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BATAAN MEMORIAL BUILDING
ROOM 101
P.O. BOX 25102
SANTA FE, NEW MEXICO 87504-5102
(505) 827-6160
FAX: (505) 827-6188

March 2, 2026

Mr. Scott Cameron
Acting Commissioner of Reclamation
1849 C Street NW
Washington, D.C. 20240

Sent via electronic mail to crbpost2026@usbr.gov

Re: State of New Mexico's comments on the Draft Environmental Impact Statement for Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead

Dear Commissioner Cameron:

The New Mexico Interstate Stream Commission ("NMISC") provides the following comments on the draft Environmental Impact Statement ("DEIS") prepared by the Bureau of Reclamation ("Reclamation") to evaluate a range of operational alternatives for managing the Colorado River and Lake Powell and Lake Mead after 2026 (the Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead). Several appendices are attached to this letter: Appendix A is list of elements that New Mexico believes Reclamation should include in a Preferred Alternative. Appendix B contains specific comments related to DEIS Resources Analysis and Technical Appendices. Appendix C contains a list of prior comments relating to this EIS process. Appendix D contains technical information to support New Mexico's positions described in specific comments. In addition, the Upper Colorado River Commission ("UCRC") is concurrently submitting comments on this DEIS, which are incorporated herein by reference as well.

Background Information Regarding New Mexico

New Mexico is an Upper Division State. Four Upper Basin tributaries to the Colorado River flow through New Mexico: the San Juan River, the Animas River, the Navajo River and the La Plata River. In addition, a large trans-basin diversion project, the San Juan-Chama project, was authorized by Congress in 1962 and diverts water from the Colorado River Basin in Colorado to supply main population centers and Tribal Nations and Pueblos in the Rio Grande watershed in New Mexico. New Mexico also has water rights in the Lower Basin as documented in the 1964 *Arizona v California* Decree. New Mexico submits these comments in its capacity as an Upper Division State.

New Mexico is apportioned 11.25% of the Upper Basin’s share of the river through the 1948 Upper Colorado River Basin Compact (“1948 Compact”). Major water users in the State are municipal, Tribal, industrial and agricultural, in San Juan County and parts of Rio Arriba, Sandoval and McKinley Counties, New Mexico. New Mexico has long had to adapt to dry hydrology and has developed tools to assist with those efforts, such as the New Mexico Strategic Water Reserve, created in 2005 and expanded in 2025, which allows the New Mexico Interstate Stream Commission to acquire water and water rights to benefit endangered species and for compact compliance. The major municipalities in New Mexico have implemented aggressive municipal water conservation programs and realized a greater than 50% reduction in use per person since 1995 while also experiencing significant population growth. Across multiple sectors, New Mexico has been implementing the Governor’s 50-Year Water Action Plan, published in January 2024, to develop strategies to ensure our communities will have clean, reliable supplies of water in the context of a hotter, drier future with up to 25% less water coming into our State.

New Mexico and the other Upper Division States have a vested interest in the management of the Colorado River, and particularly operations of the four major projects authorized by the 1956 Colorado River Storage Project Act (“CRSPA”): Curecanti (Blue Mesa), Flaming Gorge, Navajo and Glen Canyon Dams.

General Comments regarding the DEIS

Purpose and Need

Some elements in the DEIS are inconsistent with Reclamation’s stated Purpose and Need “to adopt new operating guidelines that provide more robust operating provisions than the current guidelines to address the continued loss of storage and the potential for increasing severity of drought and low runoff conditions.” For example, it is foreseeable, given current hydrologic projections, that Lake Powell levels will drop below minimum power pool (elevation 3,490 feet) in the next 12 months. In March 2024, Reclamation released a memorandum entitled “*Establishment of Interim Operating Guidance for Glen Canyon Dam during Low Reservoir Levels at Lake Powell*” (“LaFond memo”). The LaFond memo established prudent operating guidance for Glen Canyon Dam operations under low reservoir levels and should be considered in the Final EIS along with more realistic initial conditions, as described in New Mexico’s Appendix D.

Repeated use of the Upper Initial Units (“UIUs”) will not increase the stability of the overall system and the existing UIU limitations are not sufficiently analyzed in this DEIS. Any alternative that considers moving water from the UIUs without considering how those reservoirs will be re-filled is not “designed to provide for the sustainable management” of the system, especially considering the current hydrology. See DEIS footnote 2, page 1-2. In addition, Reclamation has not analyzed how releasing large quantities of water from the UIUs could affect the infrastructure at those facilities.

Geographic Scope of the Proposed Federal Action and Affected Regions and Interests

The DEIS defines its geographic scope for the proposed federal action as being from Lake Powell to the Southerly International Boundary (“SIB”) with Mexico. However, New Mexico notes issues

with the application of this scope. For instance, potential releases from the UIUs are considered outside the geographic scope of the DEIS, but the water flowing into Lake Powell because of such releases is included as part of the performance of Lake Powell under all alternatives in the DEIS. If Reclamation includes an analysis of results of a particular action, it should analyze all the effects from such actions as being within the affected environment of the proposed action, even when they do not all fall within the geographic scope of the DEIS.

The DEIS is also inconsistent regarding the analysis of potential impacts. For example, the DEIS includes an analysis of impacts in all the counties in the Lower Division States that are potentially affected by the proposed action even though they are not in the geographic scope of the DEIS. However, the DEIS does not include a similar analysis of affected counties in the Upper Division States. The DEIS covers “counties that receive water from the Colorado River and in which impacts from Colorado River shortages will occur” and therefore should also analyze impacts in all the counties in the Upper Division States that have the potential to be affected by lower river flows in the Dry and Critically Dry Conditions. Likewise, including “counties where tribal reservations affected by Colorado River shortages are located” should be expanded to include all the counties in each state where tribes that receive Colorado River Basin water and hydropower from Glen Canyon Dam are located. The counties that should be included in New Mexico are, at a minimum: San Juan, Rio Arriba, Sandoval, Taos, Santa Fe, Bernalillo, and parts of McKinley Counties. The DEIS should include a balanced evaluation of the impacts of the alternatives between the Upper Basin and the Lower Basin.

Secretarial authority in the Upper Basin

The Secretary of the Interior (“Secretary”) does not have the authority to make and apply legal determinations regarding compliance with the terms of the 1922 Colorado River Compact and only the UCRC and individual Upper Division States are empowered to make determinations regarding how uses of water in the Upper Basin can be limited pursuant to the 1948 Compact. The DEIS contains multiple references to the Secretary retaining authority to operate the UIUs in emergency and exigent conditions without specifying the source(s) of that authority.

Secretarial authority in the Lower Basin

As the water master of the Lower Basin, the Secretary has the authority to make annual surplus and shortage determinations, *Arizona v. California* (1964), and the DEIS should analyze a defensible mass balance for Mead inflows and outflows as a necessary element of managing water in the Lower Basin. The analysis should include restrictions on the use of mainstem Colorado River water below Lake Mead for underground storage without direct recovery infrastructure and mechanisms to address drawdowns.

Specific Comments Regarding Elements in the DEIS

- New Mexico supports a Lake Powell water release rule curve template with Lake Powell releases based on Lake Powell’s elevation only, as considered by Reclamation in the DEIS. New Mexico also supports a conversion of Upper Basin water in an Upper Basin Contribution Pool (“Contribution Pool”) at a ratio of 2 to 1 compared to Lower Basin

reductions when Lower Basin reductions are greater than 1.5 million acre-feet (“maf”). Finally, New Mexico supports the range of additional Lower Basin reductions greater than 1.5 maf provided under the Enhanced Coordination, Maximum Operational Flexibility and Supply Driven Alternatives.

- Under the Supply-Driven Action Alternative in the DEIS, a concept called “Gap Water” is used to deliver water from the Upper Basin into Lake Powell to sustain the prescribed Natural Flow volume and deliver it to the Lower Basin. “Gap Water” is hydrologically unrealistic and has no legal basis. The Upper Division States’ ability to contribute water to Lake Powell from the UIUs is explicitly modeled and therefore, the source of hypothetical “Gap Water” is unclear and should be reconsidered by Reclamation.
- It is unclear whether Upper Basin conservation and releases from the UIUs are added together to provide a total sum for Upper Basin contributions. It is also unclear whether the term “Upper Basin conservation” means conservation created in a specific water year or the cumulative volume of contributions stored in Lake Powell. New Mexico suggests that Reclamation include both Upper Basin conservation and UIU releases for the calculation of Upper Basin contributions. Throughout the Final EIS, Reclamation should substitute the word “contributions” for the word “conservation” when discussing Upper Basin contributions.
- The DEIS should utilize model CRSS v.6 to analyze Upper Basin hydrologic shortages. Hydrologic shortages are reductions in available water supply beyond any administration or regulation that occurs in the Upper Basin. They vary between 0.6 and 2.3 maf per year and average 1.2 maf per year. Hydrologic shortages create real socioeconomic hardships that should be analyzed in the DEIS.
- The other reservoirs in the system besides Lake Powell and Lake Mead (Flaming Gorge, Blue Mesa, Navajo, Mohave, and Havasu) play a very minor role and should not be considered in the Final EIS. Storage potentially available in the UIUs should not be counted as a trigger for operational restrictions or as a mechanism for water for releases to Lake Powell.
- The Congressional intent of Section 602 of the Colorado River Basin Project Act of 1968 was to allow flexibility within the Long Range Operating Criteria (“LROC”) for reservoir operations when implementing the Colorado River Basin Project Act. The Basic Coordination Alternative’s “release volume from Lake Powell would be based on flexible implementation of the LROC and provides for specified releases both above and below 8.23 maf.” DEIS, Ch. 2, 2-14, but the No Action Alternative and the Basic Coordination Alternative use 8.23 maf as a fixed release, contrary to Congressional intent.
- Reclamation is concurrently working on NEPA analyses for the Verde Reservoirs Sediment Mitigation Project and the GSC Farm-Queen Creek Water Transfer in Arizona, which will have impacts to the mainstem of the Colorado River and should be considered in connection with the Final EIS.
- The DEIS does not accurately analyze total water use in both basins (mainstem, tributaries, and evaporation and transit losses). While the DEIS analysis is focused on the mainstem of the Colorado River below Lake Powell, Reclamation should analyze the total water uses in both basins to avoid inappropriate comparisons. For example, evaporation and transit

losses in the Upper Division States are calculated as a use deducted from their apportionments, but Reclamation reports on Lower Basin mainstem uses in the Water Accounting Report, and Lower Basin tributary uses through the Lower Basin Consumptive Use and Losses Report (“CU&L”) separately, and has also conducted an analysis of Lower Basin evaporation and transit losses through a separate report. Appendix D to this comment letter includes a combined analysis by the Upper Division States, using Reclamation’s own published numbers to provide a consistent basis for comparison, which Reclamation should use as a more accurate assessment of Colorado River Basin water uses and losses in the Final EIS.

- The DEIS should consistently refer to the explicit text of the Colorado River Storage Project Act (“CRSPA”) when citing its purpose, specifically: “In order to initiate the comprehensive development of the water resources of the Upper Colorado River Basin, for the purpose, among others, of regulating the flow of the Colorado River, storing water for beneficial consumptive use, making it possible for the States of the Upper Basin to utilize, consistently with the provisions of the Colorado River Compact, the apportionments made to and among them in the Colorado River Compact and the Upper Colorado River Basin Compact, respectively, providing for the reclamation of arid and semiarid land, for the control of floods, and for the generation of hydroelectric power, as an incident of the foregoing purposes, ...” 43 U.S.C. § 620.
- Reclamation owns and operates Glen Canyon Dam and must balance competing federal interests through the DEIS to consider environmental, tribal, hydropower, water supply and recreational interests. As owner and operator of Glen Canyon Dam, it is in Reclamation’s best interest to reduce risks to Lake Powell under all alternatives in the DEIS.
- The Upper Division States proposed a draft alternative to Reclamation in March 2024, which was refined in December 2024. In the January 2025 Alternatives Report and the DEIS, Reclamation concluded that the Upper Division States’ proposal did not “provide an appropriate basis for comprehensive and coordinated operations of Lake Powell and Lake Mead, a necessary component of the purpose and need of this proposed action.” The DEIS has not adequately explained how the Upper Division States’ draft alternative, as refined, does not meet the Purpose and Need.
- The No Action alternative was not disclosed until 2024, after the closing of the comment period on scoping that occurred in August 2023. The Continued Current Strategies (“CCS”) creates confusion for the reader as to how it interacts with the No Action alternative.

Specific Comments Regarding Particular DEIS Action Alternatives

Basic Coordination Alternative (formerly Federal Authorities Alternative)

- The Basic Coordination Alternative does not fully meet the Purpose and Need as acknowledged by Reclamation (“Reclamation acknowledges that the operations under this alternative may not provide adequate protection of critical infrastructure or the system and may be viable only in the short term given current reservoirs conditions.”).

- Reclamation should provide a rationale/source for the total Lower Basin reduction of 1.48 mafy.
- Figure 2-4 (pg. 2-14) shows the Powell rule curve that Reclamation has developed for this action alternative. The rule curve prescribes a minimum of 7.0 maf releases at or below 3,525. On page 2-15, Reclamation notes that “If on October 1 Lake Powell is projected to fall below 3,500 feet within the upcoming WY, Reclamation would consider additional measures as necessary to protect critically low elevations, consistent with the Law of the River.” Reclamation should update the rule curve to allow for lower releases as necessary, given the additional information obtained by Reclamation through the LTEMP SEIS (Section 6E) process, as well as discussions with the Basin States. This would provide a modeling assumption that is more consistent with the operational objective for this alternative.
- The DEIS states that the operations under this alternative may not provide adequate protection of critical infrastructure or the system and may be viable only in the short term given current reservoir conditions. Reclamation states that if this alternative were selected in the ROD, Reclamation would “seek additional authorities, if needed.” DEIS, Ch. 2, 2-11. Reclamation should clarify what new authorities the Secretary may need to seek to “to implement additional measures to protect critically low elevations at Lake Mead including additional shortages [beyond 1.48 maf] to Lower Basin water users.” DEIS, Ch. 2, 2-13. Finalizing a Record of Decision with critical omissions does not meet the basic requirements of a NEPA environmental impact analyses.

Enhanced Coordination Alternative (formerly Federal Authorities Hybrid Alternative)

- The Enhanced Coordination Alternative includes the concept of a Protection Pool in Lake Mead. DEIS p, 2-22 and 2-23. The DEIS notes that while the elements of the Protection Pool are modeled in this alternative, “the intention is to allow for their implementation within any operational framework that includes a storage and delivery mechanism (including frameworks where conservation is excluded from all release and shortage determinations).” Reclamation should specify whether this includes a Lake Powell conservation pool or whether the option is reserved for the Lower Basin Protection Pool.
- Reclamation should explain the reason for using effective storage for Lake Powell operations while using physical storage for Lake Mead operations. (Page 2-17).
- Giving Reclamation sole discretion to modify annual operations to protect downstream resources between Powell and Mead is inconsistent with the Grand Canyon Protection Act of 1992 (Title XVIII of Public Law 102-575) and would negate the purpose and process of LTEMP.
- This alternative and the Maximum Operational Flexibility Alternative have similar outcomes that may indicate a flaw in the development of the range of alternatives. See the performance analysis of all alternatives in Appendix D using two different methods: one based on 115 numerical performance indicators found in the DEIS Executive Summary Table ES-8, and the second based on the 50th percentile Lake Powell and Lake Mead storage. Reclamation should include only one of those alternatives in the Final EIS.

Maximum Operational Flexibility Alternative (formerly Cooperative Conservation Alternative)

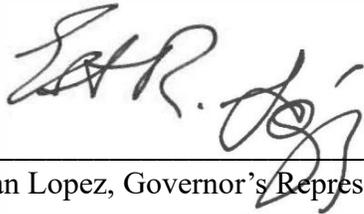
- On page 2-29, the DEIS states: “Reclamation would determine how to allocate the Conservation Reserve volume between reservoirs and could increase or decrease Lake Powell’s basic WY release volume to meet infrastructure needs or resource goals. Operation of the Conservation Reserve would not affect tracking of Lee Ferry flows.” New Mexico disagrees with this approach. Any use of the Conservation Reserve under this alternative needs to be in full coordination with the Upper Division States.

Supply Driven Alternative

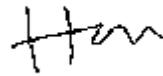
- At a static 65% of Natural Flow rate, the Supply Driven Alternative fails to meet the Purpose and Need because it poses too much risk to Lake Powell based on Reclamation’s model performance.
- Reclamation provides two differing formulas for “Gap Water.” One is provided in Appendix A, page A-30, and the other is described in DEIS Section 2.8.4.3. The latter clearly states that both conservation and any releases from the UIUs would be deducted from the annual amount of “Gap Water,” whereas, in the former (page A-30) releases from the UIUs do not appear in the calculation. Reclamation needs to be consistent in the Final EIS.
- The concept of “Gap Water” is fatally flawed. Reclamation should remove the Gap Water concept from comparisons with the other alternatives. Instead of using a “Gap Water” metric, Reclamation should model reservoir performance based on available water and evaluate risk to Lake Mead at Lake Mead instead of upstream of Lake Mead.
- The “Gap Water” concept is problematic because it is unacceptable to fill a modeling supply gap with water that would not physically exist.
- If the Gap Water concept is not eliminated:
 - Consider expressing the Gap Water concept as a water bank that allows for additional releases after infrastructure constraints have resolved. While this is unlikely to improve the performance of the alternative, it is another method that allows for comparisons to other alternatives.
 - Ensure Upper Basin hydrologic shortages are included and actual depletions are modeled, as opposed to using the Depletion Demand Schedule.
 - Instead of using a fixed 23% rate in the Gap Water formula, dynamically calculate that ratio based on the Lower Basin shortage curve minus any Lower Basin ICS use.
 - Include the role of Powell Infrastructure Protection (“PIP”) contributions in addition to conservation as noted in DEIS Section 2.8.4.3. Conservation and PIP contributions should reflect the cumulative contributions of the Upper Basin in Lake Powell.
- Reclamation should provide a rationale for calculating shortages based on August 1 Mead elevations as opposed to October 1 elevations as used elsewhere in the DEIS.
- Reclamation should use a range of Natural Flow analysis of between 58 and 62.5 % not a static 65%.

- In late summer 2025, New Mexico presented to Reclamation a tiered approach using dual signals for the Natural Flow concept. New Mexico reiterates its request that the dual signal concept be analyzed in the Final EIS. See Appendix D. The concept allows the system to function sustainably for a longer period of time than a straight natural flow management scheme and prescribes releases from Lake Powell based on the health of the upper watershed as well as the health of Lake Powell for a variety of hydrologic scenarios.

New Mexico appreciates the opportunity to provide comments on the DEIS and reserves the right to provide additional comments throughout this EIS process. In addition, New Mexico reserves all its rights under applicable law, including without limitation, the Law of the River. Nothing in this letter is intended to waive, reduce or modify New Mexico's legal rights under applicable law and this letter shall not be construed to do so. New Mexico also appreciates the Department of the Interior's efforts to facilitate an agreement among the Basin States regarding a consensus alternative and New Mexico remains willing to participate in such discussions.



Estevan Lopez, Governor's Representative



Hannah Riseley-White, NMISC Director

APPENDIX A – ELEMENTS THAT RECLAMATION SHOULD INCLUDE IN A PREFERRED ALTERNATIVE

The elements below represent New Mexico’s perspective on appropriate elements of a preferred alternative.

Term: Operating for 20 years, beginning on October 1, 2026, and operating through September 30, 2046. Operations and actions should be conducted in 2 phases with Phase 1 operations and actions to include benchmarks and deliverables that inform and potentially refine operations and actions in Phase 2.

Phase 1: October 1, 2026, until September 30, 2031

Phase 2: October 1, 2031, until September 30, 2046

Upper Basin actions (above Lake Powell)

- Upper Basin Contributions in Phase 1: Qualifying activities from 2025-2026 under the Provisional Accounting MOU are eligible for inclusion in the Upper Division States Contribution program. By September 30, 2031, the Upper Division States will have 300,000 af in the Upper Basin Contribution Pool subject to hydrologic conditions and contingent on availability of federal funding.
- Upper Basin Contributions in Phase 2: By October 1, 2031, Upper Basin will have in place all necessary instruments to contribute 100,000 af a year to the Contributions Pool, subject to hydrologic conditions and contingent on availability of federal funding.
- Reclamation will report the magnitude of Hydrologic Shortages in the Upper Basin for all sectors in the previous Water Year as part of its Consumptive Uses & Losses report each year.
- Operation of the UIUs through a DROA-like agreement between the Upper Division States/UCRC and Reclamation to protect Glen Canyon Dam’s continued ability to make releases.
 - Phase 1: When Lake Powell is projected to decline below physical elevation 3,525 ft in the next 12 months under the Most Probable projection, the Upper Division States and Reclamation will develop a plan (volume and timing) for DROA-like releases, in coordination with the Upper Basin Tribes. All Units will be considered for participation, and DROA-like releases will be made subject to the Upper Initial Units Records of Decision, authorized purposes, and existing and future contracts. Reclamation and the Upper Division States will concurrently consult with Lower Division States, and reservoir working groups. Government-to-government consultation between Reclamation and Basin Tribes would occur concurrently. Reclamation will make DROA-like releases from the Upper Initial Units pursuant to the plan during Phase 1. The actual volume to be released under the plan will be based on hydrologic conditions. The net release volume shall not exceed 1.0 maf in any 5-year period. DROA-like releases will be system water, not operationally neutral. Federal funding will be necessary to mitigate the local impacts of DROA-like operations from the UIUs. Upper Initial Units recovery will be through normal Upper Initial Units reservoir operations pursuant to the existing Records of Decisions and the agreement between the Upper Division States and Reclamation. Reclamation will track and account for DROA-like releases and recovery.
 - Phase 2: The Upper Division States and Reclamation will assess the effectiveness of the DROA-like mechanism during Phase 1. Depending on the status of the UIUs, their

recovery, and total 5-year released volume at the beginning of Phase 2, the Upper Division States and Reclamation will make adjustments as informed by operational experience for Phase 2. For Final EIS modeling purposes, Reclamation should use the details provided under Phase 1.

Lake Powell Operations

- Operationally neutral Upper Basin Contribution Pool storage account in Lake Powell
- Sub-accounts in the UIUs with operational flexibility for the Upper Division States
- Upper Basin Contribution Pool to include opportunities for both developed and unused tribal water as part of each state's participation
- Powell rule curve to determine releases: Scenario 8 Mod 10. This information is included in Appendix D.
- Conversion of Upper Basin water in the Contribution Pool at a ratio of 2 to 1 compared to Lower Basin incremental reductions in use greater than 1.5 maf to increase the effective elevation of Lake Powell. Maximum Upper Basin conversion will not exceed 300,000 af in a scenario where Lower Basin maximum reductions are 2.1 maf.
- Two triggers to begin considering additional actions at Lake Powell (elevations 3,525 and 3,500):
 - Monitoring: Lake Powell minimum probable projects an elevation of 3,525 ft or less in the next 24 months.
 - Within Year Monthly Adjustments (no change in total annual volumes): Lake Powell most probable projects an elevation of 3,525 ft or less in the next 12 months.
- Consult/Plan for Upper Initial Unit Releases: Lake Powell most probable projects an elevation of 3,525 ft or less in the next 12 months. (DROA-like).
- Consult/Plan for Powell Release reduction: Lake Powell minimum probable projects an elevation of 3,500 ft or less in the next 12 months. (Section 6E-like).

Lake Mead Operations

- Existing ICS to be converted to a new mechanism over 10 years.
- No delivery/use of existing ICS if Lake Mead is below 1,025.
- Lower Division States and Reclamation will develop a program for future ICS together, including consideration for augmentation and interstate transfers/exchanges.
- Reclamation and the Lower Division States will concurrently consult with Upper Division States. Reclamation will also consult with Upper Division States to prevent adverse impacts.
- Reclamation will report on ICS creation and delivery in the Lower Basin for the previous Calendar Year as part of its Consumptive Uses & Losses report each year.
- The new program will include delivery/use restrictions at low elevations in Lake Mead. For Final EIS purposes, Reclamation should assume 1,025 elevation in Lake Mead.
- Any use/delivery of existing and future ICS shall not result in (a) unintended conversion of water in the Upper Basin Contribution Pool; or (b) any additional releases from Lake Powell if Lake Mead levels are projected to fall below 1,000 feet because of the ICS delivery.
- Two triggers to determine additional actions at Lake Mead (Elevations 1,000' and 950').
- Monitoring: Lake Mead minimum probable project an elevation of 1,000 ft or less in the next 24 months.
- Consult/Plan for Additional Responsive Actions: Lake Mead most probable projects an elevation of 1,000 ft or less in the next 12 months (goal to protect elevation 950 ft).

Lower Basin (below Lake Mead)

- Lower Basin reductions in Phase 1: Static 1.5 maf/yr, except for spill avoidance in Mead.
- Lower Basin reductions in Phase 2: Up to an additional 600,000 af above 1.5 maf, based on Lake Mead elevation only.
- By September 30, 2031, Lower Basin parties, Mexico, and Reclamation will have all required instruments in place to implement additional reductions of up to 600,000 af in Year 6 and for the duration of the agreement, if necessary.
- By October 1, 2031, the Lower Basin parties and Mexico will be prepared to implement additional reductions of up to 600,000 af in Year 6 and for the duration of the agreement, if necessary.
- Sufficient federal funding is required for the Lower Basin in Phase 1 and Phase 2 to implement conservation projects and invest in conservation, efficiency and augmentation infrastructure.

Sequence of operational actions on October 1st of each year:

- Determine releases from Lake Powell based on the rule curve.
- Determine Lower Basin reductions based on the Lower Basin shortage curve, and any use of existing ICS.
- Determine any conversion from the Upper Basin Contribution Pool.

APPENDIX B – SPECIFIC COMMENTS ON RESOURCES AND APPENDICES

Specific Comments regarding the DEIS Resources Analysis

Hydrologic Resources 3.3

- The DEIS states that “There are no legal requirements to not deplete groundwater for nearby wells, although decreasing reservoir elevations may contribute to decreased groundwater elevations depending on hydraulic conductivity. Secondary impacts on groundwater are not considered in this analysis.” (TA 3 page 3-98). It is unclear from the above language whether and how groundwater pumping in Arizona along the Colorado River mainstem was simulated in the model, both as to its physical effect on river flows, and accounting for use of Arizona’s Colorado River apportionment. Moreover, Reclamation’s statement that it did not analyze effects on groundwater because there are “no legal requirements” is troubling. The Secretary of the Interior is the Water Master in the Lower Basin and is empowered to manage the Lower Basin.

Geomorphology and Sediment 3.5

- The DEIS evaluates the frequency and durations of High Flow Experiments (“HFEs”) as an indicator of impacts to geomorphology and sediment, with an assumption that sandbar deposition will be sufficient to partially compensate for natural erosion when HFEs occur for 60 hours or longer at least every 4 years. This assumption is incorrect since HFEs are an experiment affecting subannual flows and may occur based on the Secretary’s Designee’s discretion informed by recommendations from the Glen Canyon Dam Adaptive Management Program. HFEs are not automatically conducted simply because the experimental triggers are met. The DEIS should evaluate the historical frequency of HFEs since the advent of the Long Term Experimental Management Program and apply that frequency for modeling purposes.

Water Quality 3.6

- The methodology for evaluating salinity impacts should include the use of Reclamation’s Salinity Economic Impact Model (“SEIM”) to understand the economic impact of salinity changes due to each alternative.
- On page 6-9, the DEIS states “In this section, salinity is analyzed as it relates to the salinity criteria set by the Colorado River Salinity Control Forum.” While the approach of comparing modeled salinity values to the Forum’s salinity criteria is valuable, it is insufficient on its own. The salinity impacts of each alternative should also be evaluated against the Continued Current Strategies (“CCS”) baseline results.

Fish and Other Aquatic Species 3.8

- Reclamation used a model from Southern Nevada Water Authority (“SNWA”) for both Water Quality and Fish & Aquatic resources. Reclamation should identify whether this model has been peer-reviewed and approved as meeting Reclamation standards. This comment also applies to any other non-federal models that Reclamation may have used for this DEIS.

Vegetation 3.9

- Reclamation should clarify the temporal scope of “historical conditions.” How far back did Reclamation consider when evaluating historical conditions for vegetation?

- Did Reclamation consider the effect of climate trends on the sustainability of certain species and ecological communities in the Grand Canyon separately from Glen Canyon Dam operations?

Terrestrial Wildlife 3.10

- Reclamation should specify whether the species-specific impacts referenced on page 3-111 that will be addressed in future Biological Opinions will be part of this EIS process.

Tribal Resources 3.13

- Reclamation should extend NHPA Section 106 consultation to any Tribes and Pueblos that may have a cultural connection to the Grand Canyon and the Colorado River generally.
- The geographic scope and affected environment of the Impacts Analysis Area does not include tribal land in the Upper Basin. This is important because all alternatives evaluated in the DEIS take into account impacts to the Lower Basin Tribes, but they do not quantify impacts to Upper Basin Tribes, even though Reclamation uses modeling assumptions that include Upper Basin Tribes' water.
- Under Section 3.13.2, it is unclear why the first decade is expected to have greater variability and reduced woody riparian habitats and why conditions improve in the second and third decades. Please provide the basis for these statements and indicate whether they are based on the climate modeling that was performed or on some other analysis.

Recreation 3.14

- Under Section 3.14.1, Reclamation identifies the affected environment for Recreation for Lake Powell to the Southern International Boundary. If Reclamation assumes UIU operations as certain to occur, then the affected environment study area for this analysis should include impacts to the UIUs due to Reclamation's assumptions within CRSS.
- Regarding TA 14: While 8,000 cfs flows would likely be tolerable, daytime flows as low as 5,000 cfs would create many problems for river boaters from Lees Ferry to Lake Mead under any of the alternatives. Accidents would likely increase; trip duration might also increase due to slower travel times.

Dams and Electrical Power Resources 3.15

- Please include an optimal elevation at Lake Powell for hydropower production, similar to Lake Mead.
- New Mexico notes that Glen Canyon Dam's power production capacity when Lake Powell is at minimum power pool is still 5.5 times higher than Hoover Dam's power production at Lake Mead's minimum power pool.
- Please provide a rationale for why Reclamation chose a 3-year period for Issue 2 (see page 3-166).
- Reclamation needs to provide the DMDU analysis of electricity generated at Glen Canyon Dam and the impacts on electricity rates for Hoover Dam in advance of the Final EIS, so interested parties can have access to all relevant information for this resource (page 3-169).
- Market changes and increased grid instability will impact the Upper Division States, including Tribal Nations and Pueblos, non-Indian communities, and federal military installations located in all the Upper Division States, and particularly New Mexico. Reclamation did not sufficiently consider those impacts in the DEIS.

