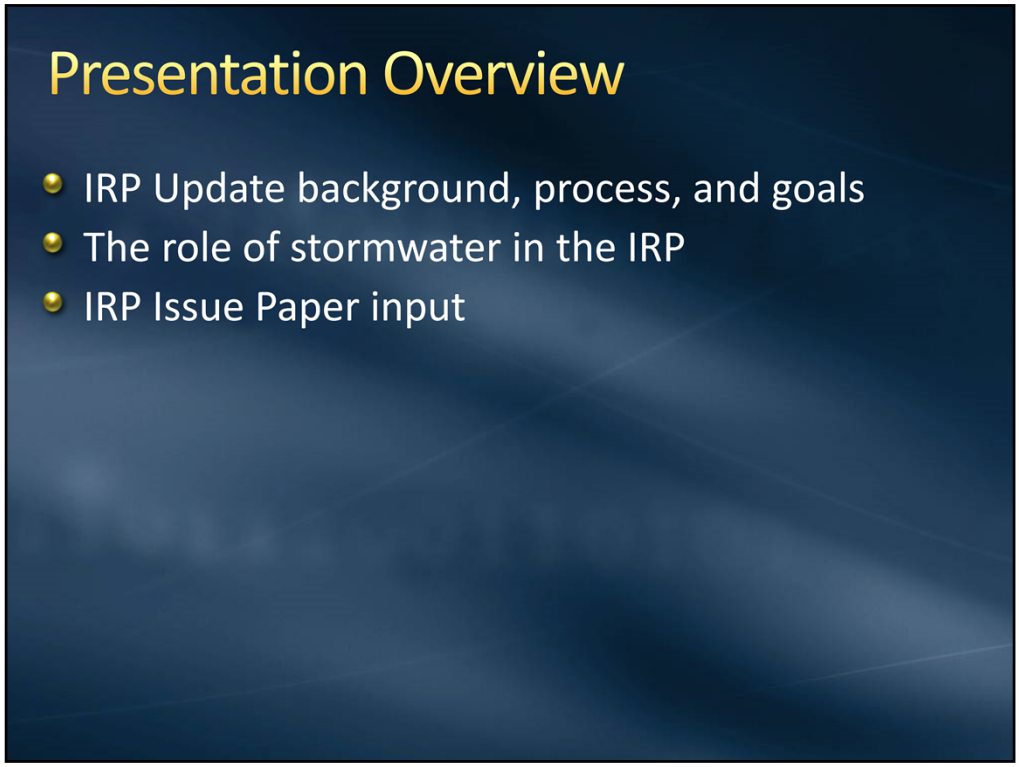
2015 Integrated Water Resources Plan Update

SCWC Stormwater Workshop
June 25, 2015



So let's focus in more detail on the Technical Update portion of the IRP Update

Our goals for the IRP Technical Update process include:

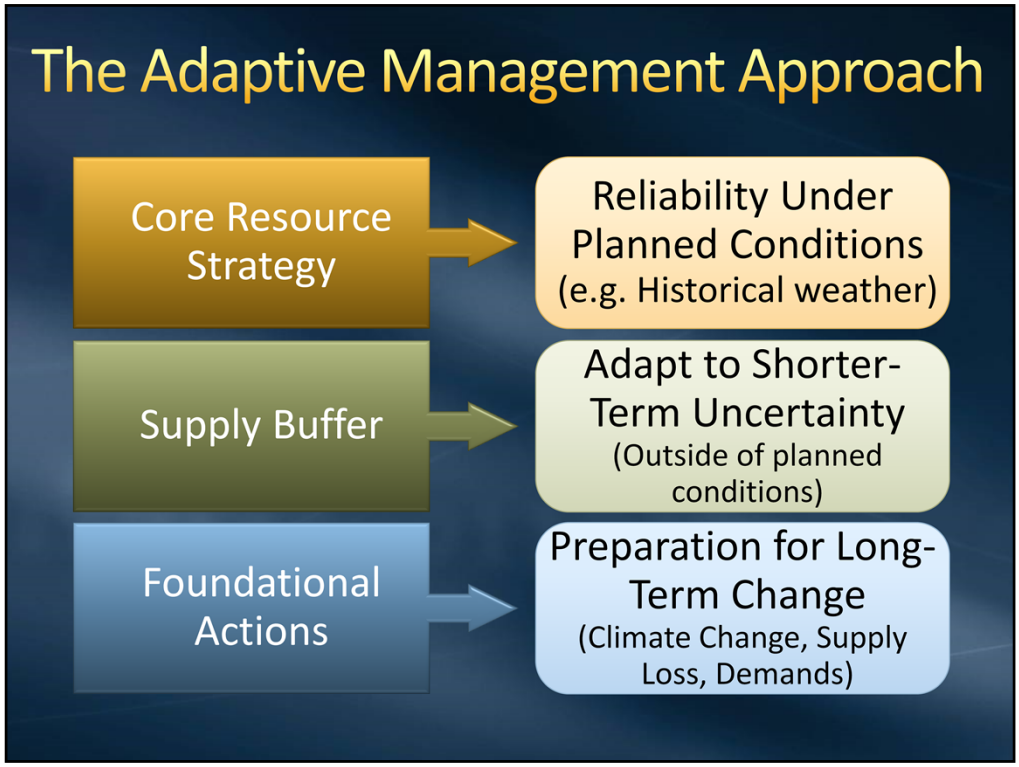
- Completing a full review and update of all of the resource targets from the 2010 IRP Update

- Working with the IRP subcommittee to identify policy issues to feed the subsequent board process

To begin I would like to provide a

The IRP is both a planning framework and the blueprint for resource development and implementation.
It has always been formulated with input from stakeholders: member and retail agencies, other water and wastewater managers, environmental, business and community interests.

Acknowledging the importance of water to the economic and social health of Southern California.
Reliability
Affordability
Water Quality
Diversity
Flexibility
Constraints – Recognizing the environmental and institutional constraints to resource development



