Delineating Geomorphic Landscape Units to assess sediment supply in the San Diego River Watershed

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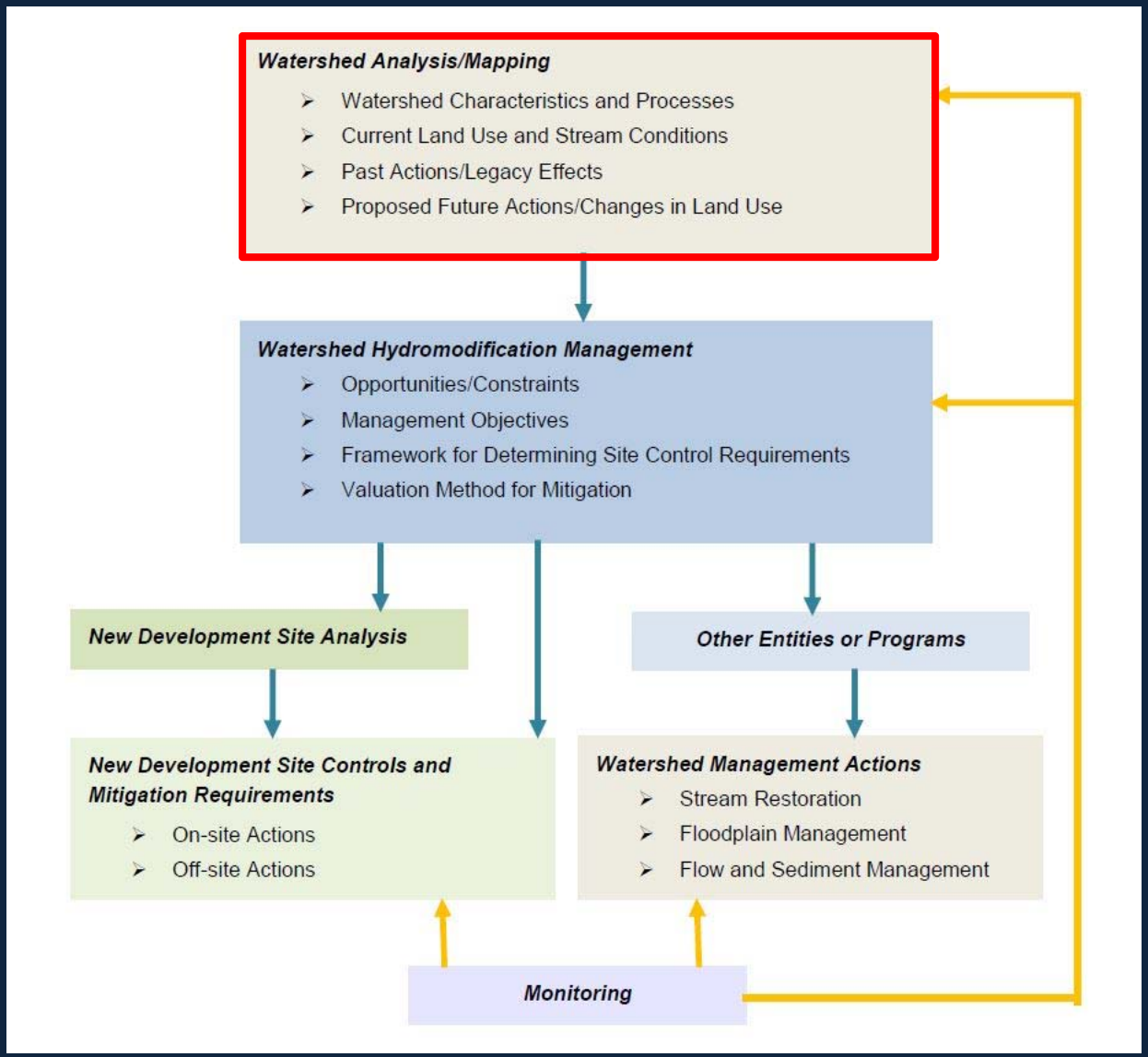
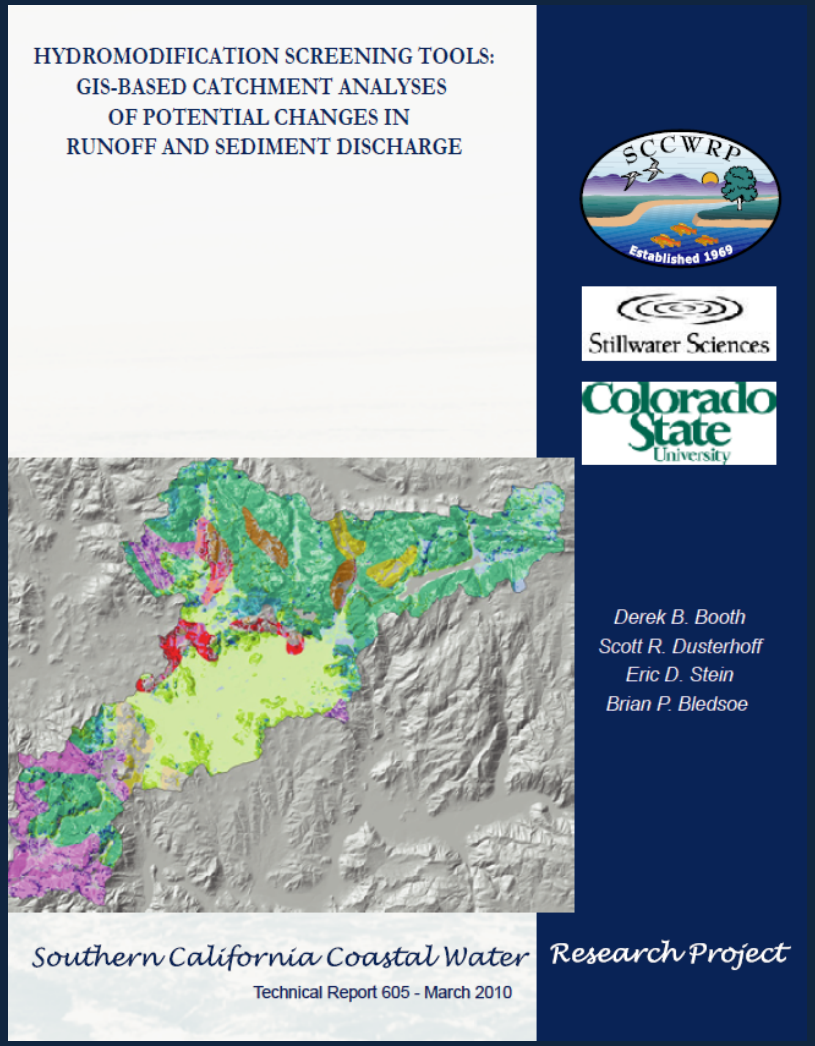

Watershed Analysis/Mapping
Watershed Characteristics and Processes
Current Land Use and Stream Conditions
Past Actions/Legacy Effects
Proposed Future Actions/Changes in Land Use
Watershed Hydromodification Management
Opportunities/Constraints
Management Objectives
Framework for Determining Site Control Requirements
Valuation Method for Mitigation
New Development Site Analysis
Other Entities or Programs
New Development Site Controls and Mitigation Requirements
On-site Actions
Off-site Actions
Watershed Management Actions
Stream Restoration
Floodplain Management
Flow and Sediment Management
Monitoring

Objectives

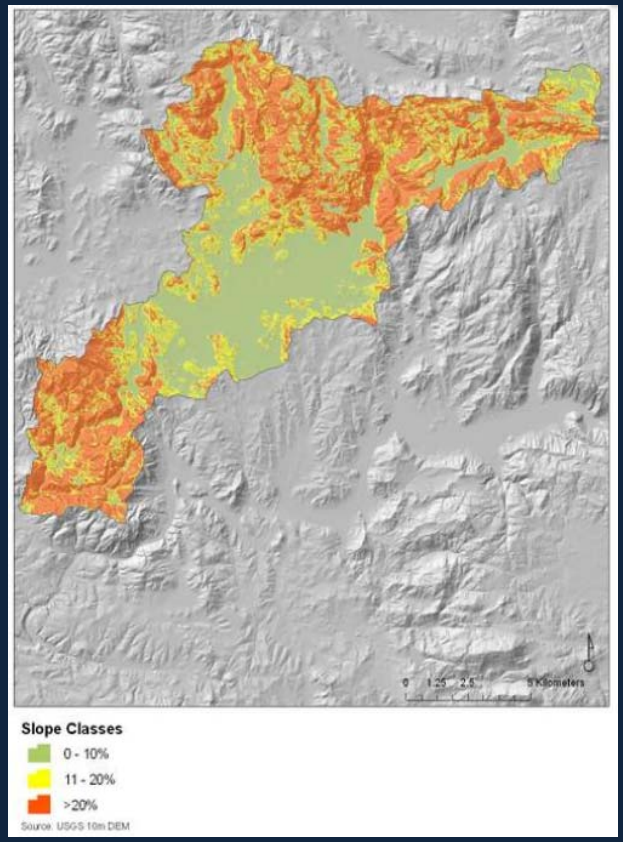
- Review of Original Geomorphic Landscape Units (GLUs) Approach
- Revised GLUs Approach
  - San Diego River Watershed
- Limitations

