How in the world did CU Boulder Green Labs Convince Scientists to Make the Switch from -80˚C to -70˚C?!

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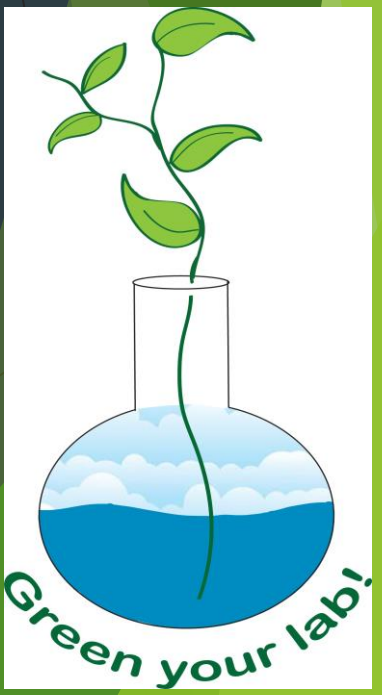
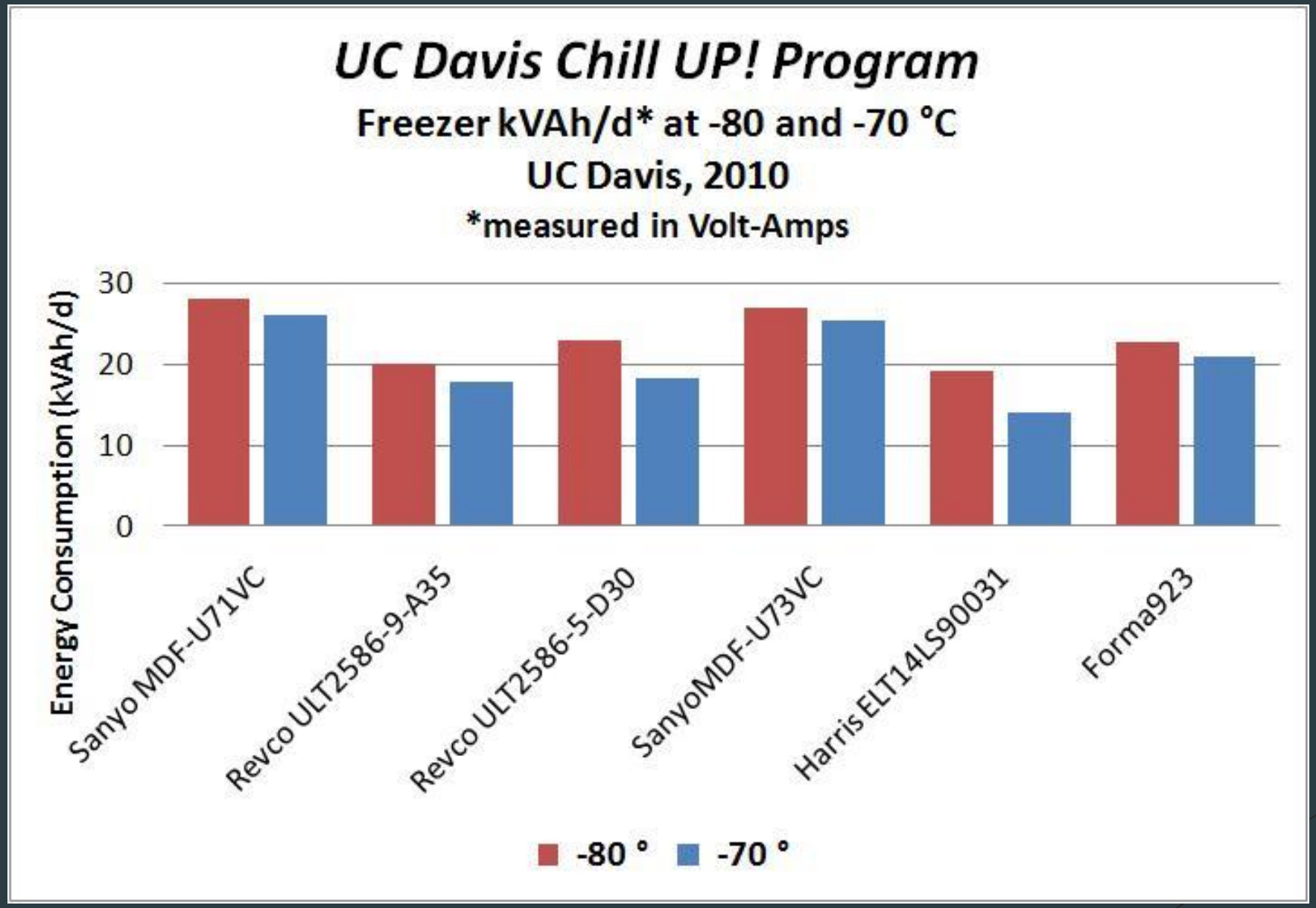


