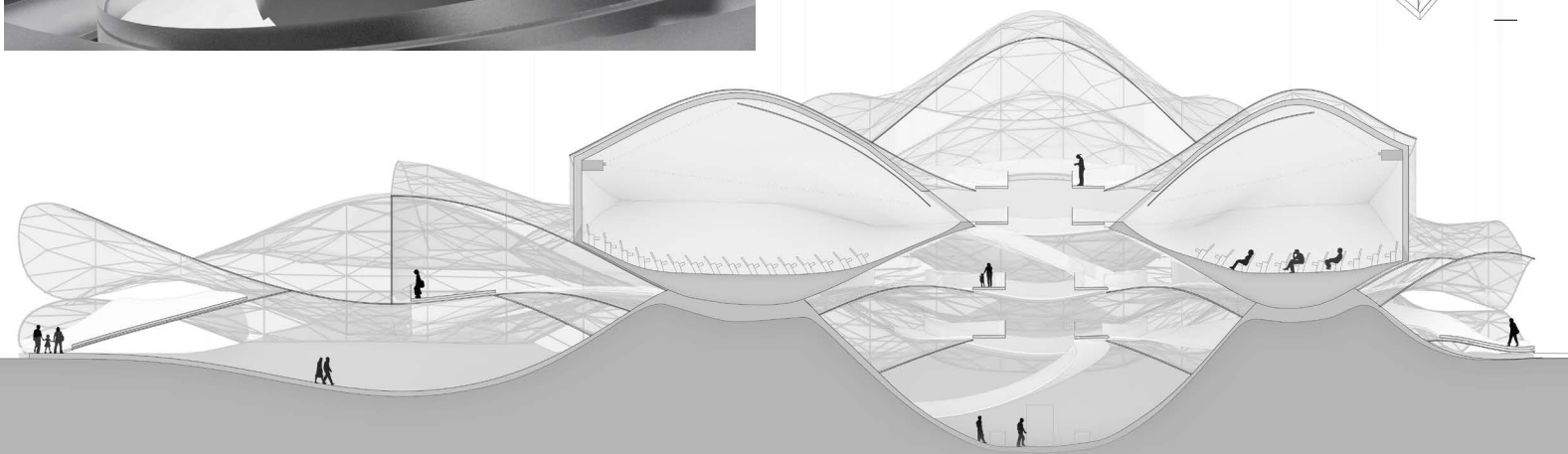
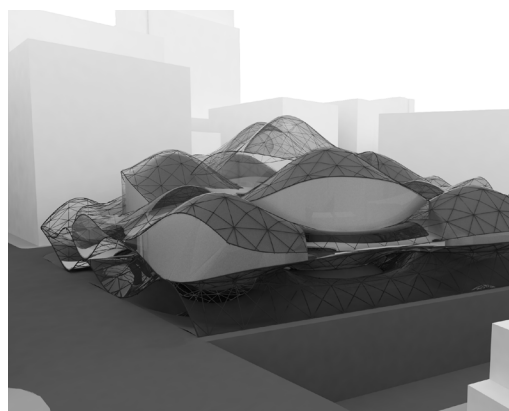
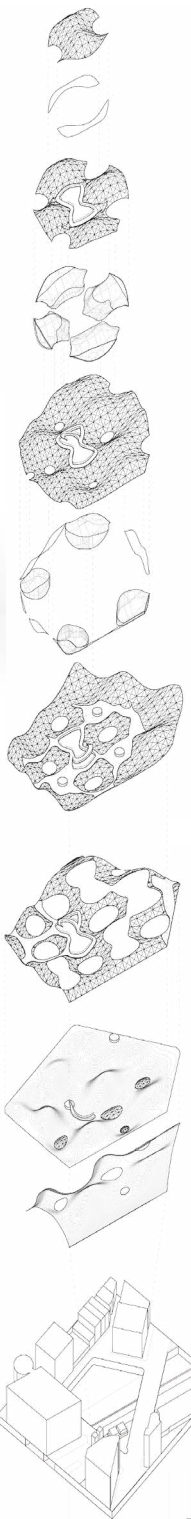
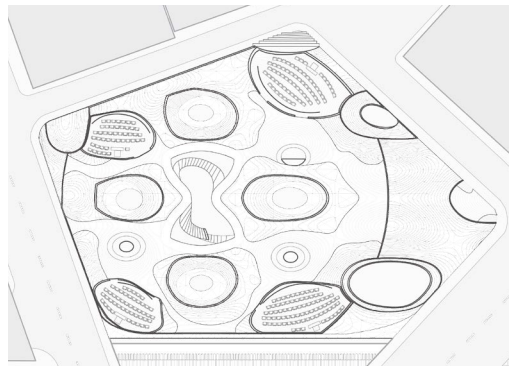


