Land Use and Environmental Analysis Methods and Metrics

June 16, 2026

Raechel Damiani, EGSS I
Paul Deaver, EGSPS II
Gabriel Blossom, EGSS I

Agenda

- Overview of Land Use Screens for Electric System Planning
- Enhanced Geothermal Systems (EGS) Environmental Evaluation Methods
- Pumped Storage Hydro (PSH) Environmental Evaluation Updates
- Adjusted Shared Area – Method for Addressing Double Counting of Lower-Implication Land Around Substations

Overview of Land Use Screens for Electric System Planning

Raechel Damiani

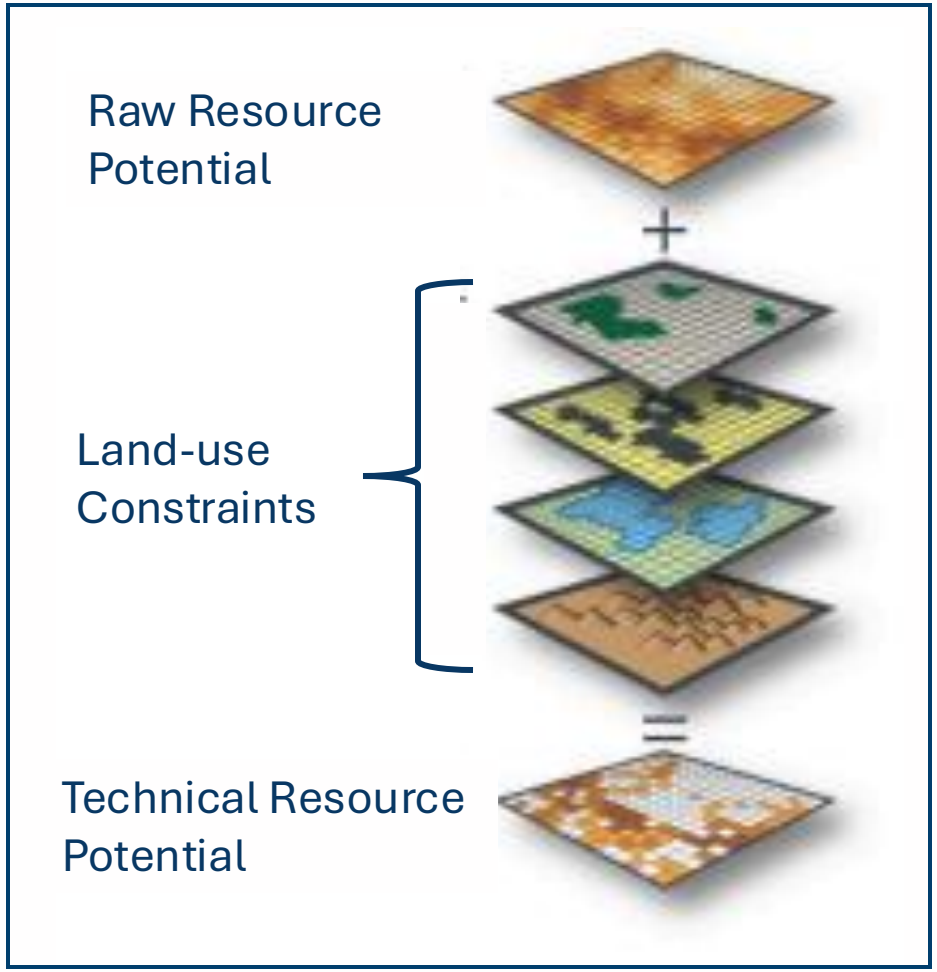
06 / 16 / 2026

Land Use Screens for Electric System Planning

- Achieving climate goals requires significant clean and renewable energy development (e.g., solar, wind) and rapid build rates

- Environmental and land use "screens"
  - Identify at a high level where build is feasible (technical resource potential)
  - Highlight areas that may face possible constraints and conflicts, including areas of environmental sensitivity, conservation, and other land uses (e.g. cropland)
  - Used in capacity expansion modeling

- Screens are landscape-level planning information: intended to inform high-level estimates of renewable build, not specific project locations



Core Land Use Screen Components

	Core Land-Use Screen
Base Exclusions	Techno-economic exclusion layer (CPUC)
	Protected Area Layer
Land Use and Environmental Constraints	Cropland Index Model* (Threshold: Mean, 7.7**)
	Terrestrial Intactness Model (Threshold: Mean, 0.3**)
	Biological Planning Priorities: • Areas of Conservation Emphasis (ACE) Biodiversity (Rank 5) • ACE Connectivity (Ranks 4 & 5) • ACE Irreplaceability (Ranks 4 & 5) • Wetlands from CA Nature Habitat and Land Cover CALFIRE Fire and Resource Assessment Program Vegetation (FVEG) Derived) • U.S. Fish and Wildlife Service (USFWS) Critical Habitat
	2025 Results (Statewide Resource Potential):
	Utility-Scale Solar: 6.1 Million acres
	Land-Based Wind: 380 Thousand acres

*Not applied to wind resources
**Areas above the threshold not included in technical resource potential estimates
Power densities of 7 acres/MW and 40 acres/MW are used to convert area to electrical power generation for solar and wind, respectively.

Terrestrial Climate Resilience Screen Components

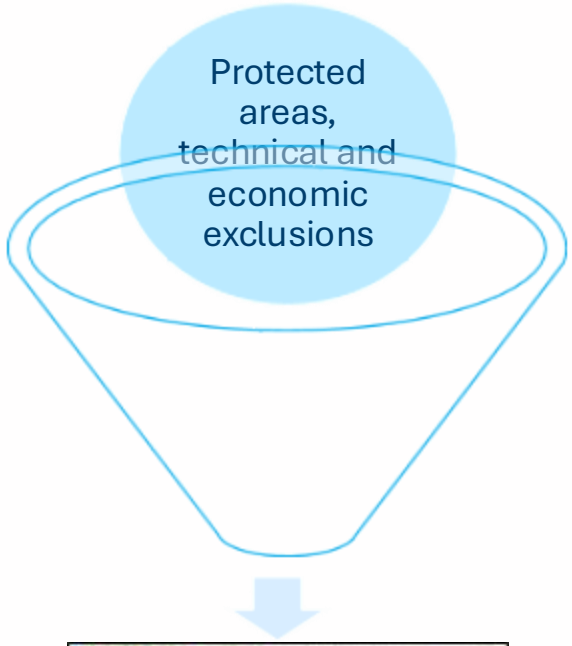
	Terrestrial Climate Resilience Screen
Base Exclusions	Techno-economic exclusion layer (CPUC)
	Protected Area Layer
Land Use and Environmental Constraints	Cropland Index Model* (Threshold: Mean, 7.7**)
	Terrestrial Intactness Model (Threshold: Mean, 0.3**)
	Biological Planning Priorities: • Areas of Conservation Emphasis (ACE) Biodiversity (Rank 5) • ACE Connectivity (Ranks 4 & 5) • ACE Irreplaceability (Ranks 4 & 5) • Wetlands from CA Nature Habitat and Land Cover CALFIRE Fire and Resource Assessment Program Vegetation (FVEG) Derived) • U.S. Fish and Wildlife Service (USFWS) Critical Habitat
	ACE Terrestrial Climate Resilience (Ranks 4 & 5)
	2025 Results (Statewide Resource Potential):
	Utility-Scale Solar: 3.9 Million acres
	Land-Based Wind: 250 Thousand acres

*Not applied to wind resources

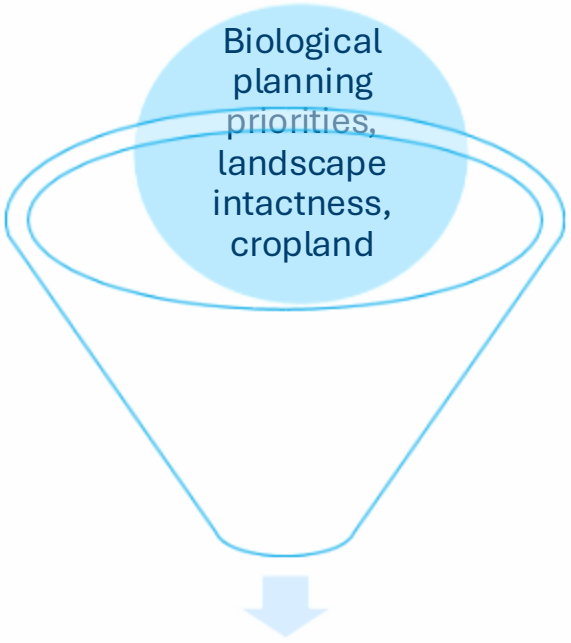
**Areas above the threshold not included in technical resource potential estimates

Power densities of 7 acres/MW and 40 acres/MW are used to convert area to electrical power generation for solar and wind, respectively.

Core Land Use Screen Example: Identifying Technical Resource Potential (Solar)

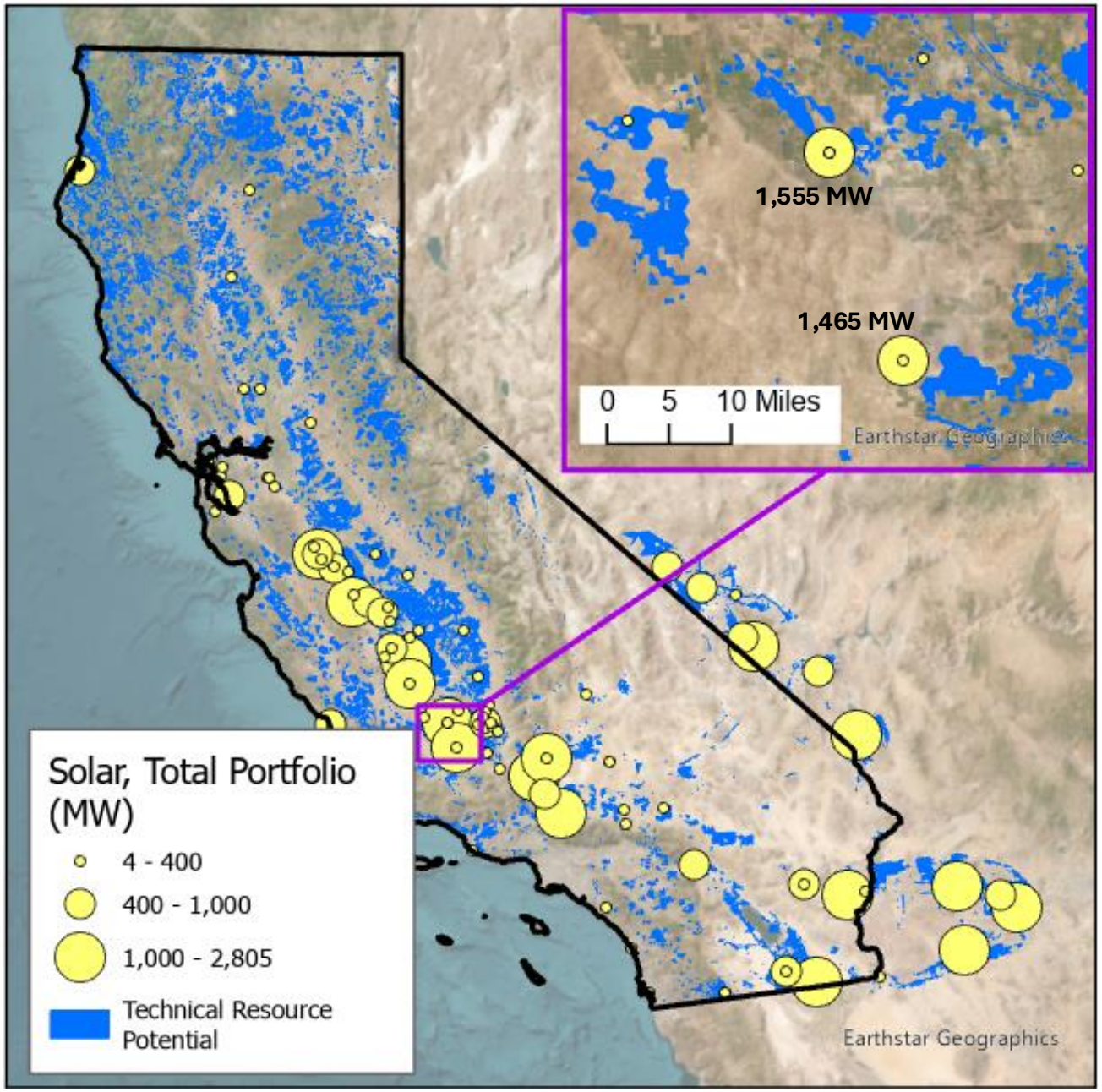


Solar technical resource potential after applying these “base” exclusions



Solar technical resource potential after applying additional environmental constraints