Core Resources Strategy

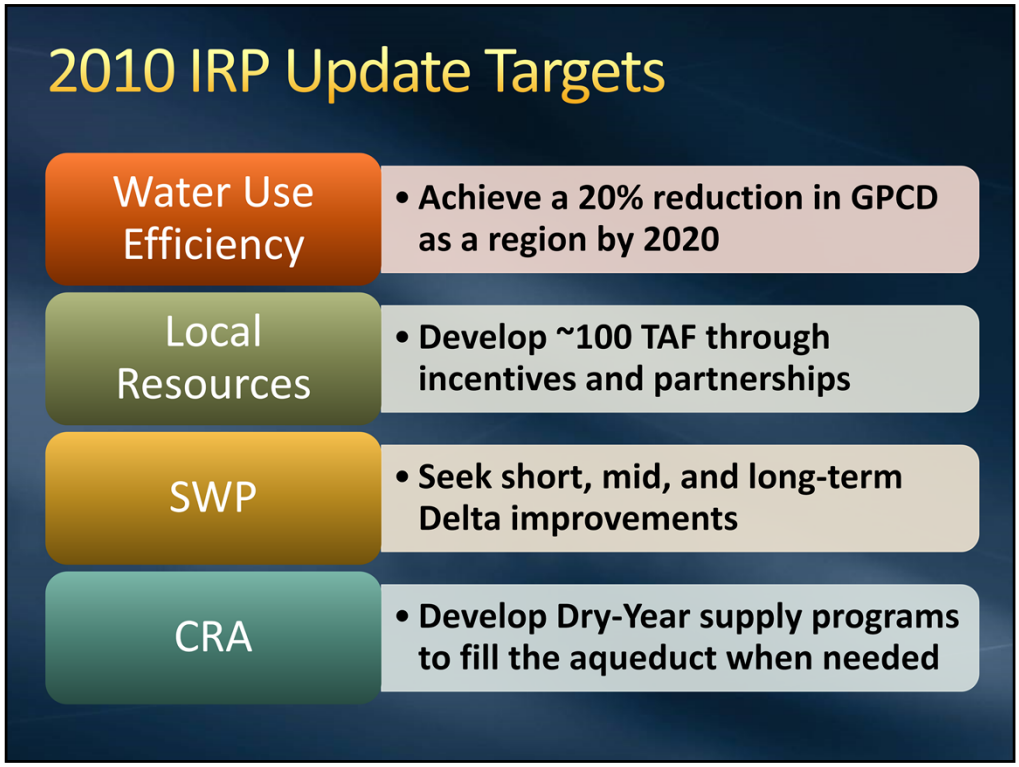
- Meet full-service demands at the retail level under all foreseeable hydrologic conditions
- Essentially this portion is what the 1996 IRP set out to do

Supply Buffer

- Went beyond the "Planning Buffer" introduced in the 2004 IRP Update
- Called for development of WUE and Local Projects to mitigate shorter term risk
- Shorter-term uncertainties include
    - Loss or reduction of existing supplies due to environmental or legal challenges
    - Fluctuations in demands due to economy

Foundational Actions

- Low regret planning and mitigation actions that present a minimal cost and risk
- Projects can be implemented more quickly when needed to help adapt to long-term change
- New supply options to help manage longer-term uncertainties
    - Permanent losses of existing and planned supplies
    - Changes in water treatment regulations
    - Changes in growth and development patterns
    - Climate Change

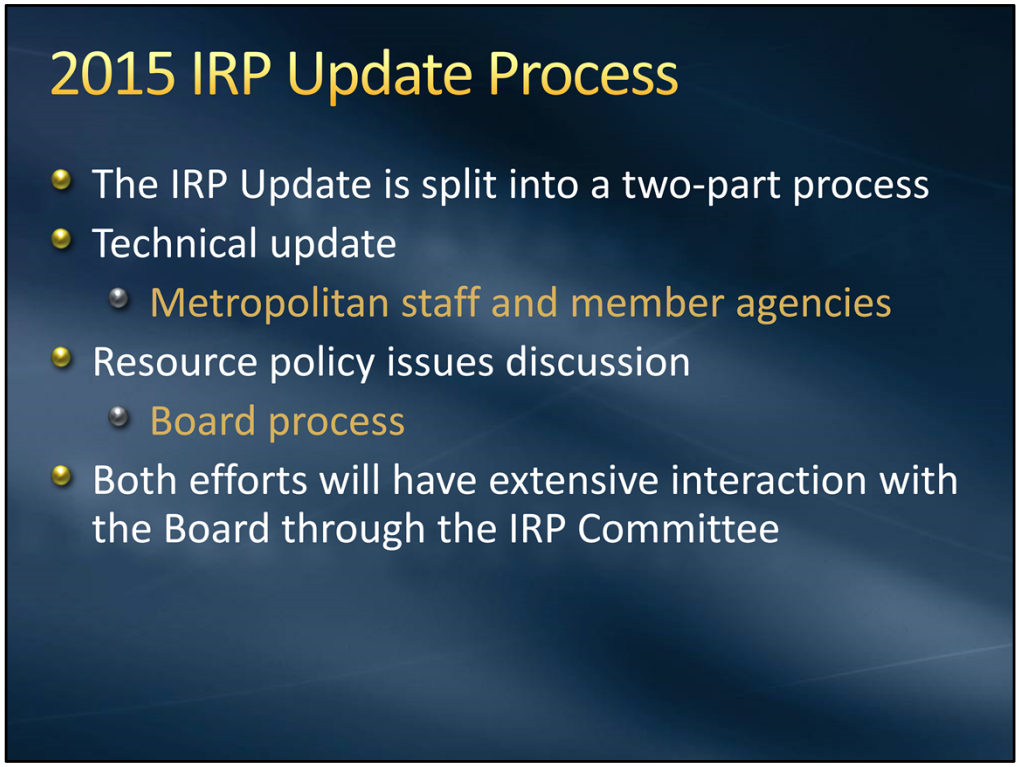


Water Use Efficiency
Conservation and recycling to achieve a 20% reduction at the regional level
Commitment is above and beyond 20x2020 legislation

Local Resources
Sought to develop just over 100 TAF of additional local supplies through groundwater recovery, seawater desalination, and recycling

State Water Project
Pursue short, mid, and long-term improvements to help stabilize delta supplies
Short-term examples: emergency preparedness actions, Complete BDCDP
Mid-term examples: Implement BDCP, implement flood control protection
Long-term examples: Water supply conveyance, ecosystem restoration

Colorado River
Continue to develop dry-year supply programs on the Colorado River System
Provide flexibility in conjunction with Lake Mead ICS to provide a full CRA as needed

