Conservation Planning & GeoDesign: Coupling Connectivity Models & 3-D Design

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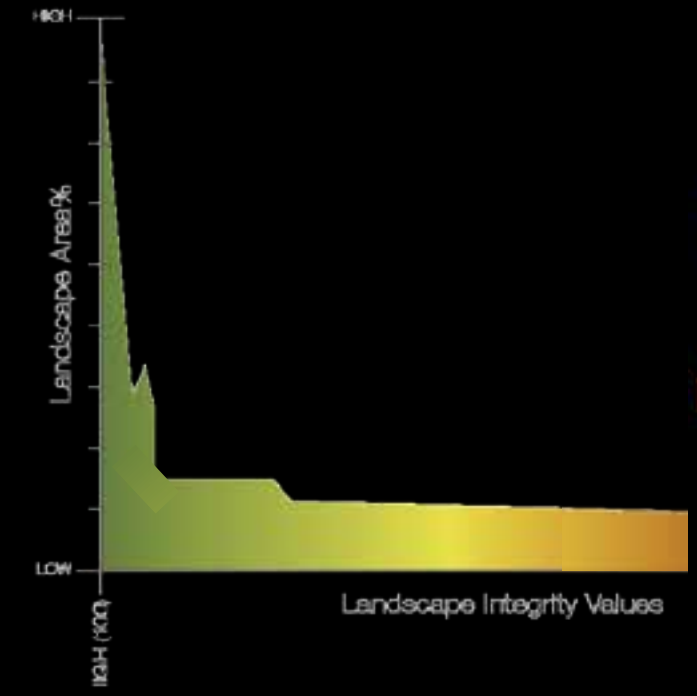
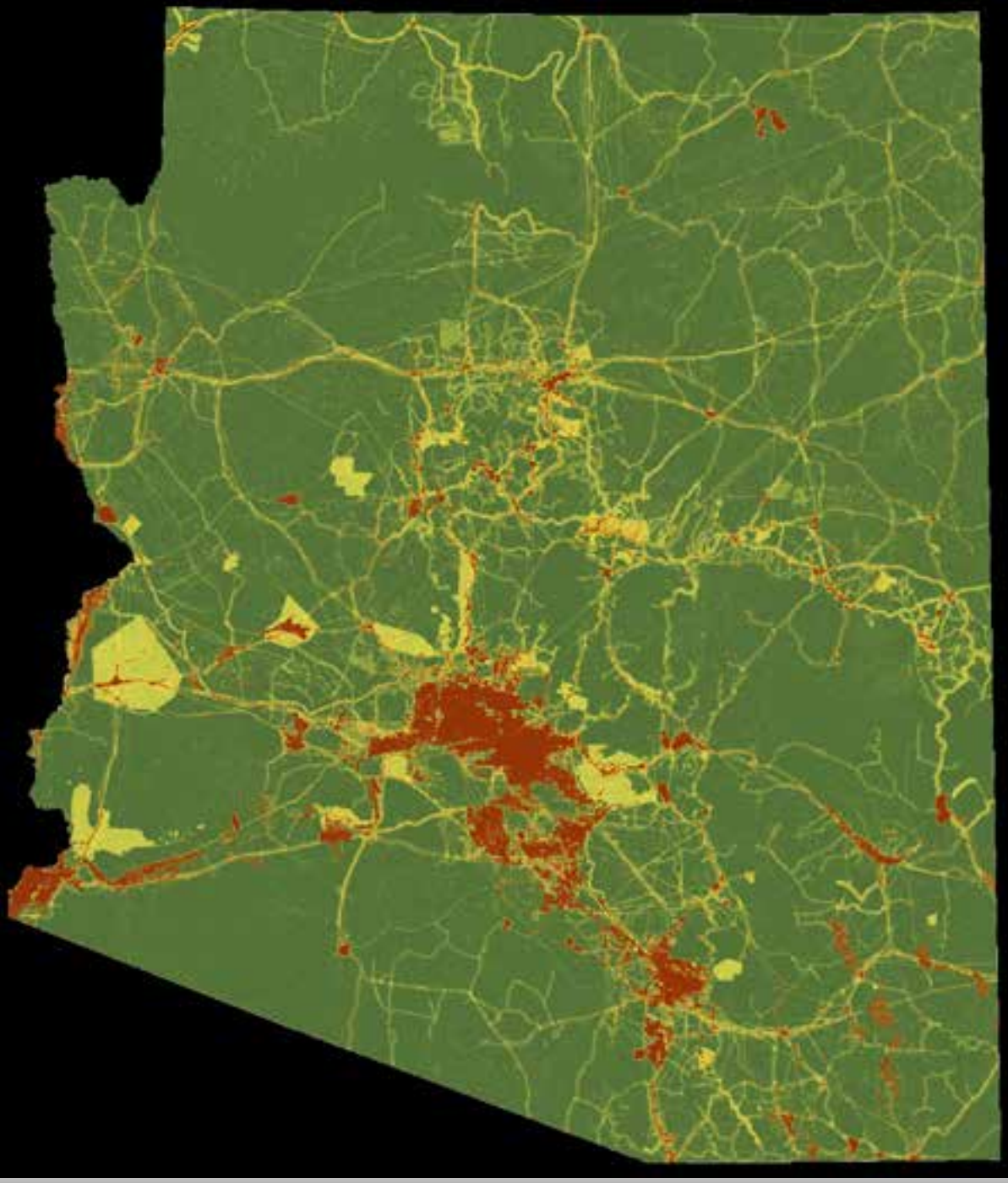
Arizona's Landscape Integrity





Arizona's Last of the Wild

LANDSCAPE BLOCKS
(LI = 100; >5,000 Ha)

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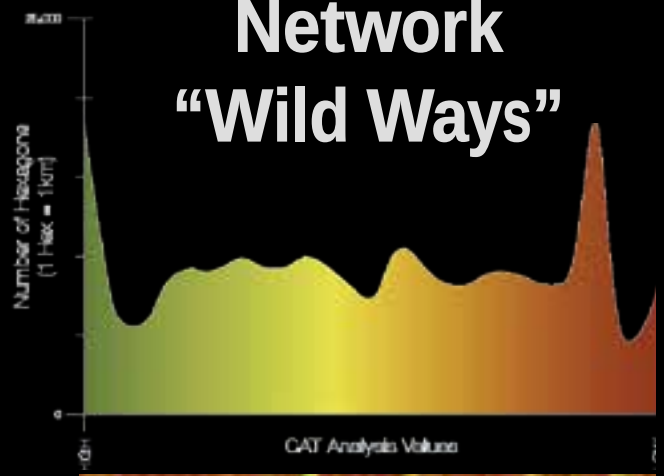
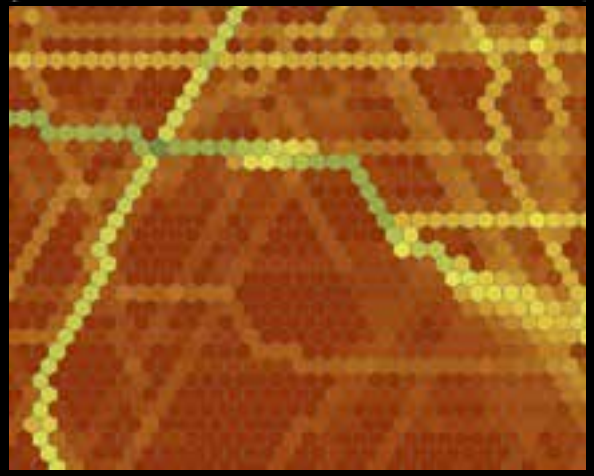
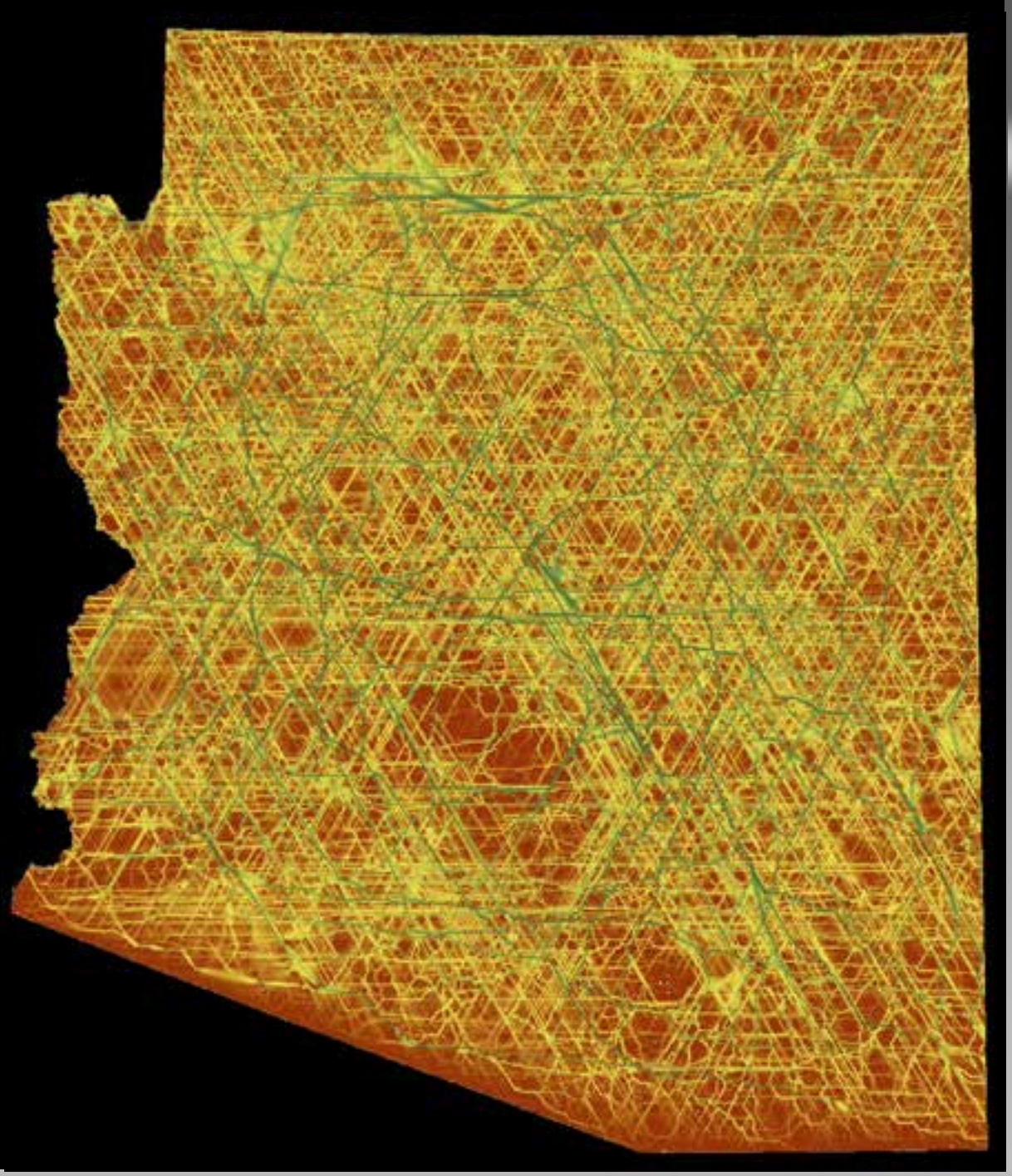
Connectivity Network "Wild Ways"



