Net Zero Water Study For Fort Irwin California

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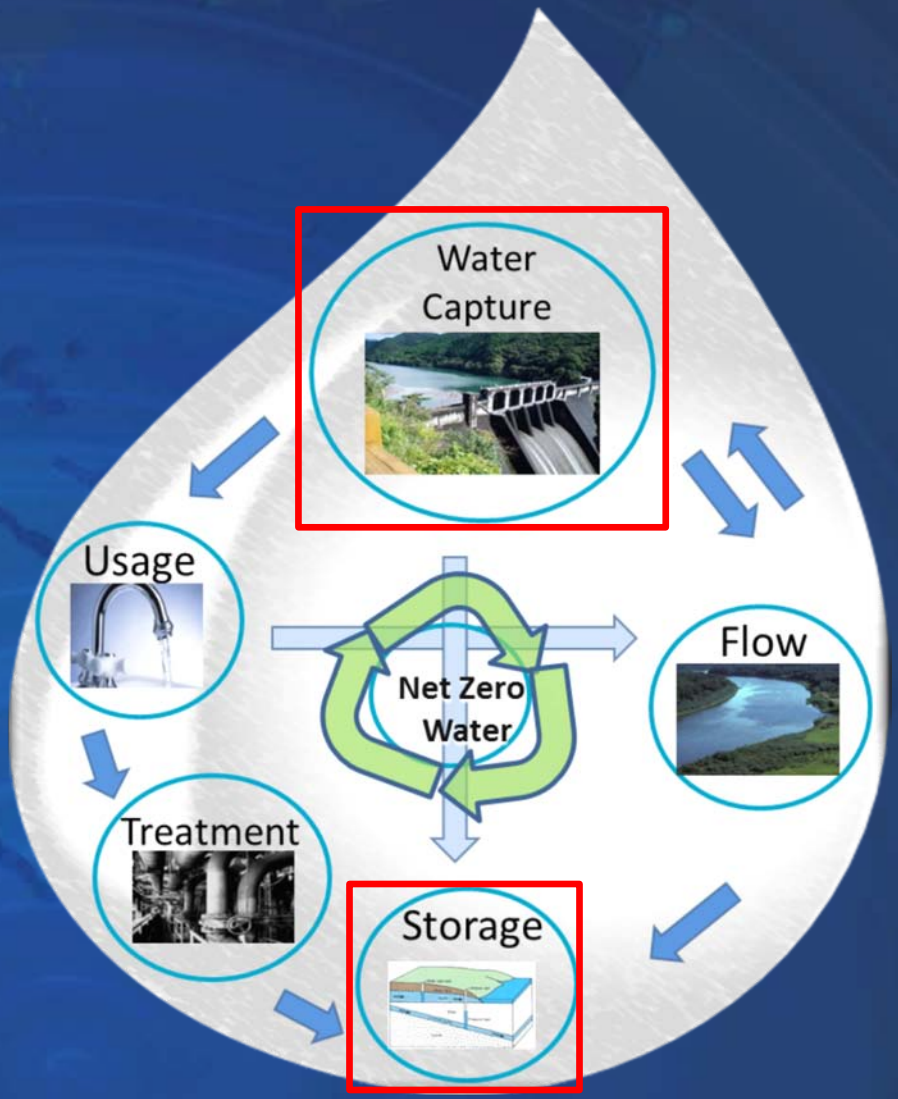
The Client

INTRODUCTION
PLATFORM & SOLUTION
DATA & METHODS
ANALYSIS & RESULTS
CONCLUSION

Background

Net Zero Water

A Net Zero Water facility limits the consumption of freshwater resources and returns as much water as it uses back to the source watershed in a year (US Army Energy program)



