Suggestions and Strategies for Creating and Growing Green Labs Programs

Kathryn A. Ramirez-Aguilar, Ph.D.
Green Labs Program Manager
University of Colorado Boulder

Suggestions

1. Find champion scientists & build from there

Strategy: Personal Outreach to Start

PERSONAL TOUCH!

Eco-Leaders =
engaged insiders

What do they want to address?

Leadership from the inside

Truth is… there are many lab members that care about their consumption.

Strategy: Use positive, public recognition

2015 CU Green Labs Award Recipients

Give Your Compressor a Break!

Increase the temperature of your ULT(Ultra Low Temperature) Freezer to -70° C

-70° C

Extend Freezer Life

-80° C

=

2-4 kWh/day saved
same as a LCD TV

Save Energy While Extending Freezer Lifetime

- Increasing the temperature means the compressor does not have to work as hard.
- Since the compressor works less, there is reduced risk for compressor failure.
- 34 ULT freezers at CU-Boulder and 40 at UC-Davis are already at -70° C or warmer.

Join These CU-Boulder Labs That Are Already at -70° C

·Anseth	·Copley	·Martin	·Schmidt	·Taatjes
·Blumenthal	·Ehringer/Marks	·Moore	·Shen	·Winey
·Chen/Junge	·Garcea	·Poyton	·Smolen	·Xue
·Collins/Stitzel	·Han	·Seals	·Stein	

For info on samples that labs are storing at -70° C or warmer go to ecenter.colorado.edu/greenlabs

CU Green Labs Contact:
Kathy Ramirez
greenlabs@colorado.edu
303-492-5562

Environmental Health & Safety

Facilities Management Sustainability

University of Colorado Environmental Center

Power Down Turn Off Climate Change

Suggestions

1. Find champion scientists & build from there
2. Raise awareness

Strategy: Posters, Contests, Meetings

Modified graphic from
Univ. of Toronto
Sustainability Office

Our most effective place to hang posters

Also in bathroom stalls.

Suggestions

1. Find champion scientists & build from there
2. Raise awareness
3. Include & collaborate with other stakeholders

Strategy: Win-win opportunities

- EH&S: BSCs, freezer inventory, fume hood sashes
- Fac. Management: fume hoods, equip. placement, doors closed
- VC of Research: shared instrumentation site

Be Safe & Energy Wise with Biosafety Cabinets (BSCs)

BSCs are required to be certified annually OR when moved/repaired

Increase your filter lifetime & save energy
→ *Turn Off Blowers Between Uses*

Follow these important guidelines to be safe and sterile

1. After use, ethanol wipe and wait 5 minutes for air to filter before turning off blower
2. Before beginning work, let the blower run for 5 minutes to filter the air and do an ethanol wipe

NIH, CDC, & NSF do NOT recommend UV lights → *False Sense of Security*

1. Only the top layer of cells is killed by the 253.7 nm UV light which has limited penetrating power
2. UV light effectiveness reduces as lamp intensity diminishes over time and dust builds up
3. UV light can damage eyes and skin

Don't forget to clean under the pan

Ethanol wiping is not only important for those surfaces you see, but also for underneath

1. Decontaminate ALL surfaces inside the cabinet (even under the pan) with ethanol or other suitable disinfectant
2. Always follow the manufacturer's instructions when using a BSC to maximize the protection of the personnel, the material on the work area, and the environment