# Climate Pod Cinema

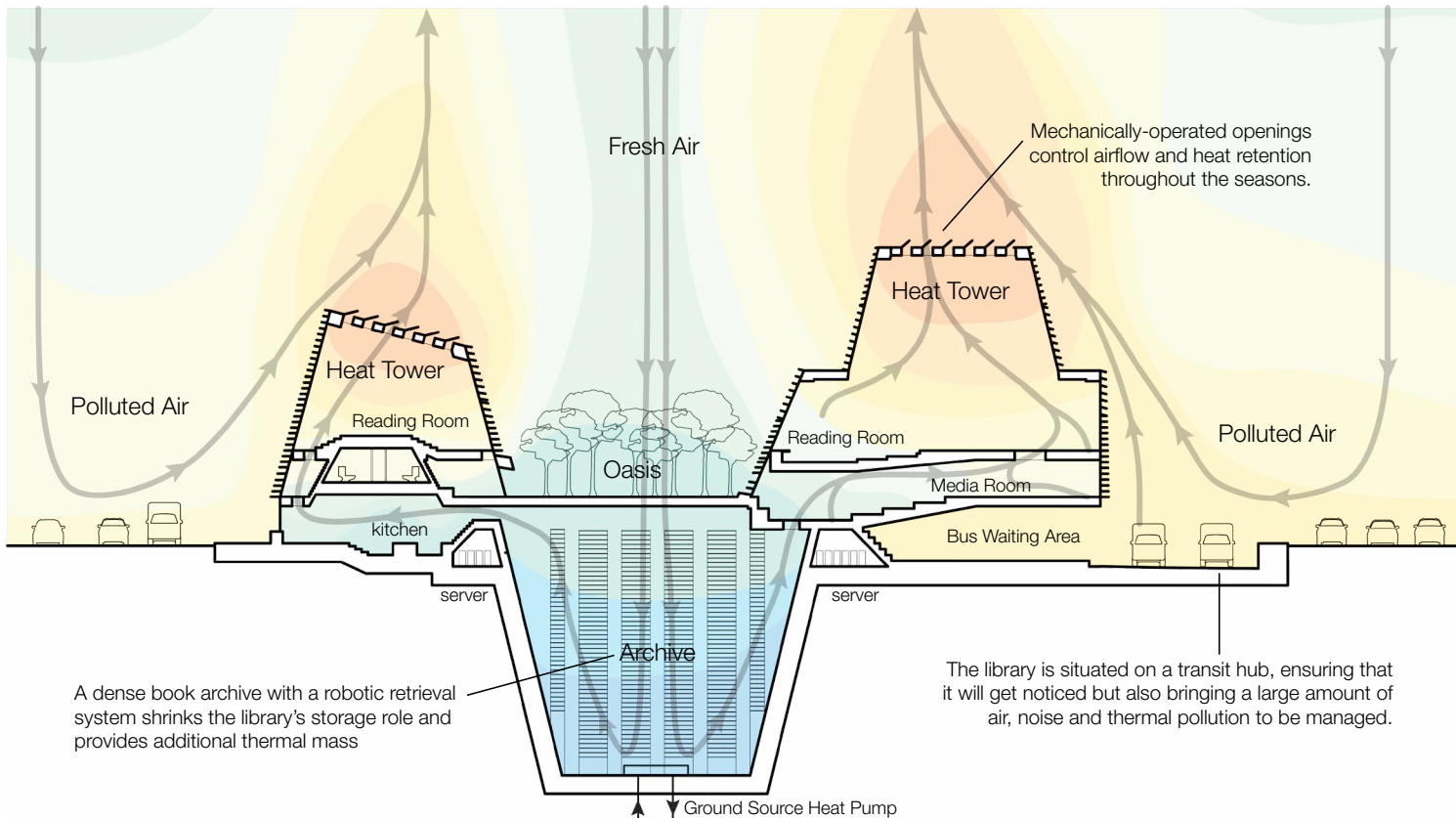
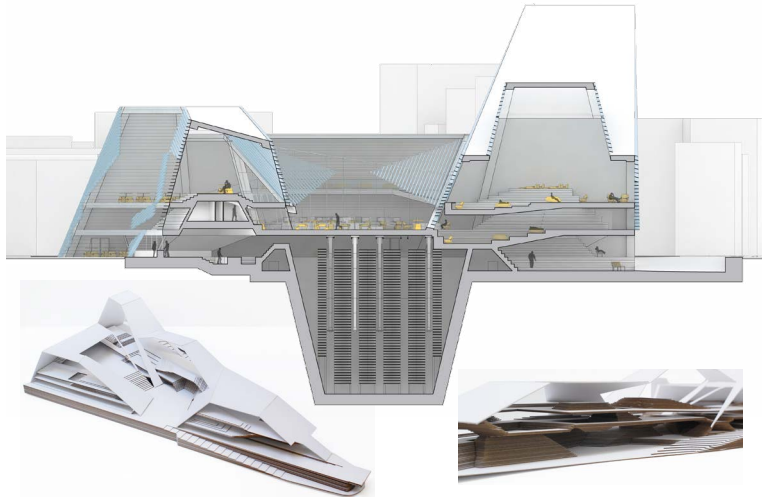
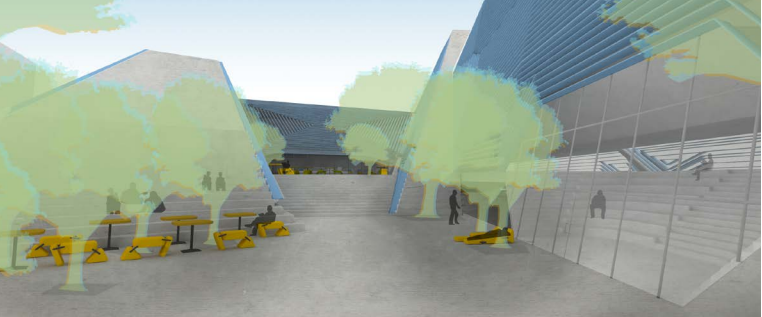
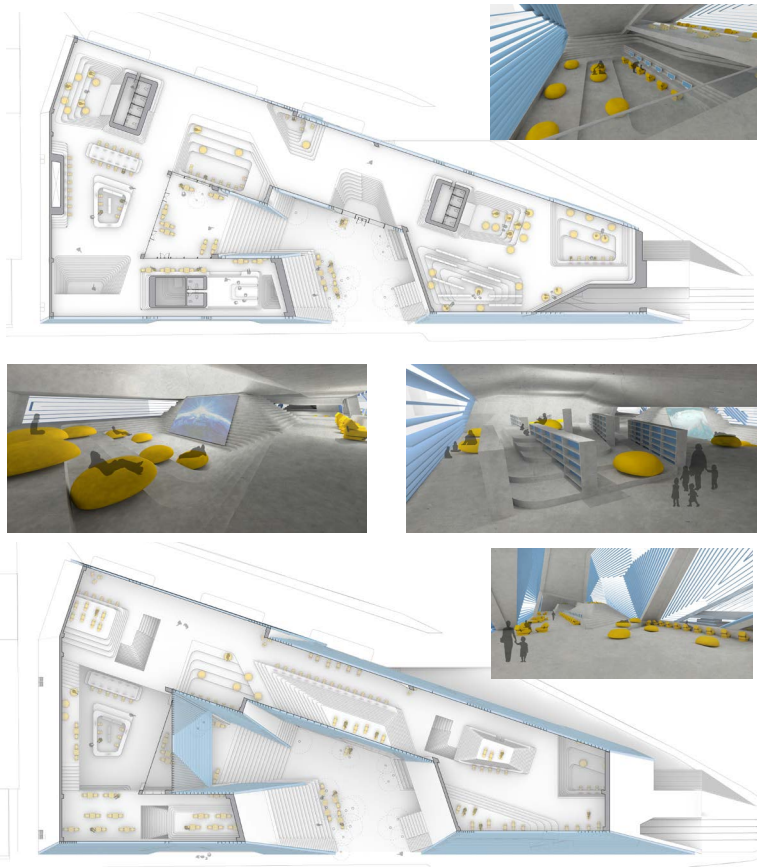
In response to the increasing accessibility of video, the domed IMAX has arisen to provide an enhanced and all-encompassing experience that cannot be achieved at home. Potential future applications of the dome include the possibility for controlled climactic experiences due to the dome's low surface area-to-volume ratio and pod-like nature. While the dome holds many potentials, it has often been difficult to systematize in a manner that includes multiple domes. Climate pod cinema is an attempt at such systemization to produce an 8-theater complex.