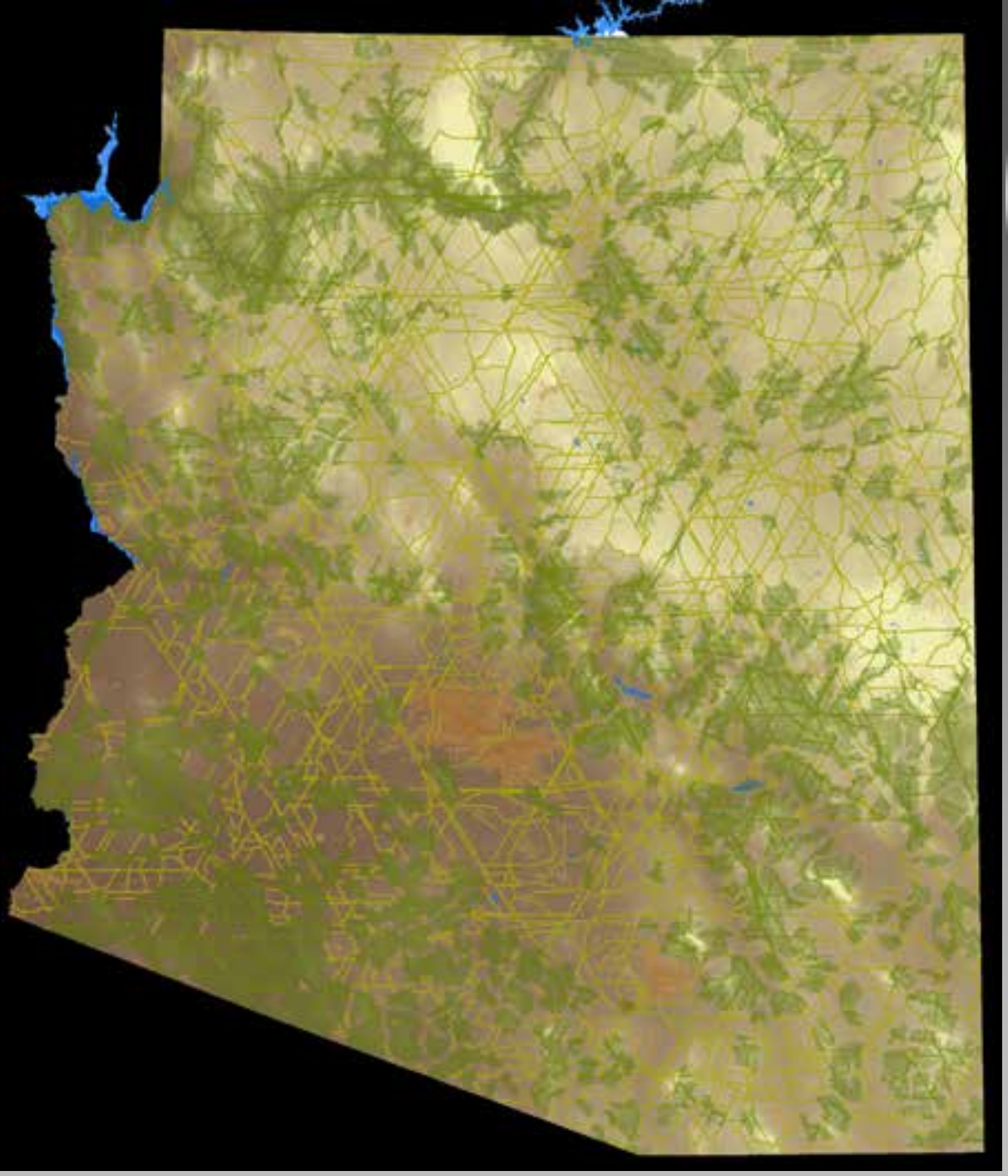




Important Connectivity Zones (ICZs) & Last of the Wild

LANDSCAPE BLOCKS

ICZ NETWORK



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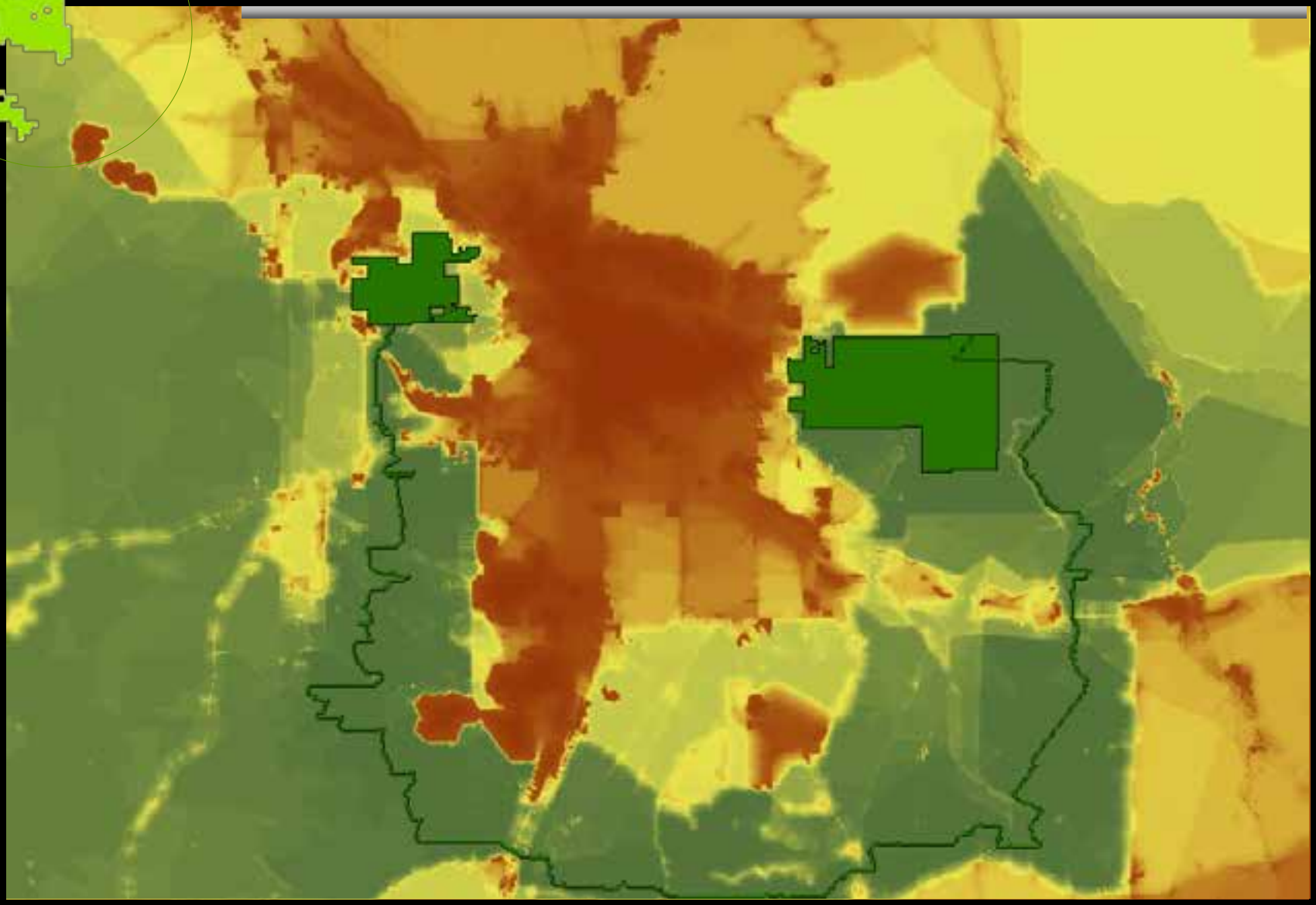
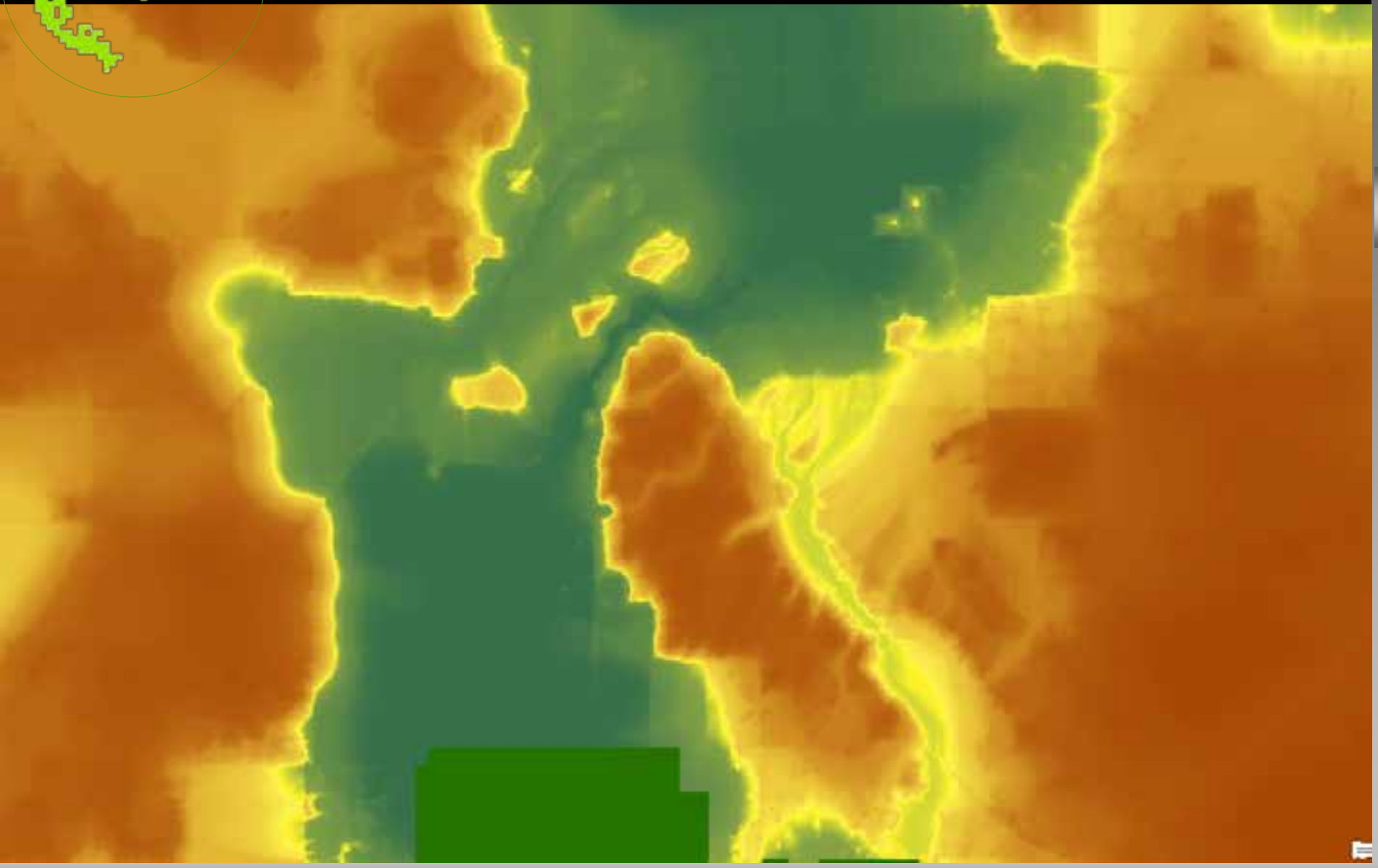
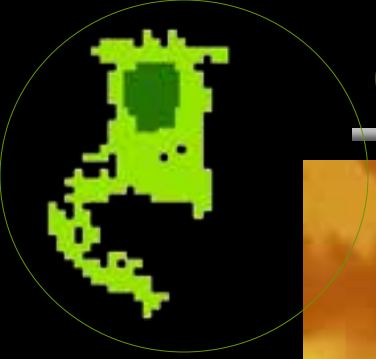
Geodesign: Data Driven Simulation