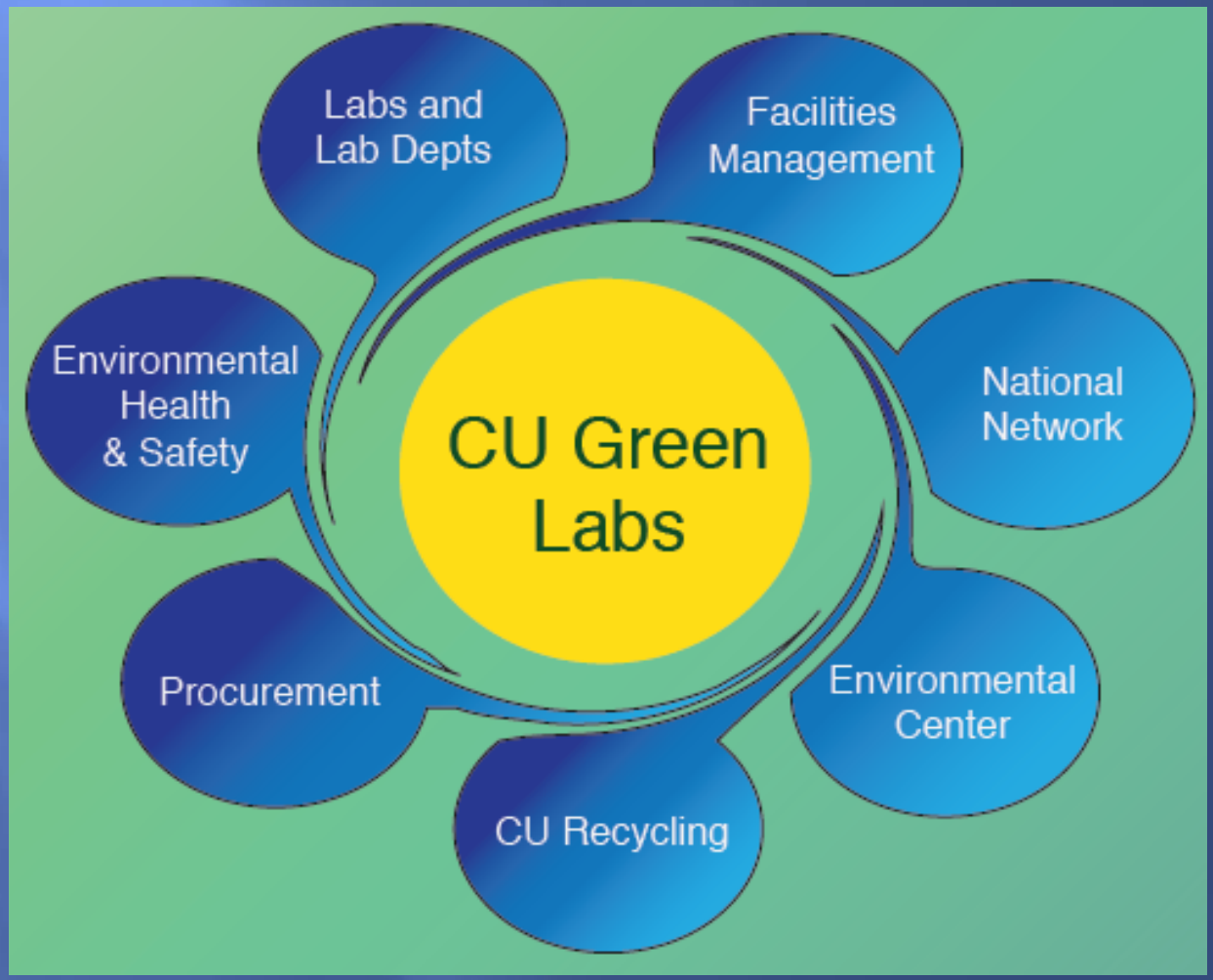
For questions regarding biosafety cabinets, please contact the biosafety group in EH&S at 303-492-6025

CU Green Labs Contact:
Kathy Ramirez
greenlabs@colorado.edu
ecenter.colorado.edu/greenlabs
303-492-8308

Facilities Management
Office of Sustainability
Environmental Health and Safety
Environmental Center
UNIVERSITY OF COLORADO BOULDER