Example Land Use Data in State Resource Planning: 2026-2027 TPP 2036 Base Case Portfolio, Solar Resources



- Technical resource potential guides identification of new resources at busbar level in Integrated Resource Planning process[1]
- Core Land Use Screen determines the technical resource potential in MW at each substation
- Informs the CAISO Transmission Planning Process

1. See slide 4 of this deck onwards for more information on how land use data and other factors are used to determine mapping. Available at: https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2024-2026-irp-cycle-events-and-materials/assumptions-for-the-2026-2027-tpp/cec_nov12_slidedeckbusbar_20251110.pdf

Land Use and Environmental Analysis in Busbar Mapping

Substation buffer area

Total Resource Potential Area

Lower Implication Land

- Uses CEC Core Land Use Screen as well as other land use and environmental factors data[1]
- E.g., Core Land Use Screen is used to define lower implication land
- Substations with limited or no lower implication land will be given less favorable "criteria alignment" scores (see next slide)

[1] *For more information, please see here. Available at https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2024-2026-irp-cycle-events-and-materials/assumptions-for-the-2026-2027-tpp/mapping_methodology_26-27.pdf*

Factors Considered in Criteria Alignment Analysis

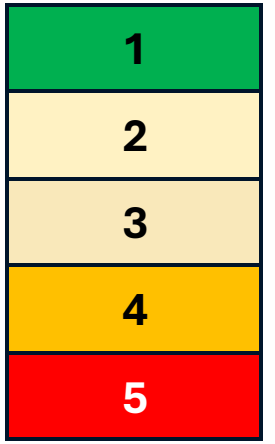
- When allocating MW to substations, the land use and environmental factors listed below are analyzed
- Calculate metrics as percentage of the total resource potential that contains a given environmental factor
- Lower percentages are relatively more favorable and result in lower criteria alignment scores – higher percentages result in higher scores (less favorable)

Land Use and Environmental Factors

Criteria 3
- Lower-implication land (as determined by Core screen)
- High Fire Threat Areas
- High Parcelization Areas (solar only)
- Critically Overdrafted Groundwater Basins
- High and Low Value Cropland Areas

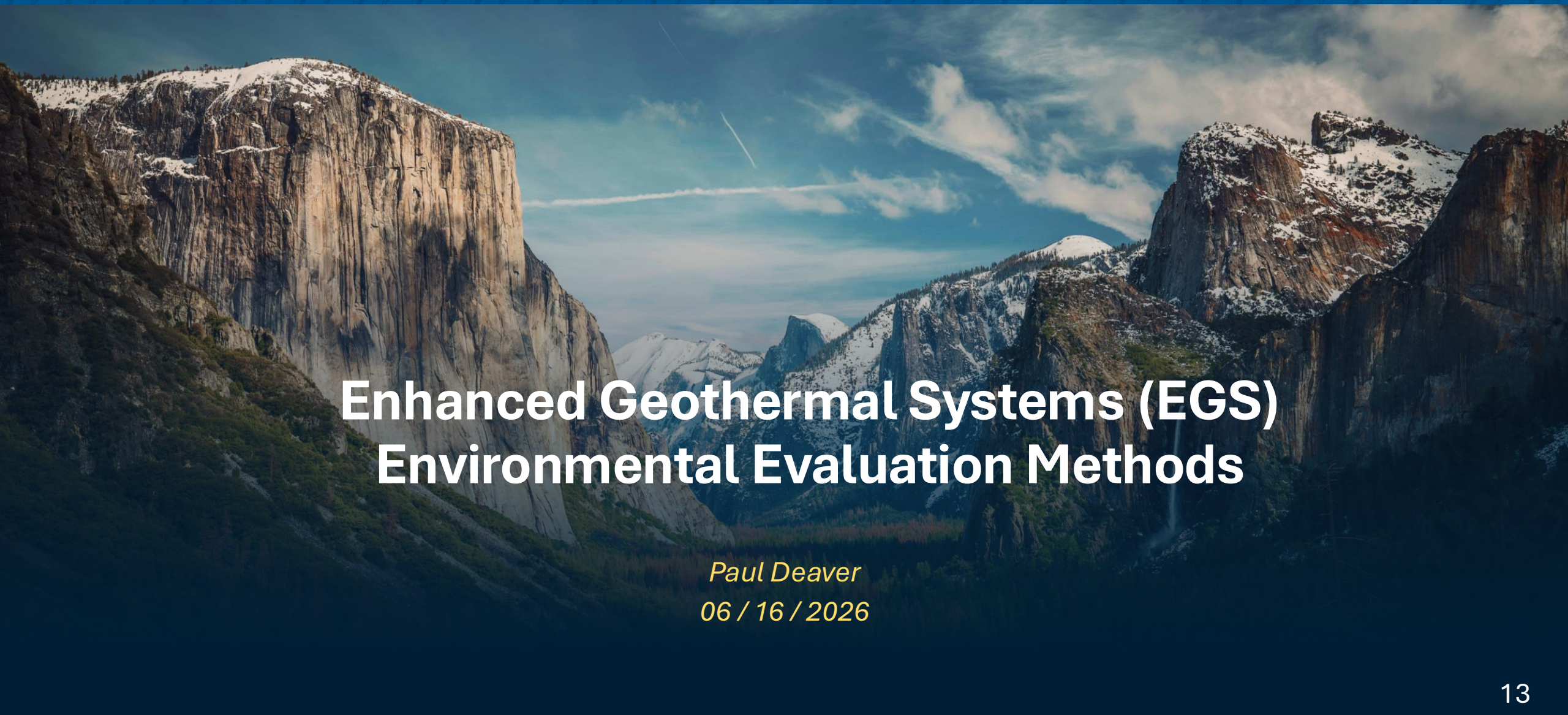
Criteria 4
- High Terrestrial Connectivity
- High Terrestrial Biodiversity Areas
- High Terrestrial Irreplaceability
- Terrestrial Landscape Intactness
- Wetlands
- Combined Areas of Conservation Emphasis (ACE) layers (High Terrestrial Connectivity, Biodiversity and Irreplaceability)

Scale of Criteria Alignment Thresholds



Most Compliant

Least Compliant



Enhanced Geothermal Systems (EGS) Environmental Evaluation Methods

Paul Deaver

06 / 16 / 2026

Why Create an Environmental Evaluation Method for Enhanced Geothermal Systems (EGS) in Busbar Mapping?

- EGS is a candidate resource for CPUC IRP modeling and busbar mapping
  - EGS resources were mapped to substations in 2026-2027 cycle

- Currently no documented method for environmental evaluation for EGS resources
  - Environmental evaluation informs the busbar mapping process to understand possible land use impacts and constraints from mapping EGS resources to substations

- Propose to create an environmental evaluation method to inform the allocation of MW in the busbar mapping process

Definitions

- **Conventional Geothermal:** Leverages naturally occurring heat, along with groundwater and rock characteristics for the recovery of heat energy, usually through produced hot water or steam.

- **EGS[1]** uses engineered reservoirs drilled to depths of 3 to 7 kilometers, utilizing advanced hydraulic stimulation to create fractures in hot, impermeable rock.
  - Near-Field EGS: Leverages existing infrastructure near conventional geothermal sites.
  - Deep-Field EGS: These sites can be anywhere; do not have to be near existing geothermal reservoirs.

Focus for today

1: See: DOE Geovision, CPUC Feb 2026 Inputs and Assumptions Report

Summary of Proposed Method

- **Near-field EGS:**
  - Use the same environmental factors* as for conventional geothermal
  - Apply these to known conventional geothermal areas

- **Deep-field EGS:**
  - Start with same environmental factors as conventional geothermal
  - Use 15-mile radius around substation, instead of geothermal fields, as analysis area
  - Use MW capacity allocated and technical resource potential for criteria alignment analysis
  - Consider Aquatic Rare Species and Important Farmland as environmental factors

***Environmental factors:** Protected Area Layer (PAL), amount of lower-implication land that can be developed on, fire threat, terrestrial connectivity, terrestrial biodiversity, terrestrial irreplaceability, terrestrial landscape intactness, and wetlands

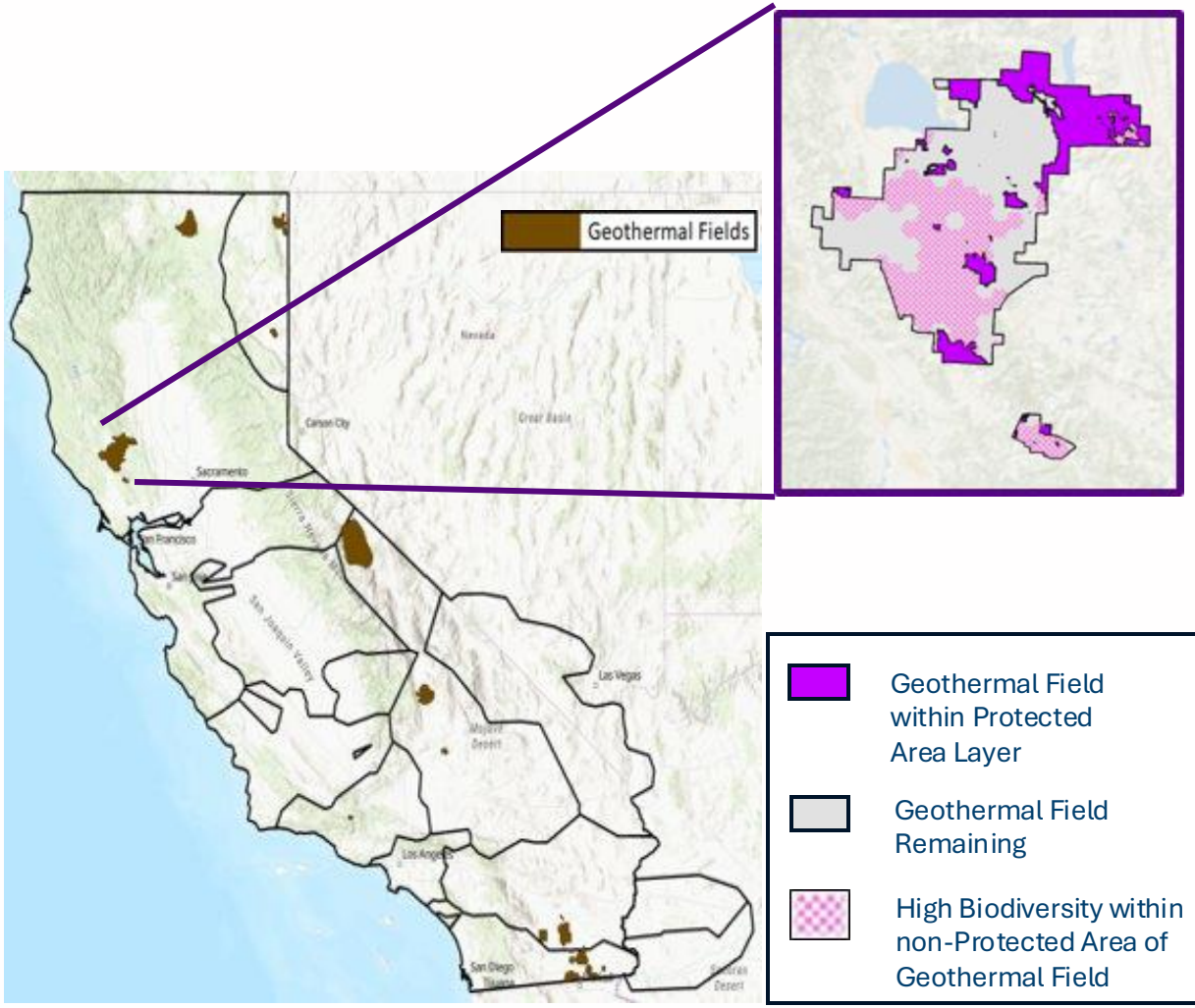
Near-Field EGS Method

Proposed Near-Field EGS Method

- Propose to use the same environmental factors and method as conventional geothermal