The Problem

Bicycle Basin
Bicycle Lake
Irwin Basin
Langford Lake
Langford Basin

Storm Water

INTRODUCTION

PLATFORM & SOLUTION

DATA & METHODS

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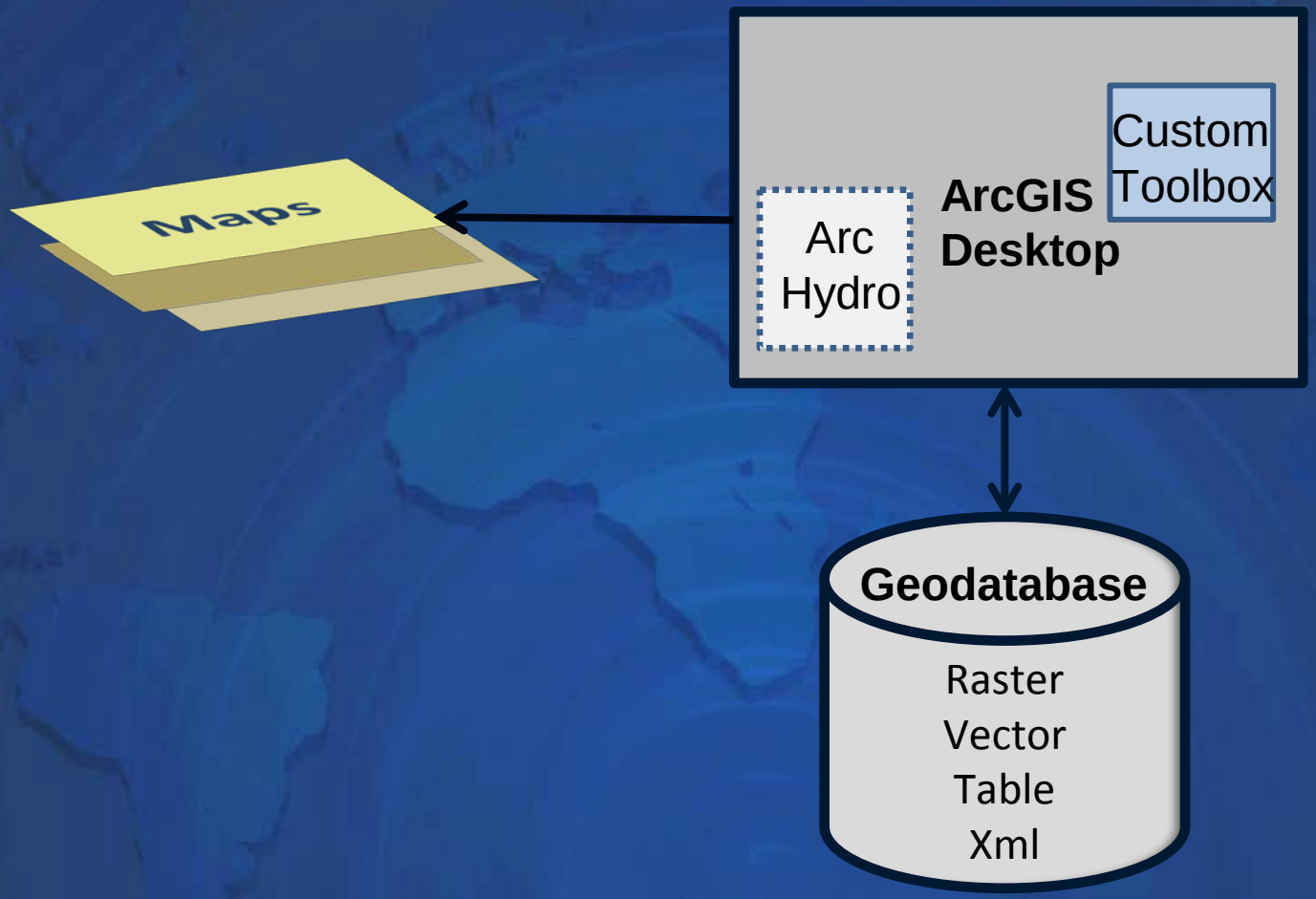
Potential Water Capture Sites

Platform & Solution



Scope

Data

Digital Elevation Model (DEM)

