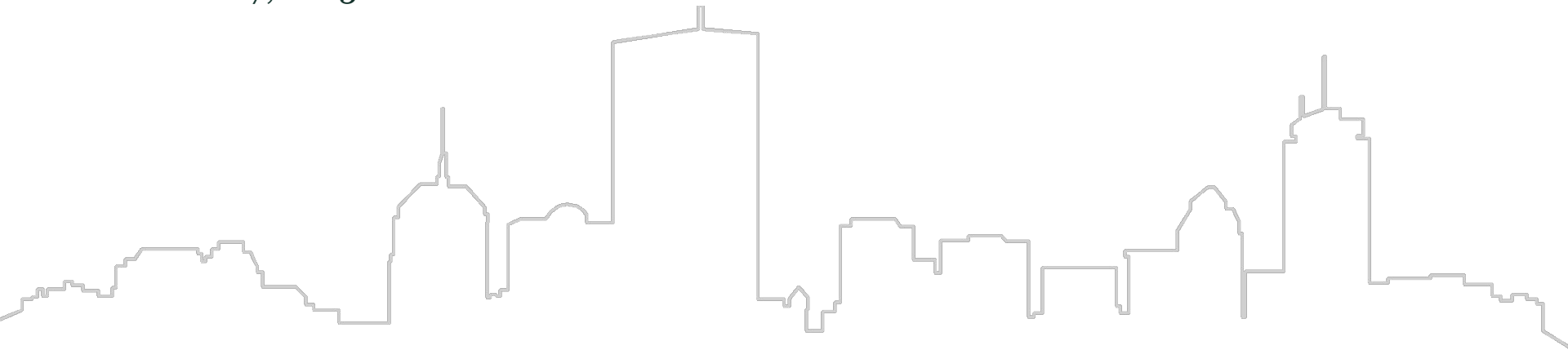
Campus as Lab Best Practices to Increase the Climate Action Impact of Higher Education Institutions

Presented by the Boston Green Ribbon Commission Higher Ed Working Group and Campus as Lab Community of Practice

November 7, 2023



Agenda

2:00	Program Description
2:05	Campus as Lab Overview
2:15	The Harvard University Living Lab Initiative
2:30	University of British Columbia Campus as Lab Initiative
2:45	Chico State Campus as Lab Initiative
3:00	Moderated Discussion & Q&A

Speakers & Panelists



Travis Milnes
Specialist for Campus as Lab within the Office of Sustainability at the University of Calgary



Dr. Ijeoma Nwagwu
Co-Chair, Campus as Lab Community of Practice, Princeton Office of Sustainability



Heather Henriksen
Chief Sustainability Officer, Harvard University



Liska Richer
Manager of the SEEDS Sustainability Program, University of British Columbia



Mark Stemen
Professor of Geography and Planning at CSU, Chico

Campus as Lab Overview



Travis Milnes, MA
Co-Chair, Campus as Lab Community of Practice
Specialist, Campus as Learning Lab
University of Calgary, Office of Sustainability



Dr. Ijeoma Nwagwu
Co-Chair, Campus as Lab Community of Practice
Interim Director of Sustainability
Princeton Office of Sustainability

Roadmap

- What are Living Labs (ENOLL)
- What are Campus as Living Labs
- Campus as Lab Case Studies
- Campus as Lab Community of Practice

What is a Living Lab (ENOLL)

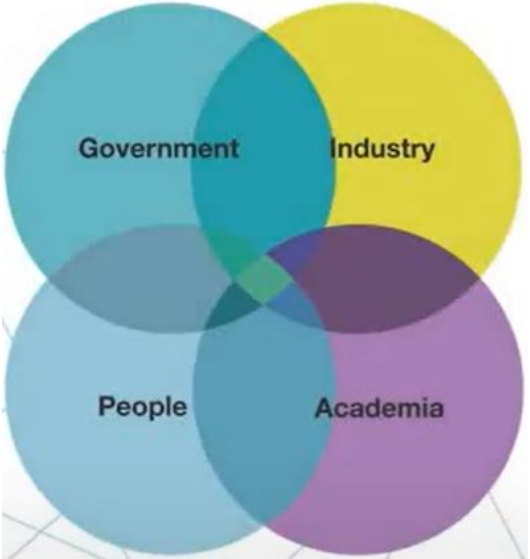
Living Labs promote **cross-collaboration** between citizens, research organizations, companies and government.

Utilize **real-life environments** as testing grounds for iterative development and sustainable impact.

Co-creation of prototyping, **testing, and innovations** (e.g. policy, products, marketing, technology, etc.).

ENOLL was established in 2006

ENOLL Member Catalog 2022
Zsuzsanna Bodi – CaL CoP 2018



Quadruple Helix Model to Innovation

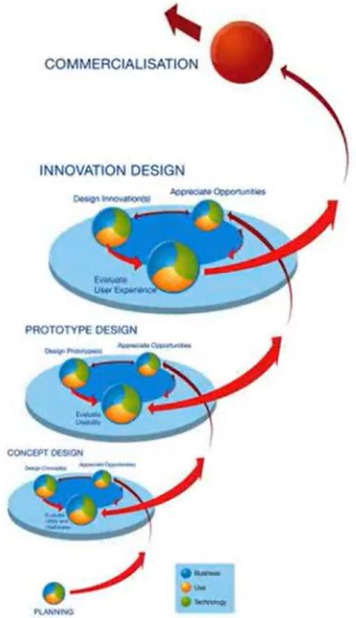
European Network of Living Labs

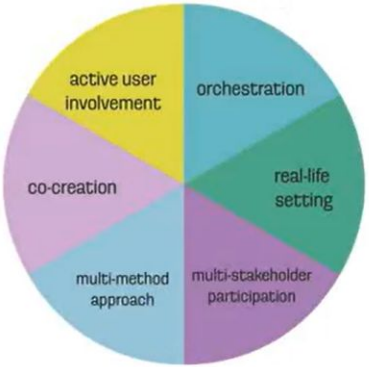
Innovation through Community

People can be involved in all phases of the innovation process thanks to Living Lab methods. From idea generation to building prototypes, from design to commercialization.

ENoLL Living Labs are in regular contact with **1,650,000 citizens** for experimentation and testing purposes.

ENoLL Living Labs reach out to around **50 million citizens** with their activities and active presence in local communities.

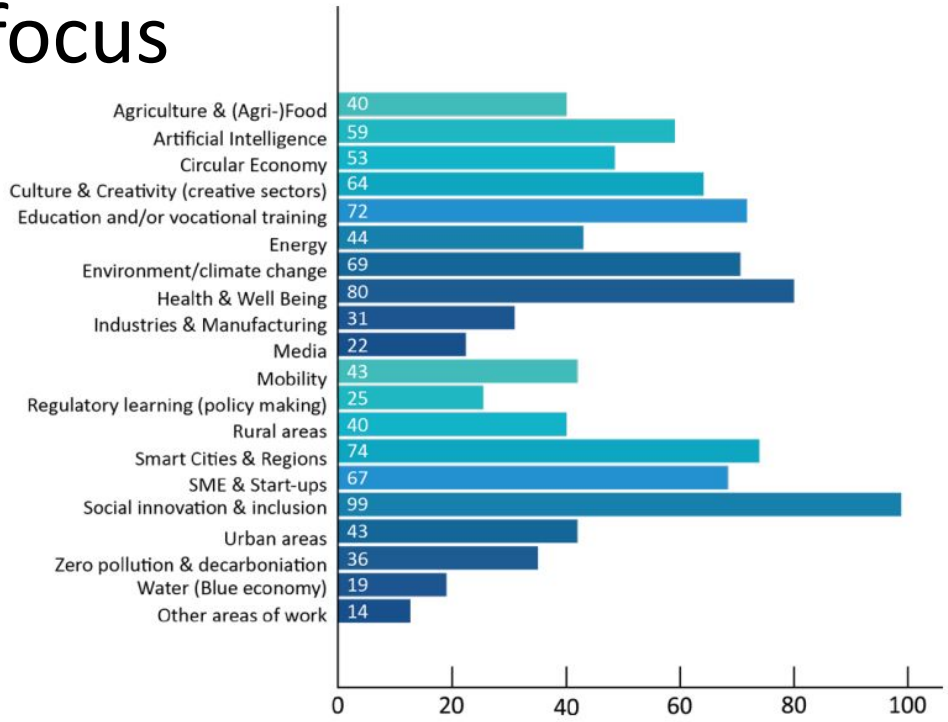




Zsuzsanna Bodi – CaL CoP 2018

European Network of Living Labs

Areas of focus



ENOLL Member Catalog 2022

European Network of Living Labs

Why are institutions ideal for Living Labs

- Large parcel of land under one decision-maker
- Own infrastructure
- Mandate to generate and disseminate knowledge
- Subject matter experts on campus
- Tolerance for longer payback periods
- Innovation Seeking

So, what is Campus as a Living Lab

Campus as Living Labs promote **cross-collaboration** between students, faculty, staff, and sometimes the broader community.

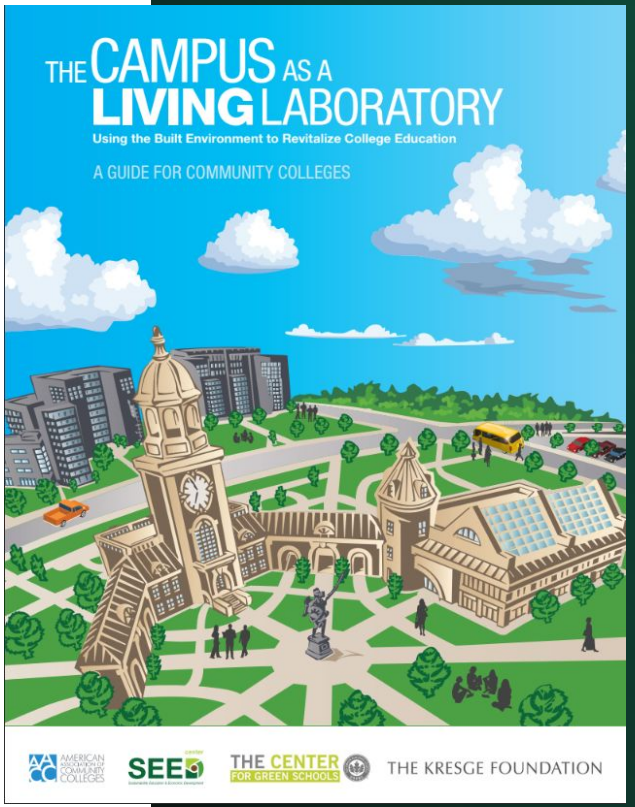
Utilize **real-life environments both on- and off-campus** as testing grounds for iterative development and sustainable impact.

Co-production of knowledge and innovation involving student **experiential learning and/or applied research.**

Haddock, R.L. and Savage, C. (2020), "Campus as Lab: Using Post-Secondary Campuses as Petri Dishes for Advancing the Sustainable Development Goals", Sengupta, E., Blessinger, P. and Yamin, T.S. (Ed.) *University Partnerships for Sustainable Development* (*Innovations in Higher Education Teaching and Learning, Vol. 20*), Emerald Publishing Limited, Bingley, pp. 67-80. https://doi.org/10.1108/S2055-364120200000020008

Early North American Adopters: Community Colleges

- Campus Living Labs utilized as a vehicle to facilitate experiential learning
- Green retrofits and reducing carbon footprint through student projects
- Leveraging campus resources and student educational opportunities to enhance career pathways.



First published 2008, re-released 2018

Community College Case Studies

Cedar Valley College



Maria Boccalandro – CaL CoP 2019

San Mateo County Community College District



Joe Fullerton – CaL CoP 2019

University Campus Case Studies

Penn State
Sustainability Institute



Peter Buck and Krista Bailey – CaL CoP 2022

Boston University
Campus Climate Lab
Institute for Global Sustainability



Dennis Carlberg and Rebecca Pearl-Martinez– CaL CoP 2022

Campus as Lab and Community Partnerships

San Diego State University

The Sage Project



Jessica Barlow – CaL CoP 2022

Rutgers

C2R2



Carrie Ferraro – CaL CoP 2021

Campus as Lab Community of Practice

Who we are: group of professionals from over 200 global higher education institutions (primarily NA) passionate about CAL initiatives that address real-world sustainability challenges

What we do: gather regularly to share knowledge and best practices in this field (mainly through a monthly webinar) empowering CAL sustainability professions to more effectively:

1.**Cultivate an ethos** of sustainability by fostering collaborative research projects and coursework combining operations, academia and communities

2.**Create** experiential learning opportunities for students to develop real-world leadership skills in the context of sustainability problem-solving



Monthly webinars featuring case studies and best practices



Collaborative space for the co-production of knowledge



Positive feedback and professional support



CaL CoP has grown to 200+ institutional members

Campus as Lab Community of Practice (CaL CoP) Launched 2016



Monthly webinars featuring case studies and best practices



Collaborative space for the co-production of knowledge



Positive feedback and professional support



CaL CoP has grown to 200+ institutional members

Join CaL CoP and/or explore resources and webinar archives

Contact Information

Travis Milnes (He/Him) MA – Co-chair
Specialist, Campus as a Learning Lab
Sustainability Partnerships and Engagement
Office of Sustainability, University of Calgary
travis.milnes@ucalgary.ca

Ijeoma Nwagwu, PhD – Co-chair
Interim Director
Office of Sustainability
Princeton University
ijeoma.nwagwu@princeton.edu



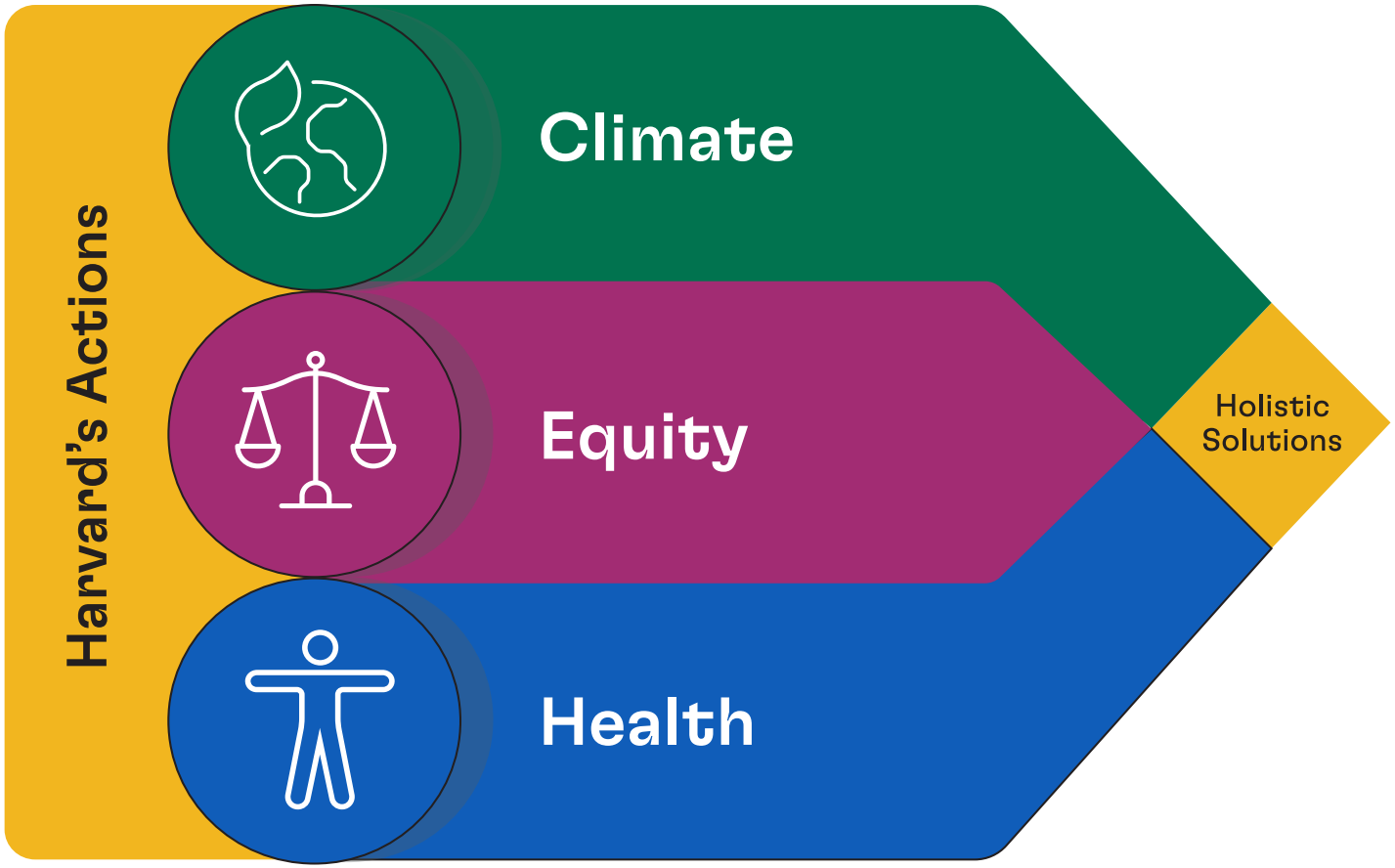
Translating research into practice at Harvard University and beyond



