

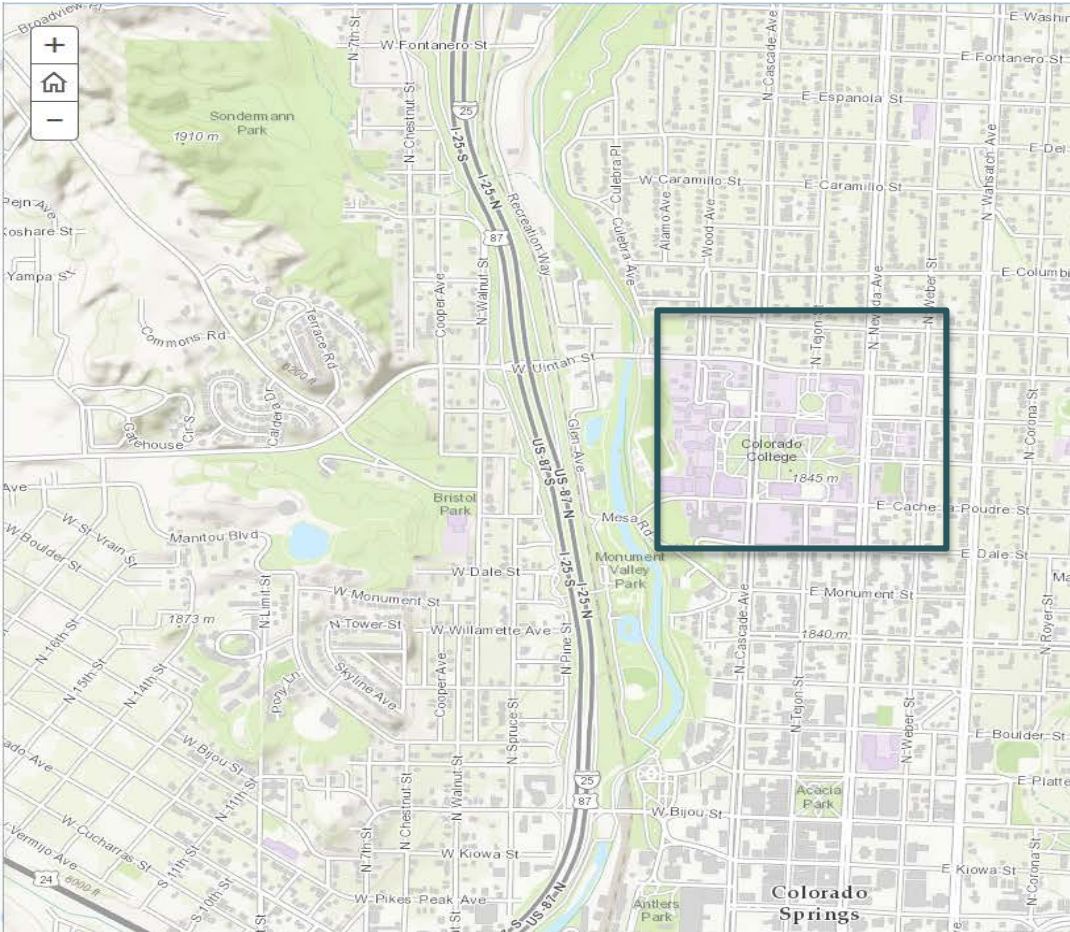


Geodesign in undergraduate education: An optimal platform for undergraduate inquiry and action

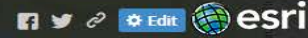
From ArcGIS to CityEngine in just 3 weeks

Dr. Christine Siddoway, Dept. Geology, Colorado College, Colorado Springs

Undergraduate liberal arts institution // one-course-at-a-time format // class size: 25
Urban campus – Colorado Springs at transition: High Plains to Rocky Mountains



A story map



Introduction to Geodesign at Colorado College

It all began with the ArcNews Fall 2013 contribution *Geodesign Education takes Flight*, by Kelleann Foster, that contains the statement, *The emerging field of geodesign can be characterized as the collaboration of science and design that takes into account the interconnectedness between humans and nature.... bringing together knowledge—in the form of both data and human expertise—and ...design creativity for the purpose of revealing and evaluating alternative futures for a place.* I'm employed at Colorado College, in the Geology Department, and this statement resonates with current initiatives at CC and in my own Department. Situated in the city of Colorado Springs, Colorado College actively identifies and engages with the challenges and impacts of urban development at the High Plains-Rocky Mountains interface during this period of population growth, resource shortages, environmental disasters, and climate change. Colorado College's Block Plan is conducive to immersion in the geospatial methods and rapid progress on development and realization of geodesign projects that enhance the College's Sense of Place.

