

Talavera Floodplain Delineation Study Technical Review

Noah's Ark Group Study
Las Cruces, New Mexico
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Scope of Analysis

- Review URS Floodplain Study
 - Identify Technical Errors
 - Assess Reasonability of Floodplain Maps
 - Evaluate Engineering Methodologies
- Prepare Report
- Present Results



Summary of Findings

- There Are Serious Technical Flaws
 - Hydrologic Modeling
 - Hydraulic Modeling
 - Adherence to FEMA Guidelines
 - Floodplain Maps
- **Conclusion: Floodplain delineation should NOT have been approved**



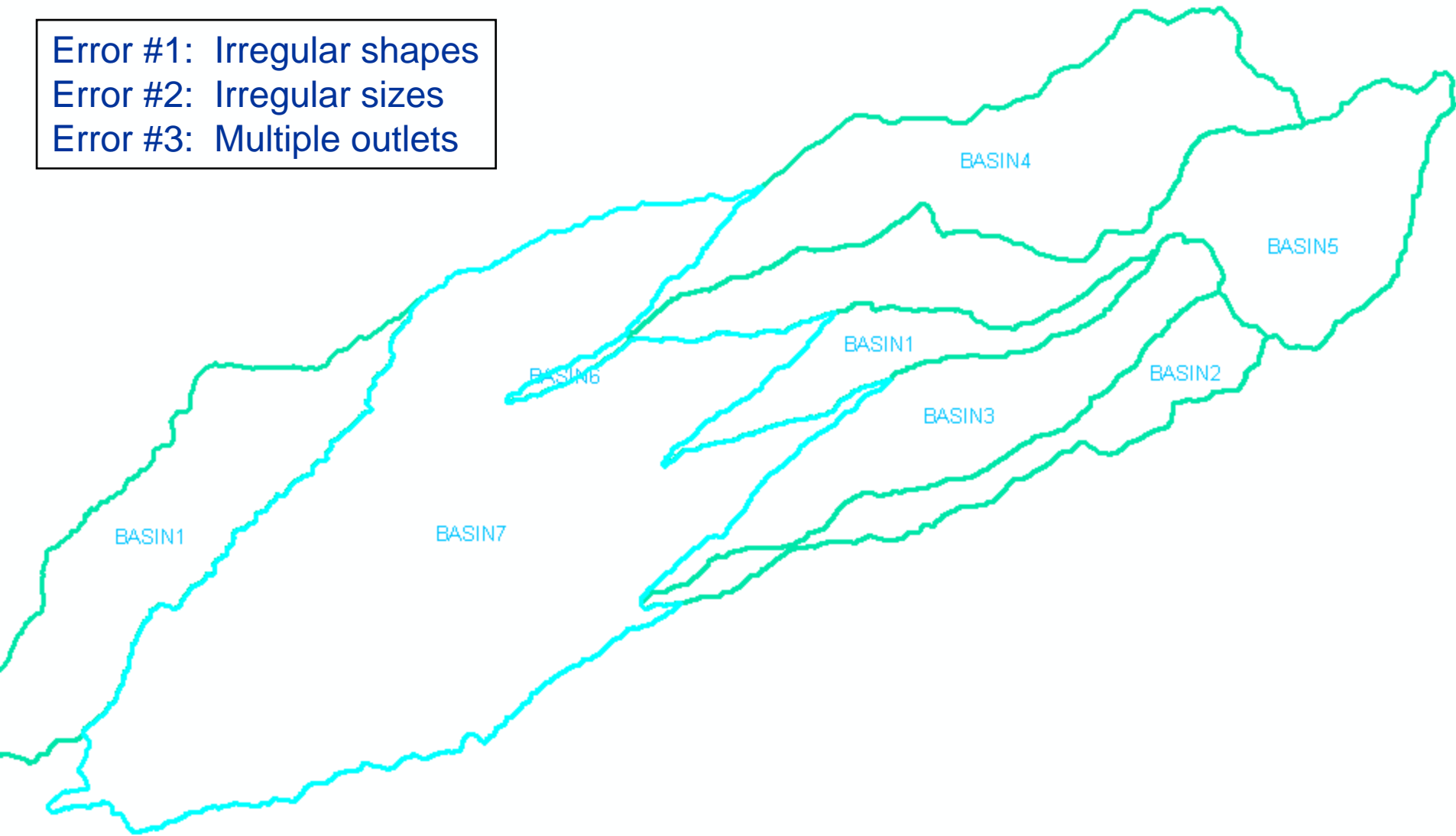
Technical Flaws: Hydrology

- Subbasin Delineation
 - Boundaries
 - Shape
 - Size
- Hydrograph
 - Regression Equation => Peak Only
 - Hydrograph Used vs. Modeled
- Discharge Inflow Points