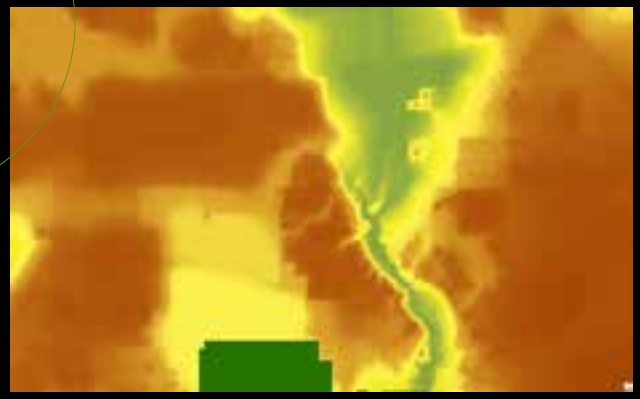


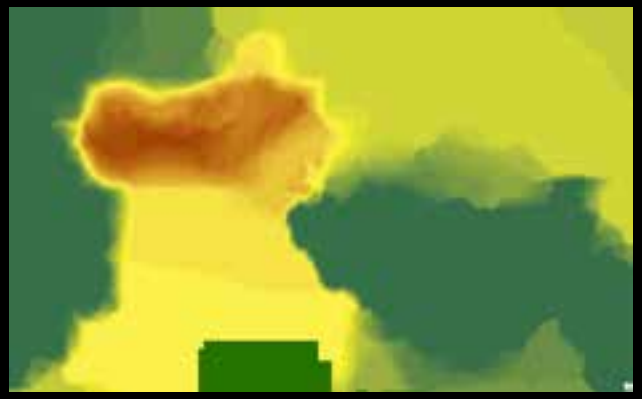
Geodesign: Data Driven Simulation

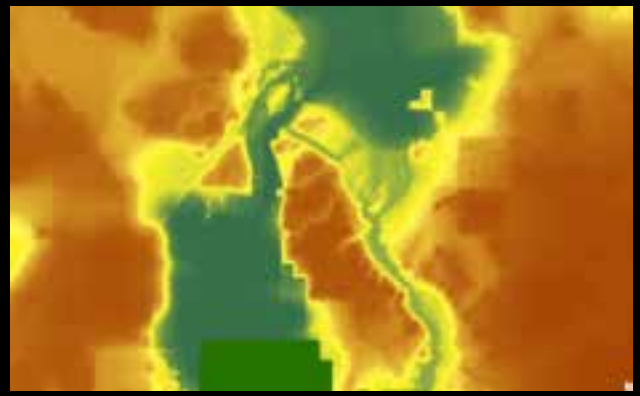


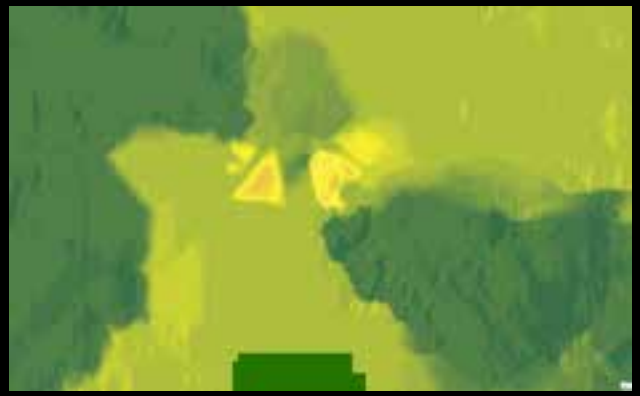
Geodesign: Scenario Evaluation

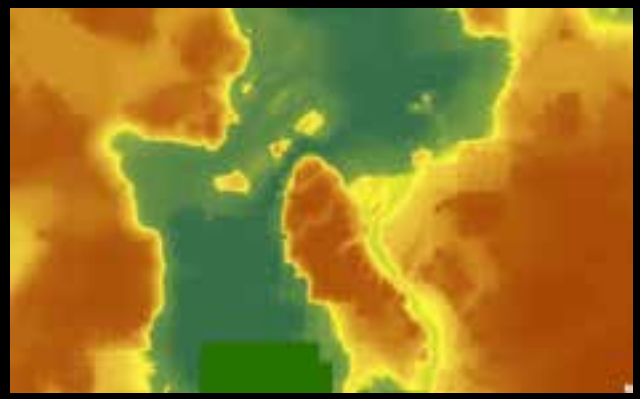


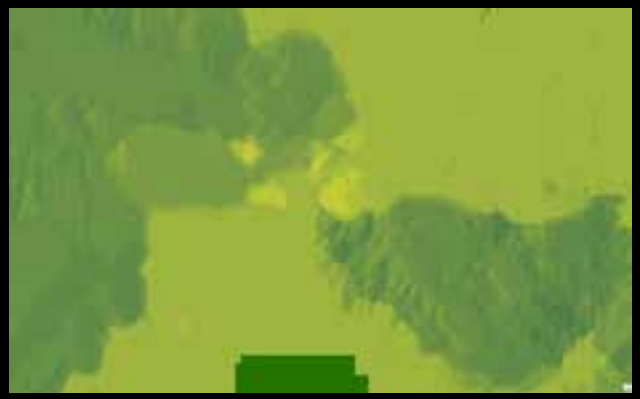












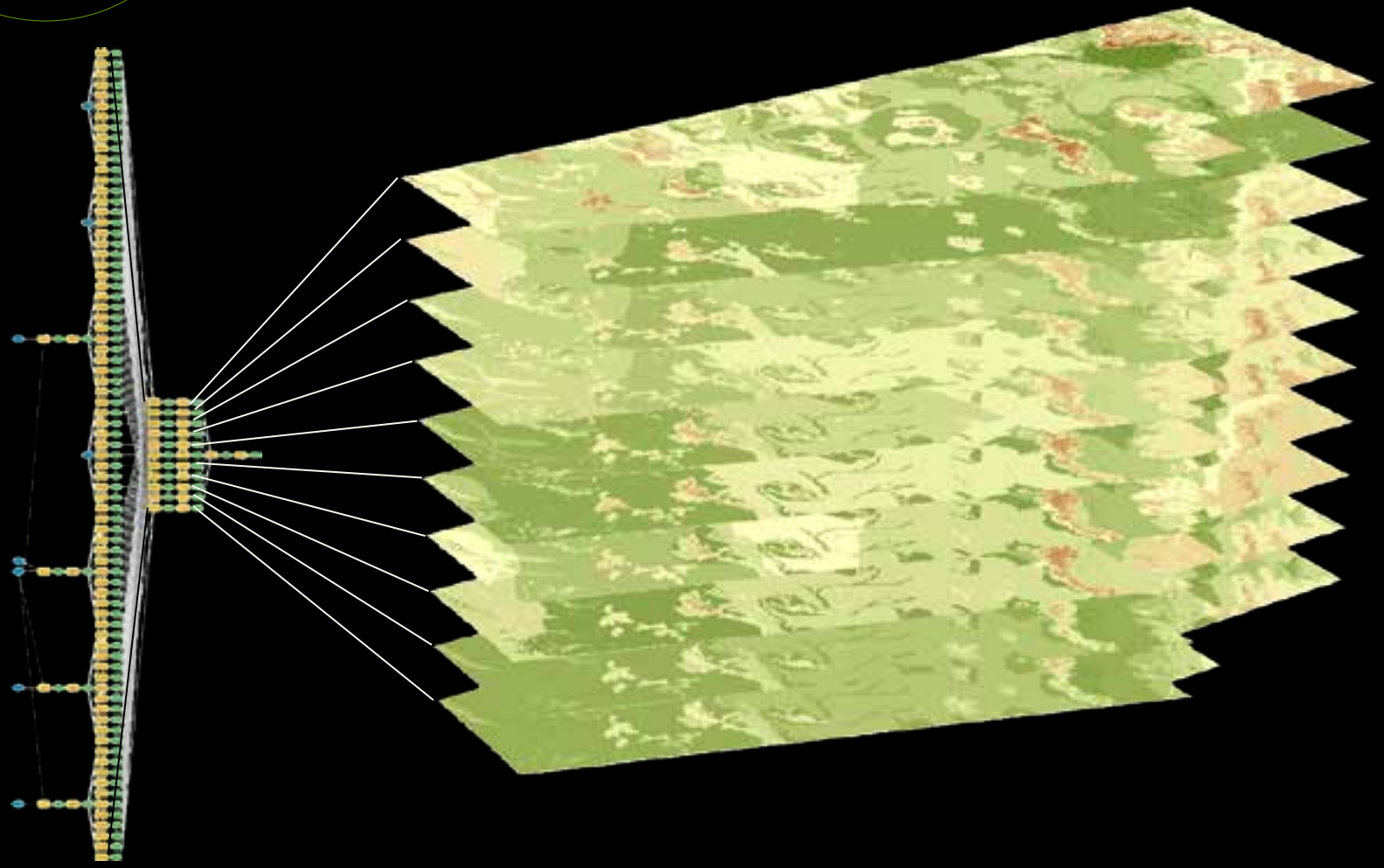
What About Vegetation Design?

Native Vegetation Library

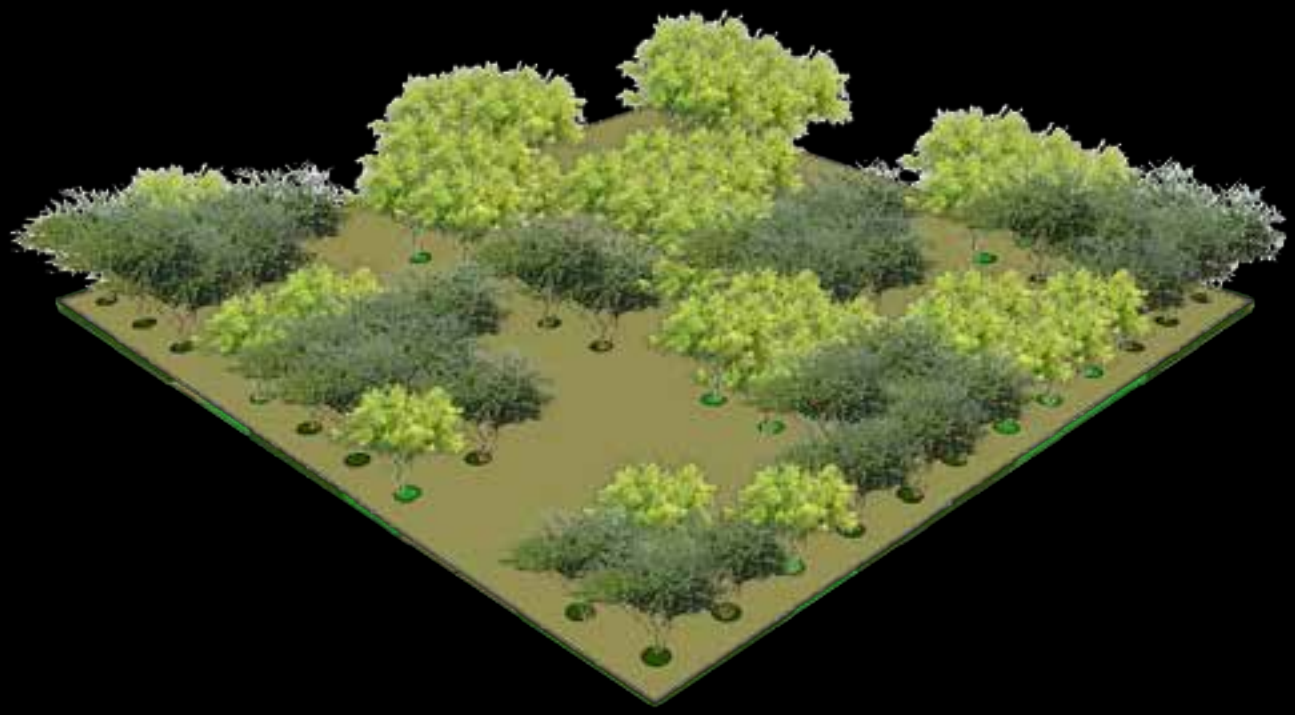
Species: Blue Palo Verde, *Parkinsonia florida*
Size: 15’
Elevation: 0 – 4,000’
Soil: Well drained, alkaline
Aspect: Full sun
Slope: Bottomland
Hydrology: Drought Tolerant, prefers riparian.
Min Temp: 18f

Common Name	Scientific Name	Size	Elevation	Soil	Aspect	Slope	Hydrology	Temp (threshold)
Trees								
blue palo verde	***Parkinsonia florida***	**15ft**	**0 - 4,000ft**	**well drained, alkaline**	**full sun**	**bottomland**	**drought tollerant, prefers riparian edge habitat**	**18F**
velvet mequite	*Prosopis velutina*	30ft	0 - 4,800ft	well drained, alkaline, deep soil	full sun	all	prefers deep water table	10F