YOU CAN TURN OFF CLIMATE CHANGE

Strategy: Regular check-ins with stakeholders to build partnerships

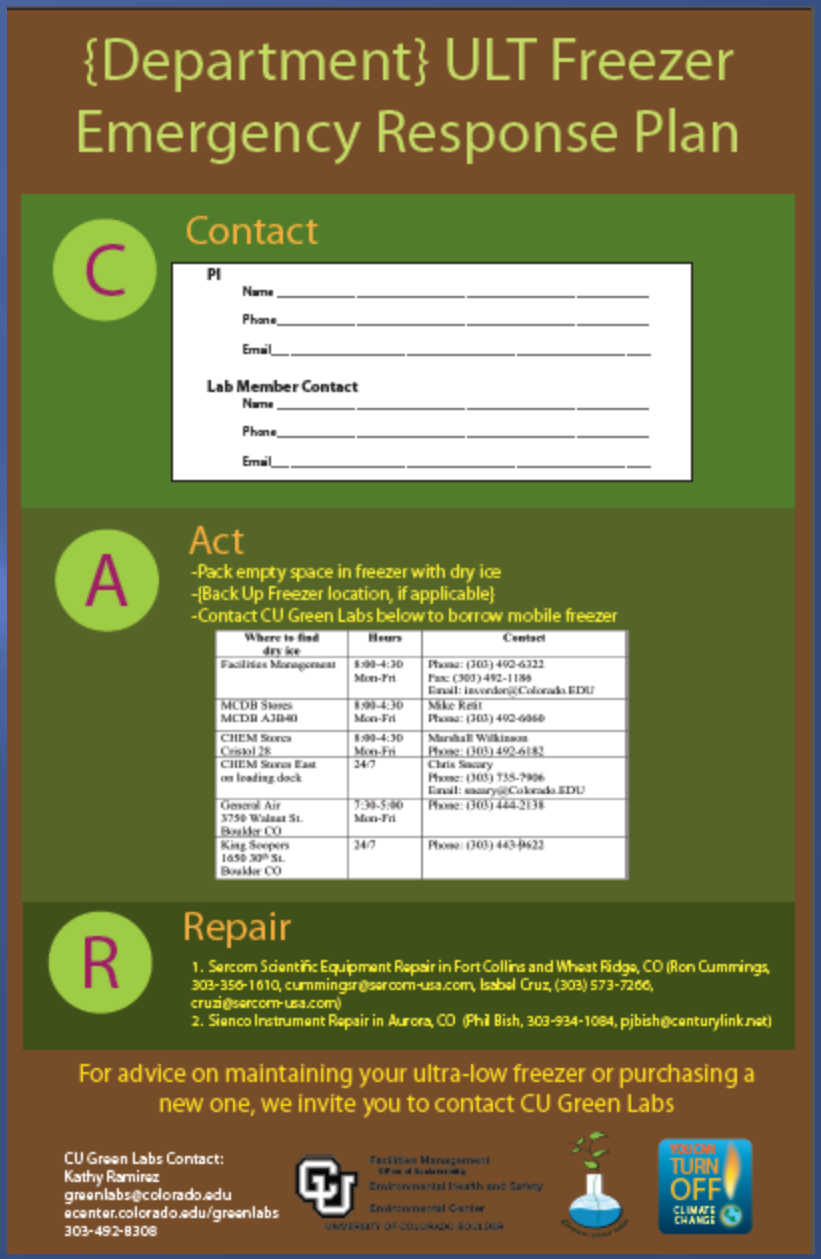


Suggestions

1. Find champion scientists & build from there
2. Raise awareness
3. Include & collaborate with other stakeholders
4. Be a resource to labs

Strategy: Find needs and fill them

- ULT failure help
- Mobile freezers
- Property disposal
- Research efficient equipment
- Give scientists a voice



{Department} ULT Freezer Emergency Response Plan

C

Contact

PI

Name _____

Phone _____

Email _____

Lab Member Contact

Name _____

Phone _____

Email _____

A

Act

-Pack empty space in freezer with dry ice
-{Back Up Freezer location, if applicable}
-Contact CU Green Labs below to borrow mobile freezer

Where to find dry ice	Hours	Contact
Facilities Management	8:00-4:30 Mon-Fri	Phone: (303) 492-6322 Fax: (303) 492-1186 Email: invorder@Colorado.EDU
MCDB Stores MCDB A3040	8:00-4:30 Mon-Fri	Mike Kehl Phone: (303) 492-6060
CHEM Stores Cristol 28	8:00-4:30 Mon-Fri	Marshall Wilkinson Phone: (303) 492-6182
CHEM Stores East on loading dock	24/7	Chris Searcy Phone: (303) 735-7906 Email: searcy@Colorado.EDU
General Air 3750 Walnut St. Boulder CO	7:30-5:00 Mon-Fri	Phone: (303) 444-2138
King Soopers 1650 30th St. Boulder CO	24/7	Phone: (303) 443-9622

R

Repair

1. Sercom Scientific Equipment Repair in Fort Collins and Wheat Ridge, CO (Ron Cummings, 303-356-1610, cummingsr@sercom-usa.com, Isabel Cruz, (303) 573-7266, cruzi@sercom-usa.com)
2. Sienco Instrument Repair in Aurora, CO (Phil Bish, 303-934-1084, pjbish@centurylink.net)