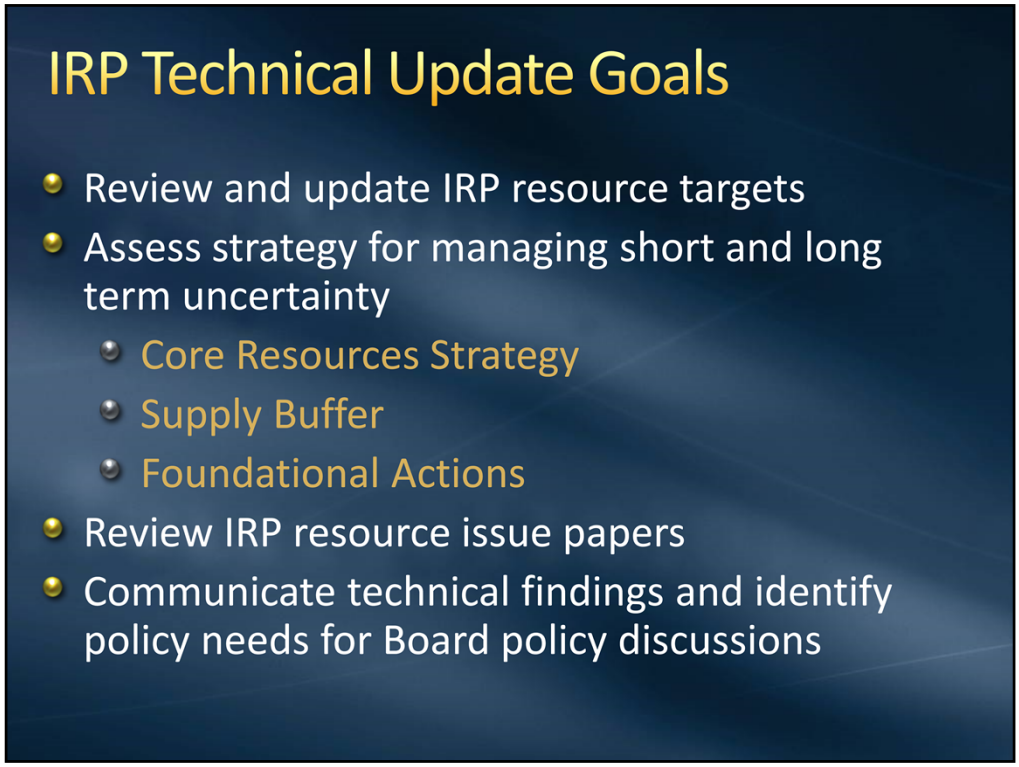


Staff is proposing that IRP Update be completed in a two phase process

The first phase will be a Technical Update of the IRP
- This effort would largely involve metropolitan staff and member agencies
- I will show you a proposed schedule at the end of the presentation

The second phase of the update would begin following completion of the Technical Update
- This effort would largely be a board process to discuss policy issues
- And would be fed by discussions raised in the technical process

Both phases will have extensive interaction through the IRP subcommittee
- **???**



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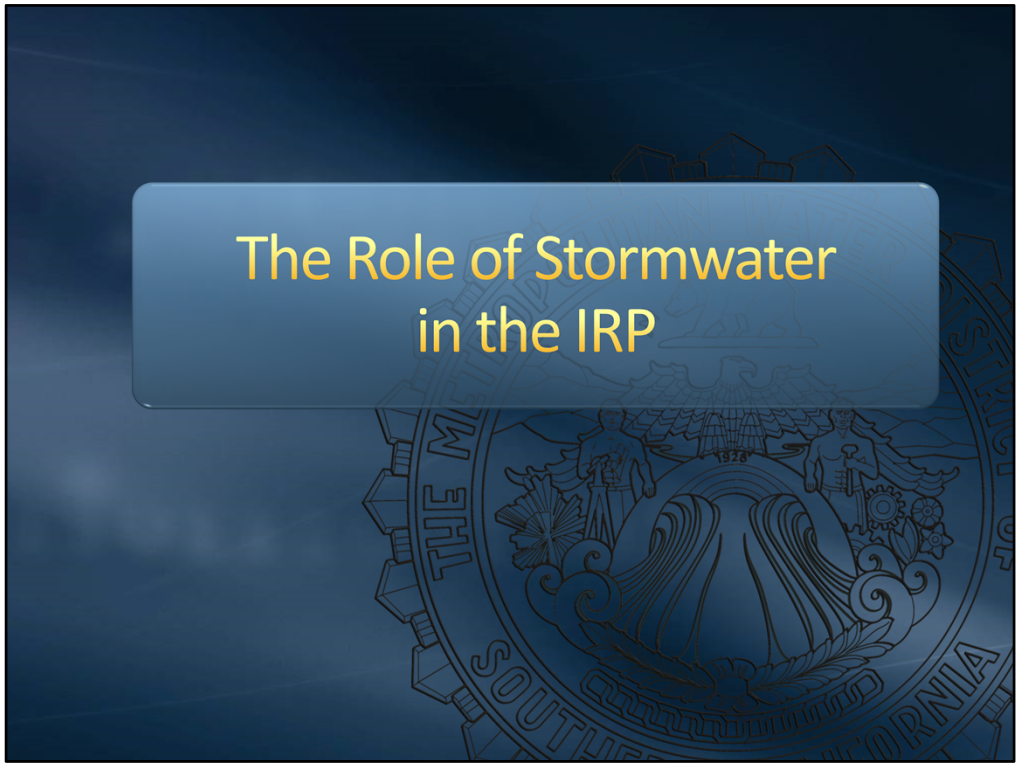
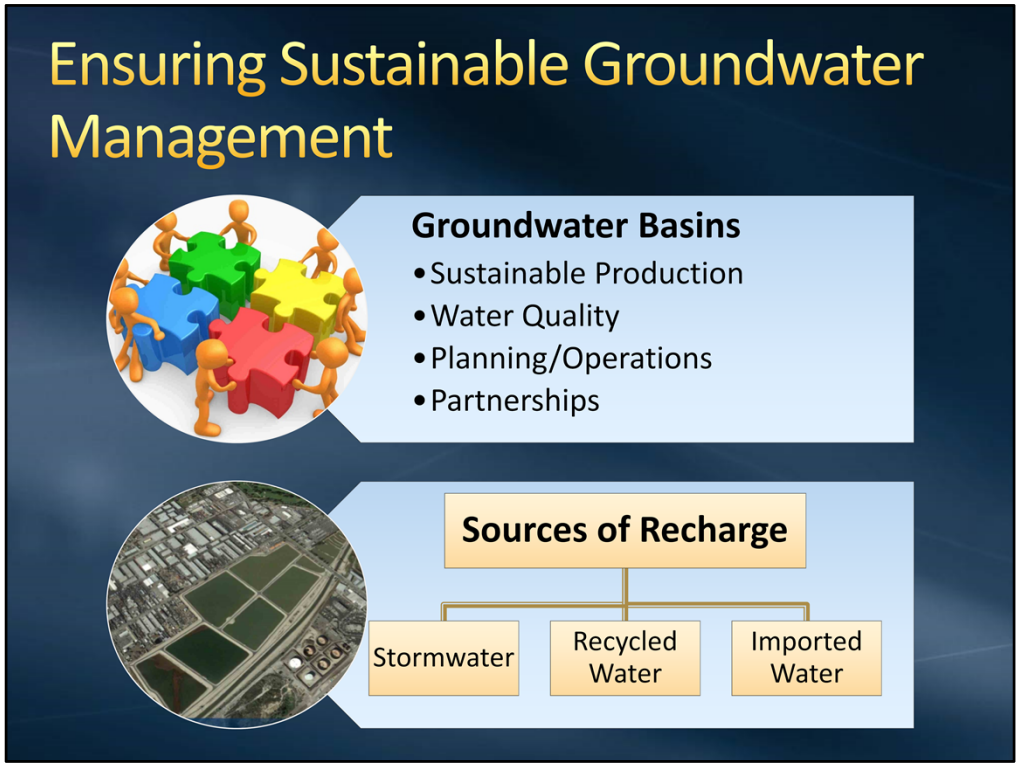

