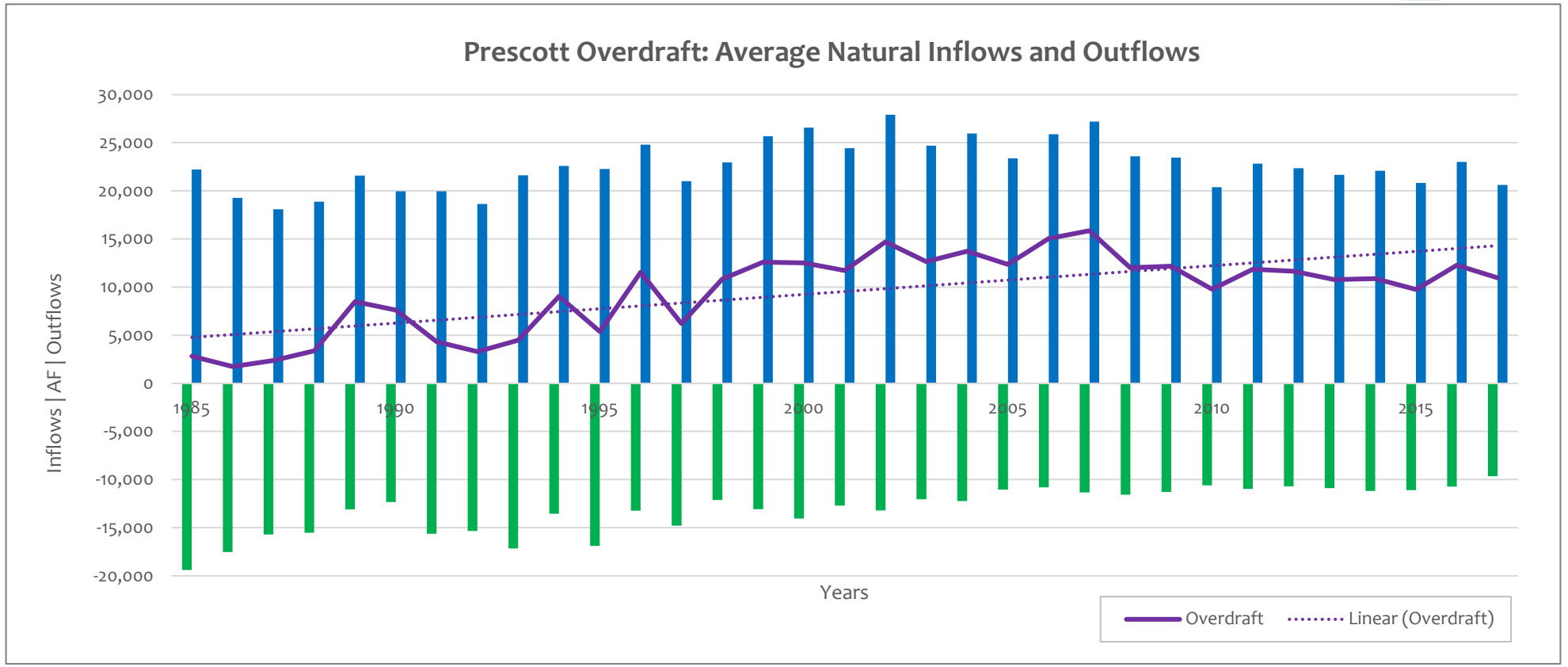
Smooth/Control Components

Potential Results



Smooth/Control Components

Potential Results



Smooth/Control Components

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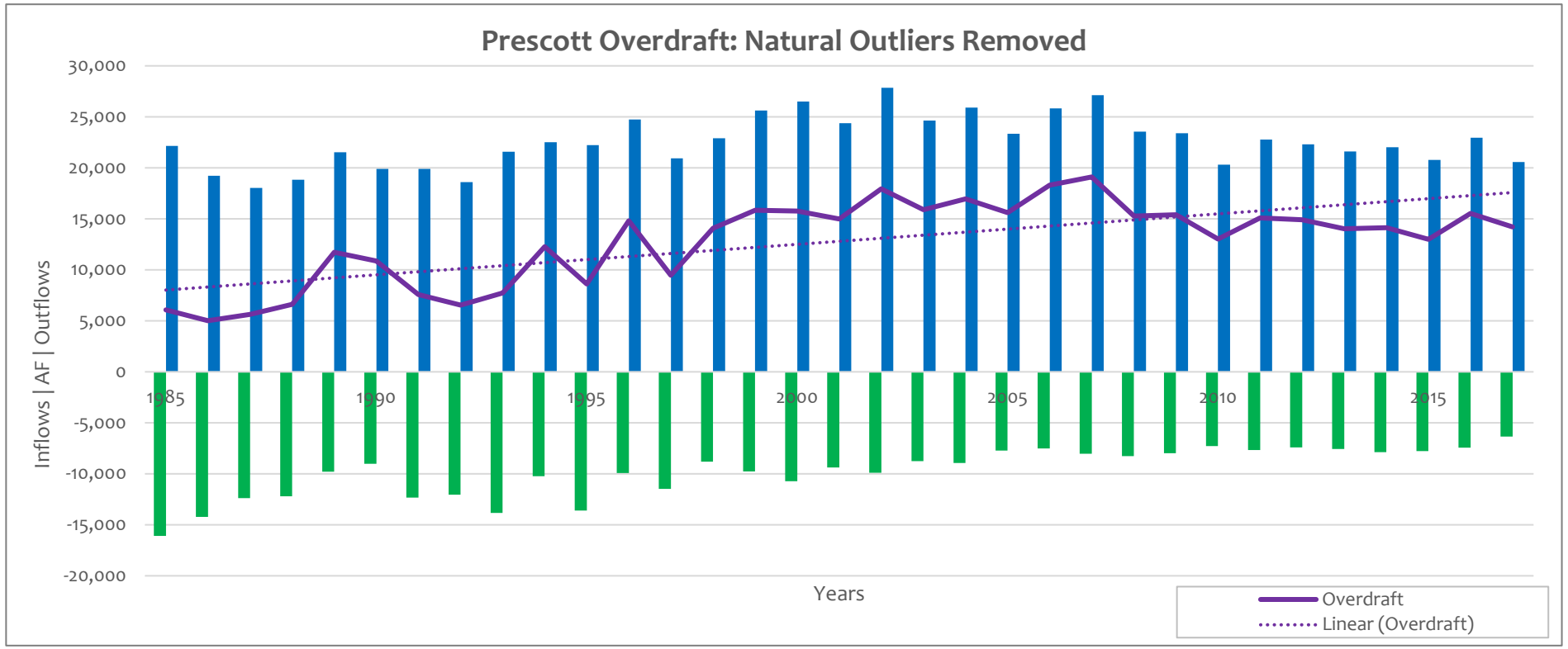