Conventional Geothermal Method

1. CEC calculates percent overlap of environmental factors in each field (example, **40%** high biodiversity in image)
2. CEC converts allocated MW to acres using capacity density
   - Calculate percent of lower implication land need for MW allocation (e.g., **10%**)
   - CPUC assigns each substation an environmental alignment rank based on **1.** and **2.** above
3. These values meet threshold for criteria alignment level 1 (less than 50% overlap, less than 20% of lower implication land used)



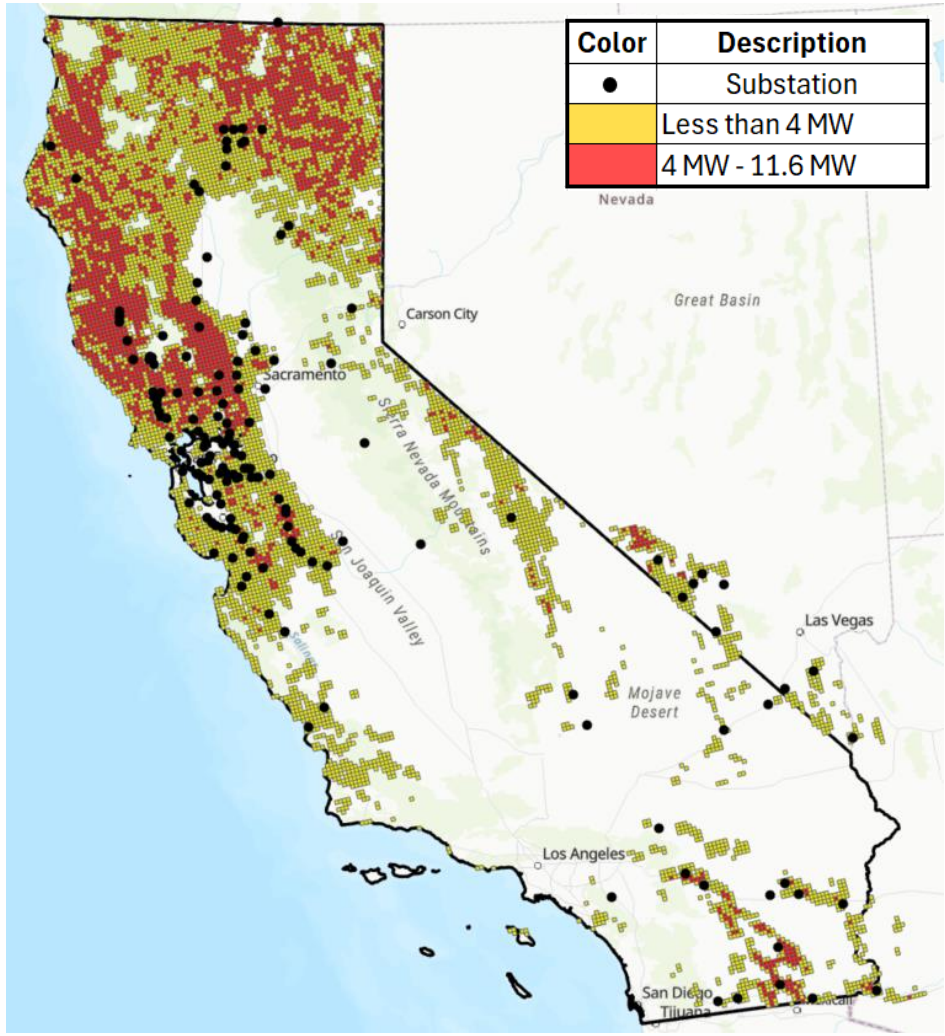
Deep-Field EGS Method

Proposed Method

Deep-Field EGS: Resource Overview

- Map on right shows:
  - Substations under consideration to be allocated EGS capacity
  - Technical resource potential (MW)

- Substantial resource potential in Northern CA



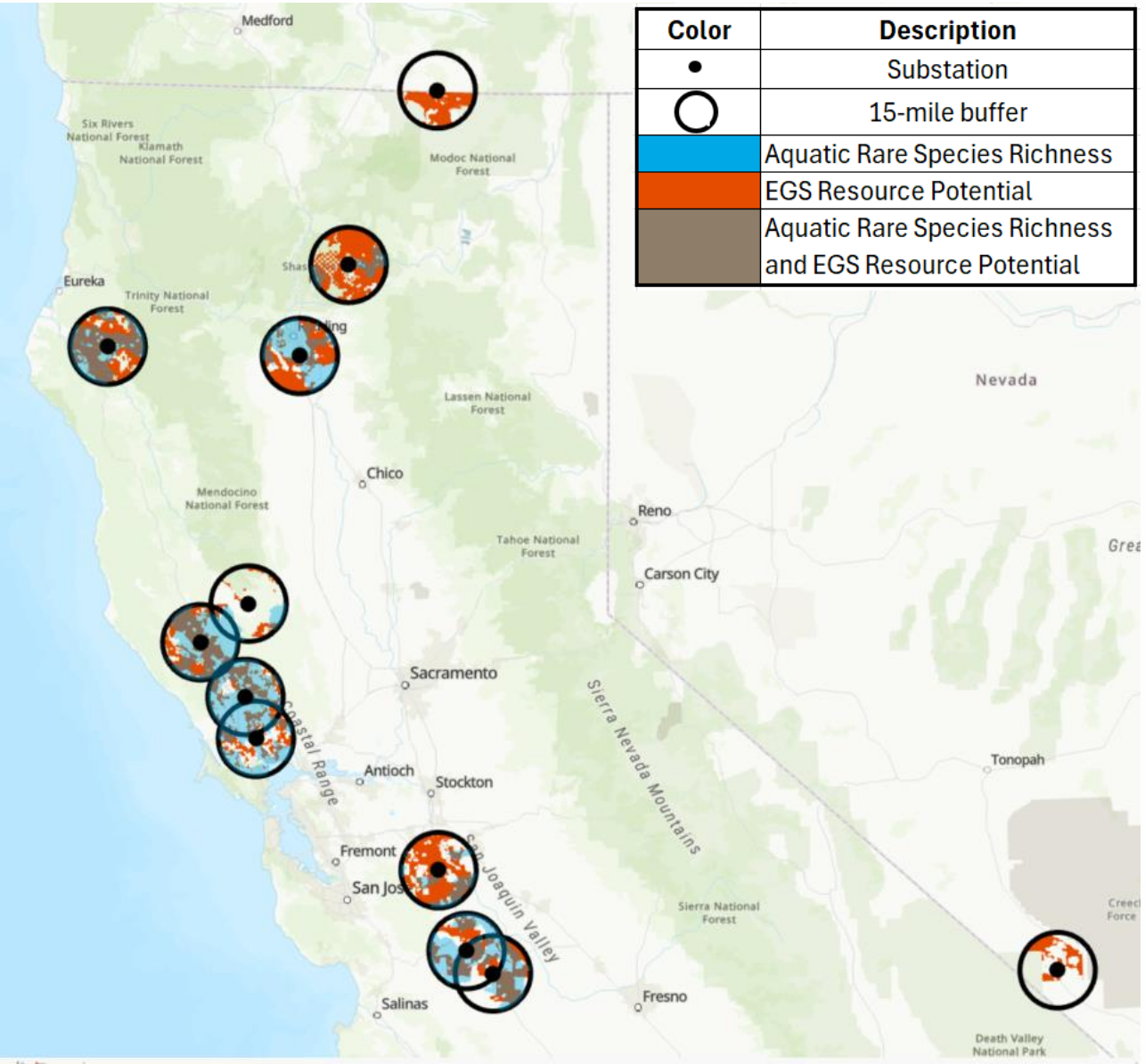
Proposed Deep-Field EGS Method: Environmental Factors

- Include all **environmental factors*** used for conventional geothermal
  - Explore two additional factors:
    - Aquatic Rare Species Richness (propose to add)
    - Cropland Index Model (not sure about adding)
  - Should additional environmental factors be considered?

- Study area is 15-mile buffer around susbstation

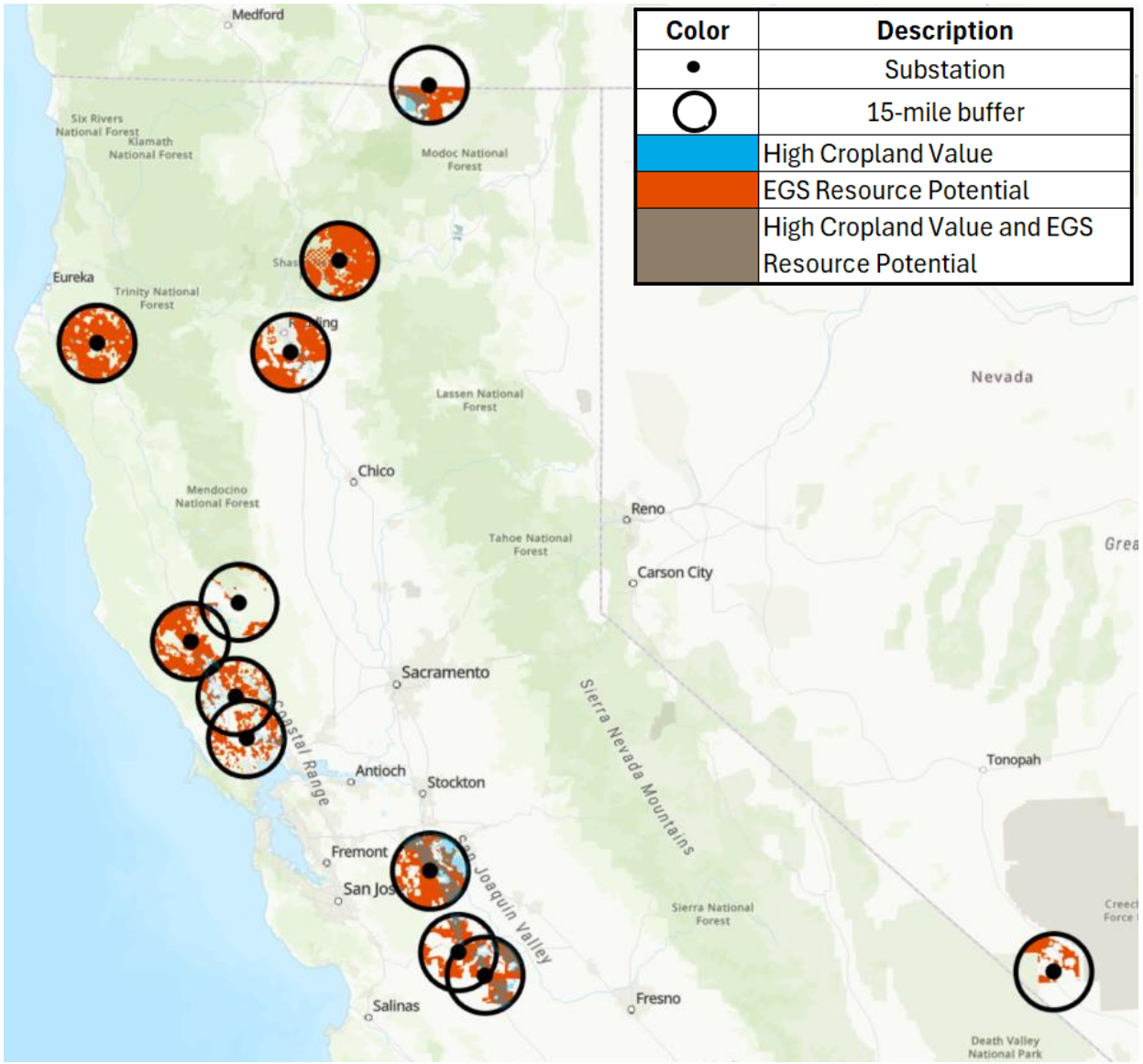
*PAL, amount of "lower implication" land that can be developed on, fire threat, terrestrial connectivity, terrestrial biodiversity, terrestrial irreplaceability, terrestrial landscape intactness, and wetlands