whitethorn acacia	*Acacia constricta*	18ft	0 - 4,500ft	sandy, caliche type, sandy loam, limestone soil	full sun	all	arid	10F
cat claw acacia	*Acacia greggii*	10ft	0 - 5,000ft	sandy, caliche type, sandy loam, limestone soil	full sun	all	arid	0F
ironwood	*Olneya tesota*	30ft	0 - 2,300ft	sandy/gravely soil	full sun	bottomland	arid	20F
Shrubs								
creosote	*Larrea tridentata*	8ft	0 - 4,000ft	sandy, sandy loam, medium loam, caliche type	full sun - part shade	bottomland - med slope	arid	0F
triangleleaf bursage	*Ambrosia deltoidea*	3ft	1,000 - 3,000ft	sandy, sandy loam, alkaline	full sun	all	arid	18F
Cacti								
saguaro	*Carnegiea gigantea*	50ft	0 - 4, 000ft	sandy, sandy loam, alkaline	full sun - part shade. Southern slopes at higher elevation	all	arid	20F
buckhorn cholla	*Cylindropuntia acanthocarpa*	9ft	0 - 3,500ft	sandy, well drained	full sun	all	arid	10F
engelmann prickley pear	*Opuntia engelmannii*	5ft	1,000 - 6,500ft	all	full sun - part shade	all	arid	10F
fishook barrel	*Ferocactus wislizenii*	8ft	0 - 5,000ft	sandy or gravelly	full sun - part shade	all	arid	10f

