A Sense of Place:
The Built Environment as a Living Lab

FLETCHER ALEXANDER
SUSTAINABILITY PROGRAMS MANAGER

DR. COLLEEN HATFIELD
FACULTY, COLLEGE OF NATURAL SCIENCES
RAWLINS PROFESSOR OF ENVIRONMENTAL LITERACY

CALIFORNIA STATE UNIVERSITY, CHICO
CSU, Chico CALL Proposals

- **2013 / 2014**
  - Dr. Jim Pushnik, Dr. Dave Brown, Dr. Eric Willard
    - Holt, Physical Sciences, Tehama, O’Connell
- **2014 / 2015**
  - Dr. Colleen Hatfield, Dr. Nate Millard, Dr. Thia Wolf
    - Shasta, Lassen, Sutter, Whitney, and Konkow Halls
    - Student Services Center
- **2015/2016**
  - Dr. Kristen Kaczynski, Dr. Janine Stone
    - Taylor II, Butte Hall +2 TBD (WREC, PSII Solar)
Objectives

• Establish access to campus building energy consumption data

• Foster dialogue between students, faculty, administration and facilities management regarding campus energy consumption and opportunities for conservation.
Objectives

• Integrate ‘real’ campus utility data into the Sustainability Pathway course curriculum utilizing cutting-edge utility management software programs and analytics in new and innovative ways.
Pathways in General Education

Diversity Studies
How difference—cultural, racial, sexual, biological, linguistic, or geographic—shapes who we are and how we live together. More

Ethics, Justice, and Policy Studies
Explore how ethics and justice help inform policy in areas related to the natural and human environments. More

Food Studies
We are what we eat! Explore the physical, social, and cultural dimensions of food at home and around the world. More

Gender and Sexuality Studies
Explore the diversity of sexual desire, social relationships, gender politics, cultural artistry, and biological systems. More

Global Development Studies
Explore the peoples of Latin America, the Middle East, Africa, and Asia and the challenges they face. More

Great Books and Ideas
Big questions and revolutionary solutions—the world's great books and ideas, ancient to modern, controversial to classic! More

Health and Wellness Studies
Students can apply the skills and knowledge gained in these classes to their lives and their health. More

International Studies
Explore the role of the United States and the economic, political, and cultural forces of globalization. More

Science, Technology, and Values
Explore how science and technology can shape the human condition—in the past, present and future. More

Sustainability Studies
Explore the deep connections between the health and vitality of the natural environment and human well-being. More
# General Education Pathways @ CSUC

## General Education Interdisciplinary Pathway Minors: Course Titles

<table>
<thead>
<tr>
<th>Great Books &amp; Ideas</th>
<th>Health &amp; Wellness</th>
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## Upper Division Pathway Courses

- CSUC 201: Health and Wellness
- CSUC 202: International Studies
- CSUC 203: Science, Technology & Values
- CSUC 204: Sustainability

## Additional Resources

- [General Education Pathways at CSUC](#)
## General Education Interdisciplinary Pathway Minors: Course Titles

### Health & Wellness

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<td>GEOS 10: Introduction to Environmental Science</td>
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<td>ARTH 100: Art Appreciation/Multicultural Perspectives</td>
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<td>ENGL 152: Introduction to Dance</td>
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<td>ANTH 111: Survey of Physical Anthropology</td>
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<td>RELIG 205: Introduction to Islam</td>
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Sustainability Pathway

Lower Division

Foundation Courses (may use one of the following courses towards 9 units of lower division Pathway):
- CHEM 100: Chemistry and Current Issues
- CIVL 175: Biological Processes in Environmental Engineering
- GEOG 101 I: Physical Geography
- GEOS 130: Introduction to Environmental Science
- NSCI 101: Intro to Earth's Environment
- NSCI/BIOL 102: Introduction to Living Systems

- CMGT 275: Architectural History
- THEA 252: Politics, Performance, and Power

Any approved Foreign Language course
- ENGL/AST 252 USD: American Indian Literature
- PHIL 129: Environmental Ethics
- RELS 247: Religion, Ethics, and Ecology