Smooth/Control Components

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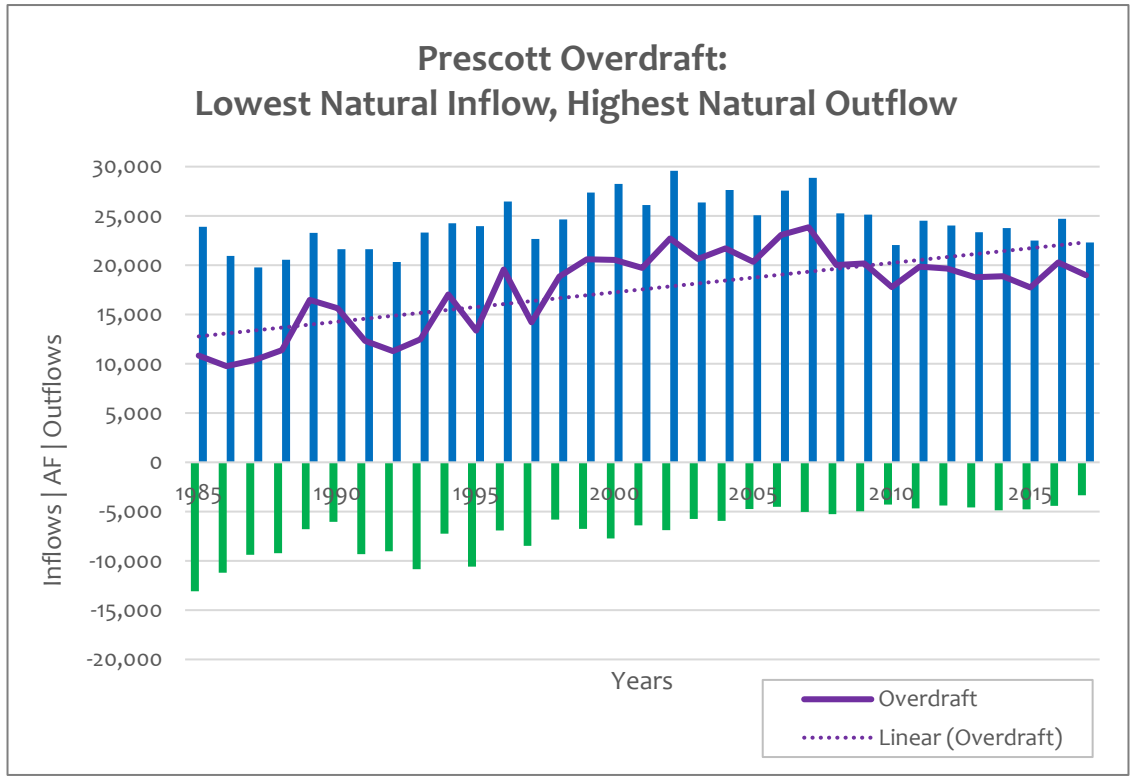
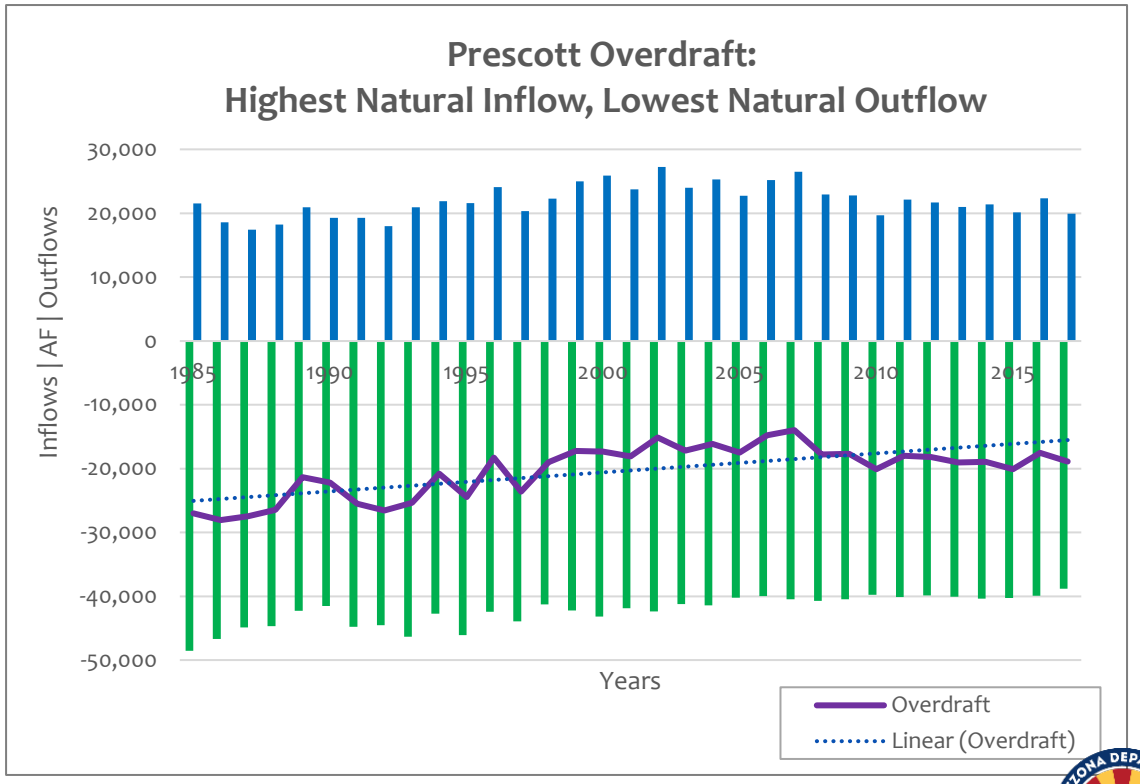