The Role of Stormwater
in the IRP



Check if the bullet items still make sense, or should be adjust them

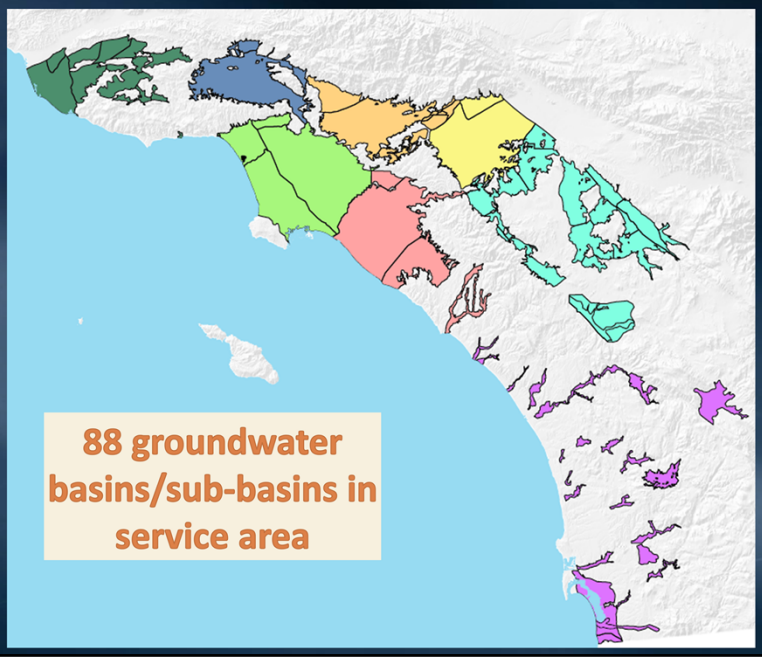
Precipitation, Stormwater, and Groundwater are Closely Related

- Precipitation provides natural/passive recharge of groundwater basins
- Water agencies have worked together for many decades to infiltrate stormwater for GW recharge
- On average, passive and active GW recharge of precipitation (stormwater) supports at least ¾ of GW produced in Metropolitan's service area
- Active recharge of recycled and imported water comprise the balance of recharge water

Stormwater Capture Supports Groundwater Production

- Active Stormwater Recharge
  - 470 TAFY average annual stormwater recharge (1986-2005)
  - High: 1.06 MAF in 2005
  - Low: 177 TAF in 2013
- Estimated Average Passive Stormwater Recharge ~ 750,000 AFY
- Average Precipitation ~ 15.2 inches/year

Groundwater Basins in MWD Service Area



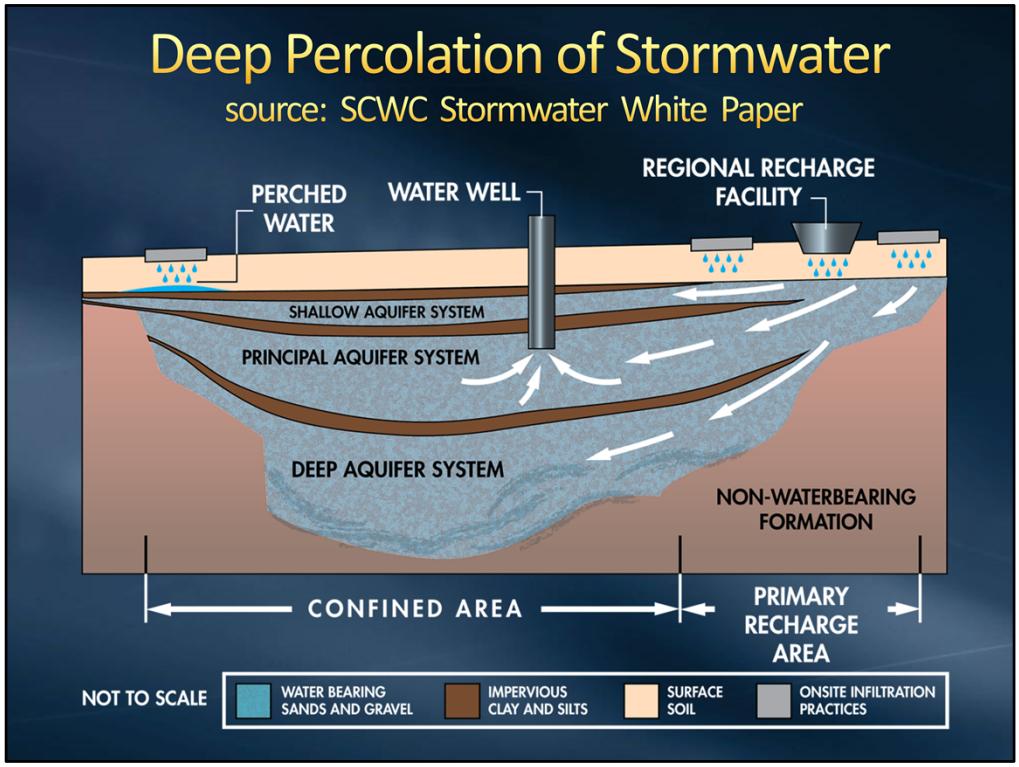
88 groundwater basins/sub-basins in service area

Can Stormwater do More for Water Supply?

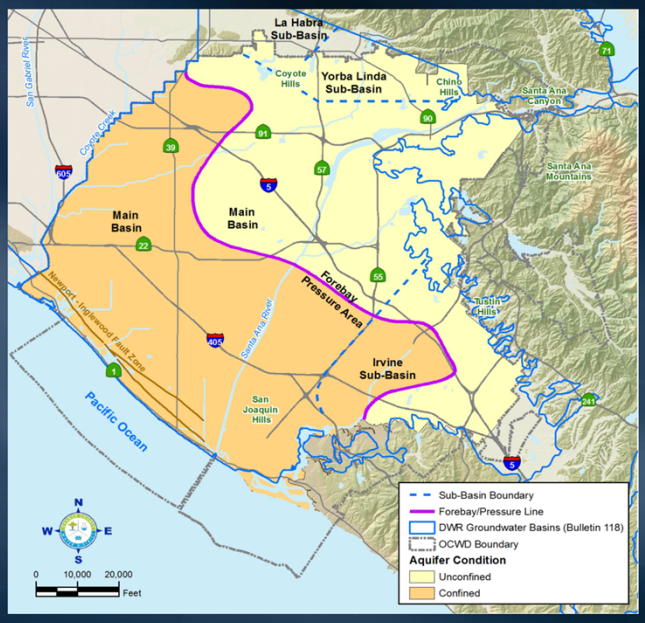
- Groundwater recharge
- Surface water supplies
- How do we quantify the water supply benefit ?
  - What is the actual offset of imported water achieved?
  - Not all infiltrated AF are equal