Heather Henriksen, MPA
Chief Sustainability Officer
Harvard University

HARVARD UNIVERSITY | Sustainability

HARVARD'S APPROACH: ACCELERATING ACTION THROUGH AN INTERSECTIONAL LENS

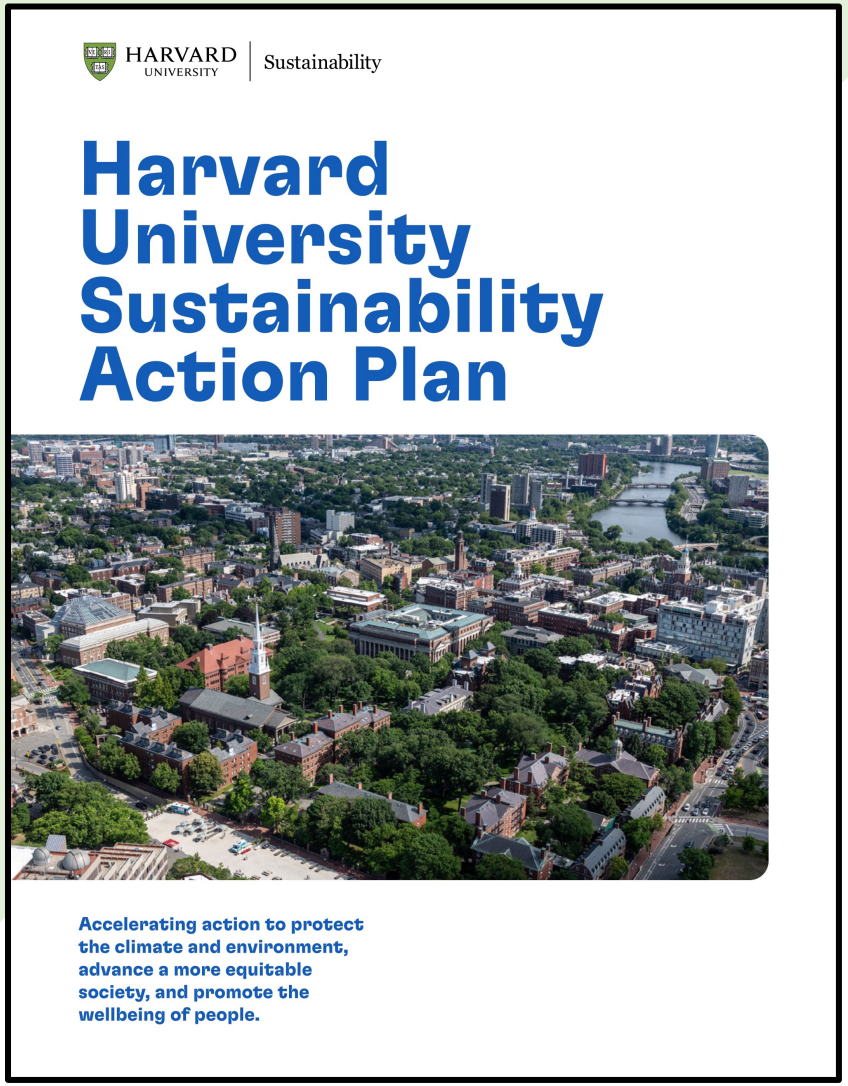


THE CITY OF HARVARD: A REAL-WORLD TESTBED



- Decentralized financials/management
- 12 Schools & Units
- 650+ buildings
- ~27 million square feet of real estate
- 3 District Energy Systems

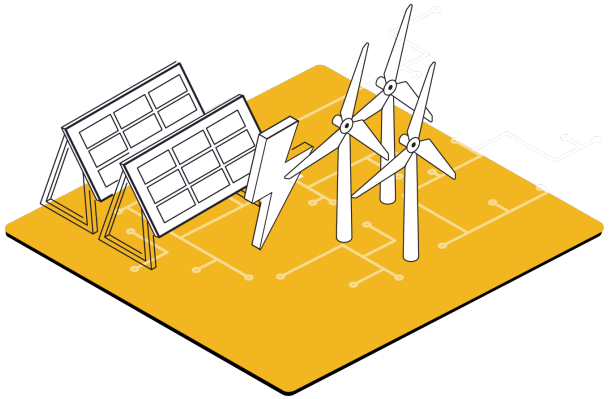
SUSTAINABILITY ACTION PLAN (UPDATED SPRING 2023)



sustainable.harvard.edu/our-plan

HARVARD'S CURRENT CLIMATE GOALS

- **Fossil Fuel-Free by 2050 (Goal Zero)**
- **Fossil Fuel-Neutral by 2026**



DISTRICT ENERGY SYSTEMS + ELECTRICITY USE + FOSSIL FUELS IN BUILDINGS + UNIVERSITY VEHICLE FLEET = Goal Zero

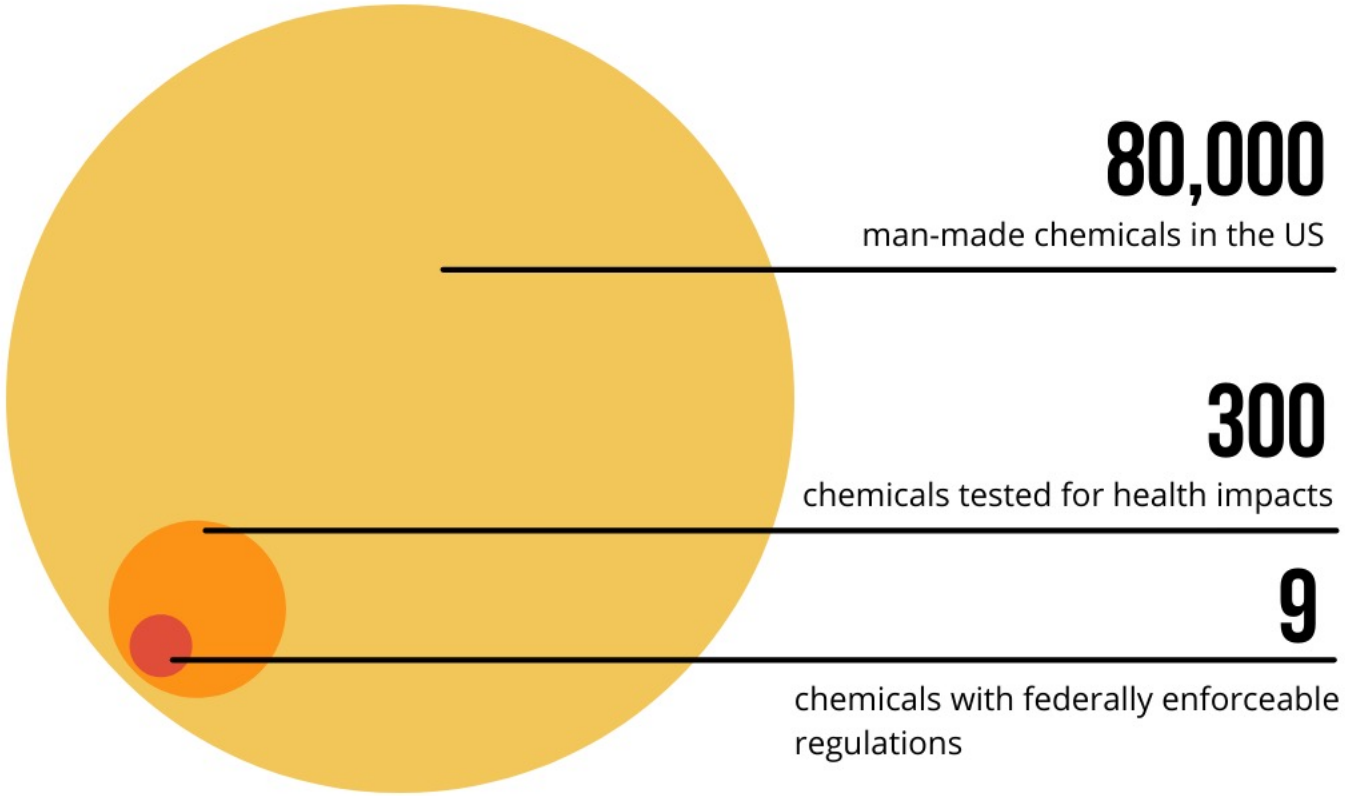
THE SALATA INSTITUTE FOR CLIMATE & SUSTAINABILITY

ACCELERATING ACTION WITH RESEARCH & EDUCATION



ANOTHER GLOBAL SYSTEMIC CHALLENGE

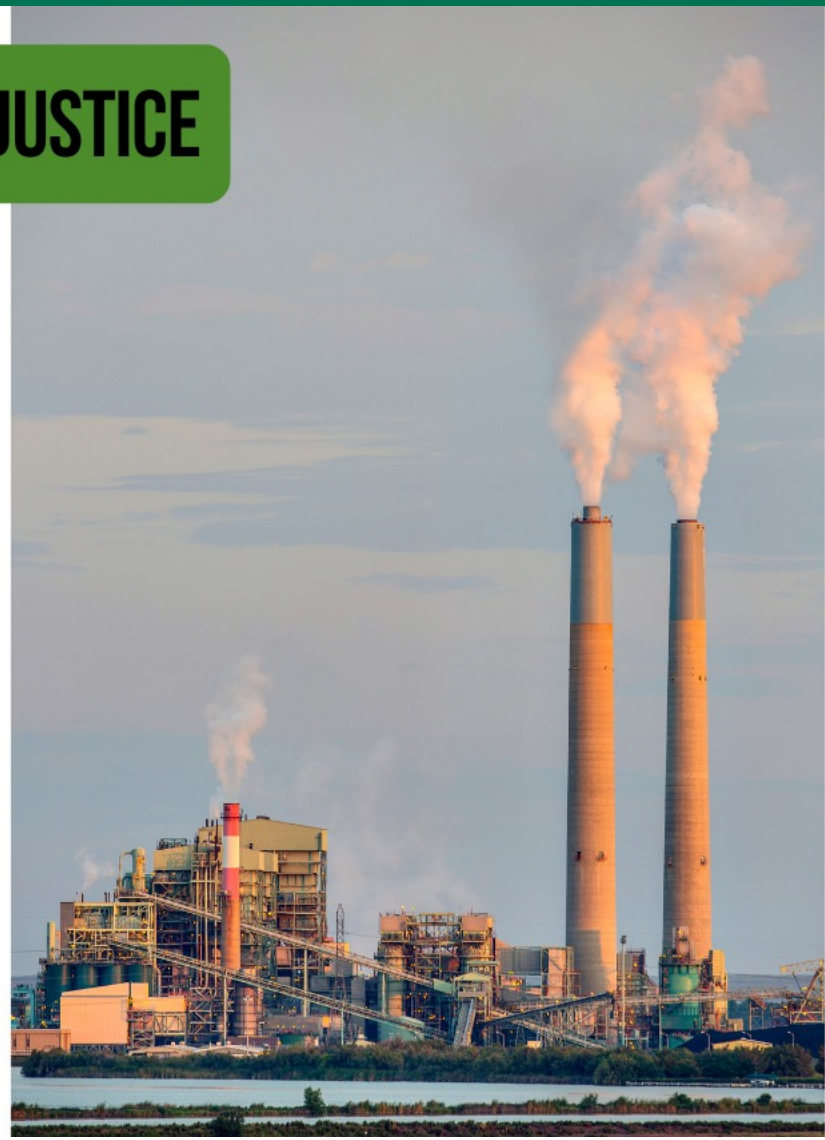
HEALTH + EQUITY + ENVIRONMENTAL JUSTICE



80,000
man-made chemicals in the US

300
chemicals tested for health impacts

9
chemicals with federally enforceable regulations



FOCUSING ON CLASSES OF CHEMICALS



Chemical flame retardants



Per- and poly-fluoroalkyl substances **(PFAS)**



Antimicrobials



Halogenated polymers



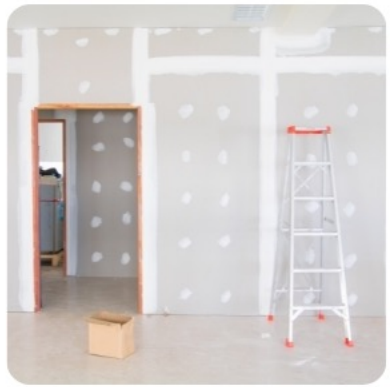
Phthalates



Bisphenols



Volatile organic compounds (VOCs)



