INTERACTIVE ACTIVITY

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March 28, 2019

SCUP PACIFIC CONFERENCE

Biophilic Design at CSU's Biology Building

hord | coplan | macht

Learning Outcomes

1. Identify **opportunities** in the built environment **on your campus** where **biophilic design elements** could **positively impact** the wellbeing of your campus's users.

2. Work with your campus plan to **incorporate small and large-scale biophilic design components** into future buildings.

3. Discuss **the impact biophilic design has on building occupants** and **review heat mapping data** from the Biology Building to determine what types of spaces people are most drawn.

4. List the **14 elements of biophilic design**, including the patterns, colors, and textures from the natural environment that humans repeat and celebrate in the built environment.

01 Introductions

02 Campus Vision

03 Science Exhibit Design

04 Professor & Student Perspective

05 Biophilic Design & Sustainability

06 Interactive Activity & Panel Discussion

Q&A

01 INTRODUCTIONS

INTEGRATED TEAMS

JEN CORDES
Hord Coplan Macht

ARA MASSEY
US Green Building Council (USGBC)

TRACEY ABEL
Colorado State University

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Studio Tectonic

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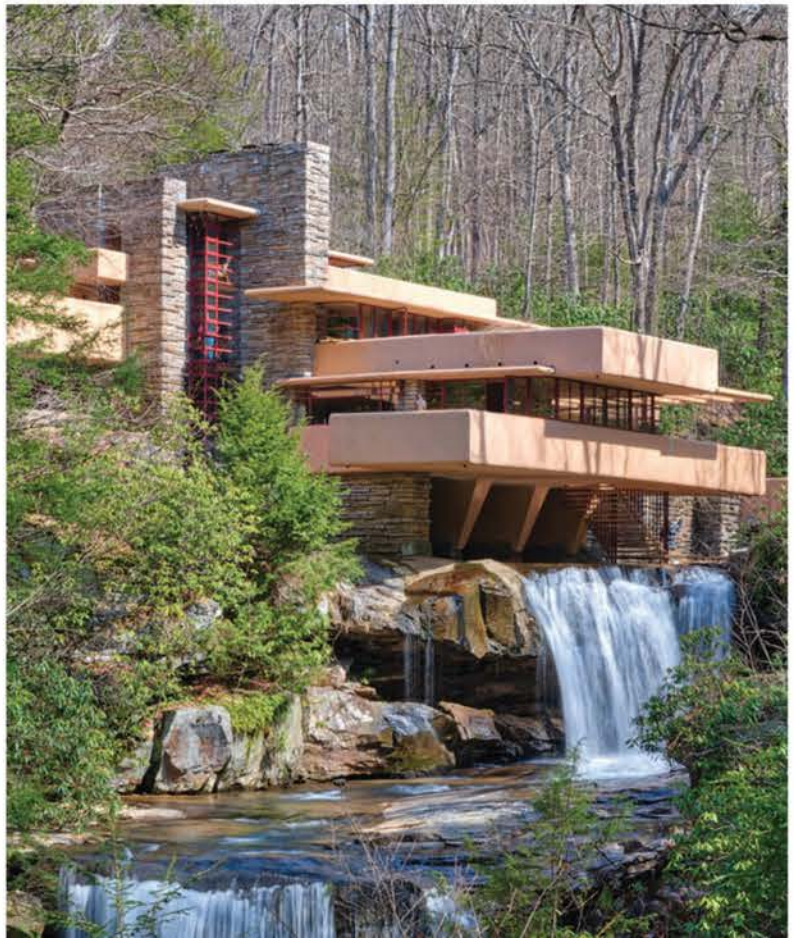
Colorado State University

What is biophilia?