Geology

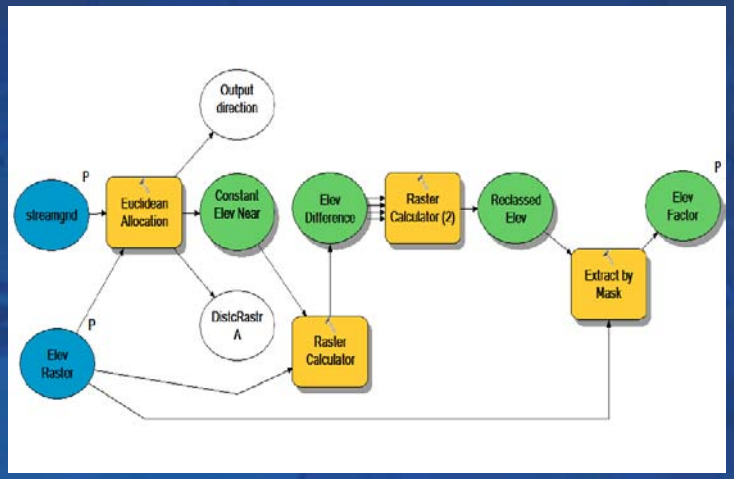
Soil

Land Cover

Rainfall

GIS Tools

- Model tools



- Custom toolbox

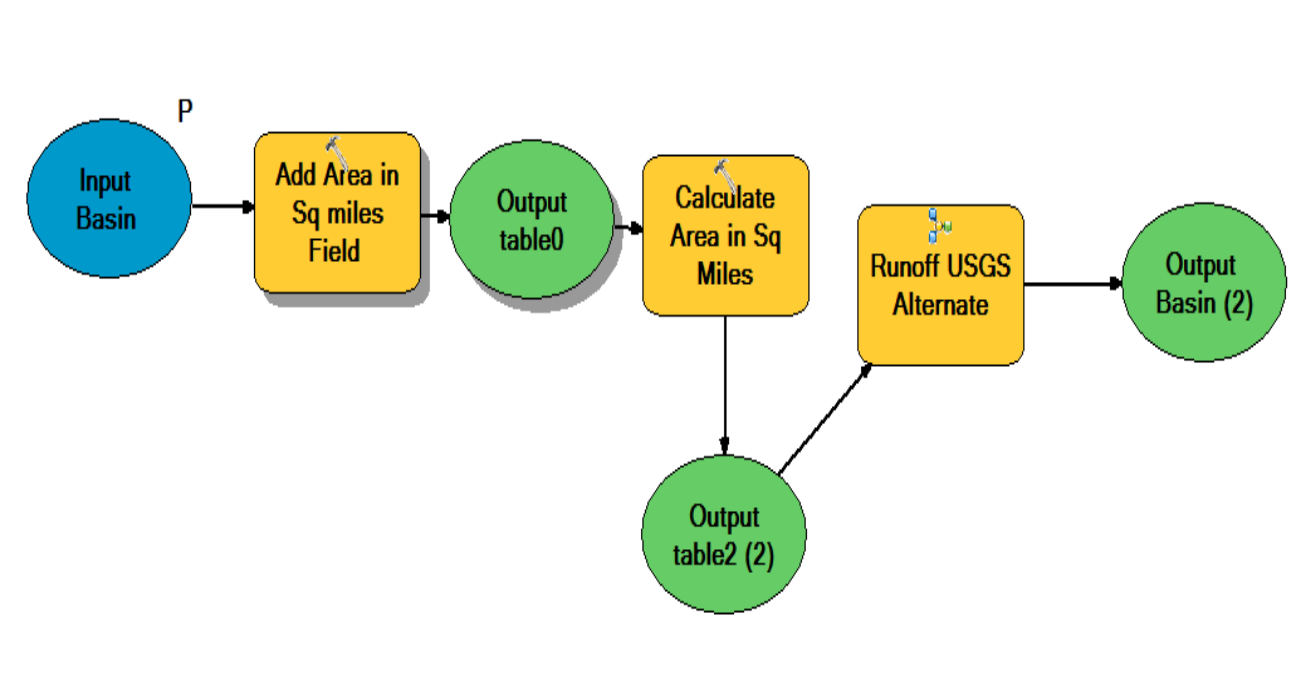
Basin Delineation

Natural Basin

Storm Basin

HUC Basin

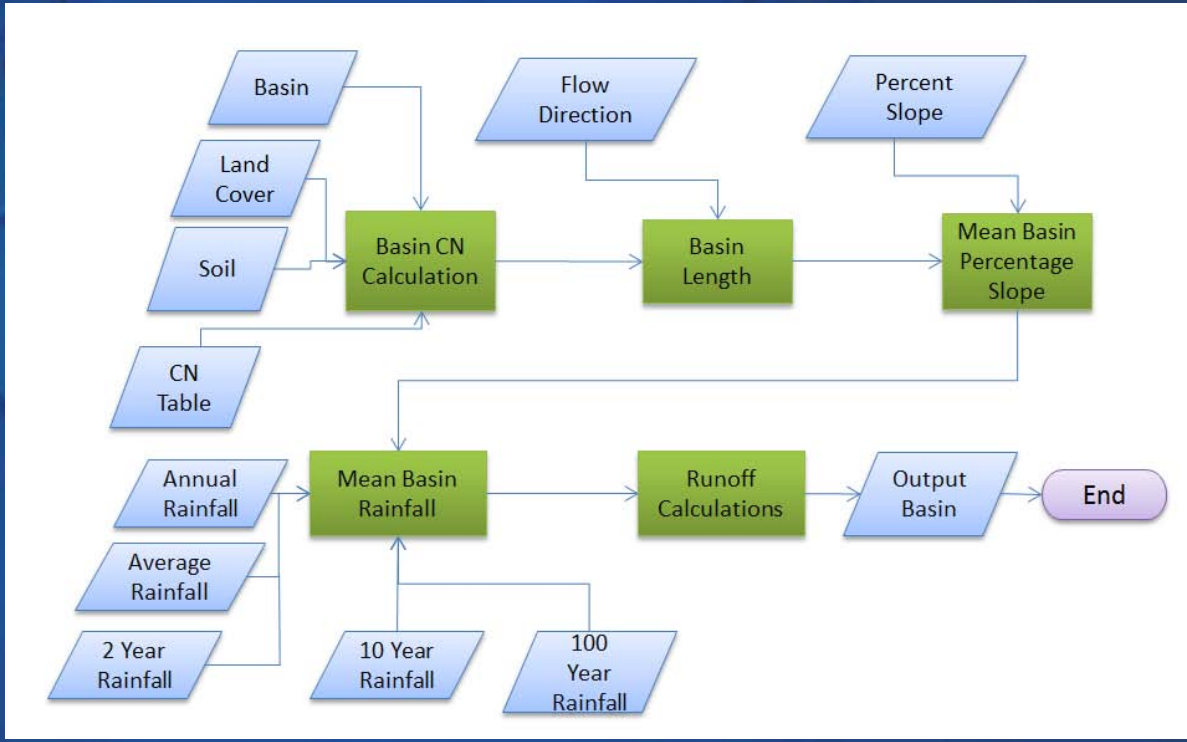
Quick Peak Discharge Estimate



Comprehensive Runoff Estimates

Curve Number :