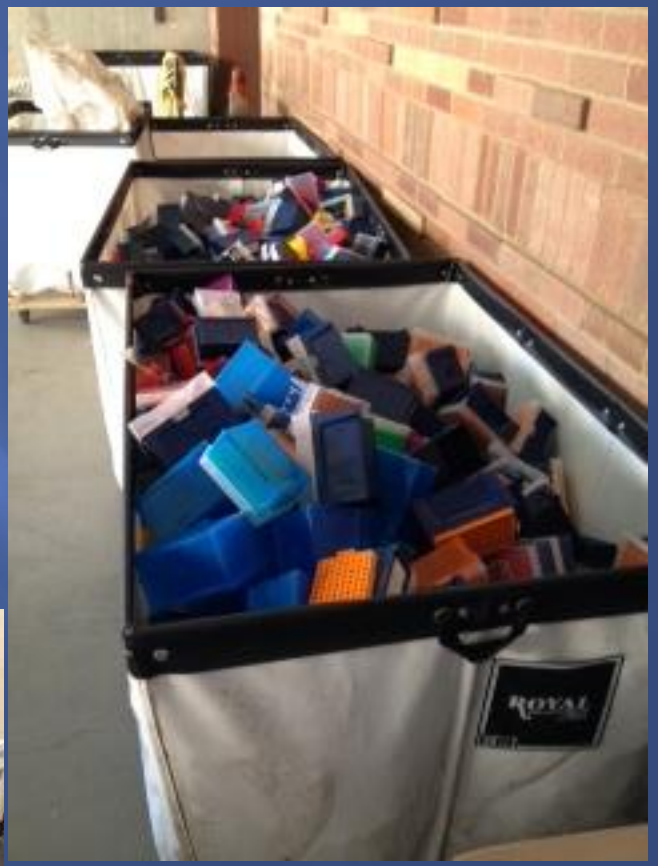
For advice on maintaining your ultra-low freezer or purchasing a new one, we invite you to contact CU Green Labs

CU Green Labs Contact:
Kathy Ramirez
greenlabs@colorado.edu
ecenter.colorado.edu/greenlabs
303-492-8308

Facilities Management
Office of Sustainability
Environmental Health and Safety
Environmental Center
UNIVERSITY OF COLORADO BOULDER

TURN OFF CLIMATE CHANGE

Strategy: Listen to what lab members want to address



Suggestions

1. Find champion scientists & build from there
2. Raise awareness
3. Include & collaborate with other stakeholders
4. Be a resource to labs
5. Connect occupants financially with their energy, water, trash, and space use

Strategy: Connect depts w/ consumption

Berkeley
UNIVERSITY OF CALIFORNIA

- Began FY ’12-13
- 27 operating units
- ‘10-’11 electrical static baseline
- Saved $870,000 FY ’12-13 (8.35 GWh)
- Saved $1,000,000 FY’13-’14

Occupants receive $ savings

Occupants pay $ difference (starting 2014-2015)

Resource: Chuck Frost, UC-Berkeley Utilities

Strategy: Purchasing Incentives

Up to 5 yrs of energy or water savings:

- Equipment replacements
- New equipment

Low Temp Environmental Chamber: 5.5°C and Lighting

33.2 kWh/day

11.2 kWh/day

66% reduction in electricity

$3252 incentive= 5 yrs electricity savings

Suggestions

1. Find champion scientists & build from there
2. Raise awareness
3. Include & collaborate with other stakeholders
4. Be a resource to labs
5. Connect occupants financially with their energy, water, trash, and space use
6. Utilize national/international groups & resources