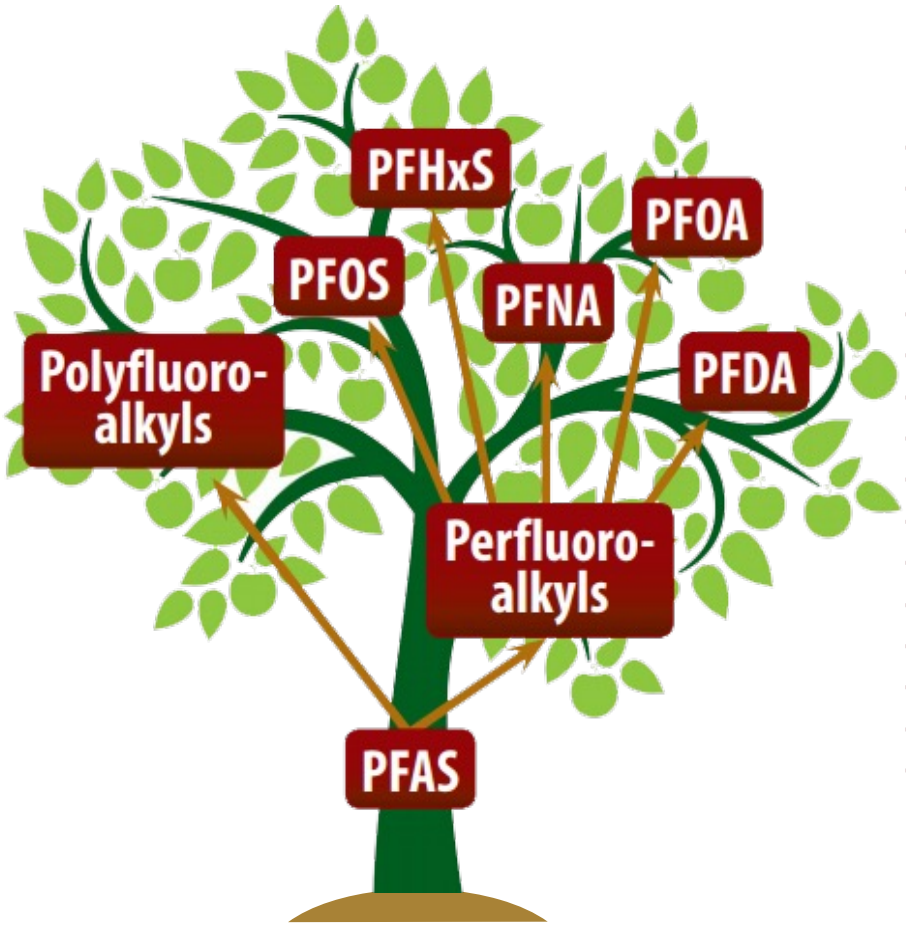
Heavy metals

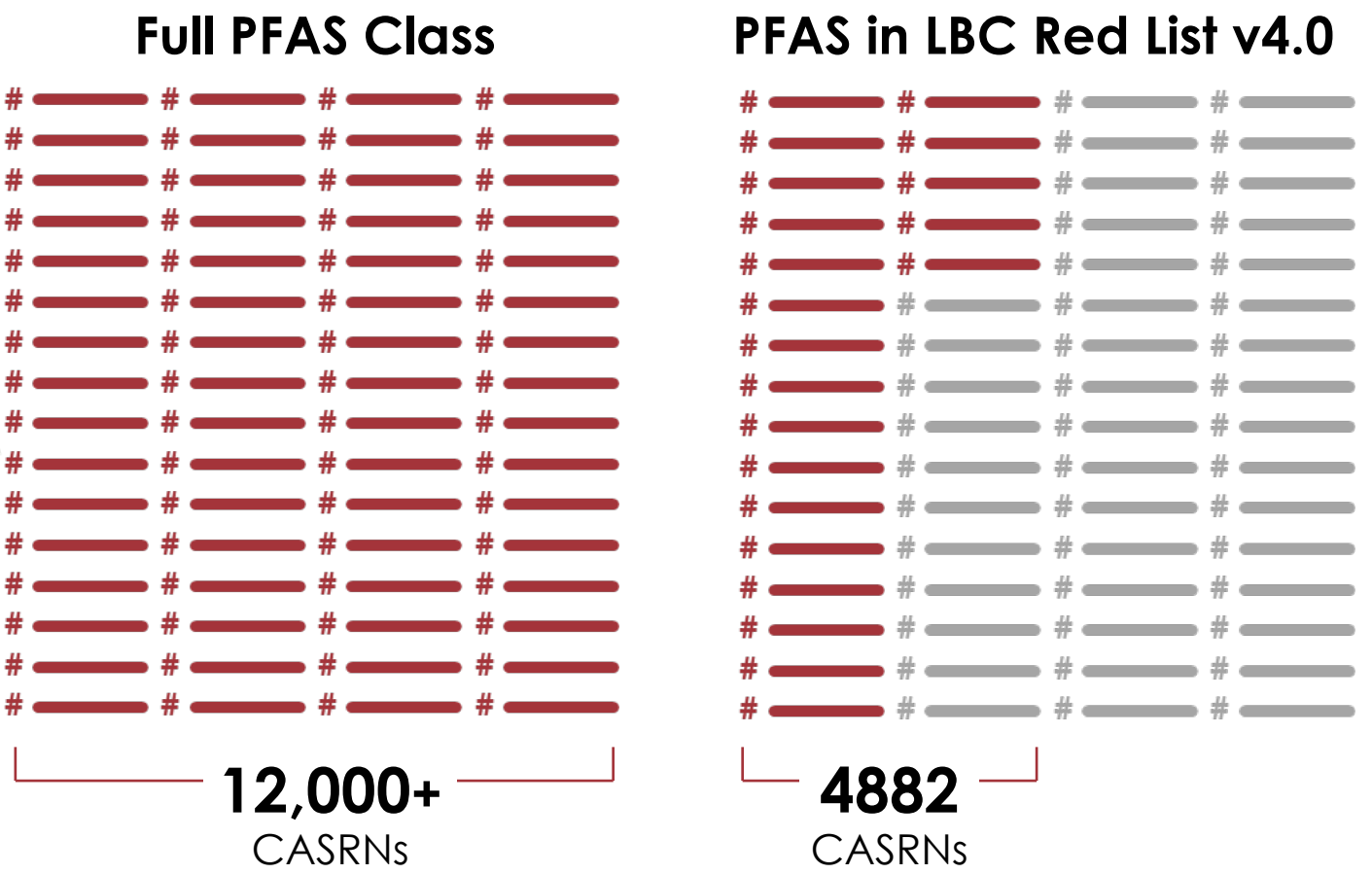
SCIENCE ON HEALTH RISKS IS CLEAR

Chemical classes	Partial list of health risks
Chemical flame retardants	**Thyroid disruption, reduced fertility, Cancer,** lower IQ, immune impaired
PFAS (Per-and poly-fluoroalkyl substances)	Testicular & kidney **cancers, diabetes**, early menopause, high cholesterol
Antimicrobials	**Antibiotic-resistance;** endocrine, thyroid, & **reproductive changes**
Halogenated polymers	Cancers, developmental effects
Phthalates & bisphenols	Adversely affects child mental, motor/behavioral development
Volatile organic compounds (VOCs)	Neurotoxicity, reproductive toxicity, carcinogenic effects
Heavy metals	Reduced mental function, damage to lungs, kidneys, liver, & other organs

CLASS-BASED APPROACH ADDRESSES "REGRETTABLE SUBSTITUTION"

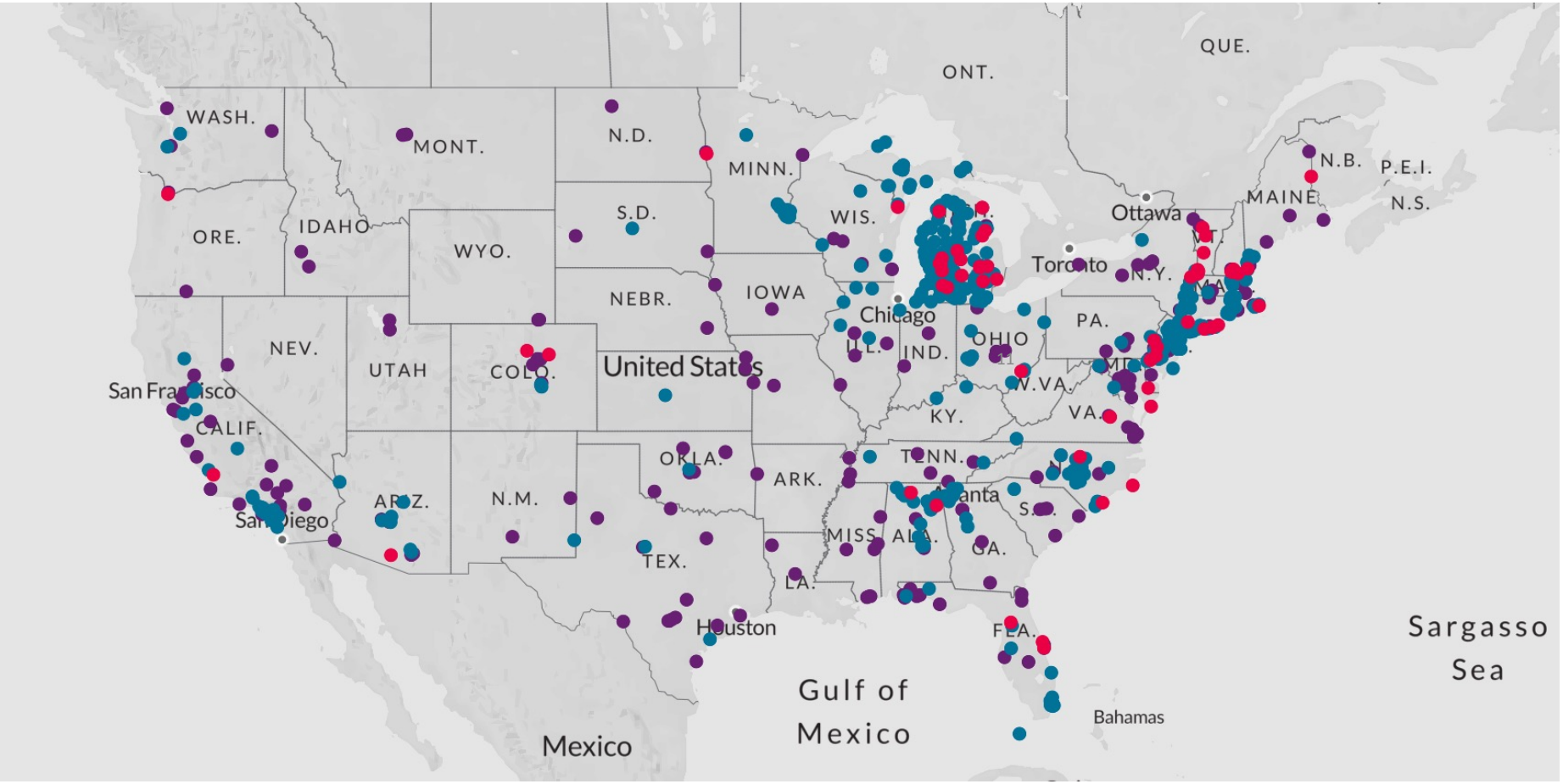
HOW DO CLASSES DIFFER FROM LISTS?





UPSTREAM AND DOWNSTREAM IMPACTS

PFAS "FOREVER CHEMICALS" IN DRINKING WATER

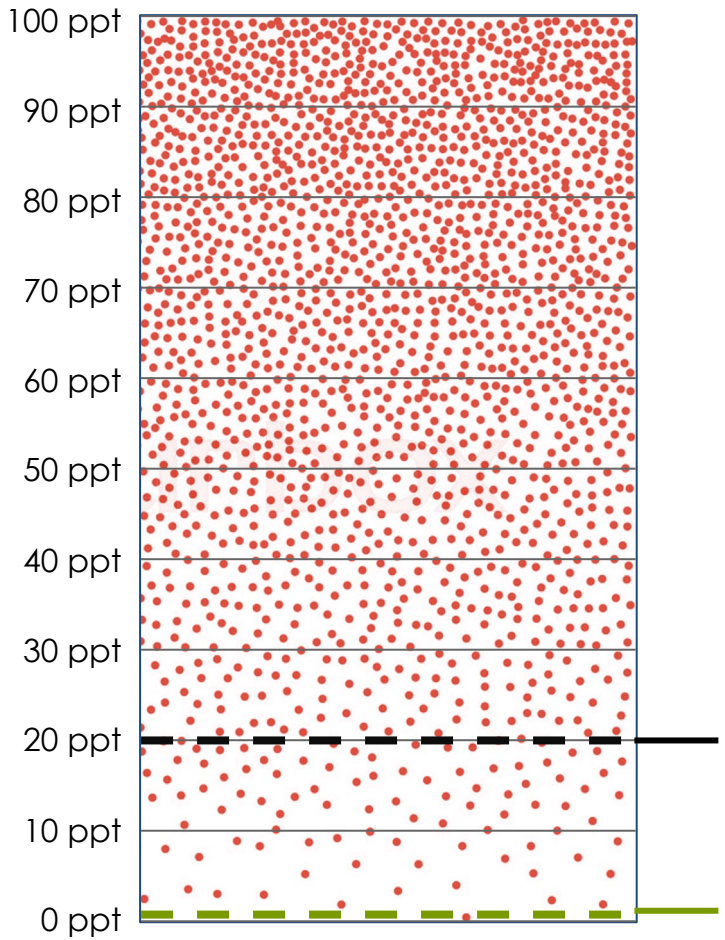


200M+ Americans' drinking water likely contains PFAS

40,000 sites = potential sources of PFAS

Source: **EWG**

FOREVER CHEMICALS CONTAMINATE DRINKING WATER: LIMITS?



Before 2023, Partial PFAS Limits in MA, NH, VT, NY, NJ (Only covers max 6 PFAS chemicals)

Environmental Protection Agency agrees with Science in 2023, Recommended new Safe levels (Yet only 6 PFAS chemicals)



Dr. Elsie Sunderland (SEAS)

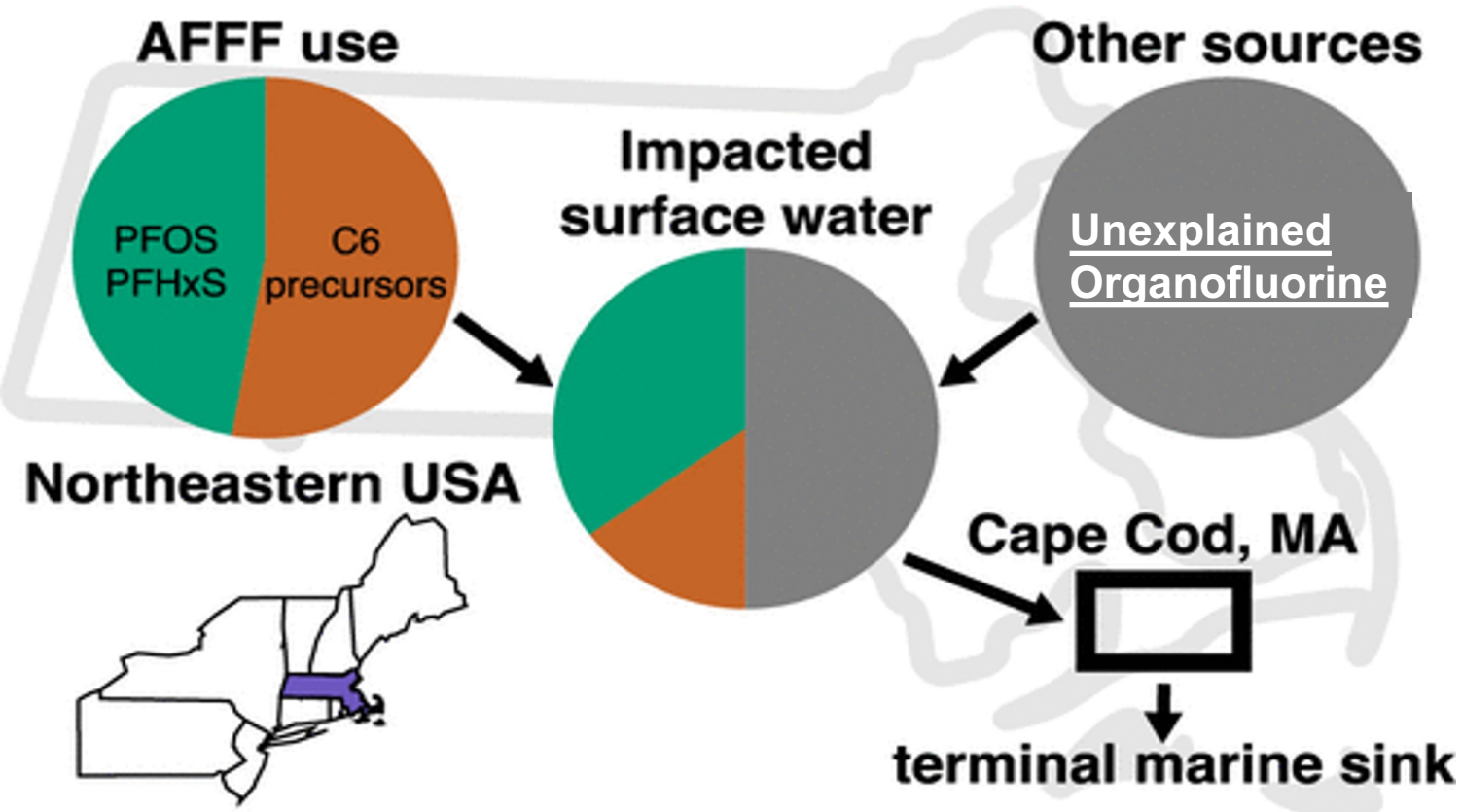


Dr. Philippe Grandjean (HSPH)

Source: Reuters, EWG

"WE MUST STOP USING PFAS"

CAPE COD STUDY ASKS: WHERE ARE 50% OF PFAS COMING FROM?