COLORADO COLLEGE

Introduction to Geo^v design logy



Geology professor (yes, I actually do study rocks ! Closely. Geologic data and imagery are spatially located, hence GIS is a crucial tool.

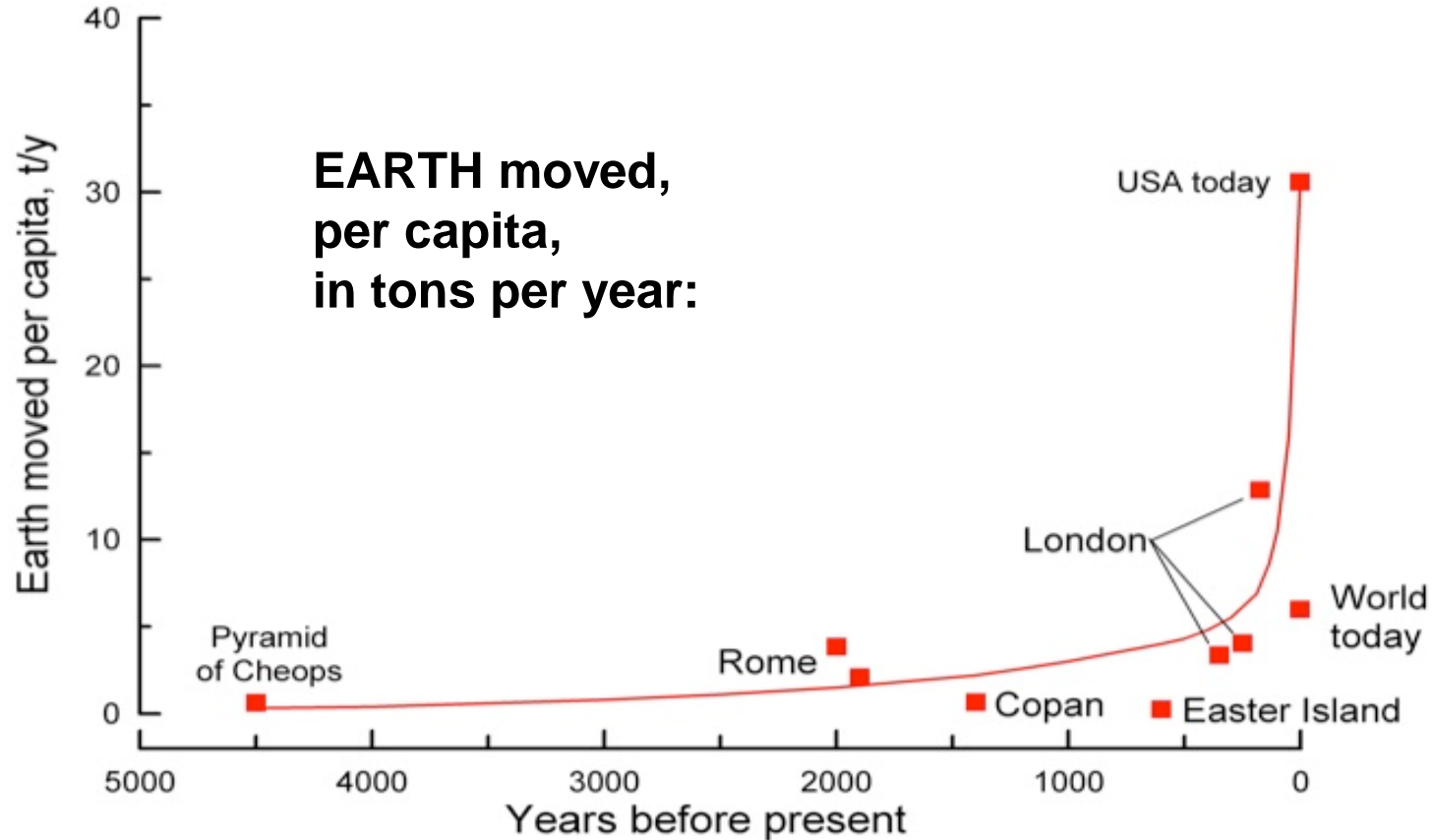
**team
taught
course**



Professor of Art, Carl Reed
internationally known sculptor
educator with long experience –
teaching 3D design

why introduce geodesign?
why bring geological science
in to geodesign?

why geology and geodesign?



why introduce geodesign? Why work to bring **geological** science into geodesign?

Colorado's devastating Black Forest fire...



By Jason Hanna, CNN

Updated 6:48 AM ET, Fri June 21, 2013

The 16,000-acre Black Forest Fire killed two people and destroyed more than 500 structures, and it prompted thousands of people to flee.

"This is the worst fire in Colorado history in terms of damage," Rose told CNN.

Investigators are still trying to figure out what caused the fire. Investigators scouring a 24-square-foot area where the fire is thought to have begun on June 11 have "all but ruled out natural causes," Maketa said.

"I can't really go any further on that, but I can say we are pretty confident it was not, for instance, a lightning strike," Maketa said.



Deciding when to let a house burn
02:19

The Pueblo Chieftain

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Lower Ark sues over stormwater



BY CHRIS WOODKA THE PUEBLO CHIEFTAIN

Published: November 20, 2014; Last modified: November 20, 2014 09:12AM

ROCKY FORD — Colorado Springs is facing a lawsuit over the failure of voters to approve a drainage district in the Nov. 4 election.

The Lower Arkansas Valley Water Conservancy District board voted to give Colorado Springs notice that it would file a federal lawsuit over violations of its stormwater permit under the Clean Water Act.

The lawsuit could be filed in 60 days, although the district is willing to discuss "effective remedies" during that time.

The board also voted to ask Pueblo County commissioners to investigate whether Colorado Springs has violated its 1041 permit for the Southern Delivery System because it has not adequately funded stormwater protection for Fountain Creek.

"We're frustrated about to our limit," Lower Ark Chairman Lynden Gill told Colorado Springs Councilman Merv Bennett, utility board chairman, who spent an hour explaining how Colorado Springs intends to deal with the stormwater question after the failure of a regional drainage district in the election.

Sedimentation rates and alluvial processes during extreme precipitation events in semiarid environments at the urban-mountain interface

Events at the urban-wildland interface, Colorado Springs, September 2013.



Dirk Rasmussen and C. Siddoway, Colorado College
20 May 2014, GSA Rocky Mountain/Cordilleran Meeting

Geodesign NOW:

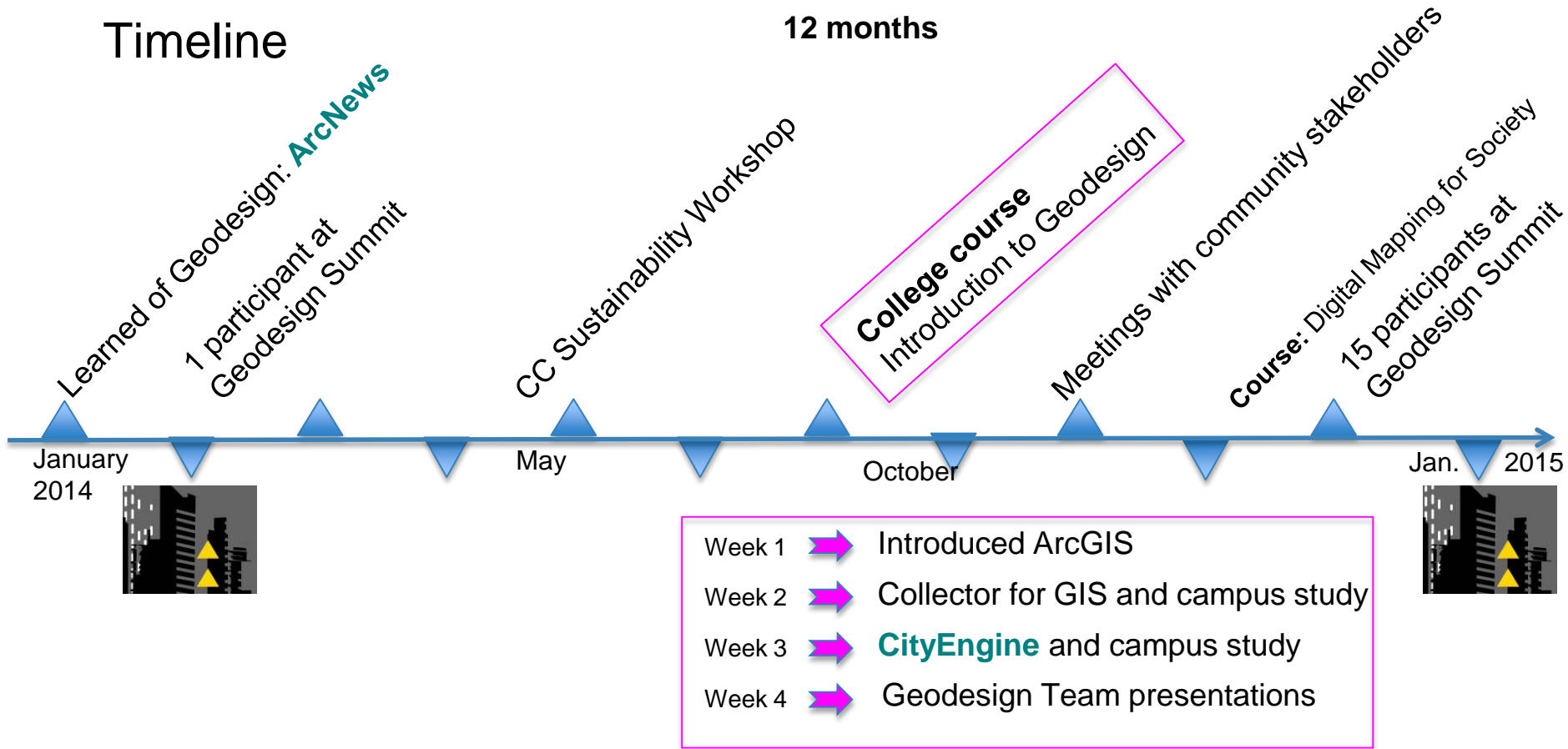
These catastrophic events and rapid impacts on regional infrastructure provide impetus to