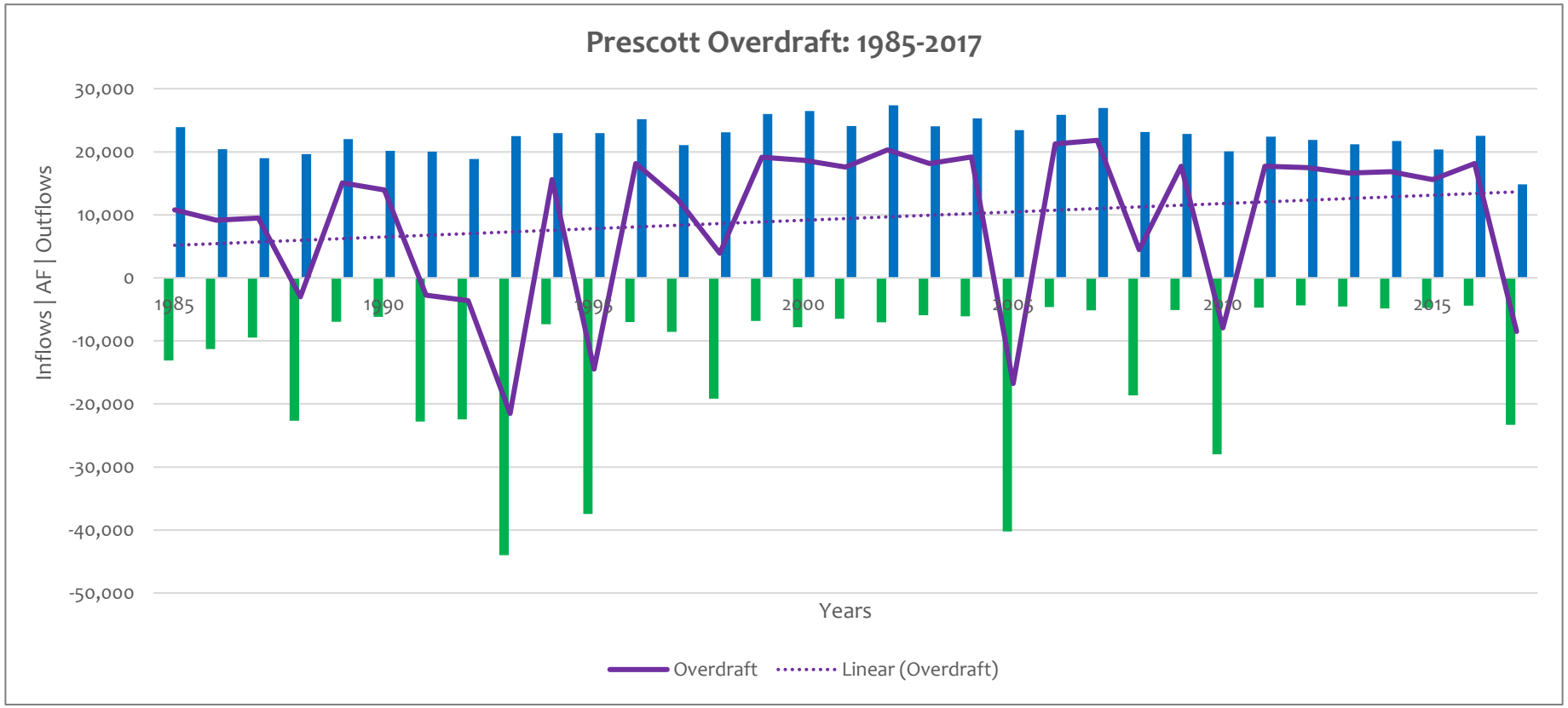


Defining Long-Term

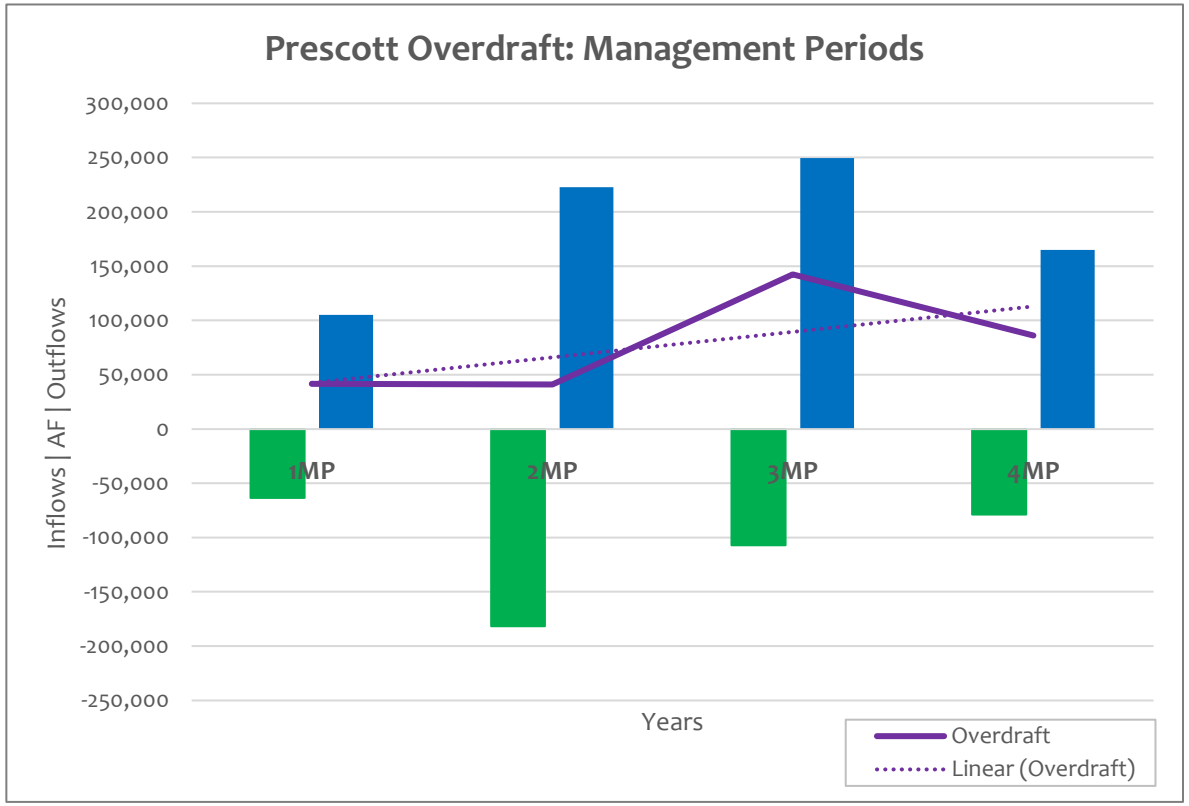
* Choose a time frame for long-term Safe-Yield
  - Groundwater Management Act Time Frame
  - Management Periods
  - 5, 10, or 20 years
  - Multiple time Periods
  - Different time periods for inflows and outflows