"We have no idea what our total exposure is to these chemicals and health data associated with such exposures are still lacking."

Elsie Sunderland
Gordon McKay Professor of Environmental Chemistry, Harvard



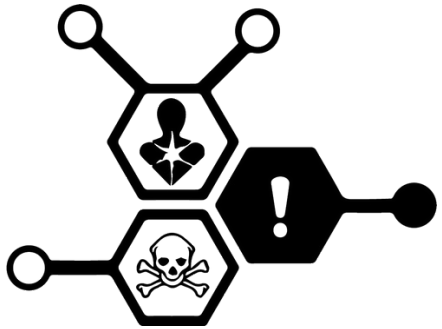
HOW DO WE SOLVE THIS CHALLENGE?
HARVARD HEALTHIER BUILDING ACADEMY (HHBA)

01



Require Transparency & Disclosure

02



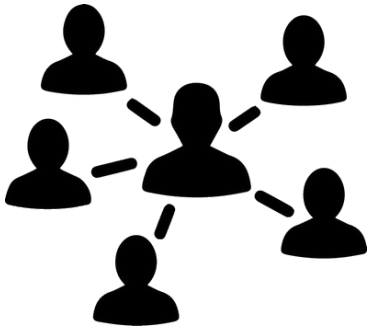
Target Chemical Classes of Concern

03



Evaluate Products & Advocate for Third-Party Standards

04



Expand the Market of Healthier Products

05



Require Healthier Materials Standards

A SOLUTION: HHBA STARTED IN 2014

Harvard Healthier Building Academy

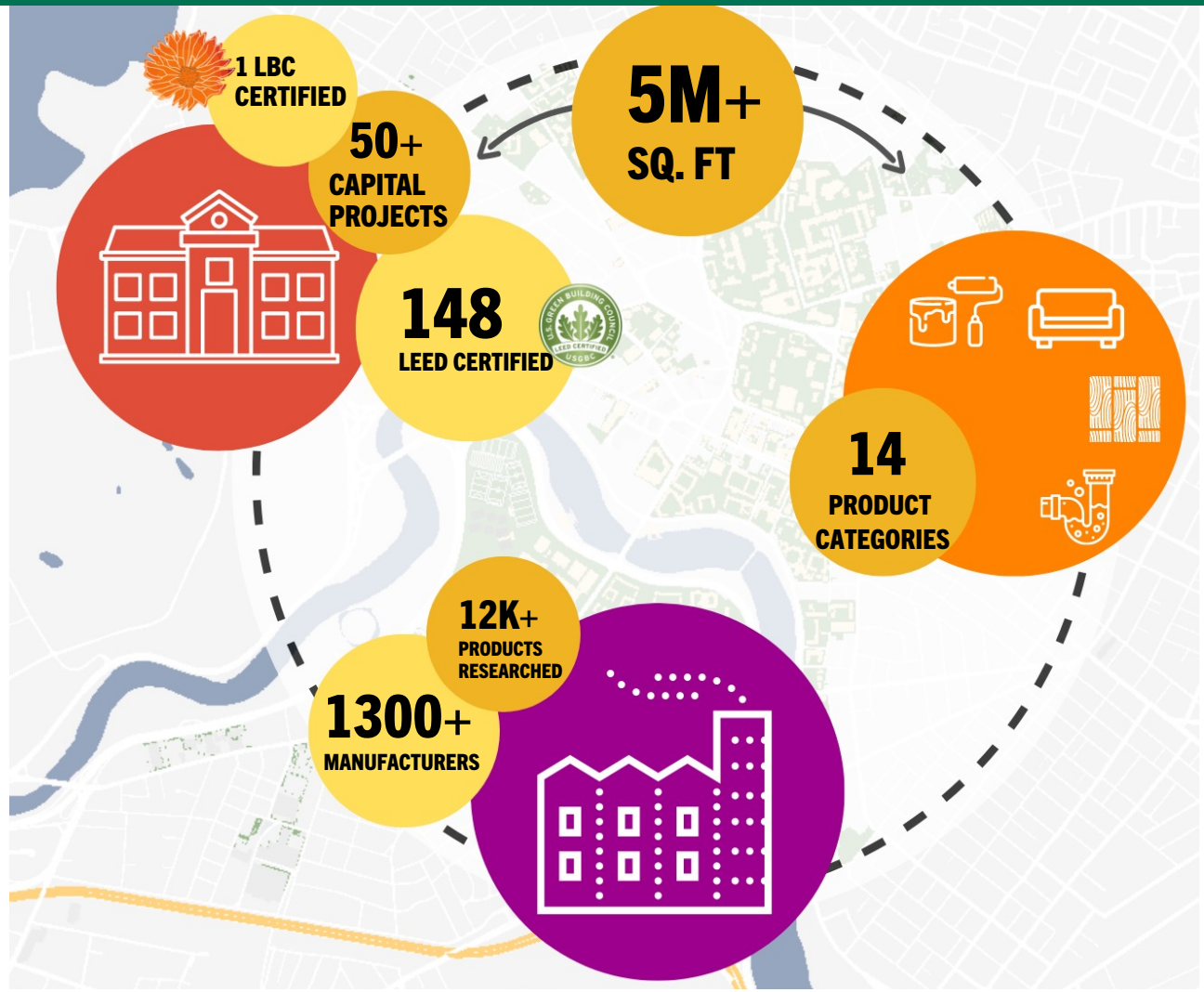
HARVARD Office for Sustainability

Harvard John A. Paulson School of Engineering and Applied Sciences

HARVARD MEDICAL SCHOOL

HARVARD T.H. CHAN SCHOOL OF PUBLIC HEALTH

Translate world-class research into practice to **transform the marketplace by creating a healthier, more equitable, and truly sustainable supply chain for all.**



STEP 1: ELIMINATE 3 PRIORITY CLASSES



Chemical flame retardants



Per- and poly fluoroalkyl substances (PFAS)



Antimicrobials

GO BEYOND 3 CLASSES WHEN POSSIBLE



Additional Chemical Classes Specific to Category

+ Reduced Embodied Carbon WITHOUT FOSSIL FUELS

CARPET CRITERIA

CLASSES TO AVOID:

- ✓ Flame Retardants
- ✓ PFAS
- ✓ Antimicrobials
- ✓ PVC
- ✓ Phthalates
- ✓ Fly Ash

Flame Retardants
PFAS
Antimicrobials
PVC
Phthalates
Bisphenols
Fly Ash
Crumb Rubber
Heavy Metals
Isocyanates

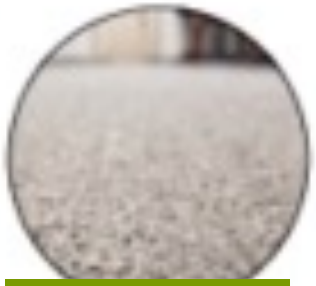
STEP 2: START WITH PRIORITY PRODUCT CATEGORIES

1. Highest Concern
2. Avoidable Additives
3. Market Availability
4. Purchasing Volume
5. Standards



HARVARD'S INTERIOR PRODUCT CATEGORIES


Furniture


Carpet


Wall Base


Resilient Flooring


Window Shade Cloth


Acoustical Ceilings


Ceramic Tile


Concrete Sealers


Textile Wall Panels


Gypsum Board


Paints & Coatings


Solid Surfacing


Insulation


Rugs & Mats

STEP 3: PILOT ON A SMALLER PROJECT/PRODUCT

Harvard's first pilot project was Smith Campus Center in 2014.

- ✓ **No cost impacts**
- ✓ **No schedule impacts**

100% **Furniture met standard (27 manufacturers)**

100% **Carpet/flooring met standard (Shaw 1st to meet)**

100% **Paint met standard**



NEXT PILOT ON LARGE PROJECT/PRODUCT (OPENED SEC 2021)

Living Building Challenge Certification Materials, Beauty & Equity

1st Research Building & Largest Globally

LEED Platinum

LIVINGLAB
Harvard Healthier Building Academy

Harvard Healthier Building Academy

550K **Sq. ft.: complex, lab multi-use building**

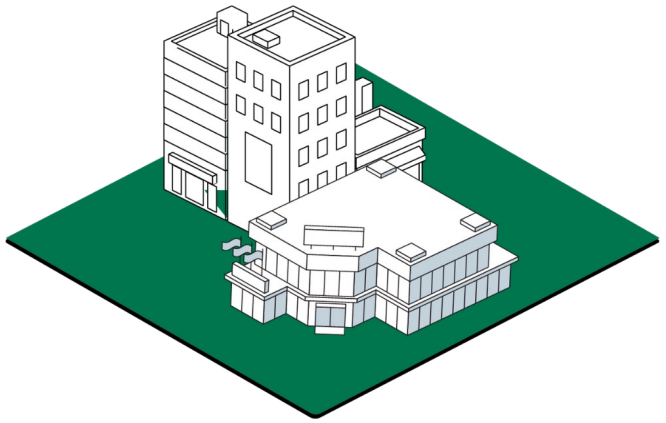


SCIENCE & ENGINEERING COMPLEX (SEC): HEALTHIER MATERIALS RESEARCH



- **Over 6,000 materials** evaluated for harmful chemicals & optimized products
- **More than 1,200 companies** provided ingredients
- Many **products reformulated to eliminate chemicals** & **reduce upstream damages**
- **1,700 products with publicly disclosed ingredients** (Declare Labels, HPDs, EPDs, FSC, Cradle to Cradle) selected by Harvard to address health, equity, and circularity

HOW WE BUILD & ADDRESS SUPPLY CHAIN EMISSIONS: CLIMATE, HEALTH & EQUITY



How We Build: Living Building Challenge Core or LEED Gold + Harvard Healthier Building Academy + indoor air quality goals.



Scope 3/Supply Chain Emissions: reduce *<u>without</u> introducing harms to health or equity*.



ROOMS WITH HEALTHIER FURNITURE & CARPET HAVE LOWER LEVELS OF CHEMICALS

- 1st known study to evaluate interior spaces with products that seek to eliminate fluorinated (PFAS) stain repellants and chemical flame retardants.
- Dr. Anna Young, HSPH, created a research study to evaluate 47 pre-renovated office suites, classrooms, and common rooms versus the same post-renovated spaces that specified healthier interior products.



↓ 78% Sum of PFAS stain repellents

↓ 65% Sum of OPE flame retardants

↓ 45% Sum of PBDE flame retardants

Research by Dr. Anna Young was funded by the Harvard Office for Sustainability, Harvard-NIEHS Center, and Harvard-NIOSH Center. The study can be found in Environment International.

SCALE PURCHASING POWER WITH BUYERS CLUB



Common Materials Framework



Thank you



Accelerating Climate Action: UBC's Campus as Living Lab - SEEDS Sustainability

Campus as Lab Best Practices to Increase the Climate Action Impact of Higher Education Institutions: Green Ribbon Commission Webinar

November 7, 2023

Liska Richer, *Manager, SEEDS Sustainability Program | Campus + Community Planning*
University of British Columbia (UBC), Vancouver, British Columbia



PRESENTATION OUTLINE

01: University of British Columbia (UBC) & Campus as Living Lab

02: SEEDS Sustainability Program Model

03: Case Study: Climate-Friendly Food Systems

04: Successes and Learnings



UNIVERSITY OF BRITISH COLUMBIA: CAMPUS AS LIVING LABORATORY (CLL)

As a public research university we have a **commitment and responsibility to leverage our academic and operational capabilities to respond to global problems** through our local context.

At UBC, **Campus as a Living Lab** is:



- A ***collaborative*** **framework**
- **Includes faculty, students, staff and community** partners
- Involves ***leveraging*** **the physical, planning and policy assets of the university** to explore and **advance societal challenges**
- **Sharing and mobilizing the knowledge** gained from these experiences to **increase UBC's collective impact** by scaling up projects, catalyzing **effective policy influence and actions**

UBC CONTEXT



85,000
DAY TIME POPULATION

63,387
STUDENTS

21,000
FACULTY + STAFF

$2.3 Bn
ANNUAL OPERATING BUDGET

$12.5 Bn
ECONOMIC IMPACT

22,000
RESIDENTS

1000
ACRES OF SITE

1800
ACRES OF FORESTED PARKLAND

>80%
BUILDINGS OWNED

13,389
INTERNATIONAL STUDENTS FROM 155 COUNTRIES

UNIVERSITY OF BRITISH COLUMBIA: CAMPUS AS LIVING LABORATORY (CLL)

Longstanding **typology of CLL work** across our campuses

- Curricular (classroom), co-curricular (paid, volunteer)
- Faculty, student, operational staff, community driven research *or* a combination of these groups
- Variation in scale and scope

UBC an **early adopter of Campus as Living Laboratory approach**

- In 2001, **SEEDS launched** with **mandate to integrate operational and academic efforts** in sustainability through research and partnerships **directly supporting the University's strategies, operational plans, and international commitments.**

At SEEDS we define CLL as the **integration of the academic and operational spheres** within or between post secondary institutions, **creating *applied* teaching, learning and research opportunities** that can **enhance the university's ability to address societal challenges at the local campus scale** while **contributing to broader societal issues and impact, impactful learning, research and engagement.**



SEEDS SUSTAINABILITY PROGRAM: OVERVIEW

THE UNIVERSITY OF BRITISH COLUMBIA
Campus + Community Planning

Vision Statement

Advance UBC's leadership in sustainability by **convening and catalyzing community-based partnerships** and **actionable solutions** towards ecological human health and wellbeing by empowering and mobilizing students to make meaningful and **positive change at UBC and in the world.**



SEEDS FORMULA FOR INNOVATION



SEEDS: YEAR IN NUMBERS

100+	700+	75	125	1000
PROJECTS	STUDENTS	FACULTY	STAFF + COMMUNITY	PARTICIPANTS



SEEDS 'BIG 5' RESEARCH PRIORITIES (current)



THE UNIVERSITY OF BRITISH COLUMBIA
Campus + Community Planning

SEEDS: INTERDISCIPLINARY COLLABORATION MODEL



Campus Biodiversity Initiative: Research and Demonstration (CBIRD)