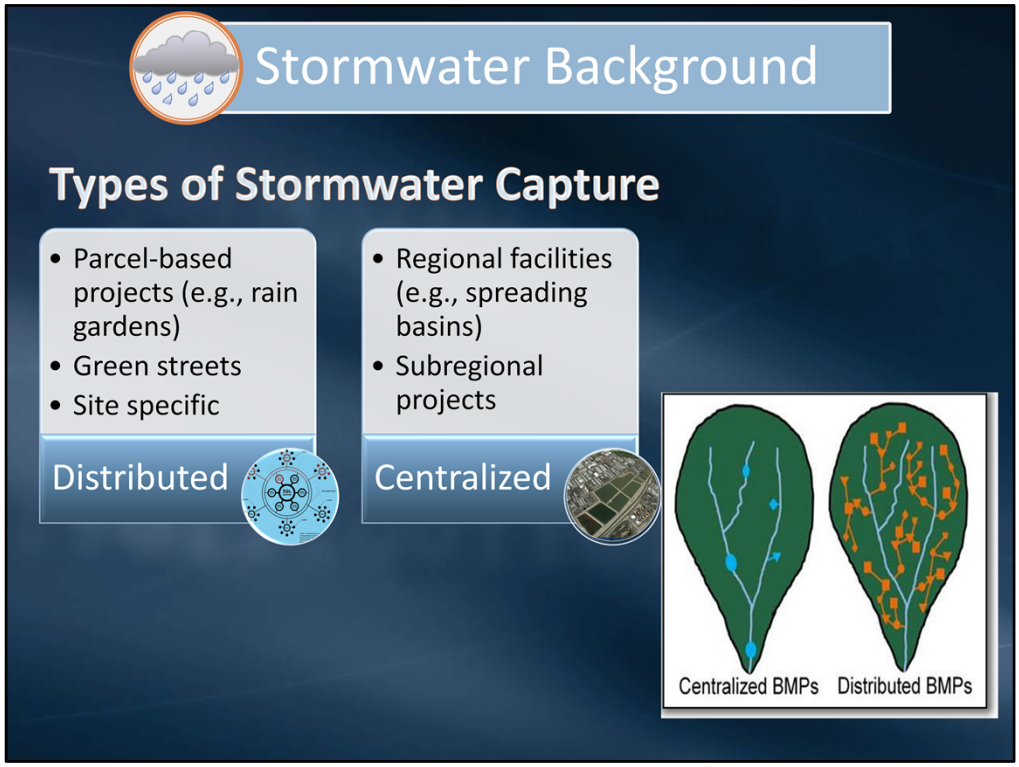
Deep Percolation of Stormwater

source: SCWC Stormwater White Paper



Recharge is Effective in Forebay





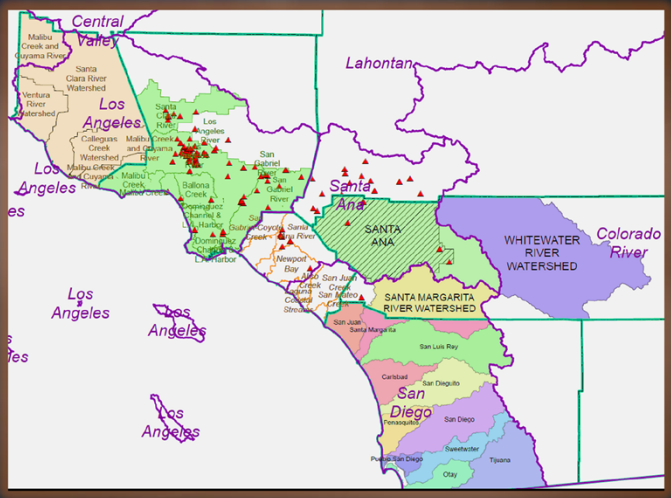
Active recharge (not talking about passive)
Talking about recharge (not direct use for now)

Stormwater Data is Preliminary

- Data are from multiple sources
- Methodologies for estimating costs and capture are not standardized
- Actual costs and capture quantities have not yet been verified
- Relationship between captured stormwater and water supply yield varies
  - Site suitability for recharge
    - Soils and geology
    - Absence of contamination
  - Quantity of infiltration at site

Sources of Stormwater Data

81 Identified Projects



- Central Orange County
- N. Orange County IRWMP
- Ventura County
- Upper Santa Clara IRWMP
- SAWPA
- GLAC IRWMP
- San Diego IRWMP
- MWD IRP
- IEUA
- Riverside FCD

Source: SCWC, 2014

Summary of Stormwater Recharge Project Costs: 81 Identified Projects

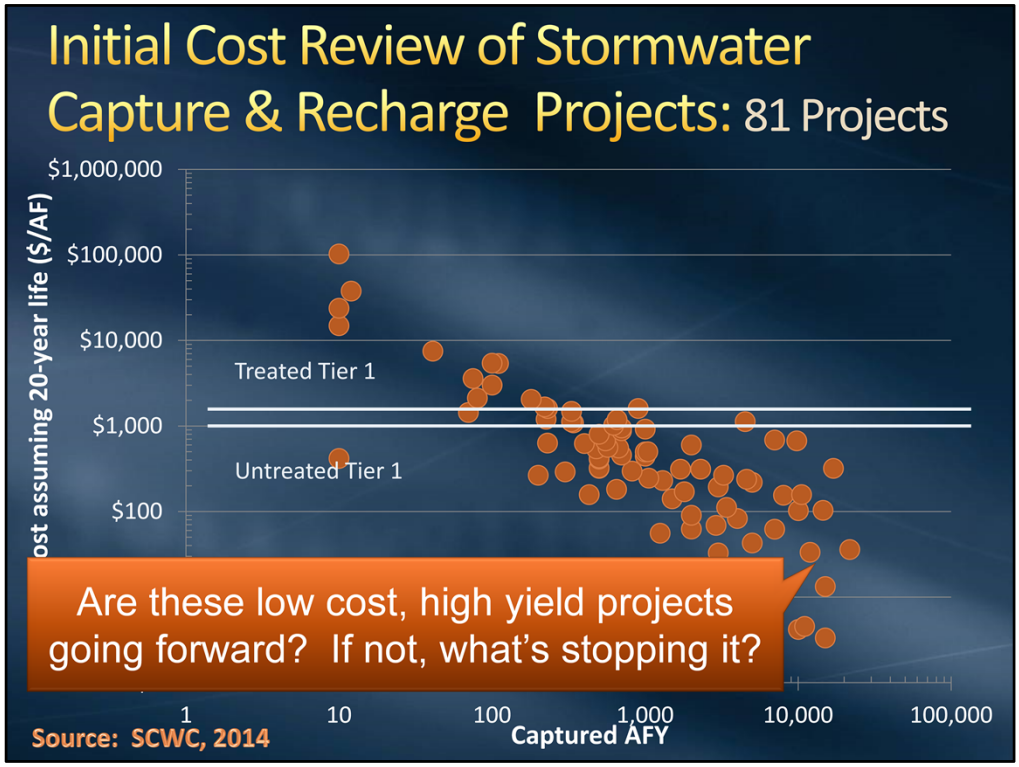
Total Cost (all projects)