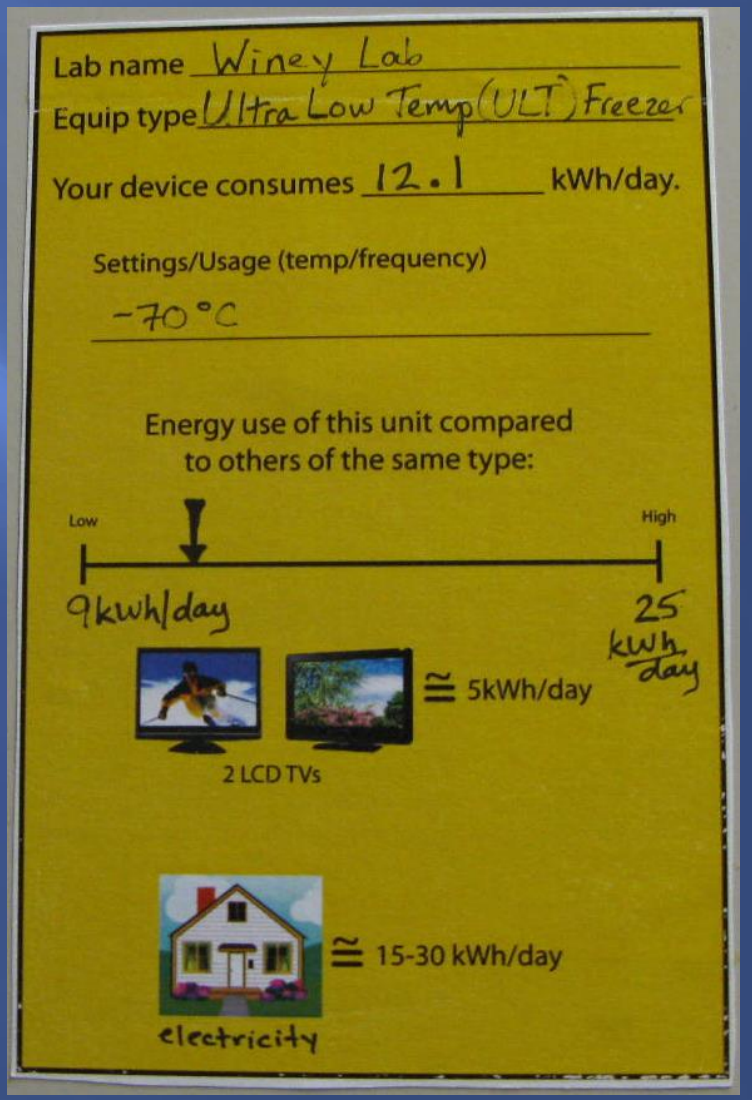
Strategy: Reach out & collaborate with Green Labs Community

- International Institute for Sustainable Labs (I2SL)
- Green Labs Planning Google Group
- Safe, Successful, Sustainable Labs

Suggestions

1. Find champion scientists & build from there
2. Raise awareness
3. Include & collaborate with other stakeholders
4. Be a resource to labs
5. Connect occupants financially with their energy, water, trash, and space use
6. Utilize national/international groups & resources
7. Justify funding with metrics