Landscape Capability Models: Native Vegetation

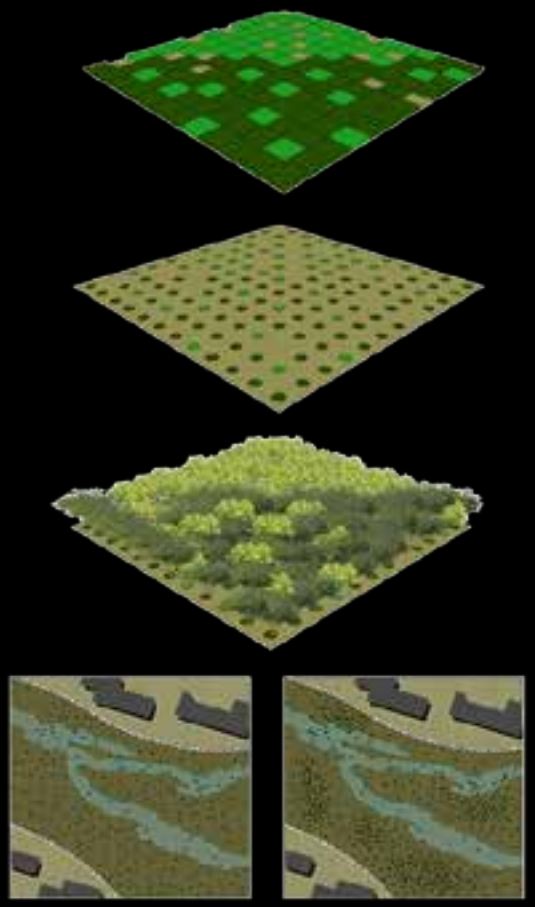


Pattern Generators & Rule-Based Design Filters

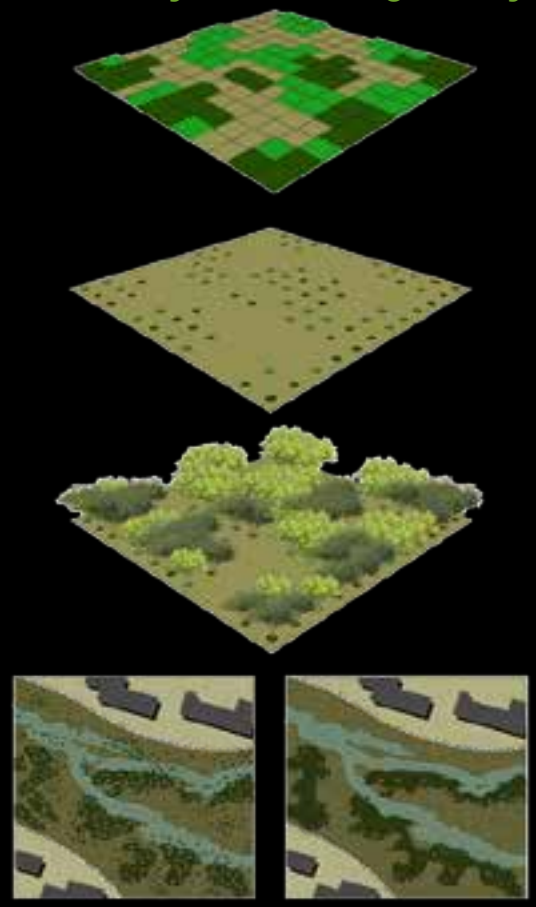


Pattern Generators & Design Filters

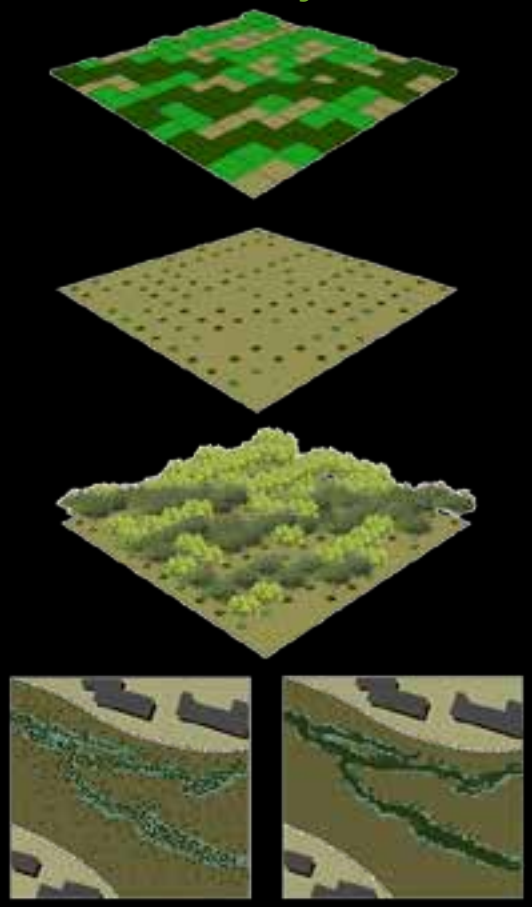
Cohesion:



Density & Heterogeneity:

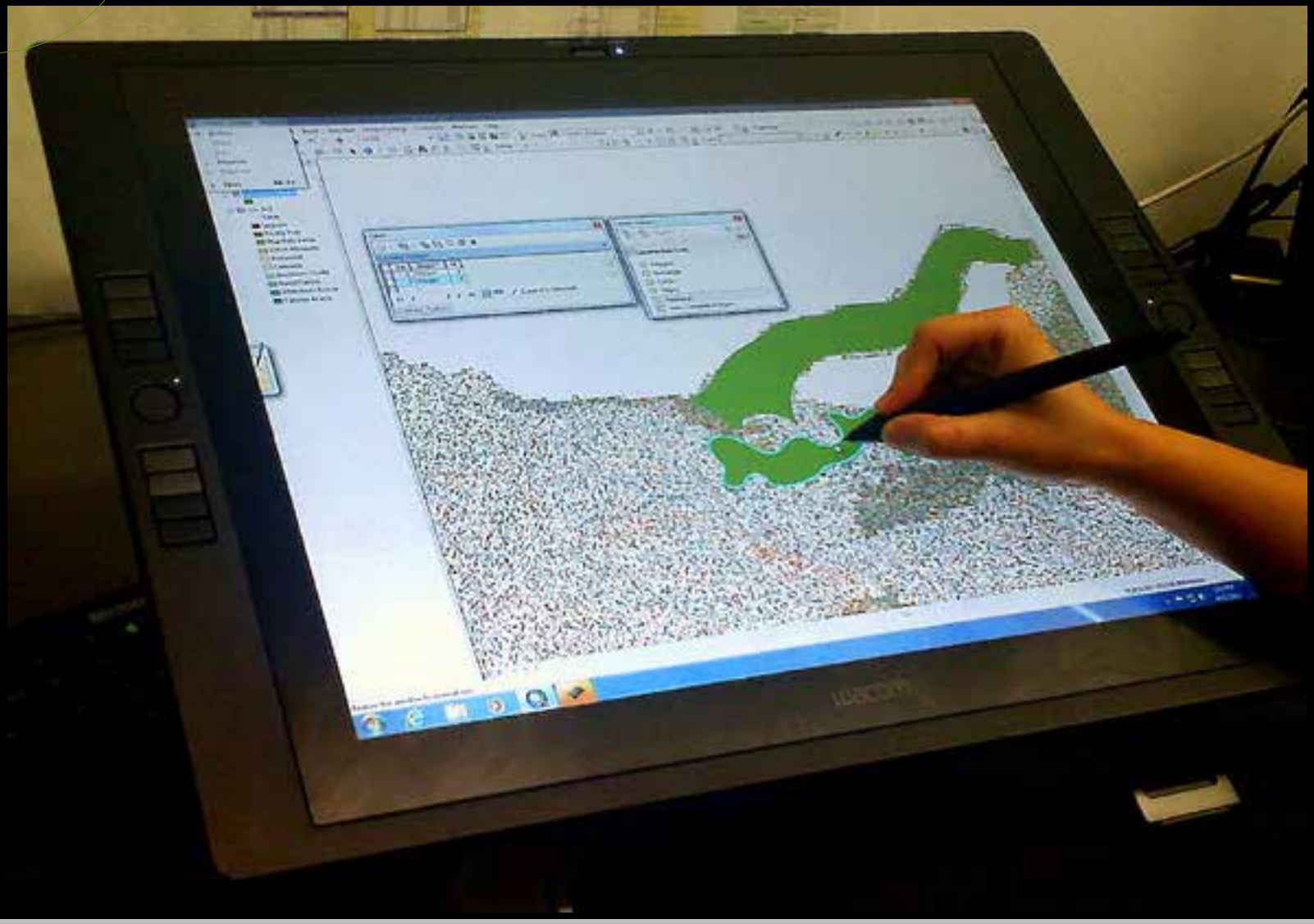


Linearity:

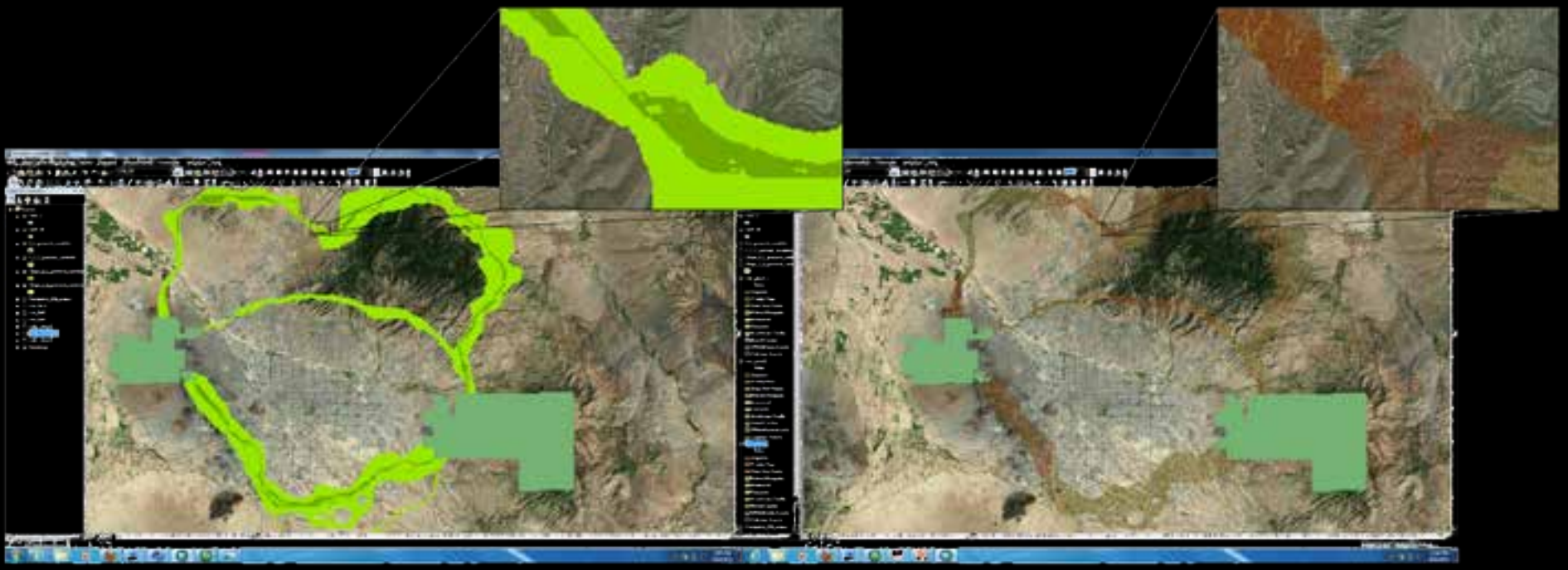


Vegetation Integration Concept

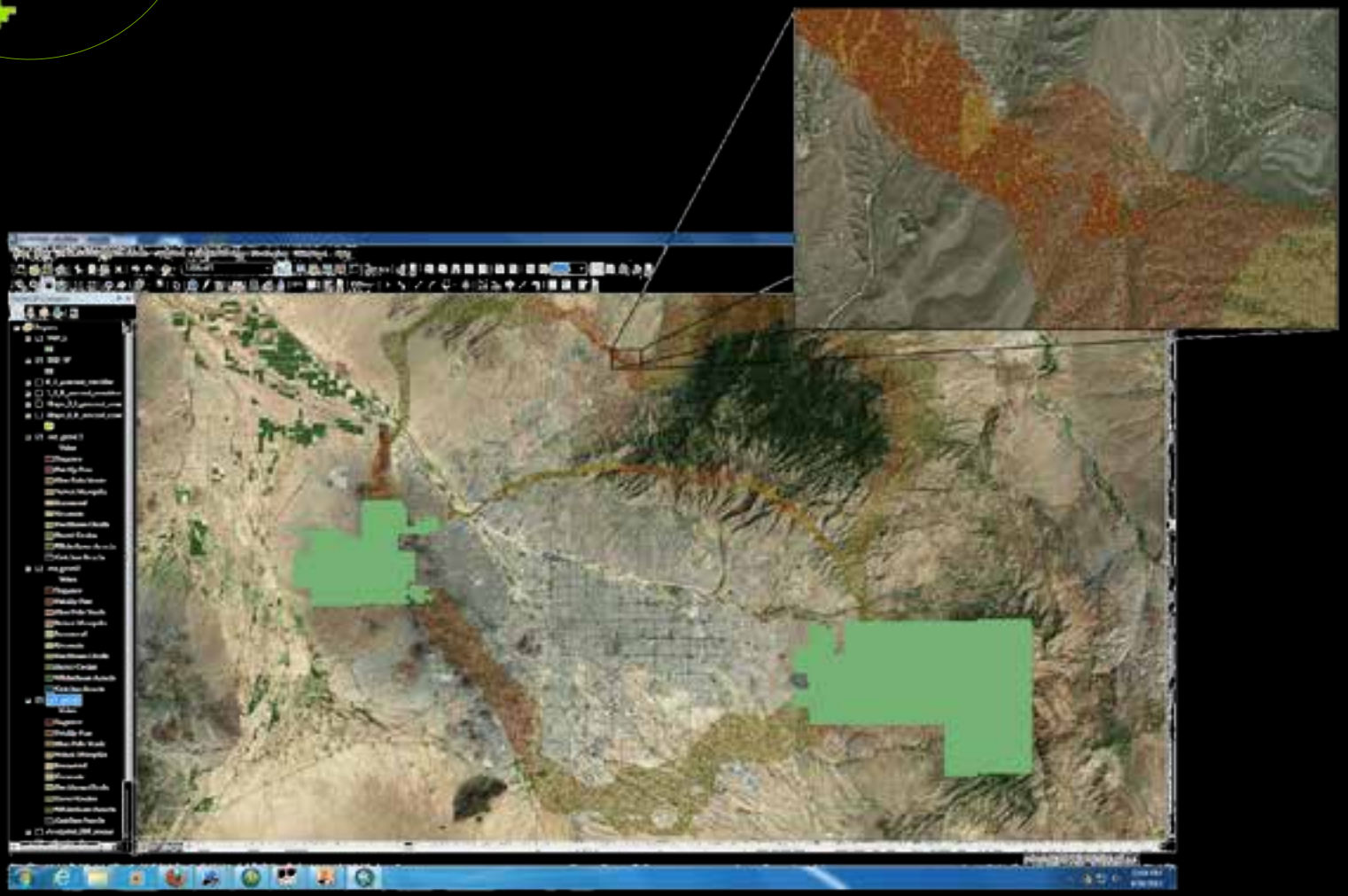
Pattern Integration and Editing



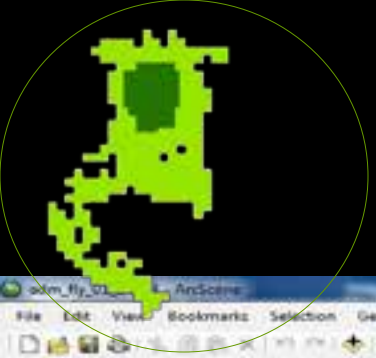
Current Vs. Proposed

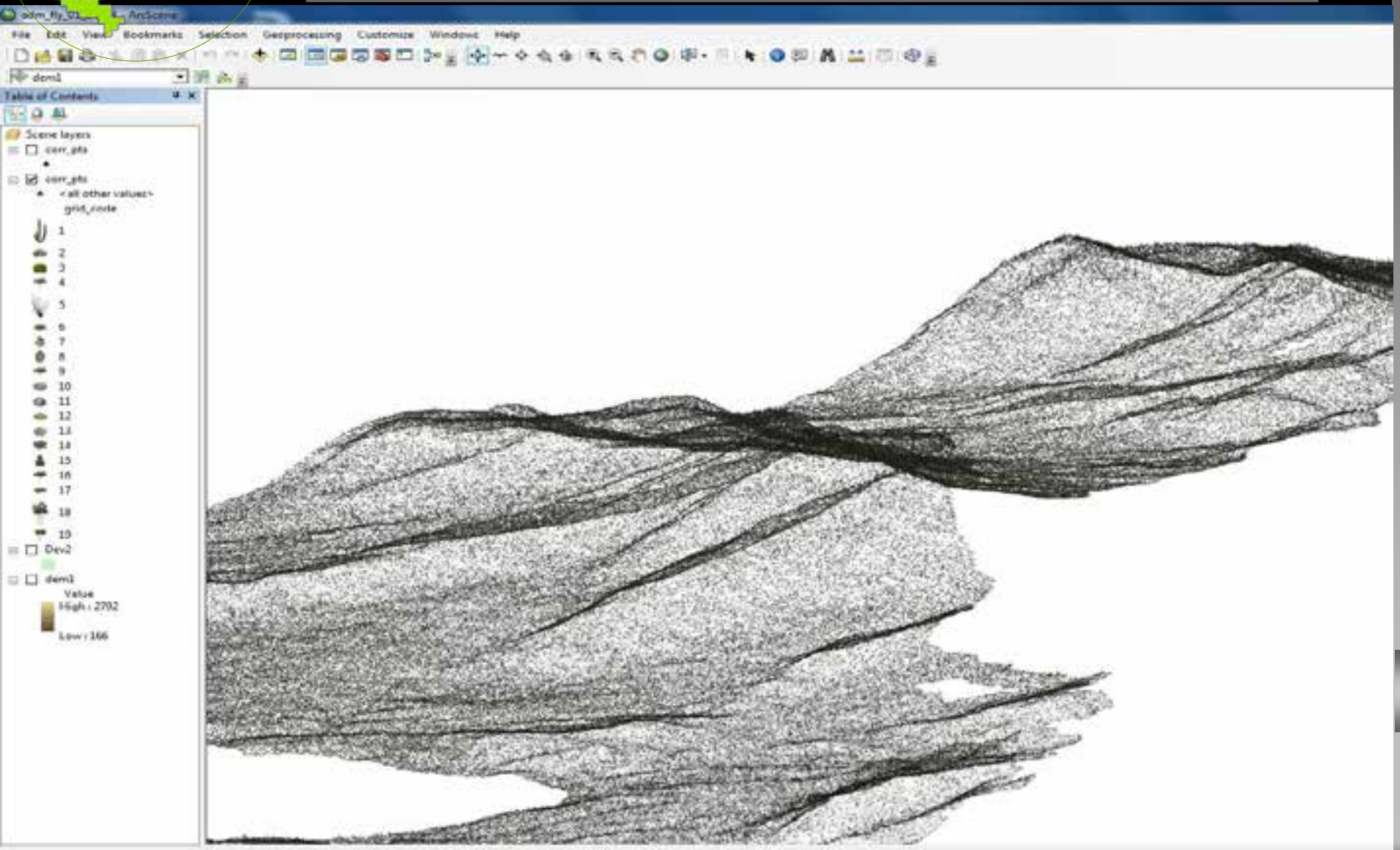


Corridor Interior Populated



Corridor Vegetation Design in Action