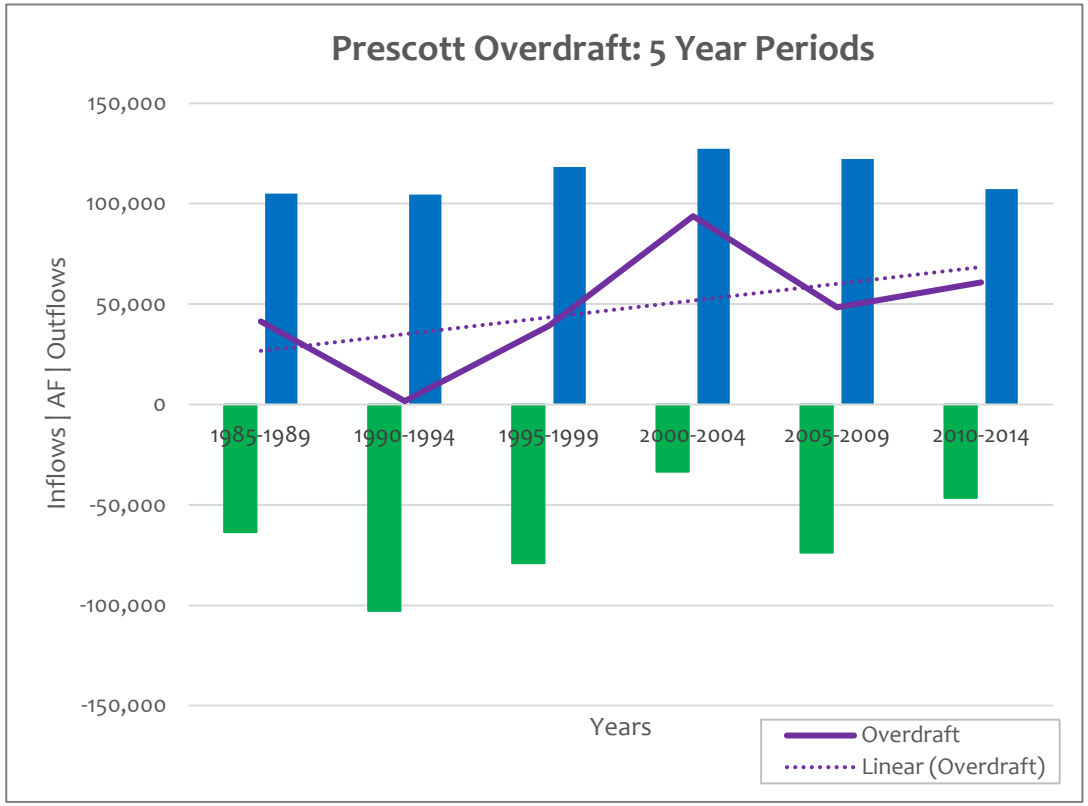
* Potential Issues
  - Can mask progress
  - Can mask lack of progress