Aquatic Rare Species Richness Example



- The buffer areas around many substations allocated EGS MW in the 2026-2027 cycle overlapped with the aquatic rare species richness variable.
  - Western and North West CA substations show larger amounts of overlap with aquatic rare species richness

Cropland Index Model Example



- Some buffer areas around substations overlap with high cropland values.
  - Mainly in Bay Area and Central Coast

Deep-Field EGS: Summary of Environmental Factors

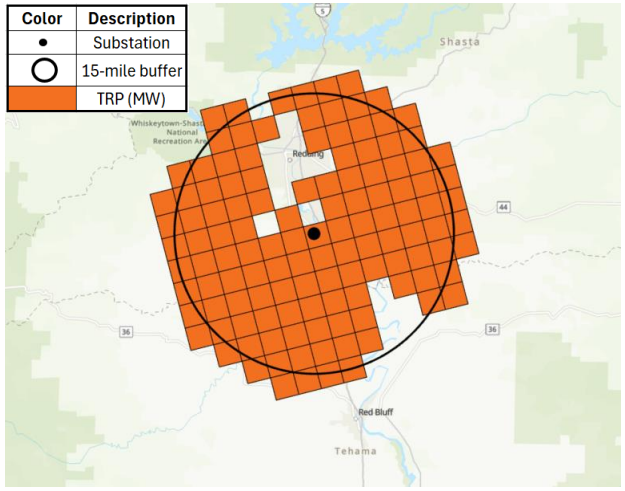
- All environmental factors for conventional geothermal are proposed to be included for deep-field EGS
- Proposing to add aquatic rare species richness due to high overlap with areas around substations allocated EGS capacity
- Potentially include the Cropland Index Model as well
    - Some overlap with EGS potential in Bay Area and Central Coast, but overlap not as substantial as aquatic rare species richness

	Environmental Factor: Conventional Geothermal and Near-Field EGS	Environmental Factor: Deep-Field-EGS
Fire Threat	✓	✓
ACE Terrestrial Connectivity	✓	✓
ACE Biodiversity	✓	✓
ACE Irreplaceability	✓	✓
Terrestrial Landscape Intactness	✓	✓
Wetlands	✓	✓
Aquatic Rare Species Richness	✗	✓
Cropland Index Model	✗	?

Deep-Field EGS: Determination of Core Screen Alignment Level (% MW utilization of TRP)

Example

89 MW of TRP[1] within 15-mile radius of substation. PAL already screened out.



CPUC allocates 40 MW of capacity to substation

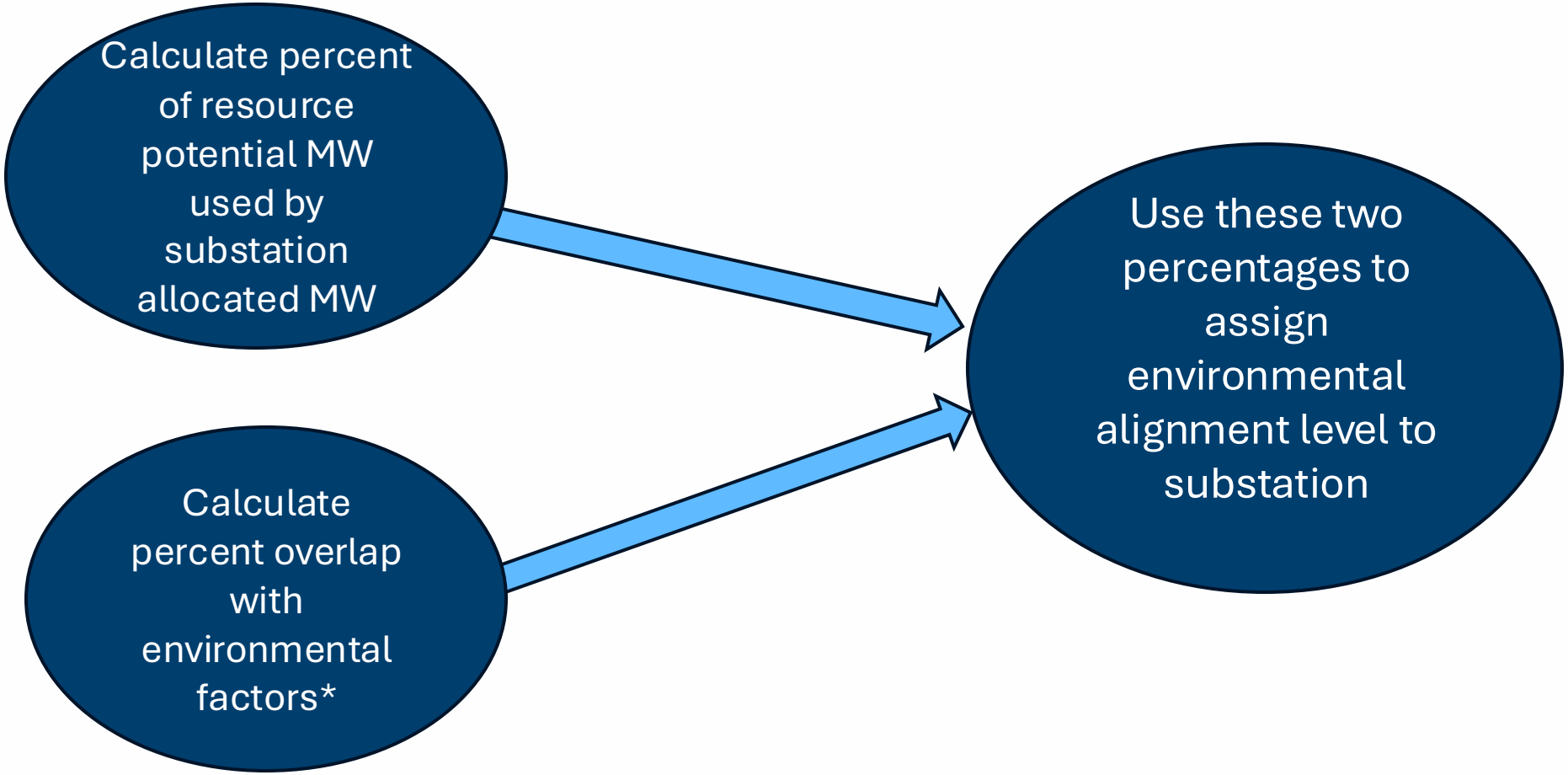
40 MW / 89 MW = 45% of TRP used for MW allocation

45% is less than 50%, so substation is assigned a core screen alignment level of 1

1. TRP MW calculated based on temperature at depth data, with areas screened out by the Techno-economic and Protected Area layers. See slide 66 of Final 2025 Inputs and Assumptions (I&A) for the 2024-2026 IRP Cycle. https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2024-2026-irp-cycle-events-and-materials/2025_inputs_and_assumptions_slides-20260210.pdf

Deep-Field EGS: Proposal for Performing Criteria Alignment Analysis

Within 15-mile radius of the substation:



*listed on previous slides

➢ Example on next slide

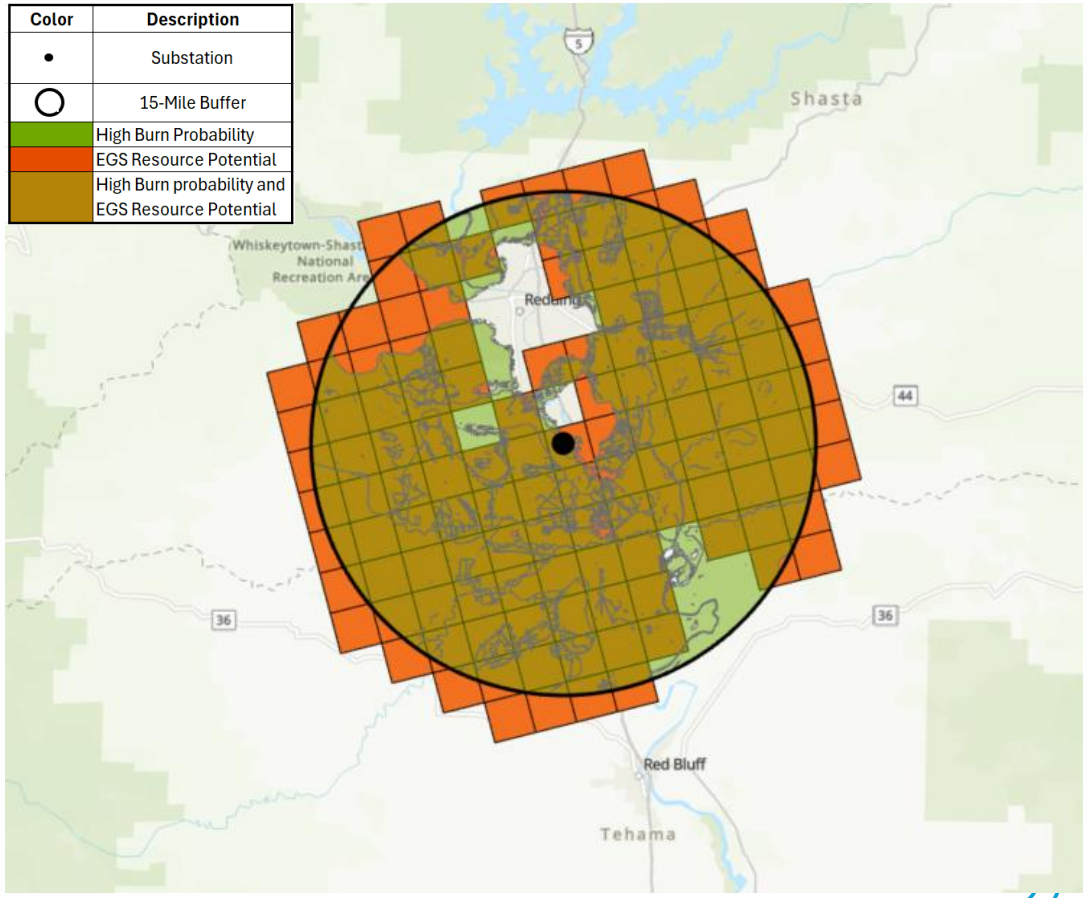
Deep-field EGS Criteria Alignment Example: Fire Risk

- **First**, calculate percent of lower-implication MW used around substation:
  - 100 MW allocated of 113 MW of TRP
  - **88%** of lower-implication MW used
- **Second**, calculate the percent overlap for burn probability
  - 452,265 acres in 15-mile circular area around substation
  - 382,717 acres of this covered by high burn probability areas
  - **85%** overlap with high burn areas.

