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NCA5 Third Order Draft Public Review

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Comment

This is a very powerful figure that clearly demonstrates that there is an increasing trend in the freque

Please explain or reference why RCP4.5 is shown instead of RCP8.5. Please explain whether RCP4.5 is s

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For the Colorado River basin in the Southwest, soil moisture in both the summer (monsoon indicator) and fall (initial conditions for water year hydrology model used by Colorado River Basin Forecast Center) are important indicators of that water year's expected runoff efficiency. It would be really useful for the southwest, and other snow-dominant water supply systems to have a figure of the fall soil moisture condition projections. Recognizing that the authors have very strict word count limitations, the authors could potentially include the fall soil moisture projection graph in the Appendix 4: Indicators chapter.

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Please update the text to reflect 1980-2022 because when going to the NCEI website, the dollar amou

Considering this chapter's word count limit, it seems many words are dedicated to this figure. Is there a way to include the level descriptions in the figure instead of spelled out in the text?

AMWA and WUCA suggest adding another reference to the "water conservation and reuse" management topic. While Chang et al. 2018 supports the increased uncertainty, SNWA 2019 provides specific conservation tactics to address greater uncertainty between supply availability and demand. This reference is a useful resource for water managers looking for tools to increase conservation. https://www.snwa.com/assets/pdf/reports-conservation-plan-2019.pdf . Alternatively, you could consider referencing EPA's best management practices, https://www.epa.gov/watersense/best-management-practices.

Here are some suggestions to improve clarity on this figure: Although this chapter is nation-wide, for

In water stressed regions, a significant data gap is actual consumptive water use information, whether estimated using diversions or water orders, or via metering for municipalities, which is not mentioned by the authors in this chapter. Additionally, implementing updated water use information in planning models is also behind. See Ch 3 in Lukas, Jeff, and Elizabeth Payton, eds. 2020. Colorado River Basin Climate and Hydrology: State of the Science. Western Water Assessment, University of Colorado Boulder. DOI: https://doi.org/10.25810/3hcv-w477.

The authors should consider changing "further stress existing" to "exacerbate" to make the language more concise.

The California coast is certainly an important topic. To make this section more applicable to southwest states beyond California, the authors could frame this section regarding CA as "adaptation lessons learned to non-coastal southwest communities." If the authors cannot make that change, this section could be reduced by word count to this section to allow more coverage of the topics relevant to the southwest region as a whole.

Is it possible to enlarge the subtext in the figure? It is difficult to read. Same for Figure 28.1.

AMWA and WUCA suggest adding another reference to the statement, "There is improved understanding and modeling of climate change impacts on specific sectors and processes, such as water (Hoerling et al. 2019; Udall and Overpeck 2017." We would add, "Lukas, Jeff, and Elizabeth Payton, eds. 2020. Colorado River Basin Climate and Hydrology: State of the Science. Western Water Assessment, University of Colorado Boulder. DOI: https://doi.org/10.25810/3hcv-w477." This report synthesizes the latest climate change and hydrology research and needs for the Colorado River basin.

The authors should delete "of precipitation" to make the sentence more concise.

The authors should indicate in the caption or on the figure what CMIP and/or scenario are shown.

This image would be more impactful if the left image (a) was from the year 2000 or the start of the Colorado River basin drought.

AMWA and WUCA recommend you change, "Urban and industrial water conservation, recycling, and reuse improvements could support economically productive industries such as microchip manufacturing in the Southwest." to "Urban and industrial water conservation, recycling, and reuse improvements could support watersmart and economically productive industries in the Southwest." Microchip manufacturing has historically been a large water consumer. It's only through implementation of more recent reuse technology that newer plants are using less water.

AMWA and WUCA recommend USGCRP consider adding information about the differing needs for climate change mitigation and adaptation across different built environment sectors in this section and chapter. One important piece of information to add is "Additional sector-based networks exist to help cities understand and connect on climate change adaptation (suggested citation: https://www.wucaonline.org/assets/pdf/WUCA-leading-practices-report-2021.pdf)."

AMWA and WUCA recommend USGCRP mention there are different needs for climate change investment across different built environment sectors in this section and chapter. It is worth mentioning that investment in water sector infrastructure specifically does not meet the estimated needs of the water sector. One assessment estimated the US water sector needs to invest a total of $109 billion per year in water infrastructure over the next 20 years in 2019 dollars to close the water infrastructure gap (https://www.uswateralliance.org/sites/uswateralliance.org/files/publications/The%20Economic%20Benefits%20of%20Investing%20in%20Water%20Infrastructure_final.pdf). Other water sector-specific investment resources that should be highlighted include https://journals.plos.org/water/article?id=10.1371/journal.pwat.0000039, https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/us-water-infrastructure-making-funding-count, https://infrastructurereportcard.org/investing-in-aging-water-infrastructure/.

