

Fifth National Climate Assessment

Errata

Last updated June 6, 2024

All changes listed below have been included in the English-language versions of the report. (Updates will not be reflected in the Spanish-language PDFs, except as noted below).

Errors

Chapter 1: Overview

- The caption for Figure 1.7 was revised to note that Florida has the highest total damages for the 2018–2022 period, as shown in the figure, while Texas has the highest damages over the period of record for the dataset. This text:

“During this period, Texas had the highest total damages (\$375 billion); Florida experienced the highest damages from a single event—Hurricane Ian (\$113 billion).”

was replaced with the following:

“During this period, Florida had the highest total damages (\$140 billion) and experienced the highest damages from a single event—Hurricane Ian (\$113 billion). Over the 1980–2022 period, Texas had the highest total damages (\$375 billion).”

Implemented 12/21/2023. Included in Spanish PDF.

Chapter 2: Climate Trends

- The US Caribbean was incorrectly included in a sentence noting regions with observed decreases in average annual precipitation, which was based on an earlier version of Figure 2.4. The final version of Figure 2.4 shows a small increase in average annual precipitation for Puerto Rico. The sentence in the paragraph preceding the figure has been changed from:

“Hawai’i (Ch. 30), the Caribbean (Ch. 23), and parts of the Southwest (Ch. 28) are getting drier (Figure 2.4), recording average annual precipitation decreases between 10% and 15% over the same time period.”

to read:

“Hawai’i (Ch. 30) and parts of the Southwest (Ch. 28) are getting drier (Figure 2.4), recording average annual precipitation decreases between 10% and 15% over the same

time period.”

Implemented 12/21/2023. Included in Spanish PDF.

Chapter 19: Economics

- The Mexico–US migration projection in Table 19.1b was revised to +0.7 (*) million and +3.2 million (***) from +1.4 million (*) and +6.7 million (***) for the intermediate (*) and very high (***) scenarios, respectively. This correction was made to account for a comment pointing out an error in the cited study. In the revised analysis, the negative relationship between crop yields and migration is found to be robust only for rural Mexican states, instead of for the whole country. The NCA5 authors thus multiplied the estimated response of migration to climate-driven crop yield reductions by the population of the rural states rather than the population of the whole country to obtain the corrected estimates. Two citations related to the issue with the original study were also added:

Auffhammer, M. and J.R. Vincent, 2012: Unobserved time effects confound the identification of climate change impacts. *Proceedings of the National Academy of Sciences*, 109 (30), 11973-11974. <https://doi.org/10.1073/pnas.1202049109>

Feng, S. and M. Oppenheimer, 2012: Applying statistical models to the climate–migration relationship. *Proceedings of the National Academy of Sciences*, 109 (43), E2915-E2915. <https://doi.org/doi:10.1073/pnas.1212226109>

Implemented 1/18/2024. Included in Spanish PDF.

Chapter 21: Northeast

- The first sentence of the paragraph preceding Figure 21.1 was corrected to insert a citation that was missing and to clarify references to relevant figures. The changes are shown below (bold for additions, strikethrough for deletions):

Precipitation in the Northeast has increased in all seasons (Figure ~~21.1~~**2.4**),²⁹² and extreme precipitation events (defined as events with the top 1% of daily precipitation accumulations) have increased by about 60% in the region—the largest increase in the US (Figure 2.8; **see also Figure 21.1**).

Where the added citation number 292 is: Huang, H., J.M. Winter, E.C. Osterberg, R.M. Horton, and B. Beckage, 2017: Total and extreme precipitation changes over the northeastern United States. *Journal of Hydrometeorology*, **18 (6)**, 1783–1798. <https://doi.org/10.1175/JHM-D-16-0195.1>

Implemented 2/29/2024. Included in Spanish PDF.

- The caption and online metadata for Figure 21.1 were updated to provide more detailed information about the methodology used to construct the figure. The revisions to the

caption are shown below (bold for additions, strikethrough for deletions):

FIGURE 21.1. The four charts show the number of ~~days~~ **daily events** per year with precipitation totals equal to or exceeding 2, 3, 4, and 5 inches, ~~respectively (blue lines)~~, from 1958–2022 (blue lines), along with trend lines (black) computed from linear regressions over the full period. Numbers in the top left corner show **the percent increase relative to the long-term average**, ~~percentage change computed as the difference between the end points of the trend lines~~ **divided by the 1958–2022 average**. ~~compared to the long-term average over the years shown. The number of days is interpolated from gridded weather station observations across the Northeast. The number of daily events is defined as the total number of extreme precipitation accumulations recorded at all stations across the observing network in the Northeast. See the figure metadata for details on the methodology.~~ The trends shown suggest an increase in the frequency of extreme precipitation, with larger increases for the more extreme precipitation events. Figure credit: USDA Forest Service, Drexel University, NOAA NCEI, and CISESS NC.

