Welcome!
Our Team

- Tina Evans, Assoc. Professor, Sustainability Studies (Lead)
- Whitney Chandler, Teaching Assistant, Student & Researcher
- Becky Edmiston, Asst. Professor, Biology
- Dan Edmiston, Adjunct Faculty, Outdoor Ed
- Tracey Hughes, Librarian
- Dr. Peter Perhac, CEO, CMC Steamboat Campus
- Becky Potter, Professor, English/Communications
- Cyd Pougiaies, Architect
- John Saunders, Professor, Wilderness Studies
- Natalie Savage, Student & Researcher
- Tom Smiley, Assoc. Professor, Restaurant & Culinary Management
- Pete Waller, CMC Facilities Director
- Cynthia Zyzda, Professor, Visual Arts & Humanities
- And now you too!
Dr. Peter Perhac

Photos by CMC
Pete Waller - Gardens @ CMC (and maintaining them!)

• Edwards Campus
  — Garden & Sustainable Cuisine program

• Breckenridge Campus
  — Greenhouse partnership with High Country Conservation Center
    — Summer Sustainability Institute

• Timberline Campus
  — NRS Soils Lab & Greenhouse

Photos by CMC and Summit County News
The Afternoon’s Agenda

• Welcome by Dr. Peter Perhac
• Gardening at other CMC campuses – Pete Waller
• Charrette/Workshop Process – Cyd Pougiales
• Ute Indians & Bear Park – John Saunders
• Elements of the Project – Various Team Members
• Lessons Learned by Elkstone Farm – Terry & Chloe
• Breakout Sessions
• Group Presentations
• Summary/Next Steps

Photos accessed at http://permaculture.org
Cyd - Charrette/Workshop Process

Goal:
Through intense group participation to procure conceptual designs for the Bear Park Greenhouse & Gardens Project.
John Saunders – Ute Indians & Bear Park

Photo from http://www.coloradofilmm.org/production/location/item/557.html
Current CMC programs with potential curricular needs for greenhouse

- Associate of Applied Science: Culinary: Sustainable Cuisine - variety of agriculture courses
- Associate of Arts: Outdoor Education - survival, medicinal, edible plants
- Associate of Arts: Biology courses - general college biology, botany, science of biology
- Bachelor of Arts: Sustainability Studies - variety of foodshed, agriculture, ecology, conservation biology courses, capstone, internships
Collaboration with existing disciplines

- Engineering: design & construction
- Art: botanical drawing, hardscape
- Culinary: variety of opportunities
- Business B.S.: business planning, marketing, product research, capstone courses
Potential programs/certificates utilizing greenhouse within the curriculum

- Permaculture design certificate
- Permaculture workshops
- Permaculture teacher education (continuing education for professionals)
- Beekeeping courses & workshops
- Workshops for community: soils, composting, edible landscaping, food forest, bee sanctuaries
Tina Evans - Grants

- **Jewel-Osco** - support healthy and thriving communities by funding nonprofit organizations
  - Environmental stewardship: environmental stewardship and sustainable operations
  - Potential award: $125,000

- **Organic Crop Improvement Association** - support organic agriculture through research and education projects that will benefit producers, processors, and consumers.
  - Potential award: $1,500

- **Clif Bar Family Foundation** - support grassroots efforts to promote environmental protection, sustainable food and agriculture, and the reduction of environmental health hazards, as well as efforts that contribute to building stronger communities.
  - Potential award: $8,000

- **Fiskars Brands, Inc.** - support the community garden movement by providing tools and financing for unique new community garden initiatives
  - Potential award: $3,500
• Tellabs Foundation - build capacity of nonprofit organizations by supporting sustainable initiatives. Priority funding areas are education, health & environment.
  • Potential award: Minimum $10,000

• National Science Foundation - support undergraduates in the pursuit of research and development opportunities, and seek to improve opportunities to learn science, mathematics, engineering, and technology (STEM) and to increase student achievement, engagement and persistence in those areas.
  • Potential award: Unspecified with $600,000 maximum

• Dynamics of Coupled Human and Natural Systems (CHN): CNH Research Coordination Networks support research coordination networks that focus on the dynamics of coupled natural and human systems aiming to advance CNH research or create new directions in research or education, with innovative ideas for implementing novel networking strategies especially encouraged.
  • Potential award: Approximately $250,000 to $500,000 for a project period of up to 5 years.
Becky Potter – Community & Events

- Partnerships
  - Northwest Colorado Food Coalition (NWCFC) & Culinary program
    - Food growing education & cooking classes for low income people

- Schools
  - Support field trips for local school children to our site -- benefits to long term student recruiting
Becky Potter – Community & Events

• Community Members & Guests

  • Visitor, work & learn landscape tours

  • Sustainability discussion forums

• Potlucks

• Introductory & Guest workshops

• Harvest events
Natalie – Furniture, Fixtures & Equipment

• **Furniture**
  - Indoor Seating Benches
  - Work benches
  - Stools
  - Classroom tables
  - Workspace tables i.e. potting, planting
  - Picnic tables
  - Sawhorses
  - Chairs
  - Outdoor seating benches

Photo from [http://minneapolis.olx.com](http://minneapolis.olx.com)
Natalie – Furniture, Fixtures & Equipment

- Fixtures
  - Counters
  - Washing station
  - Vermiculture tower
  - Lighting
  - Compost bin
  - Water tanks
  - Locker/cubbies
  - Fencing
  - Solar lighting for paths
Natalie – Furniture, Fixtures & Equipment