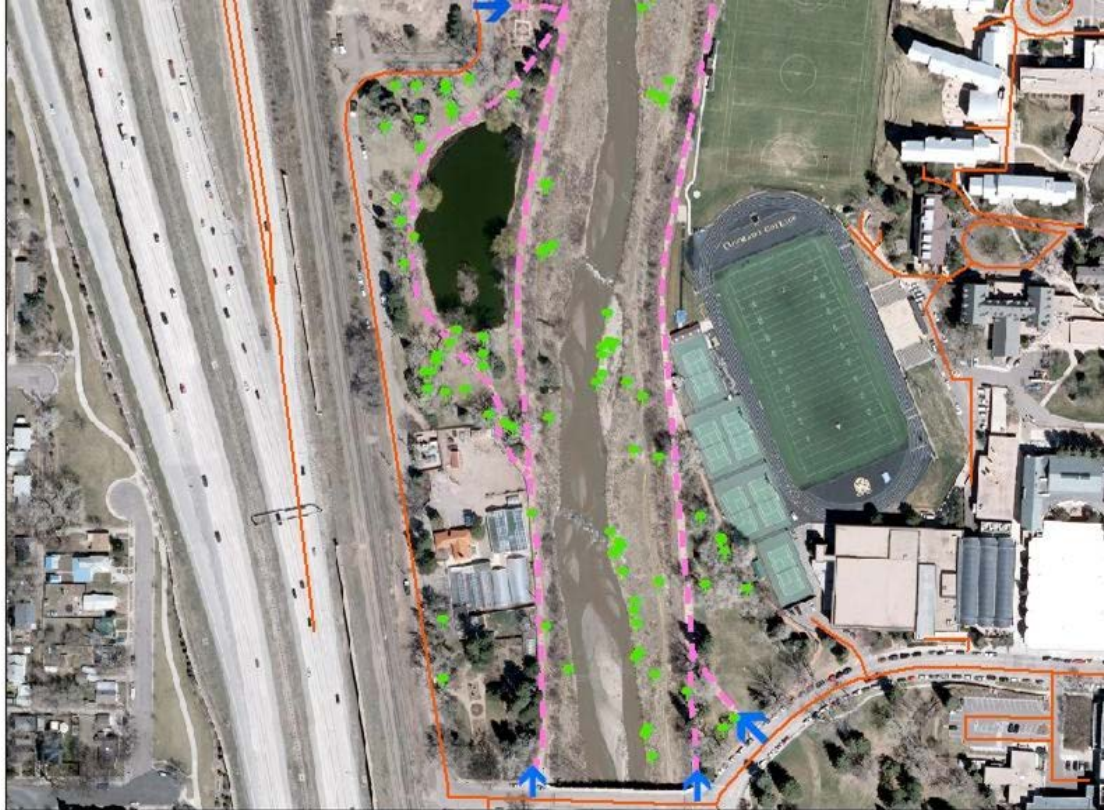
“Turn disagreement into agreement.”

- C Steinitz

Timeline

12 months







Legend

-  Cottonwood
-  roads1
-  Trails



0 0.0225 0.045 0.09 Miles

-  Week 1: ArcGIS
-  Week 2: Collector

Smartphone-based field data collection:

- ArcGIS online via **academic ORG account**

*Western border of campus –
drainage ditch, interstate highway,
coal-carrying rail line ...*

Where is the flood plain?

GIS data

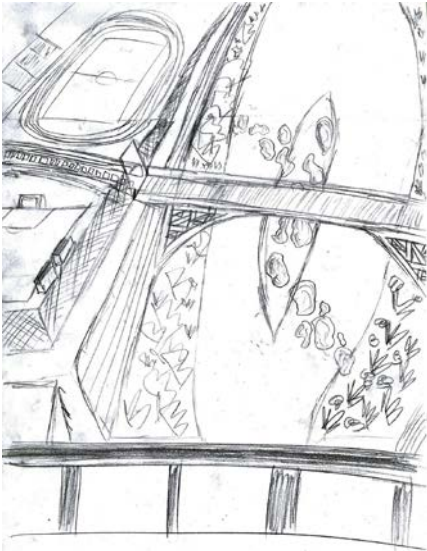
Interdisciplinary student team:

Art and Design

Environmental science

Ecology

Geology / Hydrology



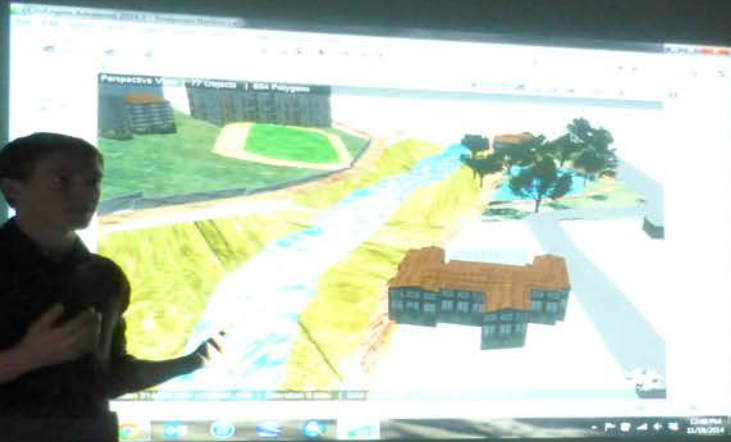
Restoration of riparian zone:

Ecosystem services, recreation, public education,
natural beauty, human health

To be reintroduced following long period of management
focused solely on flood control *