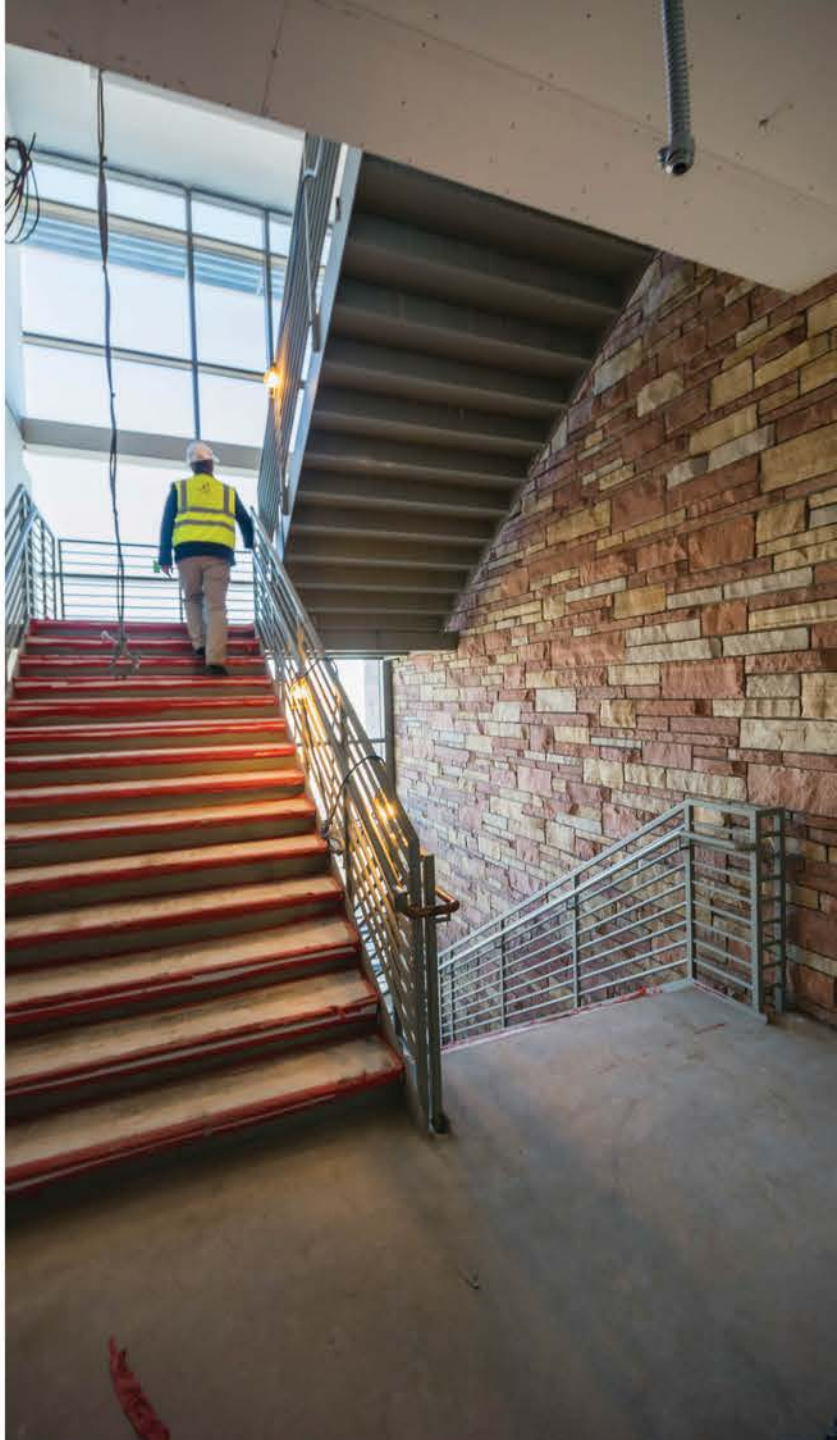
Incorporating nature into the built environment