88% of lower-implication MW used,

85% overlap with high burn probability areas:

Substation gets **Criteria Alignment Level 4**



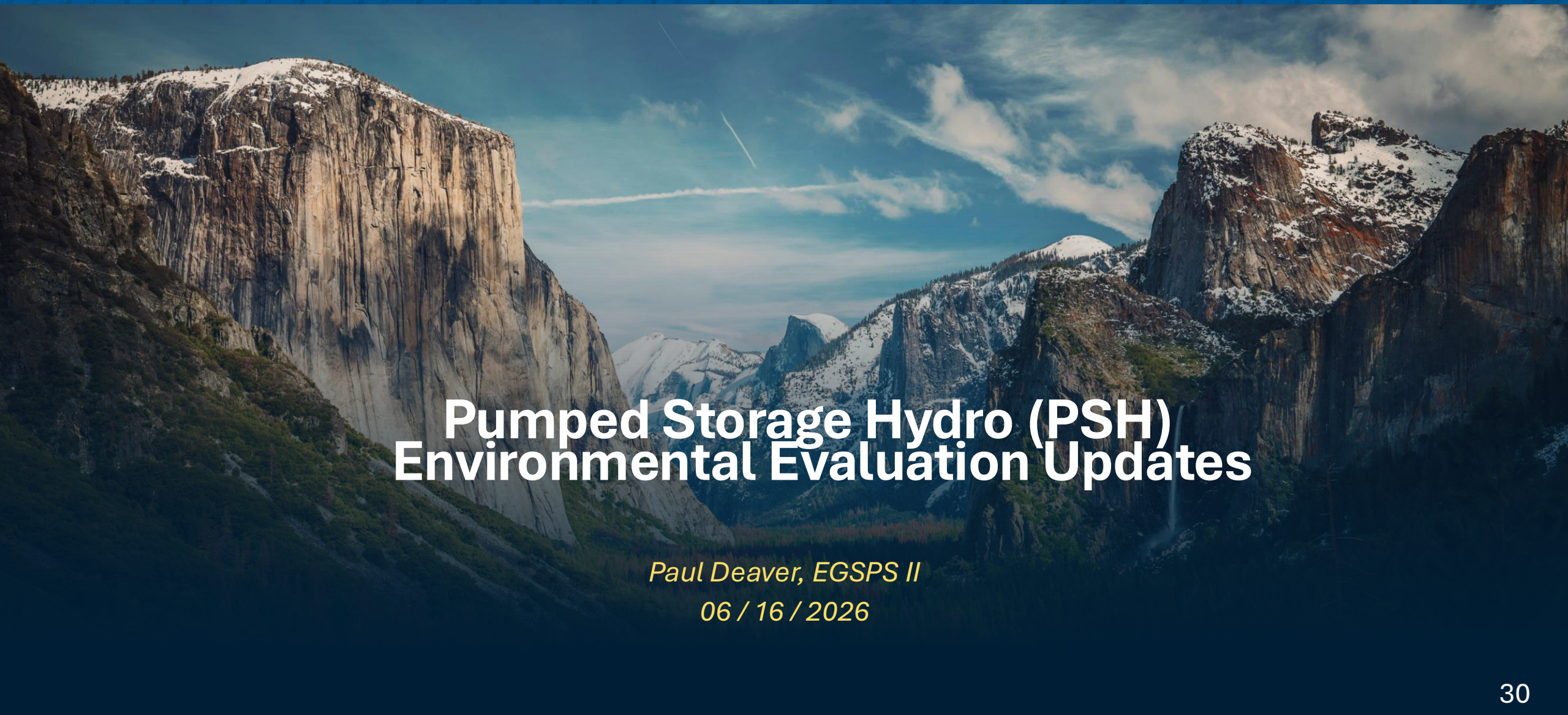
Stakeholder Questions: Near-Field EGS

- Does near-field EGS have similar siting flexibility to conventional geothermal?

- Should different or additional environmental factors be used for near-field EGS evaluation?

Stakeholder Questions: Deep Field-EGS

- Should the environmental factors for conventional geothermal be used for EGS?
  - Are there additional environmental factors that should be considered?



Pumped Storage Hydro (PSH) Environmental Evaluation Updates

Paul Deaver, EGSPS II

06 / 16 / 2026

Refresher: PSH Busbar Mapping Process (Example)

IRP modeling shows 700 PSH MW required

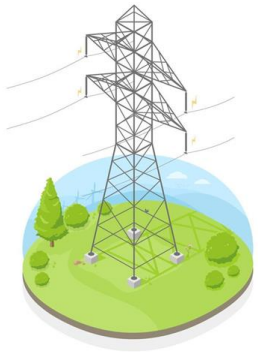
CPUC Busbar Mapping

Example based on 2025-2026 IRP busbar dashboard

Potential Pumped Storage Site (FERC Application Name)	Assigned MW
Eagle_Mountain	
Swan Lake North Pumped Storage	
LEAPS	
San_Vicente	400
Mokulumne Pumped Storage	300
Bison_Peak	
Tehachapi Pumped Storage	
Nacimiento Pumped Storage	
Twitchell Pumped Storage	
Whale Rock Pumped Storage	
Vandenberg Pumped Storage	
Haiwee Pumped Storage	
MQR Pumped Storage	
Salt Springs Pumped Storage	
Isabella Pumped Storage	
Maxwell Pumped Storage	

CPUC staff chooses specific PSH sites to map MW, based on commercial interest, environmental analysis, etc.[1]

CPUC Decision Transmitting Portfolios to CAISO



CAISO TPP; new Tx projects

1: See slide 60 of CPUC's Busbar Mapping Results Slide Deck, November 2025. Available at: https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2024-2026-irp-cycle-events-and-materials/assumptions-for-the-2026-2027-tpp/cpuc_tpp-portfolios-and-busbar-webinar-slides_20251112.pdf

Background

- Pumped Storage Hydroelectric (PSH) environmental analysis implemented in 25/26 IRP/TPP cycle
  - 16 individual PSH sites with active FERC applications
  - Used combination of ***landscape*** (Geographic Information Systems [GIS]) and ***project*** data from FERC for environmental evaluation
  - CPUC makes busbar mapping decisions, in part, from these data

- Stakeholders voiced concerns with applying landscape-level analysis and a need for more transparency on how land use data is used in environmental evaluation

- In response, at August 2025 Modeling Advisory Group (MAG), CEC proposed environmental analysis for PSH on a regional level (not project-specific).
  - MAG participant feedback: Method too regional (regions too large)
  - CEC reverted to previous method for that cycle, but committed to improving method

- **Today: Overview of staff proposal for this IRP/TPP cycle**

PSH Definitions (1 of 2)

- **On-Stream:**[1] PSH site reservoir connected to a flowing water feature (like a river or stream)
- **Off-stream:**[1] PSH site reservoir not connected to a flowing water feature
- **Brownfield site:**[2] A real property where its re-development is complicated by environmental contamination. Examples: A closed landfill, abandoned mines, old industrial site, or contaminated manufacturing plot
- **Groundwater basin**: An underground cavern consisting of a permeable aquifer, or stacked aquifers, capable of storing and supplying large volumes of water within saturated porous soil or rock

1: See Pacific Northwest National Laboratory: https://www.pnnl.gov/news-media/open-or-closed-pumped-storage-hydropower-rise
2: See Wisconsin Department of Health Services. https://www.dhs.wisconsin.gov/environmental/brownfields.htm

PSH Definitions (2 of 2)

- **Landscape metrics (from GIS data)**: Percent of area around PSH project (currently circle with 5-mile radius) covered by environmental metric (e.g., 30% of area has high biodiversity)

- **Landscape alignment level (from landscape metrics):**[1] An environmental alignment rank (1 is strong alignment with environmental planning priorities, and 5 is not aligned) based on the landscape metrics

- **Project metrics (from FERC permit/license):**[2] FERC project-level information (upper reservoir, lower reservoir, water source)

- **Project alignment level (from project-specific metrics)**: An environmental alignment rank (1 is strong alignment with environmental planning priorities, and 5 is not aligned), based on the site characteristics

- **Final PSH alignment level**: Overall environmental rank from averaging landscape and project ranks

1: See CPUC https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2024-2026-irp-cycle-events-and-materials/assumptions-for-the-2026-2027-tpp/mapping_methodology_26-27.pdf
2: See FERC licensing. https://www.ferc.gov/licensing

Current PSH Environmental Evaluation Method

- **Area of evaluation:** 5-mile radius around center point of the PSH project

- **Landscape metrics:** Seven GIS landscape-level metrics for analysis
  - Protected Area Layer (PAL), biodiversity, connectivity, irreplaceability, intactness, aquatic rare species richness, aquatic irreplaceability
  - Assign an environmental alignment level based on the percent overlap of the environmental metrics within the area of analysis
- **Project metrics:** CPUC staff assessment of project attributes:
  - lower reservoir (new or existing), upper reservoir (new or existing), water source
  - Assign environmental alignment level based on CPUC busbar mapping methodology document[1]

- Capacity allocation determined from landscape and project alignment levels, along with other information

1: See page 34 of CPUC Methodology for Resource-to-Busbar Mapping for the Annual TPP at https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2024-2026-irp-cycle-events-and-materials/assumptions-for-the-2025-2026-tpp/mapping_methodology_vruling_2024-09-06.pdf.