Implemented 2/29/2024. Included in Spanish PDF.

- For Figure 21.9, a production issue resulted in several counties with a take-up rate of 5%–10% being displayed with the color used for the 10%–50% take-up rate. The map has been corrected and updated with a more accessible color scheme.

Implemented 3/14/2024. Included in Spanish PDF.

- In the narrative section for Key Message 4, New Hampshire was deleted from a list of states in the region with emissions reduction laws, by changing the sentence:

“Eight states in the region (ME, NH, VT, MA, RI, CT, NY, and NJ) have laws requiring emissions reductions of at least 80% by 2050 (usually against a 1990 baseline).”

to read:

“Seven states in the region (ME, VT, MA, RI, CT, NY, and NJ) have laws requiring emissions reductions of at least 80% by 2050 (usually against a 1990 baseline).”

Implemented 11/14/2023. Included in Spanish PDF.

- Table 21.1 documents activities since 2018, but, to maintain consistency with an existing caveat noting New Hampshire has a pre-2018 climate action plan, a note and citation have been added indicating that Washington, DC, has a pre-2018 climate impact assessment.

Implemented 12/21/2023. Included in Spanish PDF.

Chapter 23: US Caribbean

- A statement about precipitation trends in the region was clarified by changing the sentence that read

“No clear trend is detected in seasonal or annual average rainfall over PR.”

to read as follows:

“No clear **long-term** trend is detected in seasonal or annual average rainfall over PR, **although Figure 2.4 does show a small increase (less than 5%) in Puerto Rico in 2002–2021 compared to the 1901–1960 average.**”

Implemented 1/18/2024. Included in Spanish PDF.

Chapter 26: Southern Great Plains

- Figure 26.5 was incorrectly labeled and described as showing methane concentrations rather than methane mixing ratios. The figure was updated with revised labeling, and text in the paragraph preceding the figure and in the figure caption was revised to more accurately and clearly describe the information presented in the figure and to clarify that the data shown were for the period May 2018 to March 2019.

The original text read:

(text before figure) The Permian Basin leaks the largest amount of methane per year from any US gas-producing region (Figure 26.5), an amount sufficient to supply natural gas to 7 million Texas households annually.⁷⁰

(Figure title) Methane Emissions Across the Permian Basin (May 2018 and March 2019)

(Caption) **Figure 26.5.** The maps show satellite-measured methane emissions (in parts per billion in volume [ppbv]) across (a) the contiguous United States and (b) the Permian Basin (black box and inset map), averaged during May 2018 and March 2019. Darker shading represents higher methane emissions; missing data are shaded white. (The original published source did not include data for Alaska, Hawai'i and the US-Affiliated Pacific Islands, and the US Caribbean.) Natural gas operations in the Permian Basin leak a large volume of methane, contributing to atmospheric warming. Adapted from Zhang et al. 2020⁷⁰ [CC BY-NC 4.0].

The revised text reads:

(text before figure) Natural gas operations in the Permian Basin leak the largest amount of methane per year from any US gas-producing region, an amount sufficient to supply natural gas to 7 million Texas households annually.⁷⁰ Atmospheric methane

concentrations are high across the Permian Basin as compared to the rest of the US (Figure 26.5) and are attributed primarily to natural gas production.⁷⁰

(Figure title) Methane Across the Permian Basin (May 2018–March 2019)

(Caption) **Figure 26.5.** The maps show satellite-estimated methane mixing ratio (in parts per billion by volume [ppbv]) across (a) the contiguous United States and (b) the Permian Basin (black box and inset map), averaged from May 2018 to March 2019. Mixing ratio is a measure of the concentration of a gas such as methane in the air. Darker shading represents higher methane mixing ratios; missing data are shaded white. Accounting for atmospheric transport, the spatial pattern of methane mixing ratio across the basin is closely associated with gross (before processing) natural gas production and, to a lesser extent, with oil production. (The original published source did not include data for Alaska, Hawai'i and the US-Affiliated Pacific Islands, and the US Caribbean.) Natural gas operations in the Permian Basin leak a large volume of methane, contributing to atmospheric warming. Adapted from Zhang et al. 2020⁷⁰ [CC BY-NC 4.0].

Implemented 1/11/2024. Included in Spanish PDF.

Chapter 27: Northwest

- A sentence in the caption for Figure 27.2 was revised to more clearly indicate it referred to surface temperatures and to add a missing citation. The sentence that read:

“Residents are disproportionately exposed to extreme heat in these areas, where temperatures are up to 13°F warmer than the city’s average surface temperatures.”

Now reads:

“Residents are disproportionately exposed to extreme heat in these areas, where **surface** temperatures are up to 13°F warmer than the city’s average surface temperatures.⁶⁸”

Implemented 4/4/2024. Included in Spanish PDF.