**floods can be formidable, but do not occur annually!*

CityEngine model for Restoration of Riparian zone:



Restoration, Recreation & Reconnection

Natalie Berkman
Molly Broom
Colin Chupik
Russell Wolfe

2. Sustainability & Resolution of incompatible Uses

DPAC Design:



Renewable Energy

Sight lines to Pikes Peak and Colorado Front Range, that represent the REGIONAL extent of our **Place of Learning**

DPAC Design – Site Comparison via CityEngine Models

Existing condition

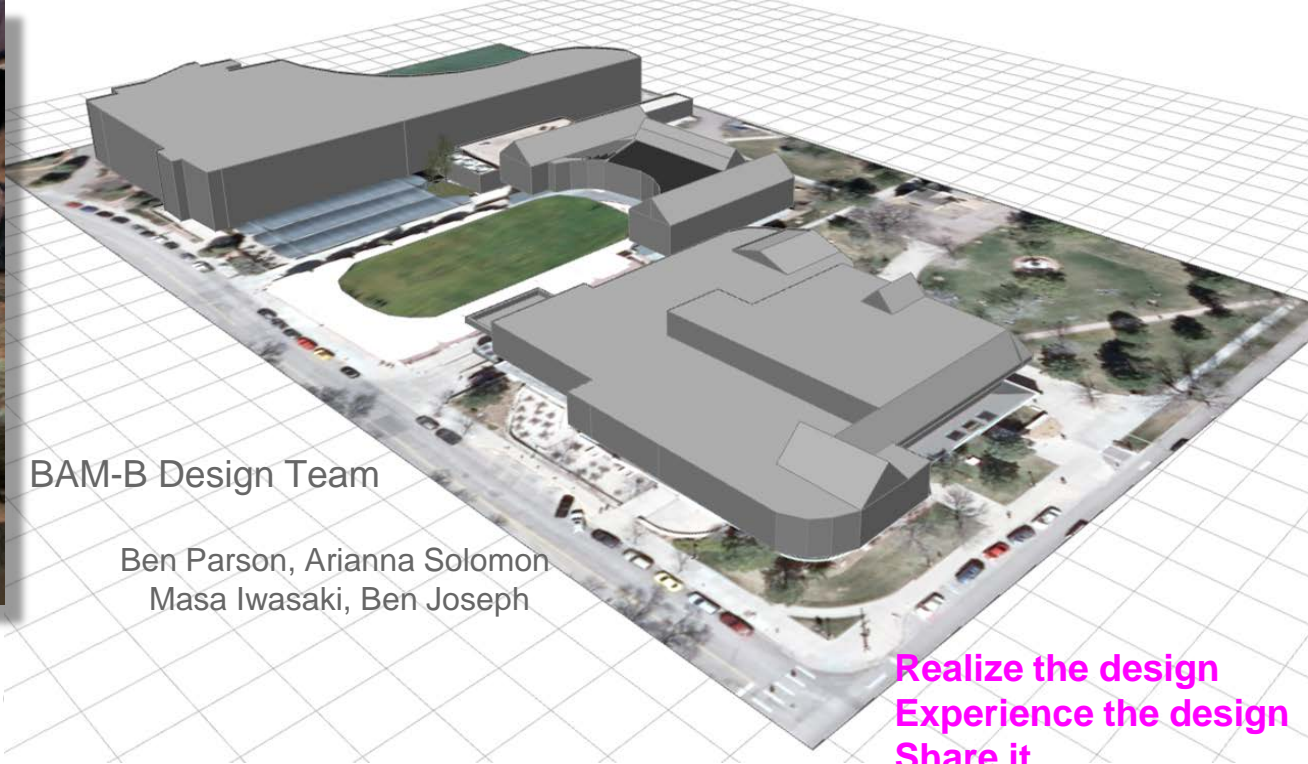


Pedestrian traffic, utilities, and function analysis

Alternative design



Realize the design
Experience the design
Share it



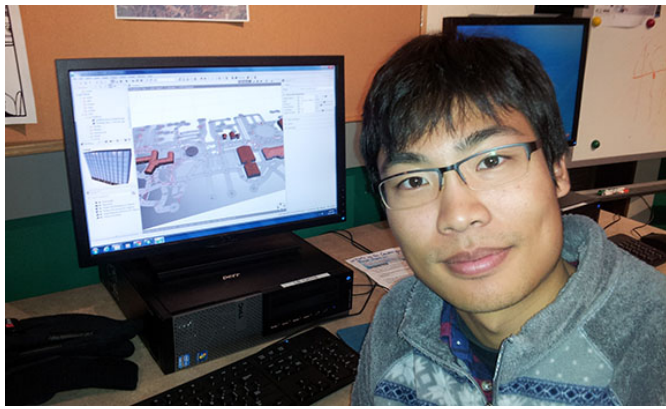
BAM-B Design Team

Ben Parson, Arianna Solomon
Masa Iwasaki, Ben Joseph

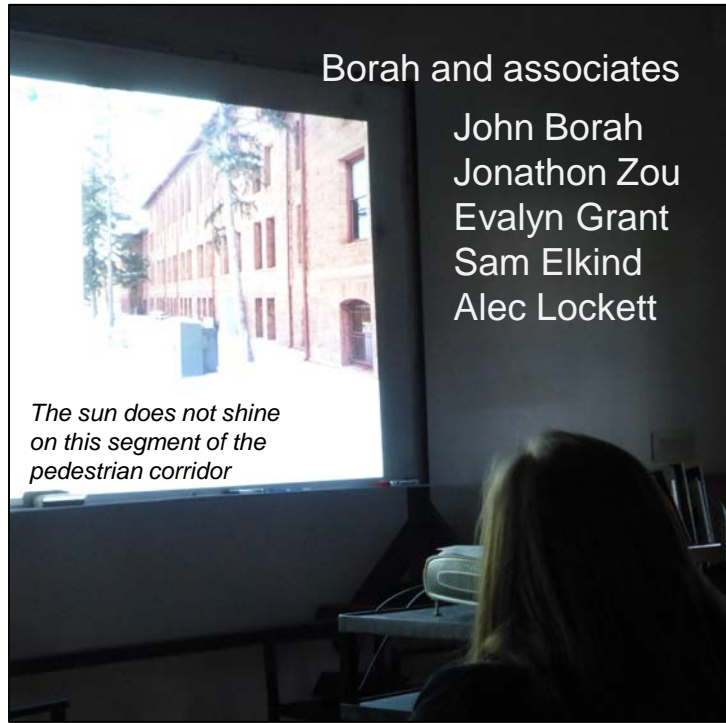
Realize the design
Experience the design
Share it

CityEngine: Redefinin

Open views to Pikes Peak – reminder of our Place, relation of College to natural landscape and Western ecosystem
Campus landscape in harmony with ideals of liberal learning and the life of the mind
Climate-appropriate vegetation
Open space --extra-curriculat *student* space – for recreation, performances, and design



4. Sky Canyon: student pedestrian corridor
– across US highway, campus utility nodes,
parking lot, intersection, and other hazards



Conclusion of course:
Geodesign 'competition'

Presentations to Jurors and
Stakeholders

Education / training opportunity

Studio centered upon College campus

- Education: GIS + tools for community engagement
- Students serve in multiple, legitimate roles: analysts, designers, constituents
- Extent and scope: each study at a suitable scale
- Provide meaningful input to new campus Master Plan architects and impact-ful 3D models to City

*Immersive learning: in academic setting,
January term, summer sessions*



- Dept. of Parks, Recreation, and Cultural Services
- COS Utilities: Fountain Creek Watershed Project

Taking this where it needs to go



Providing a planning workshop for COS City



Pikes Peak Community Foundation
Non-profit, dedicated to enhancement of quality of life for all residents



Fountain Creek Watershed Water Sentinels



Placemaking: Tony Atkin and Laurie Olin
These landscape architects and the OLIN firm, > at work on **Colorado College Master Plan**

COLORADO COLLEGE

Thank you for opps for dialog and action!

Inaugural year: Introduction to Geodesign



Thank you to CC Sustainability program, the Geodesign Summit organizers and evangelists, for inspiration throughout the year, and for Student scholarships to attend the Summit!