Socioeconomics section 3.16

- Under 3.16.1, Reclamation identifies the analysis area for Socioeconomics to encompass all the major counties in the Lower Division States. See Map TA 16-1. The affected environment analysis area, however, must also include impacts to the UIUs due to Reclamation's assumptions within CRSS.
- Because the proposed action will affect hydropower generation at CRSP facilities, Reclamation needs to analyze impacts on economic and social conditions that result from decreased hydropower generation (i.e., higher prices for electricity). This must include targeted areas in the Upper Basin that receive hydropower generated at Glen Canyon Dam, and, assuming that UIU operations continue to be included in the EIS, should also include targeted areas in the Upper Basin that receive hydropower generated at the other CRSP facilities.
- The water supply available to the Upper Division States is uncertain every year due to hydrologic variability of snowpack and precipitation. The Upper Basin use is adapted to the available supply every year, independent of the conditions at Lake Powell and Lake Mead. The Upper Division States water users often do not know how much water they will receive each year. When supplies are low, water uses are involuntarily reduced. These shortages occur to varying degrees each year and increase as water supplies diminish. They are referred to as "hydrologic shortages". Even though hydrologic shortage quantification is unique to each sub-basin each year, the best available science and modeling provide a range of hydrologic shortages varying between 0.6 and 2.3 maf per year and averaging 1.2 maf per year. Hydrologic shortages in New Mexico create real socioeconomic hardships that are not analyzed in the DEIS.
- Hydrologic Shortages are involuntary reductions in consumptive use in the Upper Basin, which are reflected and quantified in CRSS v.6. CRSS v.6 was the result of technical work by all seven Colorado River Basin States and Reclamation. It is the best science available to Reclamation for this EIS. In addition, three other methods have been used to quantify hydrologic shortages in the Upper Basin. Those include both historical and future hydrologic shortages. Hydrologic shortages in the Upper Basin vary between 0.6 and 2.3 maf per year and average 1.2 maf per year. The first method that was used to quantify historical shortages for all sections was a comparison by the UCRC of historical CU&L amount with total maximum depletions in the UCRC's 2022 Depletion Demand Schedule. The second method was used by Reclamation and the Desert Research Institute to quantify historical shortages for the agricultural sector, using eeMETRIC. The third method was used to calculate future hydrologic shortages: New Mexico used CRSS v.6 with historical hydrology for correlation of hydrologic shortages with the Natural Flow at Lee Ferry. This information is included in Appendix D. Hydrologic shortages create real socioeconomic hardships that are not analyzed in the DEIS. The Upper Division States, including New Mexico, have quantified and visualized the extent of those hydrologic shortages over the past few decades and this information is included in Appendix D.
- New Mexico requests that Reclamation analyze the socioeconomic impacts of hydrologic shortages on New Mexico communities.
- Reclamation should analyze the possibility that farmers and producers may switch to less water-demanding crops in response to increasing hydrologic variability. This possibility was mentioned in passing on page 3-176 along with switching to other sources of water. The topic of other sources of water gets a paragraph of analysis. Switching to other crops is not

mentioned again. In addition, it is not reasonable to assume that farmers will be willing to fallow fields for the entire period of analysis.

Population and Land Use 3.17

- The language on p. 3-189 regarding accommodating anticipated future growth is misleading. Future population growth does not necessarily result in increased domestic water use. In addition, any increase in water use should be analyzed in an equitable way in both the Upper and Lower Basins.
- The groundwater banking process is described in Appendix TA-17 (Page 17-40) as follows: “*Water banking and groundwater savings facilities allow participating entities to reduce immediate diversion, store conserved water in reservoir accounts, and recover water later when needed, helping to maintain deliveries during shortage periods.*” This description incorrectly characterizes operation of Arizona’s water banking and groundwater savings facilities. Groundwater savings facilities allow irrigation districts to directly use Central Arizona Project (“CAP”) deliveries (or other surface water) in lieu of pumping groundwater. This results in saving water underground, not in reservoir accounts.

Indian Trust Assets (ITA) 3.18

- In Table TA 18-1 the diversion and depletion rights numbers for the Upper Division Tribes are incorrect. Please revise the table to include the following numbers for the Navajo Nation’s diversion and depletion rights captured in its settlement with the State of New Mexico:
 - Navajo Nation
 - Diversion right: 633,531 acre-feet
 - Depletion right: 336,979 acre-feet
- The two Impact Indicators listed in this section do not appear to need to be the only two impact indicators to be considered. For instance, New Mexico tribes will be greatly affected if power generation at Glen Canyon Dam is reduced or disappears. While power generation is not an ITA, it may affect ITAs. In addition, since tribal trust land is an ITA, it seems like the analysis for land use and population (Section 3.17) must be extended to all 29 tribal reservations, which has not been done to date in this EIS.
- As discussed above, Reclamation has analyzed ITAs solely for Lower Basin Tribes. Reclamation needs to consider impacts to ITAs, including traditional and cultural practices, for the Upper Division Tribes in the Final EIS.
- On page 3-197, Reclamation states: “Note that in all cases, stored water would be available for water transactions with other Upper Basin water users, both within and across Upper Division States.” That sentence does not accurately reflect the legal mechanisms that govern water rights in the Upper Division States and the UIUs. Reclamation should delete that sentence in the Final EIS, and all other language that suggests that Upper Basin water users would be able to individually participate in Upper Basin Contribution Pool transactions. In the Upper Basin, water is apportioned under the 1948 Compact to the Upper Division States and Arizona – ***not directly to water users***. Water administration falls to the states, not the UCRC or Reclamation.
- Regarding the “Upper Basin” paragraph at the top of page 3-200, New Mexico disagrees with Reclamation’s statement that “no alternative would directly affect water deliveries to the Upper Basin tribes.” This statement ignores the fact that a large quantity of what Reclamation currently considers “system water” is unused or undeveloped settled tribal water in the Upper Basin. If Upper Basin Tribes were to develop and use that water tomorrow,

there would be that much less water flowing into Lake Powell. Any alternative that does not take this already authorized tribal growth into account is flawed because it assumes, as Reclamation does here, that Lake Powell releases will not affect tribal Upper Basin supplies.

- Regarding the “Upper Basin” paragraph at the top of page 3-200, please provide data and information supporting Reclamation’s statement that the alternatives that provide new mechanisms for conserving and storing water for Upper Basin Tribes “would benefit tribal agricultural operations in the Upper Basin.” This conclusion is not adequately supported.
- Impacts on Zuni Pueblo do not appear to be analyzed in any detail in this DEIS. Zuni Pueblo is located in the Lower Colorado River Basin and is a member of Glen Canyon Dam Adaptive Management Program. Therefore, based on Reclamation’s own assumptions, Zuni Pueblo should be considered in the analysis.
- Please note in the Final EIS whether Reclamation has consulted with other Tribal Nations and Pueblos, either within or outside of the Colorado River Basin, that have spiritual connections to the Colorado River.

Visual Resources 3.19

- Reclamation should include the canyons that are re-emerging and becoming available for public access because of lower Lake Powell levels as a visual resource in this section.
- Since Lake Powell is part of the Geographic Scope of this EIS, Reclamation should analyze the potential visual impacts of Lake Powell reaching dead-pool elevations (in addition to the Glen Canyon Dam to Mead reach and Lake Mead).

Specific Comments regarding the DEIS Appendices

CRSS Modeling Documentation/Modeling Assumptions/Shortage Allocation Model

- New Mexico appreciates Reclamation’s intent to make new guidelines for a 20-year period. However, New Mexico notes that Reclamation’s model runs are all for 33 years. In addition, Reclamation mentions the possibility of short-term guidelines through 2031. However, that has not been analyzed.
- Reclamation makes assumptions about volumes of conservation in the Upper Basin and analyzes the impacts on the performance of various alternatives. However, Reclamation does not analyze how such volumes will specifically impact the Upper Division States from the perspectives of water availability and socioeconomics.
- The CRSS modeling did not simulate intrastate banking or recovery of Arizona’s CAP supply during the analysis period. To the extent such banking occurs in the future it would alter the model results.
- Computed end-user supply impacts (shortages) to Arizona are overstated in the modeling because water that is currently banked as well as additional banking that may occur in the future could be recovered to help alleviate future shortages.
- Statements are provided in the DEIS regarding the NV-AZ Interstate Water Bank at Appendix B (B-13) and C (C-7 and C-13). The NV-AZ Interstate Water Bank is simulated only with respect to increased surface water deliveries to Nevada and a corresponding reduction in CAP deliveries to Arizona. However, the shortage model does not appear to be considering that Arizona will recover long-term storage credits to replace the reduction in CAP deliveries. This will overstate the computed shortages to CAP as a whole and to individual CAP users in years when Nevada recovers interstate banked water.

- The Gila River is a major tributary and should be included in the CRSS modeling along with the other Lower Basin tributaries that are simulated to contribute water to the Colorado River mainstem downstream of Lees Ferry.
- Flows to the mainstem from the Gila River have historically helped supply deliveries to Mexico, and exclusion of these flows from the DEIS modeling increases the simulated shortages to the Lower Basin users and distorts the analysis of alternatives. During 2008 – 2022, the flow of the Gila River at Dome (gage located near the confluence with the Colorado River) averaged approximately 11,900 AF/yr ranging from 3,700 AF (2015) to 92,700 AF/yr (2010). Gila River flows at Dome have reached approximately 4.5 maf (1993) in the historical record.
- It is unclear whether the 5% conveyance loss charge on CAP deliveries is charged against Arizona’s Colorado River apportionment in the CRSS Model simulations or whether it is simulated as a loss to the overall system.
- The description of the CRSS model simulation of evaporation and other losses is vague (*see, e.g.* p. 3-7). There is no substantive information or output provided in the DEIS regarding the simulated volumes of evaporation, riparian ET, bank storage, and other physical processes. It is unclear whether such losses are captured as part of Lower Basin shortages. More detailed results for the simulated evaporation and other losses should be provided in the Final EIS.
- The Final EIS should include a more thorough analysis of the benefits and potential impacts of the creation and use of ICS on Colorado River water users. This should include sensitivity analysis where the ICS assumptions are varied while all other simulated elements are fixed. This would allow the effects of the ICS assumptions to be identified by comparison of the various sensitivity runs of the CRSS Model.
- Reclamation must analyze hydrologic impacts of existing ICS deliveries on conversion of Upper Basin Contributions and any other Upper Basin operations in the Final EIS. There are two scenarios under which New Mexico and the other Upper Division States could be impacted by the use/delivery of ICS:
 - The existing ICS is used to offset Lower Basin shortages in a way that the net shortages are below 1.5 maf per year, but the total shortages trigger an unintended conversion of water in the Upper Basin Contribution Pool.
 - If Lake Mead drops below 1,000 mainly due to the use of ICS, that will trigger actions by Reclamation that may impact Upper Basin Contribution Pool and/or UIUs.
- Reclamation should make available more detailed output from the CRSS Model simulations in the Final EIS, including time-series results, for the following:
 - Simulated annual allocations to each Lower Division State and Mexico.
 - Simulated annual water deliveries, return flows to the Colorado River, and net water use for each Lower Division State and Mexico (total and by user).
 - Simulated annual flows from each Lower Basin tributary to the Colorado River.
- While the CRSS Model may be the best available tool for analysis of various alternatives for operating the Colorado River system, the results from these analyses presented in the DEIS should be accompanied by discussion and quantification of the extent to which the results of the model simulations are uncertain for a given input hydrology (e.g., simulated annual deliveries to the downstream states have an uncertainty of +/- X%).

- Because the specifications for the various elements of each Alternative are almost all changing from one Alternative to the other, it is not possible to tease out from the modeling results what specifically is causing differences between the simulated results for the various Alternatives. In order to better understand the effects of the various elements of each Alternative, sensitivity analyses should be performed and documented by making simulation runs in which one element is varied in isolation across each of the identified specifications for that element (a separate run for each specification) while keeping the specifications for all other elements the same.

Lower Division States Depletion Schedules

- Depletion demands from non-CAP users in Arizona are simulated to linearly increase from present levels to the total entitlements by 2040 as shown in Appendix N, including inactive users and unallocated priority 4 water entitlements. The simulated future CAP depletion demand is computed as Arizona’s 2.8 MAF apportionment minus the depletion demands for other Arizona users. Because of the simulated future increase in the depletion demands of other Arizona Colorado River water users, the annual computed CAP depletion demand decreases from 2027 to 2040 resulting in an annual reduction of approximately 177,000 AF per year by 2040. CAP diversions, along with other Priority 4 entitlements, are the most junior uses simulated in Arizona, meaning that any shortage to Arizona will be reflected in the shortage to CAP. To the extent that the demands and uses by the other Arizona water users increase by less than the projected amounts, the supply available to CAP would increase and the computed shortages to CAP users in the Shortage Allocation Model would decrease. Reclamation should incorporate this feedback in the development of the Lower Division States depletion schedules and/or shortage allocations.

Upper Division States Depletion Schedules/Sensitivity Analysis

- Based on the discussion in the DEIS, a reader could easily misunderstand how Upper Basin demands and depletions operate. A reader of Figure I-1 (p. I-3) might compare depletions versus the various demand scenarios and conclude that Upper Basin depletions are being overstated in the model because of the depletion trend to year 2060. In addition, New Mexico requests a fuller discussion of the hydrologic challenges that the Upper Basin faces be included in the Final EIS. The DEIS should expand the discussion of hydrologic shortages, including a description of how CRSS calculates depletions from demands and natural flow. New Mexico offers the following:
 - Add the current or year 2020 demand to Figure I-1, so historical CU&L depletions are placed in context of the demands.
- Use a consistent terminology of depletion demands and demands. For example, the following references do not use consistent terminology:
 - Use of “diversion schedule”: 3-8, 2nd bullet
 - Appendix J Title and first sentence
 - Title of Appendix L
 - Appendix I-18, 3rd paragraph, last sentence: “assumed Upper Basin depletions” instead of “depletion demands”
- Some values in DEIS Table L-1 differ from the UCRC published depletion demands. There appear to be some issues with rounding of numbers. Reclamation needs to verify those numbers to avoid unintended consequences of rounding.

- The latest Depletion Demand Schedule provided by the UCRC was developed in 2022. In its description, Reclamation refers to this schedule as “Updated 2016 Depletion Demand Schedule.” While the 2022 revision was a targeted update of the 2016 schedule, the schedule title should not include a reference to 2016 because that creates confusion for readers, including among the Lower Division States. Please refer to this schedule throughout the DEIS and all appendices and TAs as the “2022 Depletion Demand Schedule.”

Typographical Errors and Other Misstatements

- On Page 2-19, the text related to coordinated operations states that the shifting point between Powell and Mead is at 63% of combined storage, but the graph shows that shifting point at 70% of Powell storage or 63% of Mead storage. Please correct either the text or the graph so they provide the same information.
- On page 3-25, correct typographical error: “Blue Mesa” not “Blume Mesa.”
- On page 3-56, footnote 10, the footnote should be revised to correct “Lower Basin” to “Upper Basin” conserved water being stored in Powell.
- The DEIS acknowledges a modeling error regarding 602(a) storage under the Basic Coordination Alternative (see A-23 FN16). Please correct this modeling logic reference.
- Please include “effective storage” and “limitrophe” in the glossary.
- From Appendix L: “Neither the CRSS baseline demands nor the UCRC 2016 Depletion Demand Schedule include reservoir evaporation undistributed by state from Lake Powell, Flaming Gorge, Blue Mesa, Morrow Point, which averages 520.0 maf per year.” The maf units in this sentence are incorrect. Please correct them.
- Continued Current Strategies is noted as “CCS” in text and “Cont. Current” in tables and figures. Use a consistent short form.
- CCS performance indicators are not included in Table ES-8.
- DEIS Appendix Table A-3 matches the LaFond (2024) memorandum for single outlet works capacity and applies 3 out of 4 active outlets. Some rounding is occurring when converting the capacity as a flow rate to an annual volume. This is likely a minor issue, within modeling error, and may not have an impact if the scenarios are limiting rates based on the flow rate instead of annual volume, but please ensure there are no unintended impacts.
- Add Paria River flow statistics to DEIS page 1-11, last paragraph and on DEIS Figure 1-1 (DEIS page 1-12) add the Paria River at Lee Ferry (09382000) gage.

APPENDIX C – LIST OF PRIOR COMMENTS

All the previous comments listed below are incorporated into New Mexico’s comment letter on the DEIS by reference.

The Seven Colorado River Basin States provided a pre-scoping comment letter on September 1, 2022, in response to the *Notice of Request for Input on Development of Post-2026 Colorado River Reservoir Operational Strategies for Lake Powell and Lake Mead under Historically Low Reservoir Conditions*.

The Seven Colorado River Basin States submitted scoping comments in response to the *Notice of Intent to Prepare an Environmental Impact Statement and Notice to Solicit Comments and Hold Public Scoping Meetings on the Development of Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead* on August 15, 2023.

The Upper Colorado River Commission submitted scoping comments in response to the *Notice of Intent to Prepare an Environmental Impact Statement and Notice to Solicit Comments and Hold Public Scoping Meetings on the Development of Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead* on August 15, 2023.

The State of New Mexico also submitted scoping comments in response to the *Notice of Intent to Prepare an Environmental Impact Statement and Notice to Solicit Comments and Hold Public Scoping Meetings on the Development of Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead* on August 15, 2023.

The Upper Division States submitted a comment letter to Secretary Burgum on April 22, 2025, regarding the Department of the Interior’s Colorado River Post-2026 Operational Guidelines “Alternatives Report.”

APPENDIX D – TECHNICAL INFORMATION TO SUPPORT NEW MEXICO’S COMMENTS

New Mexico's Analysis on the Range and Performance of All Alternatives

Method 1

A similarity map is shown in Figure 1 for the alternatives. The alternatives are grouped according to how similar they are in function. A cross-correlation between each alternative was made for the 115 numerical performance indicators found in the DEIS Executive Summary Table ES-8. These performance indicators were grouped into topics of:

- Reservoir storage
- Geomorphology
- Water Quality
- Aquatic Reservoirs
- Hydropower
- Lower Basin Deliveries
- Cultural (including recreation, tribal, noise)

Combinations of alternatives where the cross correlation of a set of performance exceeded 0.8 were mapped as being similar. While an alternative can outperform another, their similarity implies that changing some aspects of one could replicate the performance of the other.

The two Supply Driven alternatives are like each other in all topics except for Lower Basin Deliveries. The deliveries are the intended difference between the priority and pro rata approaches. The Basic Coordination is like the Supply Driven alternative for Lower Basin Deliveries (Priority alternative) and aquatic reservoirs. The Maximum Operational Flexibility alternative is like the Supply Driven alternatives in one aspect: geomorphology. The Maximum Operational Flexibility and Enhanced Action alternative are similar for reservoir storage, water quality, and aquatic resources. No Action and Basin Coordination have water quality in common.

Summary:

- The two Supply Driven alternatives have nearly identically similar performance over a range of indicators
- The Maximum Operational Flexibility and Enhanced Action alternatives have several similar outcomes.
- The other alternatives are dissimilar in performance to each other.

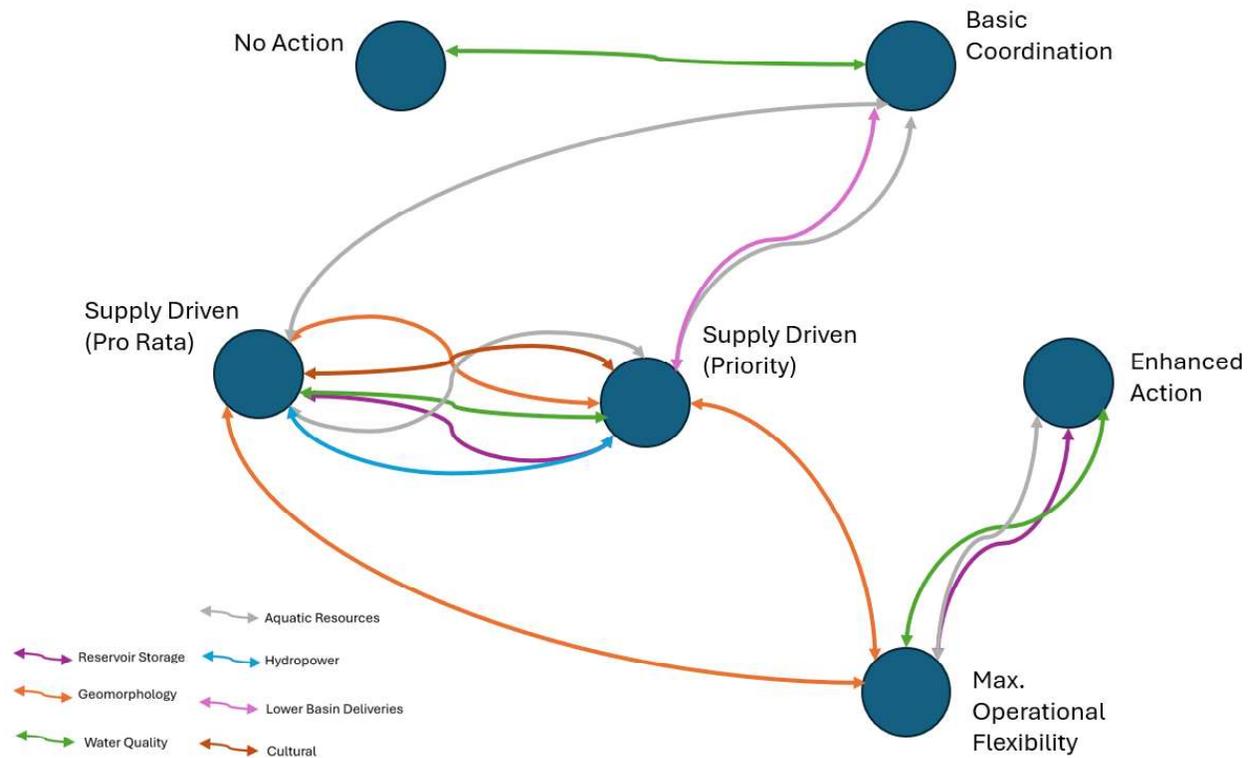


Figure 1. Alternatives Performance Indicator Similarity

Method 2

A “tornado” plot is shown in Figure 2 for the DEIS results for the 50th percentile Mead and Powell storage. Storage occurring in Mead 50% of the time will not be the same as storage in Powell 50% of the time since there is also a difference in comparing a calendar year (Mead) and water year (Powell). However, Reclamation has previously used this plot as part of the Post-2026 Process - Seven States Technical Team discussions, suggesting that this comparison is useful in understanding the trends and relative differences between alternatives.

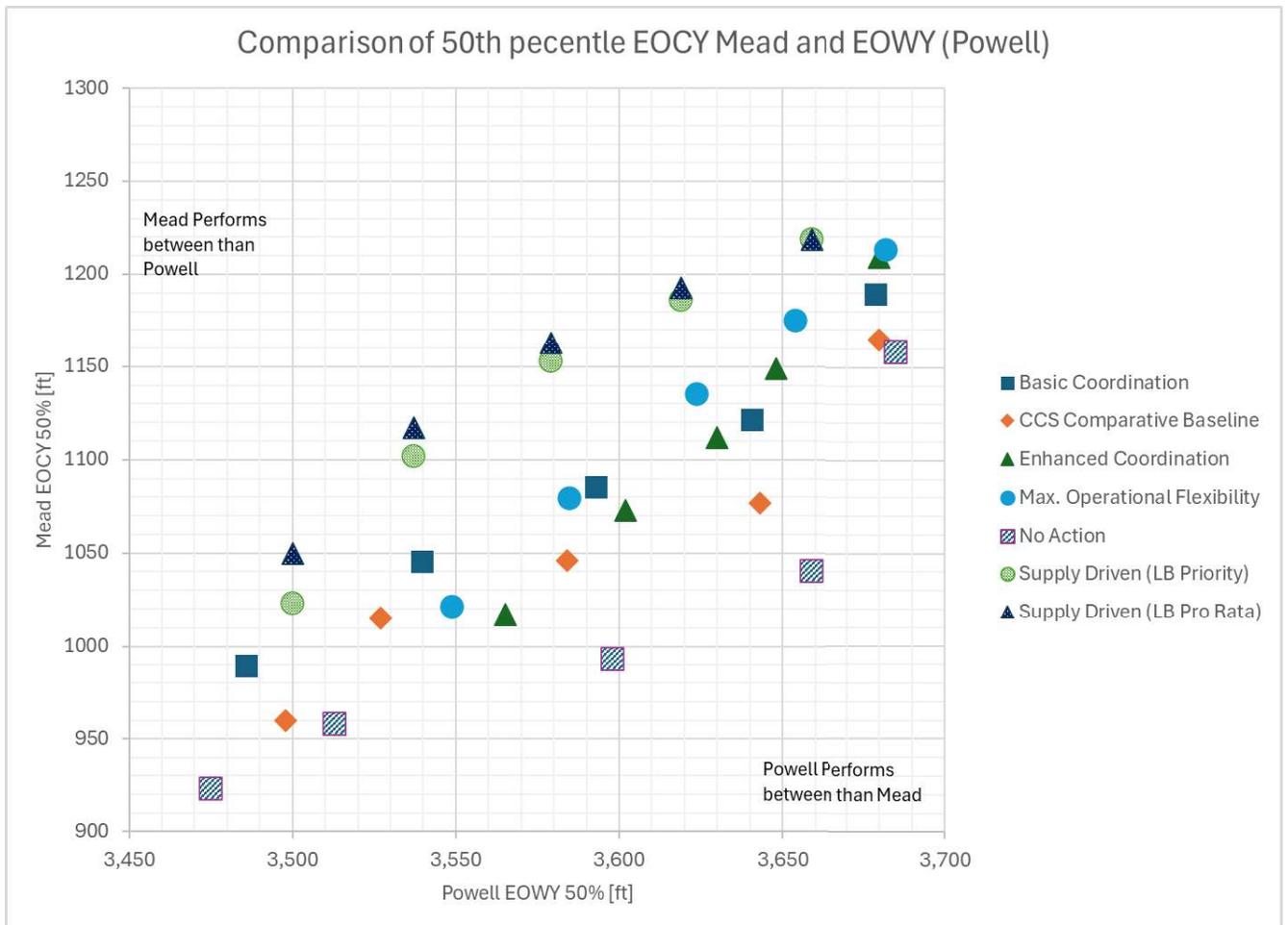


Figure 2. Approximate Tornado Plot of Alternative Reservoir Storage

Summary:

- The No Action performs badly for all alternatives, although outperforms for Powell than Mead at wetter conditions.
- The CCS is similar to No Action in the driest conditions.
- The Supply Driven alternative outperforms for Mead over all hydrologic conditions.
- Basic coordination is also biased toward Mead.
- The Maximum Operational Flexibility and Enhanced Coordination are similar, with Maximum Operational Flexibility biased toward Mead.