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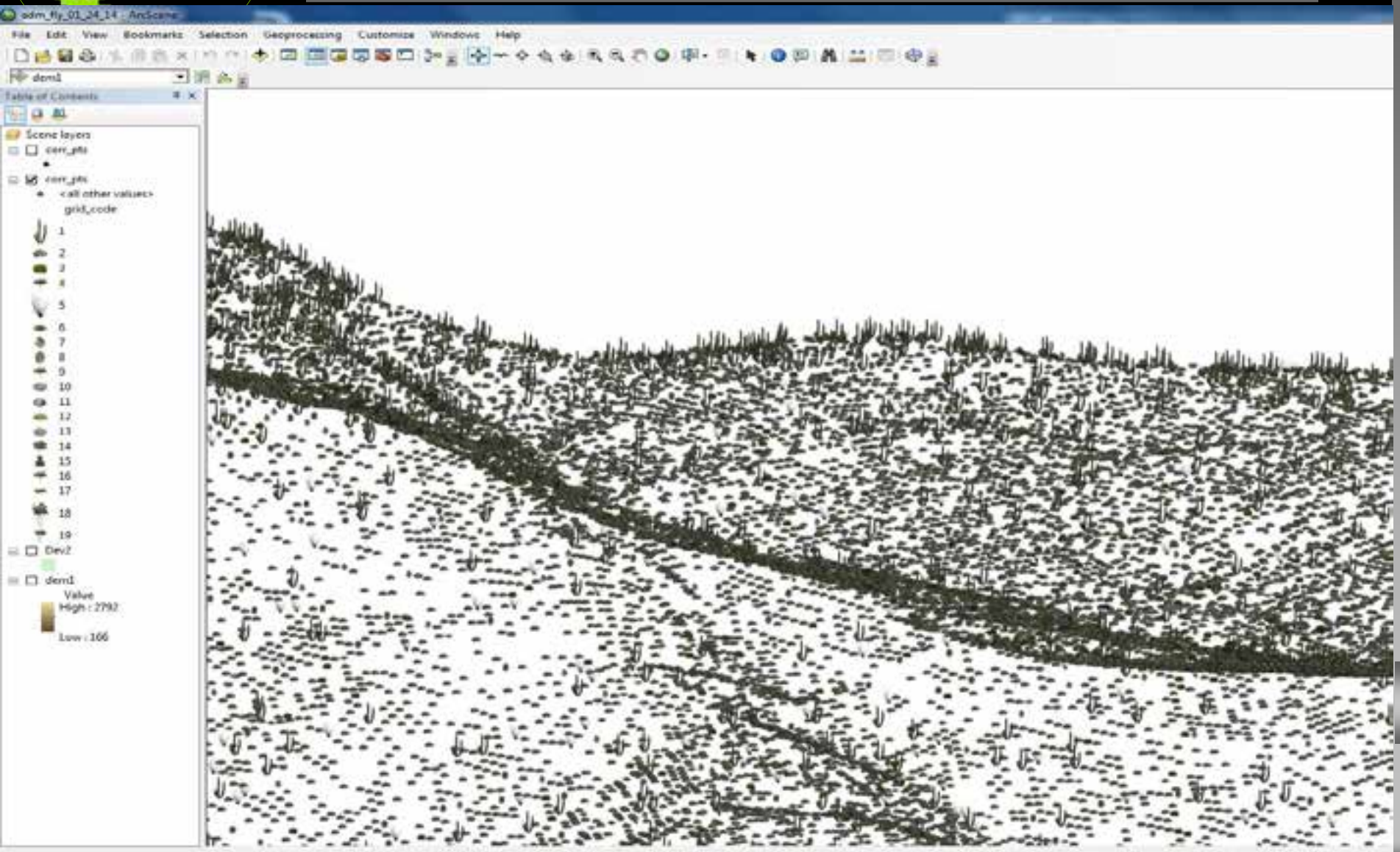

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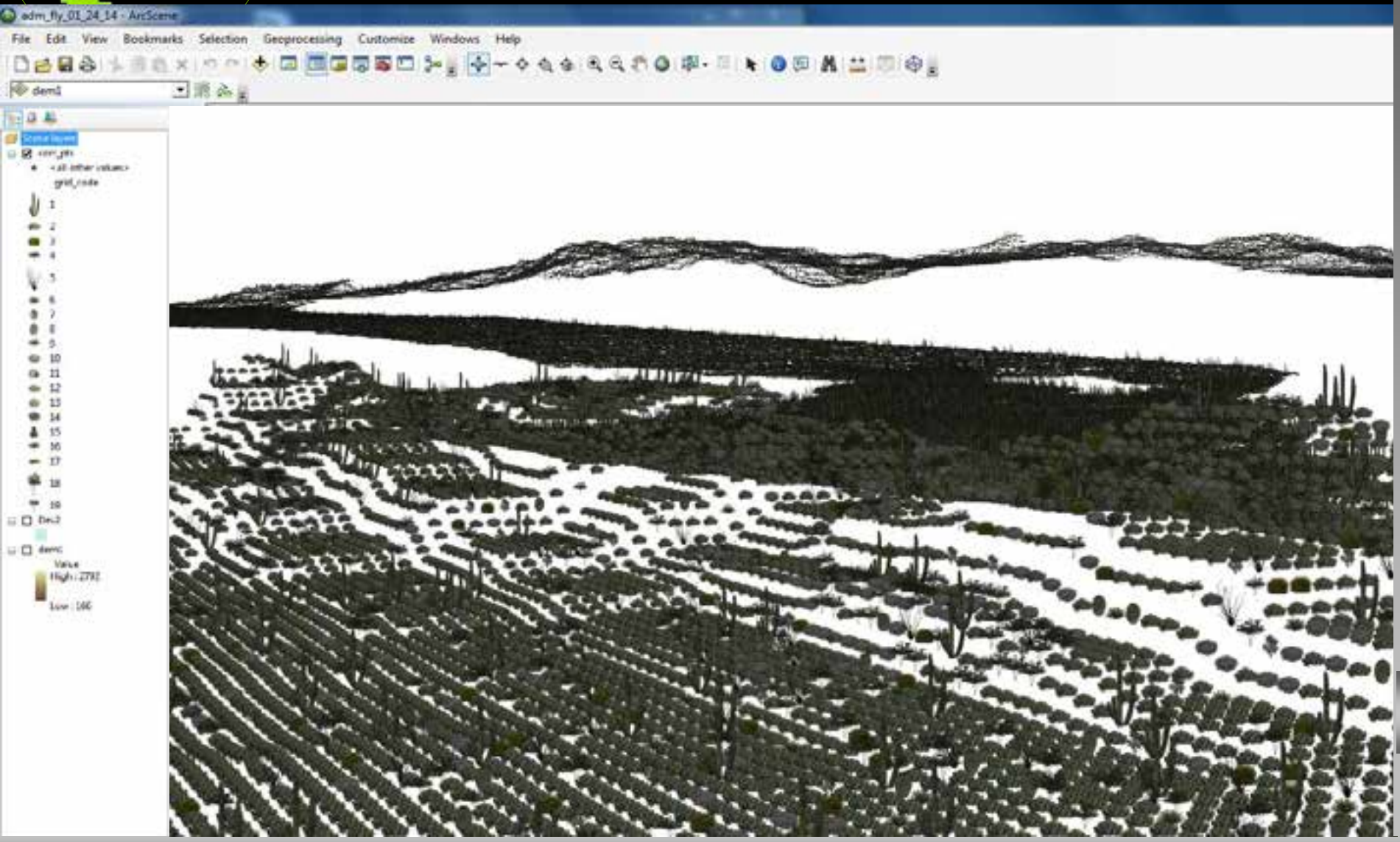
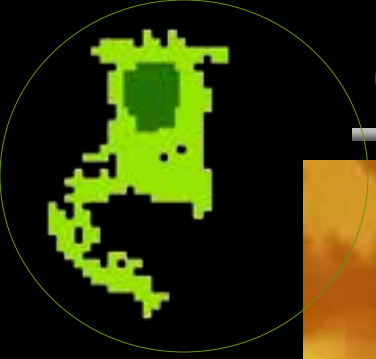
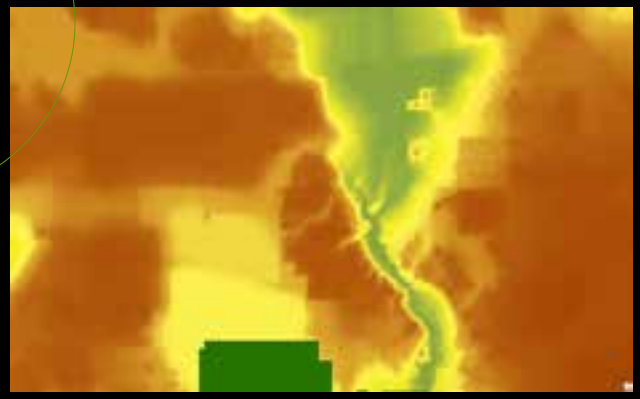
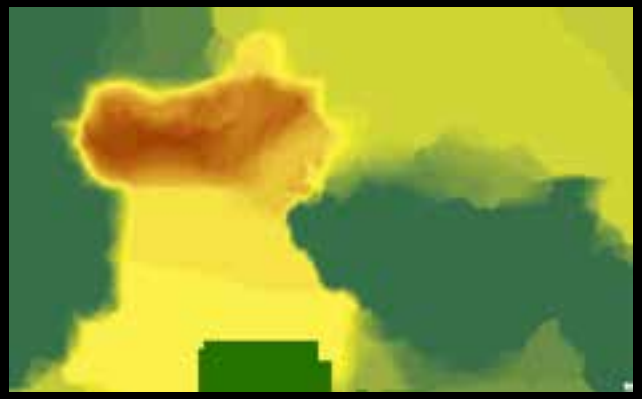
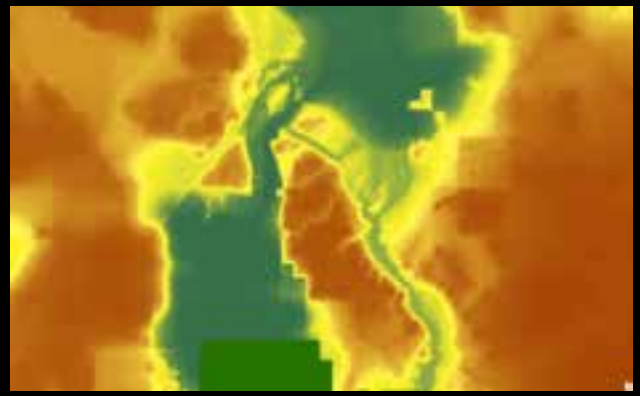