- Total Capital Cost ($800M-1.2B)
- O&M Cost ($10-$15M/yr)
- Median $/AF ~$450/AF

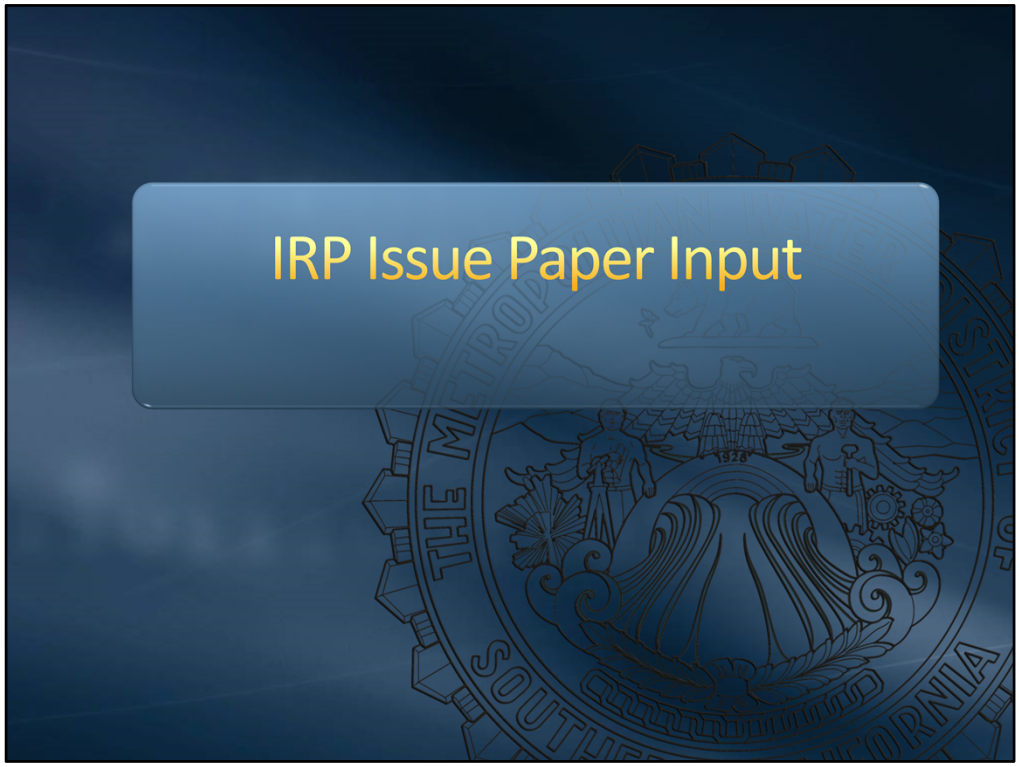
Yield (all projects)

- Average Annual 200-300 TAFY
- Median yield ~1,000 AFY per project

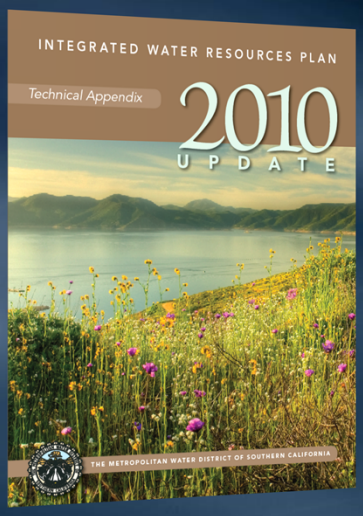
Note: Cost and yield calculation methodologies vary



Example: sediment removal, environmental impacts? Capital funds?
D. Pettijon: LRP program that will help facilitate program…never had anything like that in stormwater (how to evaluate and if region should facilitate)
Need regional leadership…right now, MWD not involved in
Harvey: offset imported water sales (current LRP), does it translate into an offset into …why not
D.P. based on yield…how would you evaluate the yield of a stormwater project of some stripe…would have to all agree upon the yield calculation of a stormwater project
KK: done stormwater capture for decades on a large scale. Now looking at some smaller projects or expand existing projects…how much actually makes it to the water table..perched water, suched a diffused way that doesn't make it to the table
Then institutional…gw rights, and unless rights increase, it it considered new yields or just maintaining exisiting yields
Hard o measure…addl amount that can pump the gw basin?
Xx: environmental laws gotten so bad over couple decades, impediment (hard to do projects in river beds, watershed)
Benefit/cost ratio…not sure how often going to rain…convince board that worth-while project based on cost/benefit
Winter time, can capture more stormwater, in summer time, can get MWD water
Henry: peak flows wipe out riparian environment …framing of where want to evaluate it
Doesn't necessarily translate into water can sell…how to monetize benefit of stormwater capture…unless water that we can sell and have direct benefits to ratepayers…barrier
DP: evaluate recharge on a case-by-case basis…can tell…gotta build a project in the right places
Hydrologically dependent, doesn't see difference with recycled water, can calculate (certainly isn't zero)
Goals for IRP (1.3 MAFY)…not a whole lot of tools in the toolbox, stormwater is one to facilitate groundwater levels
Some gw basins give a 1:1 credit, others support safe yield, others excess credits may be freed up by stormwater recharge
Don't turn back on stormwater just cuz not a straightforward…start to run out of things that can do
This round of IRP, issue that should try to address and c how to regionally support project…go thru process to see if make sense to regionally support