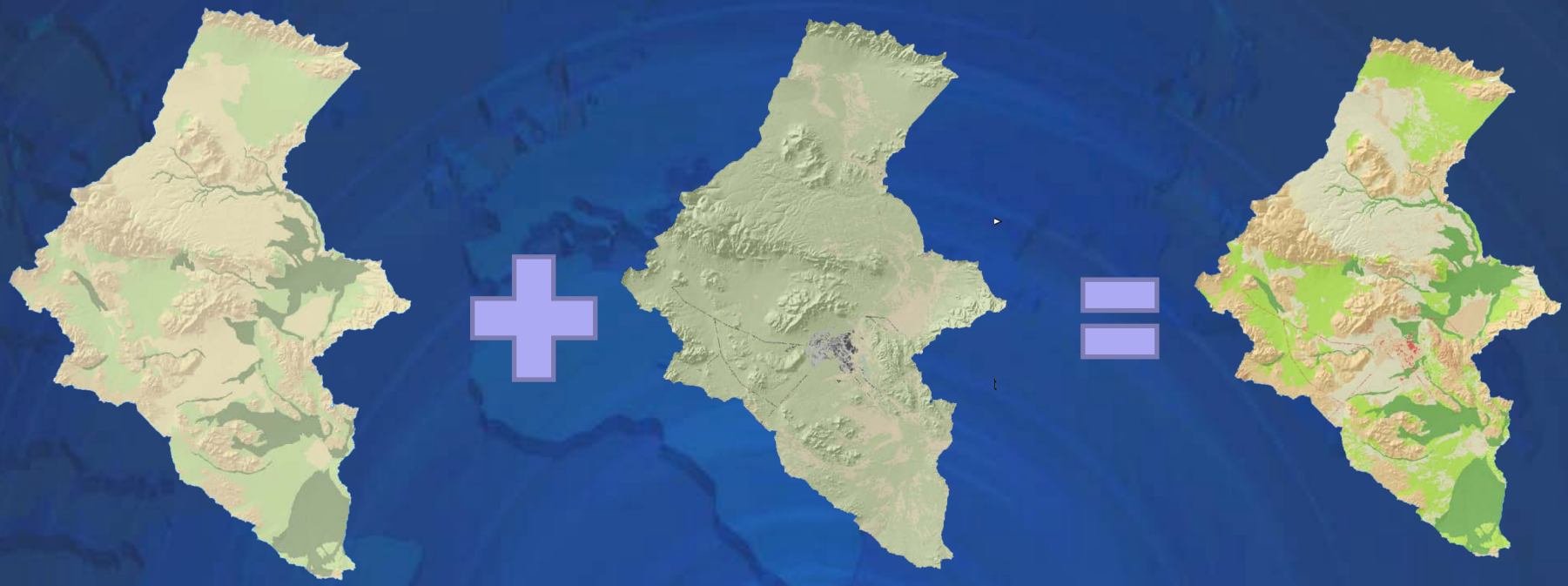
An empirical parameter used in hydrology for predicting direct runoff or infiltration from excess Rainfall
(Natural Resource Conservation Service)



Suitability Factors for Water Capture

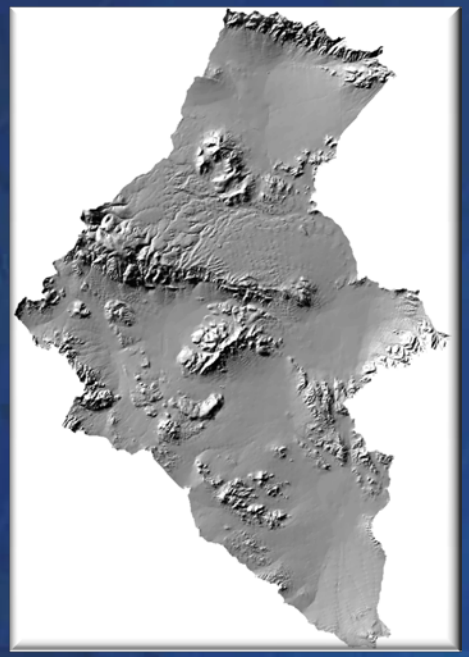
- Infiltration
- Elevation
- Runoff
- Slope