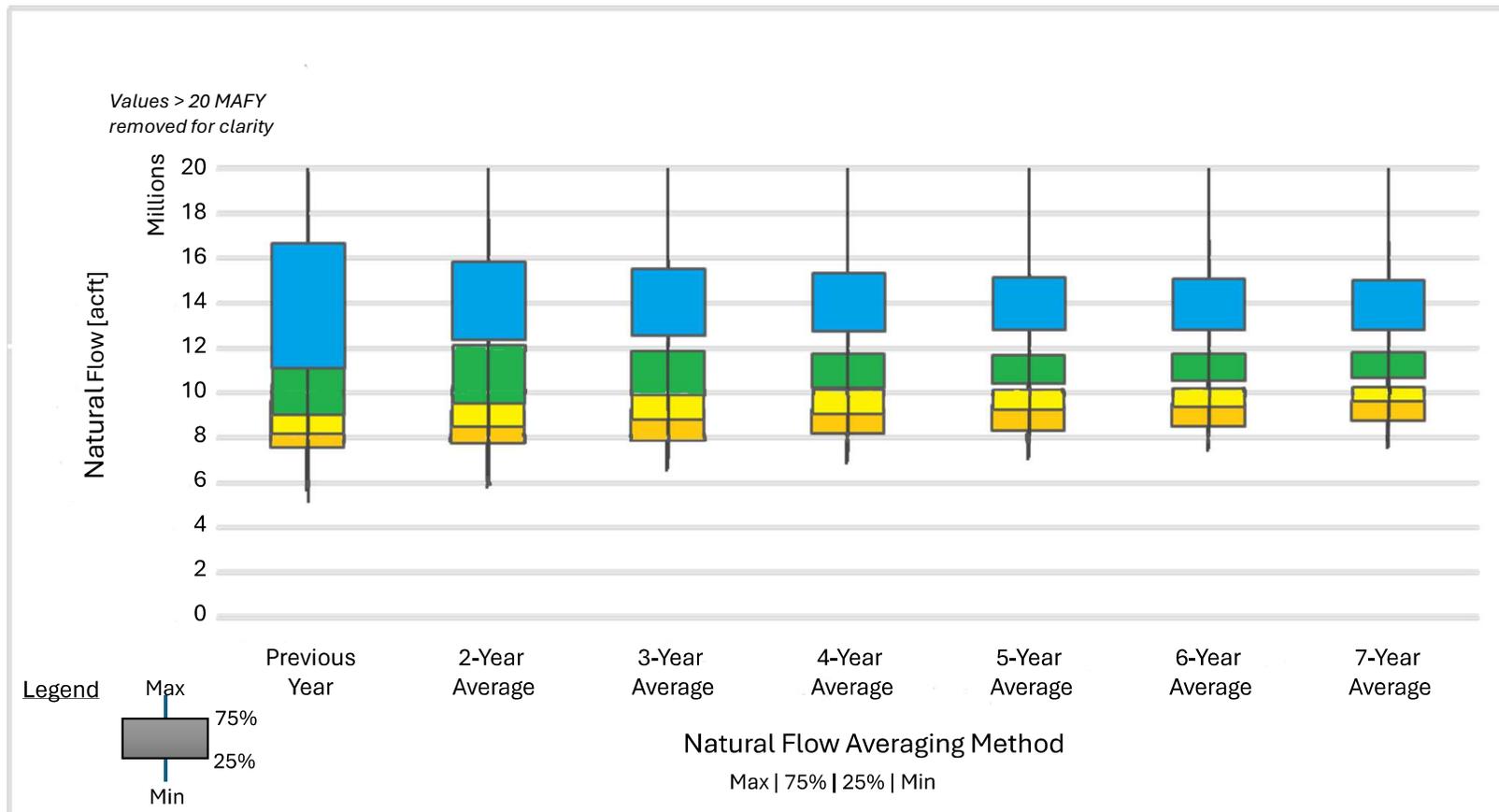
Additional Natural Flow Indicators of Lake Powell Conditions and Operations

Dual Signals Concept

Natural Flow Averages and Simulated Lake Powell Pool Conditions

We organized simulated annual (EOWY) pool elevations into:

- < 3,500 feet
- 3,500 to 3,525 feet
- 3,525 to 3,625 feet
- > 3,625 feet



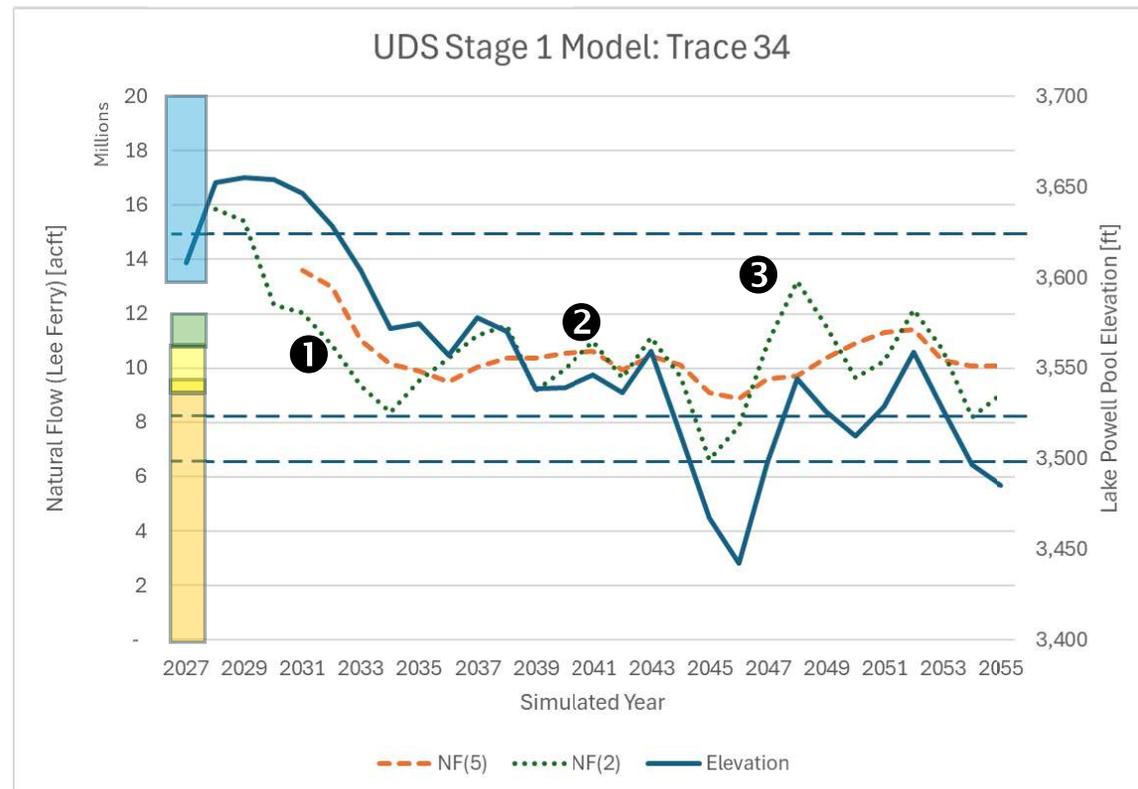
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Dual Signals Concept

- Short-term signal (< 3-year moving average): tells us what's happened recently
- Long-term signal: (> 4-year moving average): tells us about the health of storage and watershed conditions
- Using a single fixed number of years of NF (e.g., 3 years) will always be a compromise between the long-term and short-term signals

Example of Long and Short Timing Conditions

1. Short signal < Long signal
Lake condition worsening
2. Short and Long signals similar
Lake condition maintaining
3. Short signal > Long signal
Lake condition improving



Implementation Dual Signals using a Matrix

- Prescribed Release (volumetric amount not percentage) determined from a matrix of long- and short-term signals
- Every cell in the matrix is the result of an optimization exercise

Annual Releases from Lake Powell [MAFY]		Long Timing Natural Flow Signal (7-year moving average)				
		< 10 MAFY	10 to 12 MAFY	12 to 14 MAFY	14 to 16 MAFY	> 16 MAFY
Short Timing Signal (2-year moving average)	< 10 MAFY	4.7	5.5	5.9	6.6	7.0
	10 to 12 MAFY	6.1	6.6	7.2	7.7	8.7
	12 to 14 MAFY	7.0	7.4	8.0	8.6	9.4
	14 to 16 MAFY	7.6	8.2	8.9	9.7	10.3
	> 16 MAFY	7.8	10.2	11.3	12.1	13.0

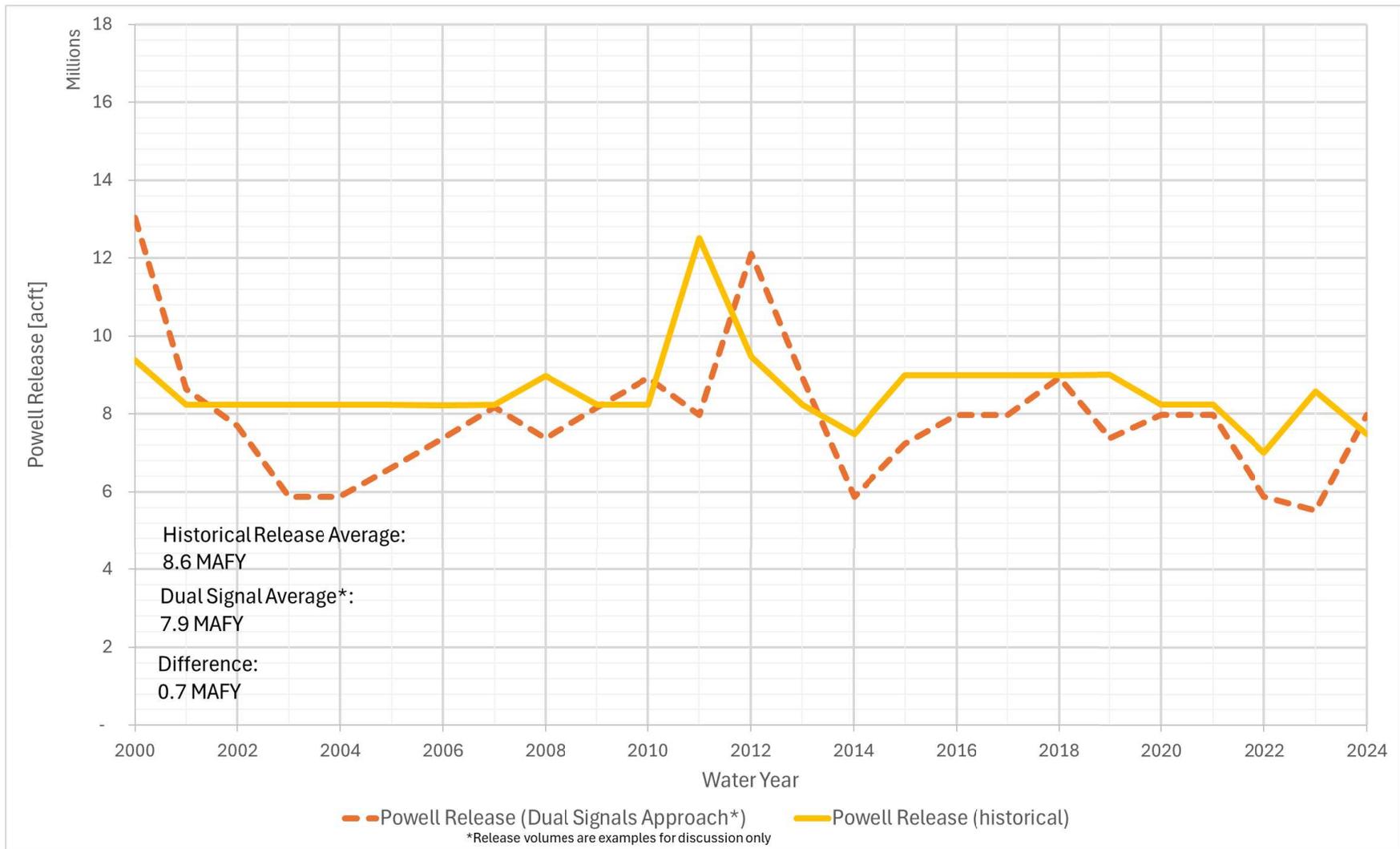
Note: These volumes are examples for discussion only, if the concept is considered.

Frequency of Historical Natural Flow Conditions

Number of Occurrences of Water Years (WY 2000 to 2024)		Long Timing Natural Flow Signal (7-year moving average)				
		< 10 MAFY	10 to 12 MAFY	12 to 14 MAFY	14 to 16 MAFY	> 16 MAFY
Short Timing Signal (2-year moving average)	< 10 MAFY	0	1	4	0	0
	10 to 12 MAFY	0	1	1	1	0
	12 to 14 MAFY	0	3	6	1	0
	14 to 16 MAFY	0	2	4	0	0
	> 16 MAFY	0	0	0	1	0

Frequency of Hydrologic Traces

Occurrence of Water Years (%) (400 traces totaling 12,000 years)		Long Timing Natural Flow Signal (7-year moving average)				
		< 10 MAFY	10 to 12 MAFY	12 to 14 MAFY	14 to 16 MAFY	> 16 MAFY
Short Timing Signal (2-year moving average)	< 10 MAFY	7%	8%	4%	1%	<1%
	10 to 12 MAFY	2%	9%	6%	3%	1%
	12 to 14 MAFY	<1%	6%	9%	5%	1%
	14 to 16 MAFY	<1%	3%	7%	6%	3%
	> 16 MAFY	<1%	<1%	3%	7%	9%



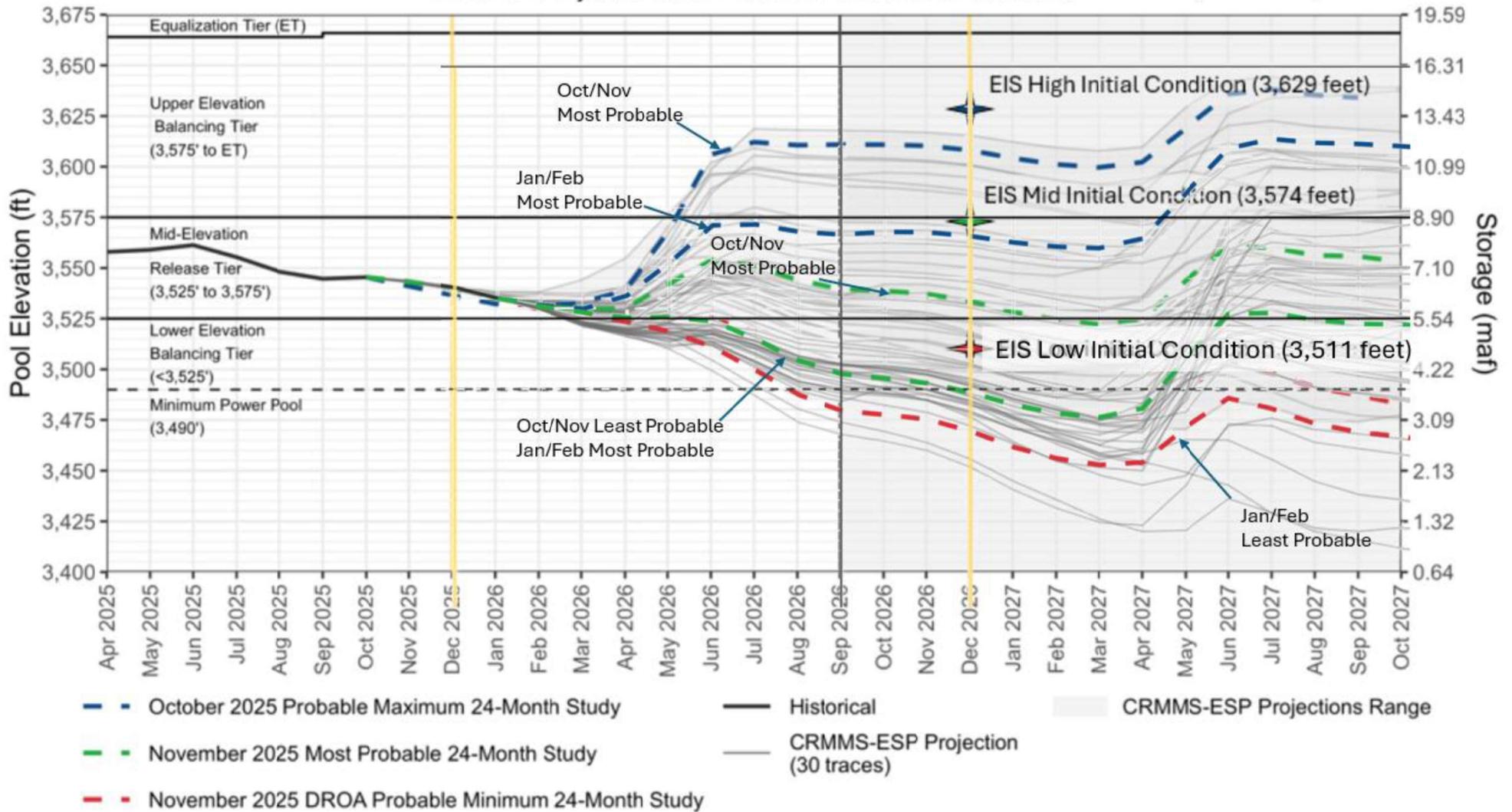
Main Advantages of Dual Signals Concept

- Considers restoring resilience for Powell + watershed health conditions
- Uses volumetric amounts, not percentages
- Is transparent and relatively easy to implement
- Already includes the low-level zone operation

Comparison of Lake Powell Initial Conditions in the DEIS and the February 2026 24 Month-Study

Lake Powell End-of-Month Elevations^{1,2} CRMMS Projections from October and November 2025

and Supplemental Unconstrained Projections from January and February 2026



Hydrologic Shortages in New Mexico's Upper Colorado Sub-Basins 1991-2023

January 13, 2025

Visualizing New Mexico's Hydrologic Shortage

- Used BOR's recalculated data from the OpenET-DRI Earth Engine parcel-level data and classifies NDVI signals into 4 irrigation categories:
 - Not Irrigated
 - Shorted (partially Irrigated)
 - Irrigated
 - Wet Soil
- NDVI classification of "Not Irrigated" to represent Hydrologic Shortages for agriculture
- Available period of record: 1991 to 2023
- Filtered from maximum extents:
 - applicable parcels prior to buildout (e.g. NAPI)
 - parcels with extensive irrigation discontinuity
 - due to conservation efforts, canal rehabilitation needs, etc.

Reporting Areas

- Reporting areas were developed from the USGS HUC 10, clipped to the New Mexico state boundary
- Manual delineation was used for the northern boundary of NAPI
 - The gravity canal from Navajo Reservoir was the boundary on the northeast. An arbitrary boundary was formed separating the fields supplied by the San Juan river and the central pivots on the north. These changes subdivided USGS HUC 10s:
 - 1408010121 Kutz Canyon-San Juan River
 - 1408010505 Ojo Amarillo Canyon-San Juan River
- Manual delineation was used for the southern boundary of the San Juan Chama project area
 - The USGS delineated Blanco Tunnel and Oso Tunnel from the National Hydrologic Dataset was used. At the Azotea Tunnel intake, an arbitrary boundary was used to complete the project area. These changed subdivided USGS HUC 10s:
 - 1408010103 Rio Blanco
 - 1408010106 Navajo River
- The intent of the reporting areas is to emphasize the irrigation conditions of existing irrigated parcels.

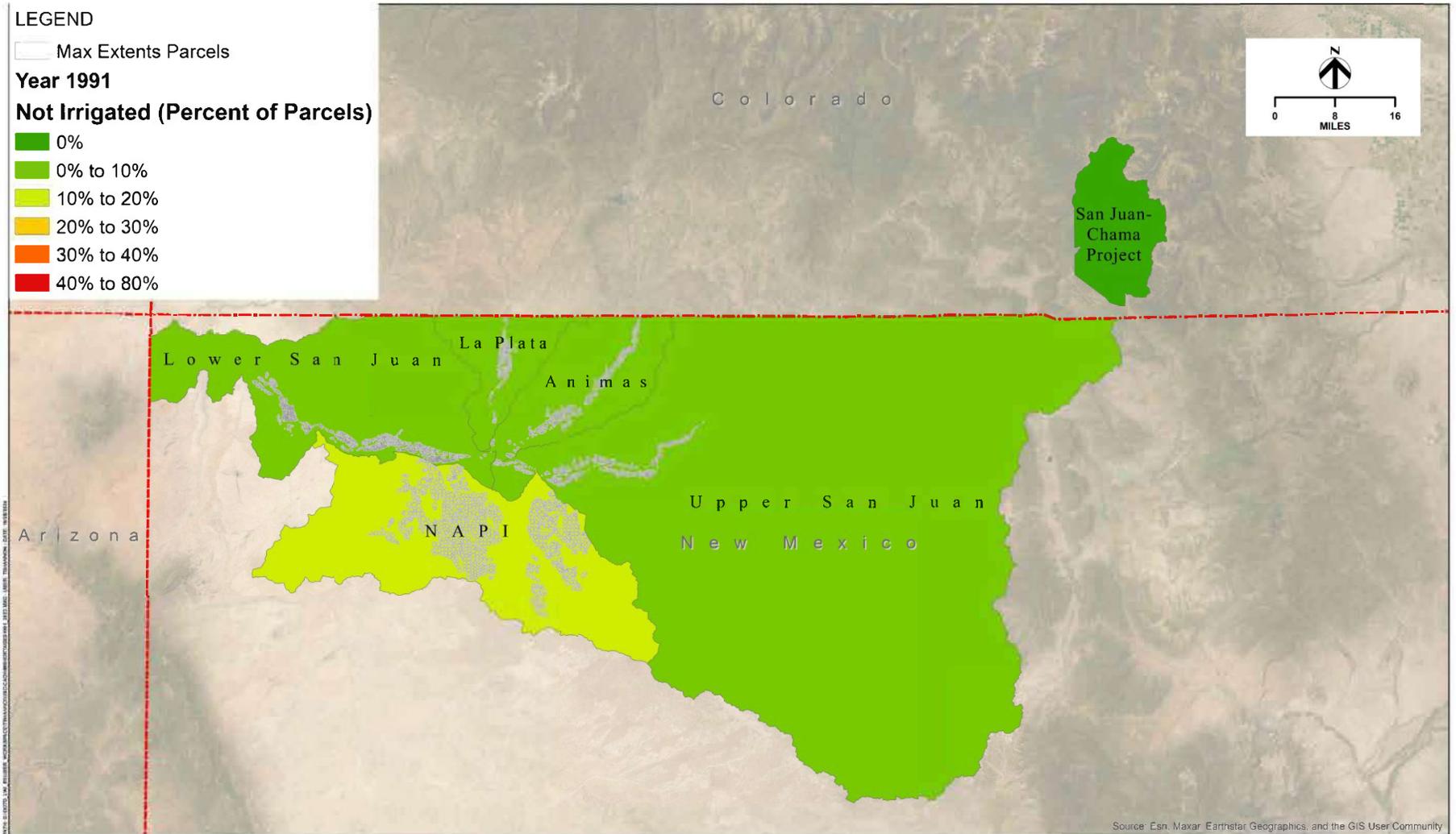
LEGEND

Max Extents Parcels

Year 1991

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



Source: Esri, Maxar, Earthstar, Geographics, and the GIS User Community

**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBETCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbetcuetoFHLSIRRSTATUSFIELD)

DATE
9/11/2024

FIGURE
1991

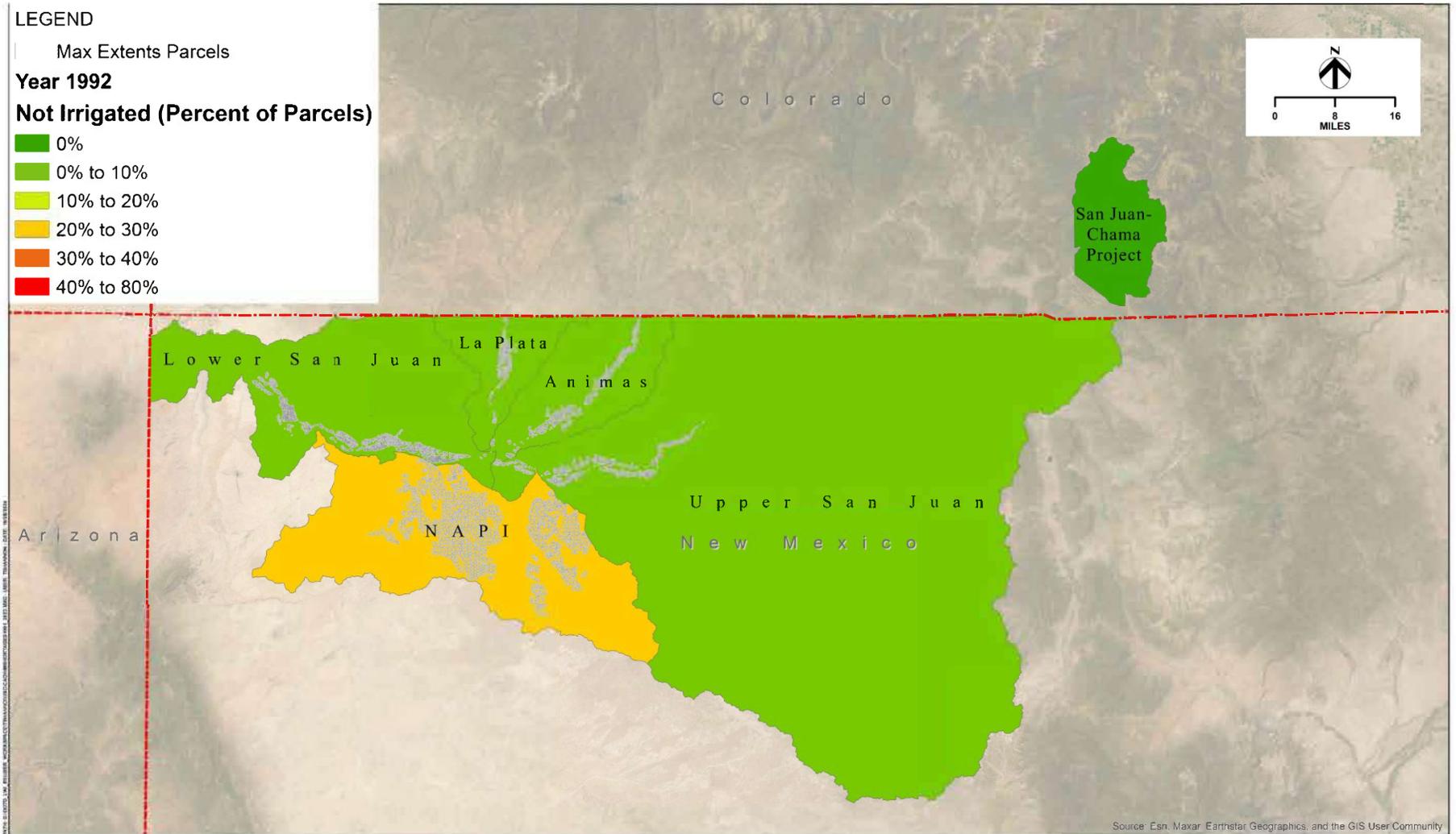
LEGEND

Max Extents Parcels

Year 1992

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBETCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbetcuetofhlsirrstatusfield)

DATE
9/11/2024

FIGURE
1992

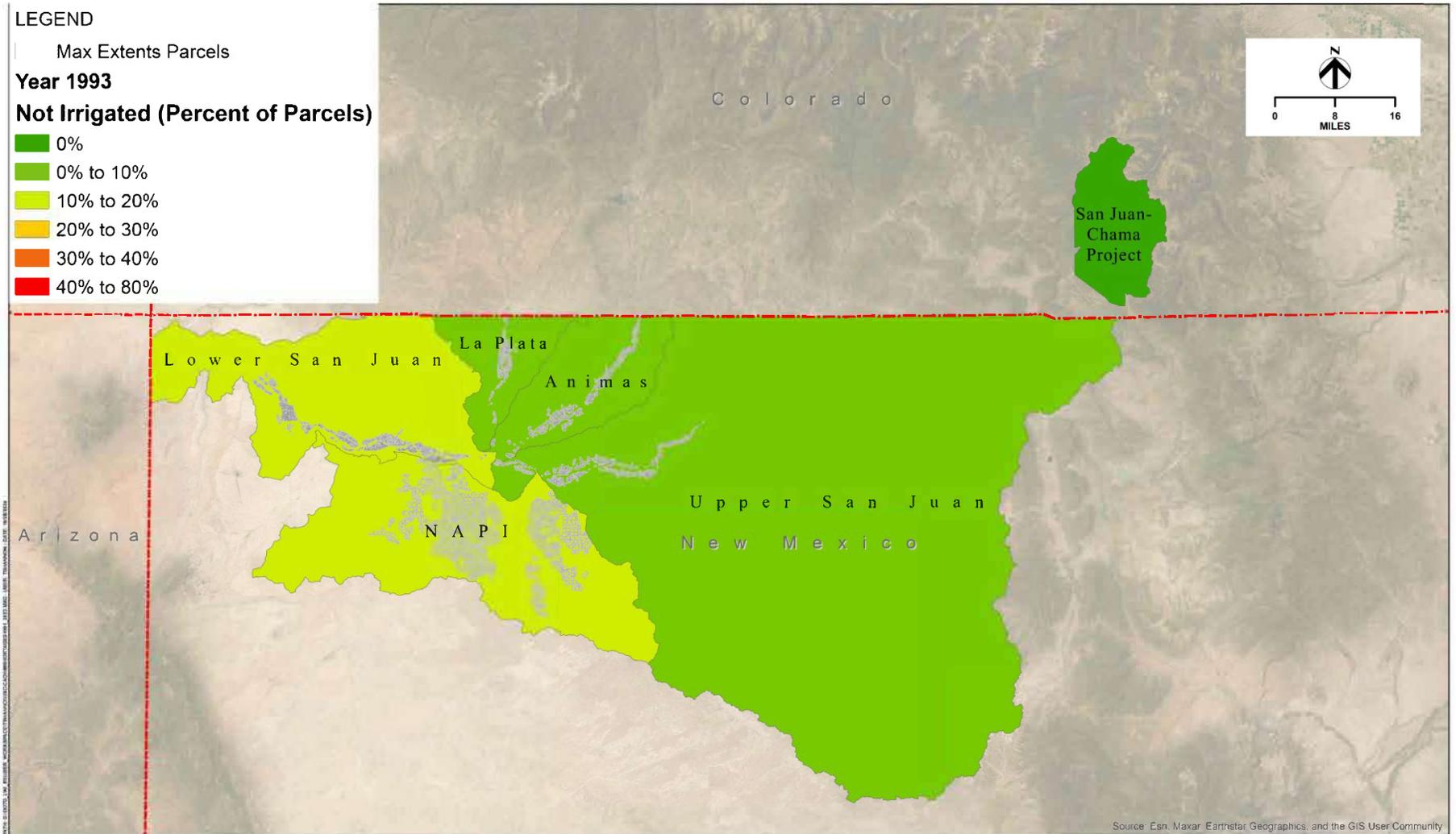
LEGEND

Max Extents Parcels

Year 1993

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



Source: Esri, Maxar, Earthstar, Geographics, and the GIS User Community

**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBETCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbetcuetoFHLSIRRSTATUSFIELD)

DATE
9/11/2024

FIGURE
1993

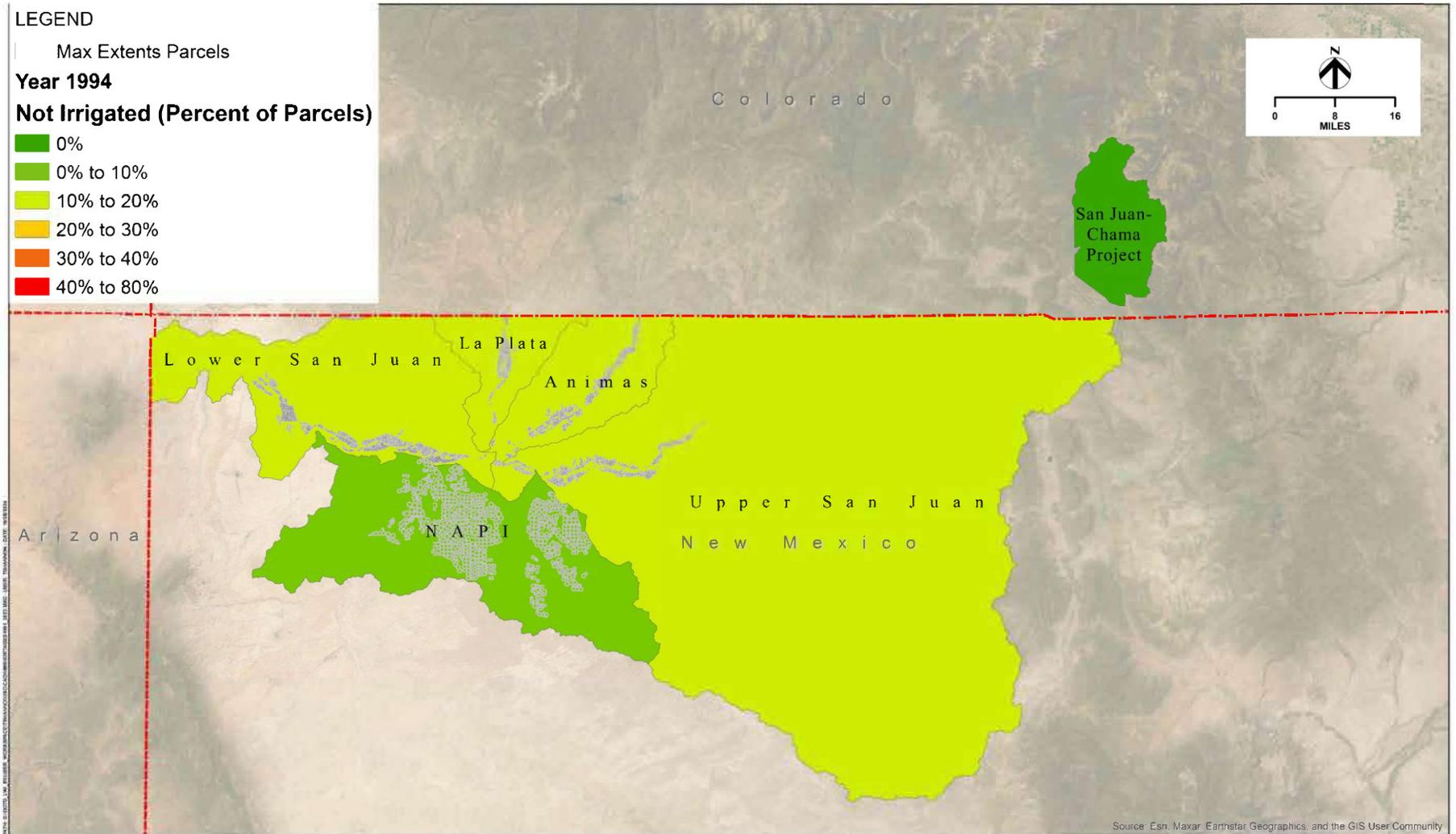
LEGEND

Max Extents Parcels

Year 1994

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBETCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbetcuetoFHLSIRRSTATUSFIELD)