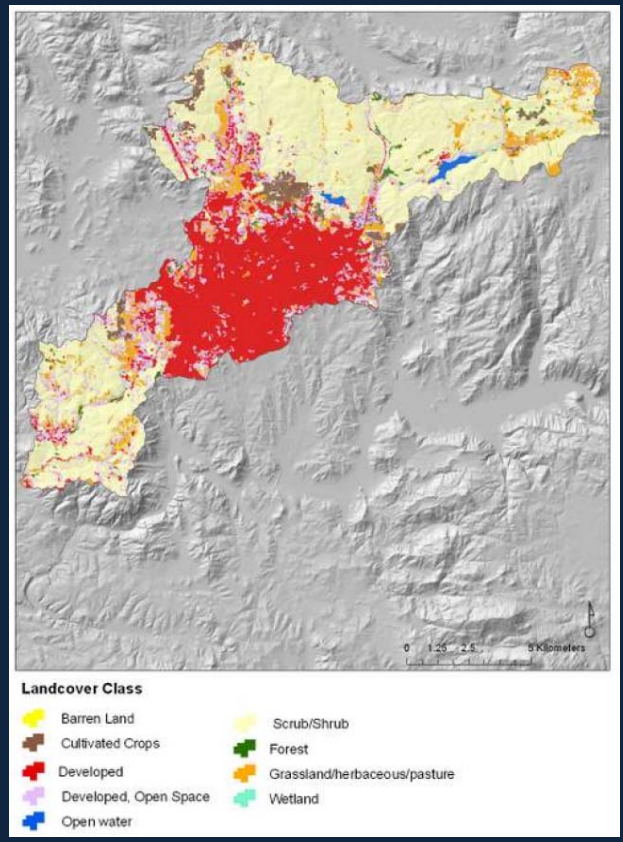
Original Approach to GLUs

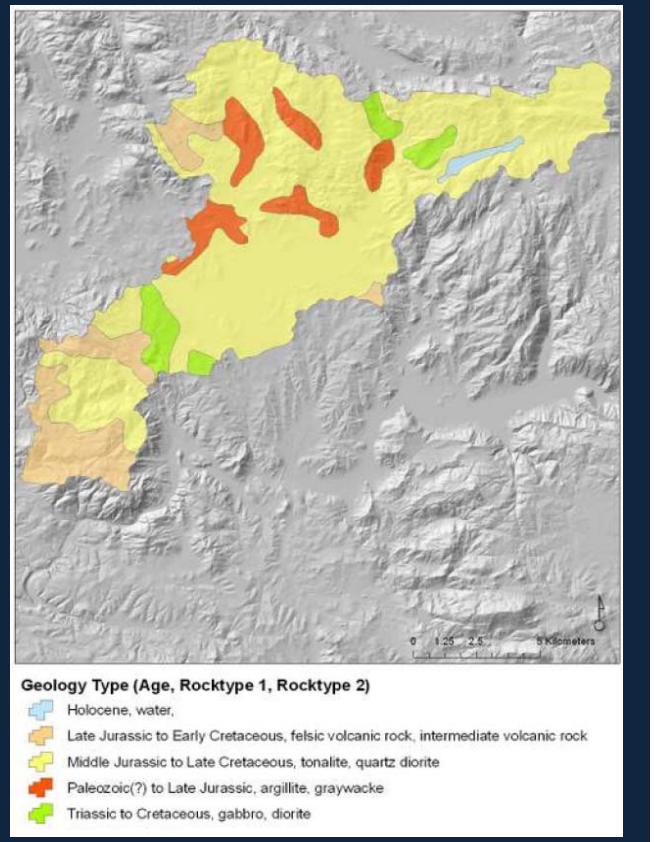
- Classification of
  Slope, Geology and Land Cover
- Planning tool to predict effects of hydromodification based on sediment changes due to landscape alteration
- Rapid assessment technique that could inform management decisions