BOSS

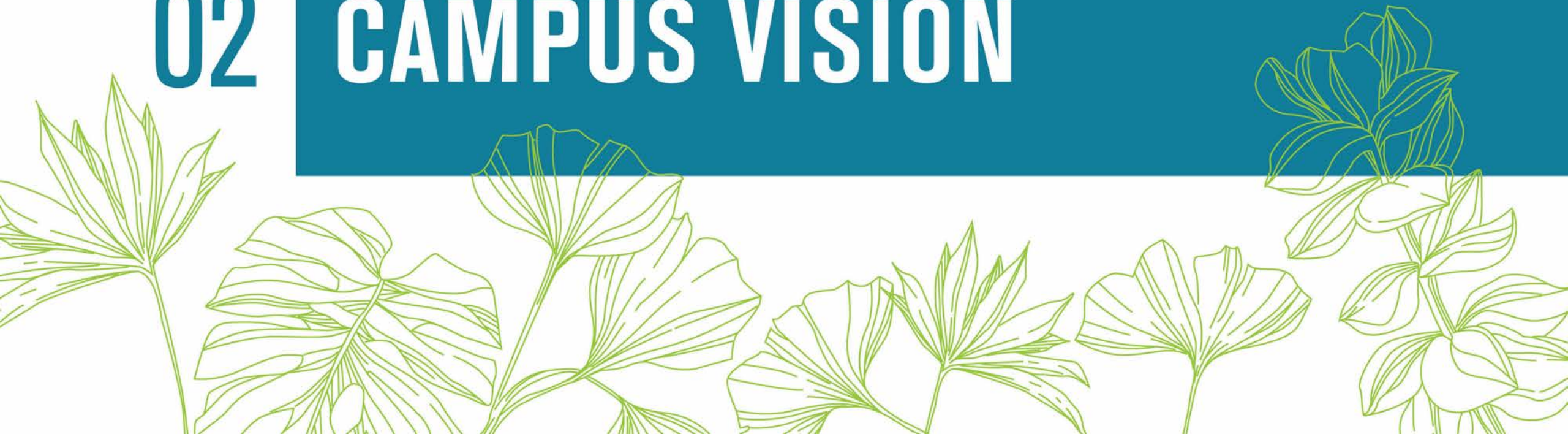

GOLD


JLG LIFT

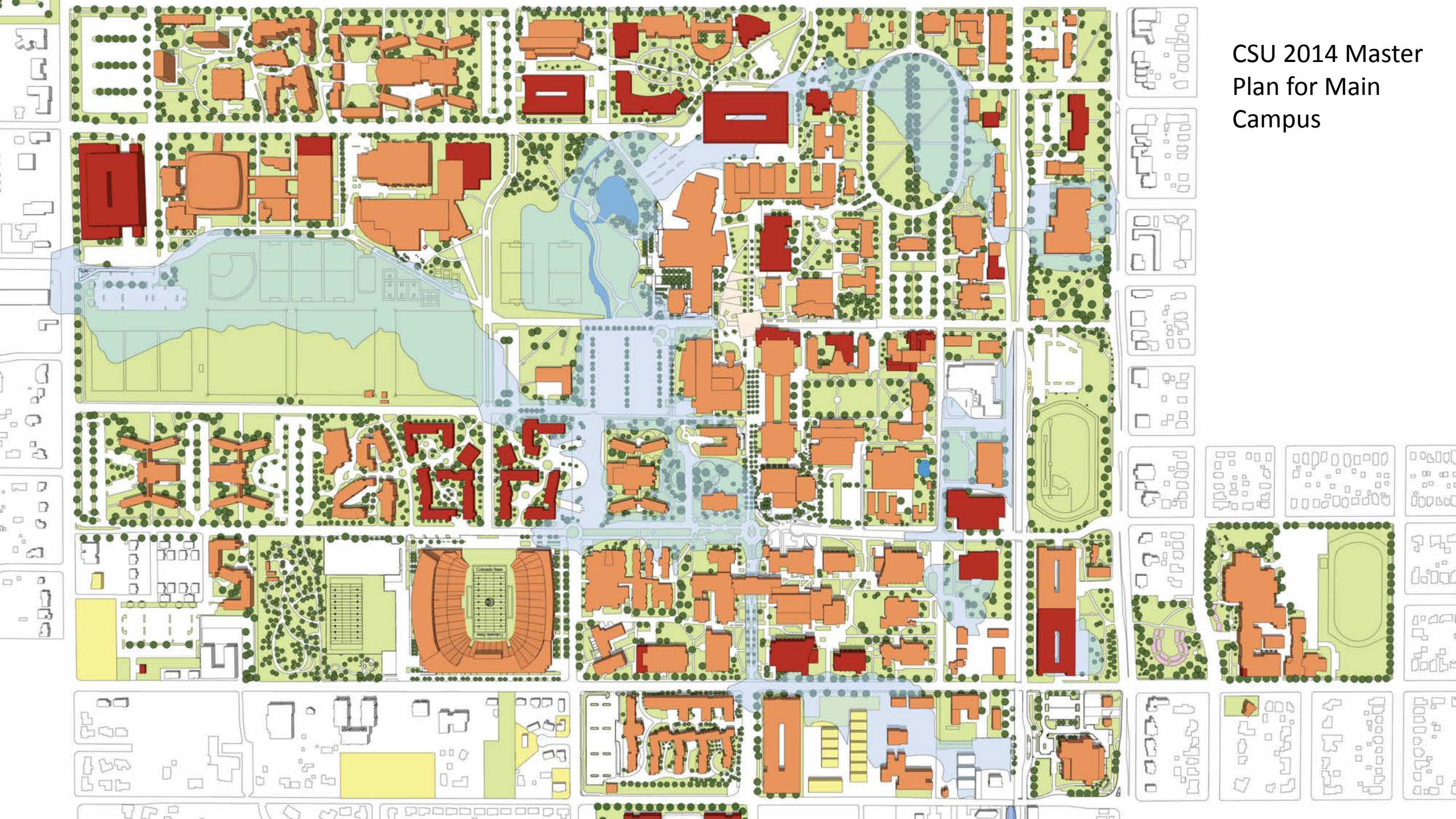


Designing for student success

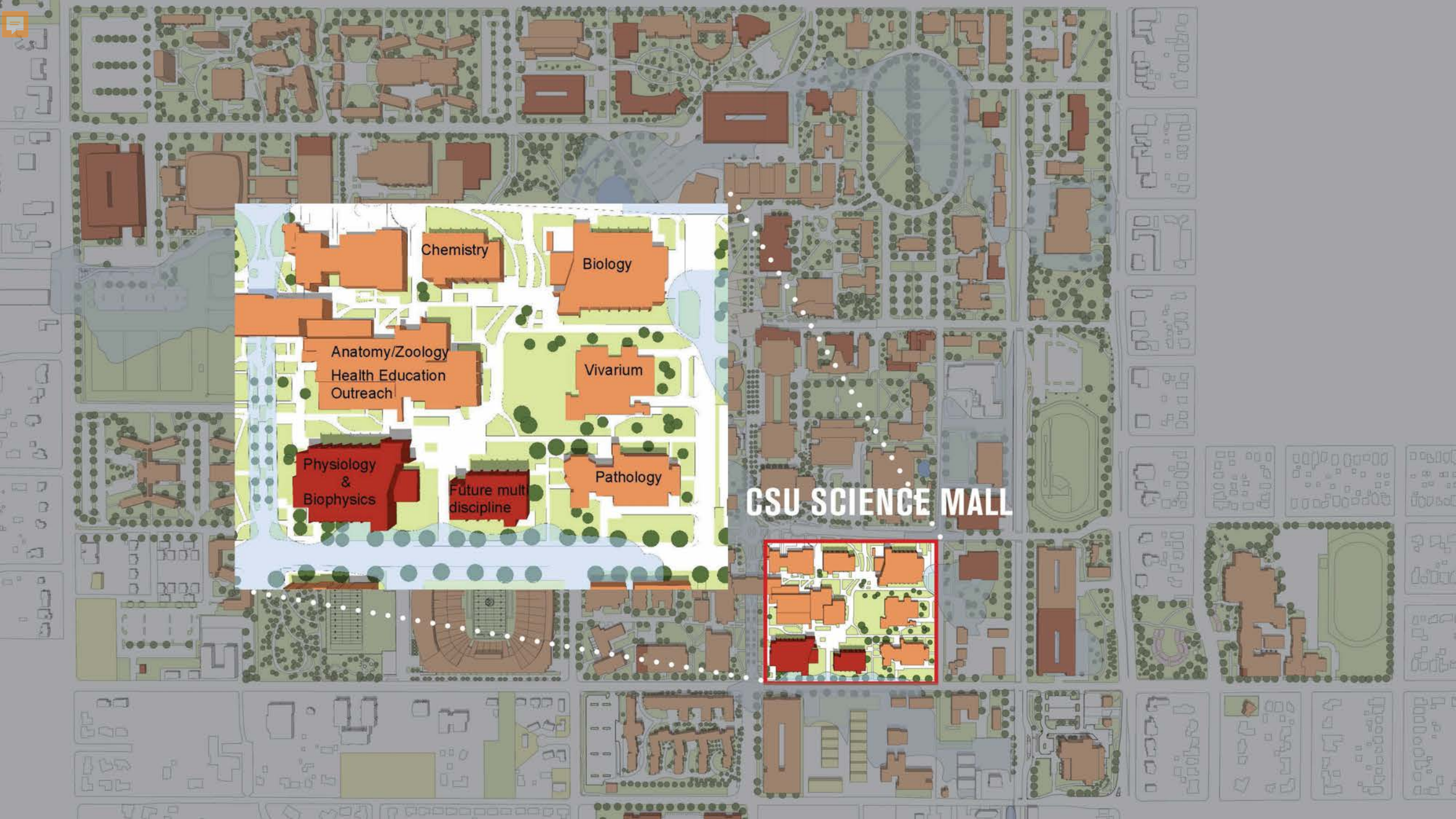
02 CAMPUS VISION

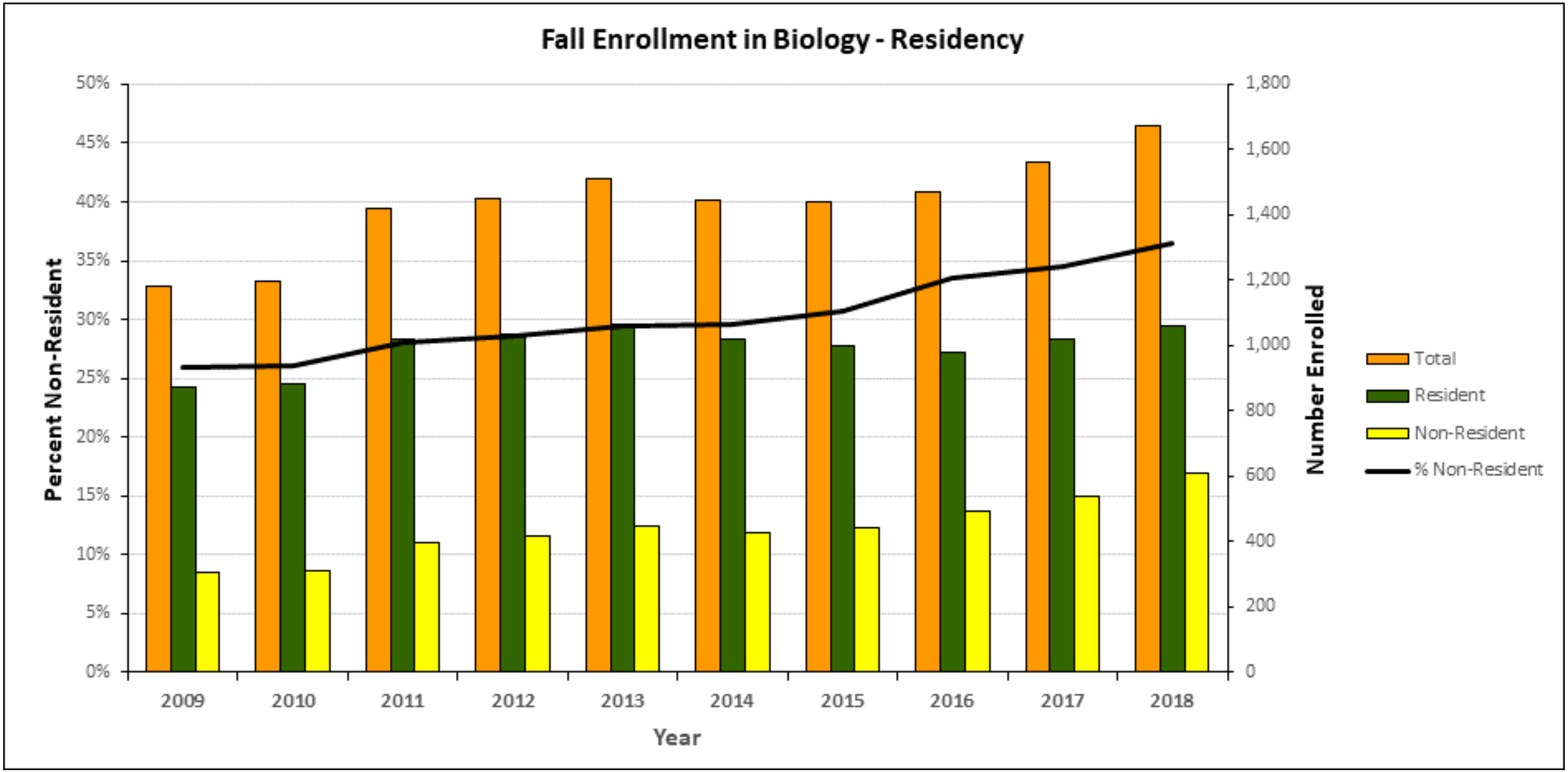


Colorado State University is **committed to excellence**, setting the standard for public