DATE
9/11/2024

FIGURE
1994

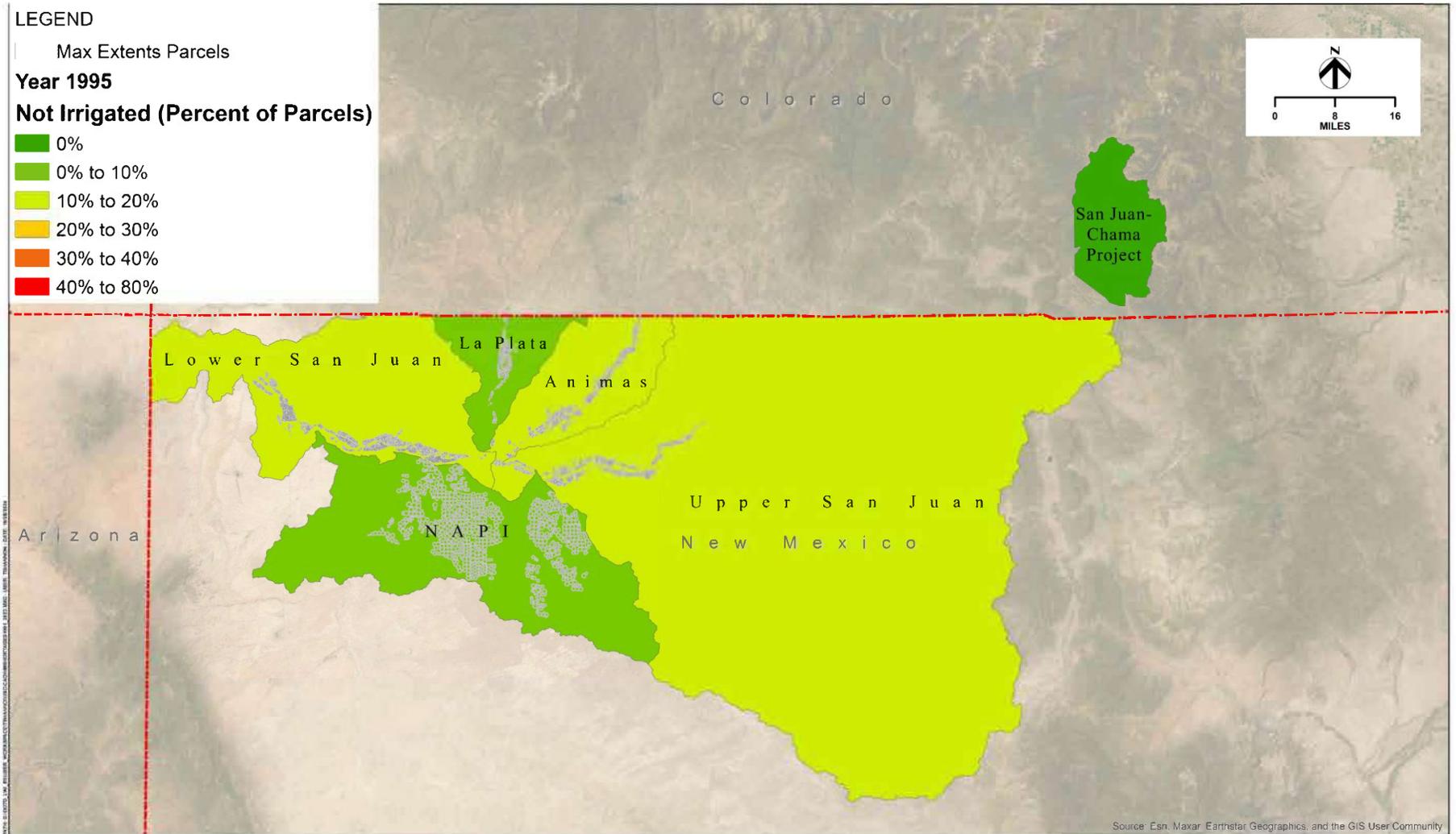
LEGEND

Max Extents Parcels

Year 1995

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBTCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbtcuetofhlsirrstatusfield)

DATE
9/11/2024

FIGURE
1995

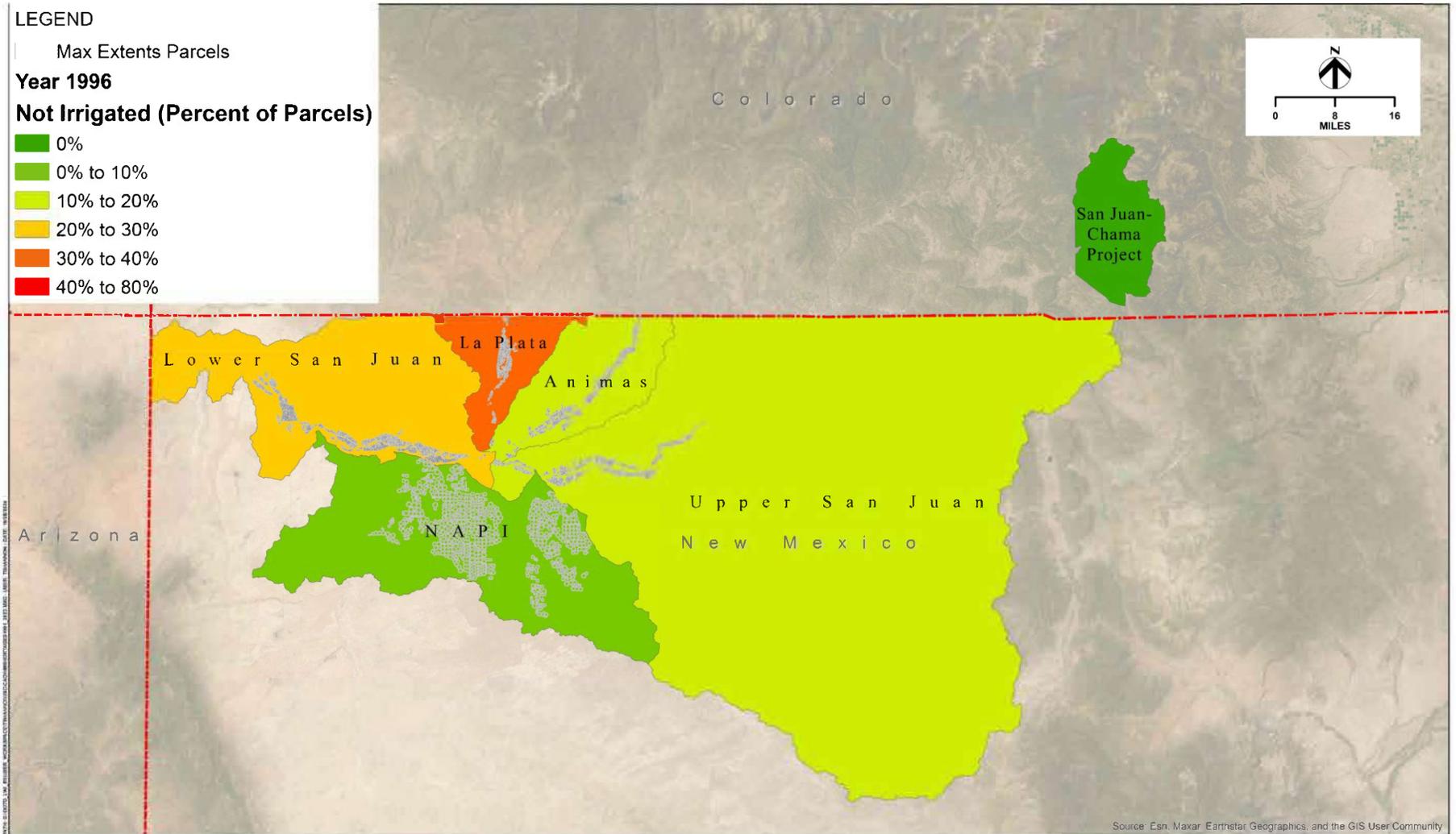
LEGEND

Max Extents Parcels

Year 1996

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBETCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbetcuetoFHLSIRRSTATUSFIELD)

DATE: 9/11/2024

FIGURE **1996**

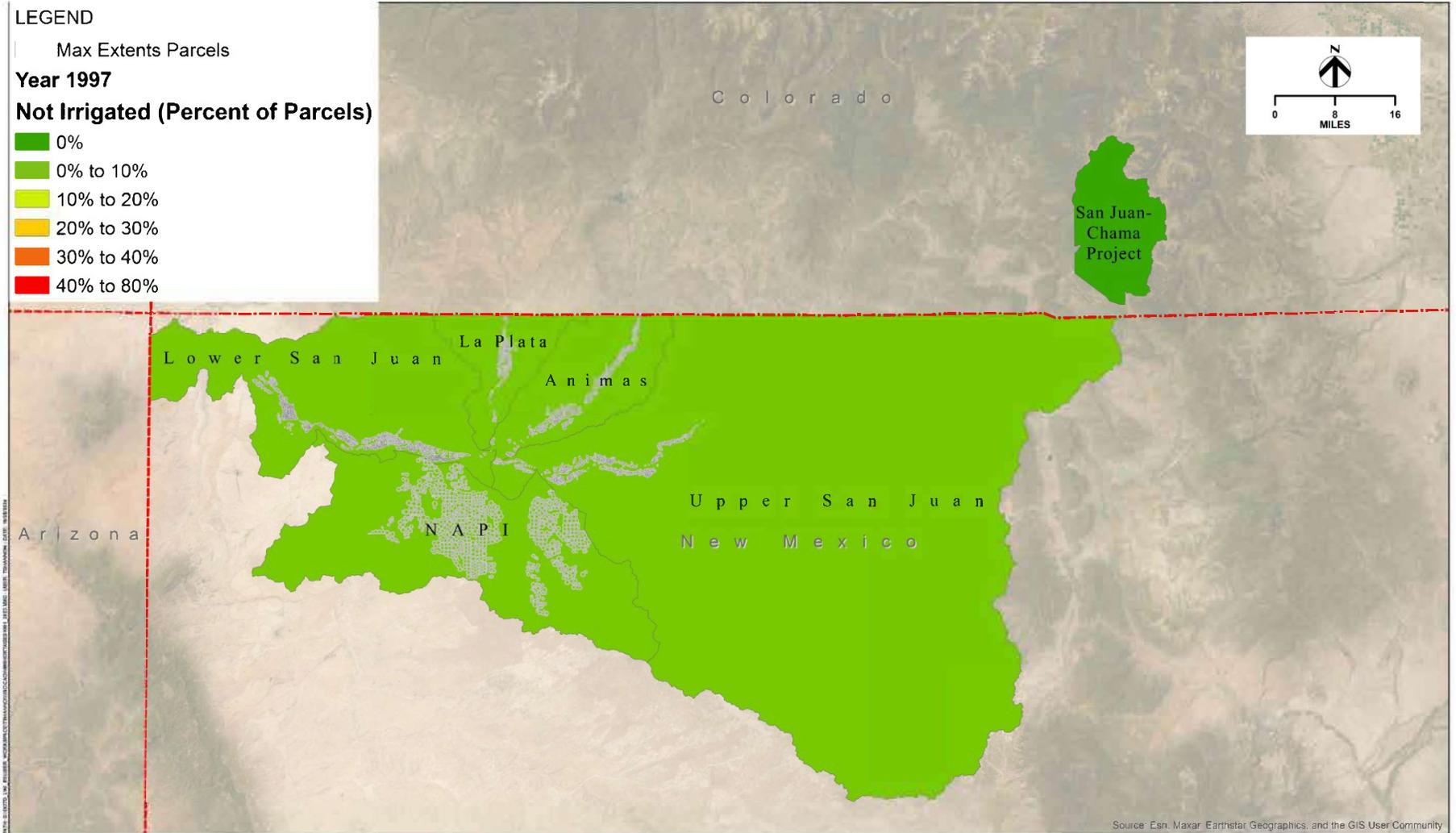
LEGEND

Max Extents Parcels

Year 1997

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBETCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbetcuetoFHLSIRRSTATUSFIELD)

DATE
9/11/2024

FIGURE
1997

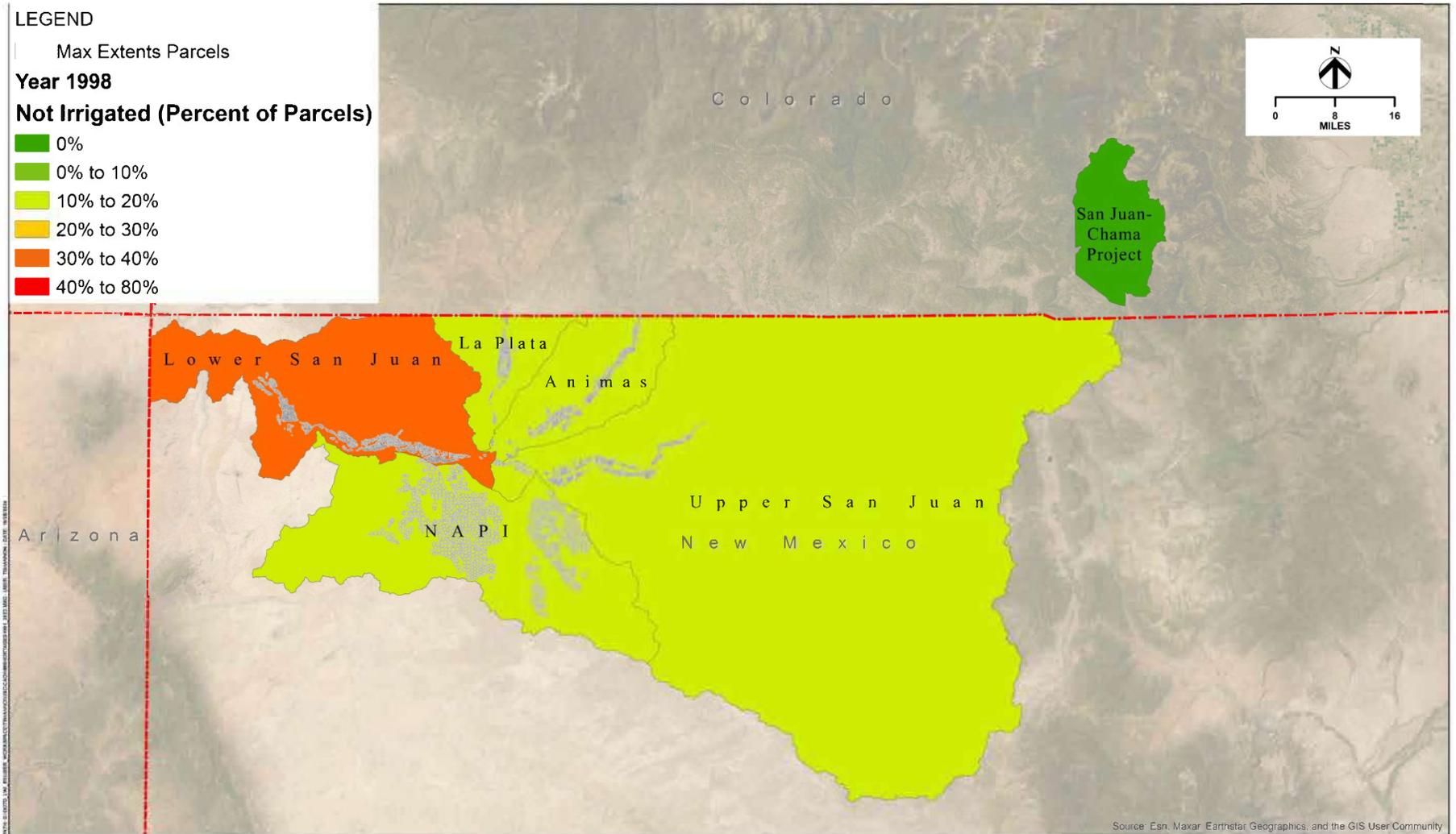
LEGEND

Max Extents Parcels

Year 1998

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



Source: Esri, Maxar, Earthstar, Geographics, and the GIS User Community

**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBETCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbetcuetoFHLSIRRSTATUSFIELD)

DATE
9/11/2024

FIGURE
1998

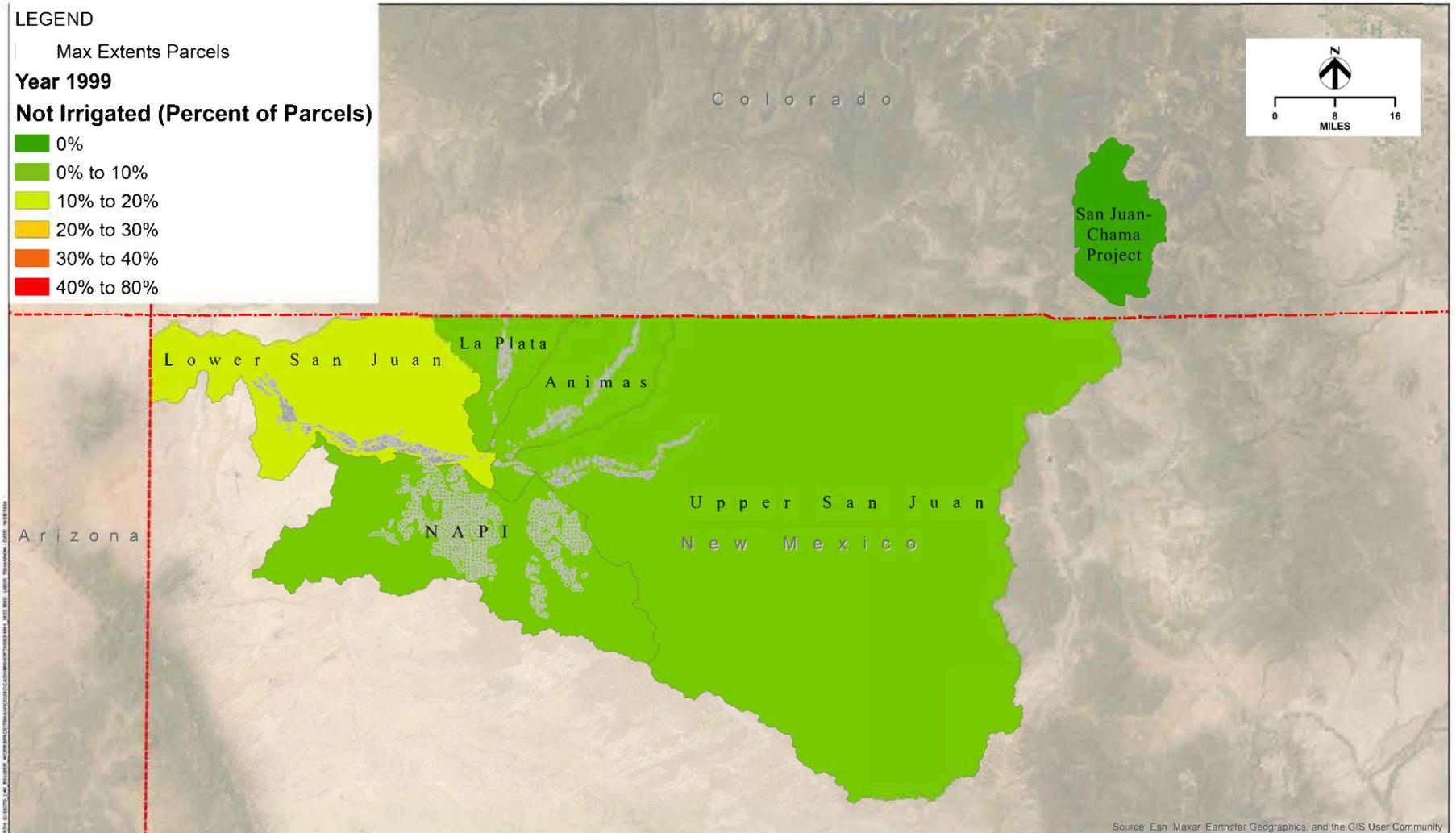
LEGEND

Max Extents Parcels

Year 1999

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBETCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbetcuetoFHLSIRRSTATUSFIELD)

DATE
9/11/2024

FIGURE
1999

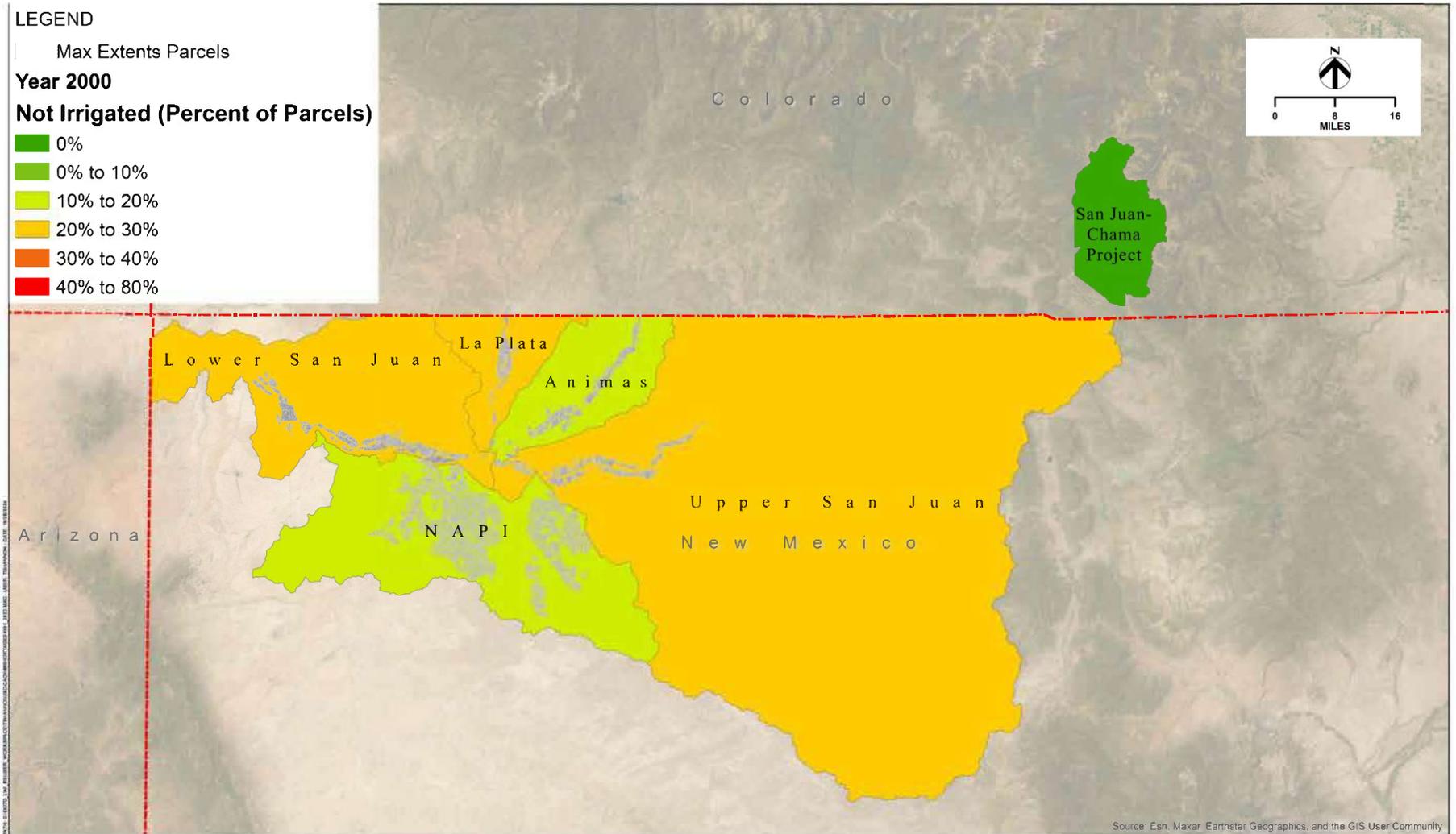
LEGEND

Max Extents Parcels

Year 2000

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



Source: Esri, Maxar, Earthstar, Geographics, and the GIS User Community

**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBETCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbetcuetoFHLSIRRSTATUSFIELD)

DATE: 9/11/2024

FIGURE **2000**

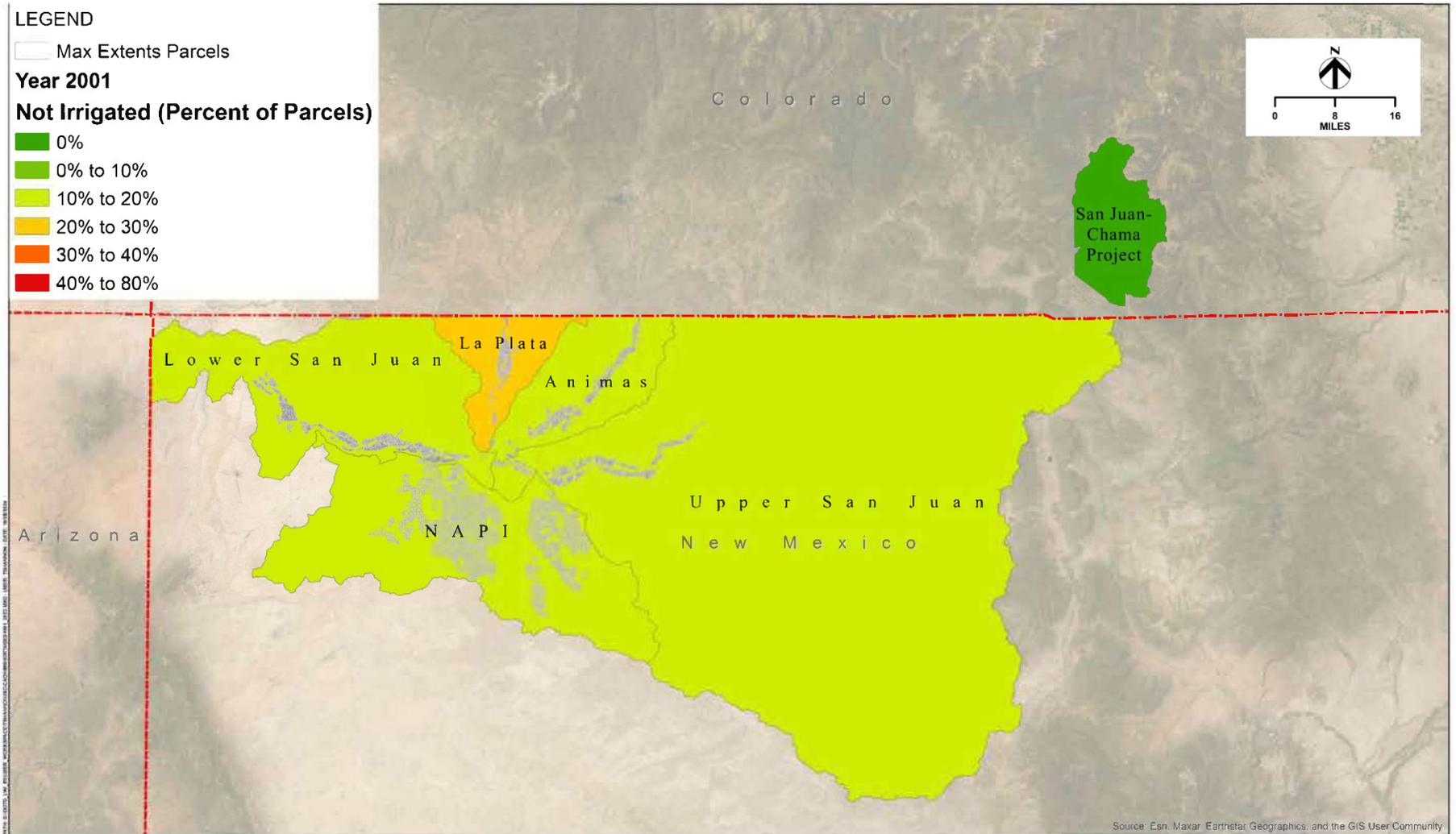
LEGEND

Max Extents Parcels

Year 2001

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



Source: Esri, Maxar, Earthstar, Geographics, and the GIS User Community

**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBETCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbetcuetoFHLSIRRSTATUSFIELD)