# Urban Oasis Library

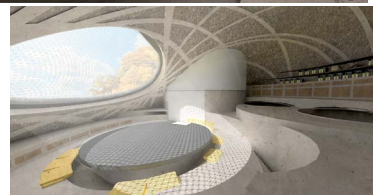
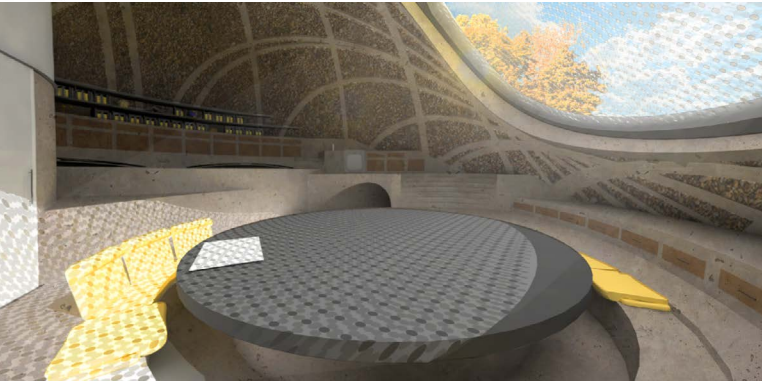
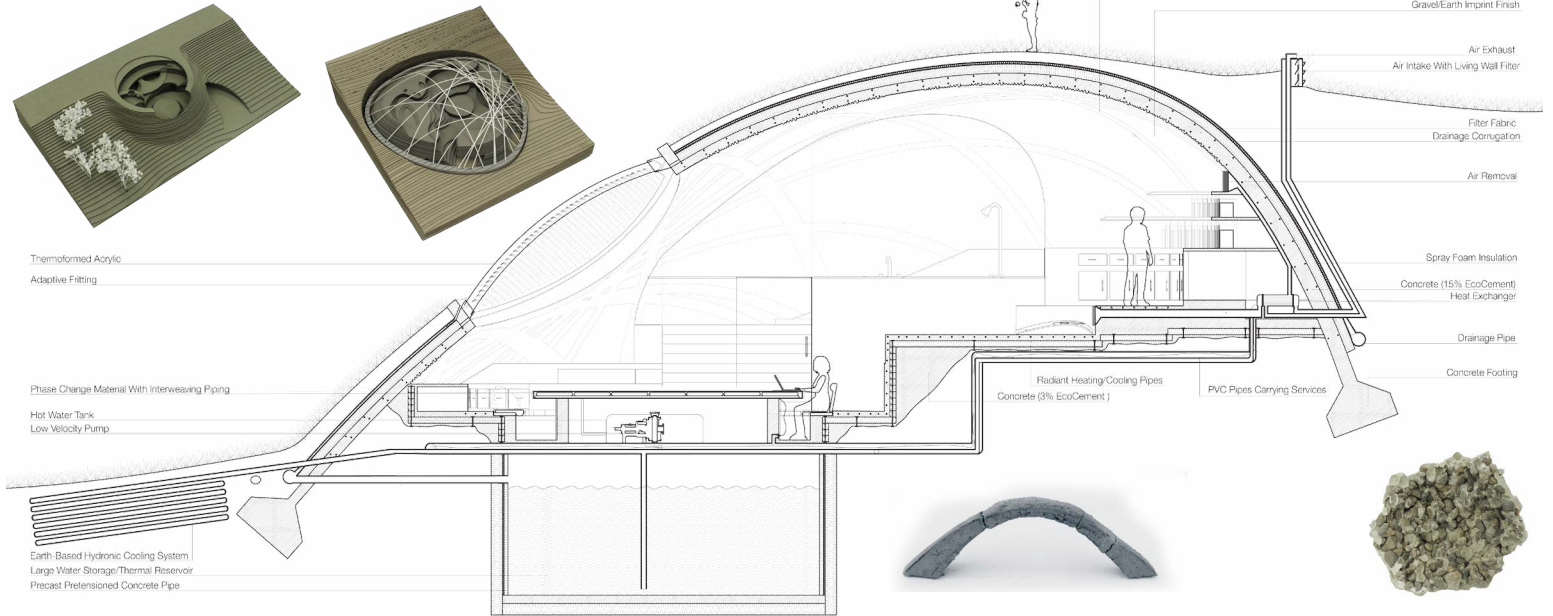
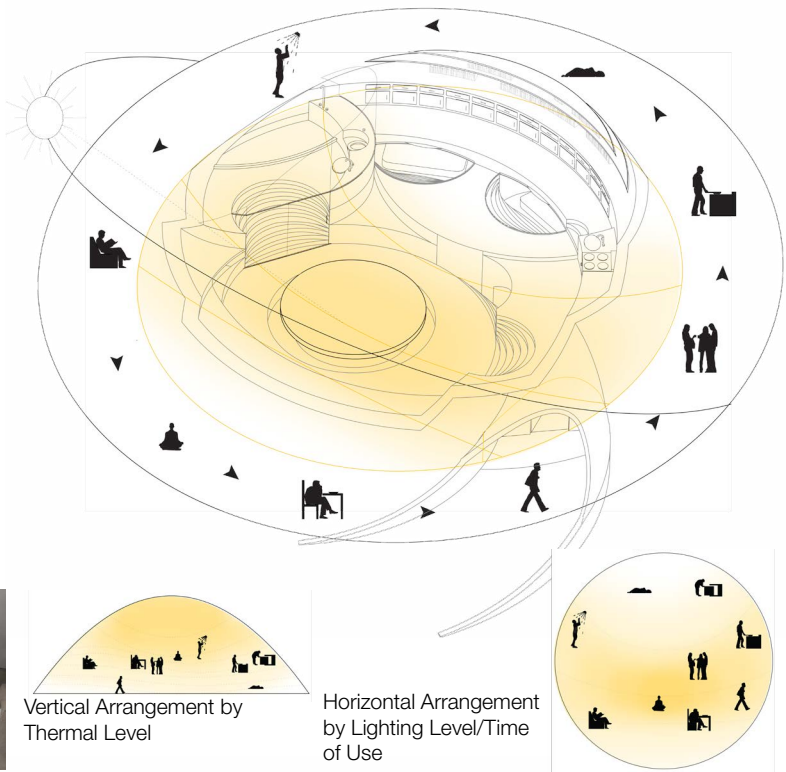
As our culture transitions into the digital age, the currently undervalued role of the library as a provider of conditions for learning will become more prominent. The once-prominent storage function of the library will shrink to become a server room and robotically-retrieved book archive, which can aid in the creation of conditions for learning as a heat source and thermal storage area respectively.