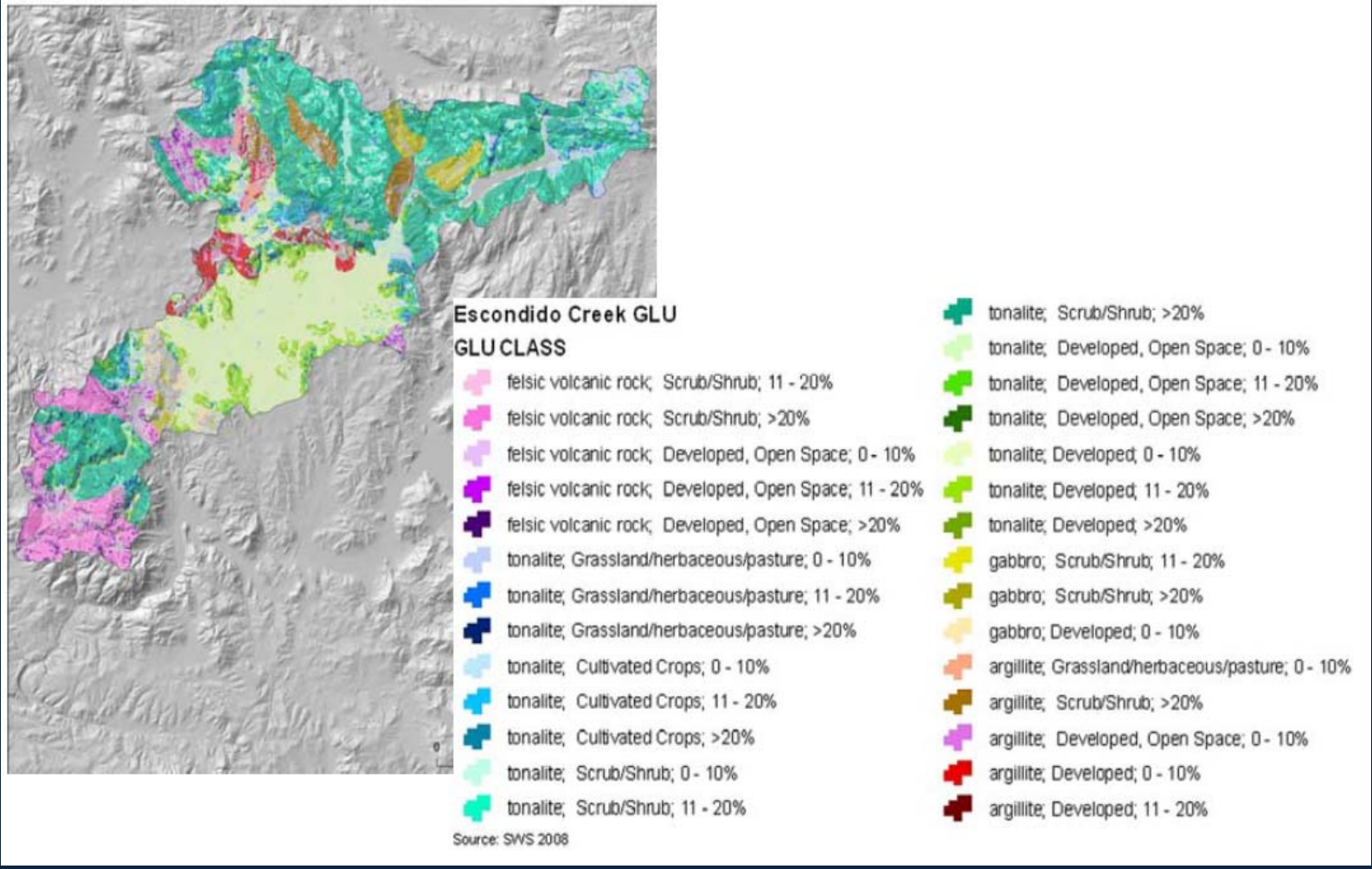
Escondido Creek Watershed



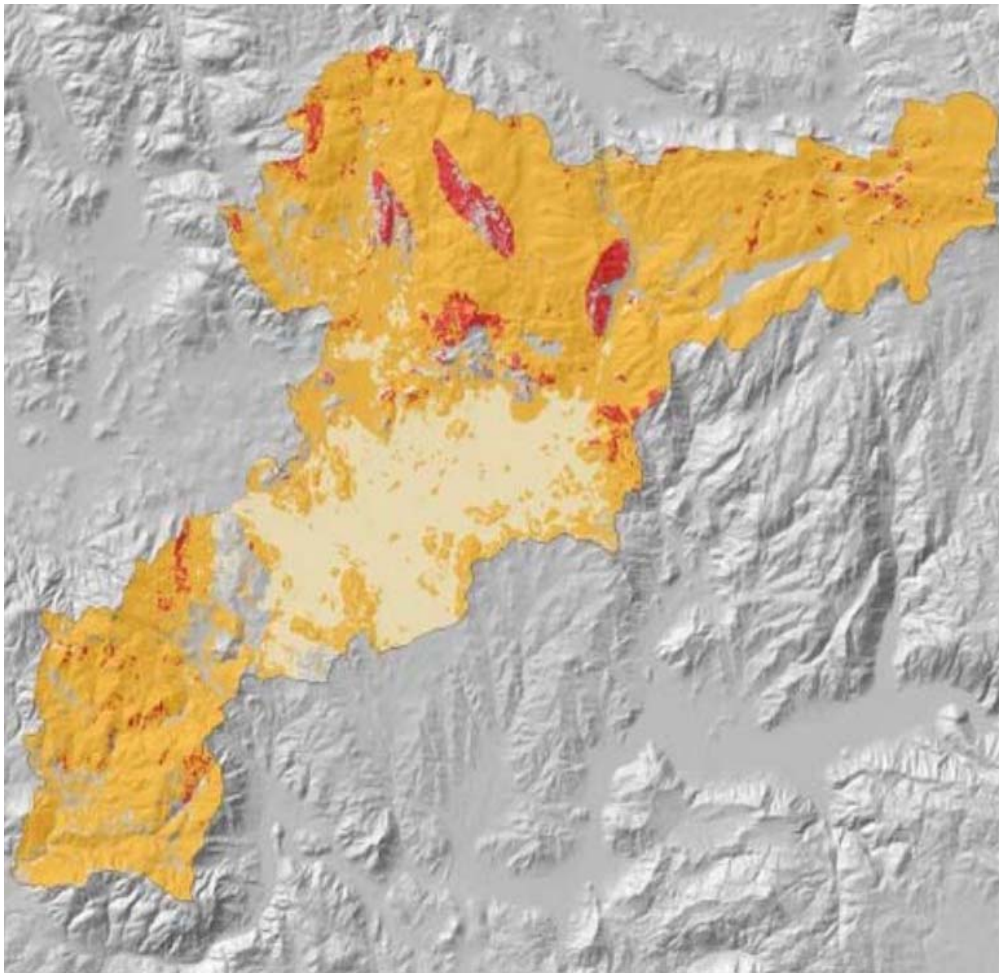




Escondido Creek Watershed



Escondido Creek Watershed



Relative Sediment Production Rates

- **Low**
- **Medium**
- **High**

Revised GLUs Approach

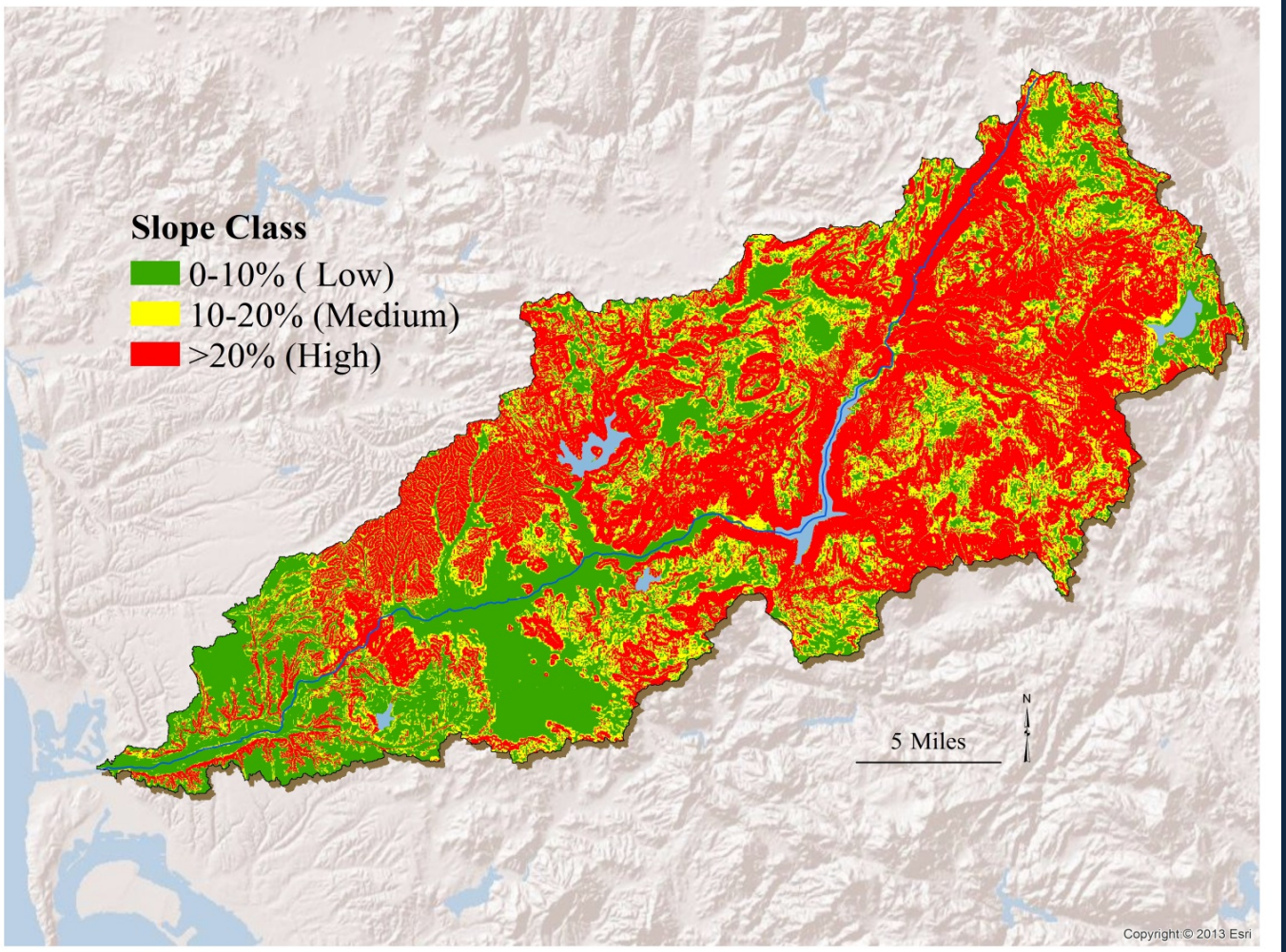
- Datasets:
  1. USGS 30 Meter elevation to derive slope
  2. CGS 1977 Jennings Geology
  3. SanGIS Current Land Use and Planned Land Use