DATE
9/11/2024

FIGURE
2001

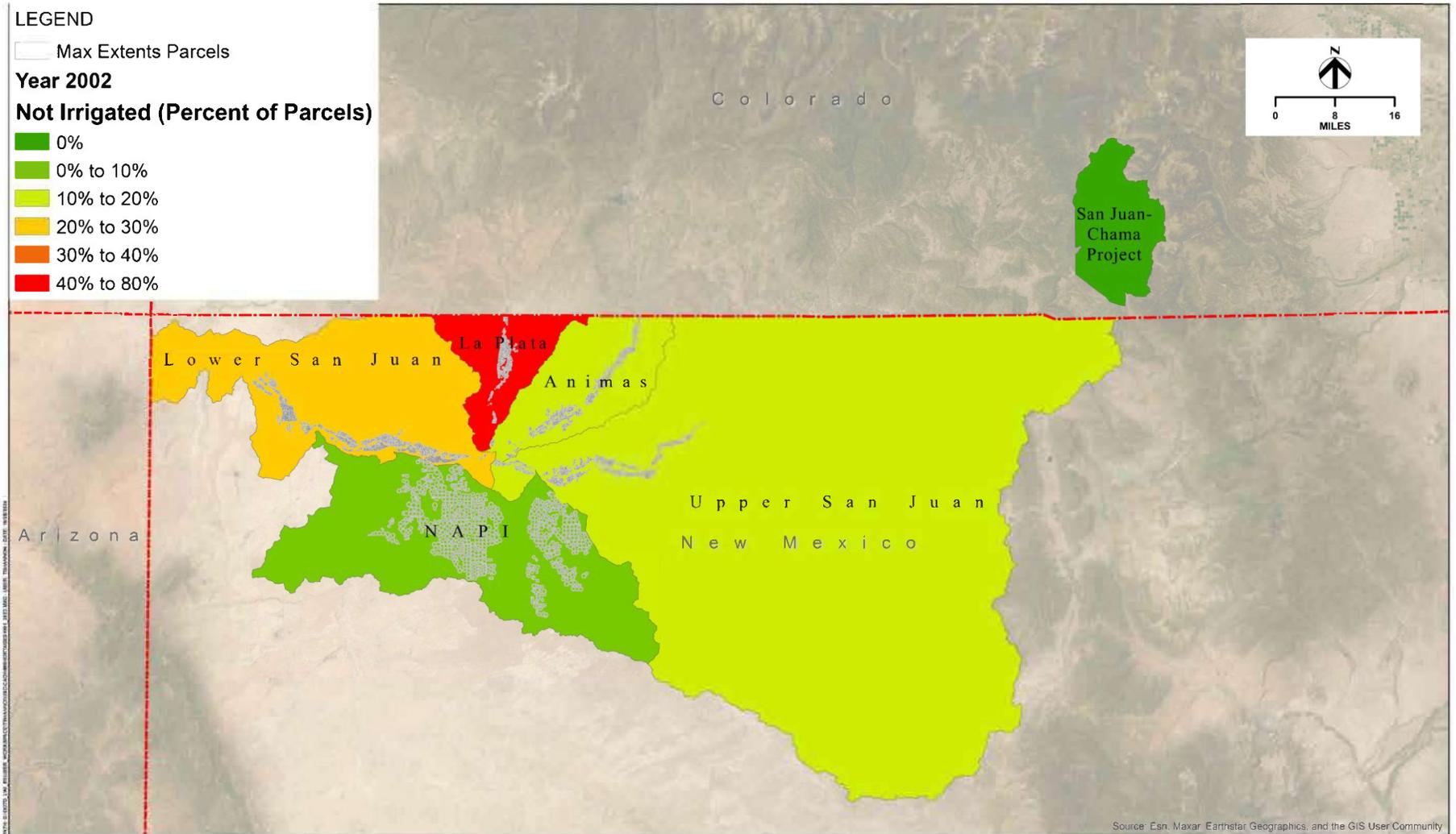
LEGEND

Max Extents Parcels

Year 2002

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBETCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbetcuetofhlsirrstatusfield)

DATE
9/11/2024

FIGURE
2002

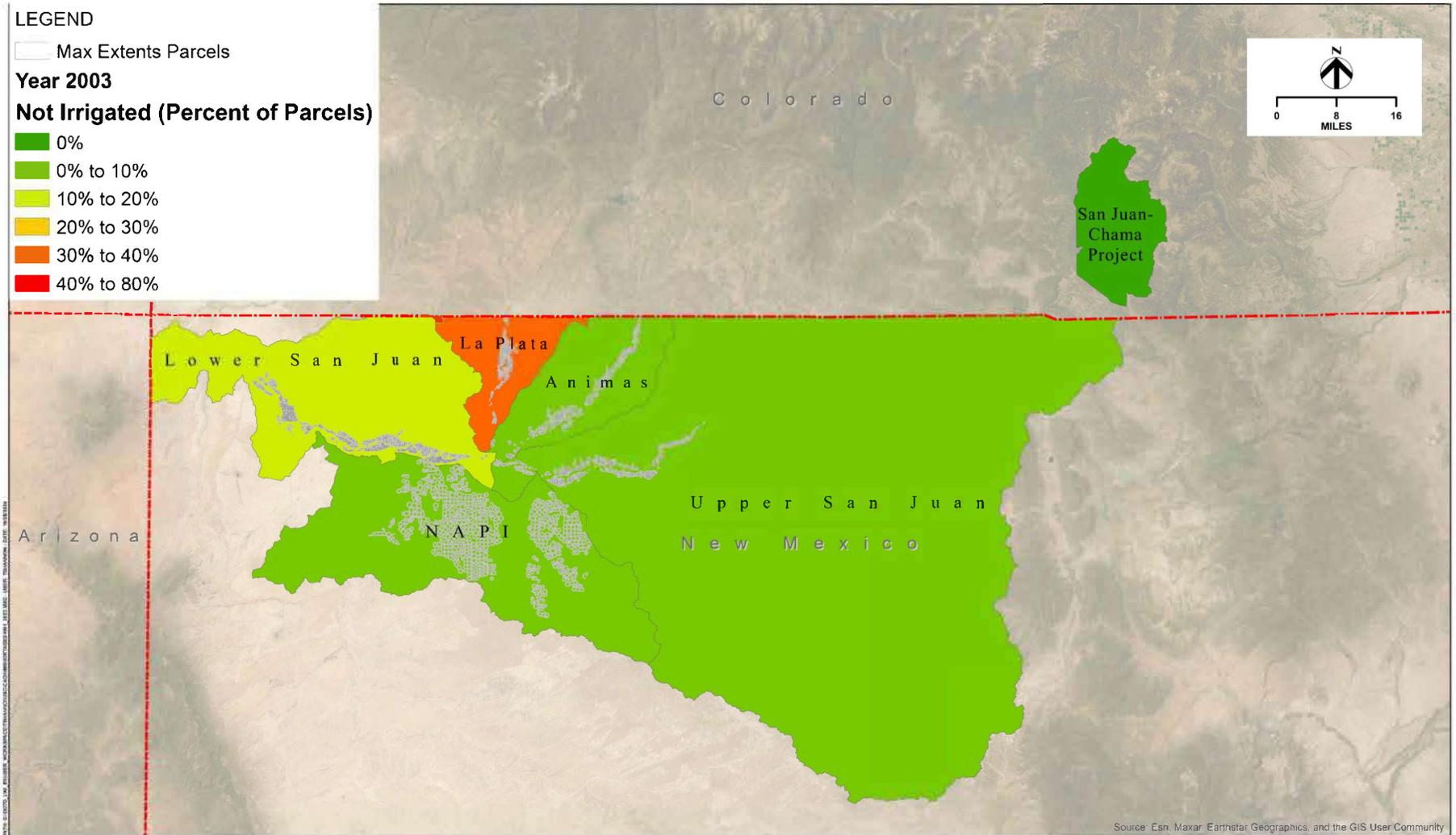
LEGEND

Max Extents Parcels

Year 2003

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



Source: Esri, Maxar, Earthstar, Geographics, and the GIS User Community

**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBETCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbetcuetoFHLSIRRSTATUSFIELD)

DATE
9/11/2024

FIGURE
2003

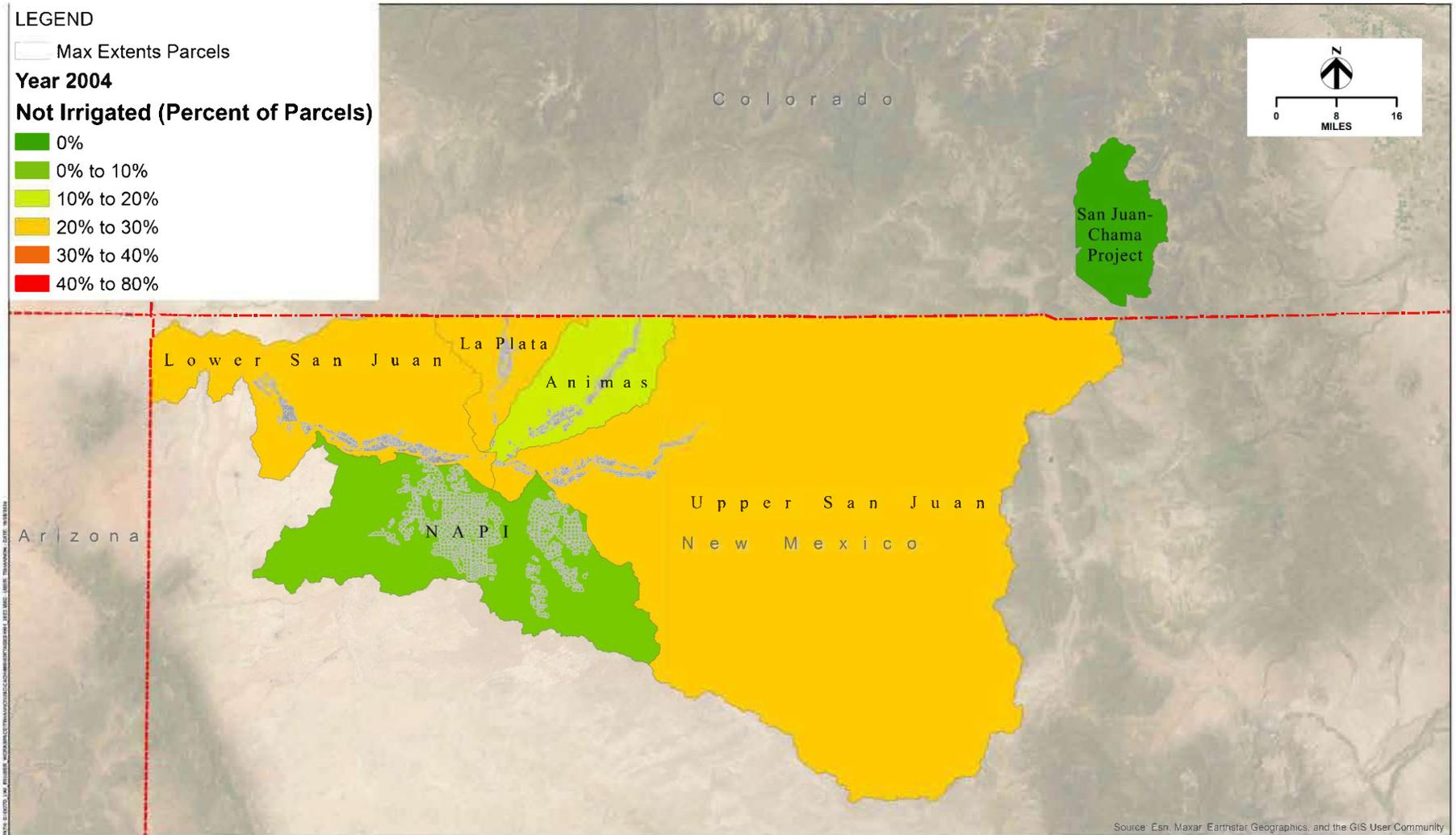
LEGEND

Max Extents Parcels

Year 2004

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBETCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbetcuetoFHLSIRRSTATUSFIELD)

DATE
9/11/2024

FIGURE
2004

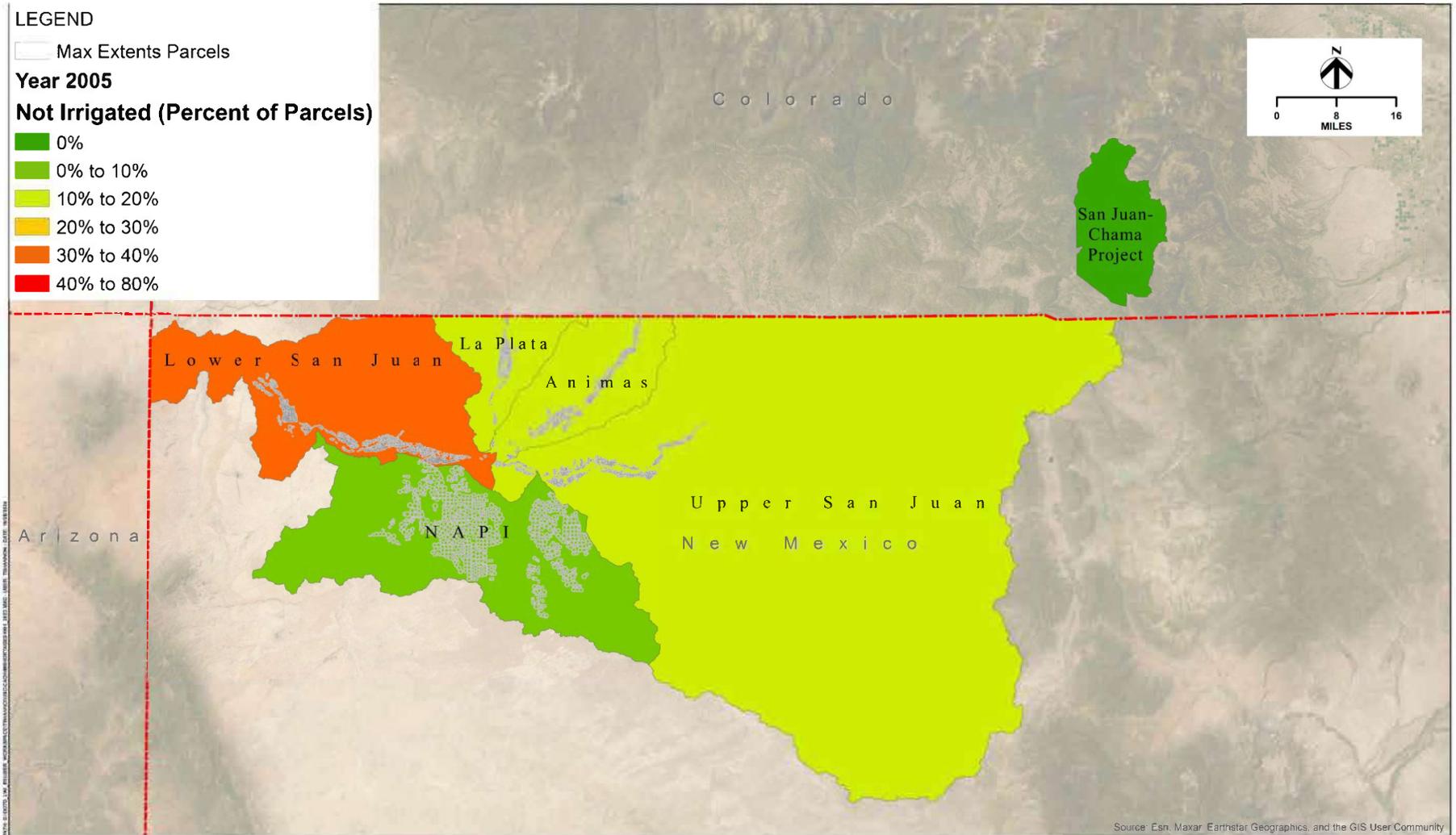
LEGEND

Max Extents Parcels

Year 2005

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



Source: Esri, Maxar, Earthstar, Geographics, and the GIS User Community

**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBETCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbetcuetoFHLSIRRSTATUSFIELD)