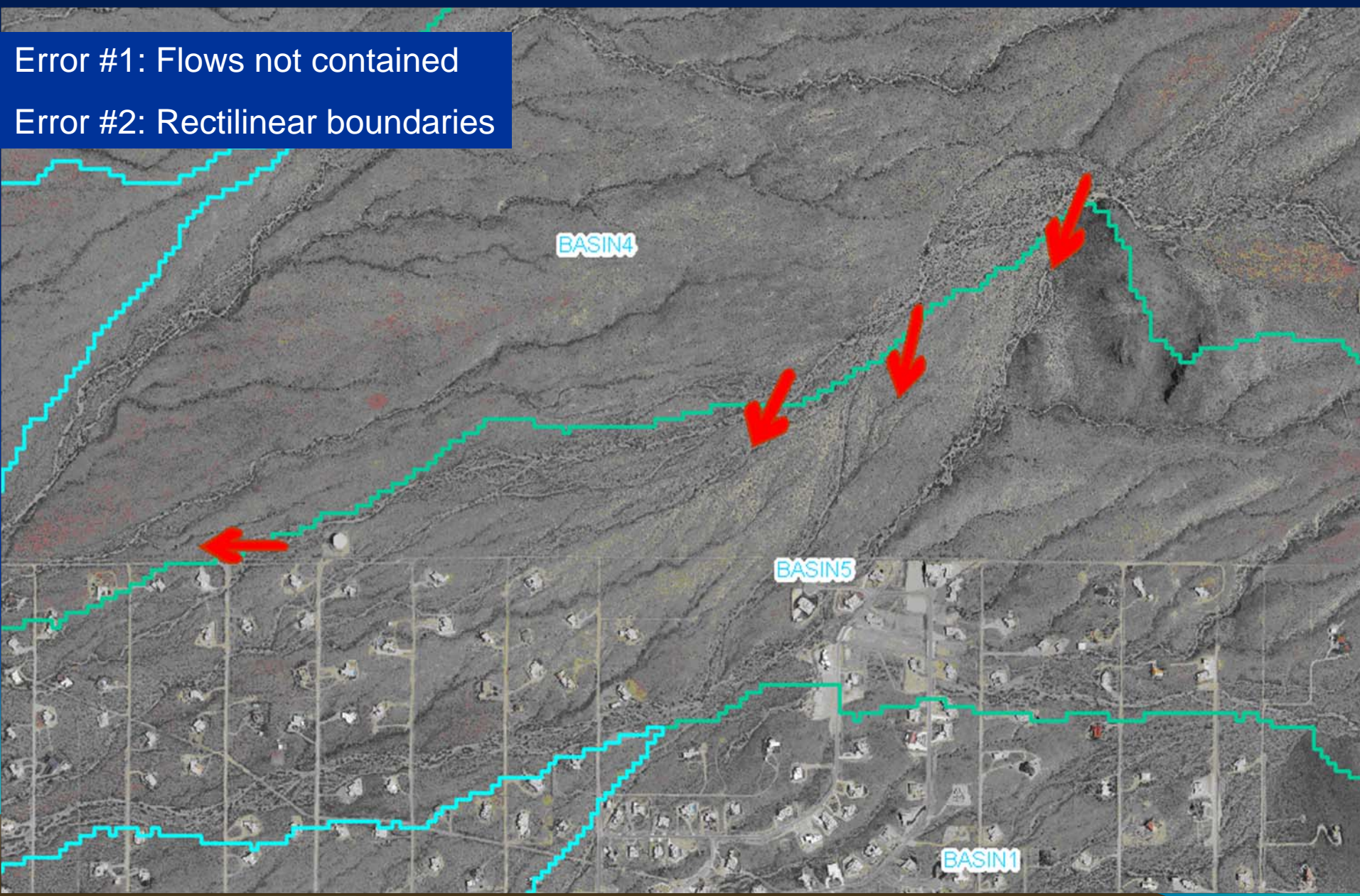


Hydrology: Subbasin Delineation

Error #1: Irregular shapes
Error #2: Irregular sizes
Error #3: Multiple outlets