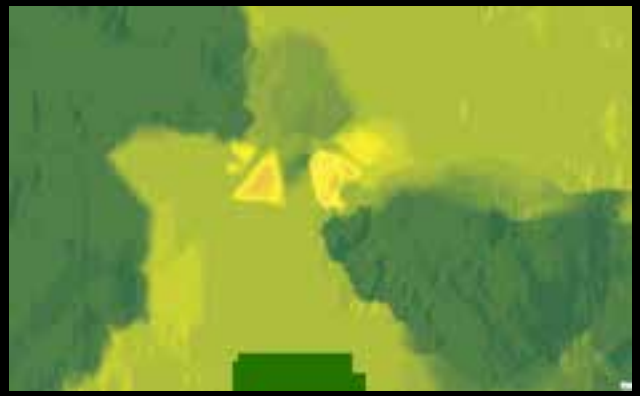
Geodesign: Scenario Evaluation

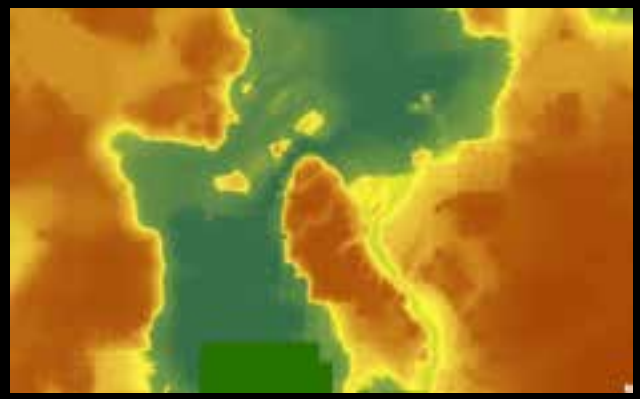


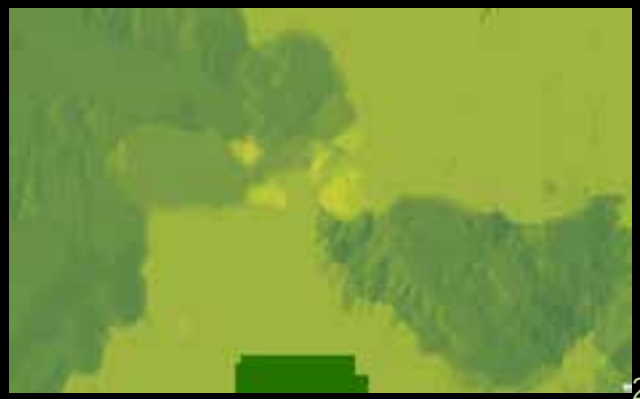




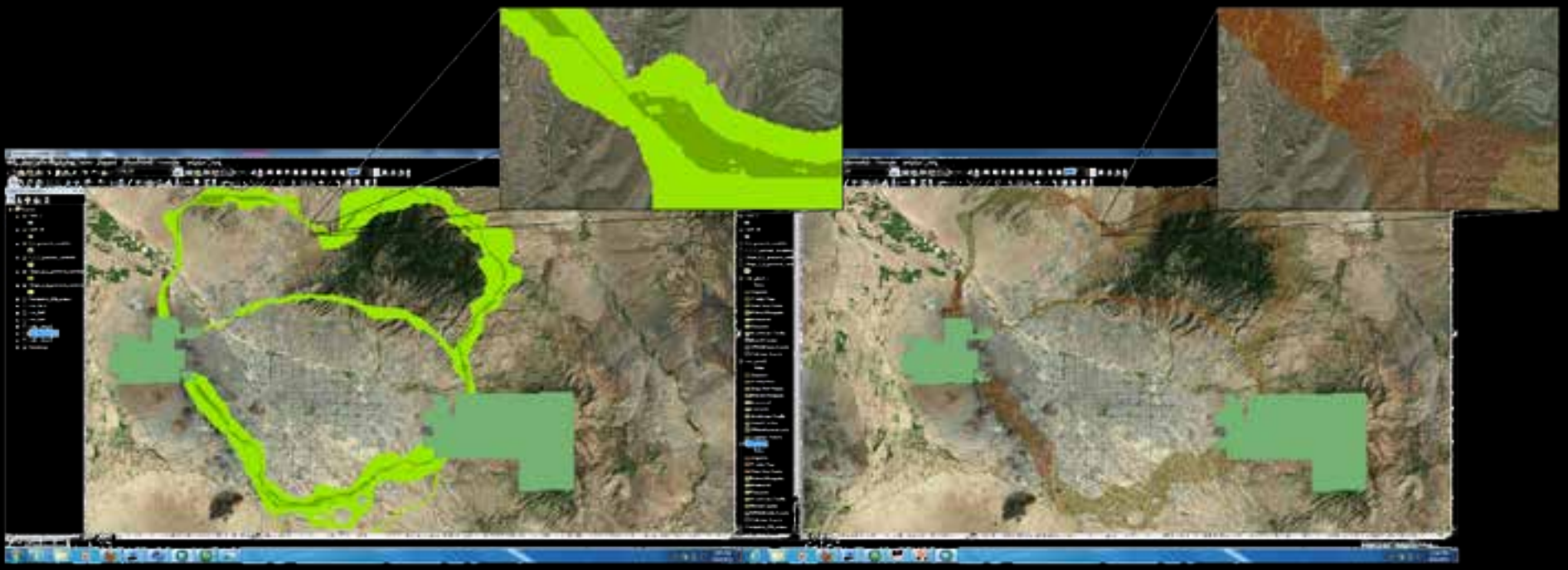








Geodesign: Corridor Vegetation Design

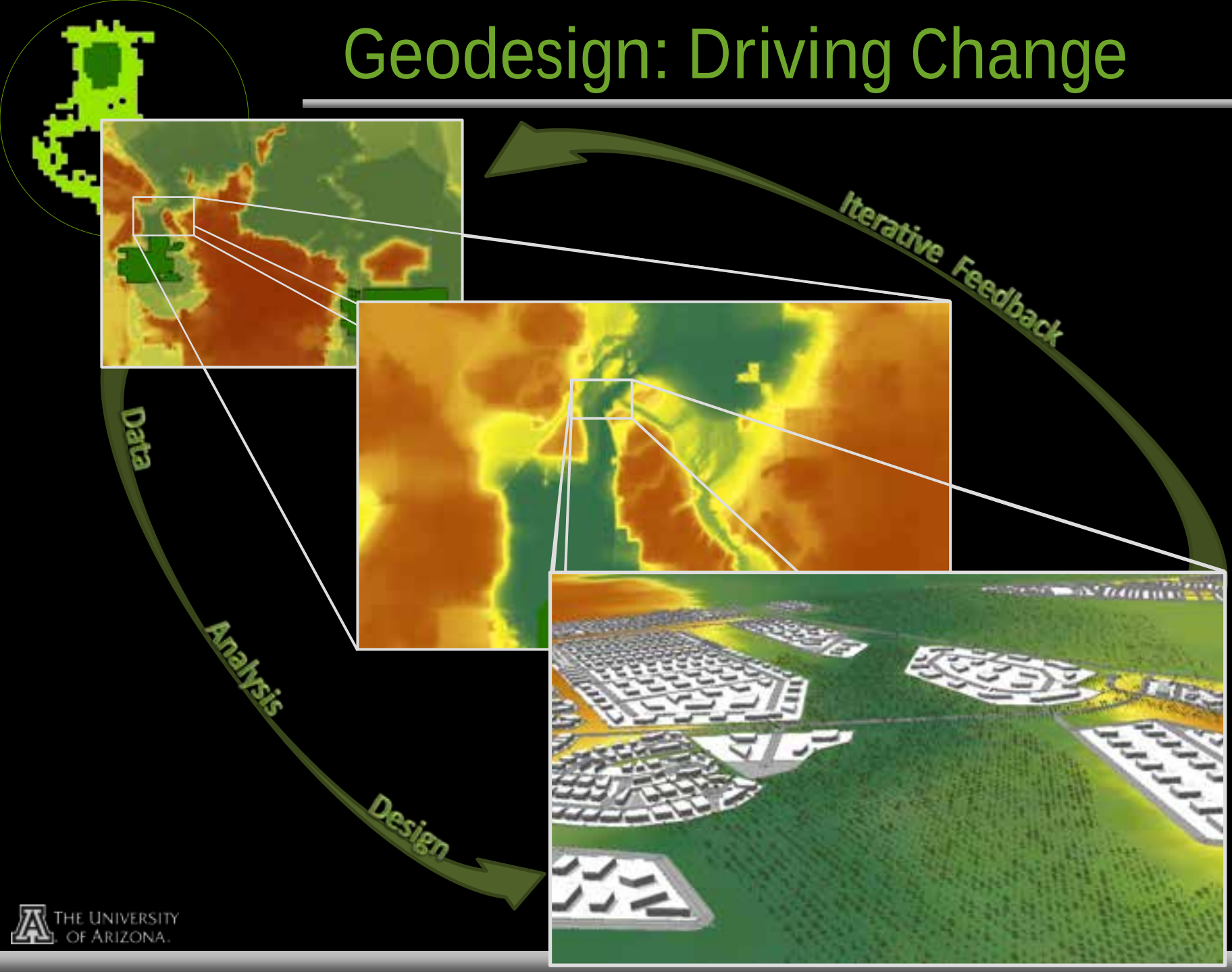


Geodesign: Corridor & Urban Interface

Geodesign: Data Driven Simulation

Geodesign: Data Driven Simulation

Geodesign: Driving Change



Thank You

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