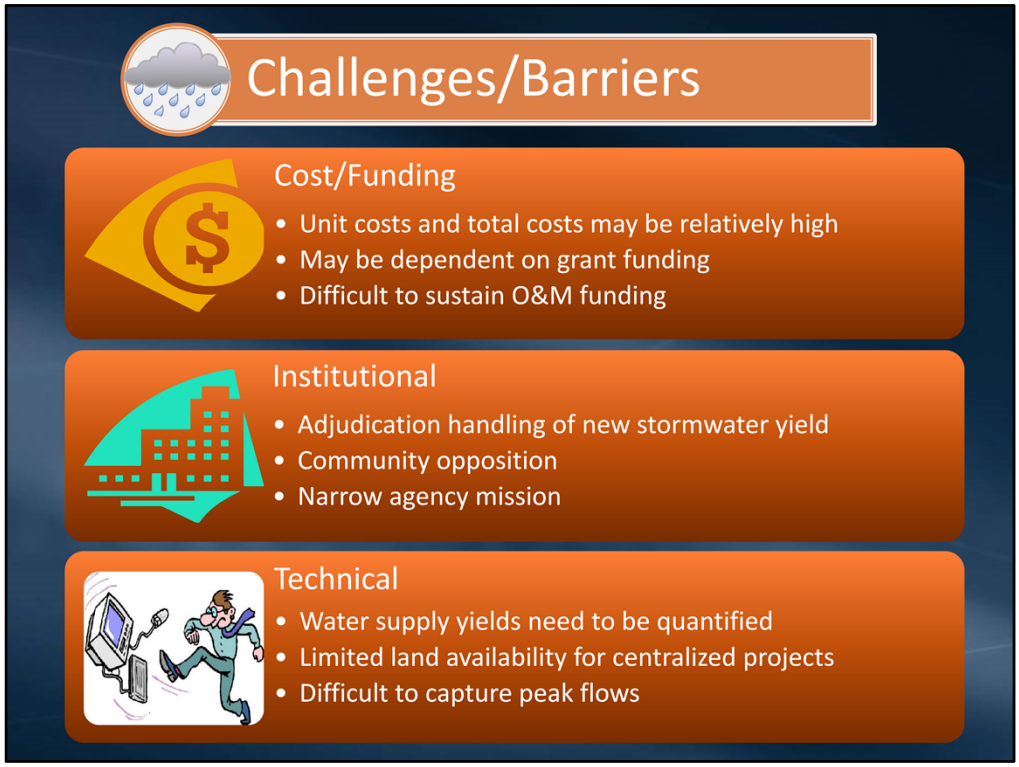

IRP Issue Paper Input

IRP Issue Paper Topics



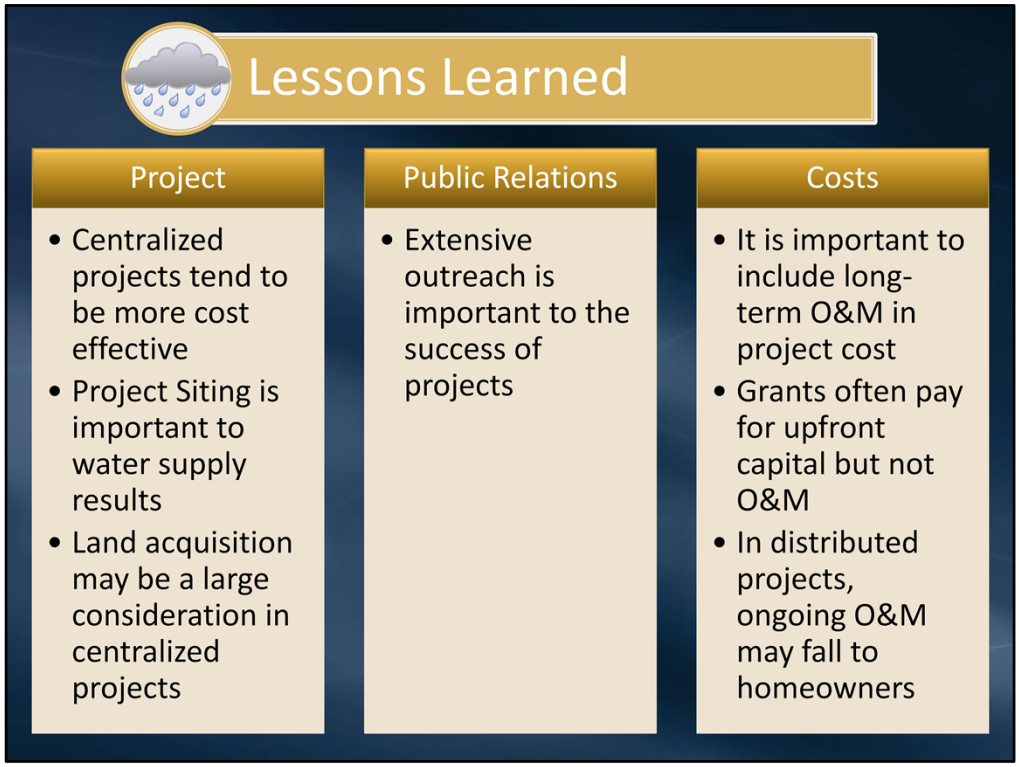
- Conservation
- Groundwater
- Recycled Water
- Seawater Desal
- Stormwater
- Graywater
- Synergy

Also have flagged (and will continue to flag) policy items, which we will go through at the end



Statement about unit cost may contradict the next slide on the costs
Variable hydrology and limited storage? Army Corps dams, etc. Peak flows attenuation

Reimbursable services agreements (adopted by MWD in 2014) **see previous note**
Elmer Avenue



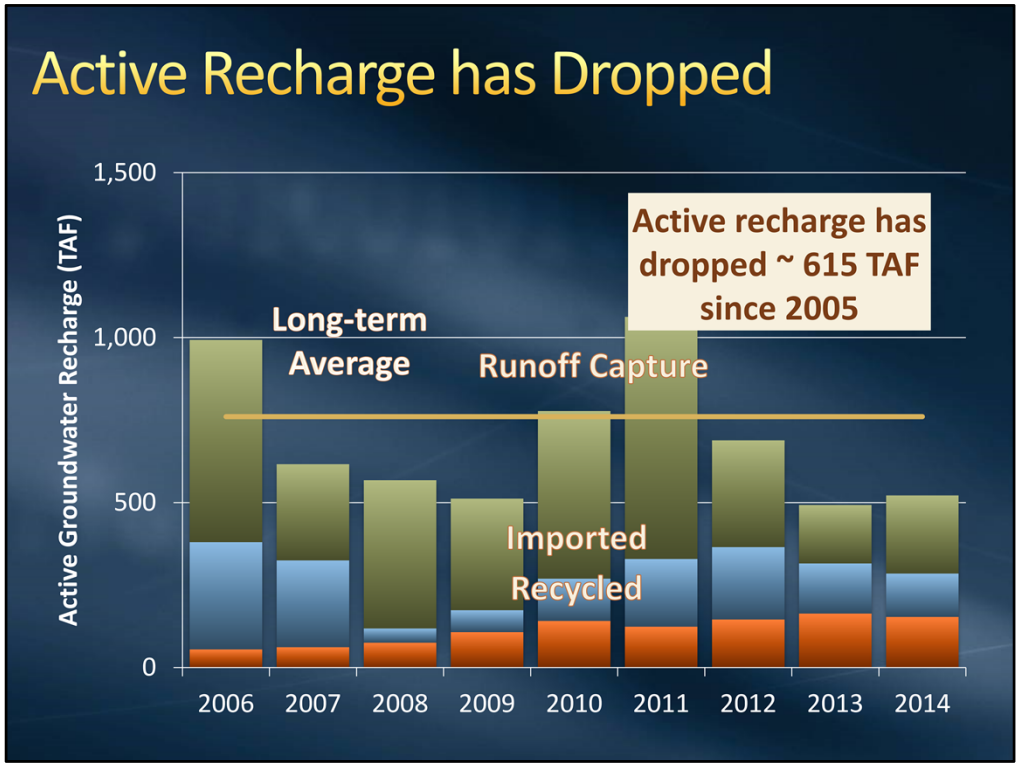
Centralized more cost-effective than distributed
Capture and infiltrate more effective than direct-use (this comment seems more like an opinion)