Strategy: Use Consumption Data Already Available



Strategy: Incremental, shared budget growth

Environmental Center

Facilities Management

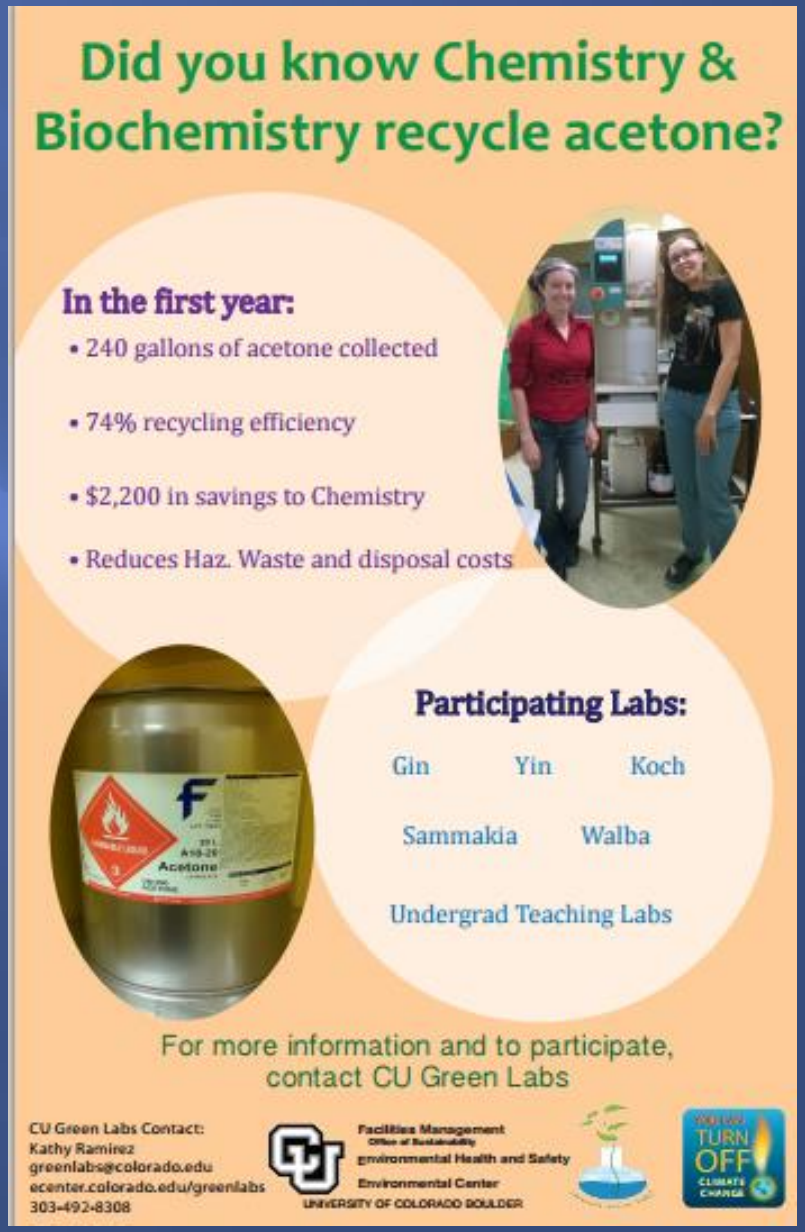
Suggestions

1. Find champion scientists & build from there
2. Raise awareness
3. Include & collaborate with other stakeholders
4. Be a resource to labs
5. Connect occupants financially with their energy, water, trash, and space use
6. Utilize national/international groups & resources
7. Justify funding with metrics
8. Leverage additional funding sources

Strategy: Green or revolving fund

Sustainable CU Grants:

- Freezer Challenge
- Green Chem Fund
- Solvent distiller
- Collection containers for recycling
- Flammable freezer



Suggestions

1. Find champion scientists & build from there
2. Raise awareness
3. Include & collaborate with other stakeholders
4. Be a resource to labs
5. Connect occupants financially with their energy, water, trash, and space use
6. Utilize national/international groups & resources
7. Justify funding with metrics
8. Leverage additional funding sources
9. Catch people when they first arrive on campus

Strategy: Graduate student orientations and welcome person for new hires

A Resource for Labs:

CU Boulder Green Labs Program

working together with labs to save energy, water, & reduce solid & hazardous waste