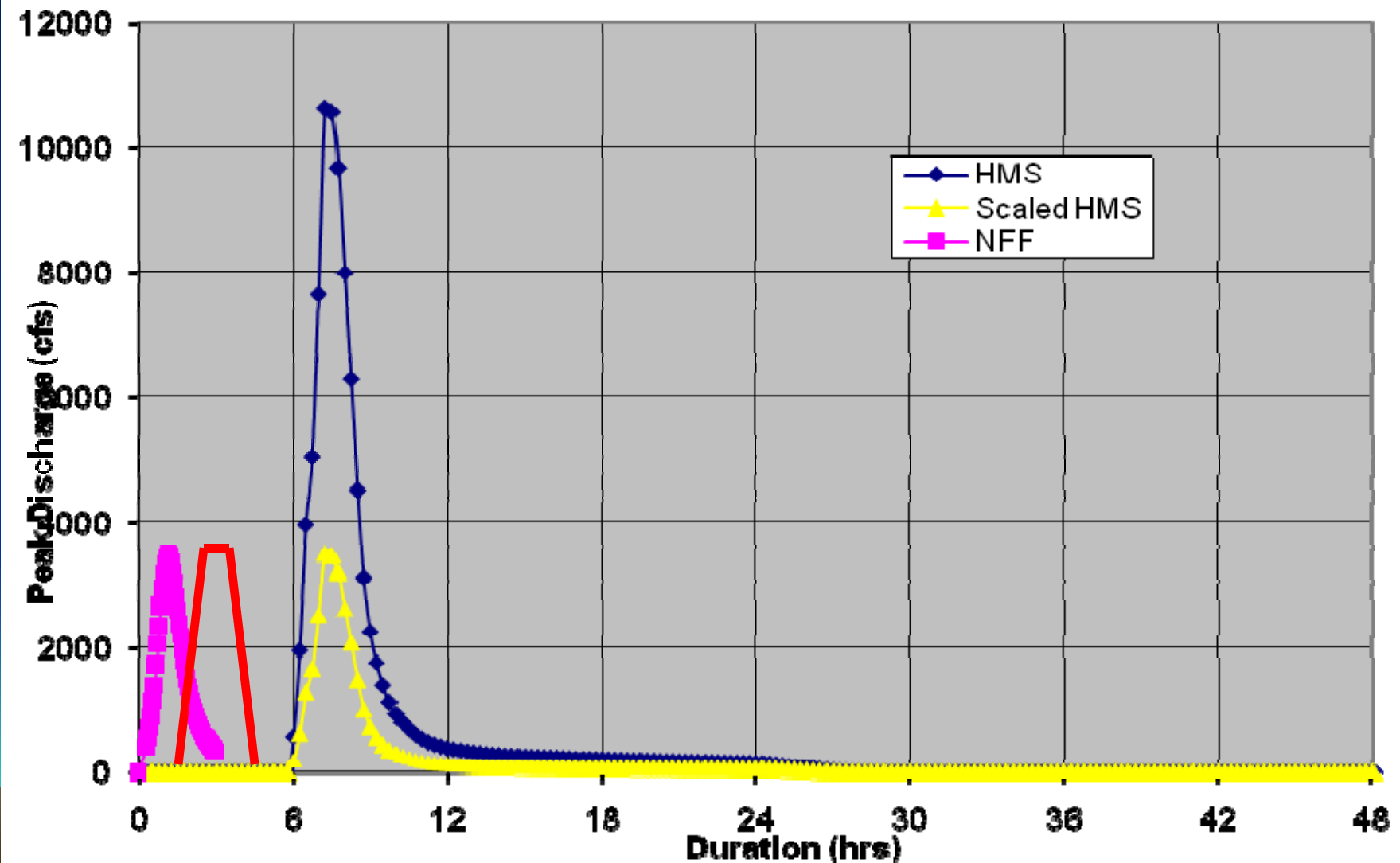


Hydrology: Subbasin Delineation

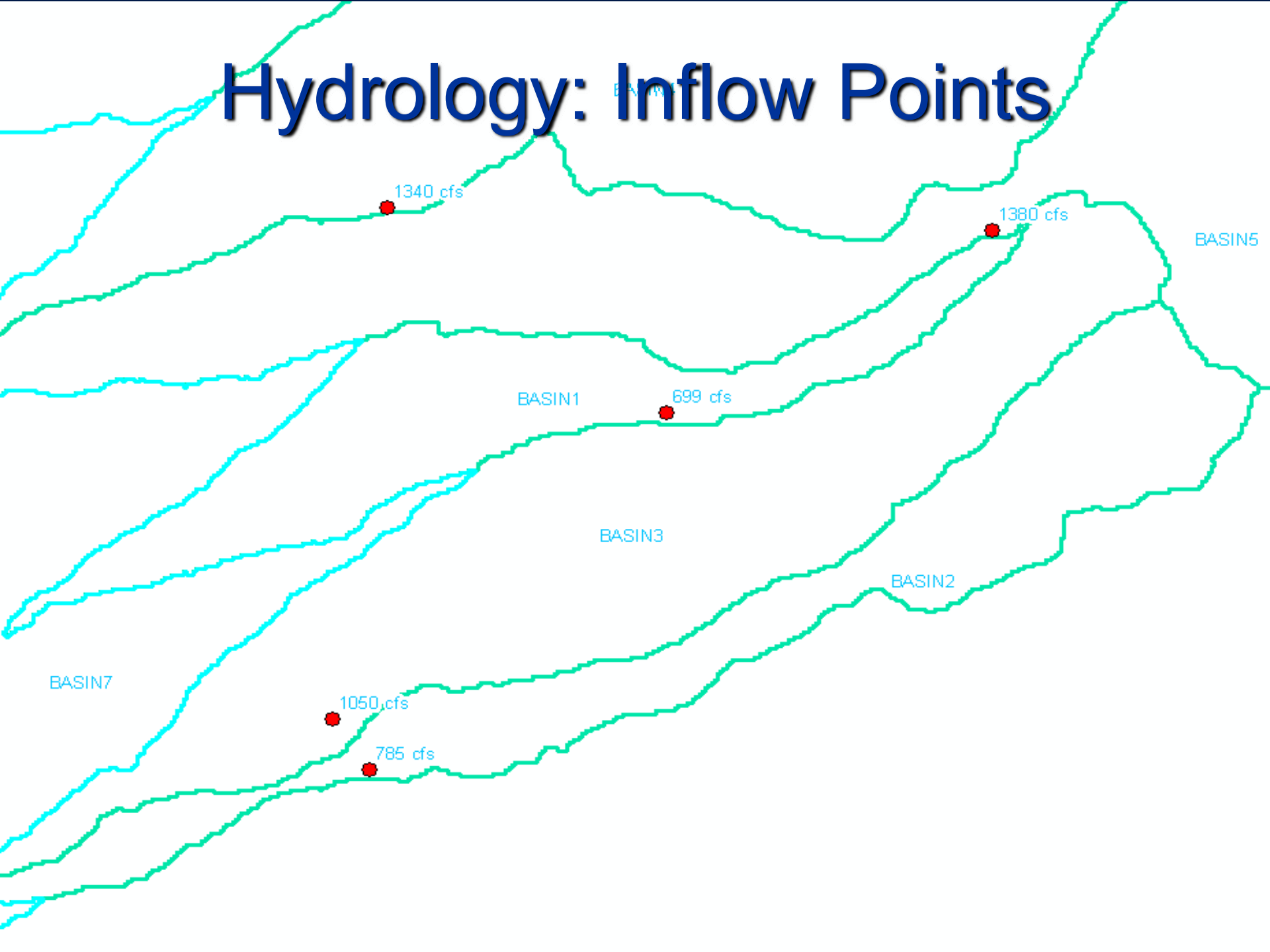