# Solar Hearth Home

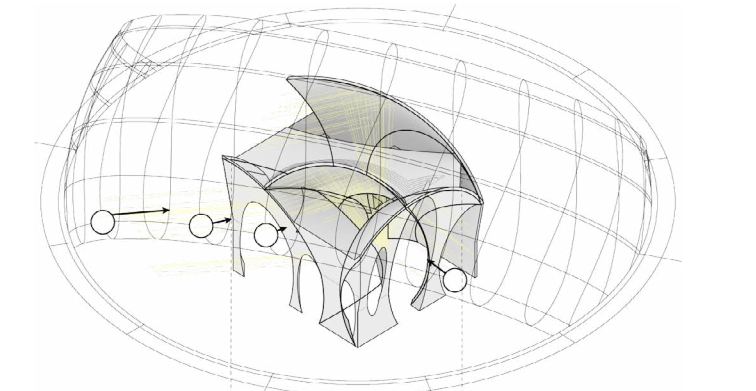
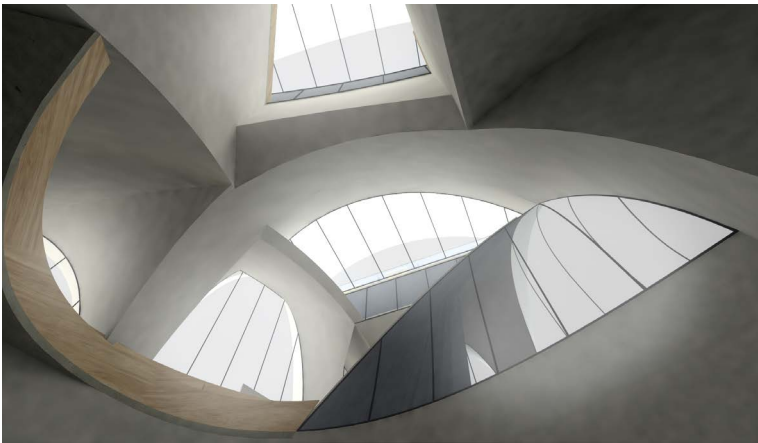
The solar hearth home imagines the impact of establishing a solar energy center within the modern home and proposes that such a center could be a topographic thermally active floor slab, which captures and distributes incoming sun energy. Above this, a dome and an oculus allow uninterrupted access of the sun to this "hearth." Additionally, the dome and oculus reinforce the notion of center within the home and capitalize on a compressive form with a high thermal mass and low surface area-to-volume ratio that is suited to a heating-dominated climate.



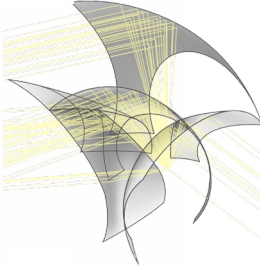
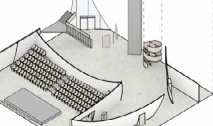
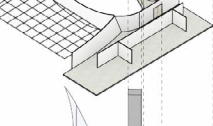
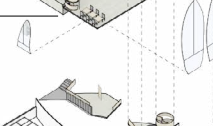
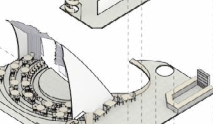
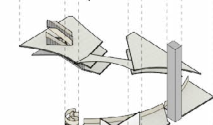
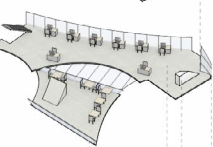
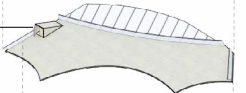