Defining Long-Term
Potential Results



Defining Long-Term
Potential Results





Defining Long-Term
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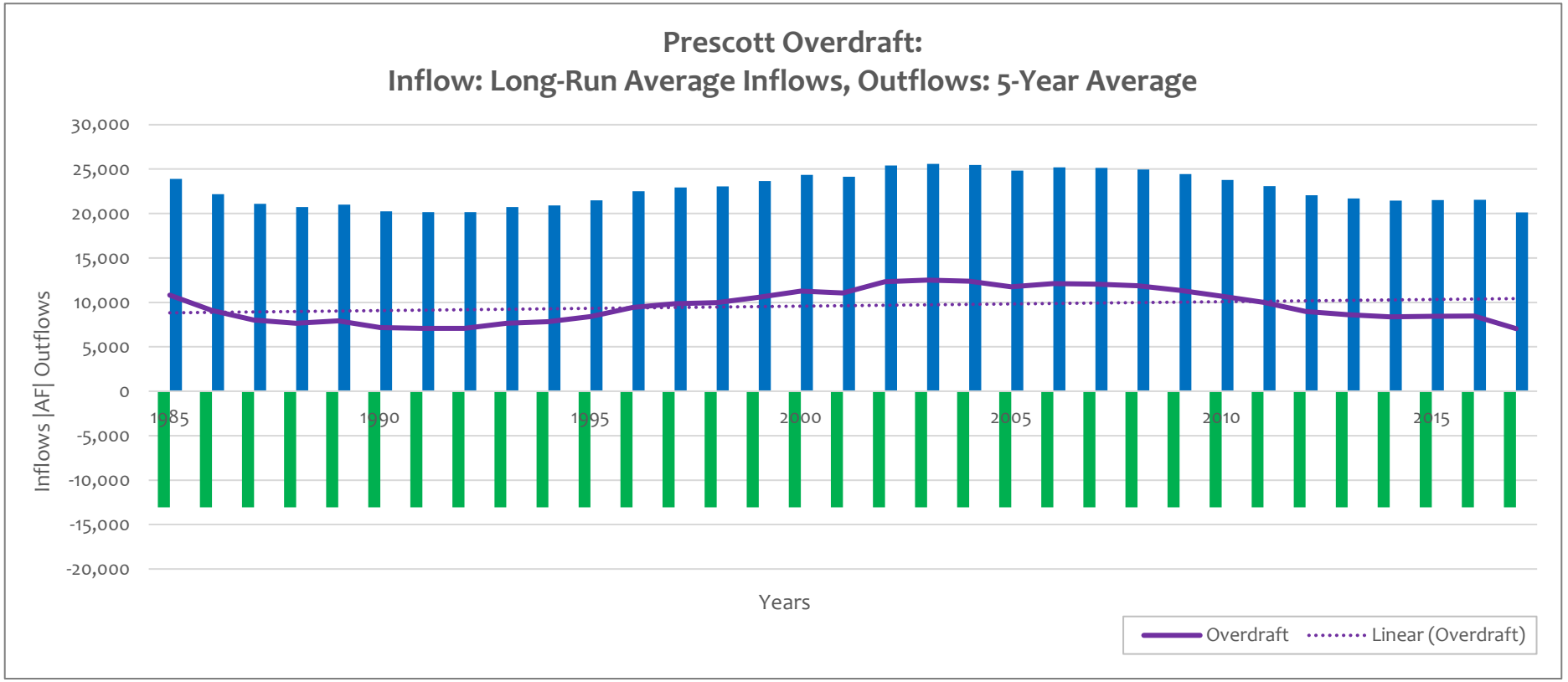
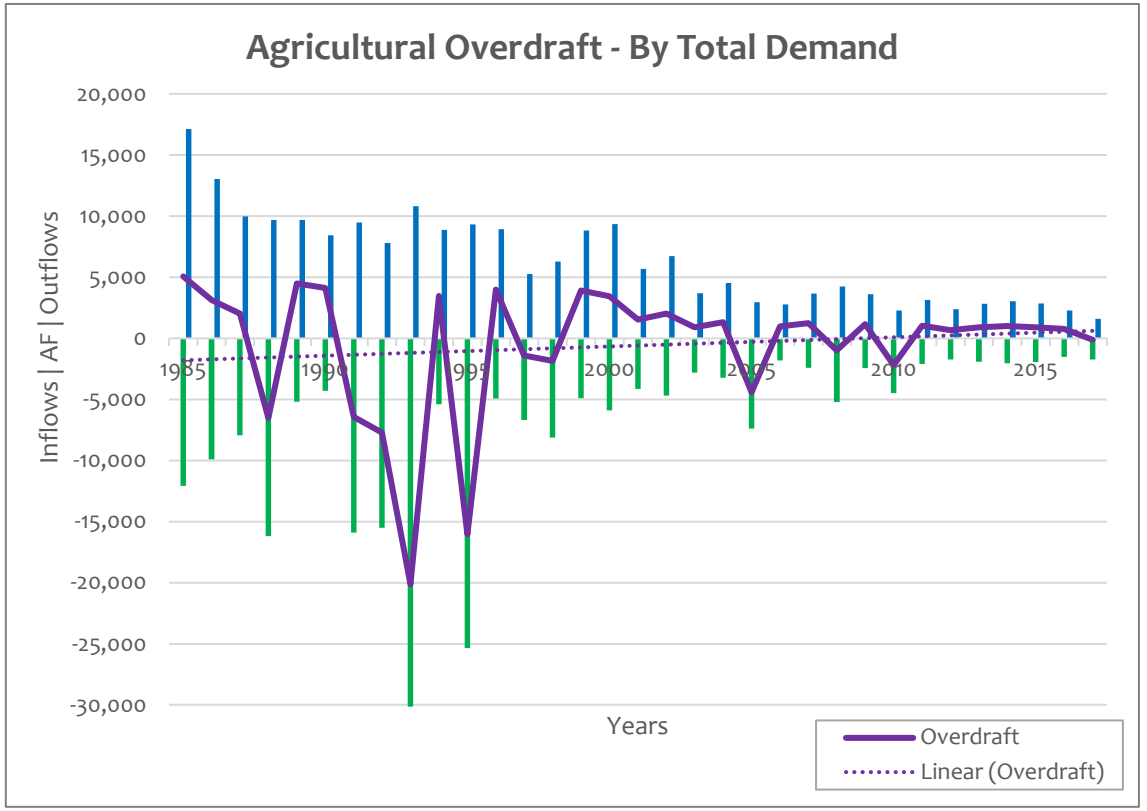