- GEOG 102 GC: Human Geography
- HIST 105 GC: Global Environmental History
- RECR 210: Natural Resources and the Informed Citizen

- ANTH 112 GC: Society, Time, and Archaeology
- ANTH 116 GC: Power and Scarcity: The Anthropology of Change
- GEOG 106 USD: The American West

- ENVL 105 I: Environmental Literacy
- NFSC 100: Basic Nutrition
- UNIV 105 I: Self, Identity, and Sustainability

Upper Division

Natural Sciences
- BIOL 334: Conservation Ecology
- GEOG 330 (Z)(I): Environmental Science
- PSSC 390 GC (F): Food Forever: Comparisons of Sustainable Food Production Systems
- PSSC 392 GC (S): World Food and Fiber Systems

Humanities
- ENGL 338 (Z)(I): Environmental Rhetoric
- HIST 341 USD: American Environment
- PHIL 336 USD: American Indian Environmental Philosophies

Social Sciences
- ECON 365: Environmental Economics
- GEOG 304: Environmental Issues
- SOCI 420 USD: Environmental Sociology
Lucid BuildingOS & Building Dashboard

- Web-accessible energy management tool

- Lucid Design Group
  - https://buildingos.com/

- http://buildingdashboard.net/csuchico/#/csuchico
Welcome to California State University, Chico’s Building Dashboard! This platform provides a public point of access to information on building energy consumption across the Chico State Campus. The Dashboard is connected to building-level electricity meters on four campus buildings and provides real-time consumption data that can be
• Building comparisons
• Within building comparison
  ○ Compare and contrast various time periods
• Energy use
  ○ per person
  ○ per square foot
  ○ hourly rate
## Proposed: Seven University Buildings & Five Campus Housing

### Older Buildings (pre-1980s)
- Holt Hall
- Physical Sciences
- Butte Hall*
- Shasta (210)
- Lassen (210)
- Whitney (512)
- Konkow (78)*

### Newer Buildings (post-1990s)
- O’Connell
- Tehama
- Student Services
- Taylor II*
- Sutter (234)

*proposed
Efforts spanning all CALL grants

- Engage students with the Lucid Energy Dashboard
- Quantify electricity usage patterns
- Link to CO2 Emissions
CALL I

- Energy use and how the information can inform the Climate Action Plan (CAP)

- ENVL105
  - Measure impact of daily academic routines in terms of energy use and greenhouse gas emissions

- GEOS330
  - Engage with Facilities and Institute for Sustainable Development
  - Couple Lucid energy use data with lighting measurements at the building scale
  - Presentations to ENVL105
CALL II

- **UNIV105 and ENVL385**
  - Dorm meter focus
  - Patterns of energy use related to campus living
  - Video essays to engage dorm residents and increase awareness
Peer-to-Peer Outreach Videos

- https://www.youtube.com/watch?v=ENr7oBIw3sU
- https://www.youtube.com/watch?v=yaxEUB8ft24
- https://www.youtube.com/watch?v=zHEk9Y5FlAE
- https://www.youtube.com/watch?v=ePL_x4jqDjU
- https://www.youtube.com/watch?v=leOgoLE4OLU
CALL III

- GEOS130:
  - Link energy consumption across the campus to how humans are contributing to environmental problems

- ECON365:
  - Evaluate the extent to which observed differences in energy use are a function of structural versus behavioral factors
  - Develop a short contingent valuation survey to estimate Chico students’ willingness to pay for a more sustainable campus with decreased emissions.
Expanded Opportunities

- **Energy use**
  - Full building
  - Sub-metering for some of buildings (finer resolution)

- **Water use**
  - Chilled and heated

- **Additional utility goals**
  - Natural gas
  - Potable water
  - Others
Challenges

• Coordination and Integration
  o Facilities – Connectivity with EMS
  o Administration

• Lucid
  o User-friendly interface