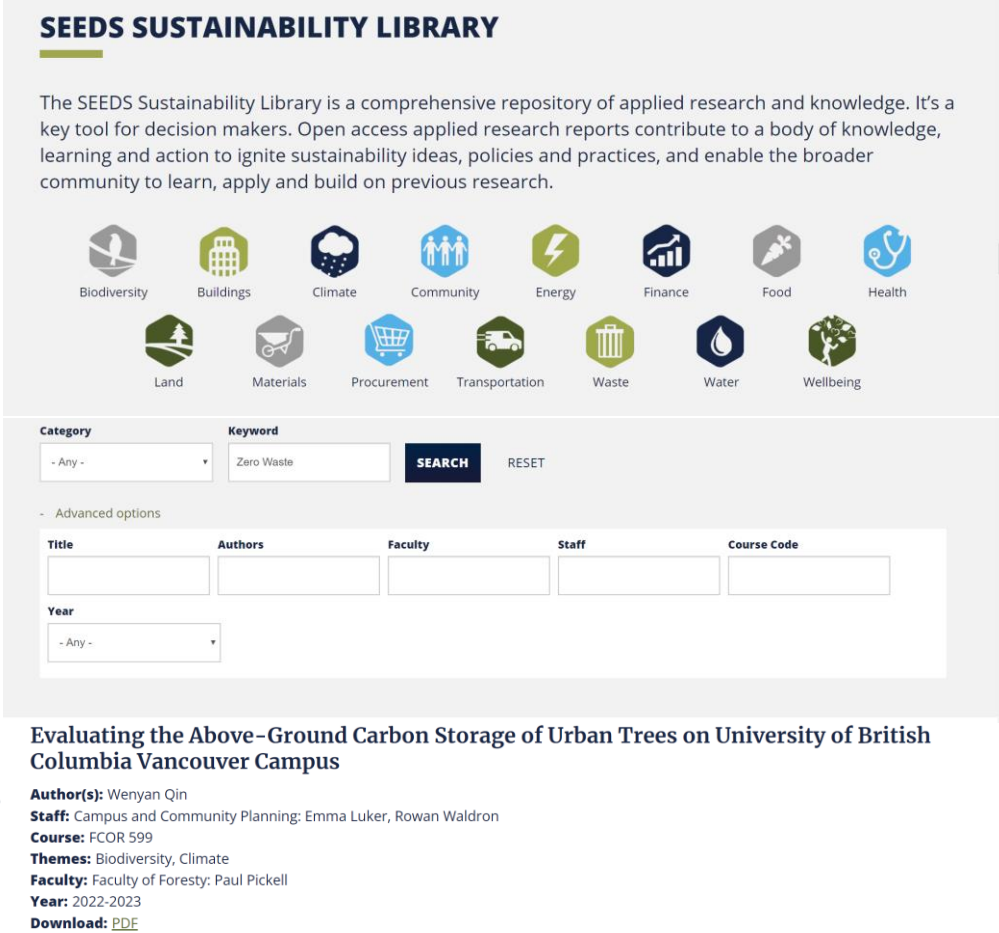
Climate Crisis in Urban Biodiversity (CCUB)



UBC Food System Committee (FSC)

RESEARCH DELIVERABLES

- **Published Research**
  - ❑ SEEDS Sustainability & UBC Libraries
- Other Deliverables: Installations, strategies, applications, designs, tools
- **Research to Practice/Policy**
  - ❑ Policy development/implementation
  - ❑ Tangible actions
- **Knowledge Exchange**
  - ❑ Presentations
  - ❑ Research 2 Action/Policy Symposiums



OPPORTUNITIES FOR FACULTY

- **Connect** curriculum to advance UBC's sustainability & wellbeing commitments (policies, plans and practices)
- **Integrate** applied research into courses
- **Offer** practical and impactful sustainability student learning and research experiences
- **Support** for research collaboration duration from inception to project close and follow up



OPPORTUNITIES FOR STUDENTS

- **Gain** valuable **career/professional skills**, including:
  - Applied research, project management, communication, networking, leadership, sustainability knowledge and experience
- **Amplify** **knowledge and action** towards UBC’s and society's critical sustainability challenges
- **Create** **positive and meaningful change**
- **Gain** **research publications & expanded networks**



OPPORTUNITIES FOR STAFF & COMMUNITY PARTNERS

- **Get support** to develop and implement sustainability plans, policies and practices
- **Leverage** interdisciplinary collaborations, student researchers, faculty mentors
- **Access** SEEDS institutional knowledge and intellectual resources in a broad range of sustainability and policy issues
- **Receive** project management support throughout research duration



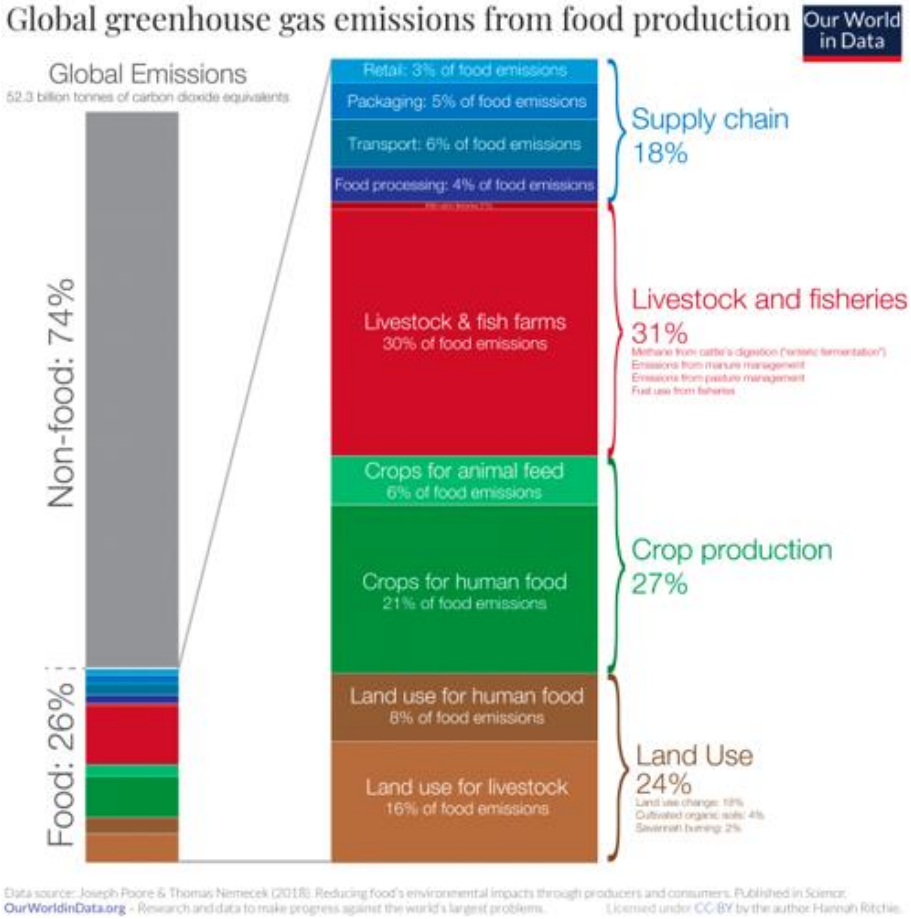
03.CASE STUDY: CLIMATE-FRIENDLY FOOD SYSTEMS





SHIFTING TOWARDS "CLIMATE-FRIENDLY" FOOD SYSTEMS





UBC's Emissions: Operational (Scope 1) & Extended (Scope 2, 3)

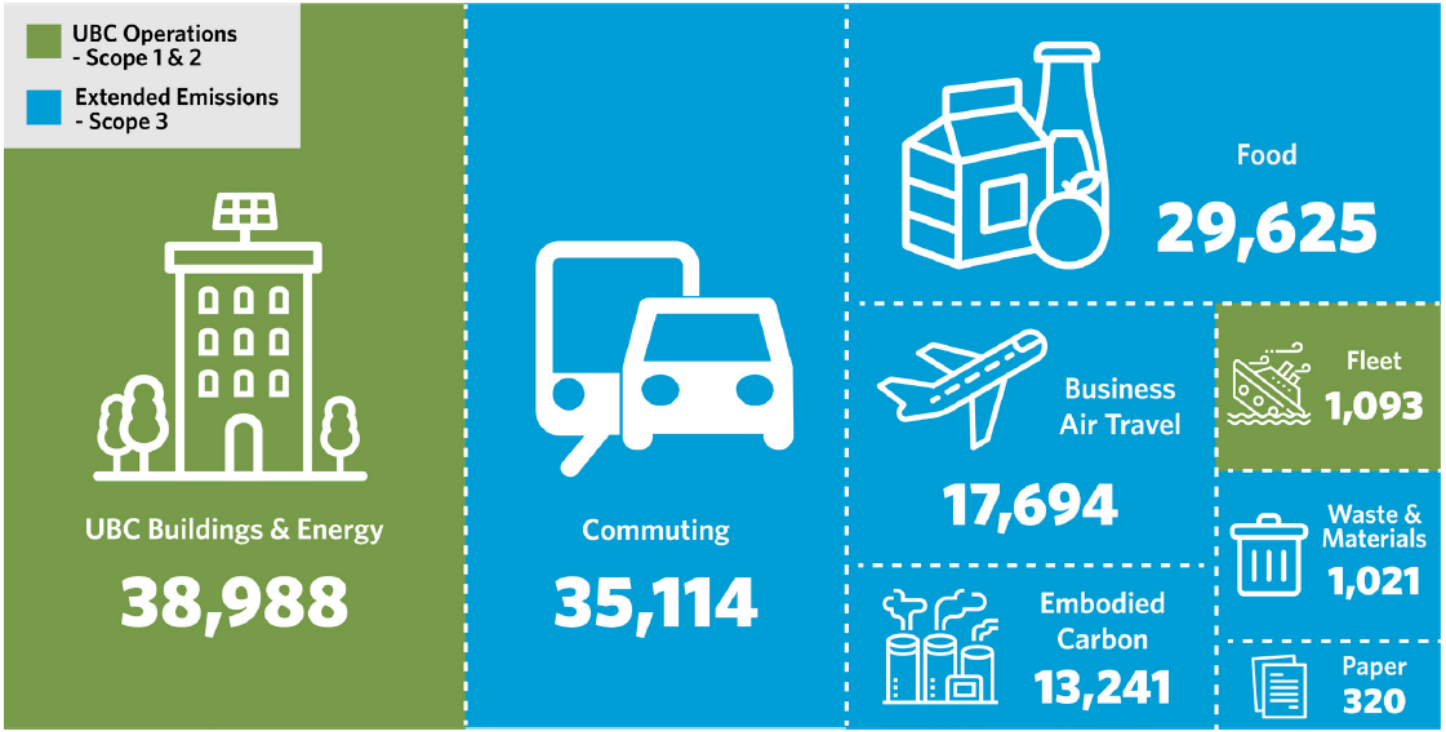


Figure 7: UBC's Operational and Extended Emissions (tCO_2e)

[Note: Extended emissions are estimated and less accurate than campus operations GHG values which are reported more rigorously as part of UBC's annual carbon reporting under BC's Climate Change Accountability Act. For the Waste and Materials category, emissions shown only include those from disposal and do not include life cycle emissions, which are much larger]

Climate-Friendly Food Systems (CFFS) Action Team

Goals:

To bring **diverse perspectives and experiences** as students, staff, and faculty involved in UBC's Food System to **ideate, coordinate and develop of student research, initiatives and interdisciplinary collaborations** that can **accelerate transitions towards a climate-friendly food system**, advance UBC's Climate Action Plan 2030 Food Actions and broader Food System priorities.

Objectives:

- **Identify and/or co-create applied research opportunities, collaborations and interdisciplinary partnerships** to advance a climate-friendly food system
- Inform the **development and implementation of campus plans, policies and practices** to accelerate climate action in our food system
- **Develop tools that increase awareness and foster effective knowledge exchange** to cultivate climate friendly food system
- **Strengthen UBC's leadership** in climate-friendly food systems
- Develop an **evaluation framework to track and monitor progress**



Climate-Friendly Food Systems (CFFS) Action Team

Partners:

Student Housing & Community Services, UBC Food Services, Alma Mater Society (AMS Sustainability Office, AMS Food & Beverage, AMS Food Bank), Campus & Community Planning (Sustainability & Engineering), UBC Botanical Garden, Faculties & Schools (Vancouver School of Economics, Land & Food Systems, Department of Statistics, Department of Psychology, Institute for Resources, Environment and Sustainability), Student Groups (Undergraduate Societies, student businesses)



UBC'S "CLIMATE-FRIENDLY FOOD SYSTEM" DEFINITION



*"UBC aims to operate within a **climate-friendly**, **just and accessible** food system, which means being committed to **operating within planetary boundaries** by reducing **GHG emissions** footprint associated with **our food systems** and enhancing food system **resiliency** from production to end disposal and recovery, while producing **positive outcomes** for people, animals and planet"*

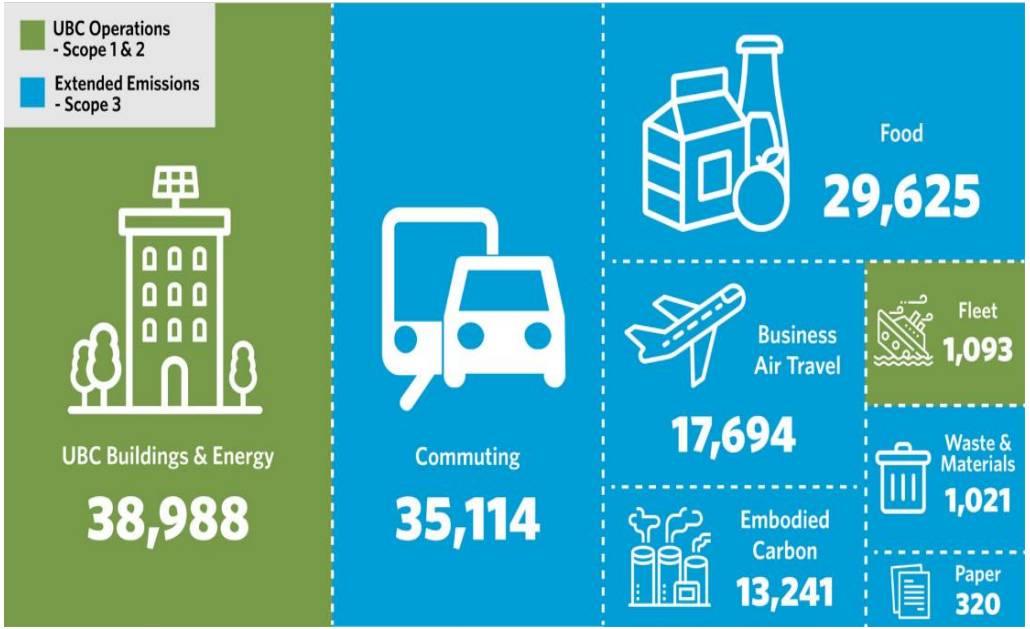
Developed by SEEDS Climate-Friendly Food Systems Action Team, May 2021

Climate-Friendly Food Systems (CFFS)



CAP 2030 Target: 50% GHG emission reduction associated with food systems

"CLIMATE-FRIENDLY" FOOD SYSTEMS AT UBC VANCOUVER



Target: By 2030, achieve a 50% GHG emission reduction of food systems.

- **7 Bold Food Actions**
- **Span climate food labelling, procurement to food waste and recovery**

UBC CLIMATE ACTION PLAN 2030: 7 BOLD FOOD ACTIONS

Short Term (By 2024)

1. Develop **campus-wide Climate-Friendly Food System (CFFS) definition**, mandatory CFFS **labeling**, and **a toolkit** to increase sustainable dietary choices and habits

2. Develop and implement **mandatory campus-wide CFFS Procurement Guidelines** applicable to all food providers

3. Develop a **Food Waste Reduction and Recovery Strategy** (including food-related waste)

4. Amend the **UBC Supplier Code of Conduct** to reflect UBC's climate commitments.

5. Develop a **Food System Resilience and Climate Action Strategy** that holistically advances climate-friendly foods at UBC including climate mitigation and adaptation.