research universities in **teaching, research, service and extension** for the benefit of the citizens around the world.

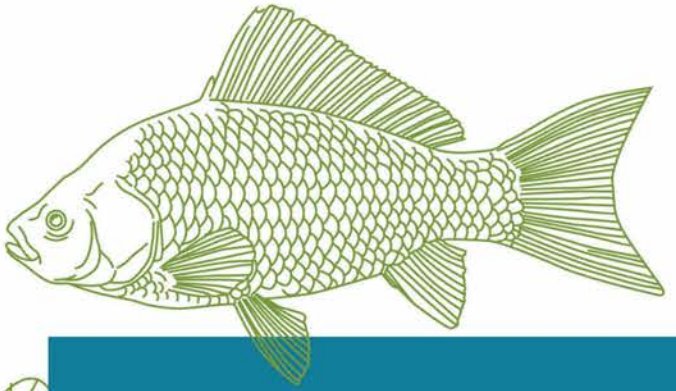


CSU 2014 Master Plan for Main Campus


Chemistry
Biology
Anatomy/Zoology
Health Education
Outreach
Vivarium
Physiology
&
Biophysics
Future mult
discipline
Pathology
CSU SCIENCE MALL


Fall Enrollment in Biology - Residency
Percent Non-Resident
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Number Enrolled
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Year
Total
Resident
Non-Resident
% Non-Resident

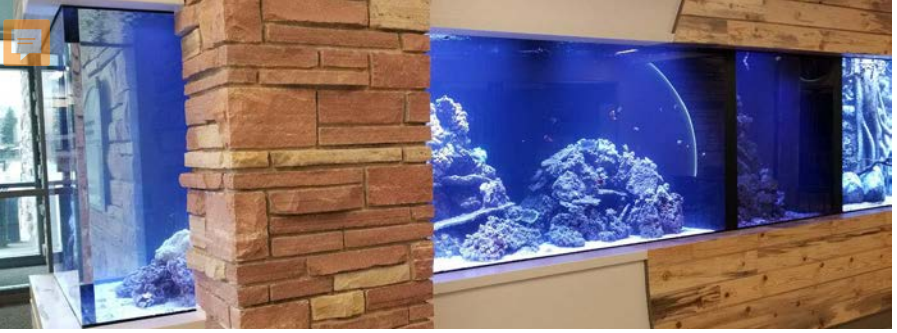

BIOLOGY
HASELDEN



03 SCIENCE EXHIBIT DESIGN


ECOSYSTEMS
BIOSPHERE
MASS/ENERGY
"Am I not partly leaves and vegetable mould myself?"
Life's energy is replenished, sourced from sun and shot as heat. Life's mass is repurposed, salvaged afresh for each new form. Despite surface differences, life's systems act as interchangeable shufflers of mass and energy.