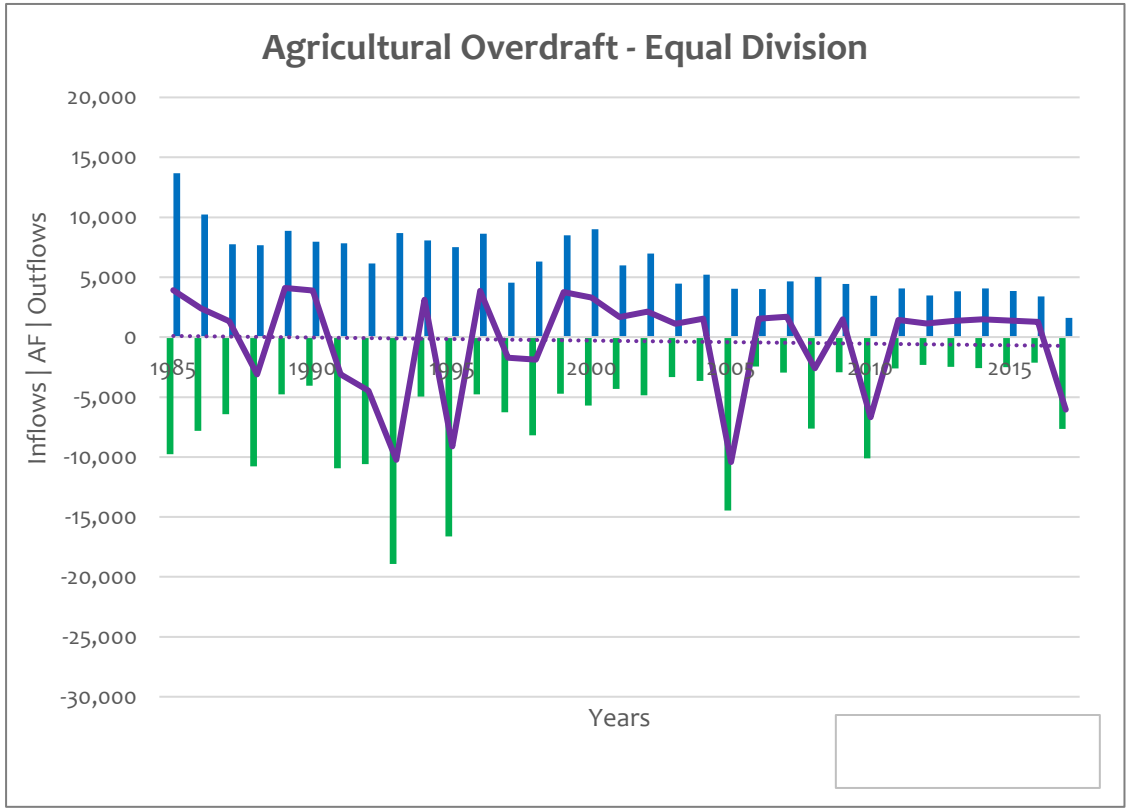
Safe-Yield by Sector

* Dividing Natural Recharge and Artificial Components
* How:
  - Proportional by total demand
  - Equal
  - Number of Rights
  - Developing a Factor
* Potential Issues
  - Equity
  - Assigning Value
  - Rewarding Large Users

Safe-Yield by Sector

Potential Results





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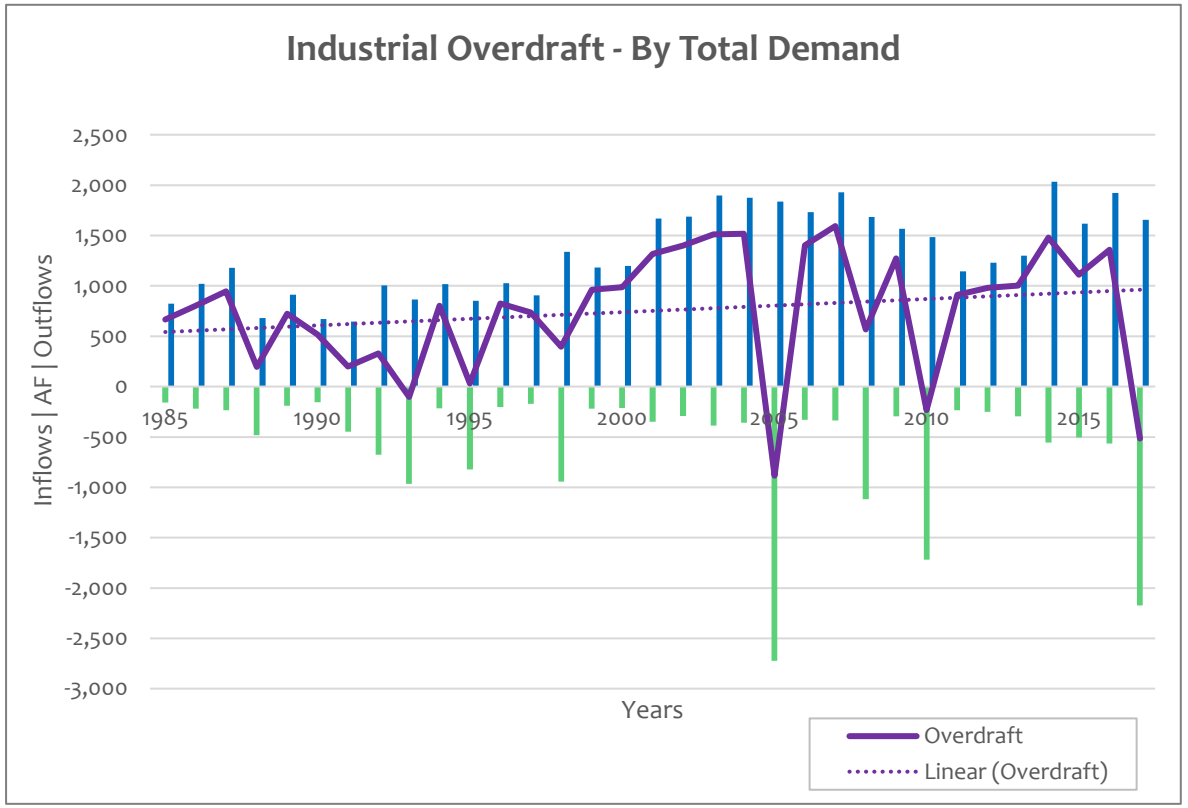