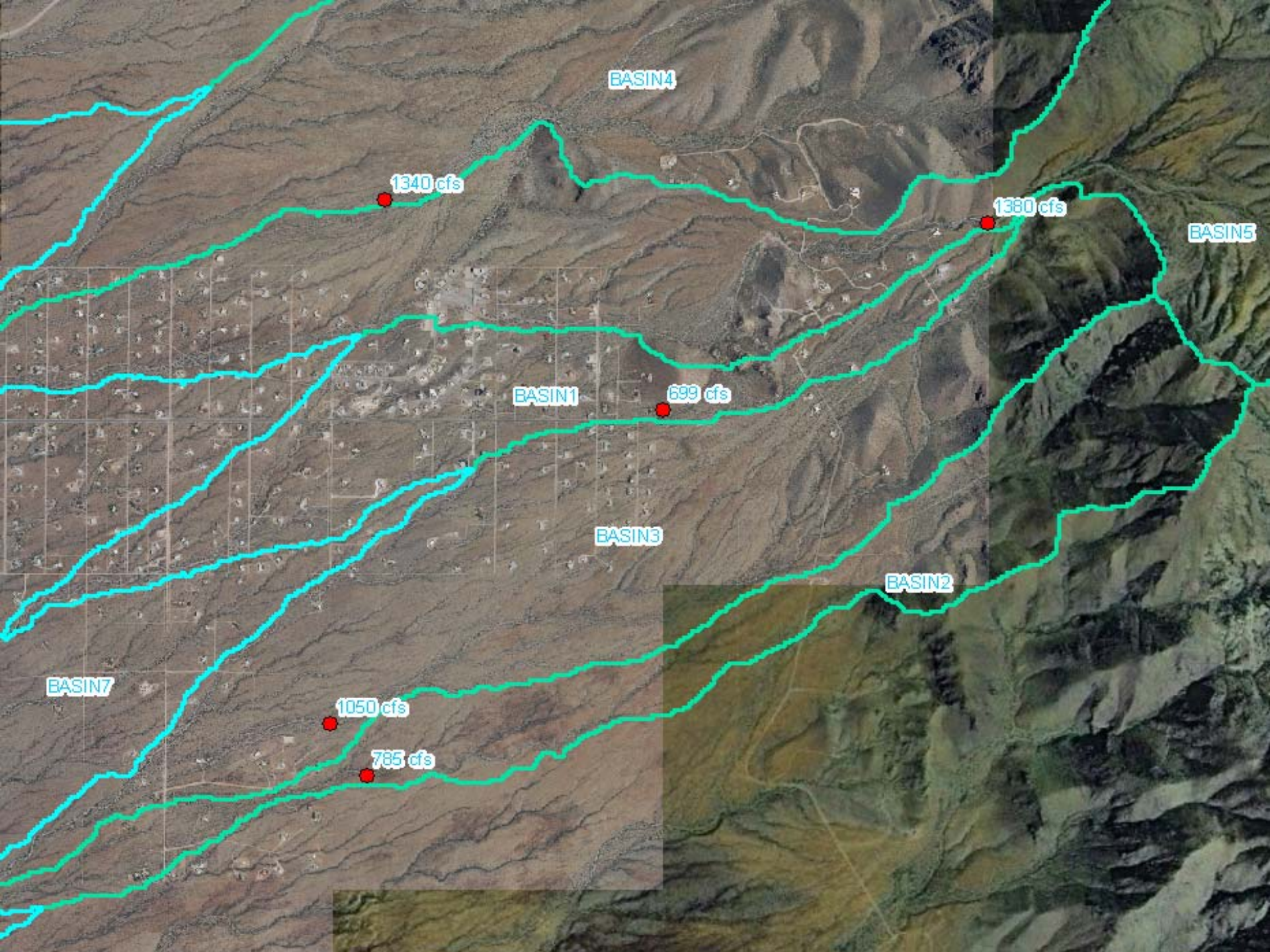
Hydrology: Hydrograph Shape

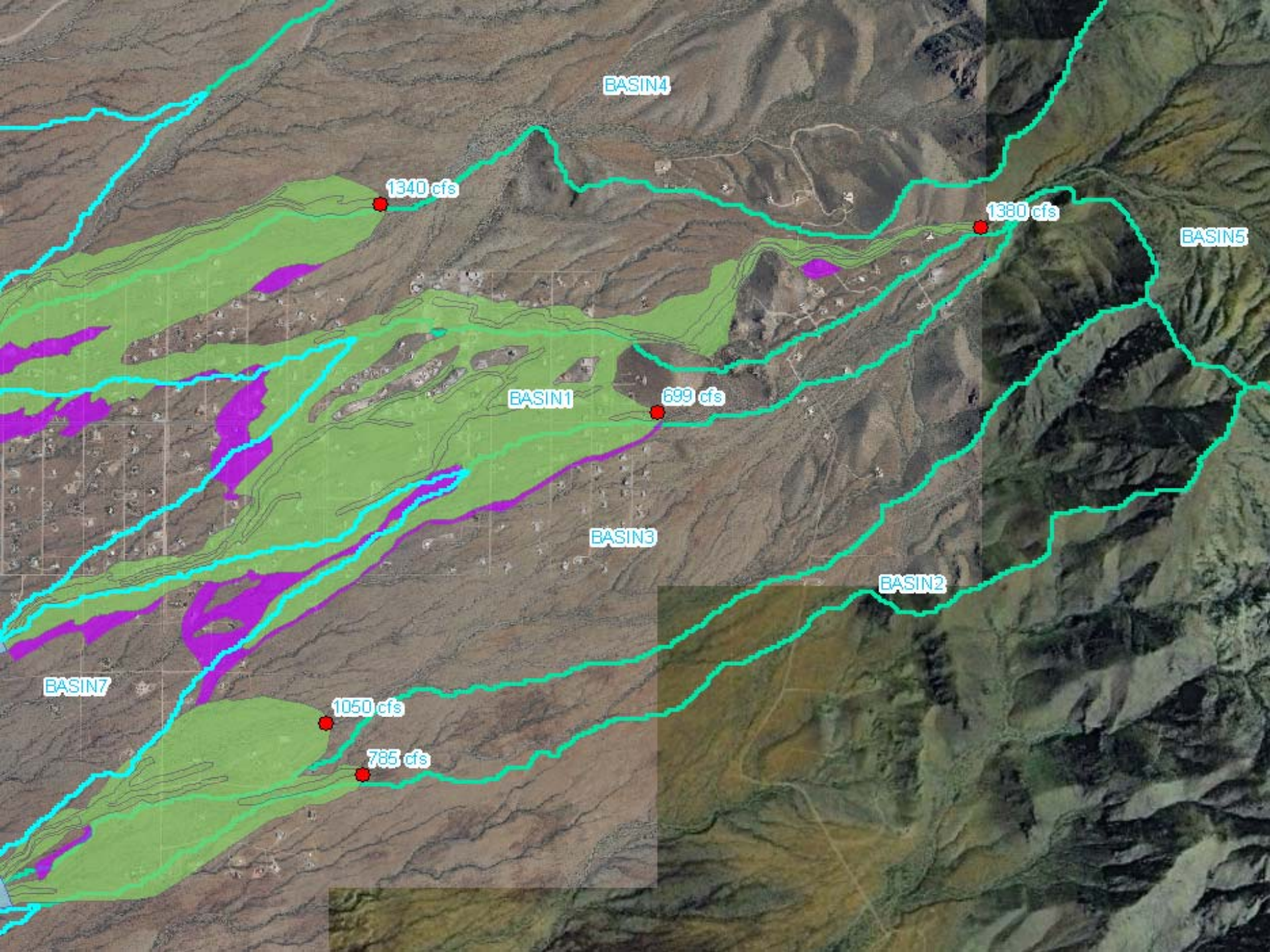
Watershed Hydrograph Comparison for Fillmore Arroyo