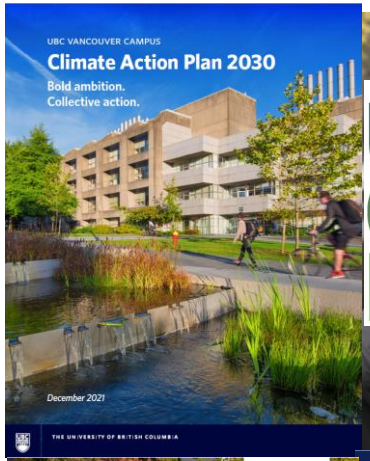
6. Leverage and expand established interdisciplinary research initiatives, and student and faculty-led research to advance climate-friendly food systems, spanning climate mitigation and adaptation. (CAP 2030, p.37)

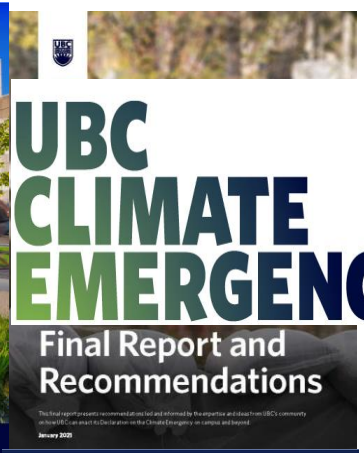
Medium Term (By 2024-2030)

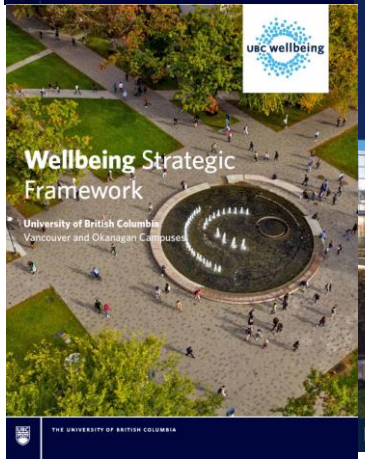
7. Enhance the **measurement and reporting of the campus food system's environmental footprint**, and coordinate with other food sustainability tracking priorities. (CAP 2030, p.37)

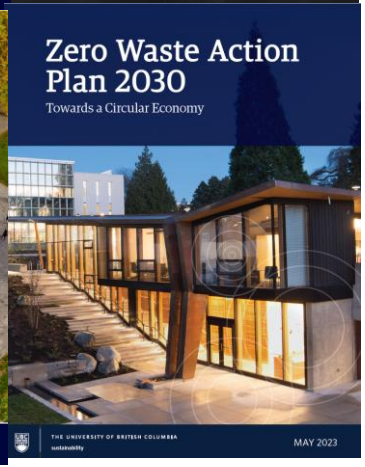
POLICY ALIGNMENT

SEEDS Sustainability Program









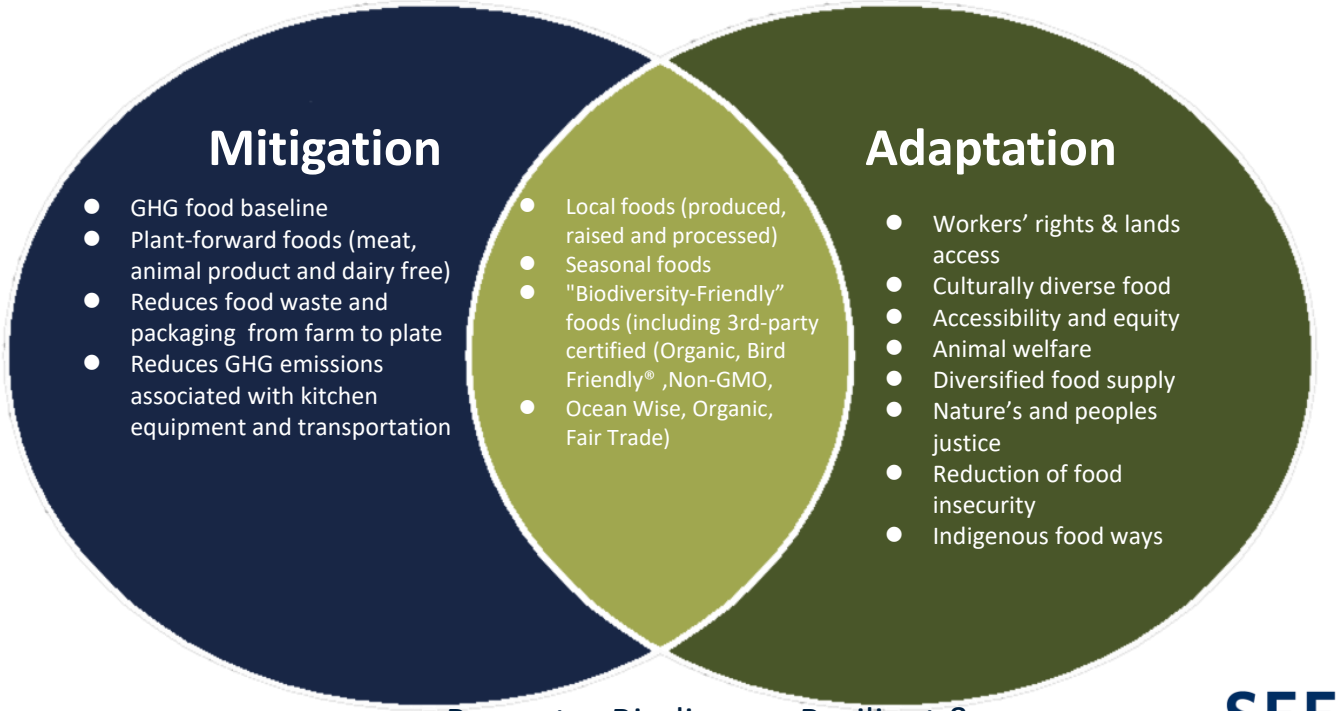


- Climate Action Plan 2030
- Climate Emergency Declaration
- Zero Waste Action Plan: Towards a Circular Economy 2030
- Alma Mater Society (AMS) Sustainability Action Plan
- Wellbeing Strategic Framework
- UBC Food Services Vision and Values
- Other University Plans, Policies and Guidelines

MAPPING ATTRIBUTES OF A CLIMATE-FRIENDLY FOOD SYSTEM (CFFS)

Reduces GHG Emissions

Supports Just, Sovereign & Resilient Communities



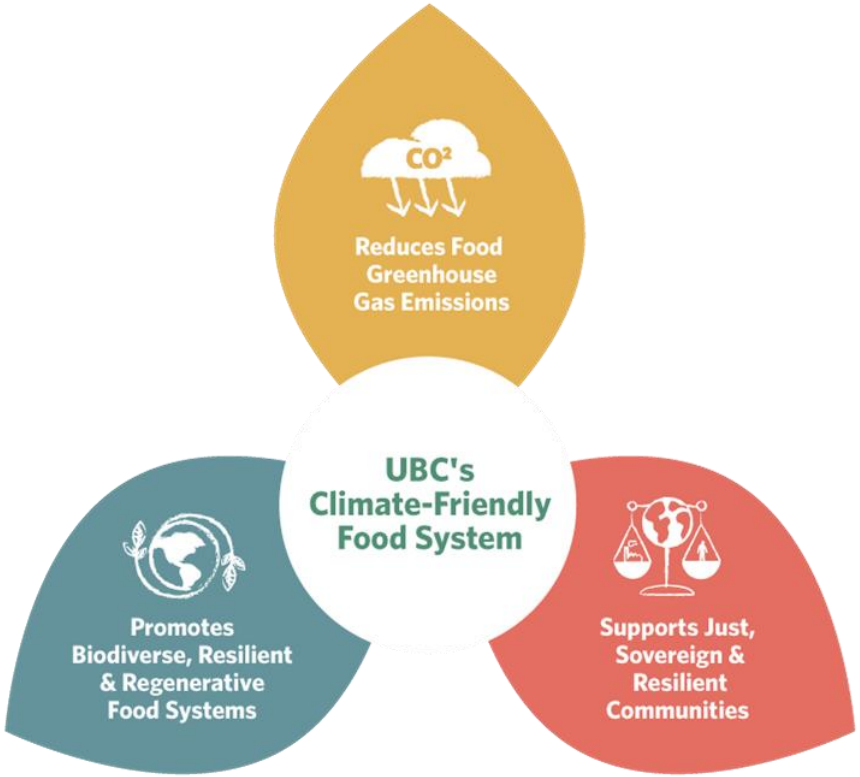
Promotes Biodiverse, Resilient & Regenerative Food Systems

SEEDS Sustainability Program

CLIMATE-FRIENDLY FOOD SYSTEM DEFINITION & ATTRIBUTES

UBC aims to operate within a climate-friendly, just and accessible food system, which means being committed to operating within planetary boundaries by reducing our GHG emissions footprint associated with our food systems and enhancing food system resiliency from production to end disposal and recovery, while producing positive outcomes for people, animals and planet

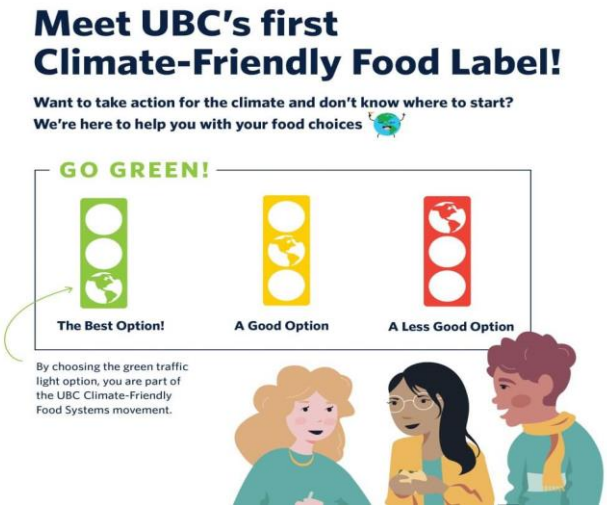
developed by the Climate-Friendly Food Systems Action Team in 2021



CAMPUS-WIDE CLIMATE-FRIENDLY FOOD SYSTEM (CFFS) DEFINITION, MANDATORY LABELING AND A TOOLKIT

CAP 2030 Actions

Develop campus-wide Climate-Friendly Food System (CFFS) definition, mandatory CFFS labeling, and a toolkit to increase sustainable dietary choices and habits

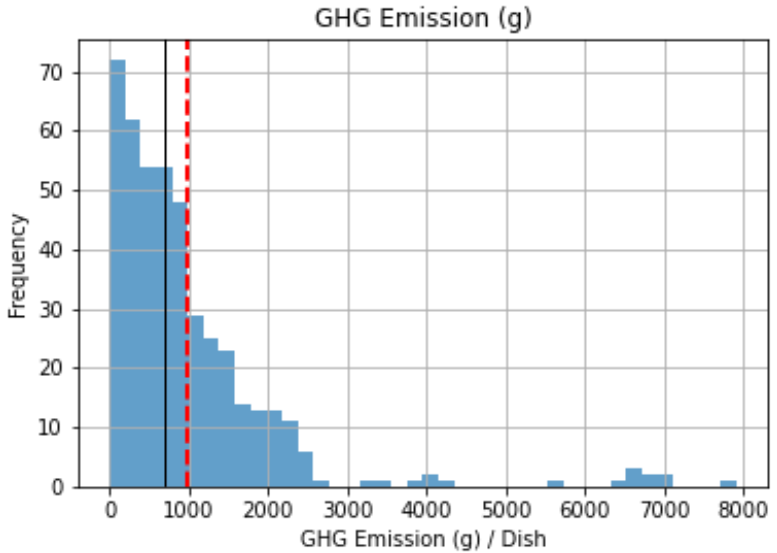


Progress:

- UBC CFFS label launched to support informed purchasing choices that can promote a climate-friendly food system
- Multi-year evaluation of the perceptions and the impacts that labels have on awareness, knowledge and purchasing decisions
- Robust Methodology & Data Assessment Framework

CLIMATE-FRIENDLY FOOD SYSTEMS LABEL: METHODOLOGY

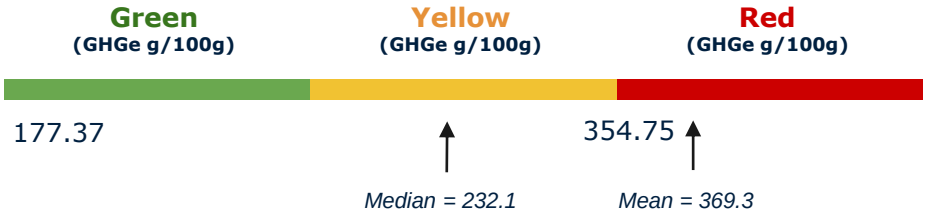
- **Methodology & Data Assessment Framework developed** to quantify **GHG emissions, nitrogen and water** footprints and **land use** of each recipe
- **Sums up the weight** of every raw ingredient **multiplied by their respective footprint** factors
- Ingredient **footprint factors are determined according to their category** in the Cool Food Calculator, which provides **data on the amount of emissions emitted during the food item's life cycle** (production, distribution and processing, excludes cooking emissions and associated food waste)





Label Cut-offs

Open Kitchen 21-22 GHG Emissions



CLIMATE-FRIENDLY FOOD SYSTEMS LABEL ITERATIONS



Pilot 1: Label Design: Globe & Thermometer traffic-light colour system of the CFFS Label tested in phase 1 at UBC Mercante pizzeria



Pilot 2: Traffic-light system of the CFFS Label tested in phase 2 at Mercante pizzeria and expanded to Open Kitchen on the UBC campus



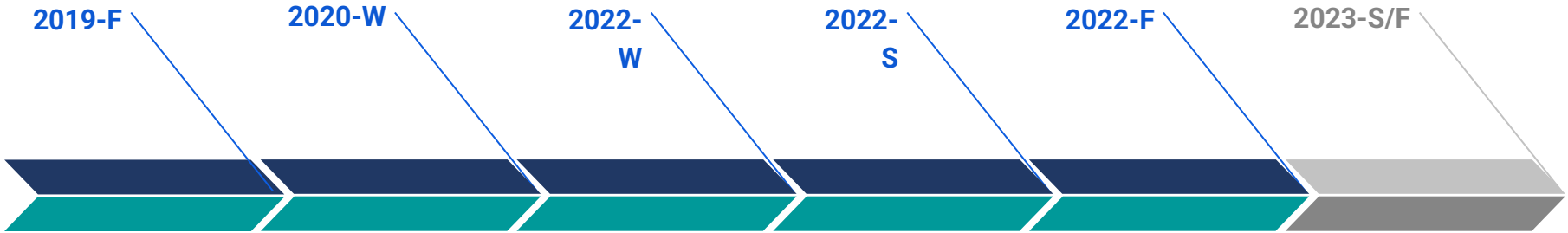
Pilot 3: CFFS Labels evaluated leading to the selection of the “happy planet” piloted for evaluation at UBC Food Services Open Kitchen



Menu item with the **largest green earth** logo associated means that the item generated at least 50% less GHG emissions, land use, water, and nitrogen per 100 grams of food produced than the average item sold during the 2019 baseline year.