Proposed Changes to PSH Environmental Evaluation Method

- **Area of evaluation:** Use project boundary (rather than previous circle with a 5-mi radius)

- **Landscape metrics:**
  - Eliminate redundant metrics (average similar metrics)
  - Add drought forecast
  - Average multiple ranks into single rank

- **Project metrics:** Same metrics as current method
  - Average multiple alignment levels into single alignment level (weighted average)
  - Add short writeup in-dashboard explaining reasoning for alignment level

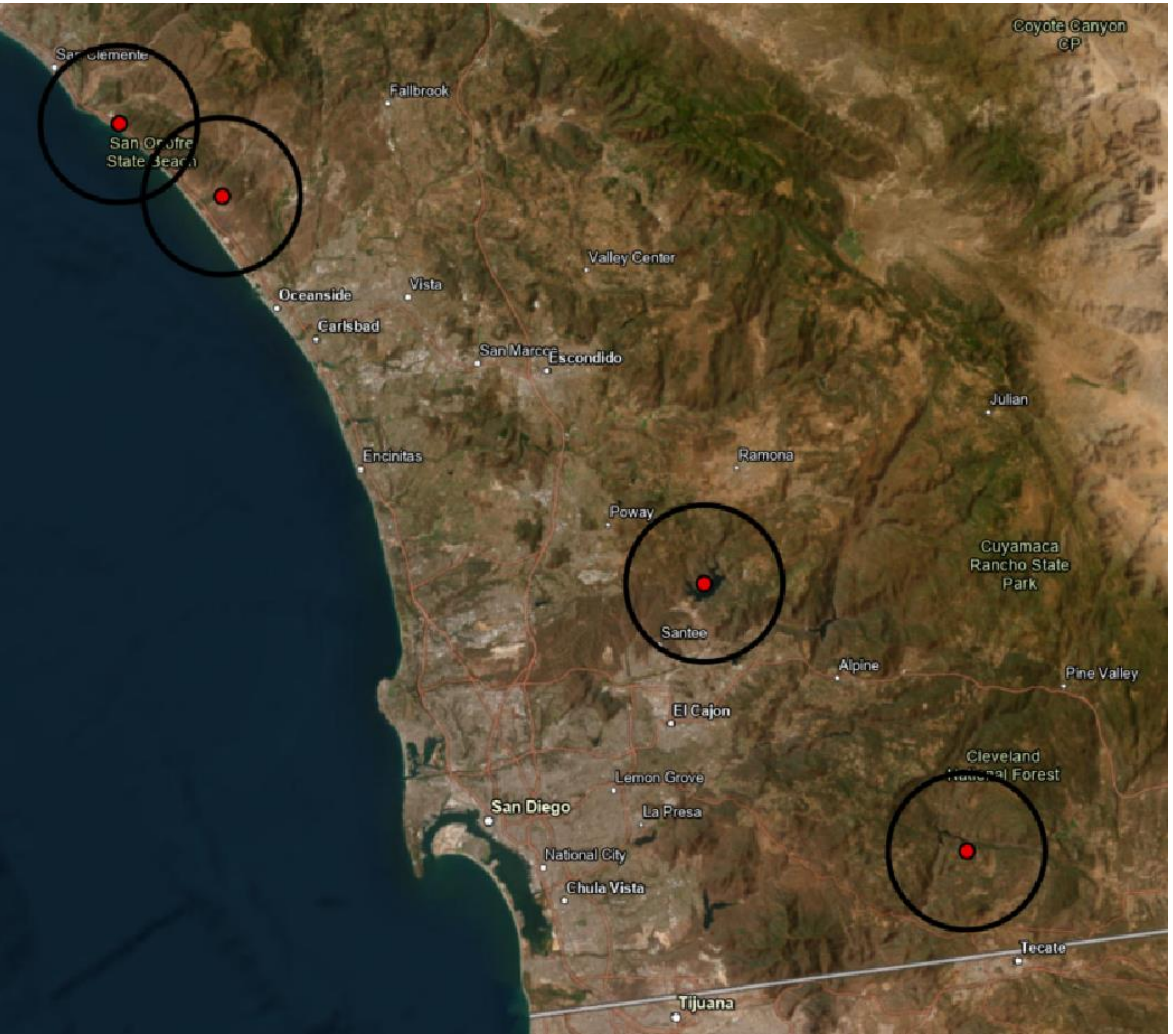
- **Final PSH environmental alignment level:**
  - Average project and landscape alignment levels into a final alignment level, using 60/40 weighting, respectively

- The next slides show an example implementation of the proposed method

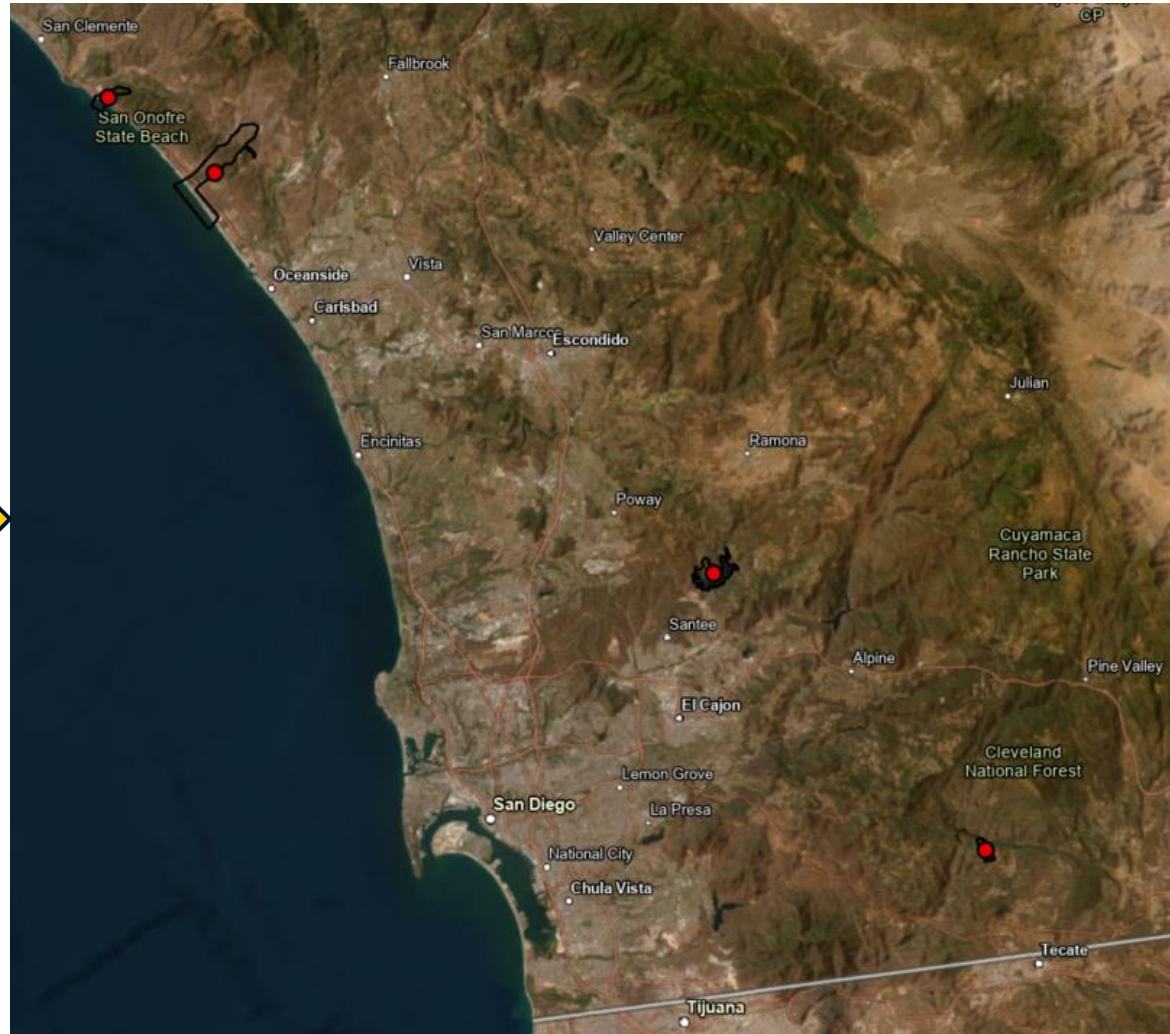
Proposed Changes to Area of Evaluation

Color	Description
●	Center of PSH Site
○	Area of Evaluation

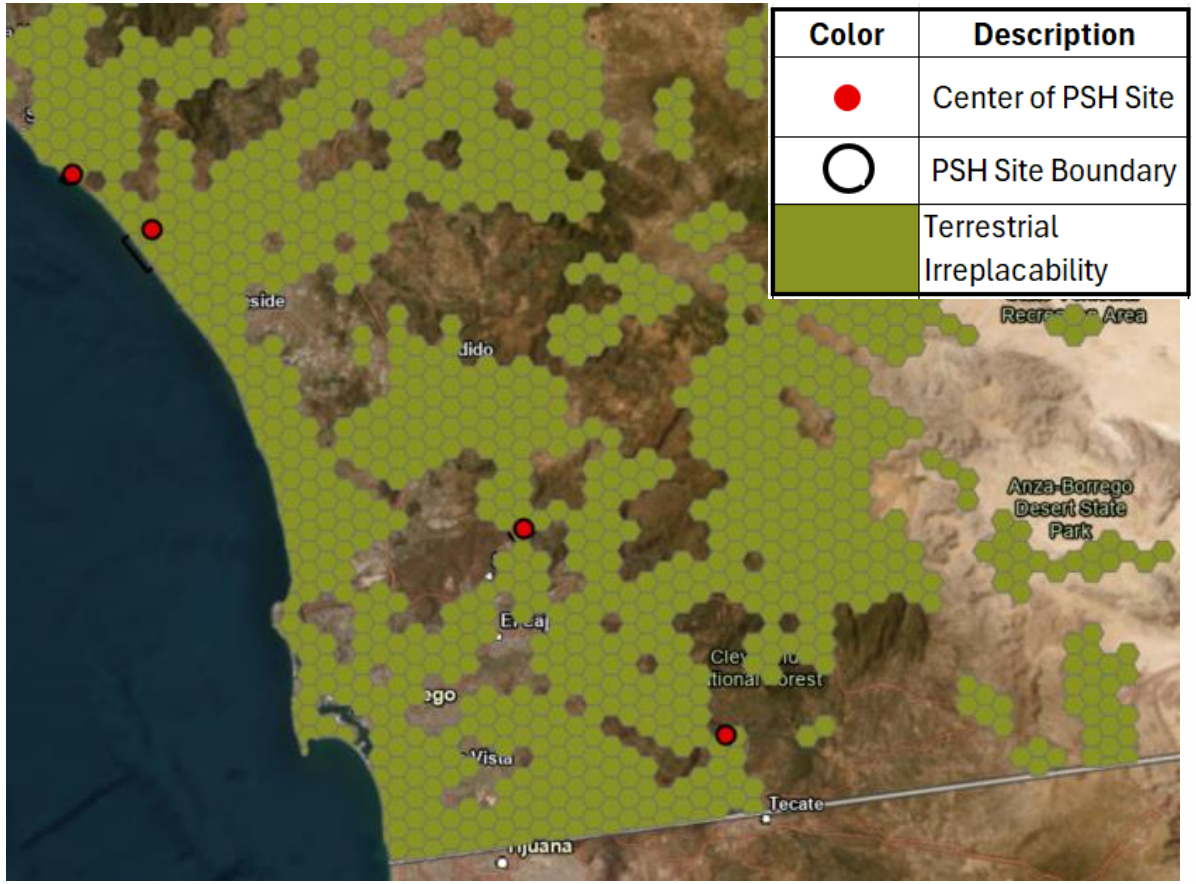
Area of evaluation: 5-mile radius



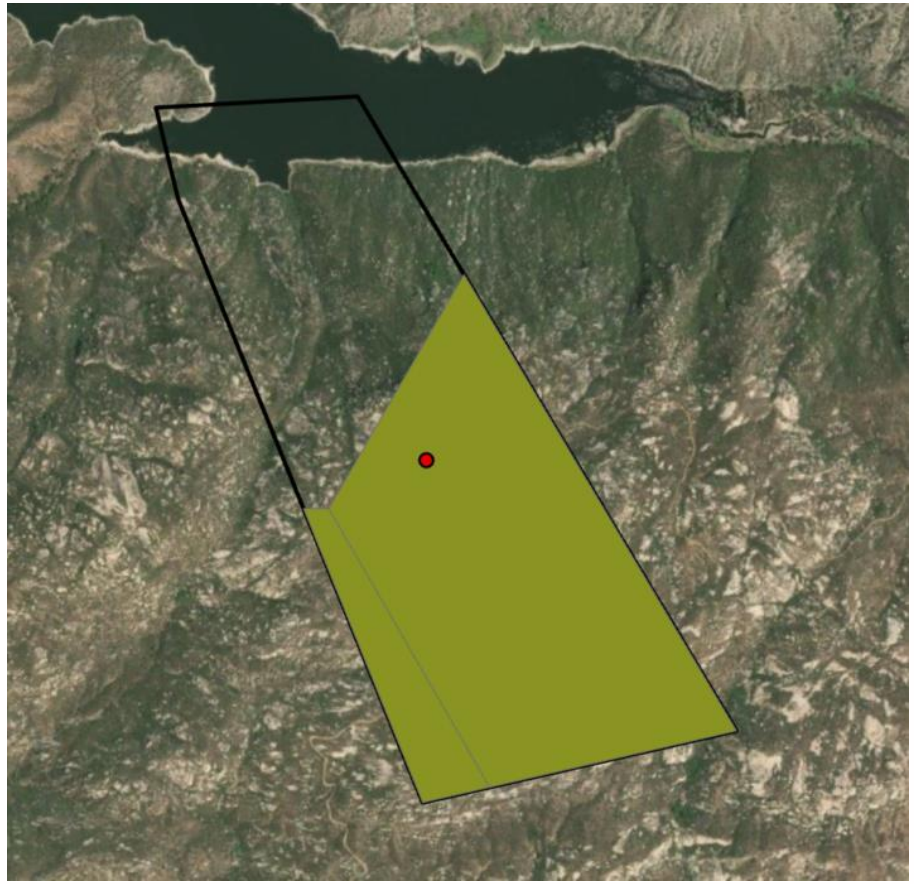
Area of evaluation: Project Boundary



Environmental Analysis Example: Terrestrial Irreplaceability



Example PSH sites in Southern California



Barrett Lake PSH Site (bottom site on left map)