Hydrology: Inflow Points

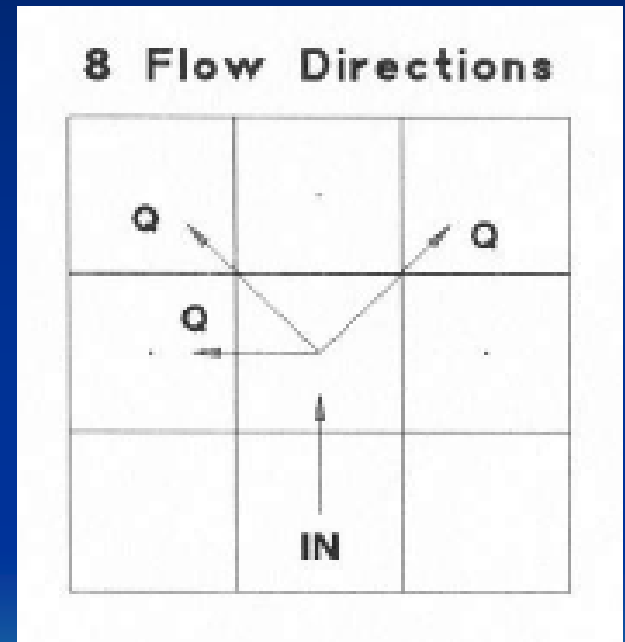




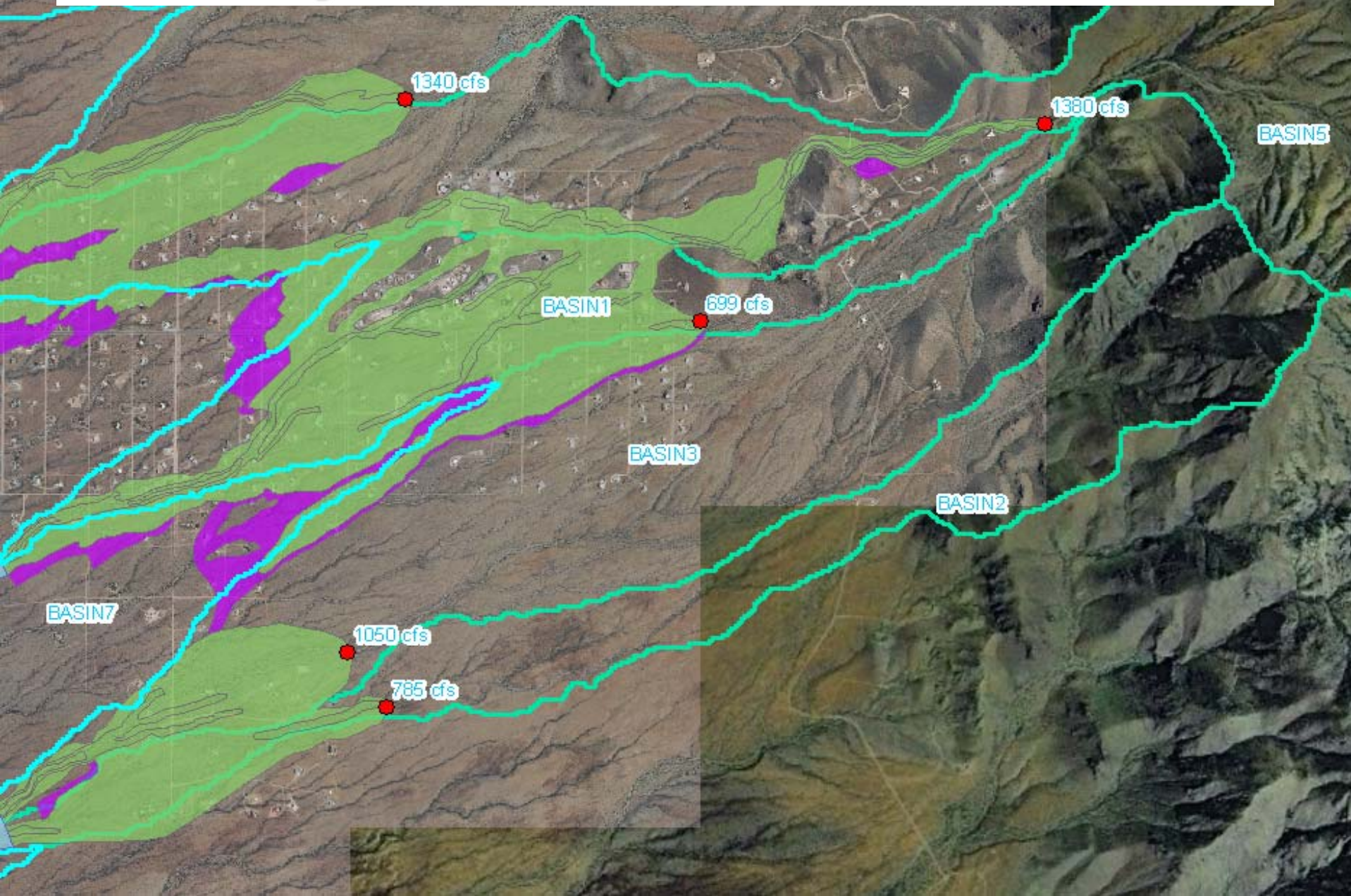


Technical Flaws: Hydraulics

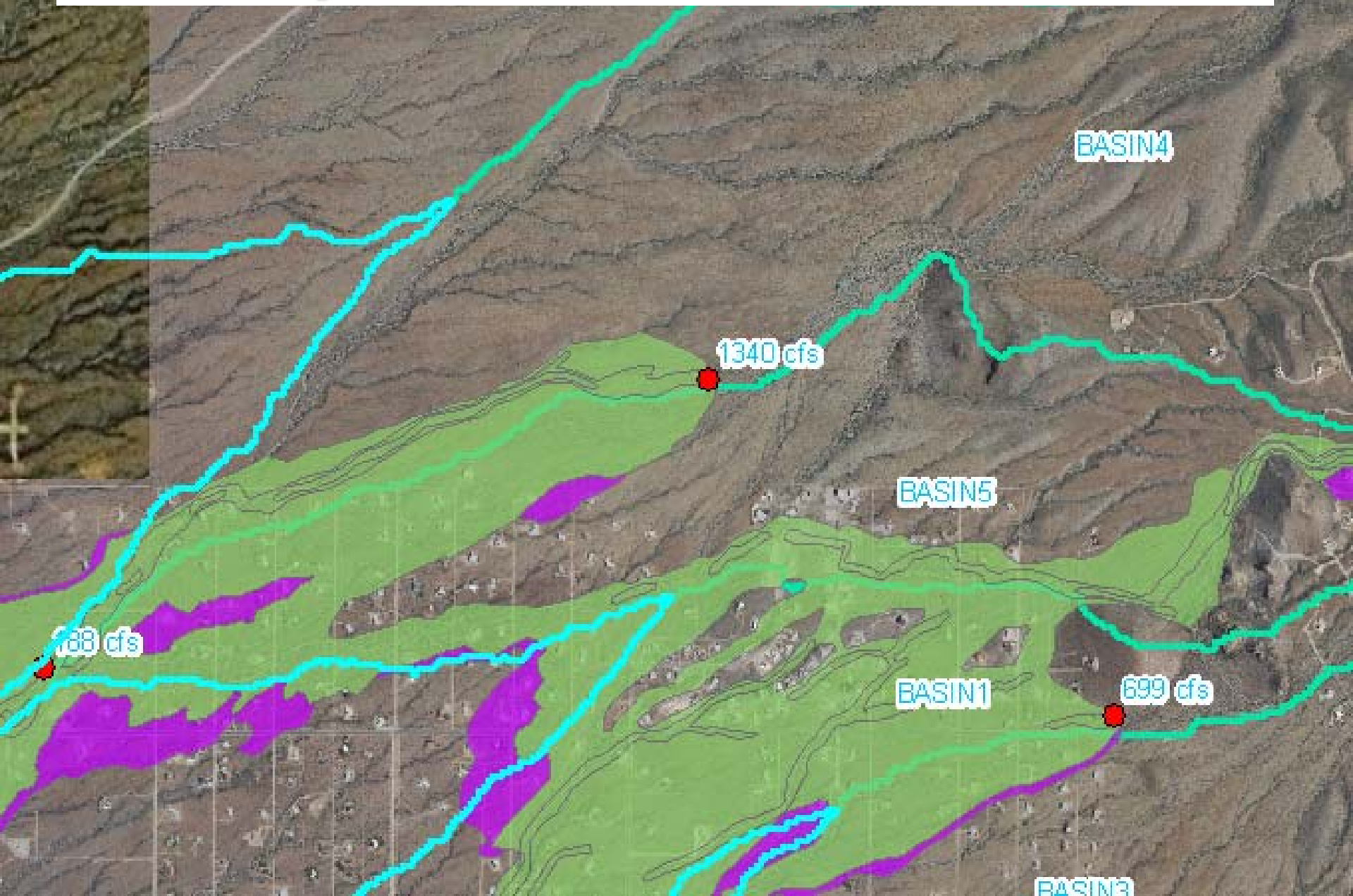
- FLO2D
 - Two-Dimensional Computer Model
 - Grid Based
 - State-of-the-Art
- Flaws in Application:
 - Hydrograph Shape
 - Discharge Inflow Points
 - Infiltration
 - Grid Size
 - Flow Channels Missed