Pilot 4:CFFS Labels refined and scaled out across all of UBC’s residence Dining Halls

SUMMARY: KEY MILESTONES



Definition

CFFS-AT developed a UBC community-based Climate-Friendly Food System Definition

Goals

(1) Reduce GHG Emissions

(2) Promote Biodiverse Resilient and Regenerative Food System

(3) Support Just, Sovereign and Resilient Communities

Actions – Phase 1

Tangible actions that advance each of the goals developed by CFFS Action Team (e.g. Climate Food Label & Methodology)

Actions – Phase 2

SEEDS research and CFFS-Action Team consultation compiled into comprehensive Procurement Strategy draft

Prioritization

Methodology to rank priorities based on impact and barrier validated by CFFS-Action Team to identify priority actions

Final Draft

In-principle agreement for final strategy

Start Implementation of high priority procurement actions & further scale out label

CLIMATE-FRIENDLY FOOD SYSTEM PROCUREMENT STRATEGY

CAP 2030 Actions

Develop and implement mandatory campus-wide CFFS Procurement Guidelines applicable to all food providers



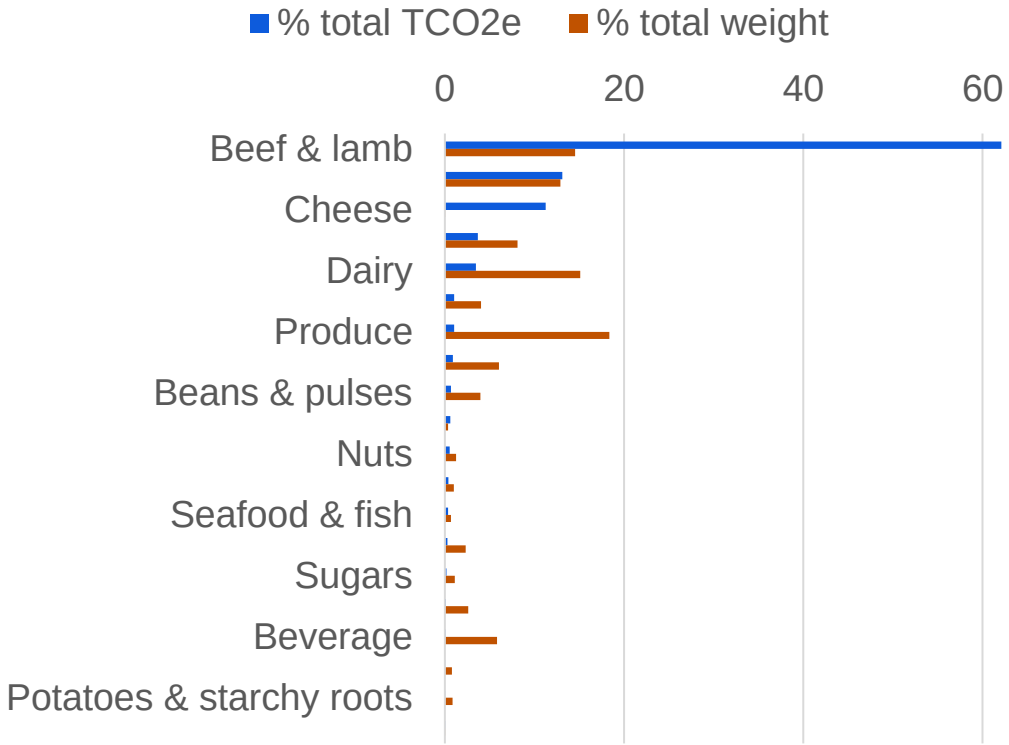
Progress:

- **Climate-Friendly Food System Procurement Strategy (draft strategy, supporting research cluster)**
- Procurement guideline incorporate 3 mitigation/adaptation attributes: "**reducing GHG emissions**", supporting "**food justice & sovereignty**" and "**building Resilient & regenerative ecosystems**"
- **Prioritization** of high impact actions

UBC Vancouver

	TCO2e	Weight (kg)
Total	22,759	2,349,890

Food category	TCO2e	% total TCO2e	Weight (kg)	% total weight
Beef & lamb	14,137	62	341,893	15
Pork & other	2,983	13	303,437	13
Cheese	2,566	11	1,360	0
Poultry	838	4	190,372	8
Dairy	792	3	355,190	15
Rice	240	1	94,681	4
Produce	235	1	431,197	18
Grains	210	1	141,751	6
Beans & pulses	157	1	93,291	4
Coffee	139	1	8,309	0
Nuts	128	1	29,739	1
Eggs	88	0	24,121	1
Seafood & fish	80	0	16,095	1
Spices & oils	65	0	54,747	2
Sugars	43	0	26,093	1
Fruit	26	0	61,161	3
Beverage	16	0	137,184	6
Vegetables	10	0	18,469	1
Potatoes & starchy roots	8	0	20,794	1
Tea	0	0	5	0



CLIMATE-FRIENDLY FOOD SYSTEM PROCUREMENT STRATEGY

Reduces Food Greenhouse Gas Emissions	**Action A: Reduce GHG emissions associated with Food Production**
	A.1 Reduce purchases of ruminant meat Products (beef, lamb, bison, water buffalo, goat, etc.)
	A.2. Reduce purchases of Non-Ruminant meat Products (pork, poultry)
	A.3. Reduce purchases of dairy Products (cow, bison, water buffalo, goat, sheep, etc.)
	A.4. Reduce purchases of Egg Products
	A.5. Reduce purchases of other Carbon Intensive Foods Products (e.g. rice, farmed seafood) and replace with Lower Carbon Intensive Products (e.g. wild seafood, root vegetables, nuts, apples, potatoes, wheat, rye, bananas, maize)
	Action B: Reduce Food Waste & Food Packaging Waste Products [in procurement practices]
	B.1. Reduce purchases of Food associated with redundant Packaging
	B.2. Reduce purchases that result in Food Waste and Loss
	Action C: Reduce Carbon Intensive Food Preparation and Storage Equipment
	C.1. Prioritize purchases of food preparation and storage Equipment that use less energy and other natural resources (e.g. water, materials) when current equipment reaches end of life
	Action D: Reduce Emissions Associated with Food Transportation [in procurement practices]
	D.1. Reduce emissions in procurement practices associated with food transportation
Promotes Biodiverse, Resilient & Regenerative Food Systems	**Action E: Increase purchases of Biodiverse Food Products**
	E.1. Increase purchases of Biodiversity Friendly-Food Certified Products (i.e. reduced land use and exposure to harmful pesticides, certifications)
	E.2. Increase purchases of Native Perennial Food Products
	E.3. Increase the diversity of Food Products purchased (i.e. seafood purchases to include smaller schooling species such as anchovies and herring)
	Action F: Increase purchases of Local Foods Products (seasonal and not-seasonal)
	F.1. Increase purchases of Local and Seasonal Foods Products
	F.2. Increase purchases of Local Foods Products (not necessarily seasonal)
Supports Just, Sovereign and Resilient Communities	**Action G: Increase purchases from suppliers who support Ethical Labour Practices**
	G.1. Increase purchases of imported Food Products from suppliers who support Ethical Labour Practices for farmers and farm workers globally (ie. reduce exposure to harmful pesticides)
	G.2. Increase purchases of BC Food Products from suppliers who support Ethical Labour Practices for migrant farm workers in BC
	Action H: Increase purchases of from Equity Deserving Businesses and Suppliers
	H.1. Increase purchases of Food Products from Indigenous Businesses and Suppliers
	H.2. Increase purchases of Food Products from Equity Deserving Businesses and Suppliers

KEY LEARNINGS & KEY TAKEAWAYS

Creating meaningful processes & impactful actions to accelerate climate action:

Community-Based Action Approaches:

Acknowledge challenges & solutions need to i**nvolve the communities who are affected** by the issues and those in **positions that can influence/ affect change**

Whole Systems Approaches:

Apply a whole systems thinking and tools to

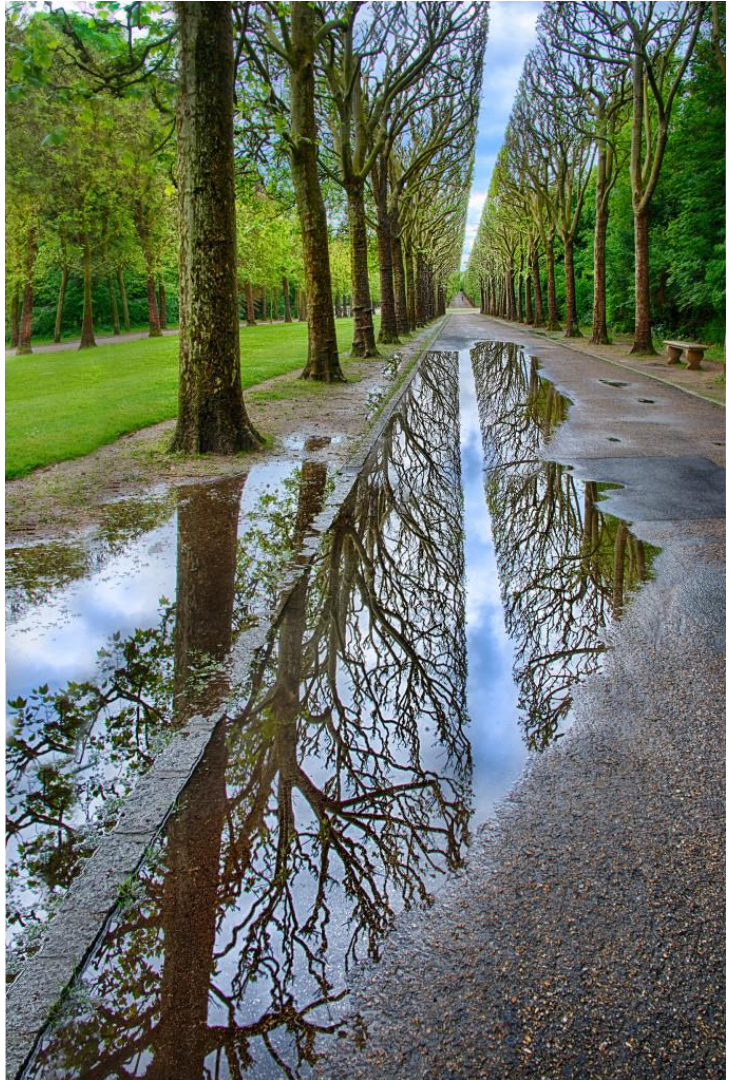
- ❑ Identify **connections** between and within food system and related societal issues
- ❑ Co-identify and pursue **leverage points** (processes, people) to create positive change

Bridge Academia with Community

- ❑ **Leverage diversity** of knowledge (academic, professional, and lived)

Incremental Radicalism:

- ❑ **Intentional** small steps **that lead towards big change**



EMERGING AND FUTURE DIRECTIONS

- Continue to **scale up and out our work and partnerships** to accelerate positive actions in our food system that **tackle interconnected crises of climate and nature** and resultant implications on ecological and human health & wellbeing
- **Continue to build out Climate Food Label and pilot automation tools**
- **Finalize our Climate-Friendly Food System Procurement Strategy** including consensus on high impact priority actions to pursue
- **Accelerate the most critical and timely actions** to achieve our 2030 goals





THANK YOU!

Learn more:

- SEEDS Sustainability www.sustain.ubc.ca/SEEDS
- Climate Food Label

https://sustain.ubc.ca/climate-friendly-food-labels

Contact: liska.richer@ubc.ca





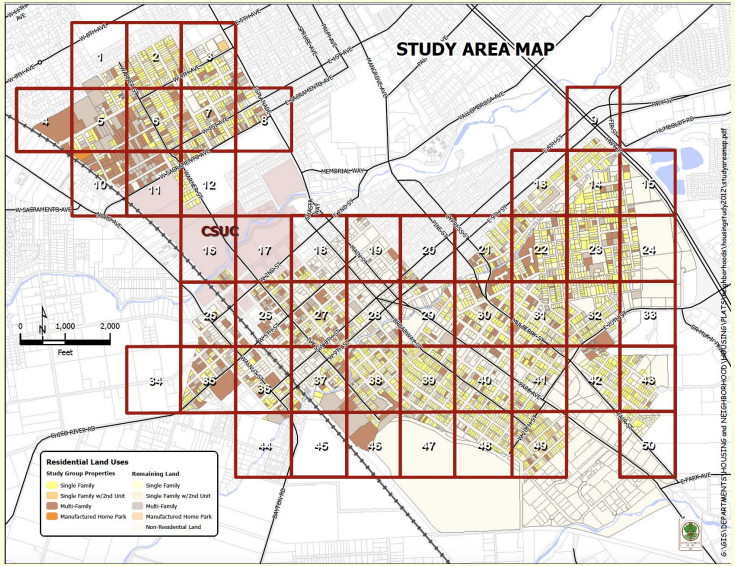


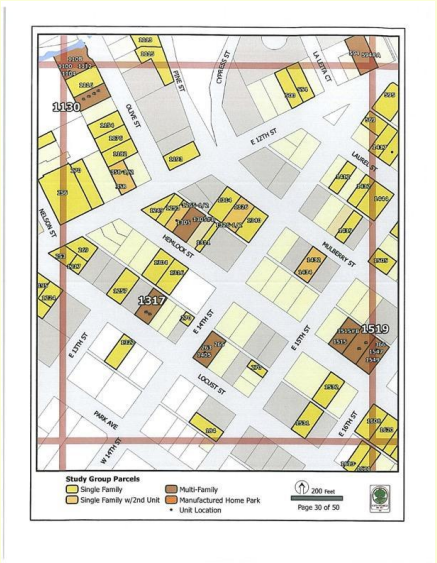


Creating a Sustainable Community: The Chico Experience

Dr. Mark Stemen
Department of Geography and Environmental Studies
California State University, Chico

City of Chico ~~Windshield~~ Handlebar Survey





Housing Conditions Inventory Handlebar Survey Guide

Map Number: _____ Property Address: _____

Y I N Is the house address number visible from street?
Y I N Does the property appear vacant? (e.g. overgrown landscaping, foreclosure sign)

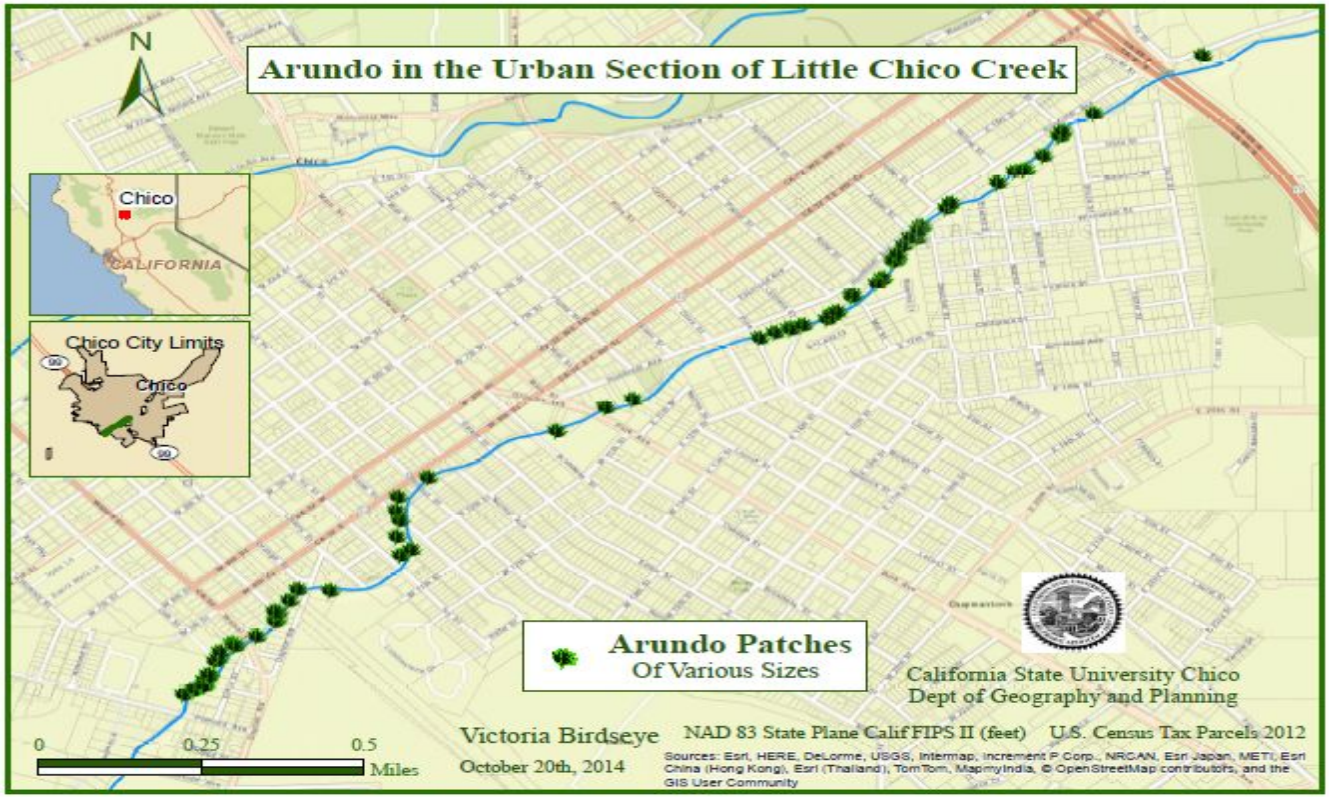
Infrastructure

Y I N Are there streetlights visible from the property (on that block)?
Y I N Is the street free of large potholes or broken pavement?
Y I N Does the street have paved shoulders?
Y I N Is the street surface even and sloped to the sides to allow for good storm water drainage?
Y I N Is the property served by curb and gutter?
Y I N Is the property served by a sidewalk?
Y I N Is the sidewalk in front of the property free of bumps and cracks that would impede wheelchair use?