# Sun Sculpted Arts Center

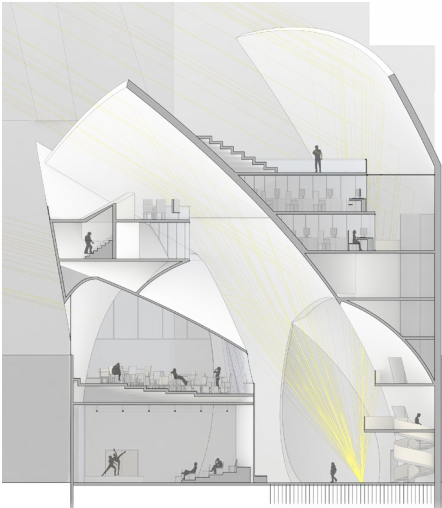
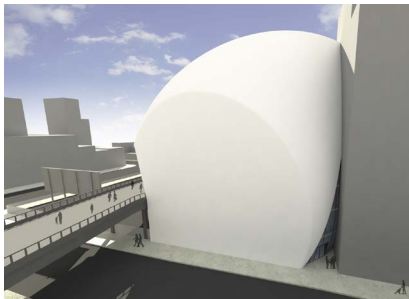
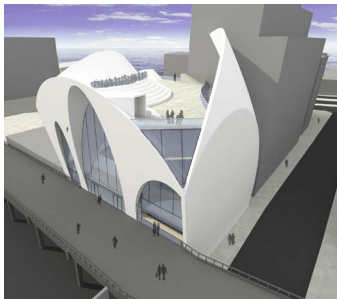
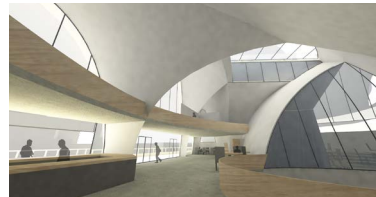
The sun sculpted arts center is defined by a central bespoke object that is composed of four primary parabolic forms that focus the sky light onto a ground-floor art gallery, where day-light from above is ideal for art-viewing. More specifically, these parabolic forms are tuned to capture the winter sun at four key hours when solar radiation is high and concentrate the solar heat onto the thermally massive floor of the gallery for storage into the cold winter night. The remaining building's program are nestled into this sun-sculpted armature, occupying spaces or voids in the armature as publicity/privacy of the program allows.



Parabolic Forms



Bespoke Armature

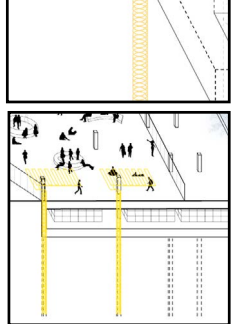
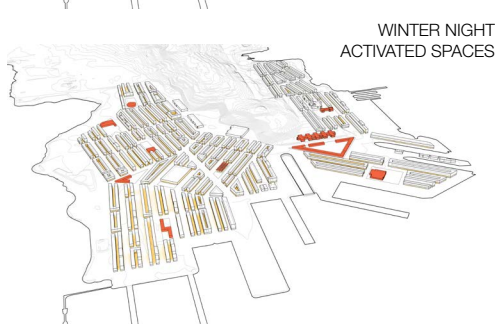
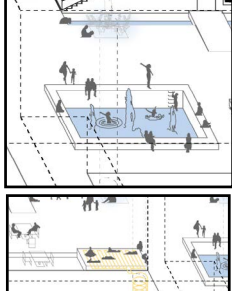
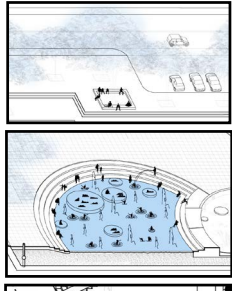
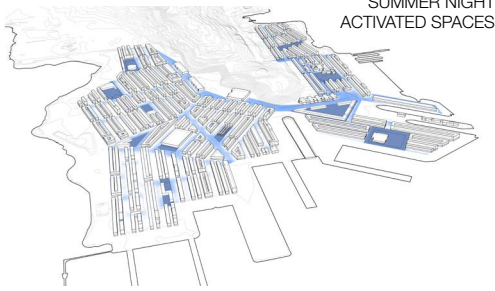
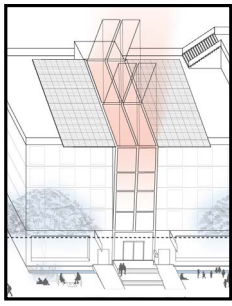
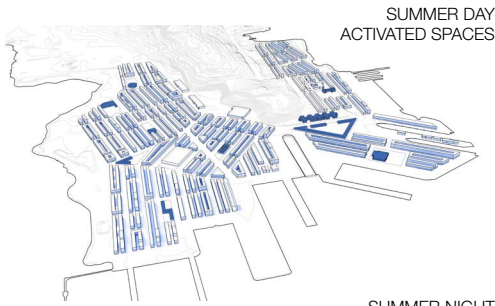
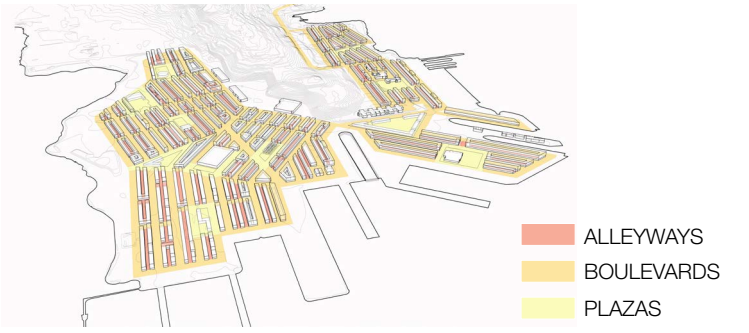




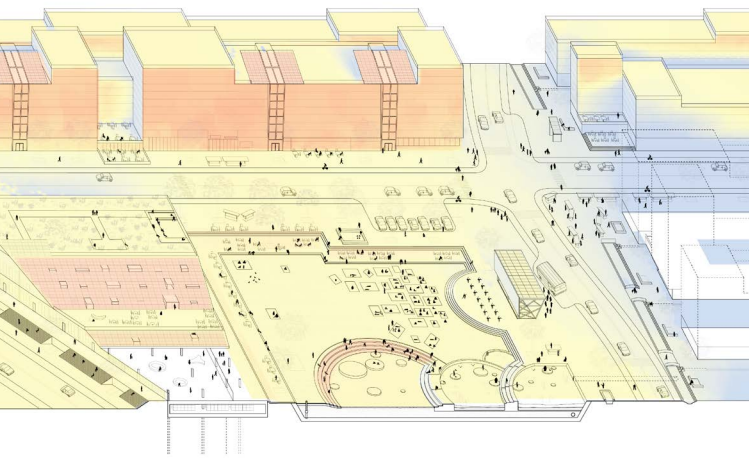
# Urban Thermal Diversity Calculator

From the perspective of an architect, a key shortcoming of the recommendations given by urban climatologists is that their climate models often oversimplify the urban landscape, ignoring the value of microclimates. The urban thermal diversity calculator recognizes this value and uses climate models along with solar radiation studies to recommend at least three types of spaces that architects might use to shape the built environment in a given climate. Each of the spaces is designed to be cooler or warmer at a certain time of day or year, ensuring that there is always a public space that is most desirable.