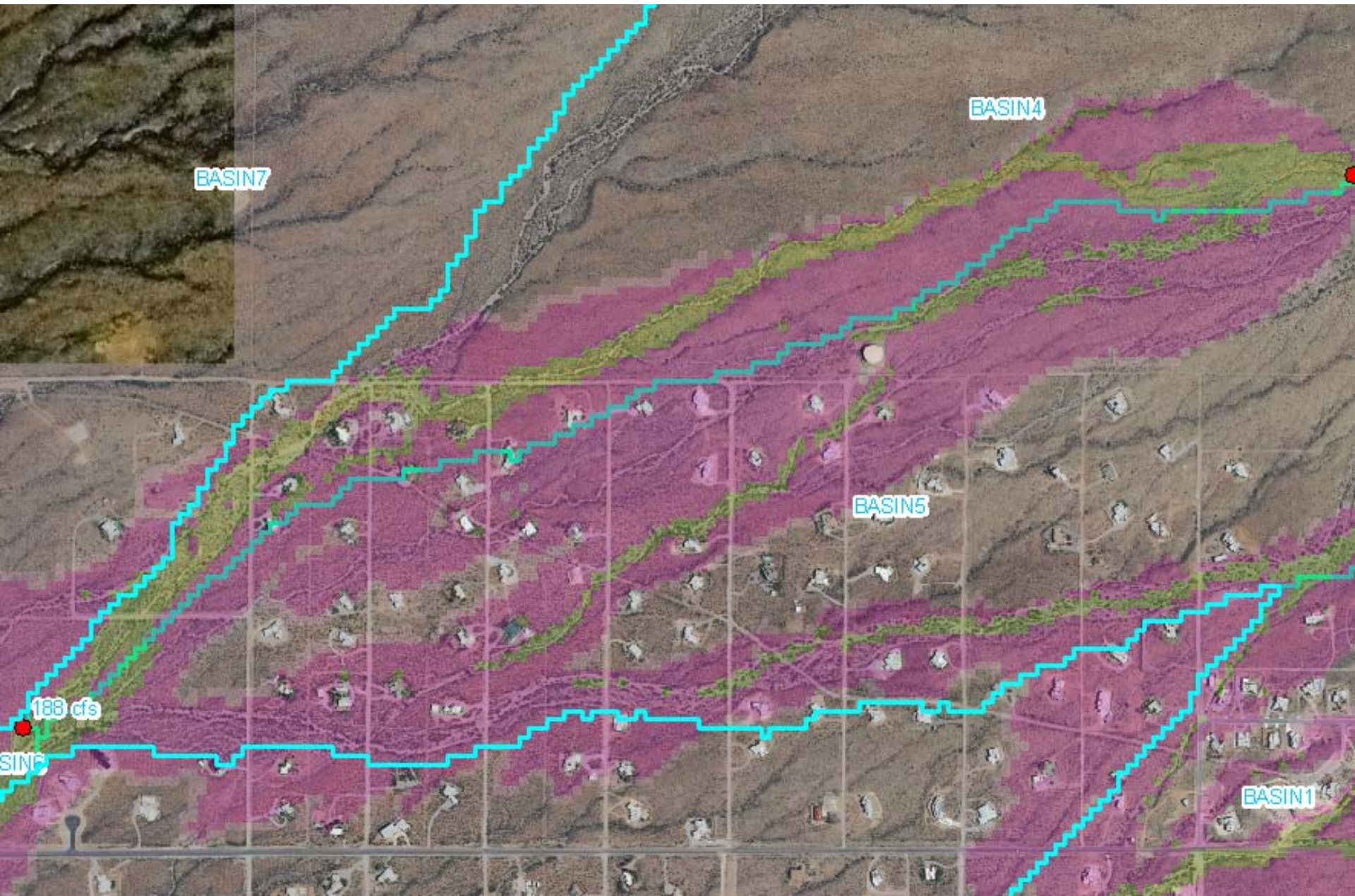
Hydraulics: Inflow Points



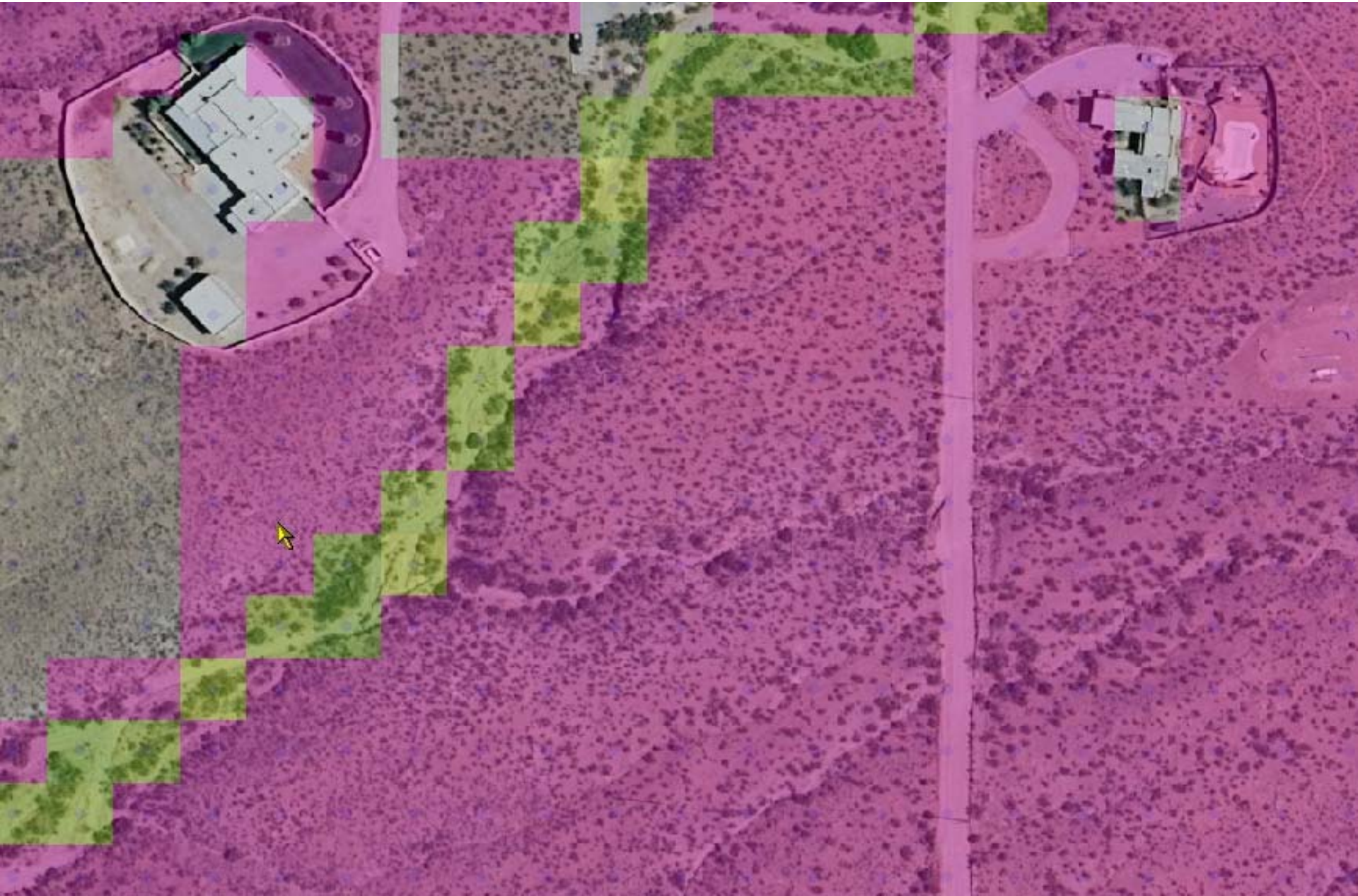
Hydraulics: Inflow Points



Hydraulics: Inflow Points



Hydraulics: Grid Size (50 ft)



FEMA Guidelines

- FEMA Guidelines Appendix G
 - Three Stage Methodology
 - Stage 1: Landform Delineation