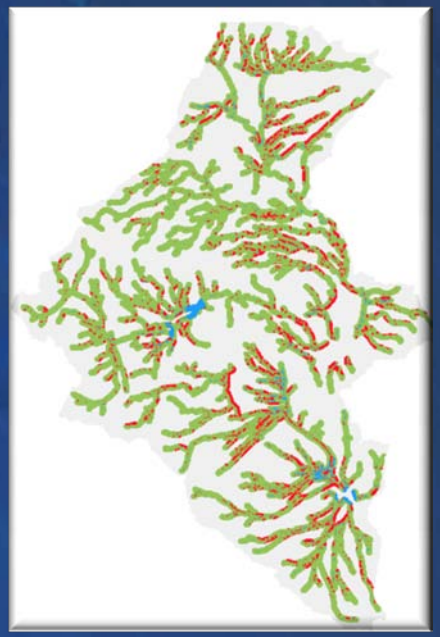
Infiltration Factor



Soil + Land Cover = Infiltration

Elevation Factor





DEM

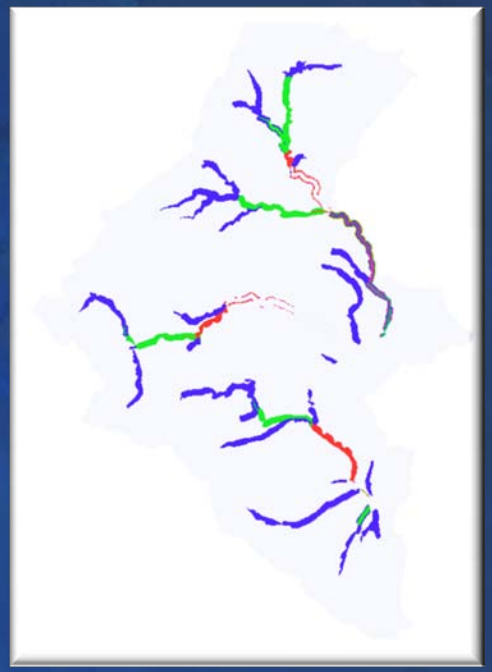
Stream

Elevation

Runoff Factor

+

=

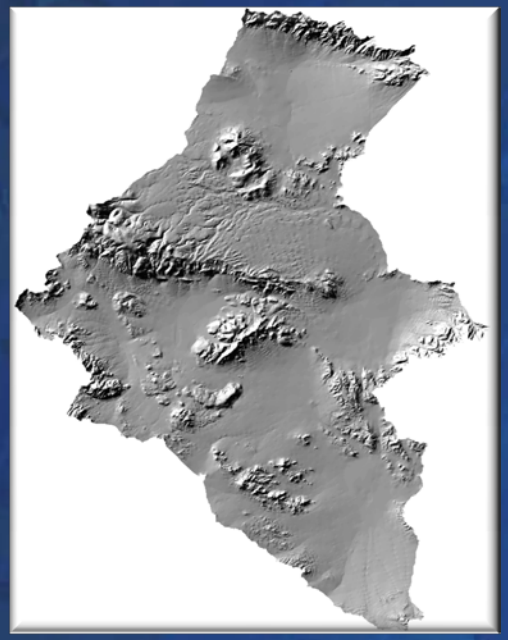


Flow Accumulation Raster

Stream

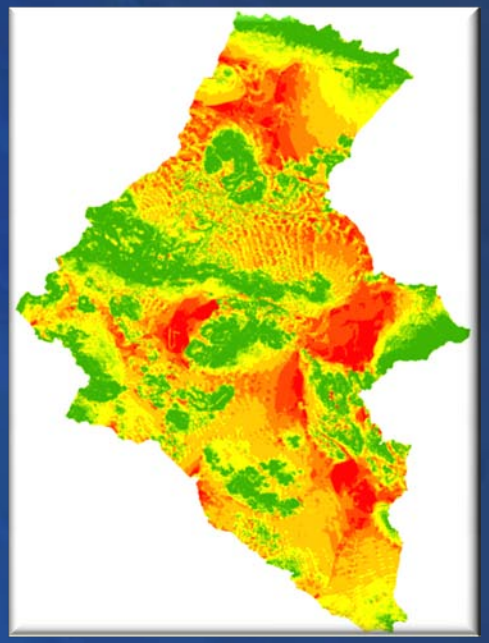