Chapter 30: Hawai'i and US-Affiliated Pacific Islands

- The bottom two panels of Figure 30.4, showing projected changes for Honolulu, Hawai'i, and Apra Harbor, Guam, were plotted with 17th-percentile values rather than the intended 50th-percentile values. Those two panels on the figure have been updated with charts showing 50th-percentile values.

Implemented 12/21/2023. Included in Spanish PDF.

- The figure credits for Figure 30.4 were corrected to reflect the fact that this is an original figure developed for NCA5 rather than an adapted figure. The credit was changed from:

“Adapted from Sweet et al. 2022.⁶⁵”

to read

"Figure credit: US Geological Survey, University of Guam, Arizona State University, and NASA Jet Propulsion Laboratory."

Implemented 1/18/2024. Included in Spanish PDF.

Chapter 32: Mitigation

- The y-axis label for panel (a) of Figure 32.16 was corrected to read “Cubic meters per gigajoule” rather than “Gigajoules per cubic meter.”

Implemented 12/21/2023. Included in Spanish PDF.

- The “Vegan” stacked bar shown in panel (a) of Figure 32.12 was corrected to account for an error in the calculation of the “Other (legumes, nuts and seeds, eggs, sugar)” category. The “Other” value was shown as 162.69 million metric tons CO₂-eq whereas the correct value is 25.03 million metric tons CO₂-eq. This correction reduces the total “Vegan” diet emissions to around 300 million metric tons CO₂-eq, which is less than the total emissions of the “Vegetarian” diet (in the previous version of the figure, the “Vegan” diet showed higher emissions than the “Vegetarian diet”).

Implemented 1/25/2024. Included in Spanish PDF.

Copyedits

Report-in-Brief PDF

- Some minor production issues introduced in a December 2023 update were fixed in the version dated March 21, 2024. This included an issue with the header of Figure 1.8 and inconsistencies in the artwork thumbnails in the headers for each chapter section.

Implemented 3/21/2024.

Chapter 1: Overview

- In the top part of Figure 1.6, the text “most of **these** emissions” was changed to read “most of **the** emissions” for clarity.

Implemented 12/21/2023. Included in Spanish PDF.

- A minor production issue with the header of Figure 1.8, which was introduced in a December 2023 update, was fixed.

Implemented 3/21/2024.

Chapter 5: Energy

- Three sentences in the narrative section for Key Message 3 were duplicated in production, beginning with “Modeling advances are improving understanding....” The duplicated sentences have been removed.

Implemented 12/21/2023. Included in Spanish PDF.

Chapter 8: Ecosystems

- A typographical error in the figure intent for Figure 8.1 (the text just below the figure itself) was corrected. It now reads “Climate effects on watersheds exemplify the amplifying impacts of **gradual** and episodic stressors” rather than “Climate effects on watersheds exemplify the amplifying impacts of **graduate** and episodic stressors.”

Implemented 2/29/2024. Included in Spanish PDF.

Chapter 22: Southeast

- On the legend for panel (b) of Figure 22.11, the text in italics was corrected to read "per **100,000** people aged 65 or older" rather than "per **100,00** people...."

Implemented 2/29/2024. Included in Spanish PDF.

Chapter 24: Midwest

- Several of the photo credits for Figure 24.4 were inadvertently omitted. The credits have been changed from:

"Photo credits: United Soybean Board [CC BY 2.0]."

to read:

"Photo credits: (top left; left, second from top) United Soybean Board [CC BY 2.0]; (top center) Carly Whitmore, NRCS; (top right) ©Elizabeth Hawkins; (right, second and third from top; bottom left) NRCS/SWCS photo by Lynn Betts [CC BY 2.0]; (bottom right) Carly Whitmore, NRCS; (bottom center) Kyle Spradley [CC BY 2.0]; (left, third from top) ©Tony Mancuso."

Implemented 12/21/2023. Included in Spanish PDF.

Chapter 28: Southwest

- In the second paragraph of the introduction, a typographical error was corrected, changing “and heat-related **morality**” to read “and heat-related **mortality**.”

Implemented 11/15/2023. Included in Spanish PDF.

Chapter 29: Alaska

- The URL for citation number 19 was corrected from <https://www.seabank.ph/info/annual-report> to <https://thealaskatrust.org/about-seabank>. The full citation now reads:

SeaBank, 2020: SeaBank Annual Report 2020. Alaska Sustainable Fisheries Trust, Sitka, AK, 129 pp. <https://thealaskatrust.org/about-seabank>

Implemented 6/6/2024. Included in Spanish PDF.

Chapter 30:

- The word "Estados" was misspelled in the Spanish PDF for Chapter 30 on the title page and footers. This has been corrected.

Implemented 6/6/2024, only in Spanish PDF.

Chapter 32: Mitigation

- In the caption for Figure 32.11, the description of an acronym used on the figure has been corrected to read “**CO₂ = carbon dioxide**” rather than “**CO₂-eq = carbon dioxide equivalent**.”

Implemented 1/11/2024. Included in Spanish PDF.