San Diego River Watershed

- 433 Sq. Mile
- Second Largest
- Highest Population

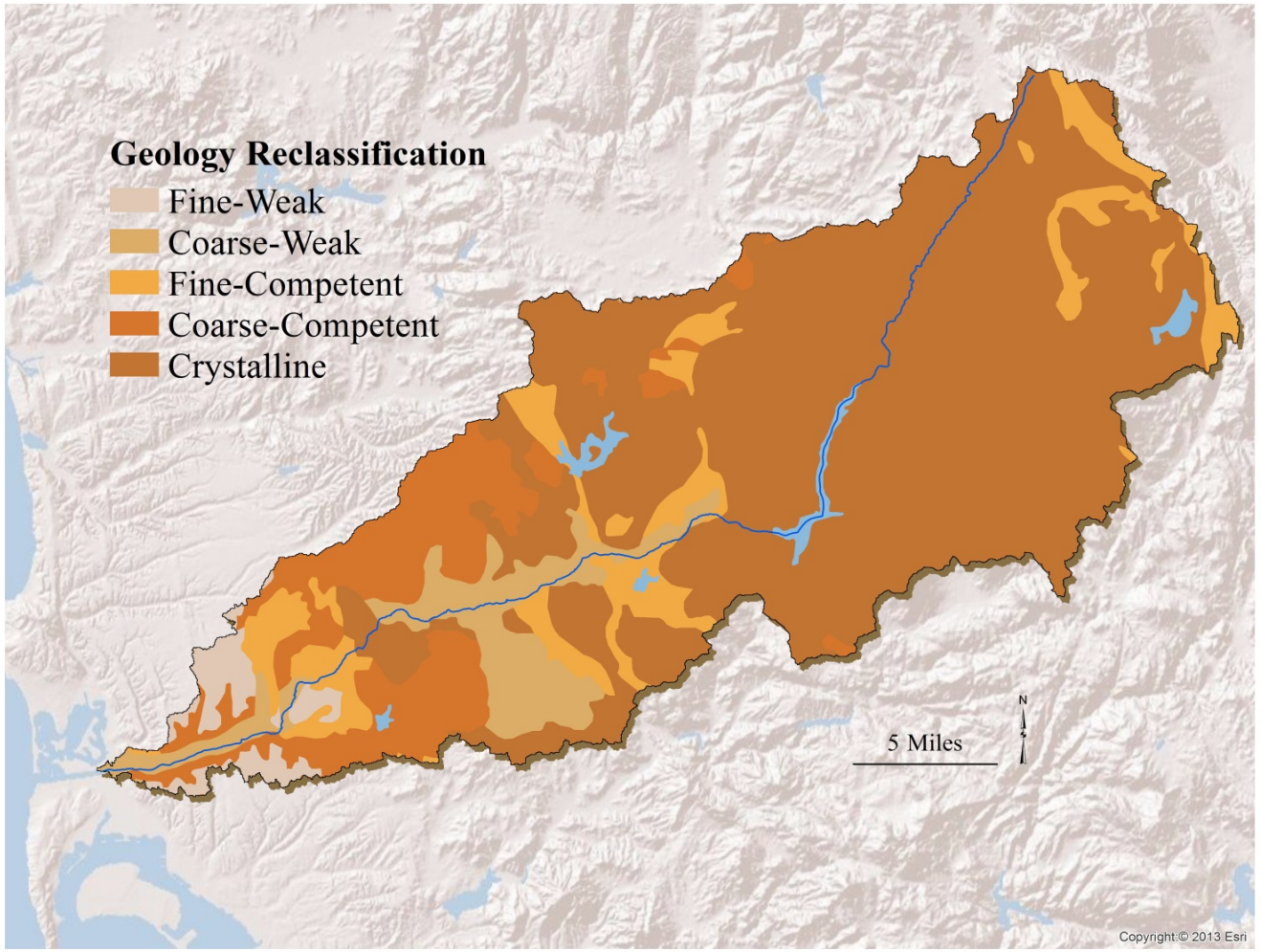
Slope Classification

- 30 Meter Resolution
- Slope stability



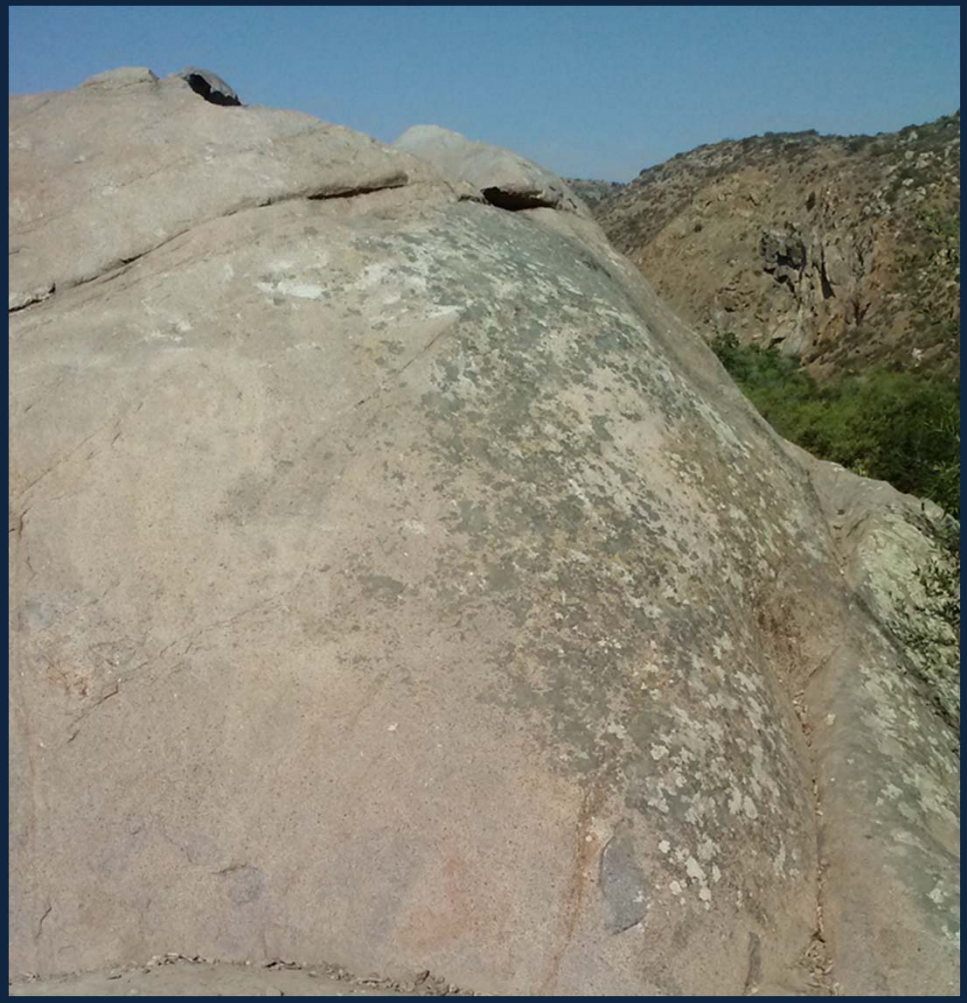
Geology Reclassification

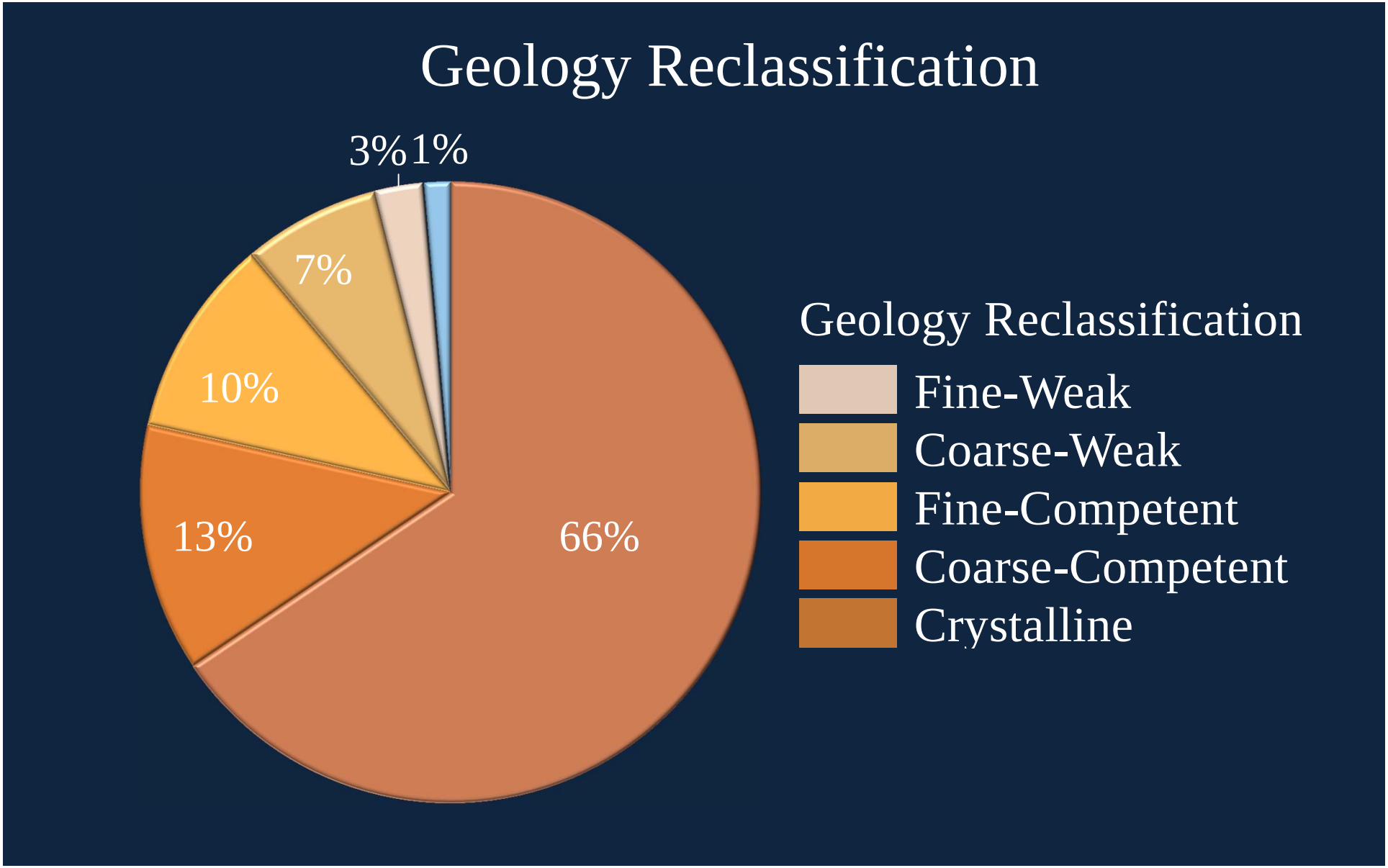
- CGS
- 68 Original
- Grouped by geologic characteristic