AMWA and WUCA recommend changing the sentence to read "However, climate change is expected to strain water quantity in many regions and degrade water quality for people and ecosystems" to emphasize early in the chapter that climate change affects both water quality and quantity.

AMWA and WUCA recommend the authors add clarifying citations to the sentence, "But barriers arise from legal and regulatory institutions that have been in place for decades or even centuries, locking in practices that hinder adaptation." Without them, it is unclear which legal or regulatory barriers the authors are referencing.

AMWA and WUCA recommend altering the statement, "The Nation's aging water infrastructure, designed under regulations and standards appropriate to an unchanging climate, is deteriorating and threatening public health" to instead emphasize the need for signficant public investments. As representatives of water utilities, AMWA and WUCA caution against portraying the state of water infrastructure in a tone that instills fears in the public about the safety of drinking water and instead describes how utilities can invest in their infrastructure. Significant investments in upgrading and installing resilient infrastructure will require either funding in the form of increased rates for customers, which threatens affordability of water for many households, or other public funding.

AMWA and WUCA appreciate the inclusion of positive movement on climate adaptation and encourage the authors to include citations on best practices and case studies in this early paragraph of the chapter.

In this Key Message 4.1 section, there are two references to "Many regions (19)" or "Many locations (24). Since most readers will view only the key messages, it would be helpful to eliminate words in other sections and add in parentheses or following the words the regions that are included.

In the "Disproportionate Impacts" section or elsewhere in the chapter, it would be useful to mention that utilities investment in their water infrastructure often requires ratepayer increases (barring grants or other complete subsidies), which harm low-income customers the most. 20% of U.S. customers pre-pandemic experienced paying water bills that exceeded 4.5% of their income, a target the EPA considers unaffordable. A citation demonstrating this is McKinsey & Company. Exhibit 3. 2021. US water infrastructure: making funding count. https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/us-water-infrastructure-making-funding-count.

AMWA and WUCA caution against portraying the state of water infrastructure in a tone that instills fears in the public about the safety of drinking water. Instead, AMWA and WUCA recommend rephrasing the sentence to emphasize that aging infrastructure without significant investment increases the risk of delivering affordable drinking water.

The authors should include citations to substantiate the claim that "progress is difficult, in part because regulations, codes, and standards involve competing interests and often span multiple jurisdictions." It is difficult to know which regulations are included. Additionally, later parts of the chapter allude to the water rights regime in the Western United States hindering progress and adaptation, but there is no explicit discussion of this or citations demonstrating how the regime hinder adaptation.

It would be worth mentioning there is no central national or regional clearinghouse of publicly available climate and hydrology data available for planners in the water sector.

AMWA and WUCA suggest adding another reference to the "adaptation guidance" topic. Utilities and

ncy of water-related disasters in the US. However, the number of billion dollar "drought" even
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unt in text ($291.1 billion) can not be found in the updated source. NCEI website now states, "T

the purpose of the figure clarity, the authors could clip the US maps either to the western stat

l municipalities across the country are considering how to update their planning and design pra

ts has remained at 1 throughout time (slightly less frequent pre-2000, 11 in 20 years vs. 18 in 2
at mid-century results.
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at mid-century results.
The distribution of damage from U.S. Billion-dollar disaster events from 1980 to 2022 is domina

es or to the Colorado River basin that is outline. As is, it's hard to see the basin outline in the 1

ctices with actionable climate change science and information. A good example of this (and o

22 years). AMWA and WUCA propose the authors add a footnote or qualifier to describe how t

ated by tropical cyclone losses. Tropical cyclones have caused the most damage ($1,333.6 billic

915-1924 left map. Also, the reconstructed flows (bottom) graph have 3 distinct peaks in flow

ne which may be a helpful resource for other water and utility managers) is the Philadelphia W

he drought count differs from other counts, such as tropical cyclones. It's unclear what the cou

on, CPI-adjusted) and also have the highest average event cost ($22.2 billion per event, CPI-adju

from 1906-2016, but it appears that they are not captured in the zoomed in (upper) graph.

/ater Department Climate-Resilient Planning & Design Guidance document (January 2022), acc

ınt reflects. It appears that although multiple basins, states, and other areas have a drought de

ısted). Drought ($327.7 billion, CPI-adjusted), severe storms ($383.7 billion, CPI-adjusted) and i

:essible here: https://water.phila.gov/pool/files/climate-resilient-guidance.pdf

eclared in a given year, the count reflects an amalgamation of basins and/or states?

nland flooding ($177.9 billion, CPI-adjusted) have also caused considerable damage based on t

:he list of billion-dollar events."

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