DATE
9/11/2024

FIGURE
2005

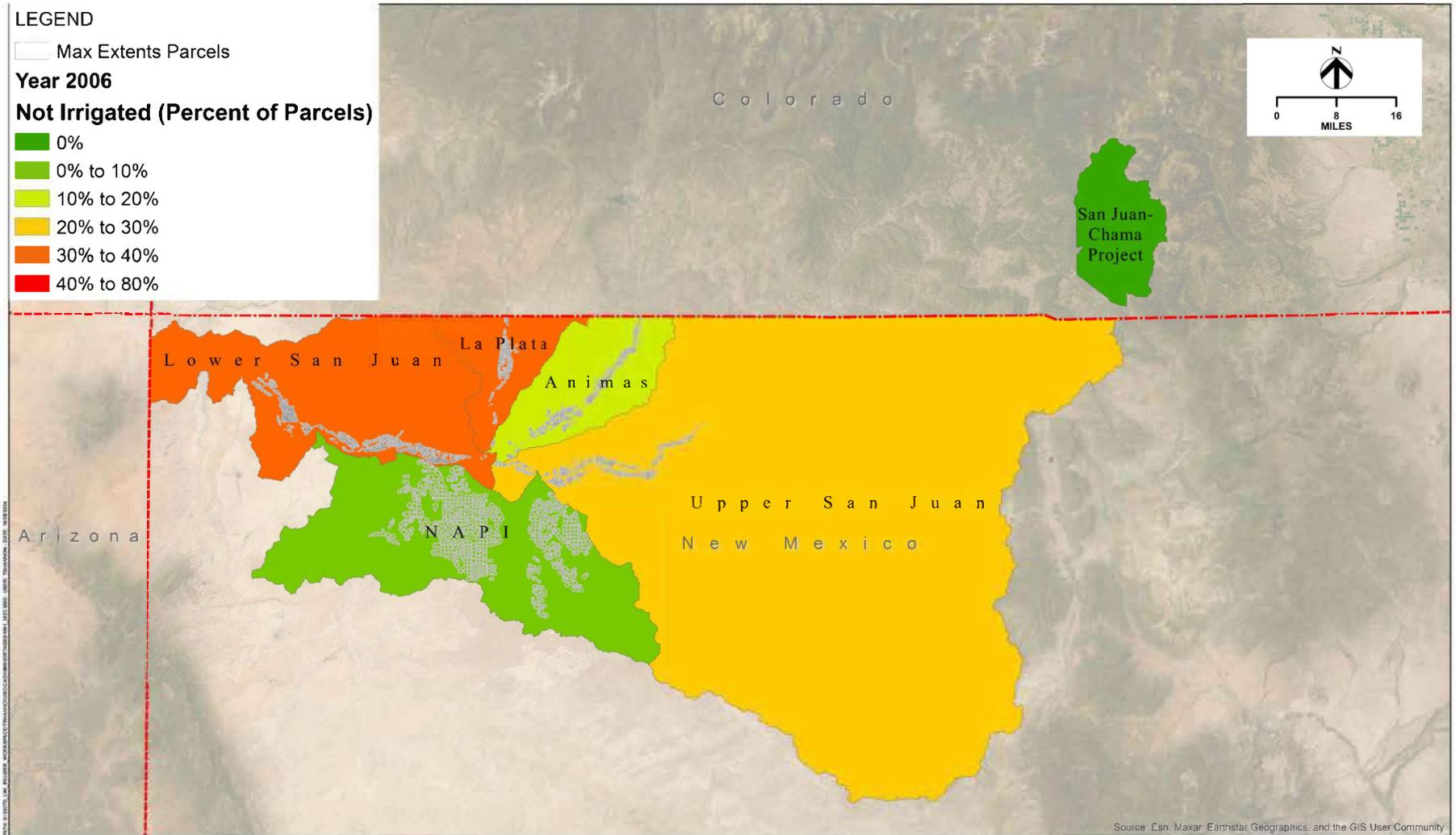
LEGEND

Max Extents Parcels

Year 2006

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



**HISTORICAL IRRIGATION SHORTAGES
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DATE
9/11/2024

FIGURE
2006

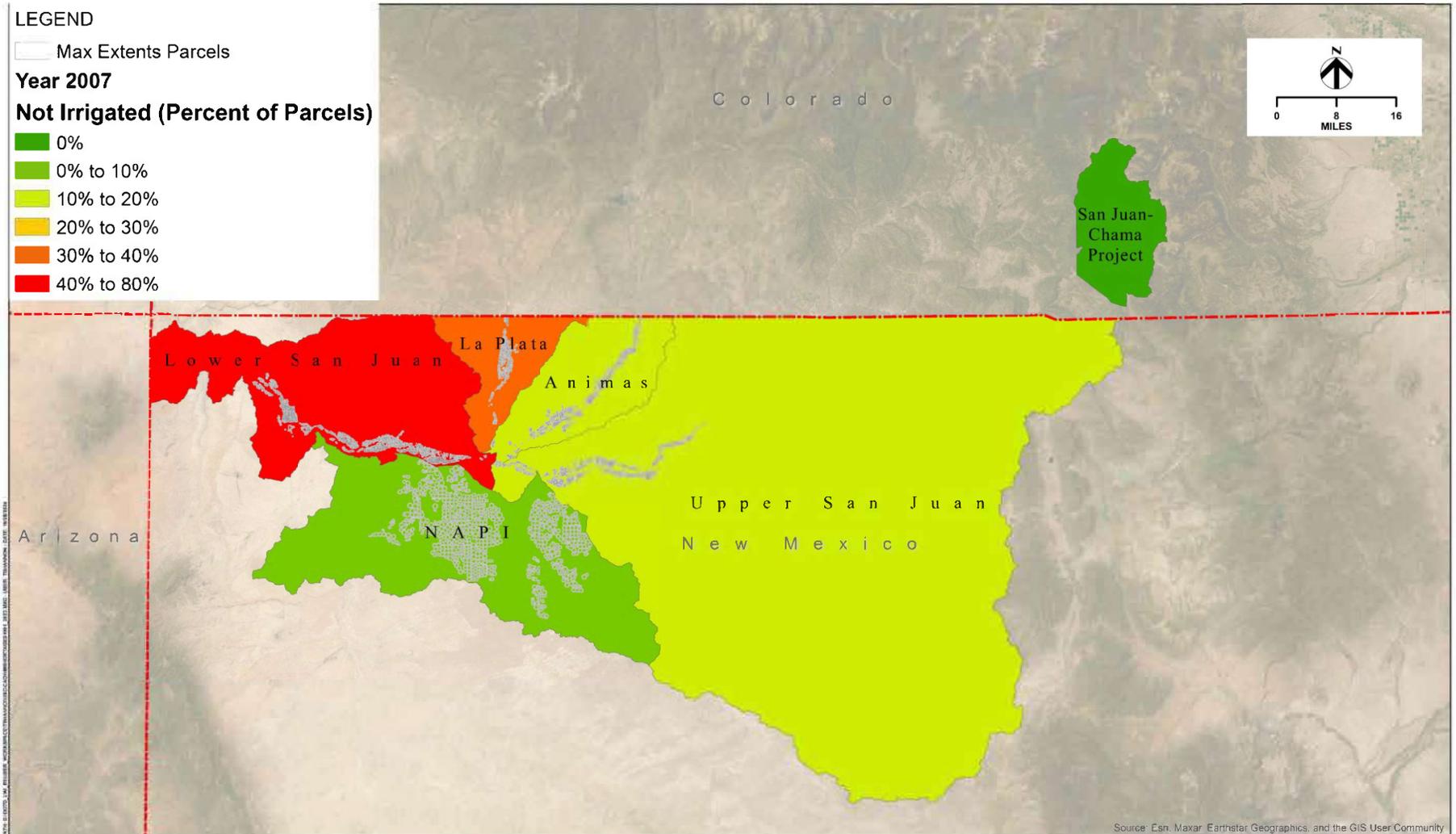
LEGEND

Max Extents Parcels

Year 2007

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



**HISTORICAL IRRIGATION SHORTAGES
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DATE: 9/11/2024

FIGURE **2007**

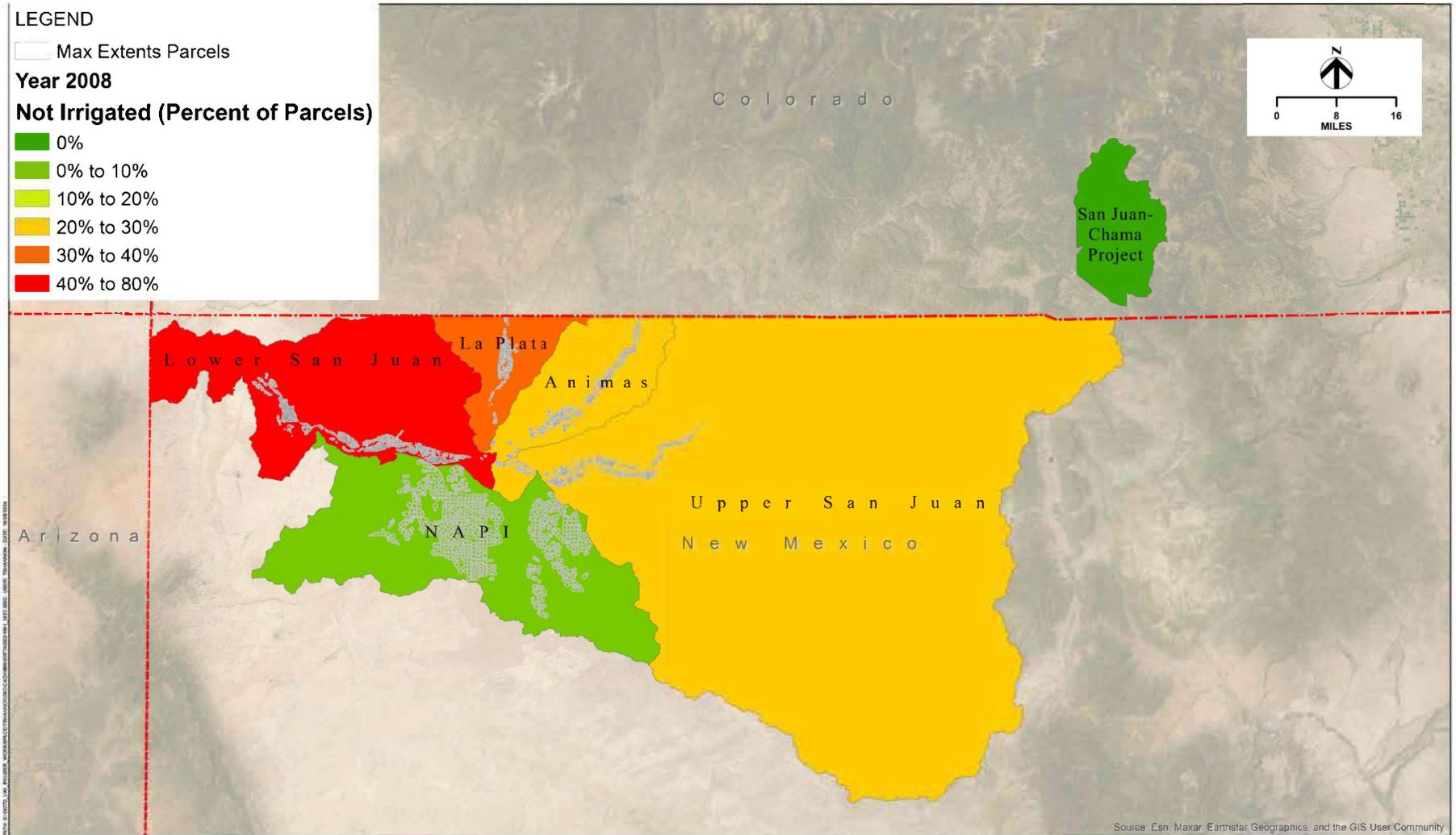
LEGEND

Max Extents Parcels

Year 2008

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



**HISTORICAL IRRIGATION SHORTAGES
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DATE
9/11/2024

FIGURE
2008

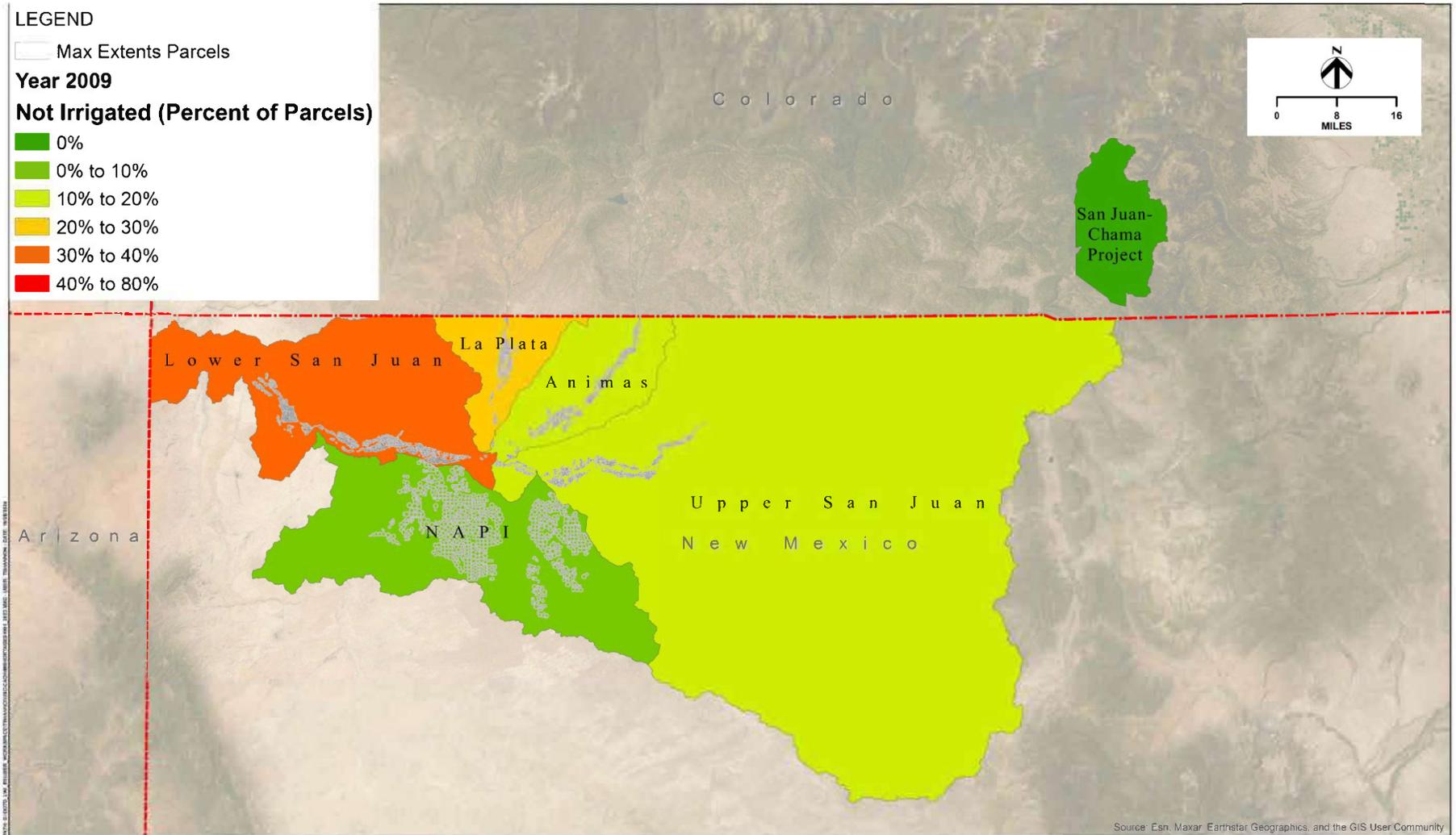
LEGEND

Max Extents Parcels

Year 2009

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



Source: Esri, Maxar, Earthstar, Geographics, and the GIS User Community

**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

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DATE
9/11/2024

FIGURE
2009

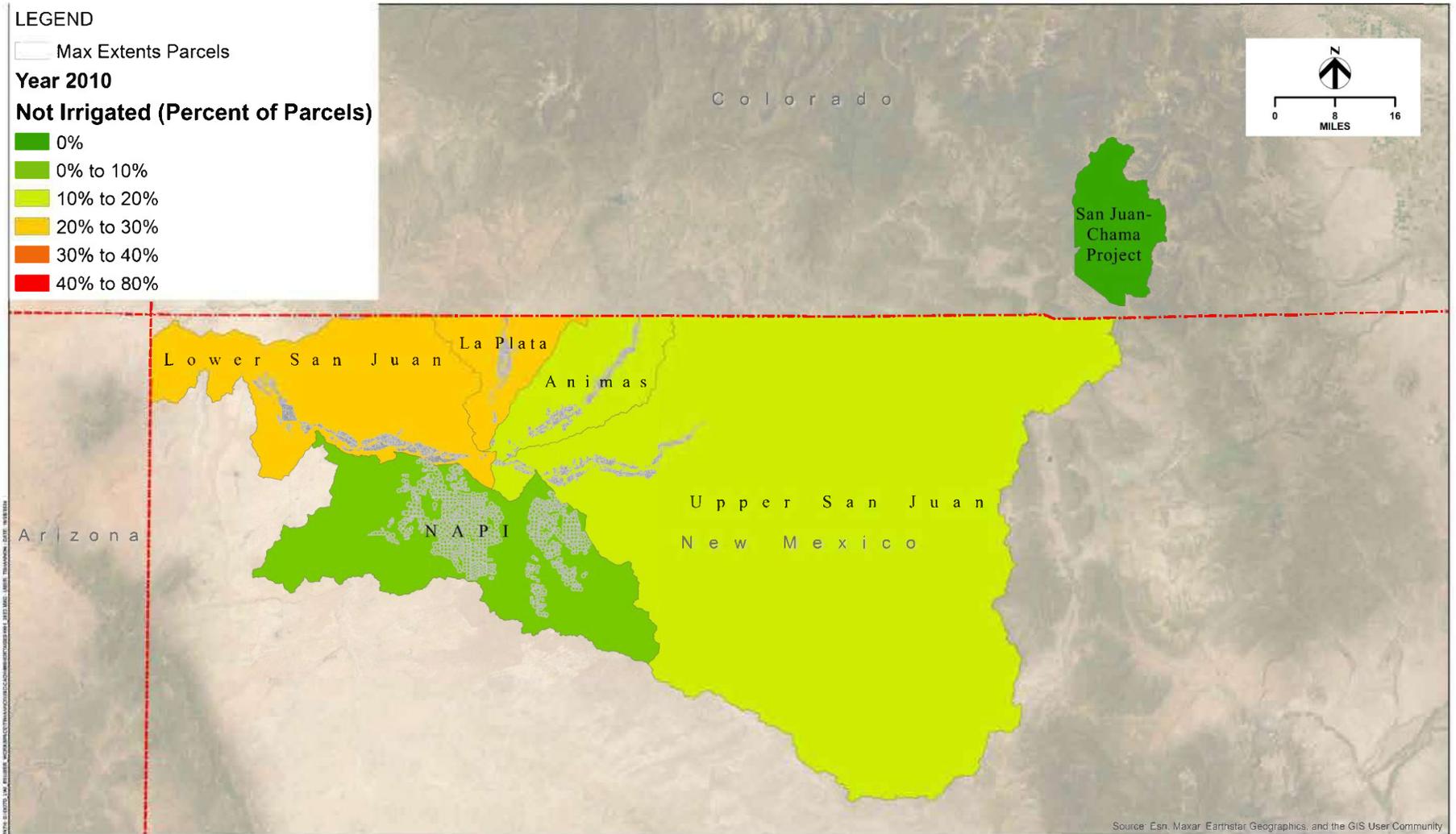
LEGEND

Max Extents Parcels

Year 2010

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



Source: Esri, Maxar, Earthstar, Geographics, and the GIS User Community

**HISTORICAL IRRIGATION SHORTAGES
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DATE
9/11/2024

FIGURE
2010

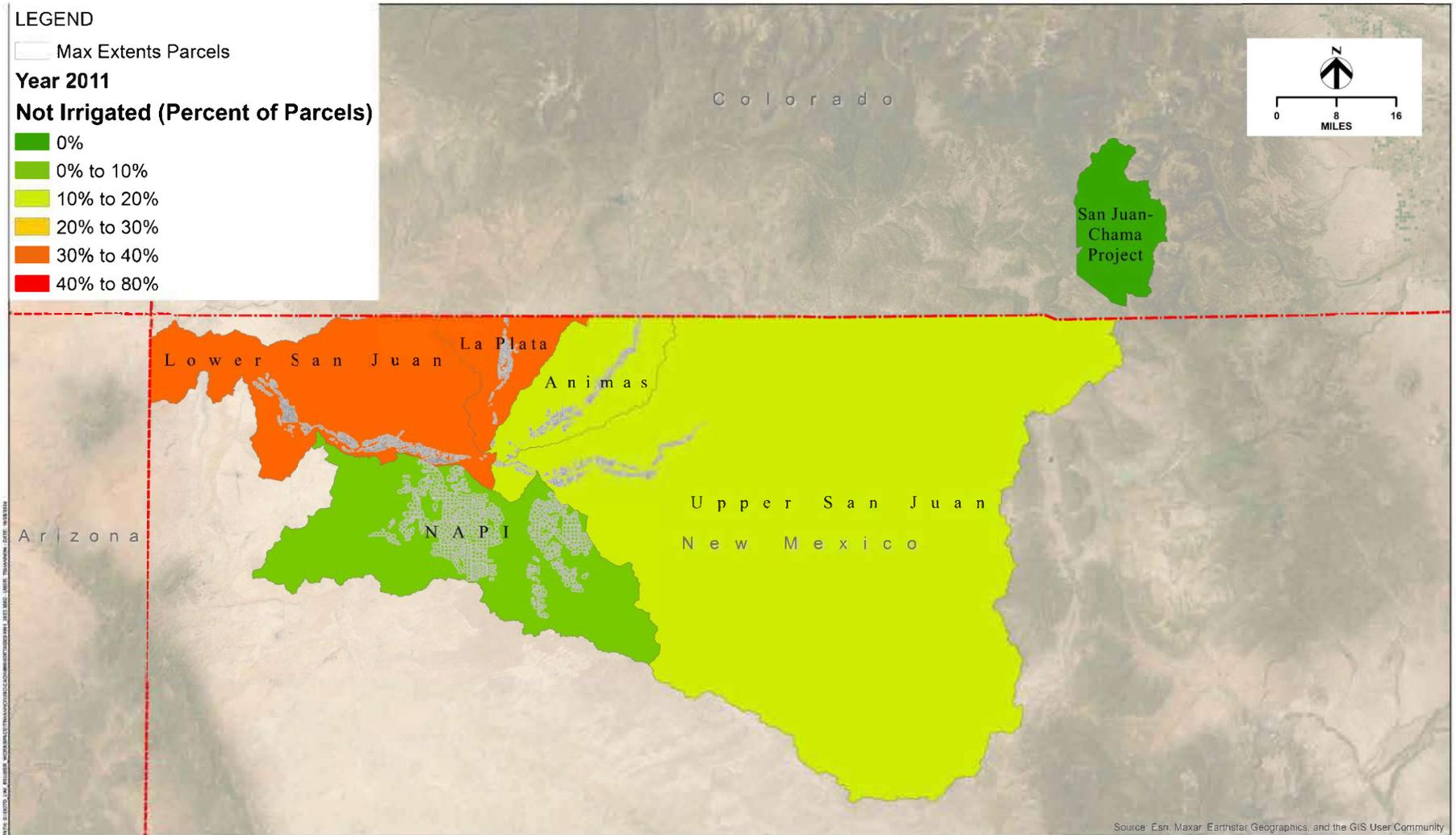
LEGEND

Max Extents Parcels

Year 2011

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBETCUE TOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbetcuetofhlsirrstatusfield)

DATE
9/11/2024

FIGURE
2011

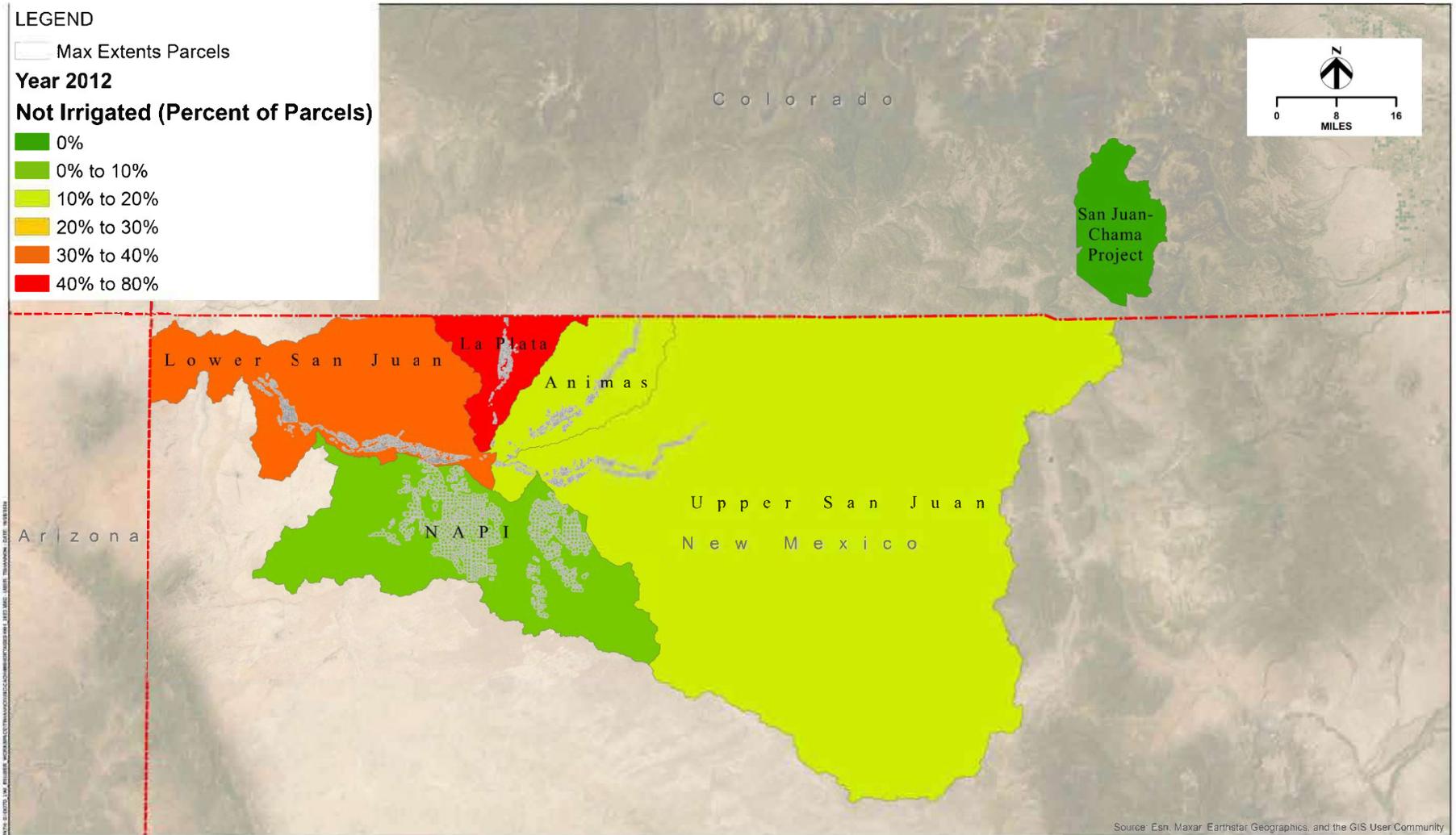
LEGEND

Max Extents Parcels

Year 2012

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



**HISTORICAL IRRIGATION SHORTAGES
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DATE
9/11/2024

FIGURE
2012

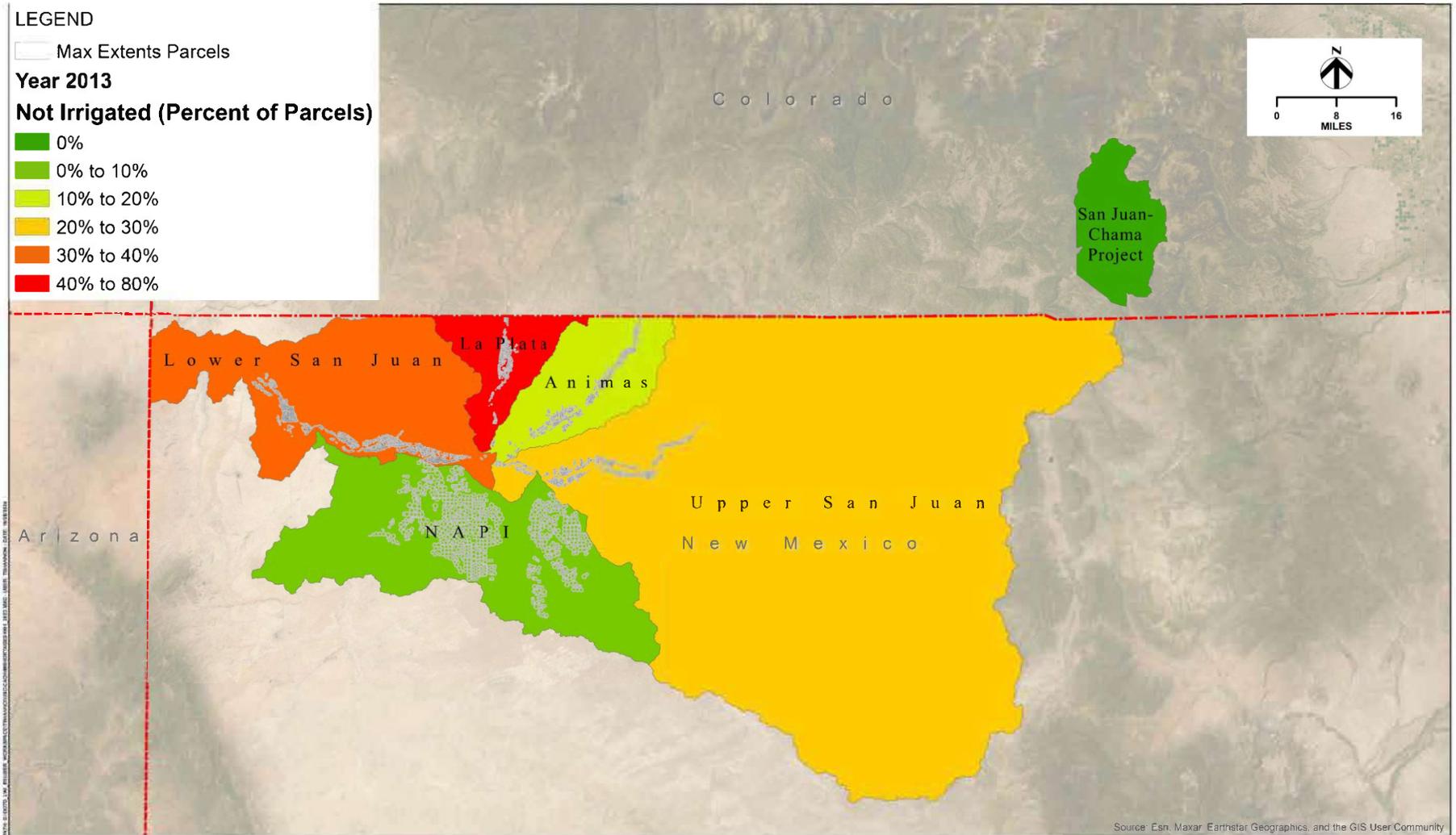
LEGEND

Max Extents Parcels

Year 2013

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBETCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbetcuetoFHLSIRRSTATUSFIELD)

DATE
9/11/2024

FIGURE
2013

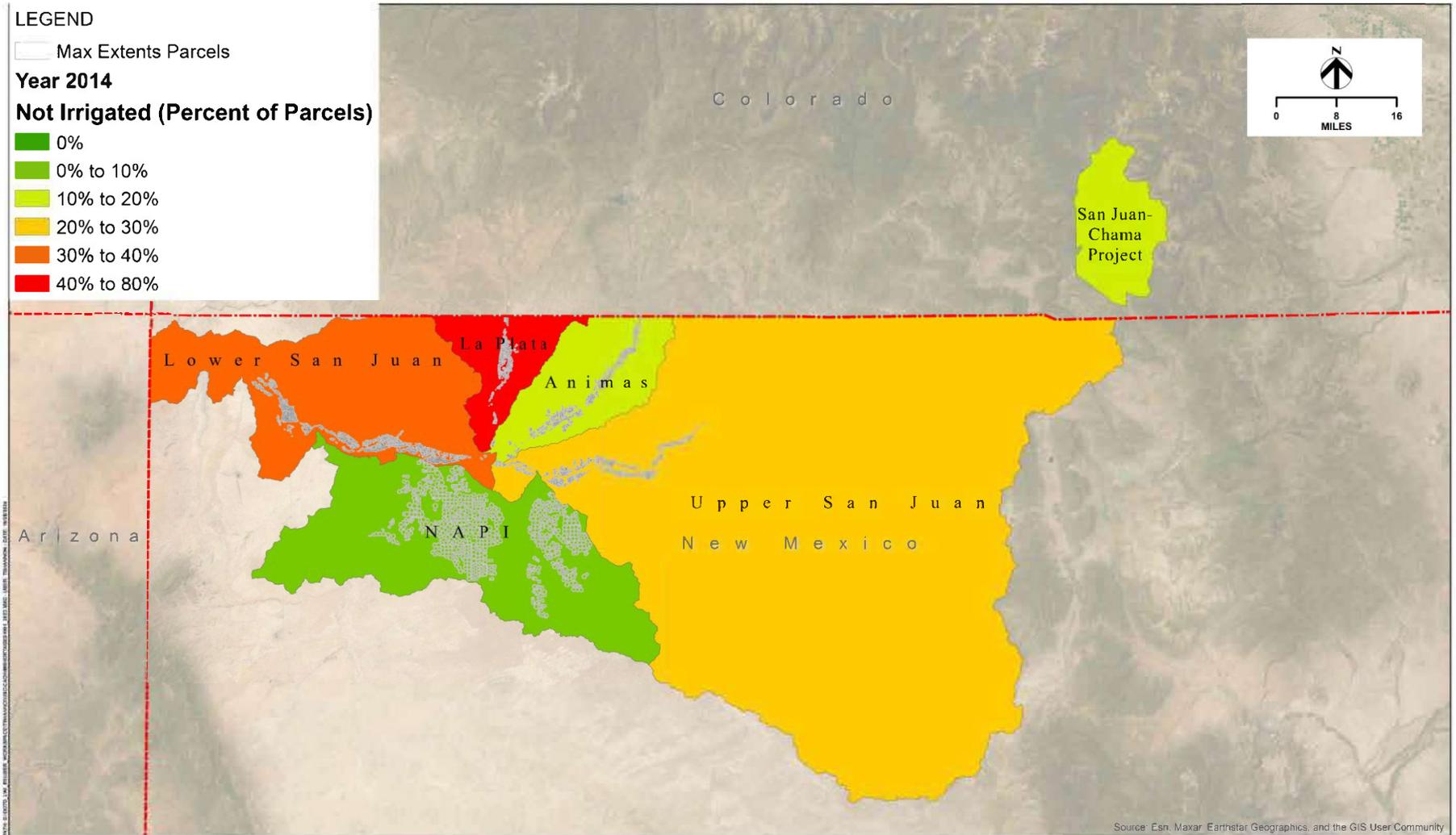
LEGEND

Max Extents Parcels

Year 2014

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

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DATE
9/11/2024

FIGURE
2014

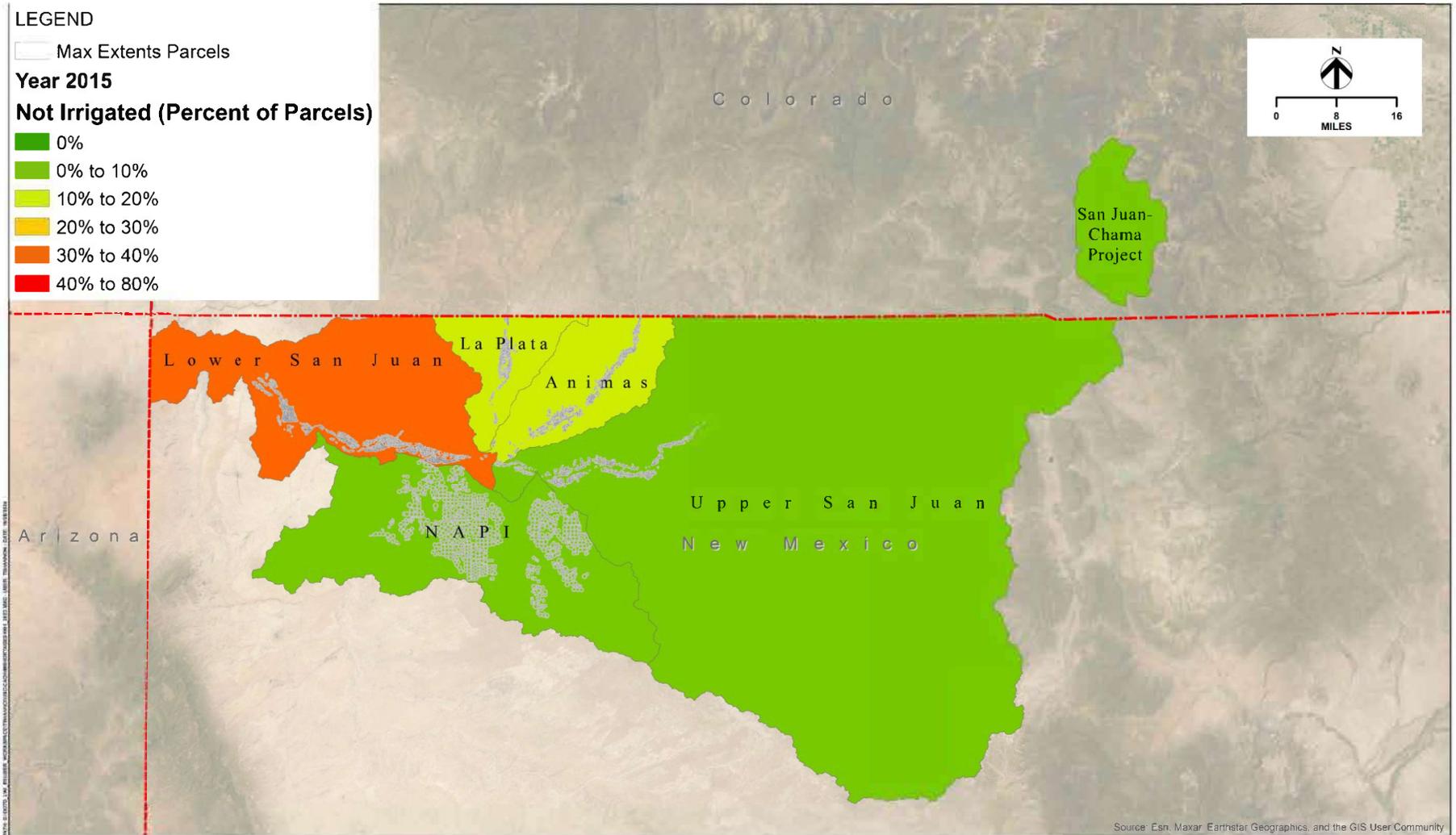
LEGEND

Max Extents Parcels

Year 2015

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



Source: Esri, Maxar, Earthstar, Geographics, and the GIS User Community

**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBETCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbetcuetoFHLSIRRSTATUSFIELD)