Coarse-Competent Classification

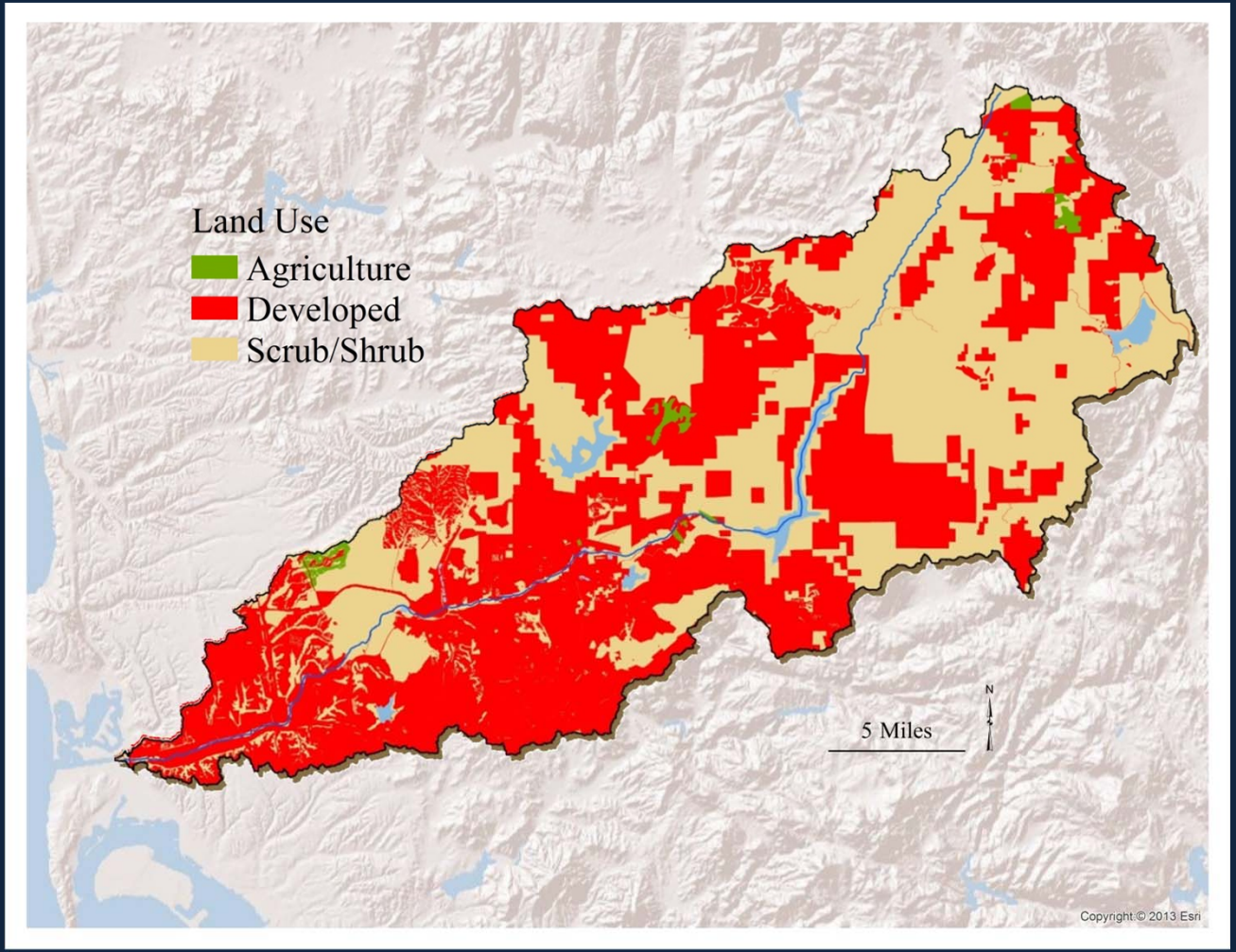
Crystalline Classification



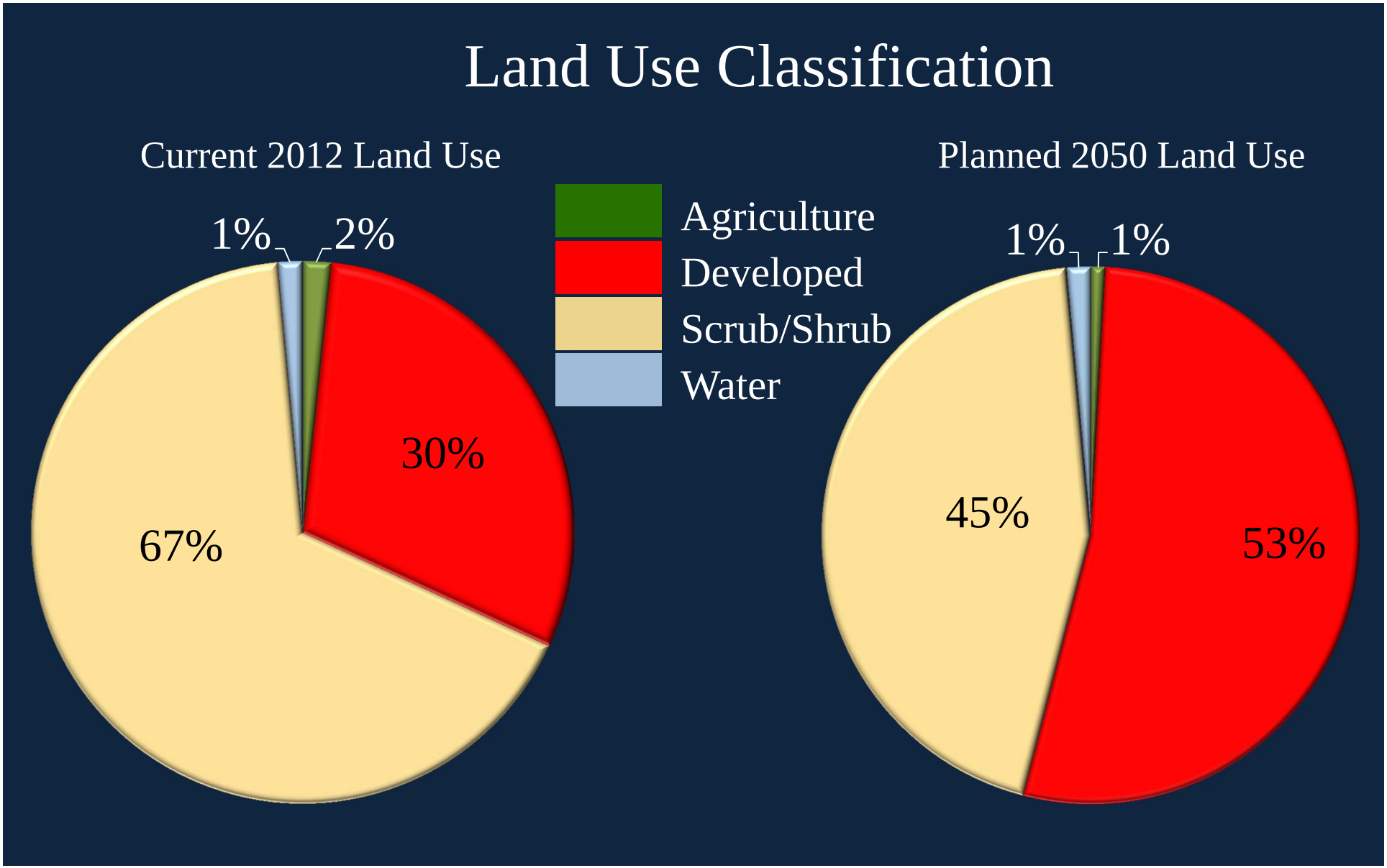

Geology Reclassification
3%
1%
7%
10%
13%
66%
Geology Reclassification
Fine-Weak
Coarse-Weak
Fine-Competent
Coarse-Competent
Crystalline