Runoff

Slope Factor



DEM

Percent Slope



Slope

Identifying Candidate Sites

Infiltration

Elevation

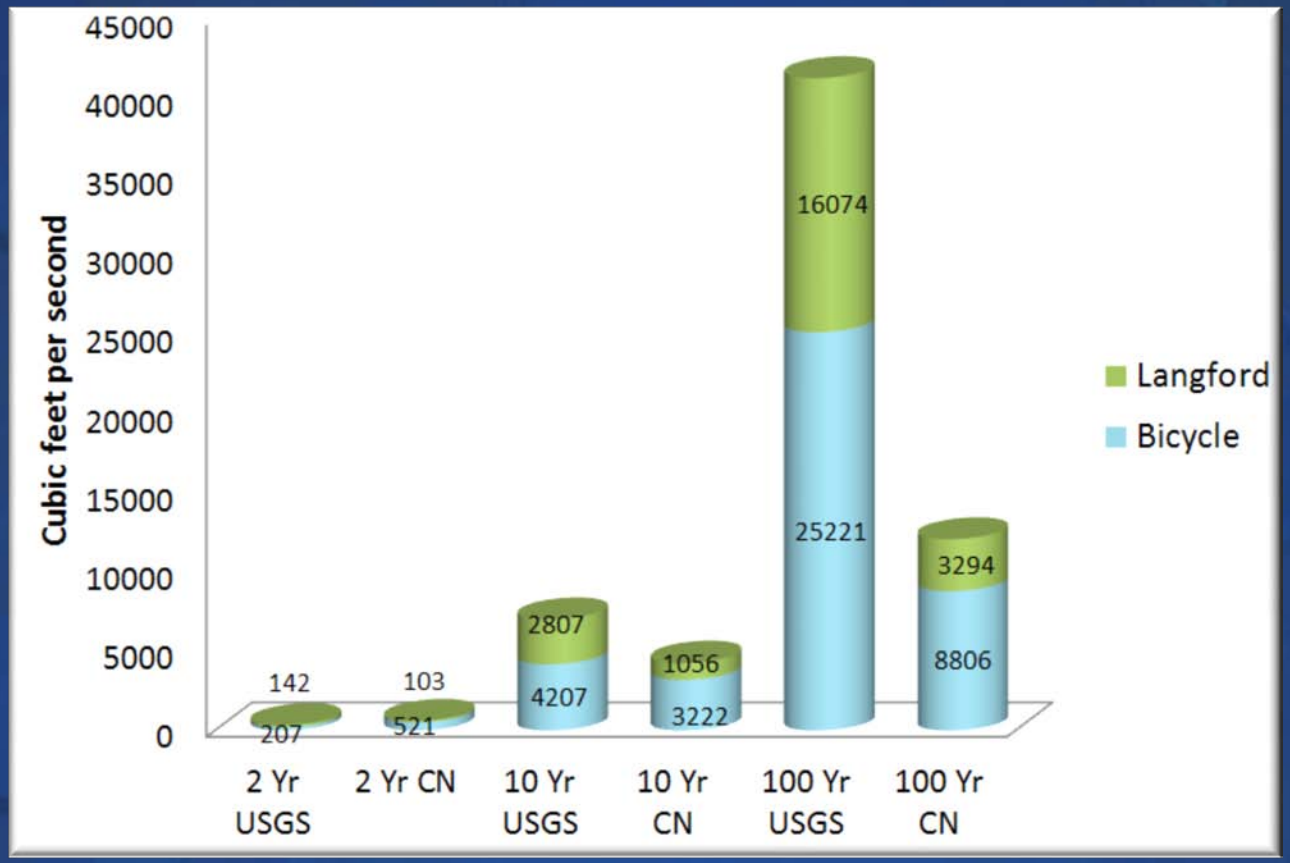
Runoff

Slope

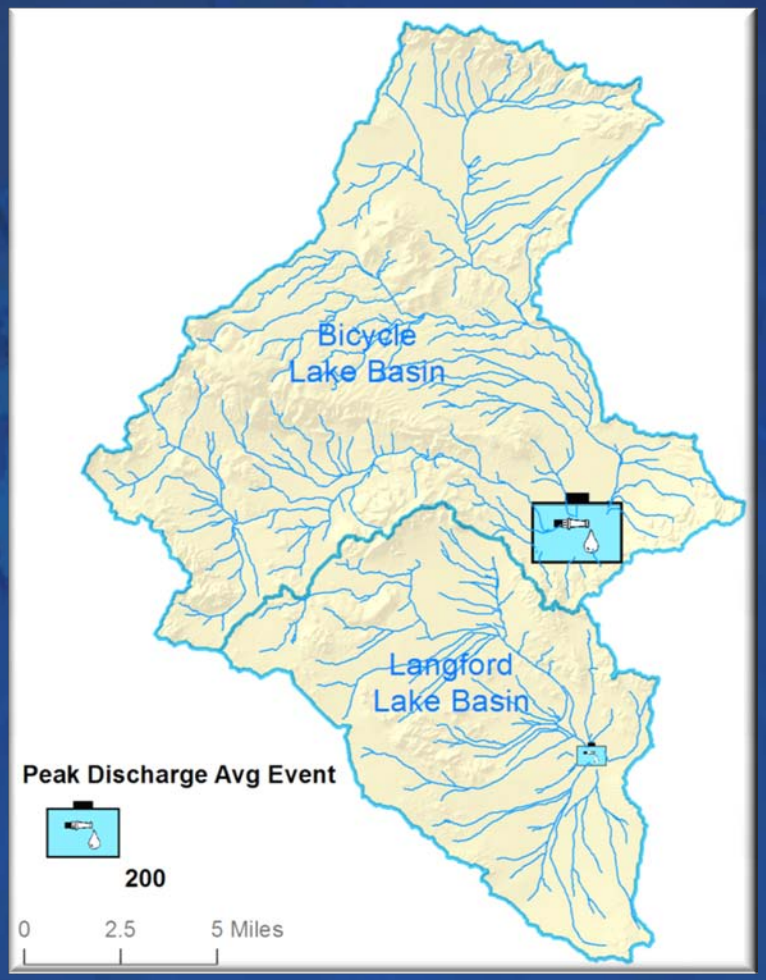
Suitability Analysis

Candidate Sites

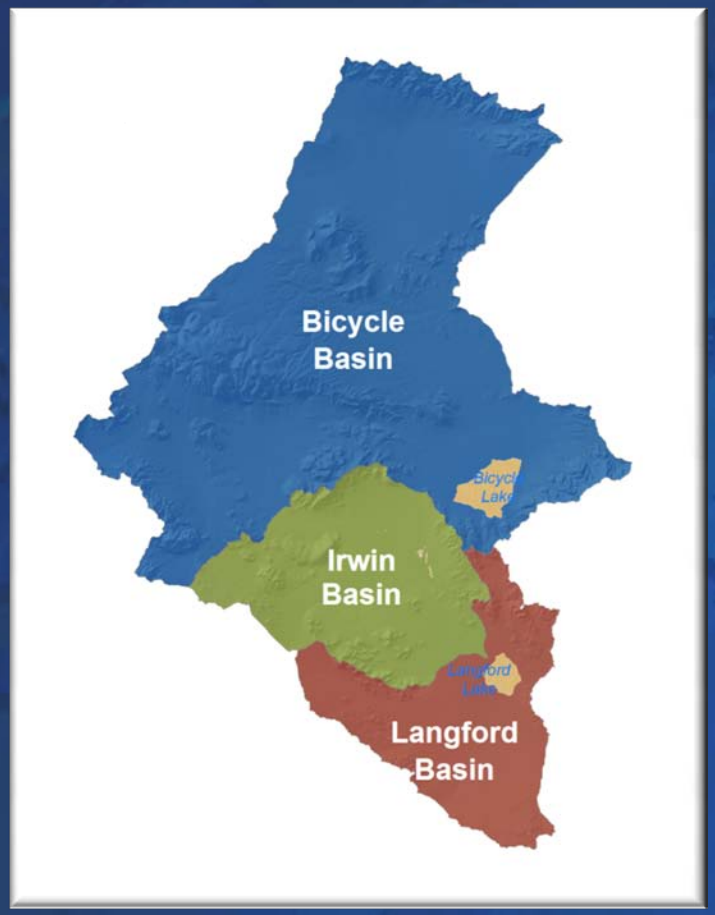