Suggestions

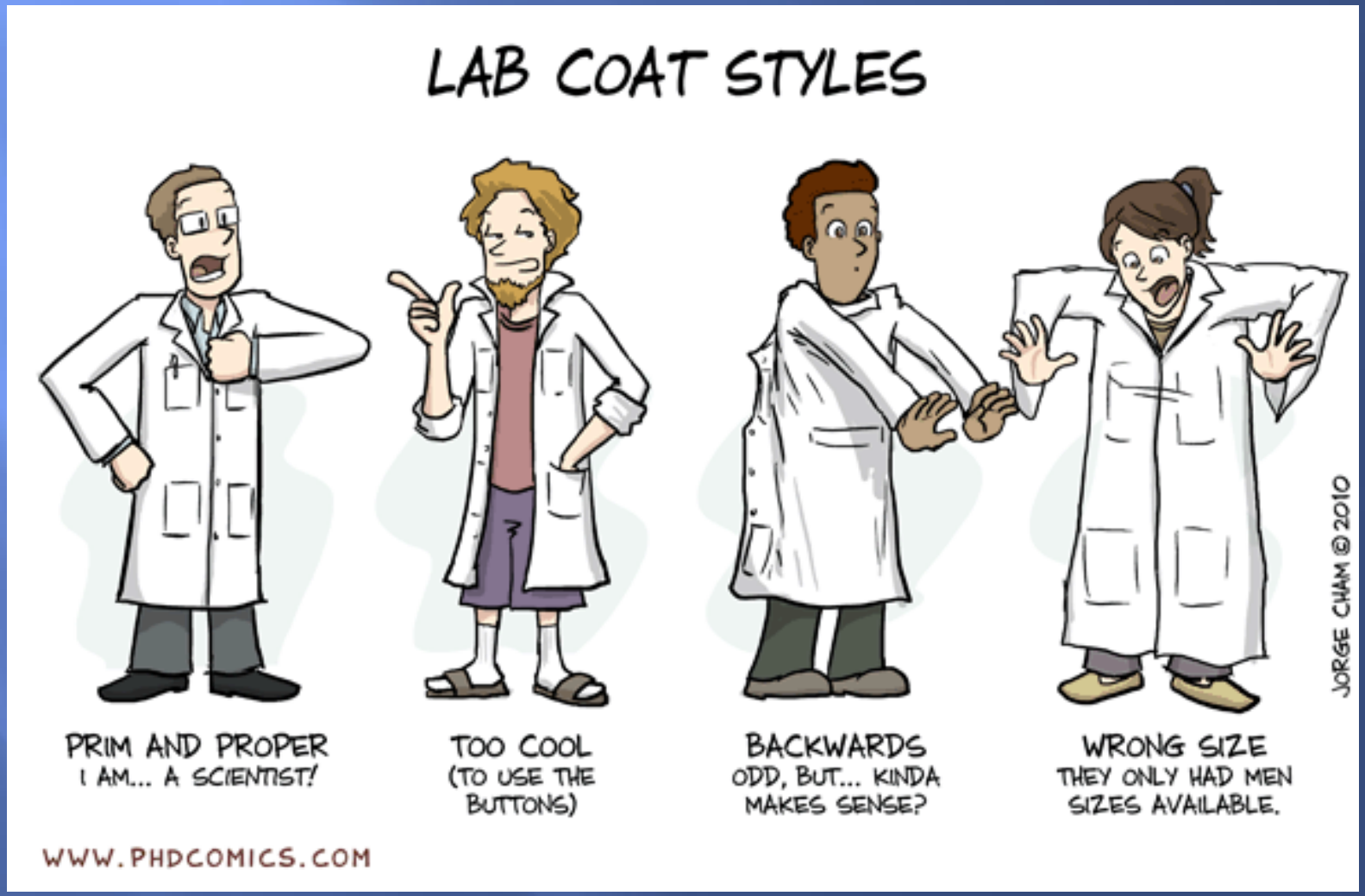
1. Find champion scientists & build from there
2. Raise awareness
3. Include & collaborate with other stakeholders
4. Be a resource to labs
5. Connect occupants financially with their energy, water, trash, and space use
6. Utilize national/international groups & resources
7. Justify funding with metrics
8. Leverage additional funding sources
9. Catch people when they first arrive on campus
10. Pilot before doing a campus-wide launch

Strategy: Pilot in engaged, flexible labs/depts that can handle bumps

Suggestions

1. Find champion scientists & build from there
2. Raise awareness
3. Include & collaborate with other stakeholders
4. Be a resource to labs
5. Connect occupants financially with their energy, water, trash, and space use
6. Utilize national/international groups & resources
7. Justify funding with metrics
8. Leverage additional funding sources
9. Catch people when they first arrive on campus
10. Pilot before doing a campus-wide launch
11. Hire leadership that understands lab culture & dynamics

Strategy: Choose a program manager that has experience as a lab scientist



Suggestions

1. Find champion scientists & build from there
2. Raise awareness
3. Include & collaborate with other stakeholders
4. Be a resource to labs
5. Connect occupants financially with their energy, water, trash, and space use
6. Utilize national/international groups & resources
7. Justify funding with metrics
8. Leverage additional funding sources
9. Catch people when they first arrive on campus
10. Pilot before doing a campus launch
11. Hire leadership that understands lab culture & dynamics
12. Allow others to lead

Strategy: Hire Grad Students to Lead

GREEN LABS TEAM LEAD

paid grad student leading Eco-Leaders & working on efforts within his/her own department or building

- Passionate insiders
- Important department members
- Have chair support
- ~5 hours per month
- Influential voices
- Great on a resume

Poster by Chemistry Team Lead

2015 ACS Green Chemistry & Engineering Conf.

Building a culture of sustainability in an academic chemistry department: Formulation and implementation of green chemistry practices on a broad scale

Lily A. Robertson,[1] Jacqueline M. Richardson,[1] Kathryn A. Ramirez-Aguilar,[2] Mark Lapham[3]

[1]Department of Chemistry and Biochemistry, [2]Facilities Management/Environmental Center, [3]Environmental Health and Safety, University of Colorado, Boulder, CO, USA