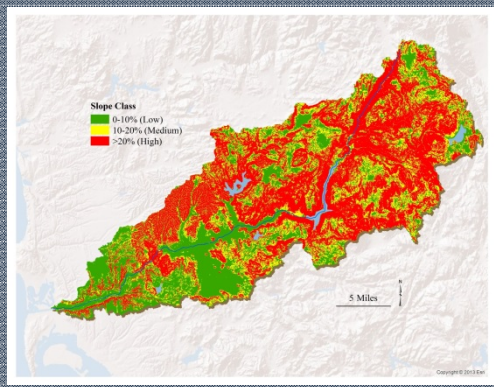
Land Use Classification

- General & Community Plans
- 90 Original
- 3 Reclassified



Land Use Classification





Slope

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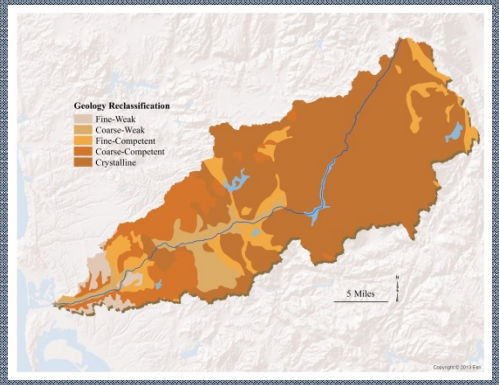

Geology

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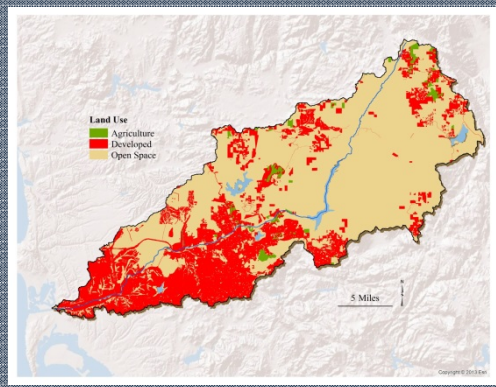
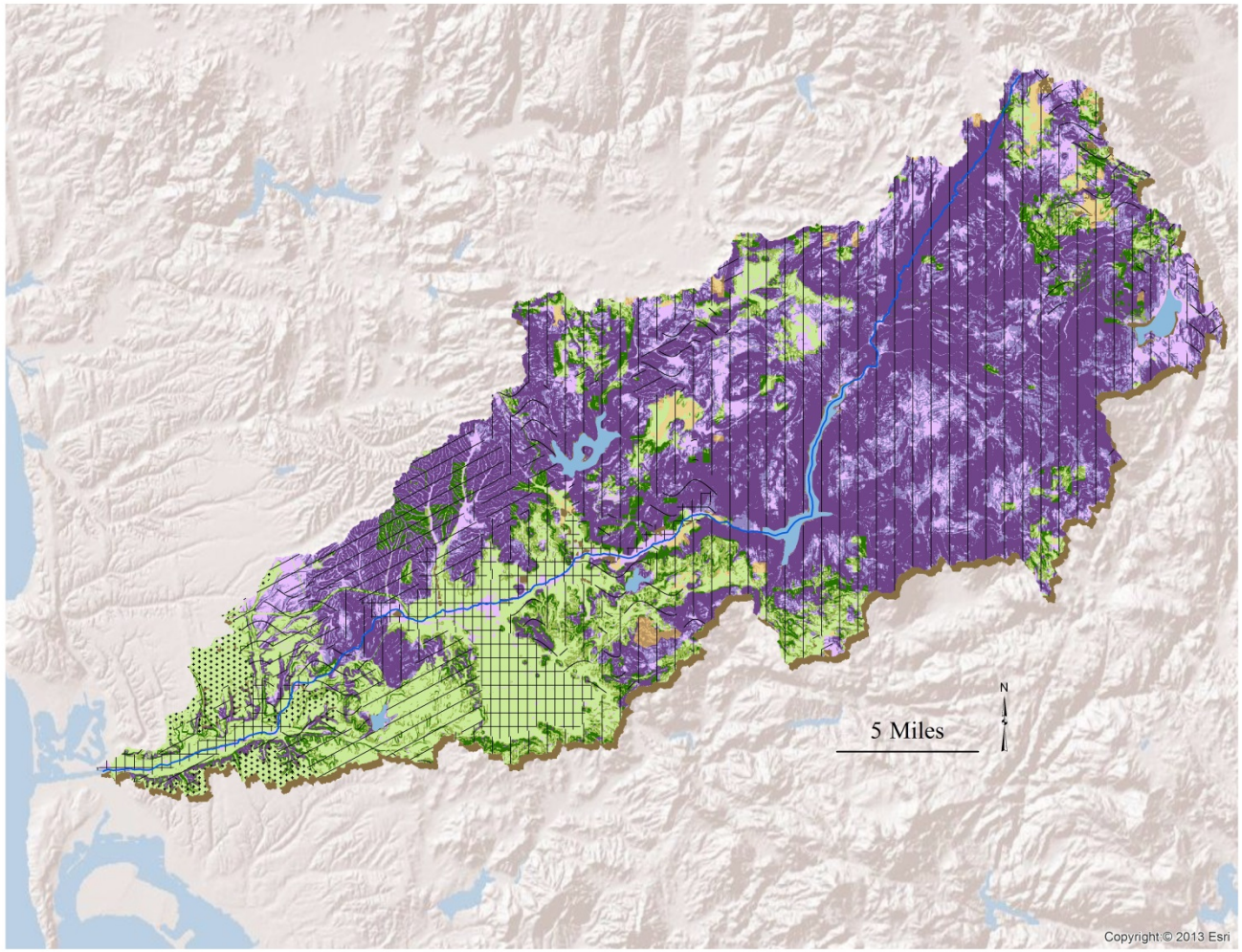


Land Use

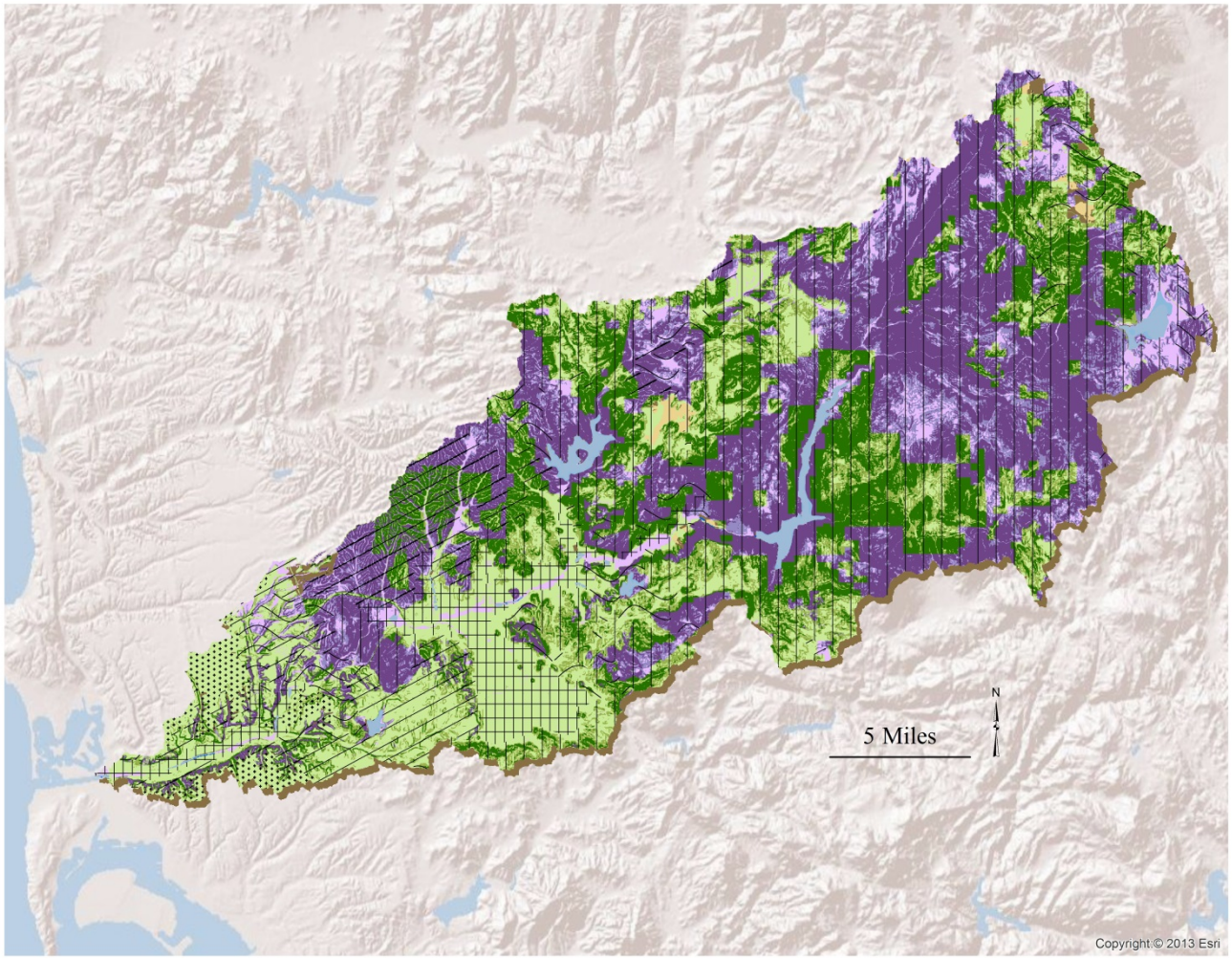
Unique Landscape Units – Current Land Use