Peak Discharge Results

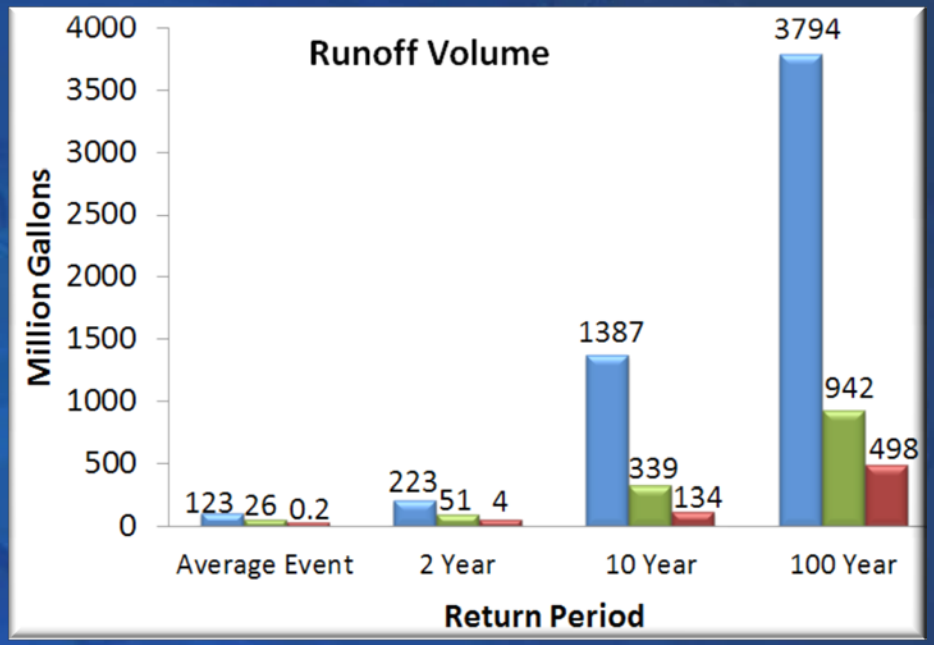


Peak Discharge Results

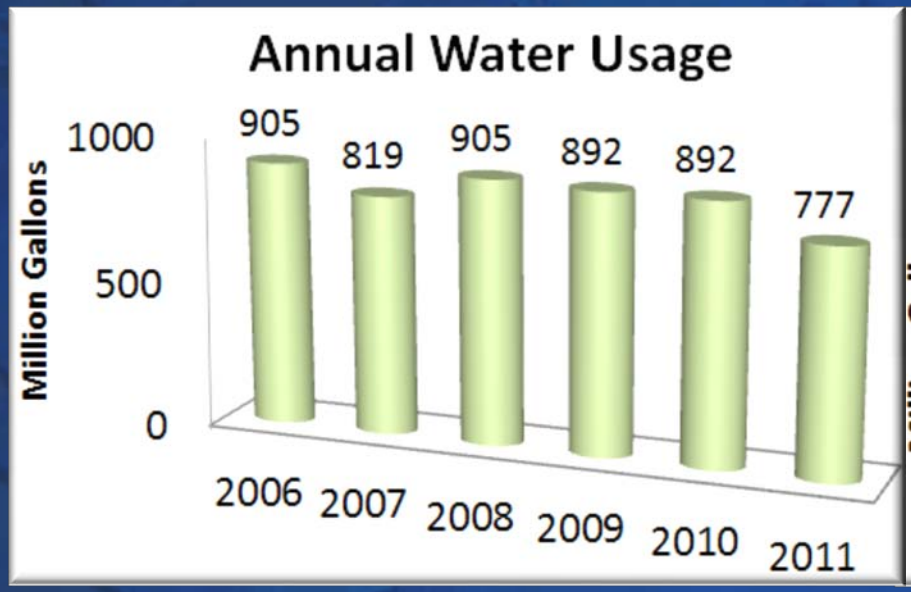


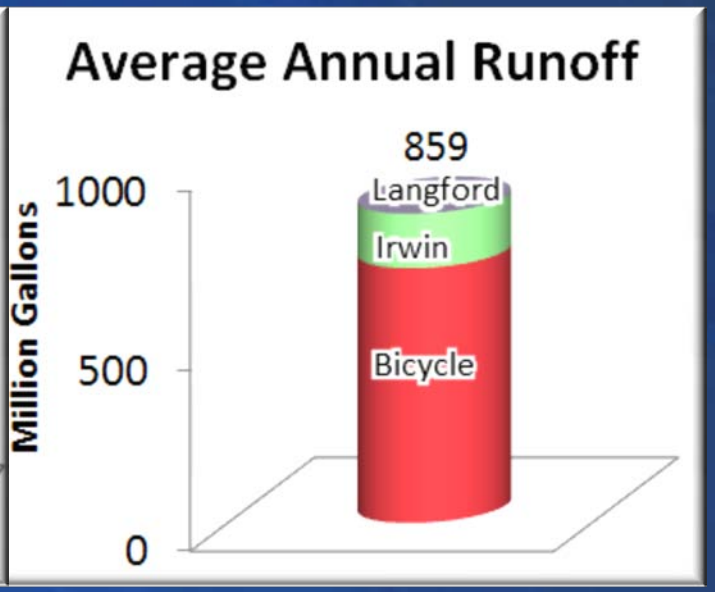
Runoff Volume for Rain Events



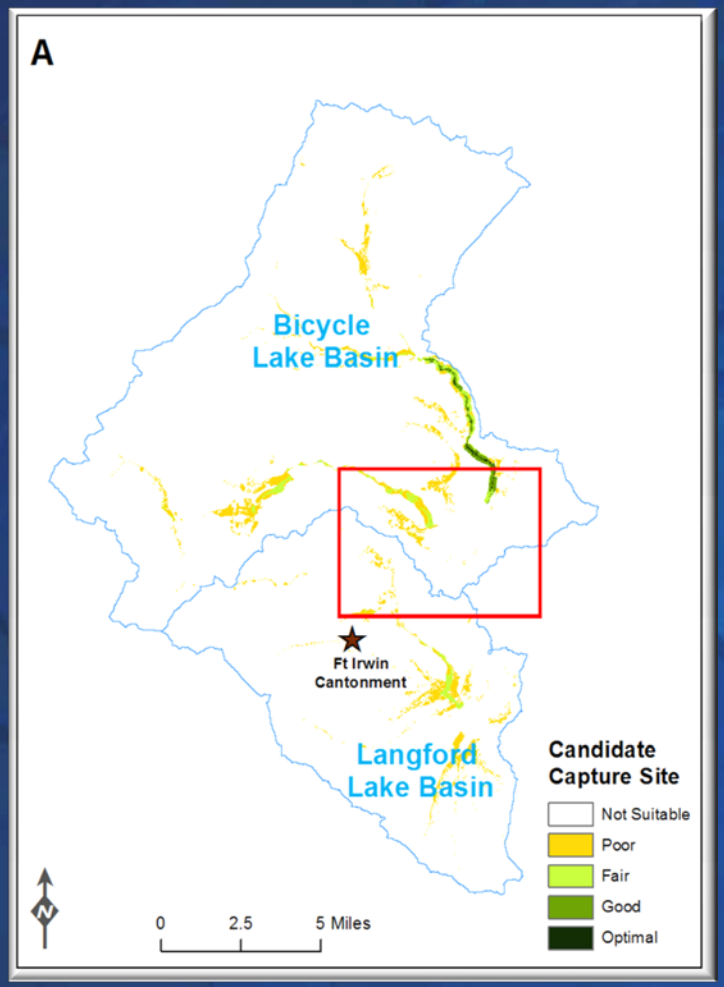


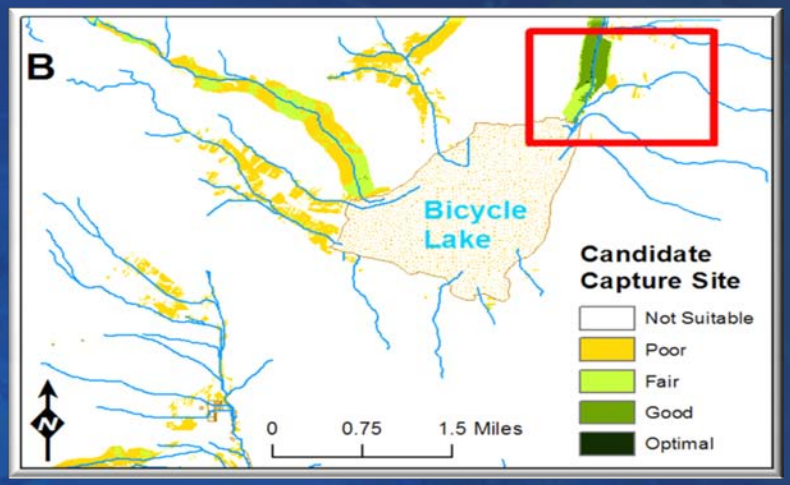