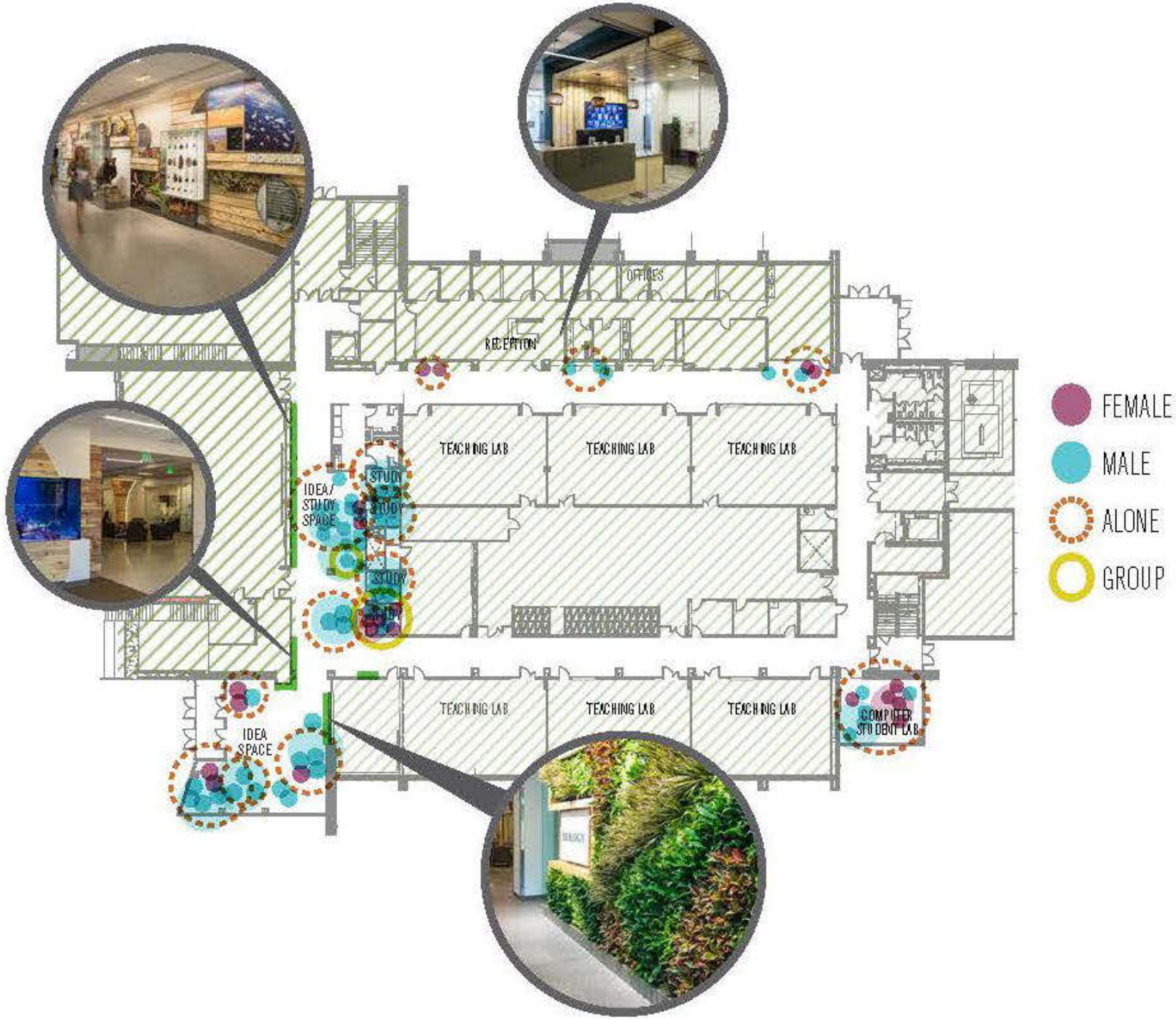
04 PROFESSOR & STUDENT PERSPECTIVE



SENSE OF WONDER

SENSE OF BELONGING IN NATURAL WORLD

SENSE OF BELONGING IN SCIENTIFIC COMMUNITY


OFFICES
RECEPTION
TEACHING LAB
TEACHING LAB
TEACHING LAB
IDEA/
STUDY
SPACE
STUDY
STUDY
STUDY
TEACHING LAB
TEACHING LAB
TEACHING LAB
IDEA
SPACE
COMPUTER
STUDENT LAB
FEMALE
MALE
ALONE
GROUP