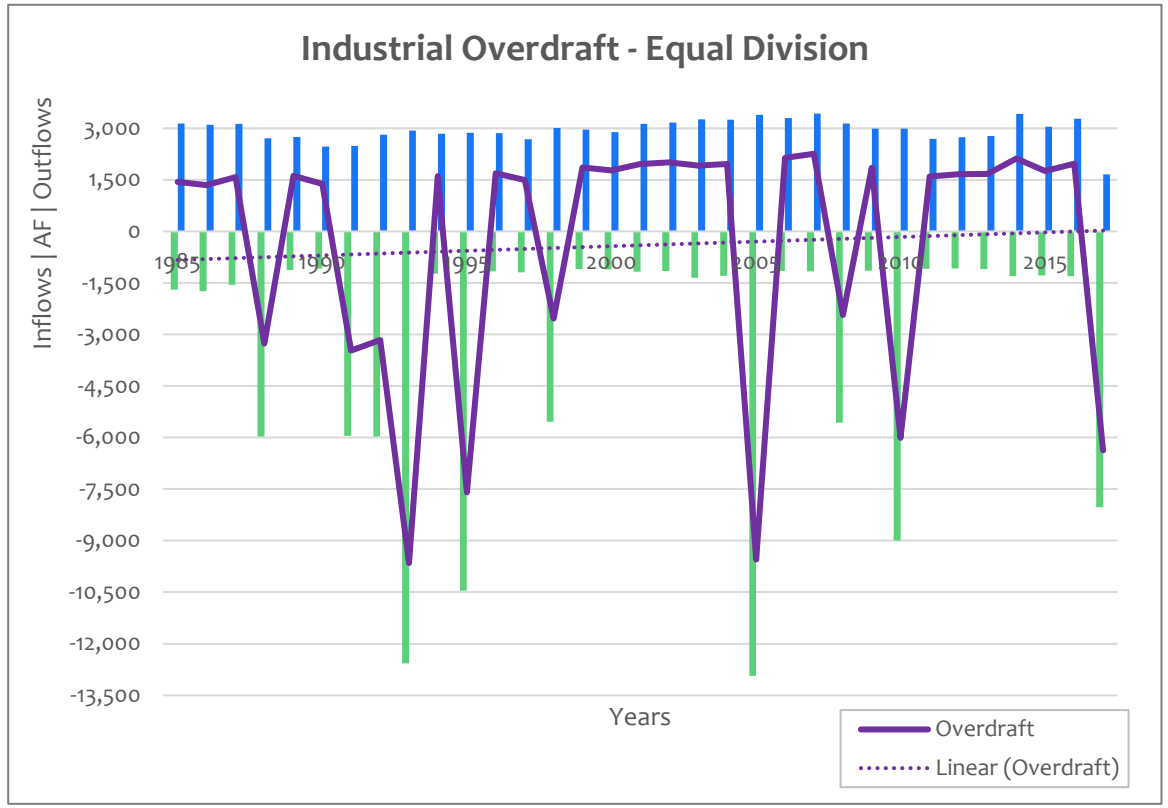

Safe-Yield by Sector

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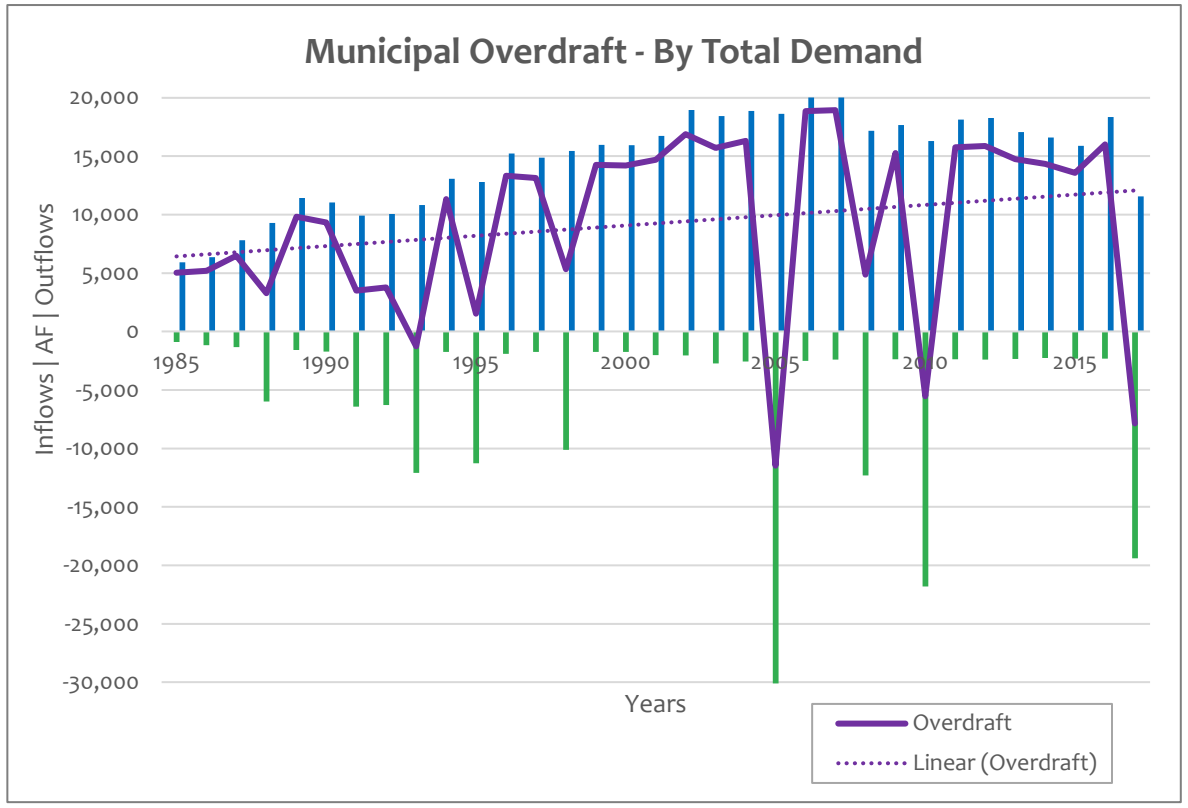