- Coarse-Competent; Developed; Low
- Coarse-Competent; Developed; Medium
- Coarse-Competent; Developed; High
- Coarse-Competent; Scrub/Shrub; Low
- Coarse-Competent; Scrub/Shrub; Medium
- Coarse-Competent; Scrub/Shrub; High
- Coarse-Weak; Agriculture; Low
- Coarse-Weak; Agriculture; Medium
- Coarse-Weak; Agriculture; High
- Coarse-Weak; Developed; Low
- Coarse-Weak; Developed; Medium
- Coarse-Weak; Developed; High
- Coarse-Weak; Scrub/Shrub; Low
- Coarse-Weak; Scrub/Shrub; Medium
- Coarse-Weak; Scrub/Shrub; High
- Crystalline; Agriculture; Low
- Crystalline; Agriculture; Medium
- Crystalline; Agriculture; High
- Crystalline; Developed; Low
- Crystalline; Developed; Medium
- Crystalline; Developed; High
- Crystalline; Scrub/Shrub; Low
- Crystalline; Scrub/Shrub; Medium
- Crystalline; Scrub/Shrub; High
- Fine-Competent; Agriculture; Low
- Fine-Competent; Developed; Low
- Fine-Competent; Developed; Medium
- Fine-Competent; Developed; High
- Fine-Competent; Scrub/Shrub; Low
- Fine-Competent; Scrub/Shrub; Medium
- Fine-Competent; Scrub/Shrub; High
- Fine-Weak; Developed; Low
- Fine-Weak; Developed; Medium
- Fine-Weak; Developed; High
- Fine-Weak; Scrub/Shrub; High

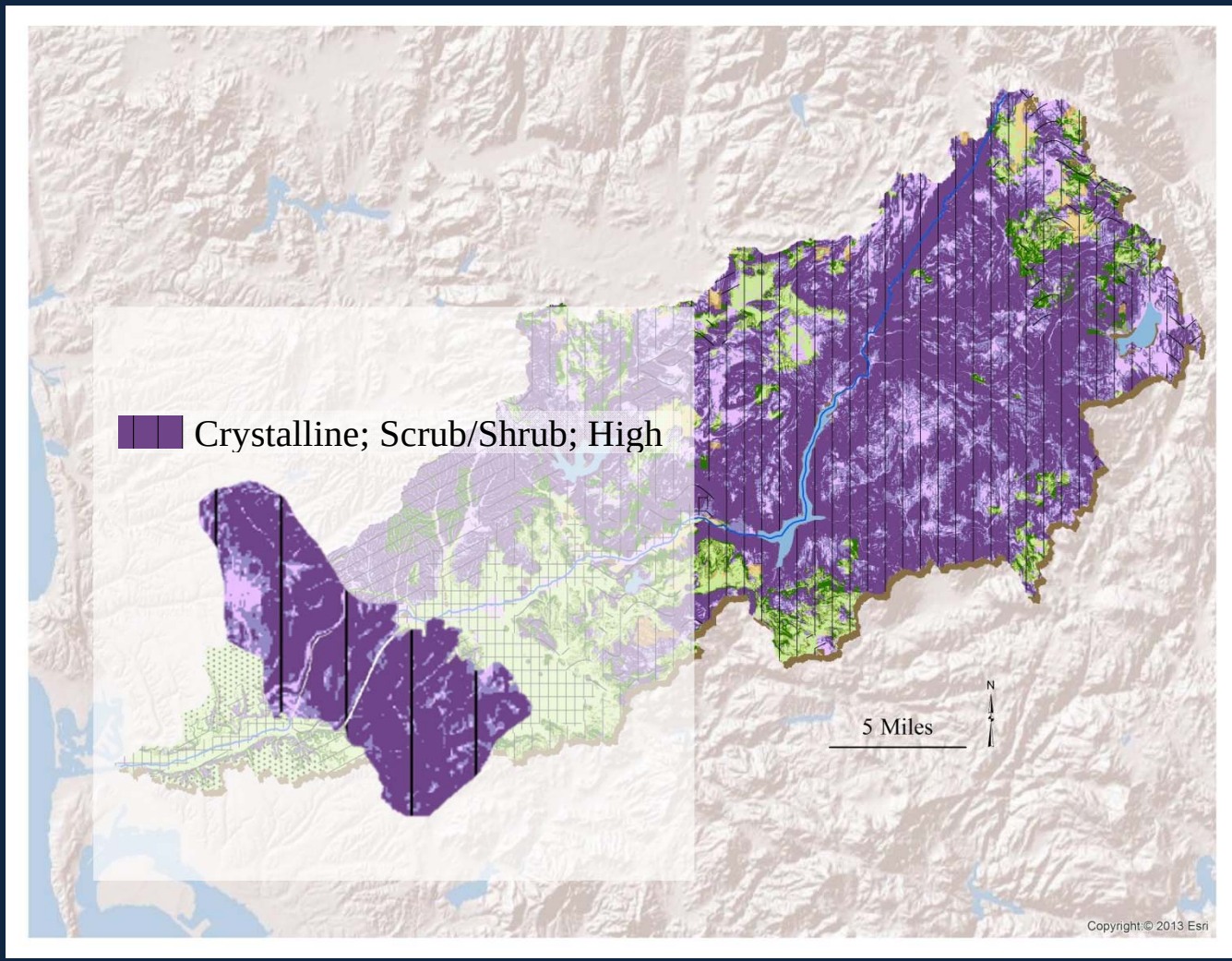


Unique Landscape Units – Planned Land Use

- Coarse-Competent; Developed; Low
- Coarse-Competent; Developed; Medium
- Coarse-Competent; Developed; High
- Coarse-Competent; Scrub/Shrub; Low
- Coarse-Competent; Scrub/Shrub; Medium
- Coarse-Competent; Scrub/Shrub; High
- Coarse-Weak; Developed; Low
- Coarse-Weak; Developed; Medium
- Coarse-Weak; Developed; High
- Coarse-Weak; Scrub/Shrub; Low
- Coarse-Weak; Scrub/Shrub; Medium
- Coarse-Weak; Scrub/Shrub; High
- Crystalline; Agriculture; Low
- Crystalline; Developed; Low
- Crystalline; Developed; Medium
- Crystalline; Developed; High
- Crystalline; Scrub/Shrub; Low
- Crystalline; Scrub/Shrub; Medium
- Crystalline; Scrub/Shrub; High
- Fine-Competent; Developed; Low
- Fine-Competent; Developed; Medium
- Fine-Competent; Developed; High
- Fine-Competent; Scrub/Shrub; Low
- Fine-Competent; Scrub/Shrub; Medium
- Fine-Competent; Scrub/Shrub; High
- Fine-Weak; Developed; Low
- Fine-Weak; Developed; Medium
- Fine-Weak; Developed; High
- Fine-Weak; Scrub/Shrub;High