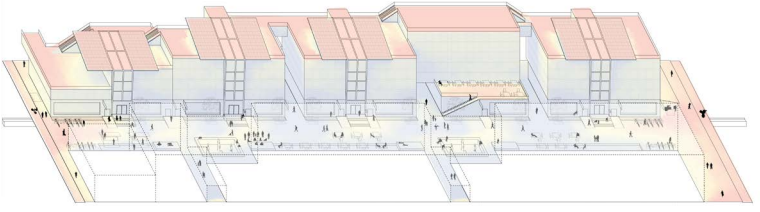
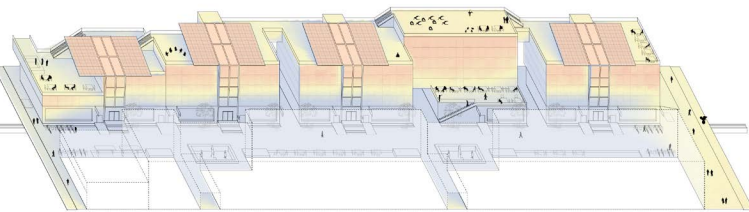
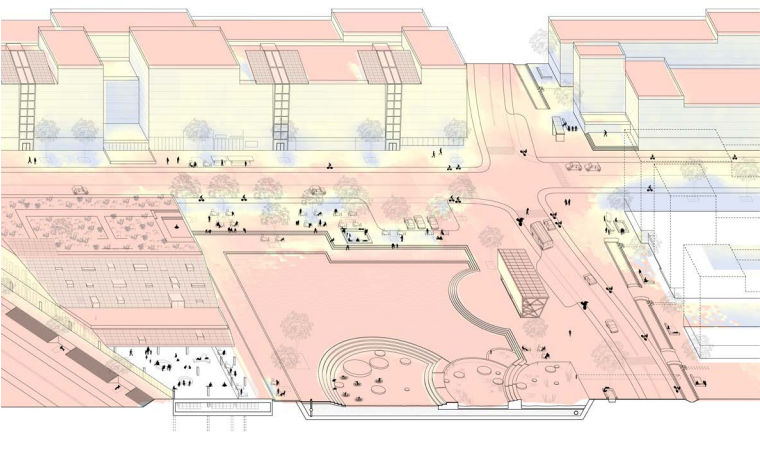
		Height To Width Ratio									
		0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0
Heat Island		-1.5°C	+4.0°C	+6.0°C	+7.0°C	+8.0°C	+8.5°C	+9.0°C	+9.5°C	+10.0°C	+10.5°C
Min Street Daylight		4,800 lux	4,100 lux	3,600 lux	3,200 lux	2,900 lux	2,700 lux	2,400 lux	2,300 lux	2,200 lux	2,100 lux
Number of Floors	10										
	9										
	8										
	7										
	6										
	5										
	4										
	3										
	2										



WINTER DAYS



SUMMER DAYS





# Suburban Agricultural Calculator

The calculator was built to help plan the development future suburban agricultural settlements by using the metabolic rate of the human being as its unit system and tracing the flow of energy from incoming sun through the land uses to the human. After performing a number of analyses on a terrain surface and weather file for a proposed site, the calculator ultimately outputs a maximum number of people that can be supported on the land for given input land uses. Also included is the limiting factor of human support (i.e. electricity, food, or biofuel).