 - Stage 2: Stability Assessment
 - Stage 3: 100-Year Floodplain
- Stage 1 & 2 Were Omitted



Floodplain Maps

- Flooding of Upland Surfaces
- No Flooding of Some Channels
- Do The URS Maps Make Sense?



Technical Flaws: Map Results

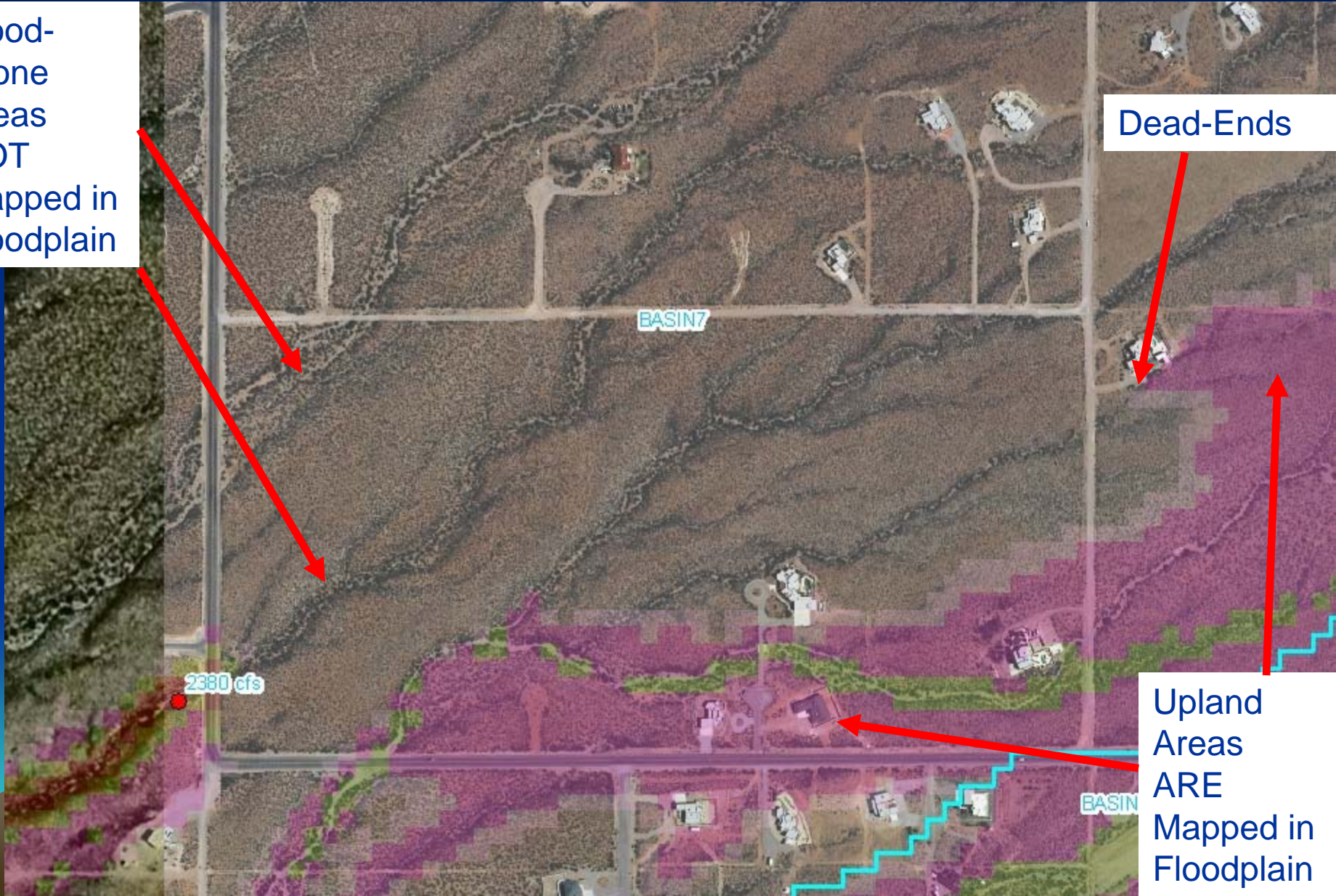
Flood-Prone Areas NOT Mapped in Floodplain