DATE
9/11/2024

FIGURE
2015

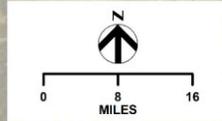
LEGEND

Max Extents Parcels

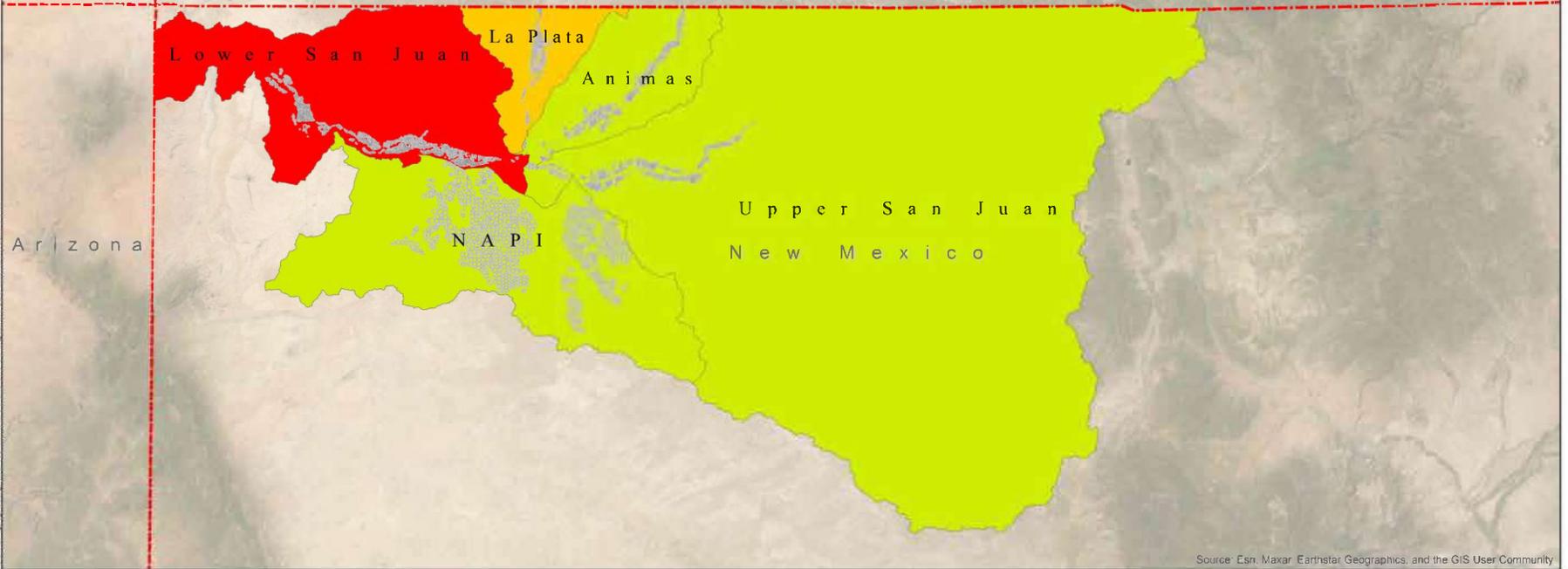
Year 2016

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



San Juan-Chama Project



Source: Esri, Maxar, Earthstar, Geographics, and the GIS User Community

**HISTORICAL IRRIGATION SHORTAGES
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DATE: 9/11/2024

FIGURE **2016**

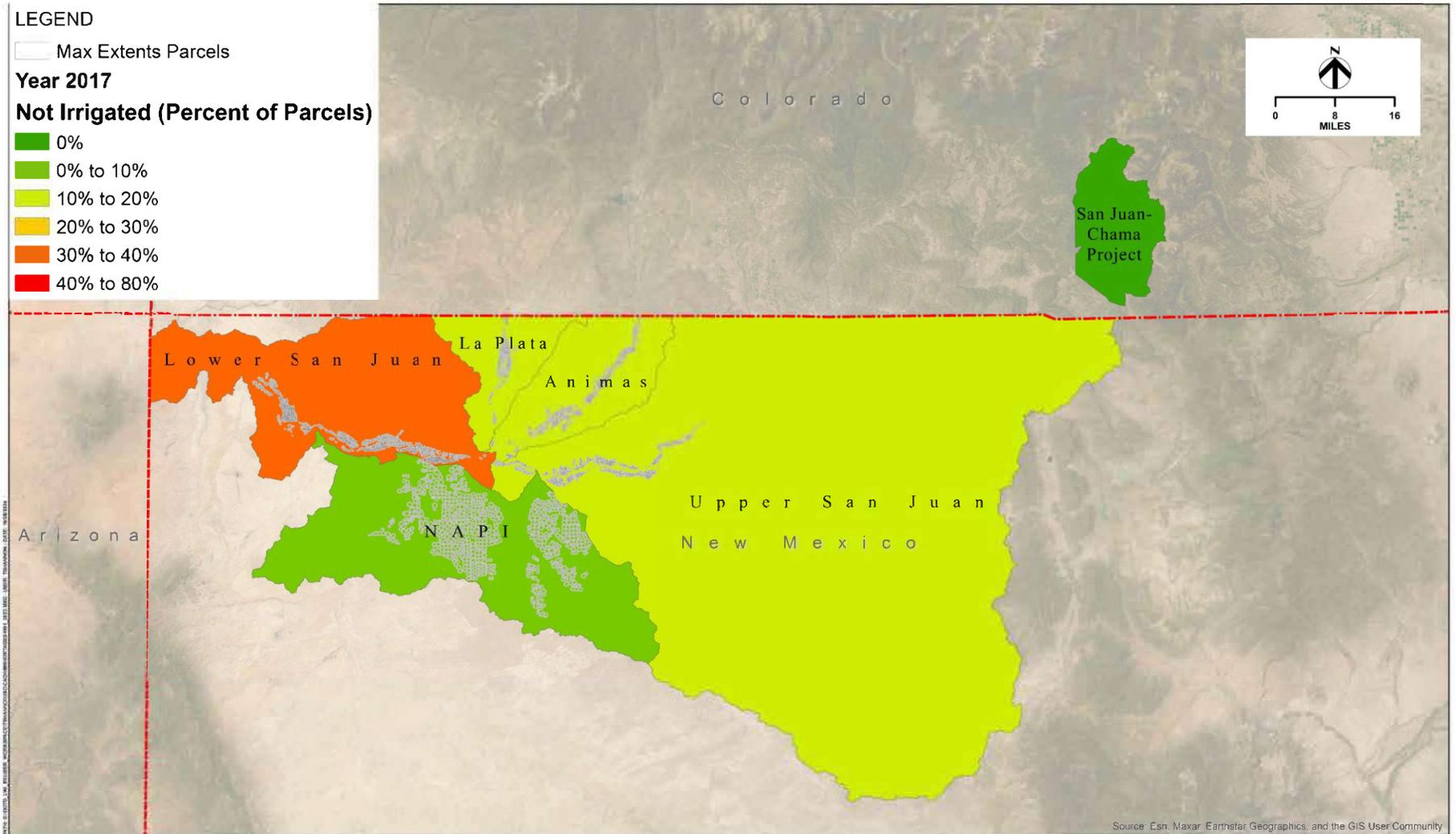
LEGEND

Max Extents Parcels

Year 2017

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



Source: Esri, Maxar, Earthstar, Geographics, and the GIS User Community

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DATE
9/11/2024

FIGURE
2017

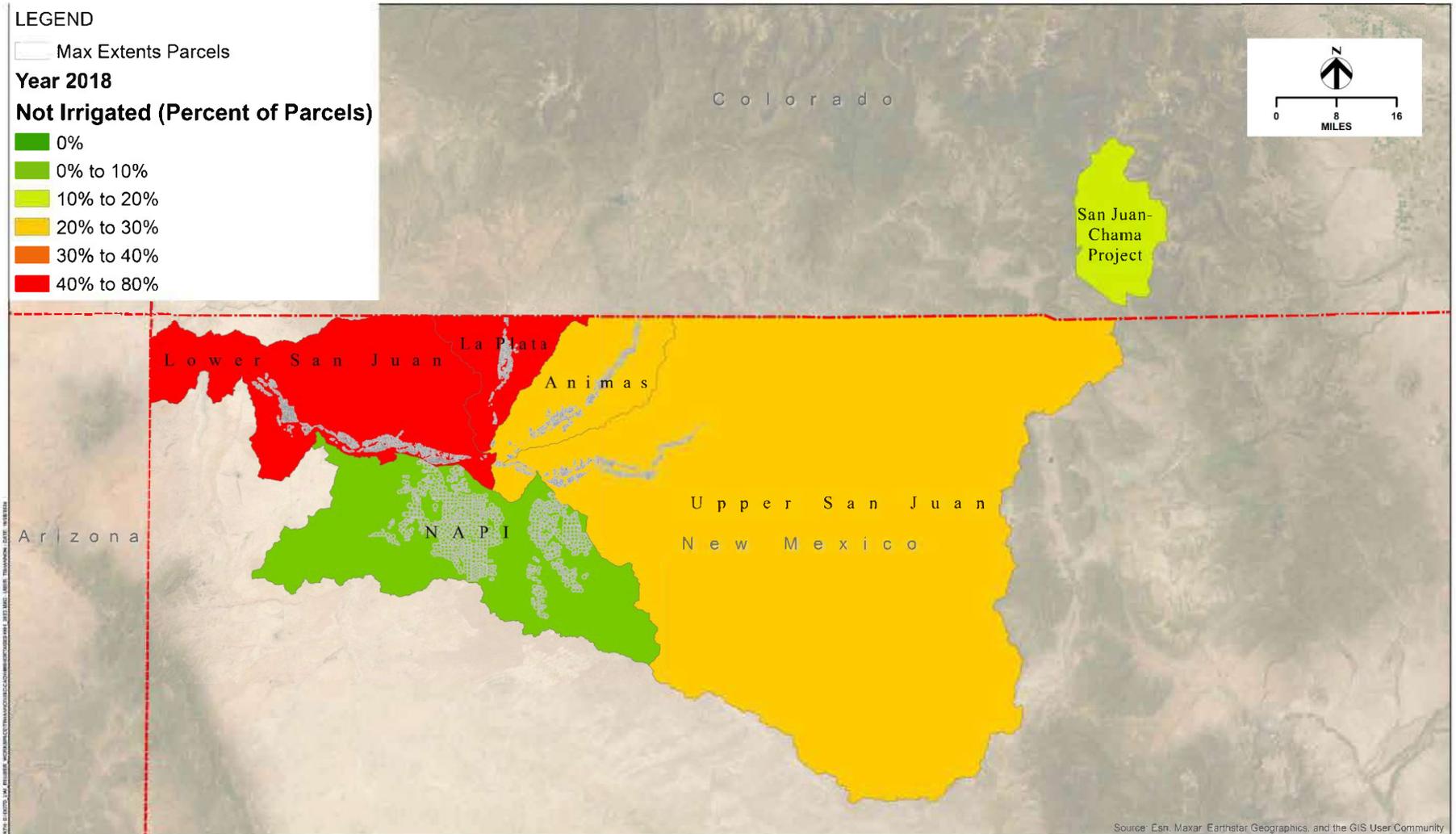
LEGEND

Max Extents Parcels

Year 2018

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



Source: Esri, Maxar, Earthstar, Geographics, and the GIS User Community

**HISTORICAL IRRIGATION SHORTAGES
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DATE
9/11/2024

FIGURE
2018

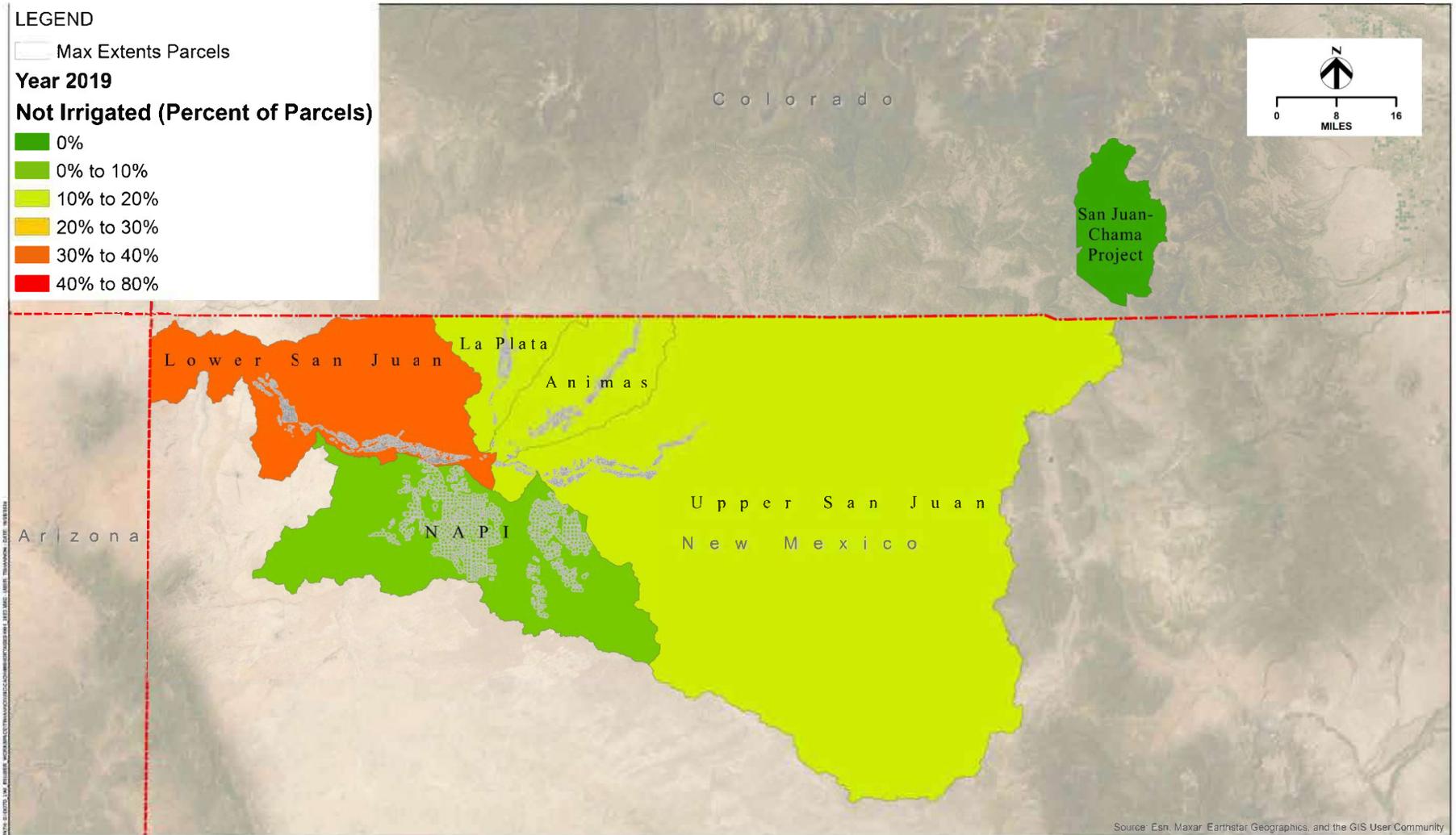
LEGEND

Max Extents Parcels

Year 2019

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



Source: Esri, Maxar, Earthstar, Geographics, and the GIS User Community

**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

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DATE
9/11/2024

FIGURE
2019

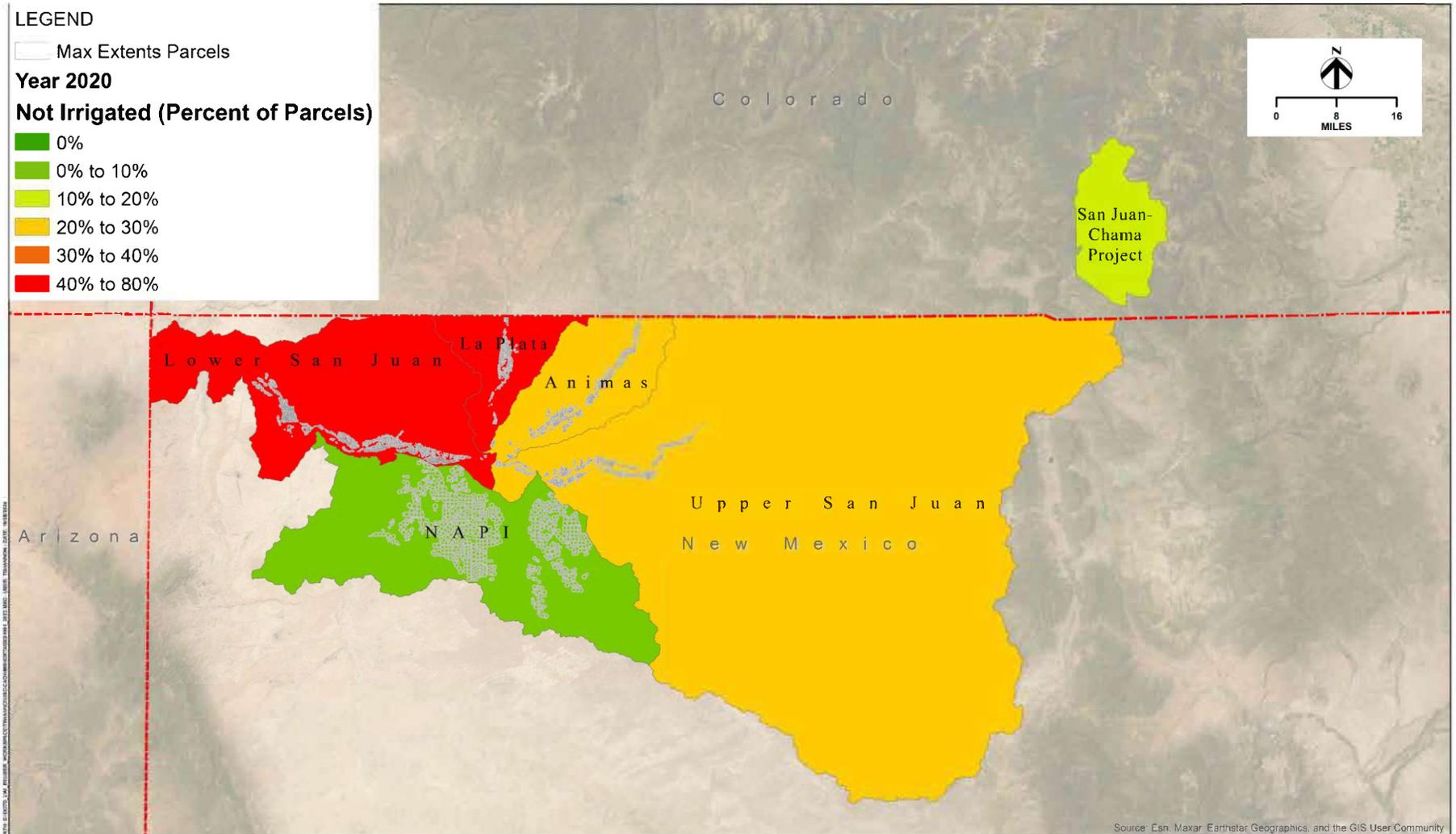
LEGEND

Max Extents Parcels

Year 2020

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



Source: Esri, Maxar, Earthstar, Geographics, and the GIS User Community

**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBTCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbtcuetofhlsirrstatusfield)

DATE
9/11/2024

FIGURE
2020

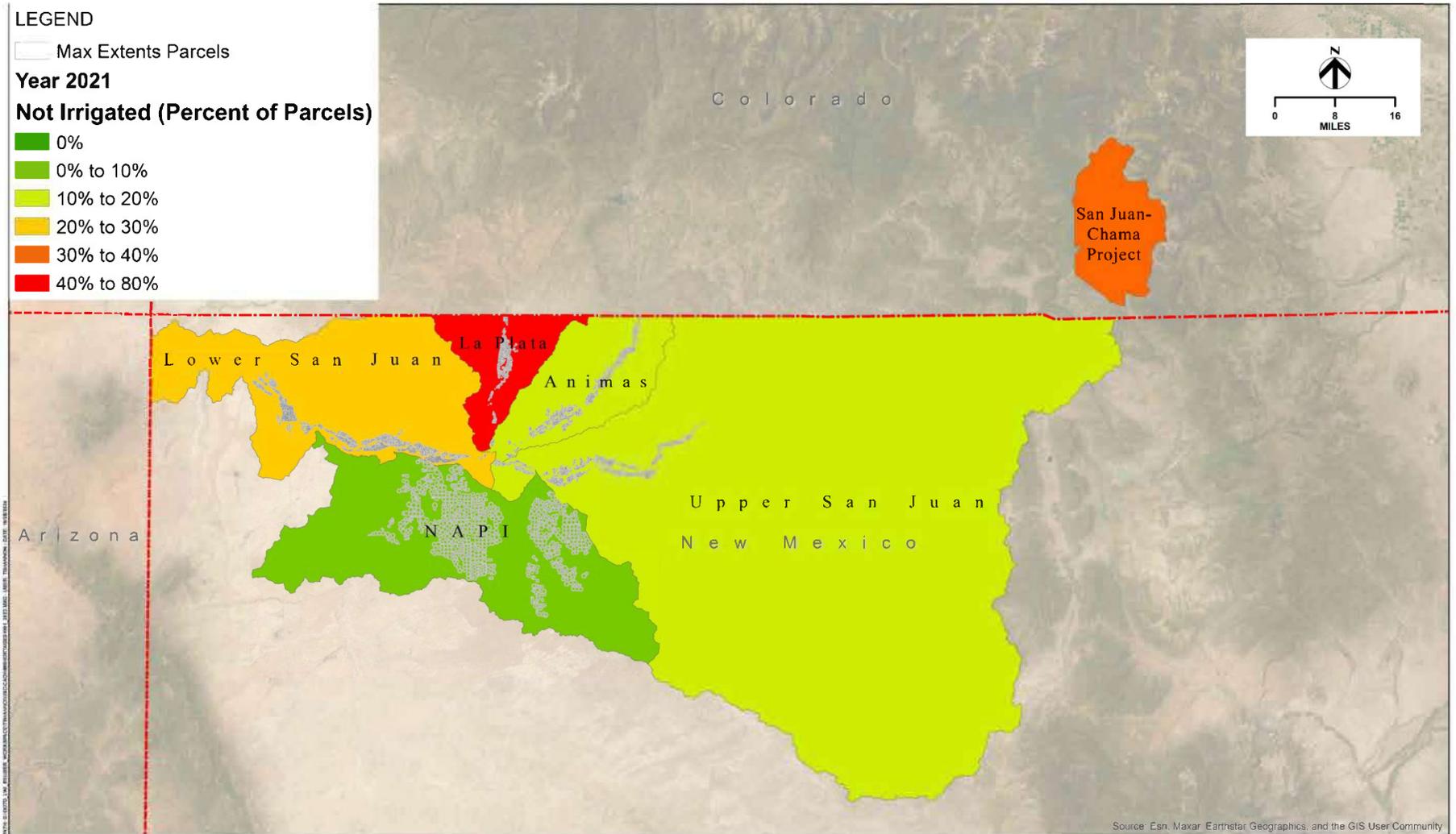
LEGEND

Max Extents Parcels

Year 2021

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBETCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbetcuetoFHLSIRRSTATUSFIELD)

DATE
9/11/2024

FIGURE
2021

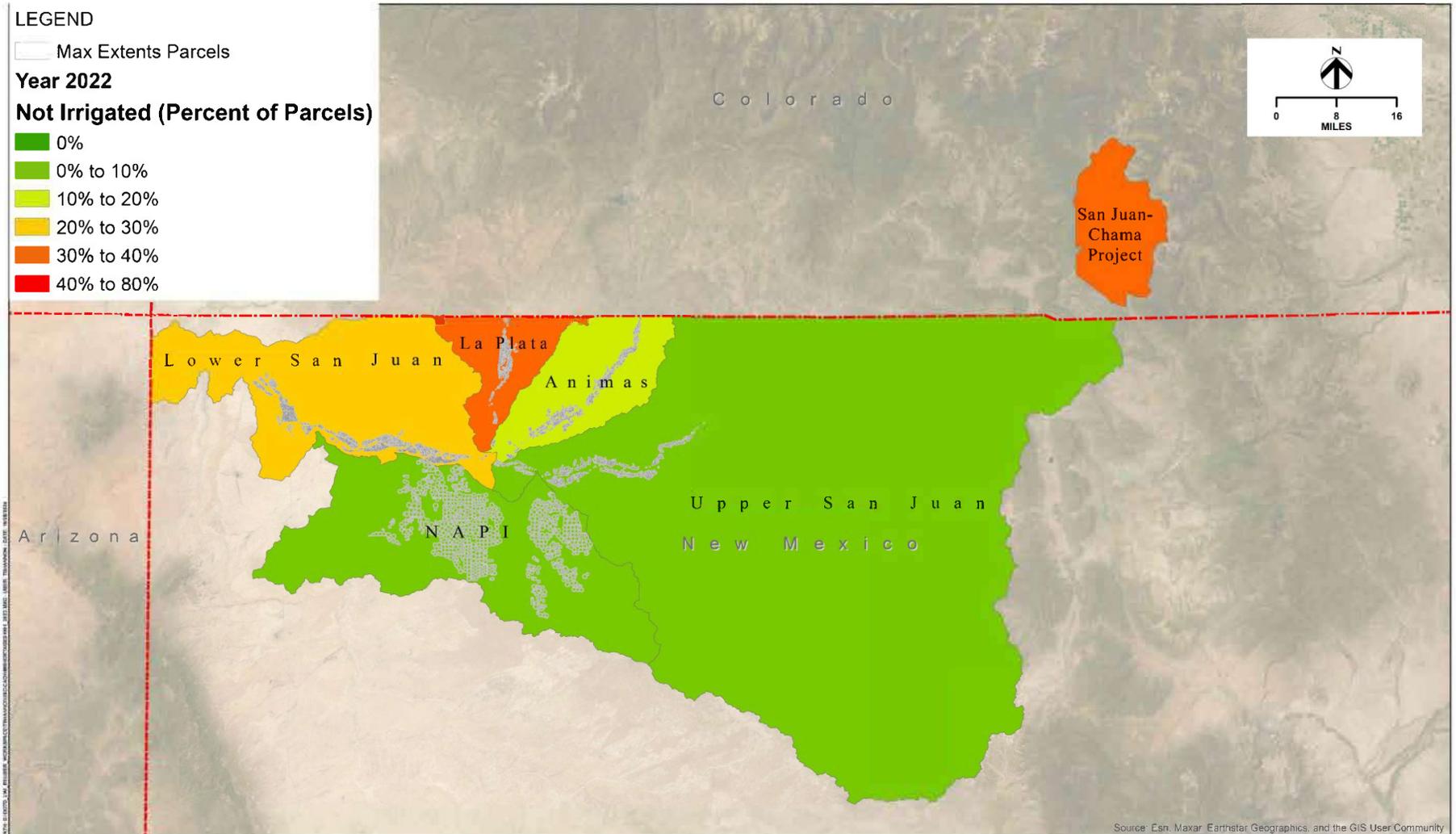
LEGEND

Max Extents Parcels

Year 2022

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBETCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbetcuetoFHLSIRRSTATUSFIELD)

DATE
9/11/2024

FIGURE
2022

LEGEND

Max Extents Parcels

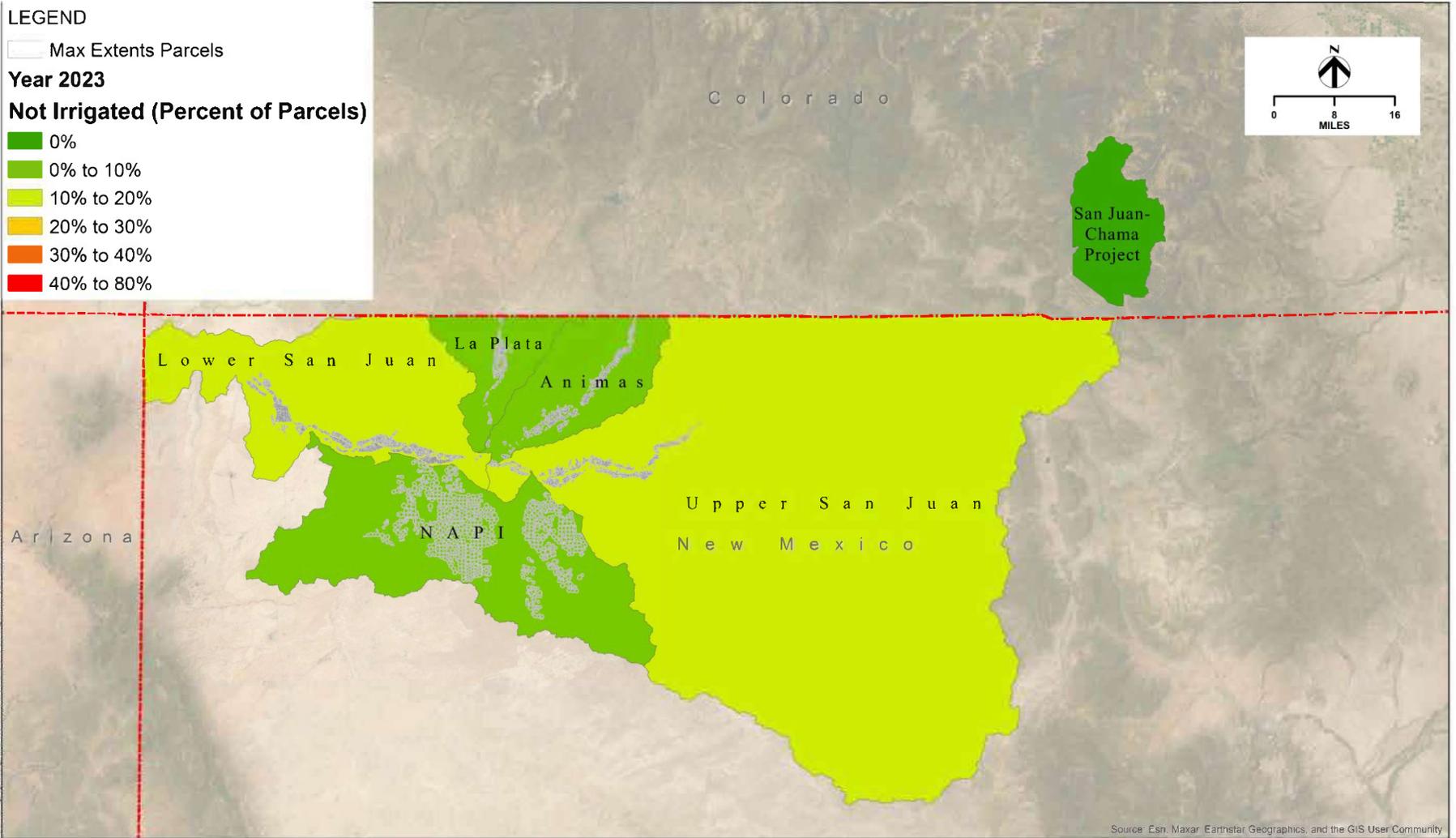
Year 2023

Not Irrigated (Percent of Parcels)

- 0%
- 0% to 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- 40% to 80%



San Juan-Chama Project



Source: Esri, Maxar, Earthstar, Geographics, and the GIS User Community

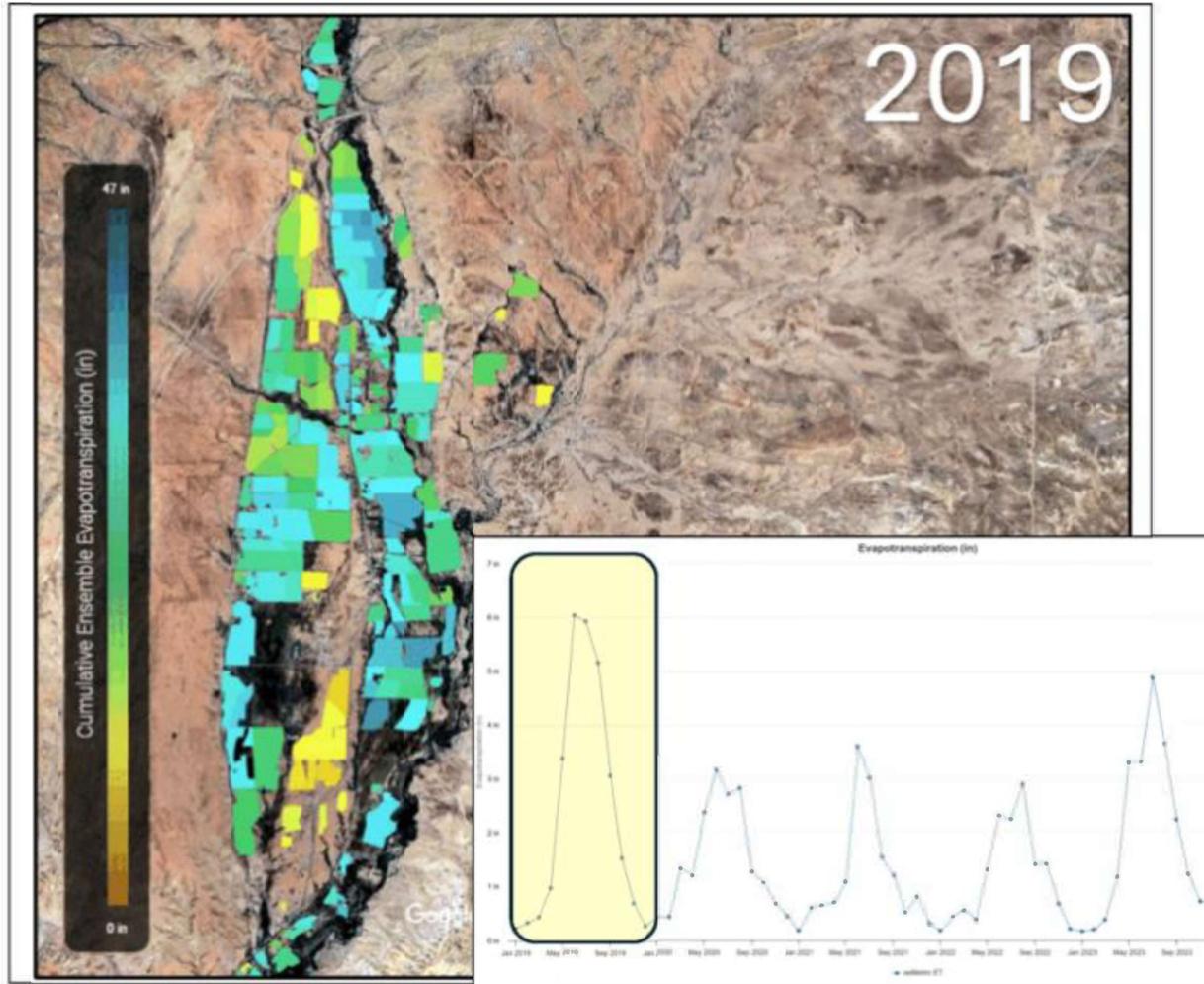
**HISTORICAL IRRIGATION SHORTAGES
BASED ON DRI NDVI IRRIGATION STATUS**

SOURCE: [HTTPS://DRI-APPS.PROJECTS.EARTHENGINE.APP/VIEW/UCRBTCUETOFHLSIRRSTATUSFIELD](https://dri-apps.projects.earthengine.app/view/ucrbtcuetofhlsirrstatusfield)