GROWING SEASON WITHOUT GREENHOUSES



GROWING SEASON WITH GREENHOUSES



FULLY DEVELOPED SUBURBAN AGRICULTURAL SCHEME

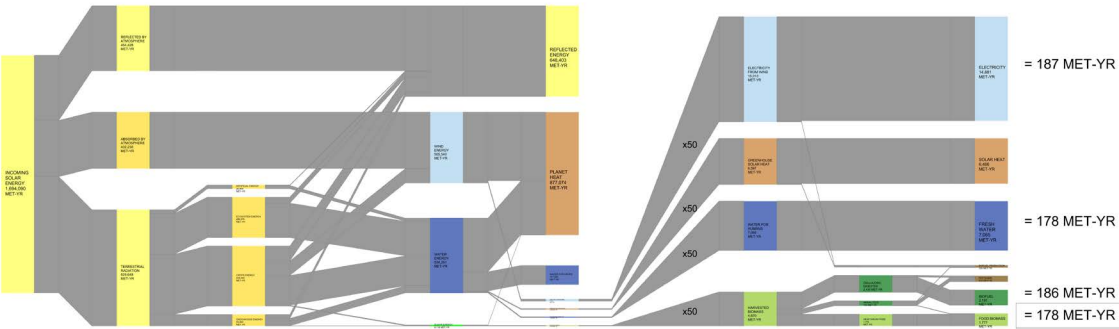


THE AGRICULTURAL CALCULATOR INTERFACE



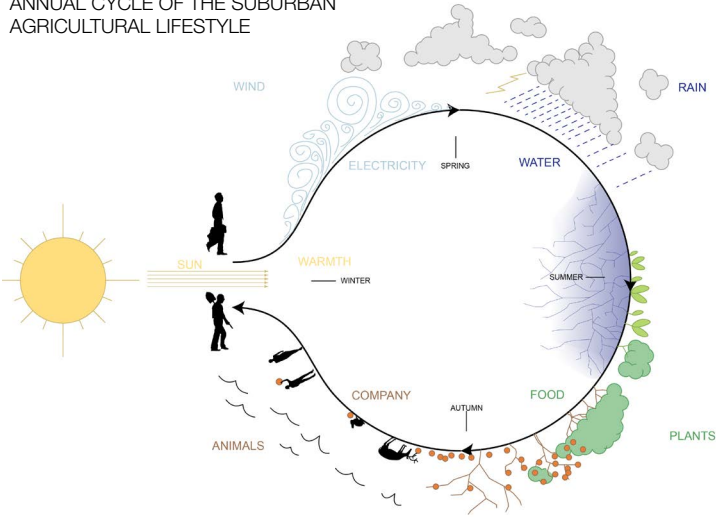
**LIMITING FACTOR  
FOOD + WATER**

**CAPITAL COST  
\$7,525,810**

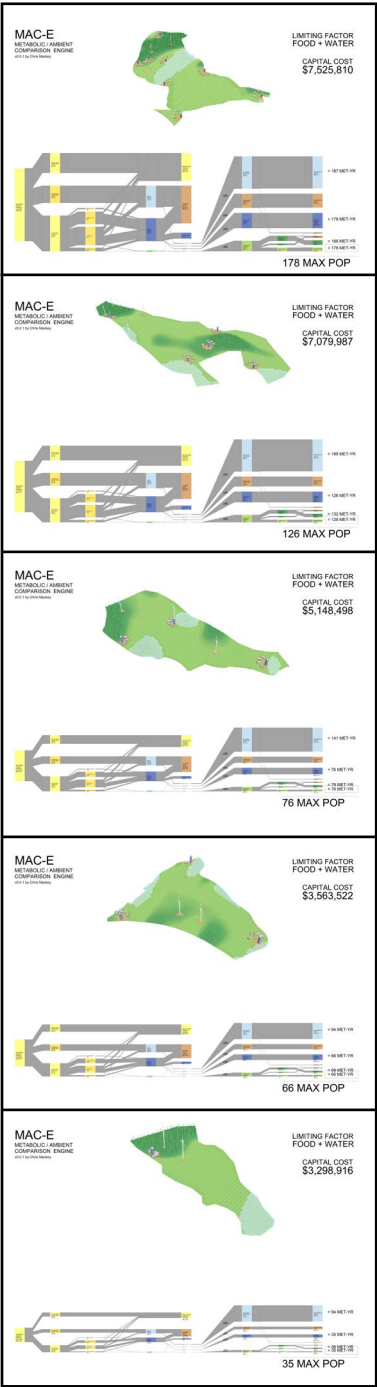


**178 MAX POP**

ANNUAL CYCLE OF THE SUBURBAN AGRICULTURAL LIFESTYLE



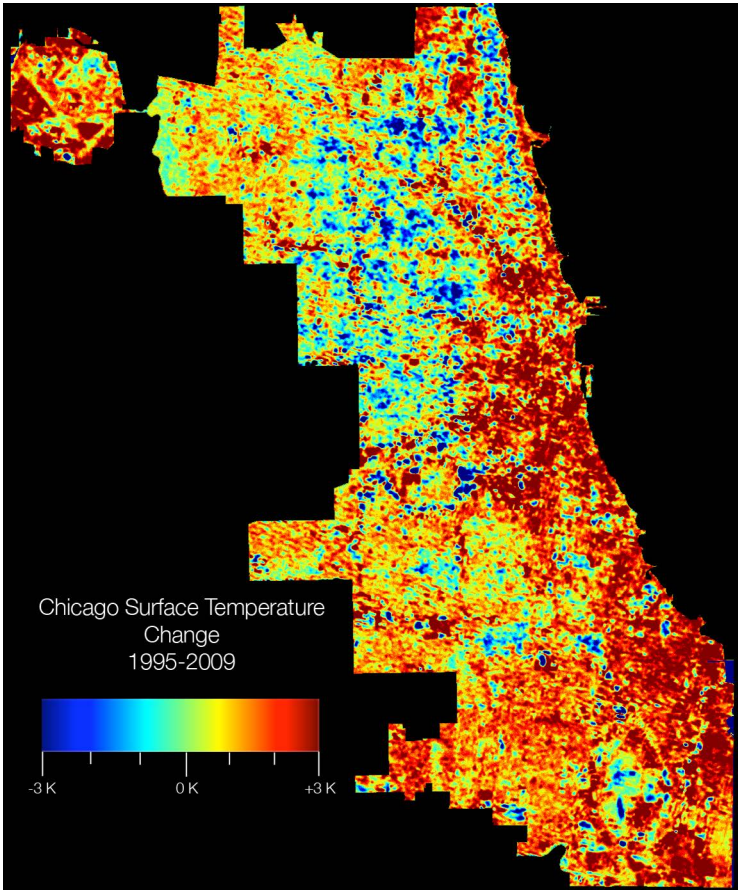
DIFFERENT TERRAIN SCENARIOS



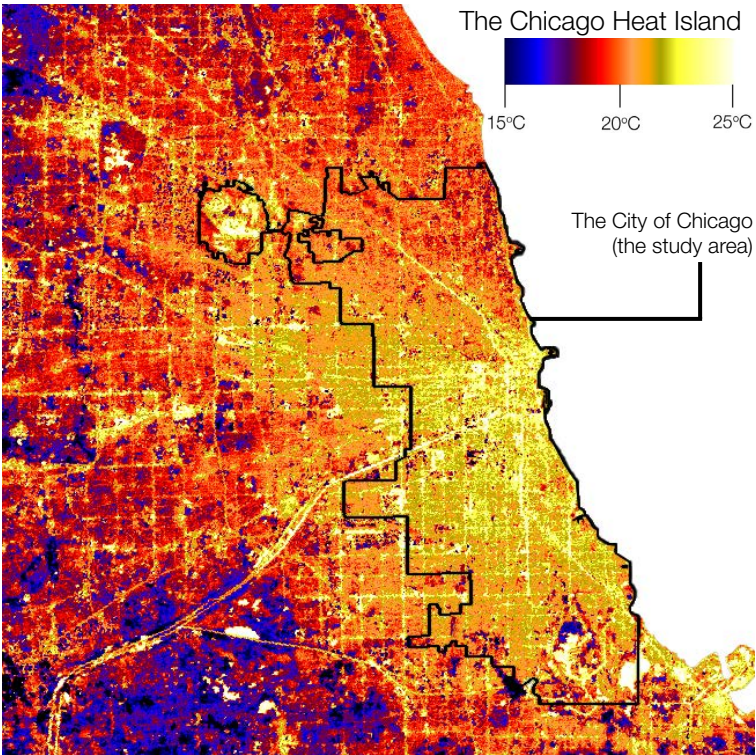
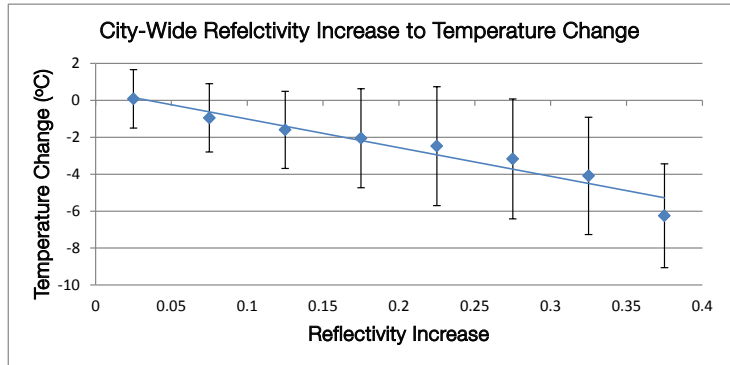
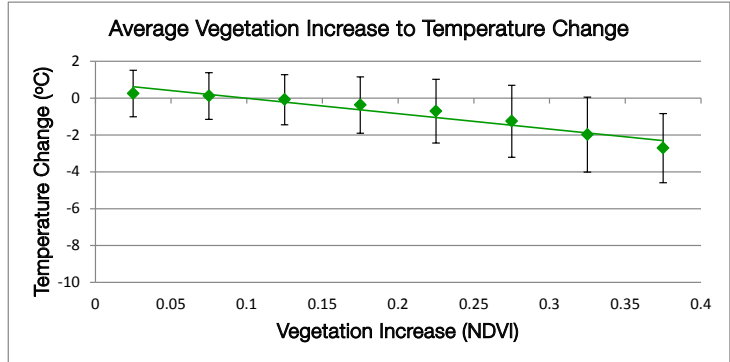