- 479 acres within project boundary. 293 of these acres are classified as high Terrestrial Irreplaceability = **61%** overlap of environmental factor
- More than 50% and less than 70% overlap equals environmental alignment **rank 2**

Proposed Method Example: Reduce Landscape Metrics

Combine terrestrial and aquatic variables into average, add drought value

PSH Site Name	Protected Area Layer	Terr Biodiversity 5	Terr Connectivity 4,5	Terr Irreplaceability 4,5	High Intactness	Aq Rare Species Richness 4,5	Aq Irreplaceability 4,5
PSH Site 1	20%	20%	15%	10%	25%	55%	60%
PSH Site 2	75%	55%	60%	70%	80%	75%	70%
PSH Site 3	30%	60%	65%	60%	20%	15%	20%

PSH Site Name	Terrestrial biodiversity Terrestrial connectivity Terrestrial irreplaceability	Aquatic Irreplaceability Aquatic rare species richness	PAL	High Intactness	Average Drought Value (2040-2069) [mm]
PSH Site 1	15%	58%	20%	25%	600
PSH Site 2	62%	73%	75%	80%	900
PSH Site 3	62%	18%	30%	20%	200

*This is an illustrative example to show how the method works

Proposed Change: Add Drought Forecast as Landscape Metric

- Reservoir water loss from evaporation can be more severe in drought areas; these evaporation losses can be worse in drought areas and degrade water quality
- Use 2040 – 2069 drought forecast from National Park Service[1]
  - The difference between potential evaporation and precipitation, measured in millimeters (mm) of water
  - 0 mm means the soil is saturated
  - Positive mm implies dry soil and a moisture shortage
- Get quantiles of raw forecast values (mm)
- 1st quantile (lowest drought potential) is rank 1, etc.
  - Interpolate alignment levels between quantiles
    - Raw score: 200 is about alignment level 1.4
    - Raw score: 417 is about 1.9, etc.

Raw Drought Score (mm)	Quantile	Alignment Level
(0 - 418)	20th	1
(418 - 585)	40th	2
(586 - 744)	60th	3
(745 - 919)	80th	4
(920 – 1,500)	100th	5

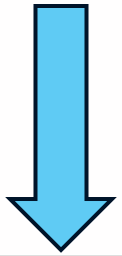
1. See: National Park Services Gridded Water Balance Model, available at: https://screenedcleanedsummaries.s3.us-west-2.amazonaws.com/Gridded_Water_Balance_Model_April_2021.pdf

Proposed Method Example: Raw Landscape Alignment Levels

Getting from percent overlap to environmental alignment level

- Alignment levels based on how much of landscape metric overlaps PSH project boundary
- Alignment level 1 means less than 50% of the area is covered by the metric, for example.

Level 1: less than	Level 2: less than	Level 3: less than	Level 4: less than	Level 5: greater than
50%	70%	90%	95%	95%



PSH Site Name	Terrestrial biodiversity Terrestrial connectivity Terrestrial irreplaceability	Aquatic Irreplaceability Aquatic rare species richness	PAL	Drought Potential	High Intactness
PSH Site 1	1	2	1	3.8	1
PSH Site 2	2	3	3	4.2	3
PSH Site 3	2	1	1	1.3	1

*This is an illustrative example to show how the method works

Proposed Method Example: Average Landscape Alignment Levels

- Take simple average of all raw landscape alignment levels
- This gives us one alignment level instead of five
- Question to interested parties:
  - Should a weighted average be used here?
  - What weight does each landscape metric (alignment level) get?

PSH Site Name	Simple Average of Landscape Alignment Levels
PSH Site 1	1.8
PSH Site 2	3.0
PSH Site 3	1.3

*This is an illustrative example to show how the method works

Proposed Method Example: Average Project Alignment Levels

PSH Site Name	Project Footprint Boundary (Acres)	Lower Reservoir Description	Lower Reservoir Alignment Level	Upper Reservoir Description	Upper Reservoir Alignment Level	Water Source Description	Water Source Alignment Level
PSH Site 1	5,000	Existing on-stream	2	Existing off-stream	1	Existing off-stream	1
PSH Site 2	7,000	New off-stream	3	Existing on-stream	2	Existing on-stream	2
PSH Site 3	2,000	New on-stream	4	New off-stream	3	Critically overdrafted groundwater basin	5

** This is an illustrative example to show how the method works

Weights for Project Alignment Levels*		
Lower Reservoir	Upper Reservoir	Water Source
1	1	3

PSH Site Name	Weighted Average of Project Alignment Levels
PSH Site 1	1.2
PSH Site 2	2.2
PSH Site 3	4.4

* Weights based on staff judgement and literature review. See: U.S. Department of Energy: https://www.osti.gov/biblio/2500381, and https://www.energy.gov/sites/prod/files/2020/04/f73/comparison-of-environmental-effects-open-loop-closed-loop-psh-1.pdf.

Proposed Method Example: Final Average of Landscape and Project Alignment Levels

- 70/30 weight (70% project alignment level, 30% landscape alignment level)
- Results in one final combined environmental alignment rank

Weights for Landscape and Project Alignment Levels*	
Project Alignment Level	Landscape Alignment Level
70%	**30%**

PSH Site Name	Project Footprint Boundary (Acres)	Landscape Rank	Project Rank	Weighted average of Landscape and Project Alignment Levels
PSH Site 1	5,000	1.8	1.2	1.4
PSH Site 2	7,000	3.0	2.2	2.5
PSH Site 3	2,000	1.3	4.4	3.5

** This is an illustrative example to show how the method works

* Weights based on staff judgment; projects' largest impacts are site-specific. See U.S. Department of Energy: https://www.osti.gov/biblio/2500381, and https://www.energy.gov/sites/prod/files/2020/04/f73/comparison-of-environmental-effects-open-loop-closed-loop-psh-1.pdf.

Summary of Proposed Method

	Current Method	Proposed Method
Area of analysis	• 5-mile radius around center of PSH site	• Project boundary based on FERC permit application
Landscape metrics	• 7 landscape metrics, including: PAL, high biodiversity, high connectivity, etc.	• Combine metrics by averaging similar metrics. • Add in drought forecast as landscape metric
Project metrics	• Lower reservoir (existing or new) • Probable upper reservoir (existing or new), and • Probable water source	Same as current method, except staff will add short writeup in-dashboard explaining reasoning for ranking
Landscape Ranks	• Calculate environmental alignment ranks for each landscape metric based on % overlap within **5-mile radius** of each site	• Calculate environmental alignment ranks for each landscape metric based on % overlap within **project boundary** of each site
Project ranks	• Assign environmental alignment rank to each project metric based on CPUC's busbar mapping methodology report (2025)	Same as current method
Averaging	• No explict averaging	• Simple average landscape ranks into one rank • Simple average of project ranks into one rank • Weighted average of landscape and project ranks into single environmental alignment rank

Adjusted Shared Area – Method for Addressing Double Counting Of Lower-Implication Land Around Substations

Gabriel Blossom

06 / 16 / 2026

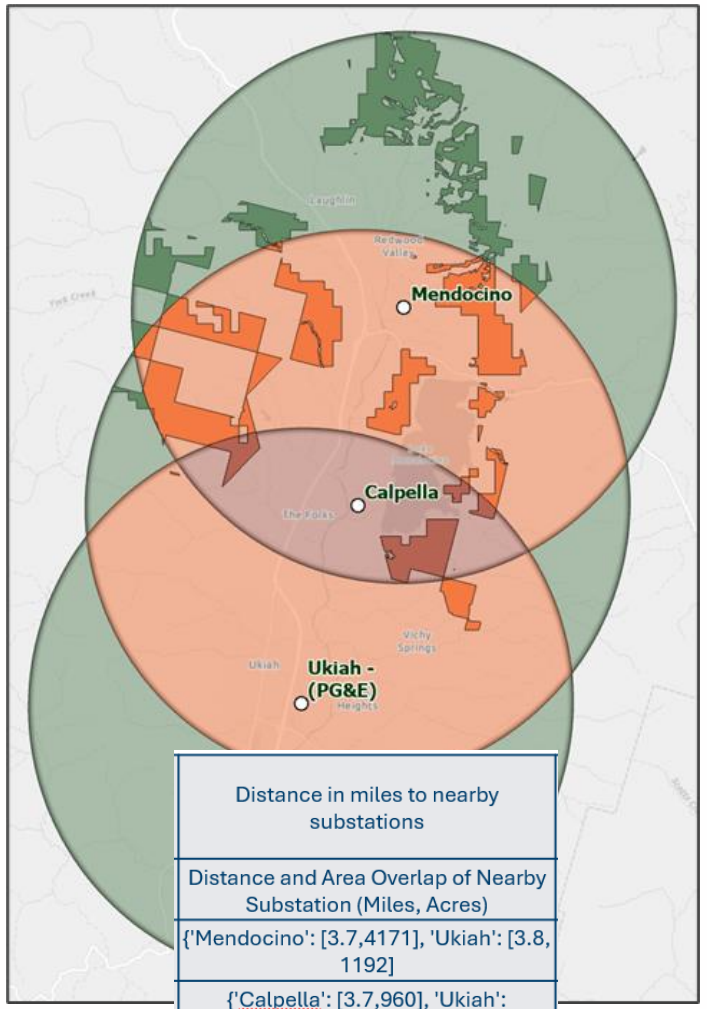
Introduction to “Double Counting”

Shortcoming of current lower implication land accounting in Busbar Mapping Dashboard

- Most land use and environmental metrics rely on how much land is available around a substation (5-30 mile circular buffer) for future resources to utilize

- Lower-implication land (i.e., resource potential after the Core Screen is applied) around a given substation can overlap with nearby substations
  - Problem: Overlap can potentially lead to “double counting”
  - The busbar mapping dashboard reports these overlaps