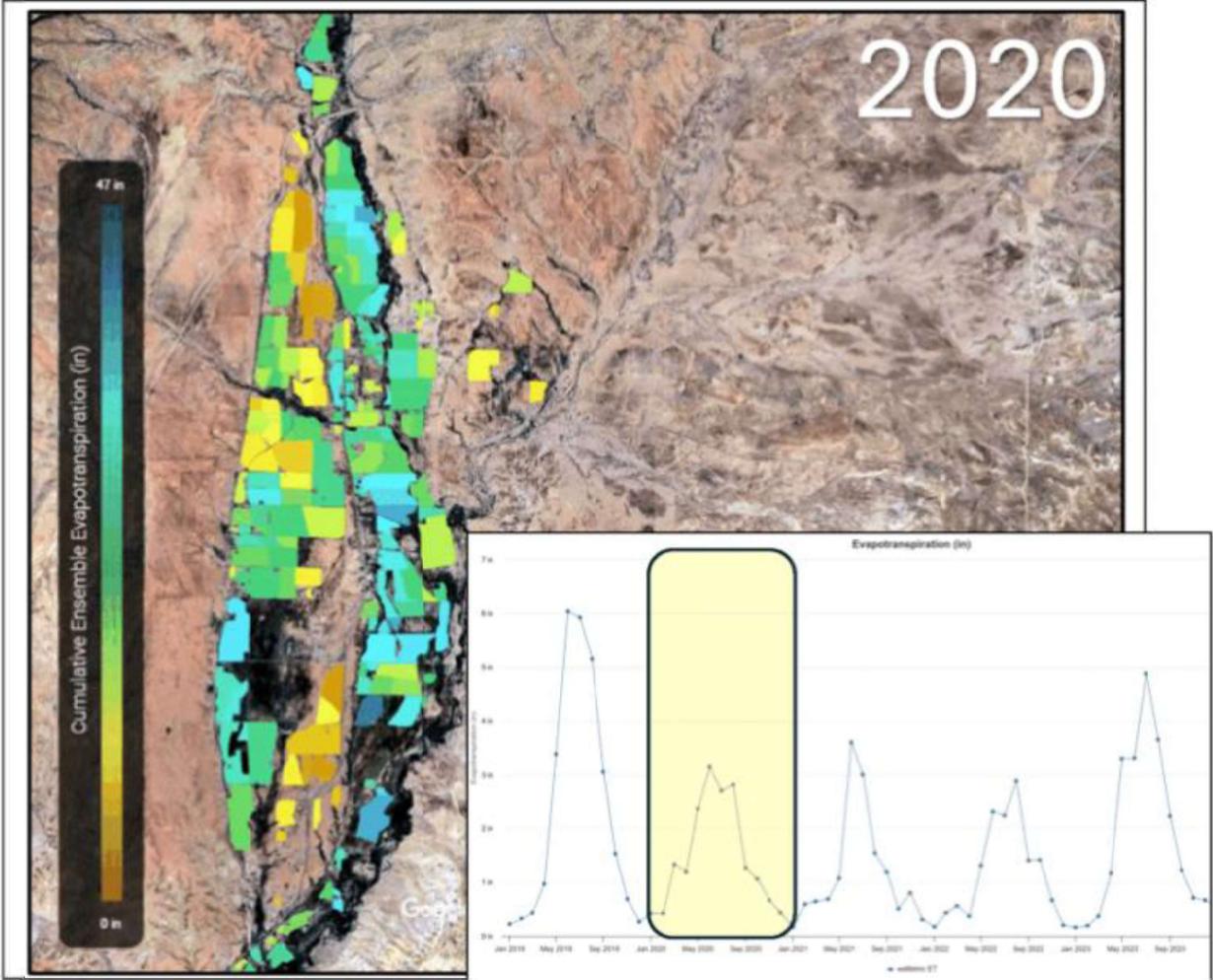
DATE: 9/11/2024

FIGURE **2023**

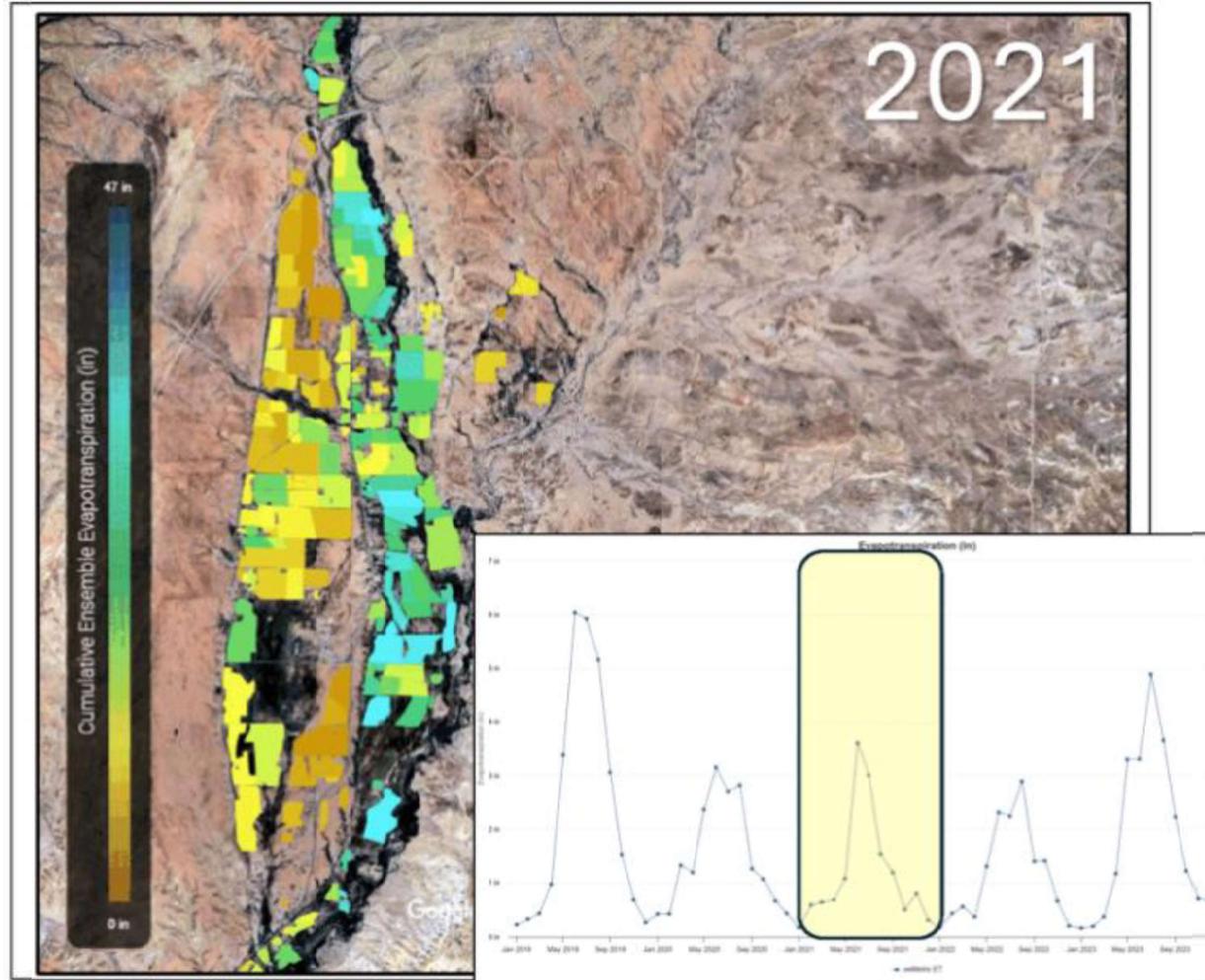
Example of Correlation with ET: La Plata River 2019-2023



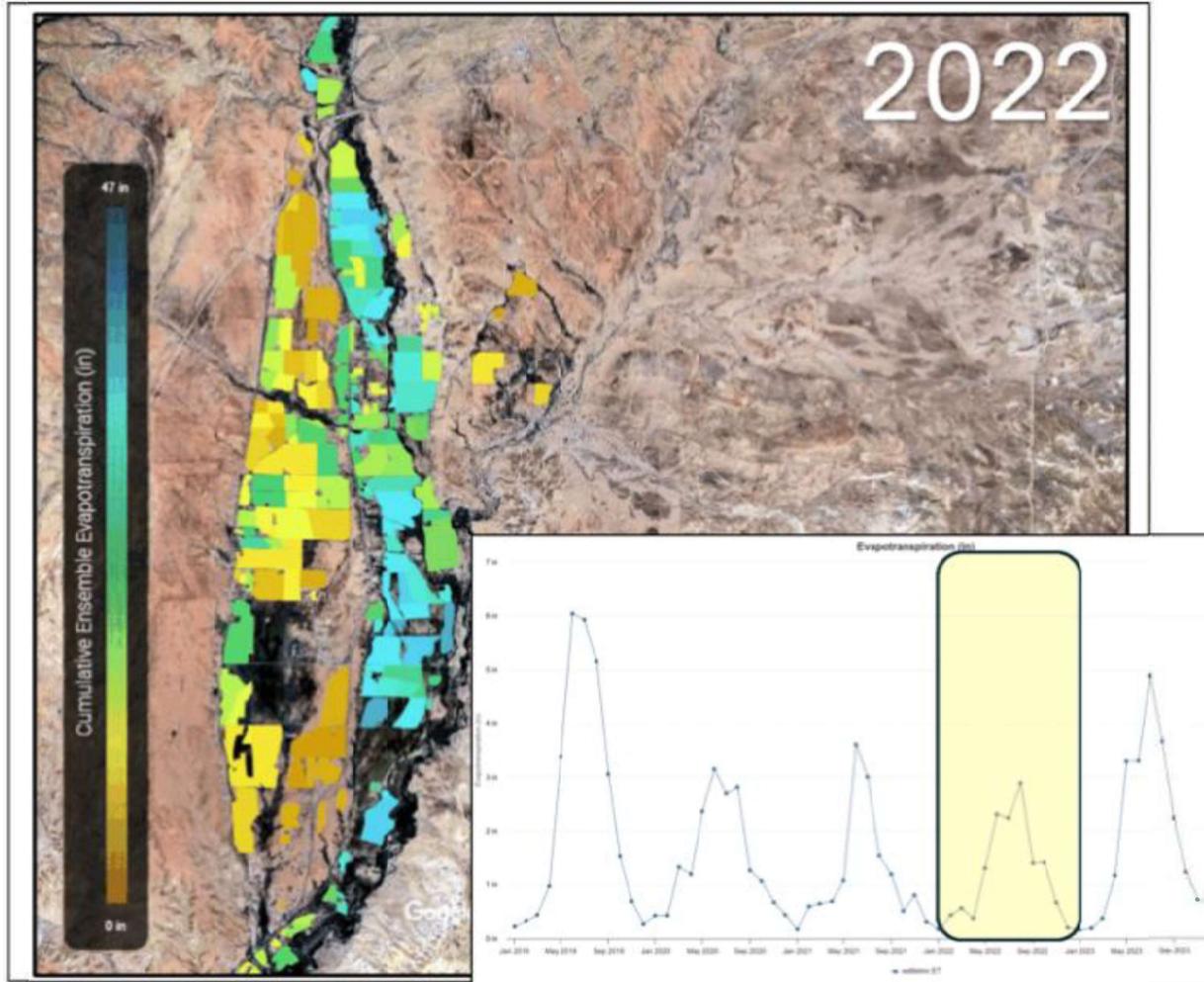
Example of Correlation with ET: La Plata River 2019-2023



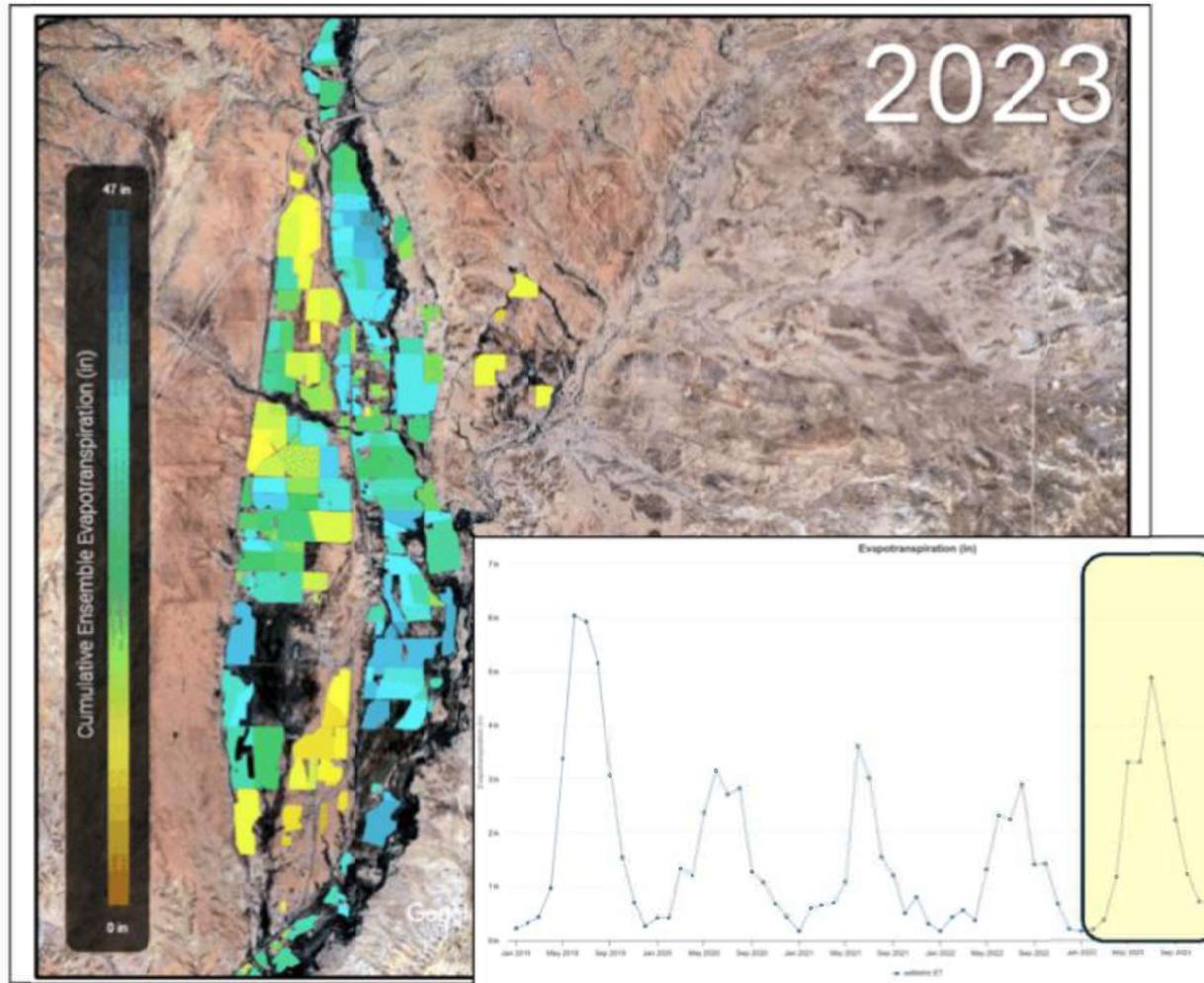
Example of Correlation with ET: La Plata River 2019-2023



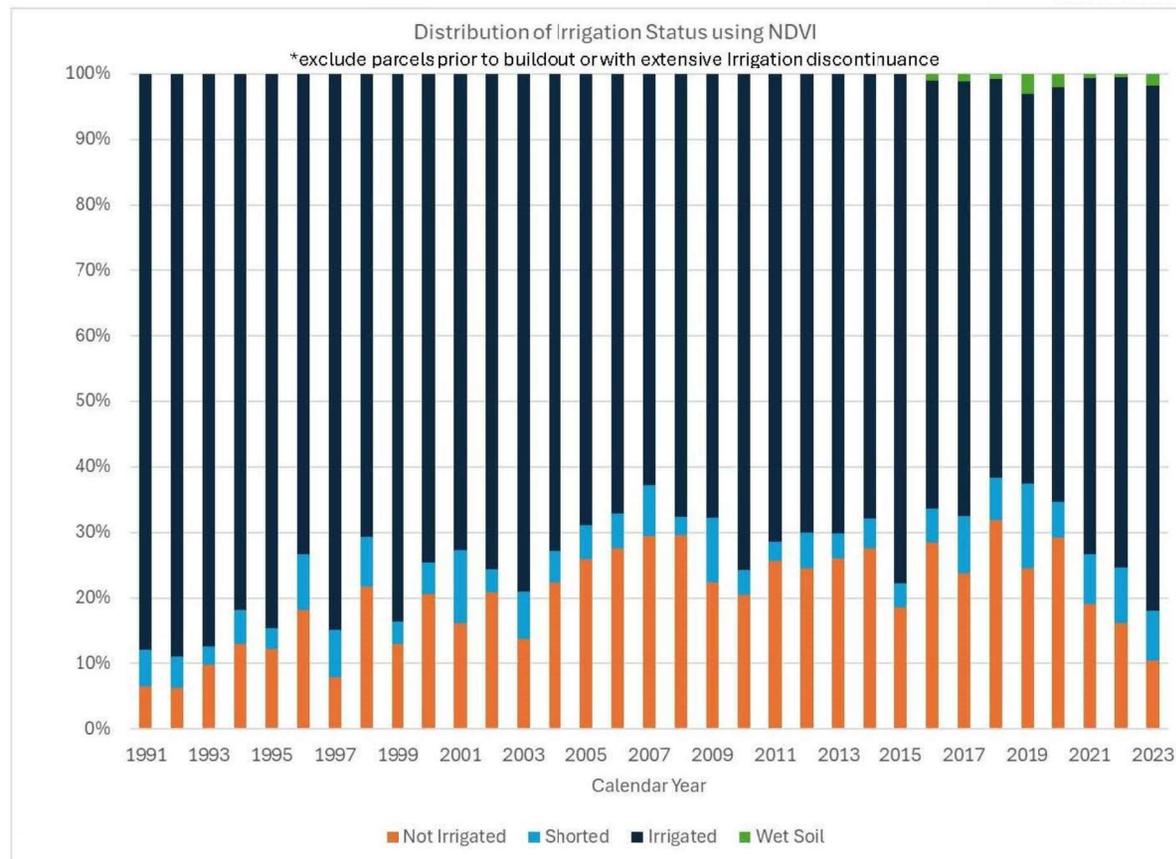
Example of Correlation with ET: La Plata River 2019-2023



Example of Correlation with ET: La Plata River 2019-2023



Hydrologic Shortages for New Mexico's Upper Colorado Basin from 1991 to 2023

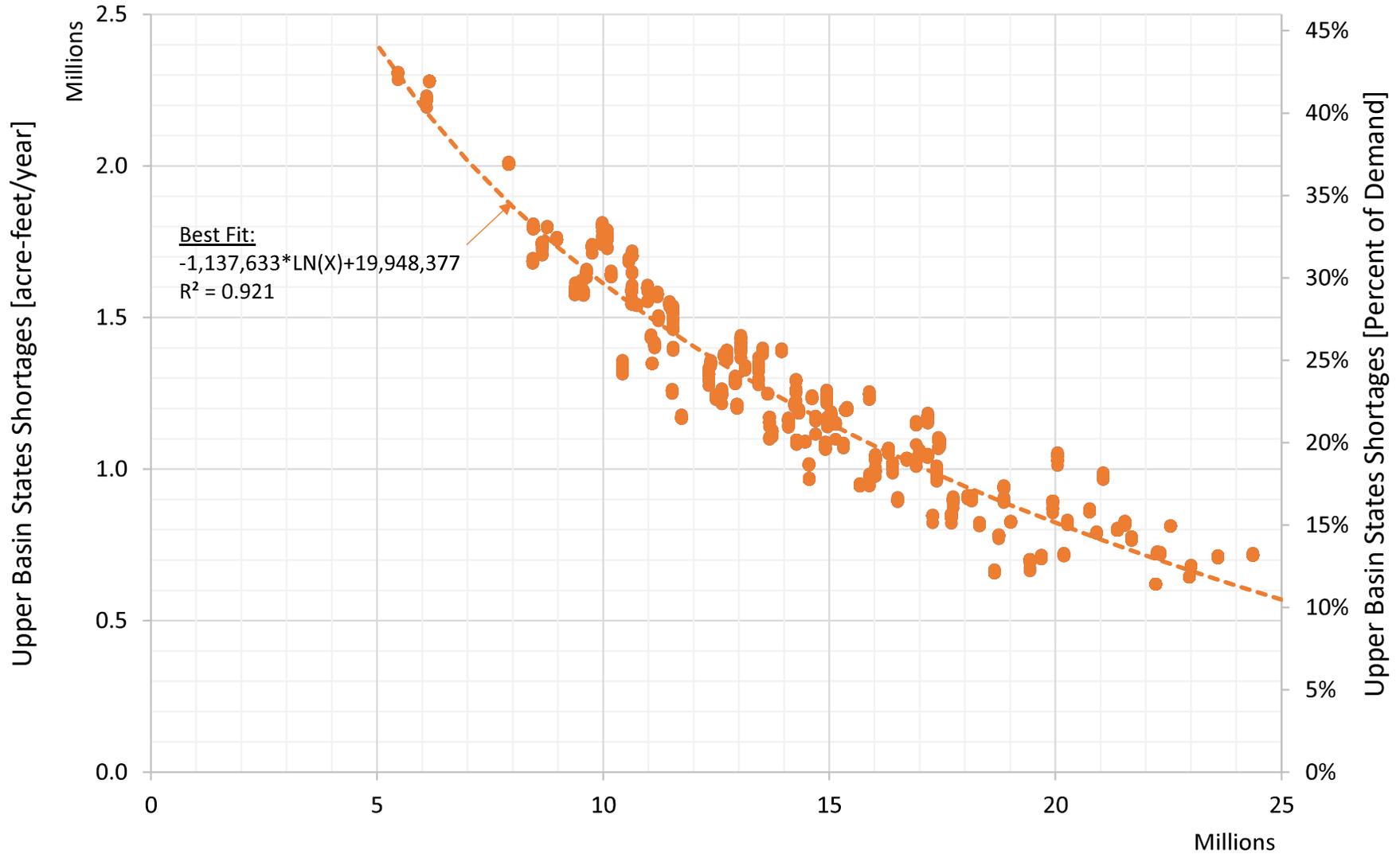


Summary

- In New Mexico, Hydrologic Shortages occur annually in the San Juan River Basin, including the Animas and La Plata tributaries.
- Over the past 33 years, Hydrologic Shortages in New Mexico's Upper Colorado River Basin have ranged from 5% to 35% for all sub-basins.
 - Upper San Juan: 4% to 24%
 - Animas: 2% to 21%
 - La Plata: 4% to 80%
 - Lower San Juan: 7% to 46%
 - NAPI: 1% to 22%
 - San Juan-Chama Contractors: 0% to 36%
- New Mexico's Hydrologic Shortages:
 - increased from about 5% in 1991 to about 30% in 2007 and peaked in 2018 as high as 35%
 - have decreased to about 10% in 2023, but still remain higher than early 1990s

Lee Ferry Natural Flow vs Upper Basin Shortage

Upper Basin Demands = year 2026 (5.44 MAF) | Natural Flow Hydrology | Model = CRSS.Aug2023v2



COMPARING COLORADO RIVER WATER USE:

AN IMBALANCE BETWEEN THE UPPER AND LOWER BASIN STATES



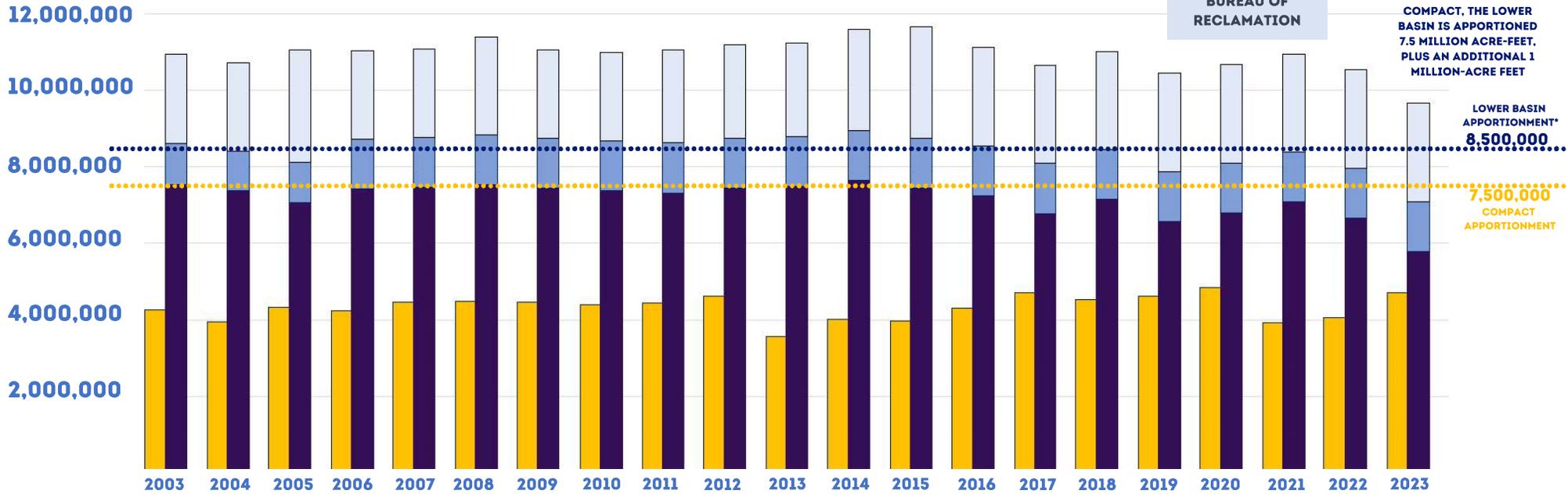
COLORADO
Upper Colorado River
Commissioner
Department of Natural Resources

DATA FROM THE
BUREAU OF
RECLAMATION

*UNDER THE 1922
COMPACT, THE LOWER
BASIN IS APPORTIONED
7.5 MILLION ACRE-FEET,
PLUS AN ADDITIONAL 1
MILLION-ACRE FEET

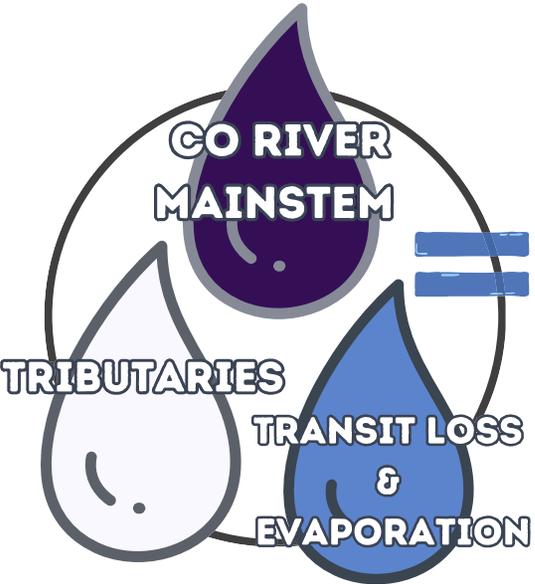
LOWER BASIN
APPORTIONMENT*
8,500,000
7,500,000
COMPACT
APPORTIONMENT

ACRE FEET OF WATER USE PER YEAR

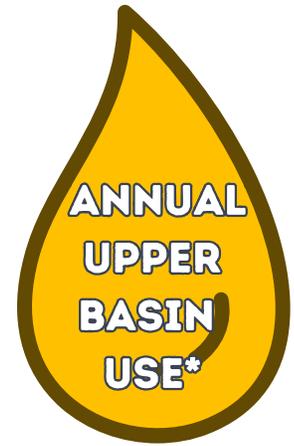
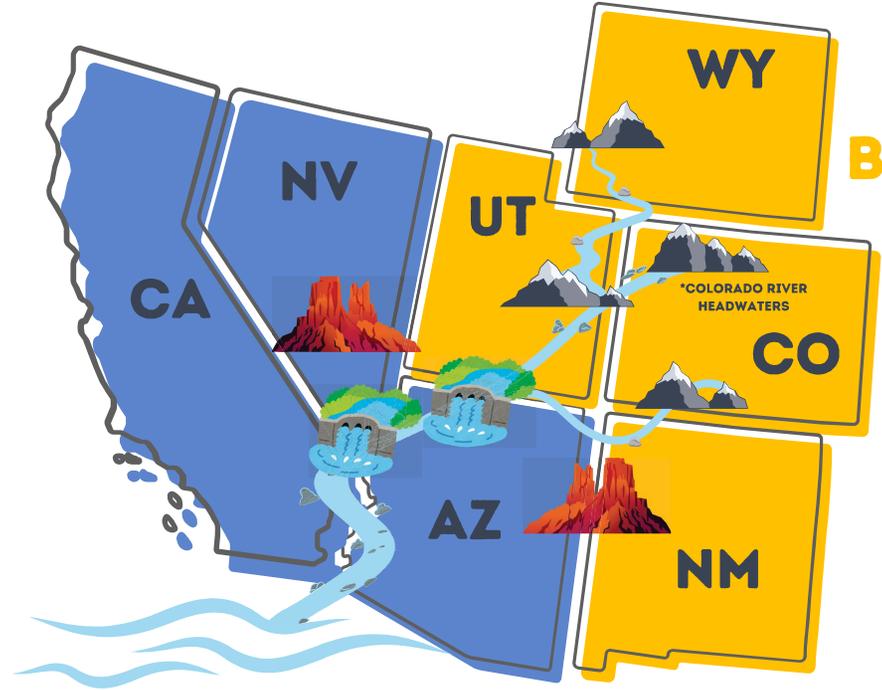


LOWER BASIN STATES

UPPER BASIN STATES



ANNUAL
LOWER
BASIN
USE



*UPPER BASIN USE INCLUDES
ALL MAINSTEM, TRIBUTARY,
EVAPORATION & TRANSIT
LOSSES COMBINED

Comparing Colorado River Water Use

An Imbalance Between the Upper and Lower Basin States

Infographic Text

Colorado State Logo: Upper Colorado River Commissioner
Department of Natural Resources

A bar graph shows how much water is used in the upper basin states and how much water is used in the lower basin states. Data is from the Bureau of Reclamation.

Y-Axis: Acre Feet of Water Use Per Year

Range: 2,000,000 acre-feet - 12,000,000 acre-feet in 2 million acre-feet intervals

X-Axis: The years of water use: 2003-2023

Data:

2003

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 11,000,000 acre-feet

2004

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 11,000,000 acre-feet

2005

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 11,000,000 acre-feet

2006

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 11,000,000 acre-feet

2007

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 11,000,000 acre-feet

2008

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 11,000,000 acre-feet

2009

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 11,000,000 acre-feet

2010

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 11,000,000 acre-feet

2011

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 11,000,000 acre-feet

2012

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 11,000,000 acre-feet

2013

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 11,000,000 acre-feet

2014

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 11,000,000 acre-feet

2015

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 11,000,000 acre-feet

2016

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 11,000,000 acre-feet

2017

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 11,000,000 acre-feet

2018

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 11,000,000 acre-feet

2019

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 10,000,000 acre-feet

2020

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 11,000,000 acre-feet

2021

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 11,000,000 acre-feet

2022

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 11,000,000 acre-feet

2023

Upper Basin - Around 4,000,000 acre-feet

Lower Basin - Around 10,000,000 acre-feet

Under the 1922 Compact, the Lower Basin is apportioned 7.5 million acre-feet, plus an additional one million-acre feet.

Lower Basin Apportionment: 8,500,000 acre-feet

Compact Apportionment: 7,500,000 acre-feet

Lower Basin States infographic is a circle bisected by three raindrops:

Dark Blue Raindrop = Colorado River Mainstem Use

Mid Blue Raindrop = Transit Loss and Evaporation

Light Blue Raindrop = Tributaries

The three combined = Annual Lower Basin Use

Upper Basin States infographic is a map of the southwestern United States showing the Upper Basin States of Colorado, Wyoming, Utah, and New Mexico in yellow and the Lower Basin States of Nevada, California, and Nevada in blue. The map includes a comic-style illustration of the Colorado River and the locations of Lake Powell and Lake Mead.

Yellow Raindrop = Annual Upper Basin Use*

*Upper Basin use includes all mainstem, tributary, evaporation & transit losses combined.

Scenario 8 Mod 10 Powell Rule Curve