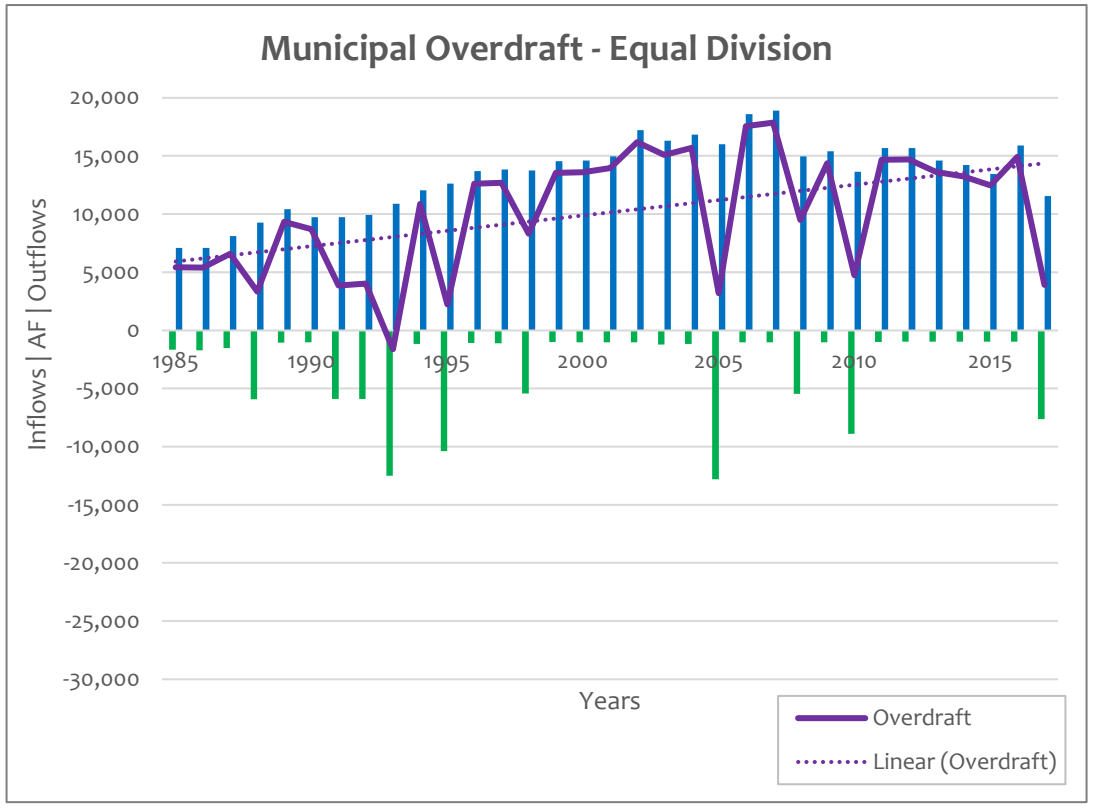

Potential Safe-Yield Communication Strategies

* Identify a specific number as goal
  - Per AMA
  - Per Sector

* Potential Issues
  - Ties too much value to one number
  - Difficult to determine

Next Steps

5MP Safe-Yield Technical Subgroup

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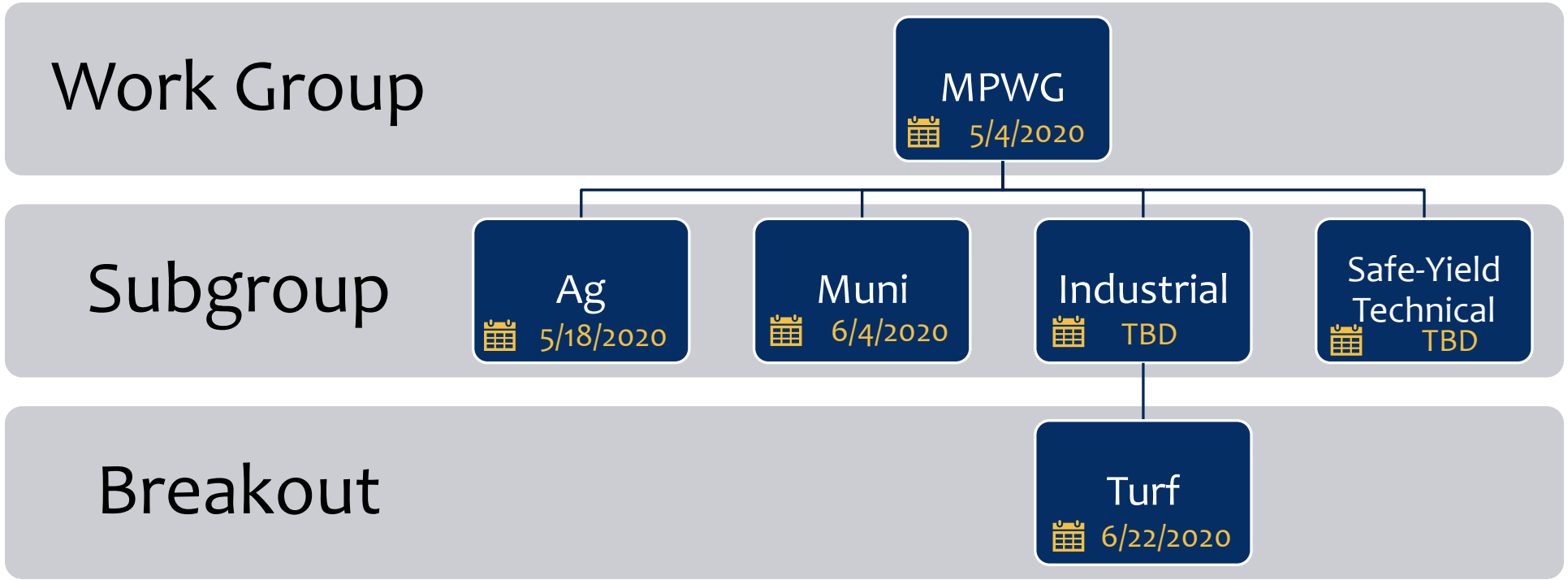
Upcoming MPWG Meetings



Questions?

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Management Plans Work Group:
new.azwater.gov/5MP

Full Text of Management Plans:
new.azwater.gov/ama/management-plans