05

BIOPHILIC DESIGN & SUSTAINABILITY

		14 PATTERNS		STRESS REDUCTION	COGNITIVE PERFORMANCE	EMOTION, MOOD & PREFERENCE
NATURE IN THE SPACE	1	VISUAL CONNECTION WITH NATURE	****	Lowered blood pressure and heart rate	Improved mental engagement/attentiveness	Positively impacted attitude and overall happiness
	2	NON-VISUAL CONNECTION WITH NATURE	**	Reduced systolic blood pressure and stress hormones	Positively impacted on cognitive performance	Perceived improvements in mental health and tranquility
	3	NON-RHYTHMIC SENSORY STIMULI	**	Positively impacted on heart rate, systolic blood pressure and sympathetic nervous system activity	Observed and quantified behavioral measures of attention and exploration	
	4	THERMAL & AIRFLOW VARIABILITY	**	Positively impacted comfort, well-being and productivity	Positively impacted concentration	Improved perception of temporal and spatial pleasure (alliesthesia)
	5	PRESENCE OF WATER	**	Reduced stress, increased feelings of tranquility, lower heart rate and blood pressure	Improved concentration and memory restoration Enhanced perception and psychological responsiveness	Observed preferences and positive emotional responses
	6	DYNAMIC & DIFFUSE LIGHT	**	Positively impacted circadian system functioning Increased visual comfort		
	7	CONNECTION WITH NATURAL SYSTEMS				Enhanced positive health responses; Shifted perception of environment
NATURAL ANALOGUES	8	BIOMORPHIC FORMS & PATTERNS	*			Observed view preference
	9	MATERIAL CONNECTION WITH NATURE			Decreased diastolic blood pressure Improved creative performance	Improved comfort
	10	COMPLEXITY & ORDER	**	Positively impacted perceptual and physiological stress responses		Observed view preference
NATURE OF THE SPACE	11	PROSPECT	***	Reduced stress	Reduced boredom, irritation, fatigue	Improved comfort and perceived safety
	12	REFUGE	***		Improved concentration, attention and perception of safety	
	13	MYSTERY	**			Introduced strong pleasure responses
	14	RISK/PERIL	*			Resulted in strong dopamine or pleasure responses


MYSTERY
MATERIAL CONNECTION W/ NATURE
DYNAMIC & DIFFUSE LIGHT
RISK/PERIL
BIOMORPHIC FORMS & PATTERNS


REFUGE
THERMAL AND AIRFLOW VARIABILITY
MATERIAL CONNECTION W/ NATURE


PROSPECT
RISK/PERIL
VISUAL CONNECTION WITH NATURE
NON-VISUAL CONNECTION WITH NATURE
THERMAL & AIRFLOW VARIABILITY
BIOLOGY

06 INTERACTIVE ACTIVITY & PANEL DISCUSSION

INTERACTIVE ACTIVITY

Go to this link to vote:

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Link to START

Link to RESULTS

SPACE #1

Link to RESULTS

SPACE #1


DYNAMIC & DIFFUSE LIGHT
RISK/PERIL
PROSPECT
MATERIAL CONNECTION W/ NATURE
REFUGE
REFUGE
VISUAL CONNECTION W/ NATURE
BIOMORPHIC FORMS & PATTERNS

SPACE #2

Link to RESULTS

SPACE #2


VISUAL CONNECTION W/ NATURE
COMPLEXITY & ORDER
NON-VISUAL CONNECTION W/ NATURE
DYNAMIC & DIFFUSE LIGHT
RISK/PERIL
PROSPECT

SPACE #3

Link to RESULTS


PROSPECT
RISK/PERIL
BIOMORPHIC FORMS & PATTERNS
COMPLEXITY & OIRDER
VISUAL CONNECTION W/ NATURE

SPACE #4

Link to RESULTS

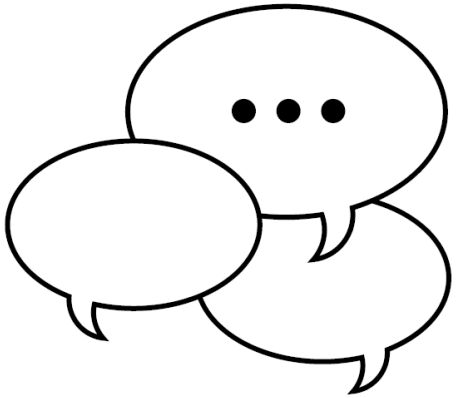
SPACE #4

SPACE #5

Link to RESULTS

SPACE #5


PH
DYNAMIC & DIFFUSE LIGHT
BIOMORPHIC FORMS & PATTERNS
THERMAL & AIRFLOW VARIABILITY
CONNECTION WITH NATURAL SYSTEMS
REFUGE



Are you doing this on your campus?

Panel discussion

THANK YOU

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Visit **hcm2.com** on April 1st to read our whitepaper on this topic!