Dead-Ends

BASIN7

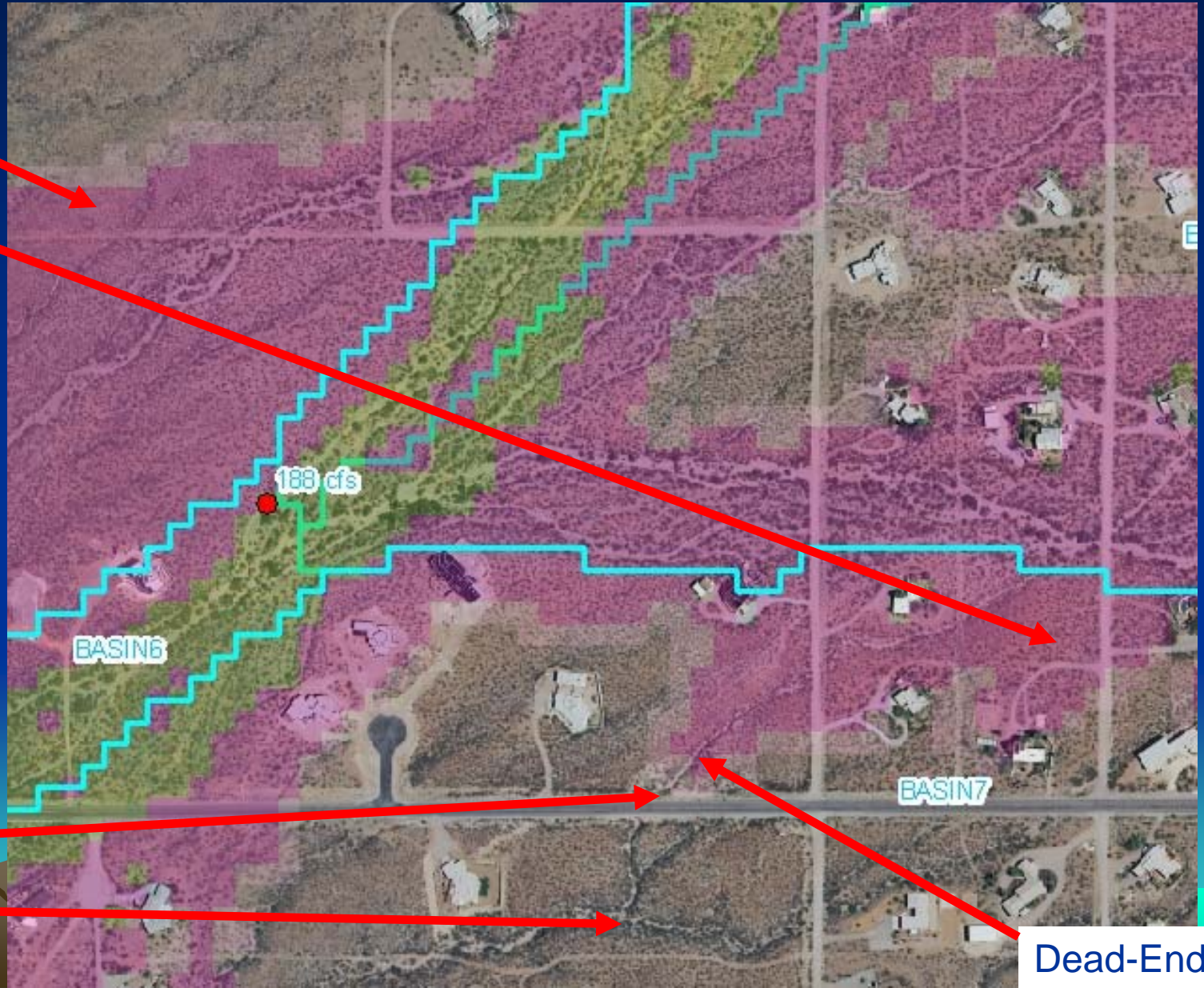
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Upland Areas ARE Mapped in Floodplain



Technical Flaws: Map Results

Upland
Areas
ARE
Mapped in
Floodplain



Flood-
Prone
Areas
NOT
Mapped in
Floodplain

Dead-Ends

Conclusions

- Serious Technical Errors in URS Study
- Floodplain Delineation is Flawed
- Floodplains in Talavera



Where to Go From Here?

- Live With Existing, Flawed Study
 - Flood Insurance Required
 - Hazard Mis-Indentification
 - New Homes vs. Existing Homes
- Revise Floodplain Delineation
 - Cost of New Delineation (~ \$95,000)
 - FEMA Review & Approval
 - Community Approval