Annual Demand and Runoff Volume

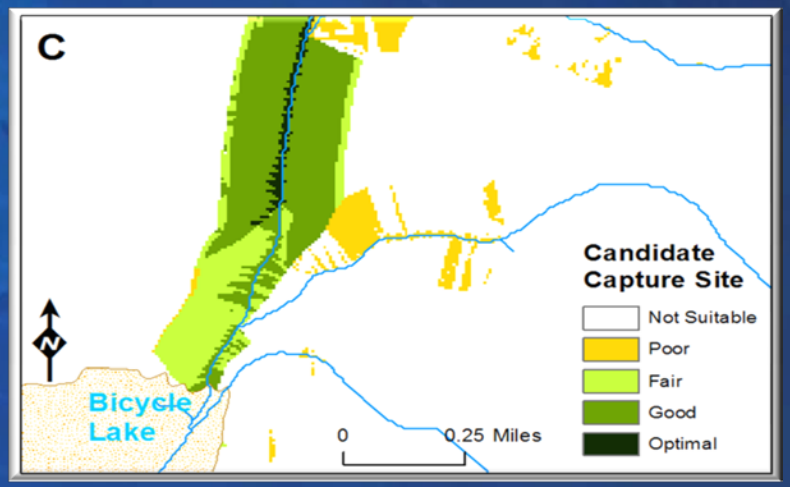




Candidate Site Analysis







Conclusion

- Volume of runoff is enough to make water capture feasible at Fort Irwin

- Recharge efforts should be concentrated on Bicycle basin

Thank you

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