Climate Change and Water in Greater LA

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Loss of Snow

Change in SWE, April 1, 2081–2100
BUSINESS AS USUAL

Sun et al. 2019
Adaptation Is Necessary
Snow at April 1

- **Business as Usual**
  - Mid-century 2041-2060: 70%
  - End-century 2081-2100: 36%

- **Mitigation**
  - Mid-century 2041-2060: 80%
  - End-century 2081-2100: 70%

Sun et al. 2019
Earlier Shift in Runoff Timing

Baseline 1981-2000

Runoff Midpoint

End of Century 2081-2100

Runoff Midpoint

Schwartz et al. 2018
Snowpack Severely Impacted During Drought

Berg and Hall 2017
What Happens During a Wet Year?

Huang et al. 2018

[Graph showing precipitation data for historical data, natural conditions, and business as usual over the period 2016–2017]
2016–2017 was an extremely wet year in California. It produced a magnificent super bloom. The abundant wintertime rain also stressed dams.


https://www.hcn.org/articles/photos-superbloom-in-california

By William Croyle, California Department of Water Resources
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More Extremely Dry Years Like 1976–1977

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More Extremely Dry to Extremely Wet Years: “Whiplash”

March 2015

5% of average snowpack
More Extremely Dry to Extremely Wet Years: “Whiplash”

March 2015: 5% of average snowpack
March 2016: 87% of average snowpack
More Extremely Dry to Extremely Wet Years: “Whiplash”

Whiplash events could be up to 2x more frequent by late-century

5% of average snowpack

87% of average snowpack
Water Resource Impacts

Imported water

• Most water in the LA region is imported from the Sierra and the Colorado River.

• Sierra snowpack is a key component of the water storage system.

• Diminished snowpack means there’s less springtime/summer snowmelt to keep reservoirs replenished.

• Earlier pulses of runoff are great challenges to water managers, who are trying to store as much water as possible in reservoirs while also preventing floods.

• Increased dry and wet extremes add to these challenges.
Water Resource Impacts

Local water

• Local water is currently an underutilized resource. Water managers are trying to make greater use of it through stormwater capture and other efforts.

• Increased extremes make stormwater capture more difficult.

• More frequent and intense wet extremes increase the risk of local flooding.

• Hotter temperatures increase water demand of agriculture and landscape vegetation.
A broader discussion of climate change impacts is available in the CA 4th Assessment’s chapter on the LA region: www.climateassessment.ca.gov/regions
More Manageable Changes Under Mitigation

Snow at April 1

- Historical Data
- Business as Usual
- Mitigation

Baseline 1981-2000

100%

36%

70%

End of Century 2081-2100

Sun et al. 2019