House/Structure Condition

[Answer "yes" if any of the following conditions are visible on any structure on the property, if there are multiple structures.]

Y I N If there is a chimney, is the chimney visibly unstable?
Y I N Are there holes in the roof?
Y I N Does the roof have multiple shingles missing or other visible damage?
Y I N Is the roof significantly uneven or does it sag to indicate structural problems?
Y I N Are windows missing frames or are the frames broken?
Y I N Are windows cracked or broken, or are panes missing?
Y I N Is the front door loose or unsecured?
Y I N Are there gaps between the door and doorframe that are visible from the street?
Y I N Does the front porch look deteriorated to the point that it looks unsafe to walk on?
Y I N Is the foundation visibly damaged or uneven?
Y I N Are the façade paint or façade materials in poor condition?



45 patches of arundo were identified, Six of those patches were recorded as 100+ feet long and 35-40 feet tall, including two that were recorded as 262 and 307 feet in length, respectively.

Chico General Plan

Policy SUS-7.2 (Support Community Gardens) – Support community gardens in appropriate locations in the City.

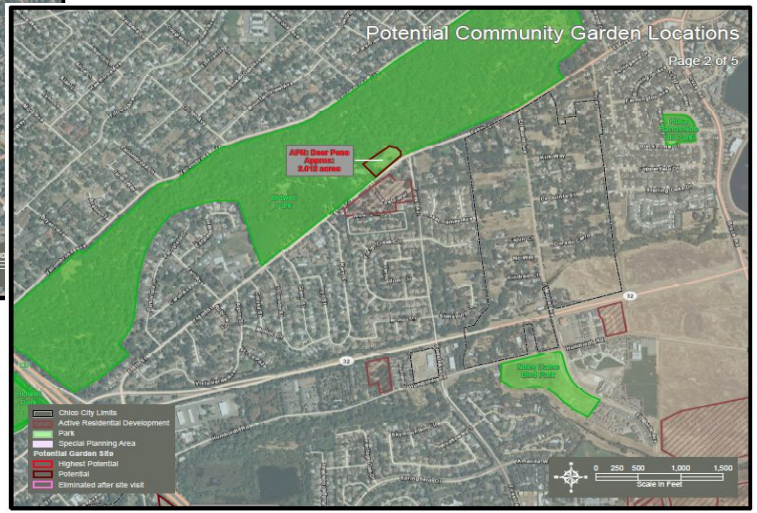
- **Action SUS-7.2.1 (Community Gardens) – Amend the Municipal Code to allow community gardens as a permitted use in appropriate zoning districts, including multi-family residential, and establish standards for their use.**

- **Action SUS-7.2.2 (Identify Community Garden Locations) – Conduct an inventory of existing community gardens, and identify opportunities for community gardens on public properties.**

- **Action SUS-7.2.3 (Gardening as Recreation) – Request that the Chico Area Recreation and Parks District and other local gardening or agricultural organizations promote community gardens by offering classes such as gardening and composting and by allowing community gardens at their facilities.**

Community Garden GIS Survey






Humboldt Community Garden
Humboldt Rd
Notre Dame Blvd
Bike Path
Demonstration Orchards
265'
155'
155'
265'
150'
345'
155'
Garden Extent
Parking/Farmers Market
Open Space
Community Garden
Agency Garden
Innovation Garden
Sensory Garden
Flower Garden
Picnic Area
1 inch is approximately 50 Feet
Map by S. Cares

Chico Farmers Markets: Outlook and Trends

The USDA reports that the direct marketing of local food is one of the fastest growing sectors of agriculture, rising 50% between 2002-2007. Nationally, local foods were valued at $1 billion in 2005, $4.8 billion in 2007 and $7 billion in 2012. In California, direct market sales increased 9.6% in 2012 alone. The USDA expects these trends to continue.





The General Plan predicts that by 2030, Chico will have a population of 139,000, an increase of 40,000 residents. More consumers and shifting preferences suggest that demand for direct market access to fresh foods will grow in the years to come, and the City of Chico and the local agricultural community need to plan accordingly. The following issues will need to be addressed in the years ahead.

Chico Farmers Markets: 2030 Vision

By 2030 the Certified Farmers Markets have grown to keep pace with the increasing numbers of consumers seeking fresh, healthy foods. The four weekly markets vary in size and character. The Saturday Farmers Market is an inclusive, adaptable expression of the Chico community that fosters local farming and serves as a hub to bring people together. The market holds a wide variety of produce, meats, cheeses, and artisan goods. Tables and chairs allow for relaxing and socializing, and a stage hosts cultural entertainment and celebration.





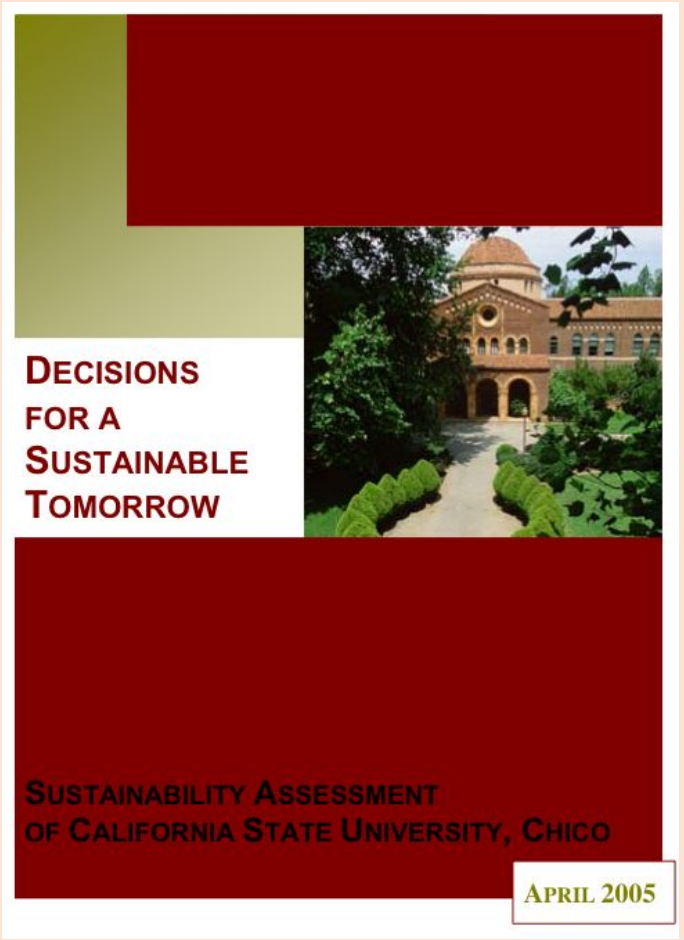
The three satellite Farmers Markets are conveniently located in different parts of town, providing easy mid-week access to fresh food and offering location specific programming to area residents.

Campus Sustainability Assessment

Released 4/22/2005

www.csuchico.edu/sustainablefuture





CALIFORNIA STATE UNIVERSITY, CHICO GREENHOUSE GAS EMISSIONS INVENTORY

_____

A Thesis

Presented

to the Faculty of

California State University, Chico

_____

In Partial Fulfillment

of the Requirements for the Degree

Master in Arts

In

Geography and Planning

_____

by

Daniel Abeyta Salazar

Summer 2007



City of Chico

Greenhouse Gas and Criteria Air Pollutant Emissions Inventory



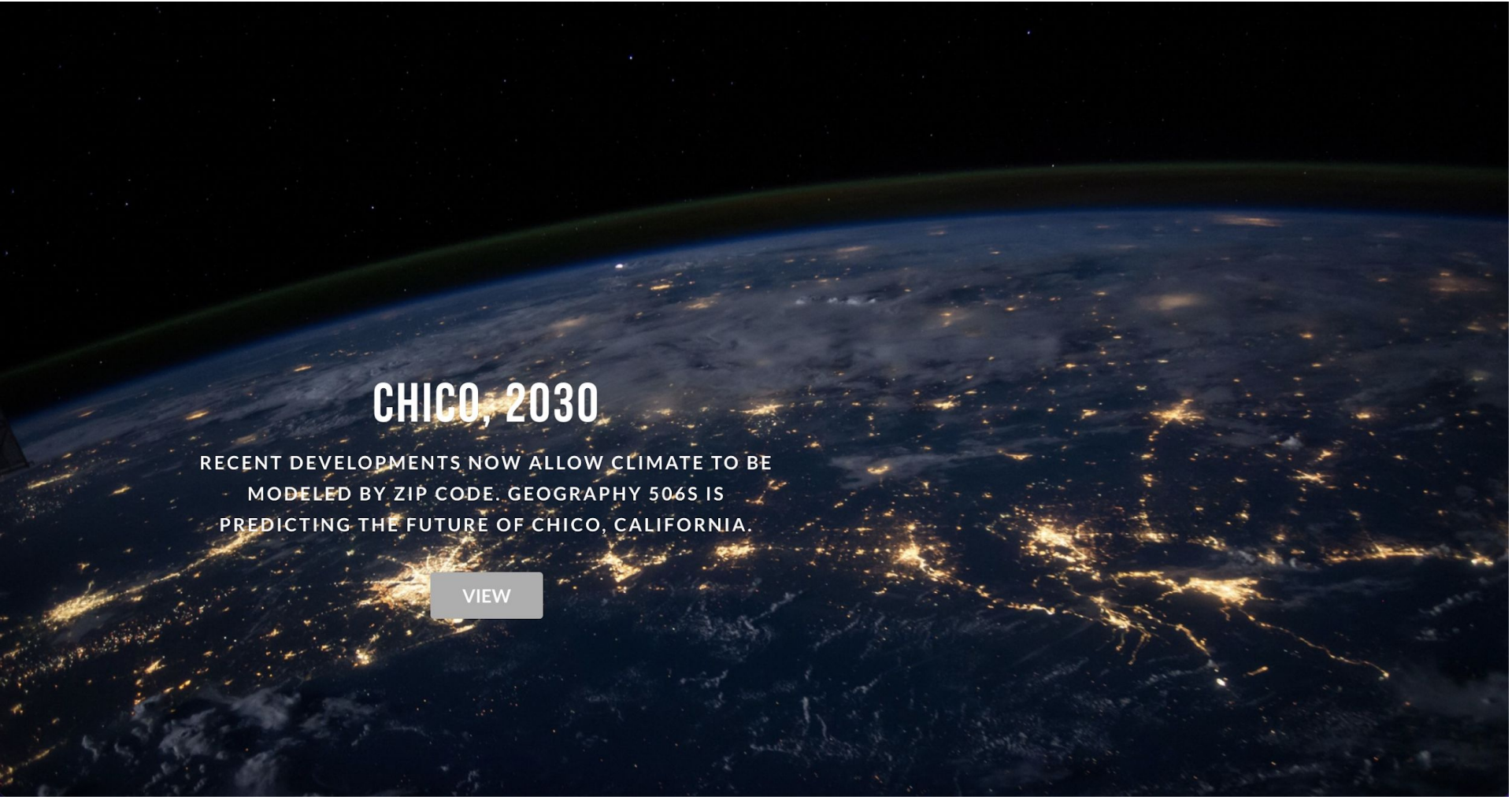
Presented by Dr. Mark Stemen, Project Director
Compiled by Daniel Salazar, Project Manager
Additional assistants from Daniel DiMeo, Amelia Gulling, Anthony Sudderth

Project Research Team

- **Project Director, Dr. Mark Stemen**
  - *Professor, California State University, Chico*
  - *Program Chair, Environmental Studies*
  - *Research Projects exceeding $200,000*

- **Project Manager, Daniel Salazar**
  - *Salazar Climate Consulting, Emissions Analyst*
  - *City of Fort Bragg Emissions Inventory, Comm. Develop*
  - *CSU, Chico Greenhouse Gas Inventory, Grad Student*

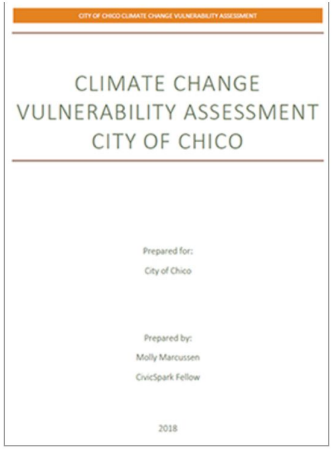
- **CSU, Chico Student Research Assistants**
  - *Transportation: Anthony Sudderth (Grad Student,Geog/GIS)*
  - *Energy: Amelia Gulling (Senior, Green Campus Director)*
  - *Waste, Water, & Sewage: Daniel DiMeo (Senior, Economics)*


CHICO, 2030
RECENT DEVELOPMENTS NOW ALLOW CLIMATE TO BE MODELED BY ZIP CODE. GEOGRAPHY 506S IS PREDICTING THE FUTURE OF CHICO, CALIFORNIA.
VIEW


AND —, BUT
THEREFORE
AND

Climate Change Vulnerability Assessment

Climage Action
Climate Change Basics
Government Initiatives
Climate Action Plan
Climate Change Vulnerability Assessment


CITY OF CHICO CLIMATE CHANGE VULNERABILITY ASSESSMENT

CLIMATE CHANGE VULNERABILITY ASSESSMENT CITY OF CHICO

Prepared for:
City of Chico

Prepared by:
Molly Marcussen
CivicSpark Fellow

2018

The Chico Climate Change Vulnerability Assessment is the culmination of a year's worth of hard work and coordination between the City's CivicSpark Fellow Molly Marcussen, the Sustainability Task Force, County and City staff, and students from Chico State's GEOG 506 class.

2019



City of Chico
Extreme Heat Event
Preparedness Plan

CITY OF CHICO
INC. 1872


CivicSpark


CALIFORNIA
CLIMATE
ACTION CORPS


BUILDING COMMUNITY
RESILIENT HUBS INITIATIVE
REGENERATIVE ECOLOGICAL FEATURES
DISASTER PREPAREDNESS & RESPONSE


SUPPORT.
UNITE.
THRIVE.

Thank You

Questions? Reach out to Azanta Thakur
azanta@greenribboncommission.org