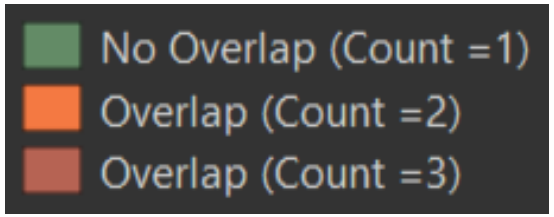
- Staff is proposing a method for quantifying and tracking this issue



Distance in miles to nearby substations
Distance and Area Overlap of Nearby Substation (Miles, Acres)
{'Mendocino': [3.7,4171], 'Ukiah': [3.8, 1192]
{'Calpella': [3.7,960], 'Ukiah': [7.5,1192]}
{'Calpella': [3.8, 1192], 'Mendocino': [7.5, 960]

Proposal: Adjusted Shared Area (ASA)

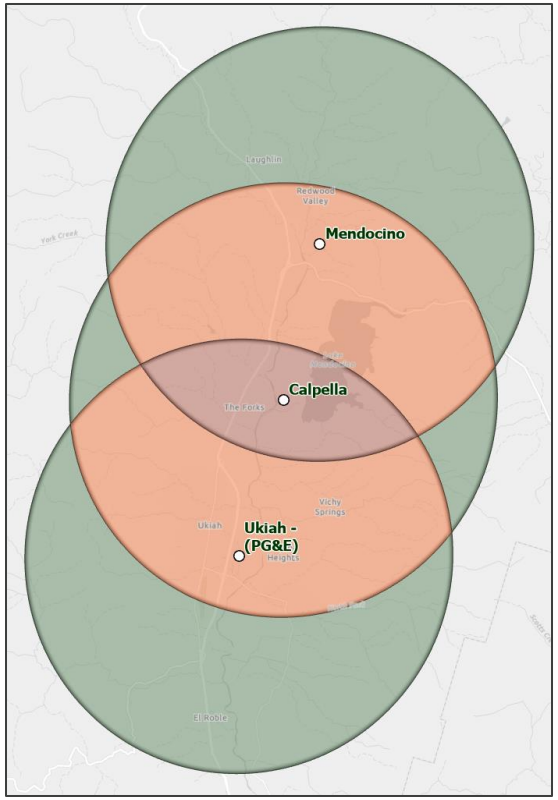
Method of addressing double-counting issue



- **Adjusted Shared Area (ASA):** Equal to area unique to the substation, plus the area of lower-implication land divided by the number of overlaps

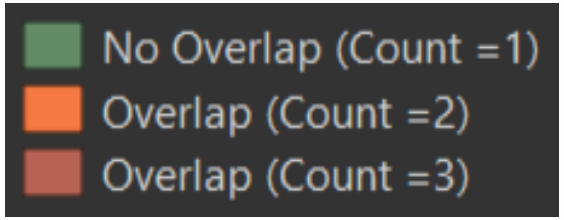
  - Formula: [Unique Area + (Shared lower-implication land areas/Overlap Count)]

  - Example: Area assigned to Calpella substation is sum of:
    - Unique “no overlap” areas
    - (Areas with 2 overlaps) / 2
    - (Areas with 3 overlaps) / 3

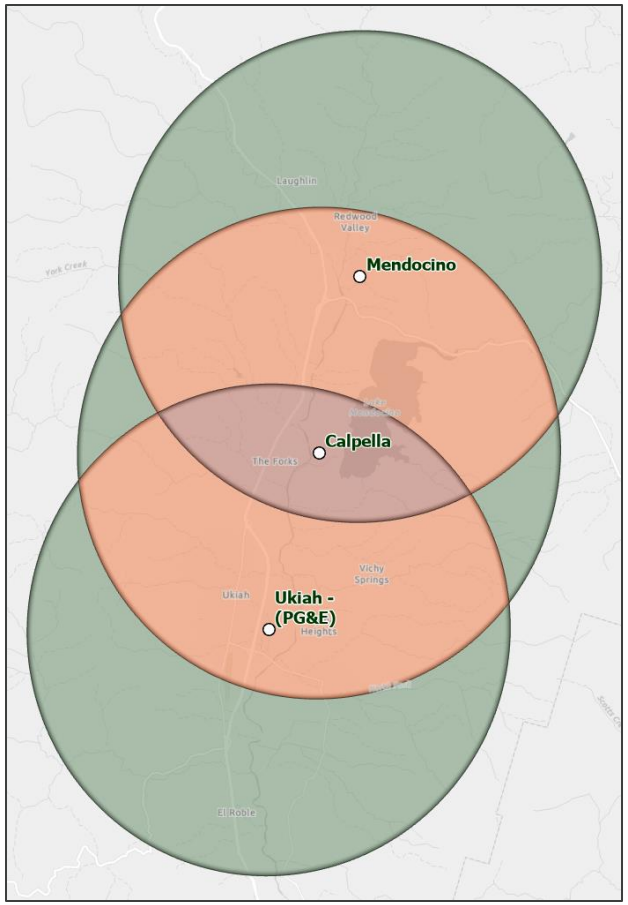


Example ASA Analysis (1 of 2)

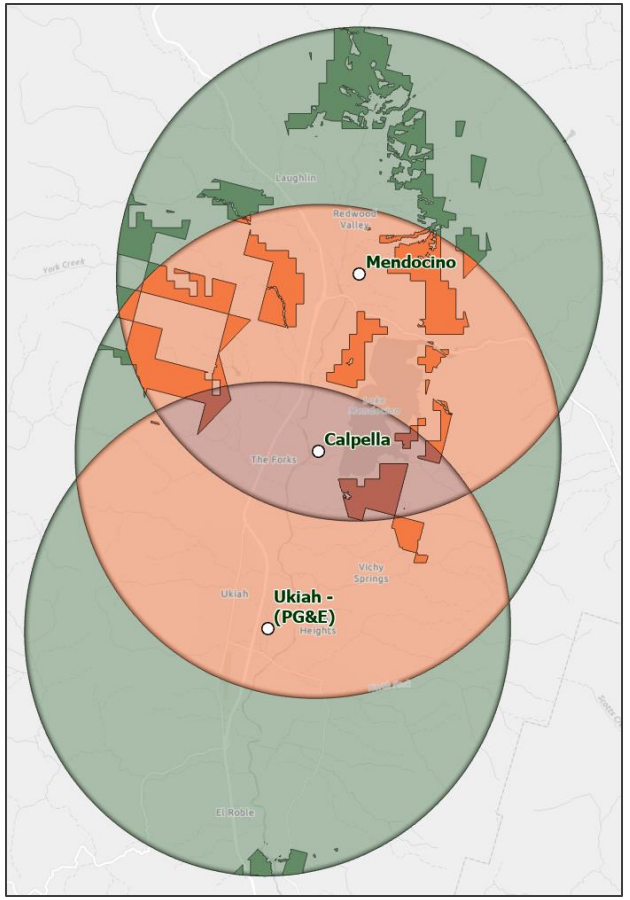
- *Buffer*
- *Count Overlaps*
- *Clip*
- *Union*
- *Calculate Geometry*



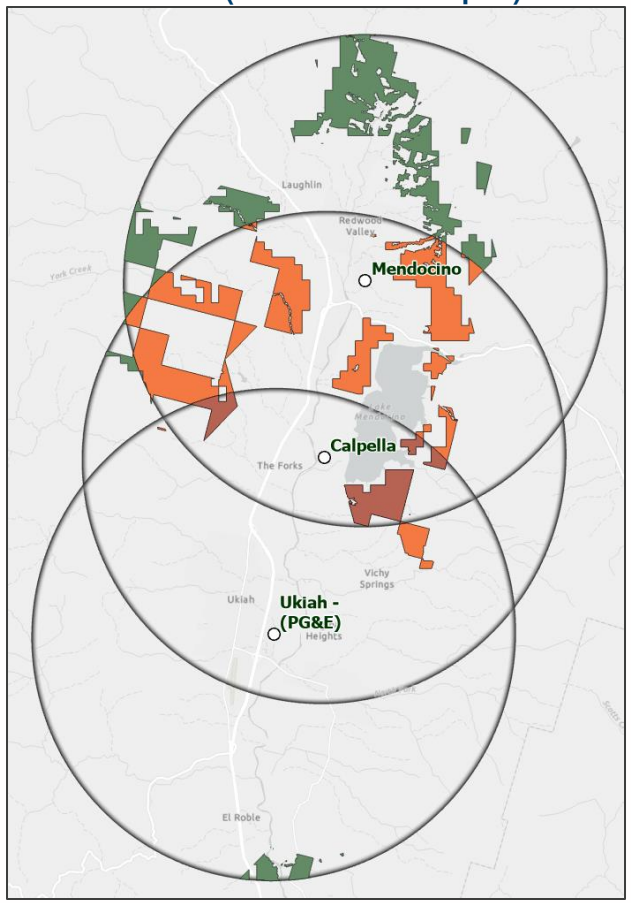
Buffers (5 Mile)



Buffers + lower-implication land

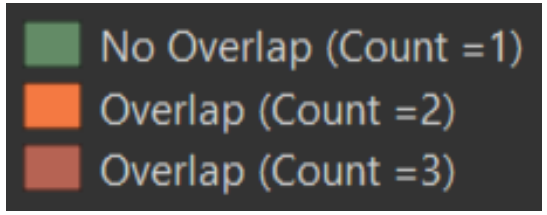


Lower-implication land union (with overlaps)



Example ASA Analysis (2 of 2)

- **Mendocino: 8,599 Acres Total / 5,873 Acres (ASA)**
  - 3,467 Acres (1 Count) = 3,467
  - 4,171 Acres (2 Count) = 2,086
  - 960 Acres (3 Count) = 320
- **Calpella: 5,434 Acres Total / 2,592 Acres (ASA)**
  - 70 Acres (1 Count) = 70
  - 4,404 Acres (2 Count) = 2,202
  - 960 Acres (3 Count) = 320
- **Ukiah: (PG&E) 1,444 Acres Total / 688 Acres (ASA)**
  - 252 Acres (1 Count) = 252
  - 232 Acres (2 Count) = 116
  - 960 Acres (3 Count) = 320



Solar lower implication land union

Proposed Application in Busbar Mapping

Proposed new metrics

	Distance in miles to nearby substations	Res. Potential after Core Land Use Screen (Lower Implication Land)	Unique Area	Adjusted Shared Area	Max Count
Name	Distance and Area Overlap of Nearby Substation (Miles, Acres)	Acres	Acres	Acres	Overlap
Calpella	{'Mendocino': [3.7,4171], 'Ukiah': [3.8, 1192]	5,433	70	2,592	3
Mendocino	{'Calpella': [3.7,960], 'Ukiah': [7.5,1192]}	8,599	3,468	5,873	3
Ukiah	{'Calpella': [3.8, 1192], 'Mendocino': [7.5, 960]	1,444	252	688	3

- In the solar and wind land use and environmental metrics data in the dashboard, the following columns will be added:
  - Unique Area: Acres of lower-implication land, intersected by a substation buffer, that is unique to a given substation.
  - Adjusted Shared Area: [Unique Area + (Shared lower-implication land areas/Overlap Count)]
  - Max Count: Maximum number of overlaps affecting the lower implication area
- All criteria alignment levels will continue to use the resource potential after the Core Land Use Screen is applied (lower implication land)

Stay Updated on CEC Land Use Screens

- Land Use Screens 2.0 Workshop occurred on June 11, 2026
- Topics included:
  - Existing Project Footprints
  - Out-of-State Screens
  - Cropland Index Model
  - Enhanced Geothermal System Screens
  - Suitability Model
- Presentation and Recording posted in Docket 26-LUEP-01
- Written comments due by July 13, 2026 to Docket 26-LUEP-01 by 5:00 p.m.