- **Equipment**
  - Shovels
  - Clippers
  - Loppers
  - Sheers
  - Pick Axe
  - Pitch Fork
  - Wheel barrows
  - Hoses

- **Irrigation systems**
- **Plant signs**
- **Sign in sheet**
- **Seeder machine**
- **Pots for plants**
- **Tool sharpeners**
- **Apple press**
- **Garden carts**

Tina – Greenhouse, Shed & WC Buildings

Photos by CMC Staff & CRMPI – Accessed at http://crmpi.org/
Tina - Greenhouse Building Types

- Hoop houses
- Domes
- Traditional greenhouses
- Earthships
**Tina - CRMPI Greenhouse Building Type Details**

- Year-round greenhouse to accommodate very cold temperatures
- Mediterranean climate, with a minimum indoor temp of around 40°F
  - Potentially add insulating curtains at additional cost
- Permaculture design, including planting beds, soil analysis, soil building strategies, and forest garden layout and planting calendars at additional cost

<table>
<thead>
<tr>
<th>Greenhouse Type</th>
<th>Out/In ΔT:</th>
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</thead>
<tbody>
<tr>
<td>Simple hoop house or high tunnel greenhouse w/o CB:</td>
<td>+20° F</td>
</tr>
<tr>
<td>Insulated hoop house or high tunnel greenhouse w/ CB:</td>
<td>+35° F</td>
</tr>
<tr>
<td>Growing Spaces Dome w/ Climate Battery:</td>
<td>+40° F</td>
</tr>
<tr>
<td>Full 4-season Tropical House w/ Climate Battery:</td>
<td>+50° F</td>
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Tina – Shed & WC Buildings

Photos by CMC Staff & CRMPI – Accessed at http://crmpi.org/
Becky Sears-Edmiston –
Climate Battery from Start to Finish!
Very generally:

- Annuals
- Perennials
- Medicinals
- Herbs

Photo from [http://www.cambridgeshireagenda.co.uk/home/bee_licious_borders_at_cambridge_university_botanic_garden_1_1010515](http://www.cambridgeshireagenda.co.uk/home/bee_licious_borders_at_cambridge_university_botanic_garden_1_1010515)
Becky Sears-Edmiston - Plants & Hardscapes

THE FOREST GARDEN: A SEVEN LEVEL BENEFICIAL GUILD

1. Canopy (Large Fruit & Nut Trees)
2. Low Tree Layer (Dwarf Fruit Trees)
3. Shrub Layer (Currants & Berries)
4. Herbaceous (Comfereys, Beets, Herbs)
5. Rhizosphere (Root Vegetables)
6. Soil Surface (Ground Cover, eg, Strawberry, etc)
7. Vertical Layer (Climbers, Vines)

Cynthia - Art as part of the process/cycle

• Sus Club & Art & Sus students engage in creative planning
• Creative plantings and seed bombs
• Ephemeral yearly art works in the garden that revert back to nature

Photos from http://luminarydotcom.wordpress.com/2012/06/10/andy-goldsworthy/
Cynthia - Outdoor Art


http://www.laboiteverte.fr/oeuvres-dans-nature-andy-goldsworthy/
Cynthia - Outdoor Art

Cynthia - Ideas

• Green Acres Exhibit, promoting creative strategies toward permaculture and community
  — http://contemporaryartscenter.org/node/502

• Edible Estates, transforming front lawns into edible gardens-educational opportunities
  — http://www.fritzhaeg.com/garden/initiatives/edibleestates/about.html

• Carnegie Mellon University, combining artistic design & function as they apply to living things-gardens
  — http://www.cmu.edu/homepage/environment/2012/spring/eco-art.shtml
Cynthia - Ideas

- Exhibitions that reflect eco-art issues and education to the community
  - Making garden art out of beetle kill trees

- Bee sanctuary in wooden art

- Community seed bomb events

- National call for eco-friendly art works & planters juried exhibition

- Work with the Steamboat Clay artisans for beautiful & functional planters
Tracey - Water

• Collection/Detention Opportunities

• Swales, swales, swales!

• Bioswales

• Great for outdoor trees & garden areas

• Plant with deep rooted, wet-feet native plants

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Photo by http://www.pinterest.com/pin/44170467592
• Hugelkultured swales & spirals
**Tracey - Water**

Design for CSC
Stelle, IL.

**Overstory**
Semi-dwarf Fruit Trees – Black Locust (N)

**Midstory**
Hazelnut – Service Berry – Dwarf Fruit Trees
– Elderberry – Siberian pea shrub (N)

**Understory**
Gooseberry – Currants – Asparagus –
Rhubarb – Herbs – False Indigo (N)

**Ground Cover**
Strawberry – Nasturtium – Covers (N)

**Vines**
Grapes – Winter Hardy Kiwi – Hope

**In Swale**
Daylilies – Comfrey

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**Hugelkultured Swale & Linear Food Forest**

Perennial trees and plants located along the entire downhill side of the hugelkultured swales.

Based on an illustration from Introduction to Permaculture by Bill Mollison.

Modified by Bill Wilson of Midwest Permaculture.

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Tracey - Water

- Irrigation
  - Ollas or clay pot irrigation
  - Drip Irrigation
  - Swales
  - Hugelkultured raised beds

Tracey - Water

- Water Laws
  - Greywater only as a potential
    - HB 13-1044
    - Water Quality Control Commission contact/lead - Bret Icenogle
    - Timeline for adoption of state level regs is March 2015
    - Backflow prevention & cross connection control to keep the grey water from the drinking water
  - No new rainwater law changes
• Retention/Detention Pond
Breakout Sessions