# Urban Heat Island: Vegetation vs. Reflection

In the face of urban heat island and climate change, cities such as Chicago have tried to cool their urban climate with new reflective and vegetated surfaces. This study evaluates the comparative effectiveness of these efforts using thermal and multispectral satellite data from NASA. Results were published to the journal Building and Environment.



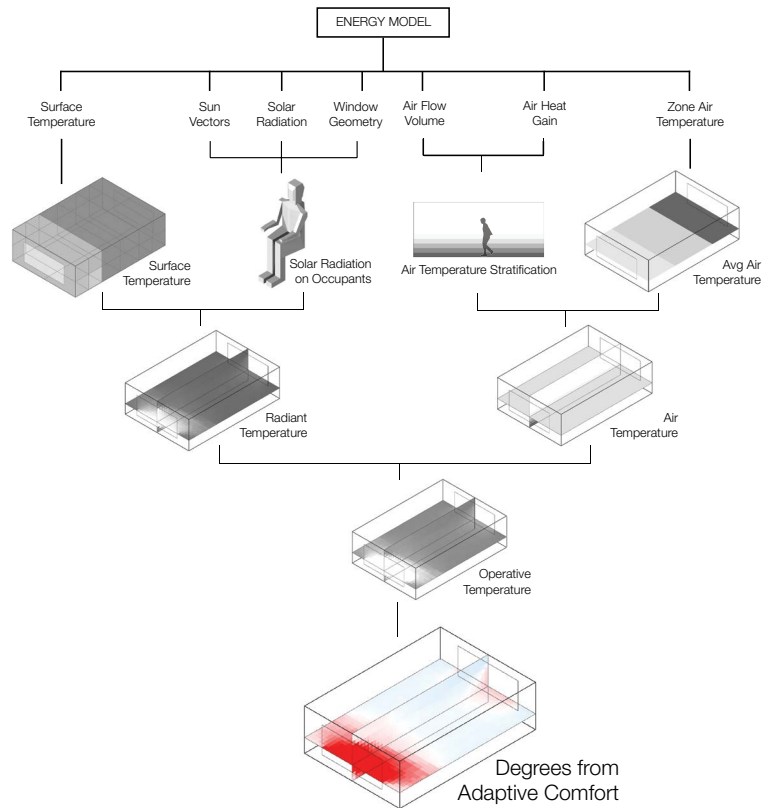
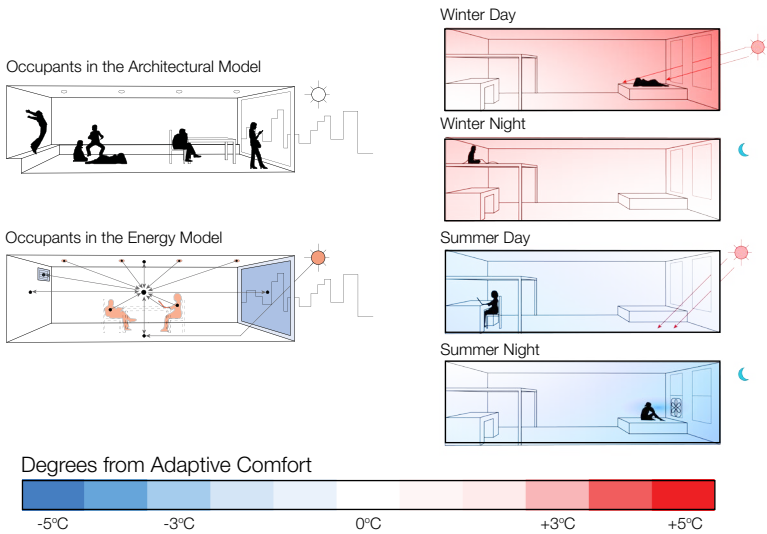
Changes in surface temperature are directly correlated to changes in vegetation and reflectivity.



Aerial Image Verification		
	New Reflective Roof	New Street Trees
1998 Aerial		
2010 Aerial		
Vegetation Change (NDVI)	N/A	+0.11
Reflectivity Change (Albedo)	+0.16	N/A
Temperature Change (°C)	-5.0 °C	-1.1 °C

# Architectural Microclimate Maps

To assist in the use of energy model results towards an instrumental end in the design process instead of a merely analytical one, a method was developed to synthesize such results into microclimate maps. Such maps are used to evaluate the success of design proposals and help locate indoor program and occupant behavior in a way that is synergized with microclimate.



## NATURALLY VENTILATED APARTMENT - LOS ANGELES - AUGUST