Xxx: All dams in so cal, prado dam filling up with silts
Kk: run trucks night and day for decades to beat the inflow

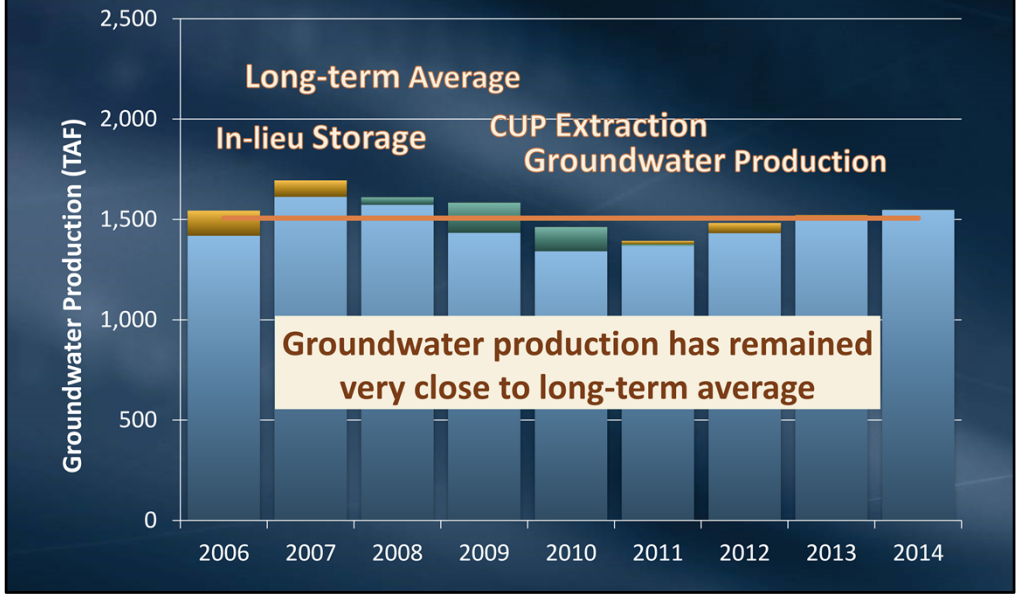
Key Takeaways

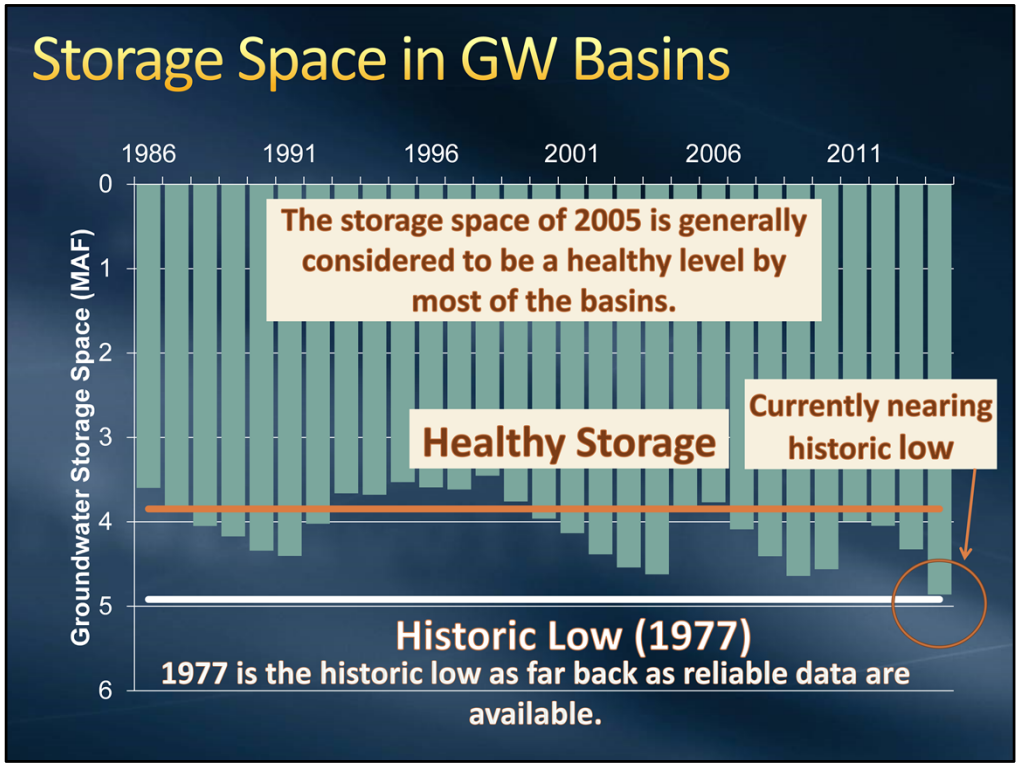
- Ensuring sustainable groundwater management is a fundamental element of the IRP
  - Stormwater plays an important role in maintaining sustainability into the future
- The IRP Issue Paper input includes recommendations for stormwater
  - Review stormwater inventory and cost data
  - Do additional studies on regional benefits and groundwater yields
  - Develop criteria for funding or incentive programs


THE METROPOLITAN WATER DISTRICT OF
SOUTHERN CALIFORNIA


Active Recharge has Dropped
Active Groundwater Recharge (TAF)
1,500
1,000
500
0
2006
2007
2008
2009
2010
2011
2012
2013
2014
Active recharge has dropped ~ 615 TAF since 2005
Long-term Average
Runoff Capture
Imported
Recycled

Groundwater Production has Remained Stable




Storage Space in GW Basins
1986
1991
1996
2001
2006
2011
0
1
2
3
4
5
6
Groundwater Storage Space (MAF)
The storage space of 2005 is generally considered to be a healthy level by most of the basins.
Healthy Storage
Currently nearing historic low
Historic Low (1977)
1977 is the historic low as far back as reliable data are available.

OC infiltration constraint map