Unique Landscape Units – Current Land Use



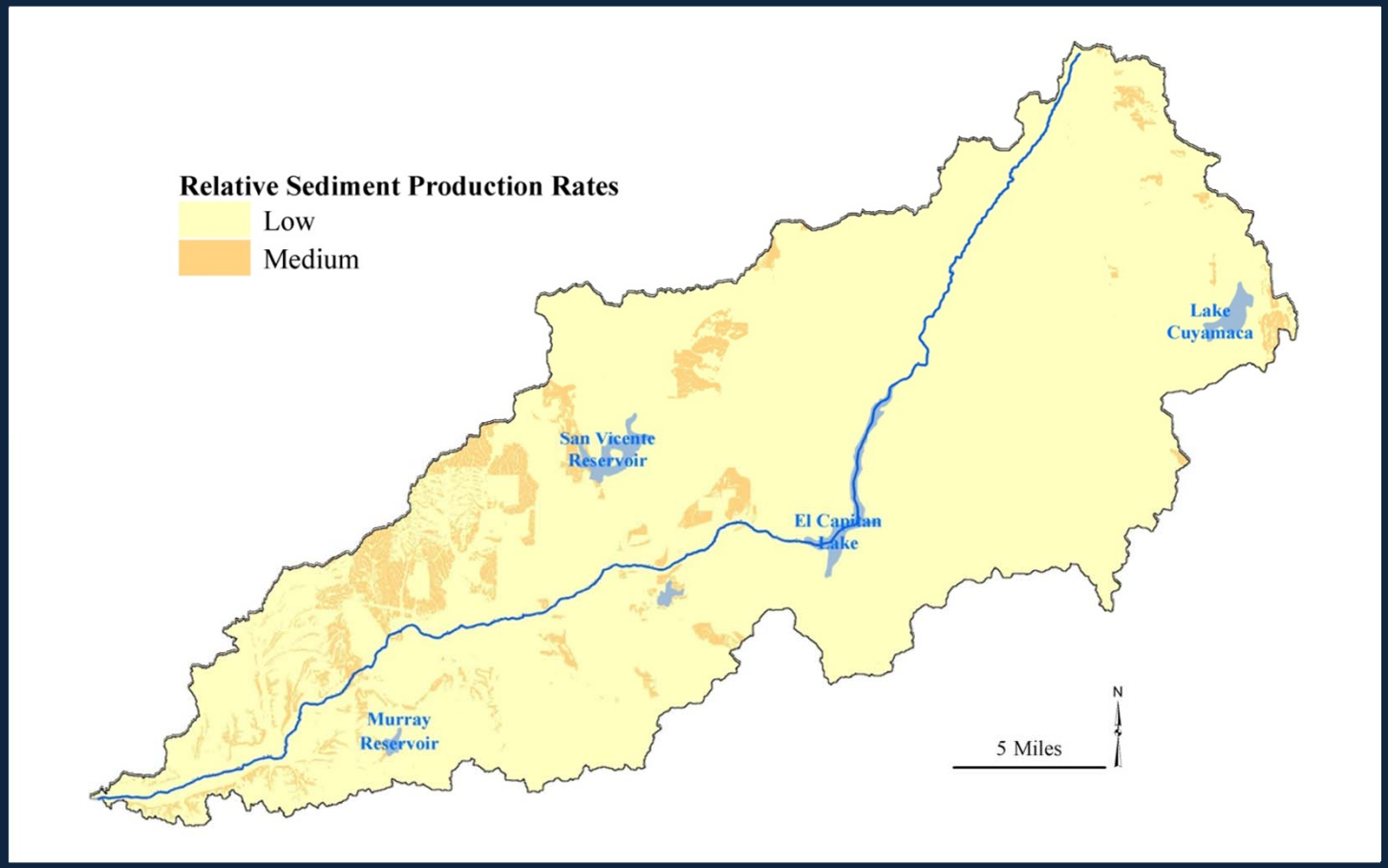
Crystalline; Scrub/Shrub; High

Crystalline; Scrub/Shrub; Low

Coarse-Competent; Scrub/Shrub; High

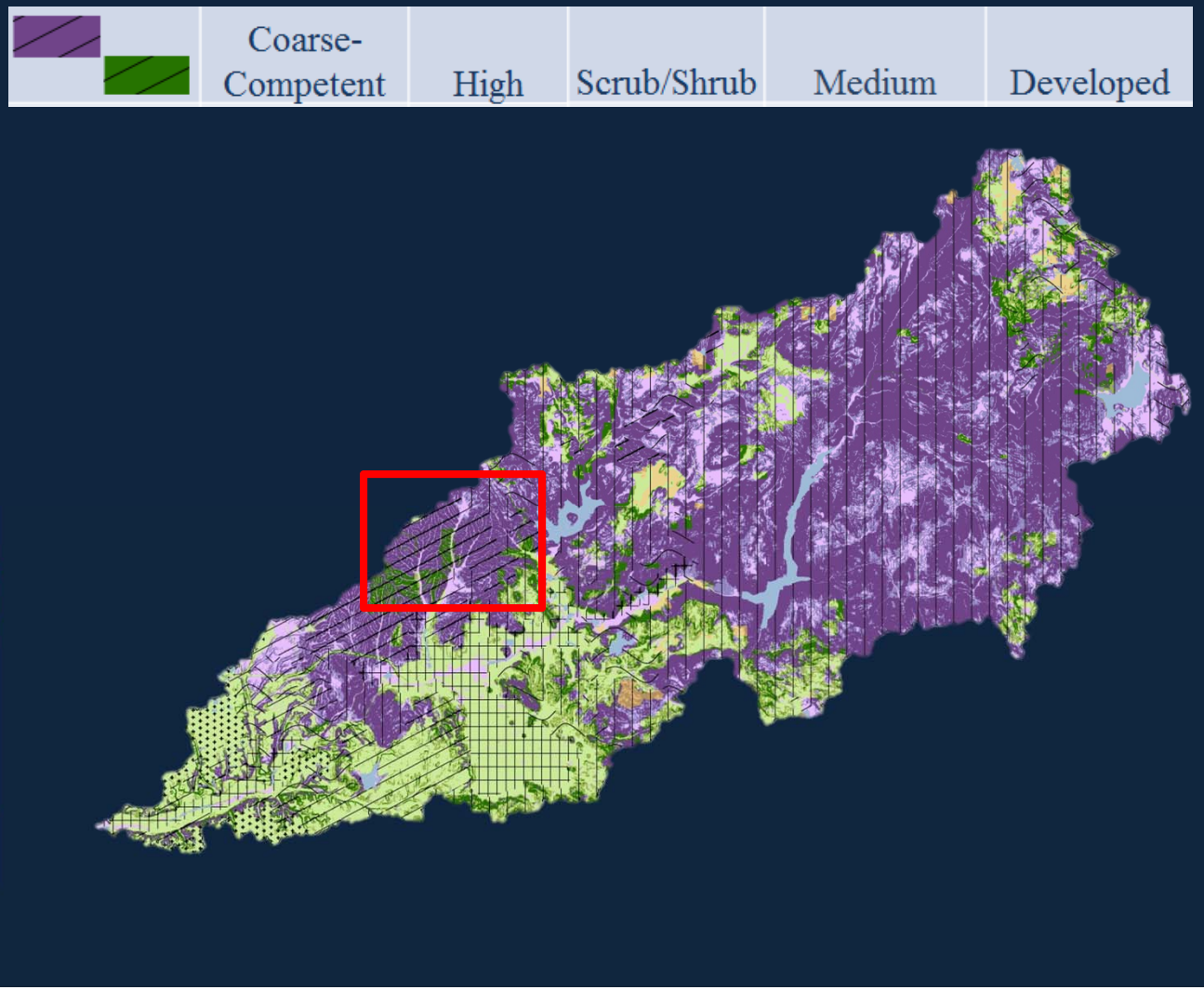
Legend	Geology	Slope	Current 2012 Land Use	Relative Sediment Production	Potential 2050 Land Use	Difference in Percent
	Crystalline	Medium	Agriculture	Low	Developed	-6.6
	Crystalline	Medium	Scrub/Shrub	Low	Scrub/Shrub	-8.1
	Crystalline	High	Scrub/Shrub	Low	Scrub/Shrub	-3.1
	Coarse-Competent	Low	Scrub/Shrub	Low	Scrub/Shrub	-0.7
	Coarse-Competent	High	Scrub/Shrub	Medium	Developed	-1.2
	Coarse-Competent	Medium	Scrub/Shrub	Medium	Scrub/Shrub	-0.2

2050



A predicted reduction in sediment could be used to identify areas of hydromodification

Relative Sediment Production



Limitations

- Defined by the coarsest dataset – Jennings Geology
- Reclassification of Categories
- Assessment of relative sediment production rates

Summary

- Goal was to identify unique landscape units that could be used in a rapid assessment of the watershed
- 3 indicators of potential sediment production
- Predicted reduction in sediment could be used to identify areas of hydromodification and assist decision makers
- Dataset and Classification limitations

Questions?

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