Learning Objectives

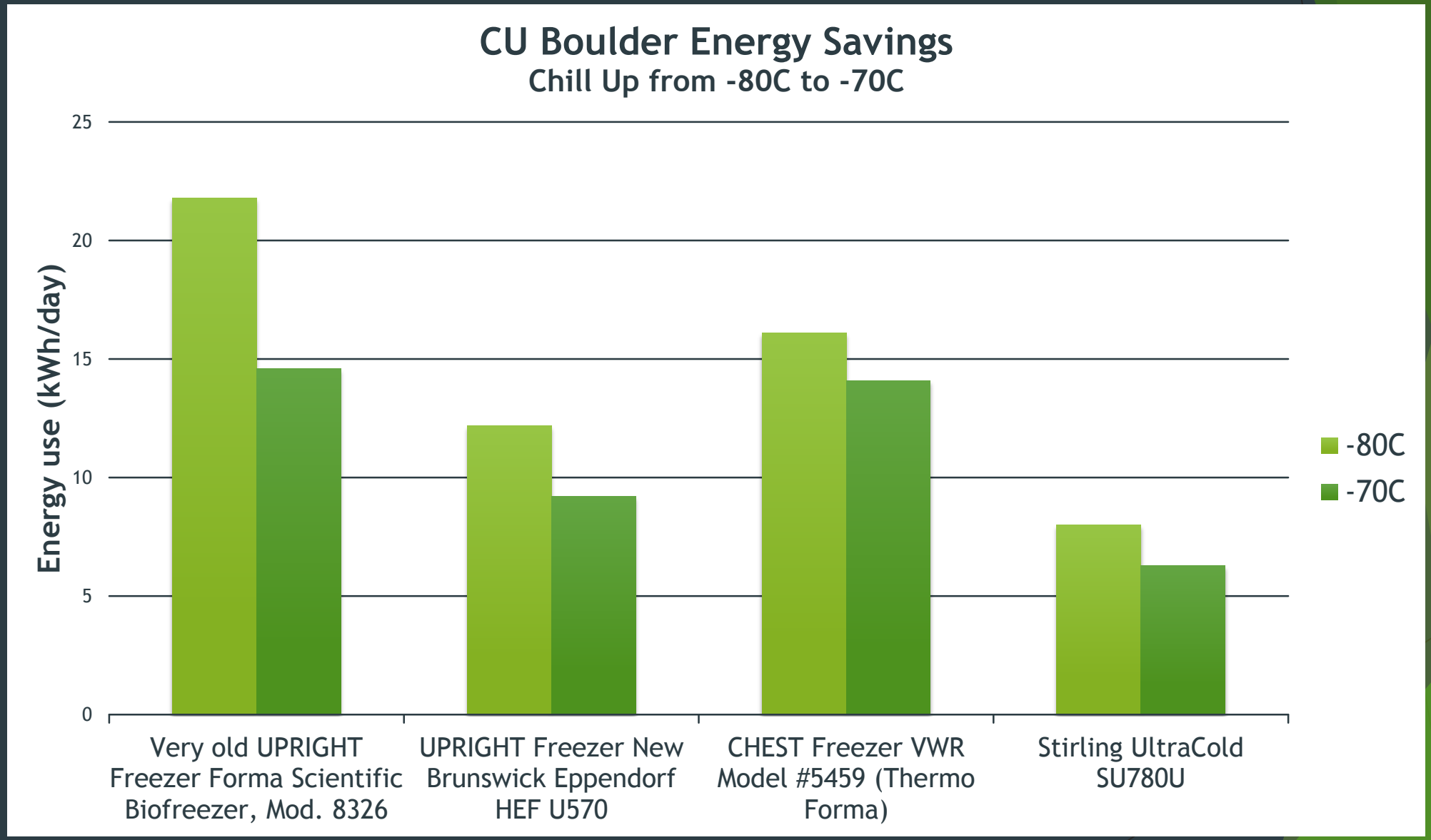
- Energy savings from switching from -80 ^{0}C to -70 ^{0}C
- How CU Green Labs worked with labs
- Addressing concerns raised by scientists
- Resources for other campuses

Where did the idea come from?

- Winey Lab in MCDB at CU-Boulder

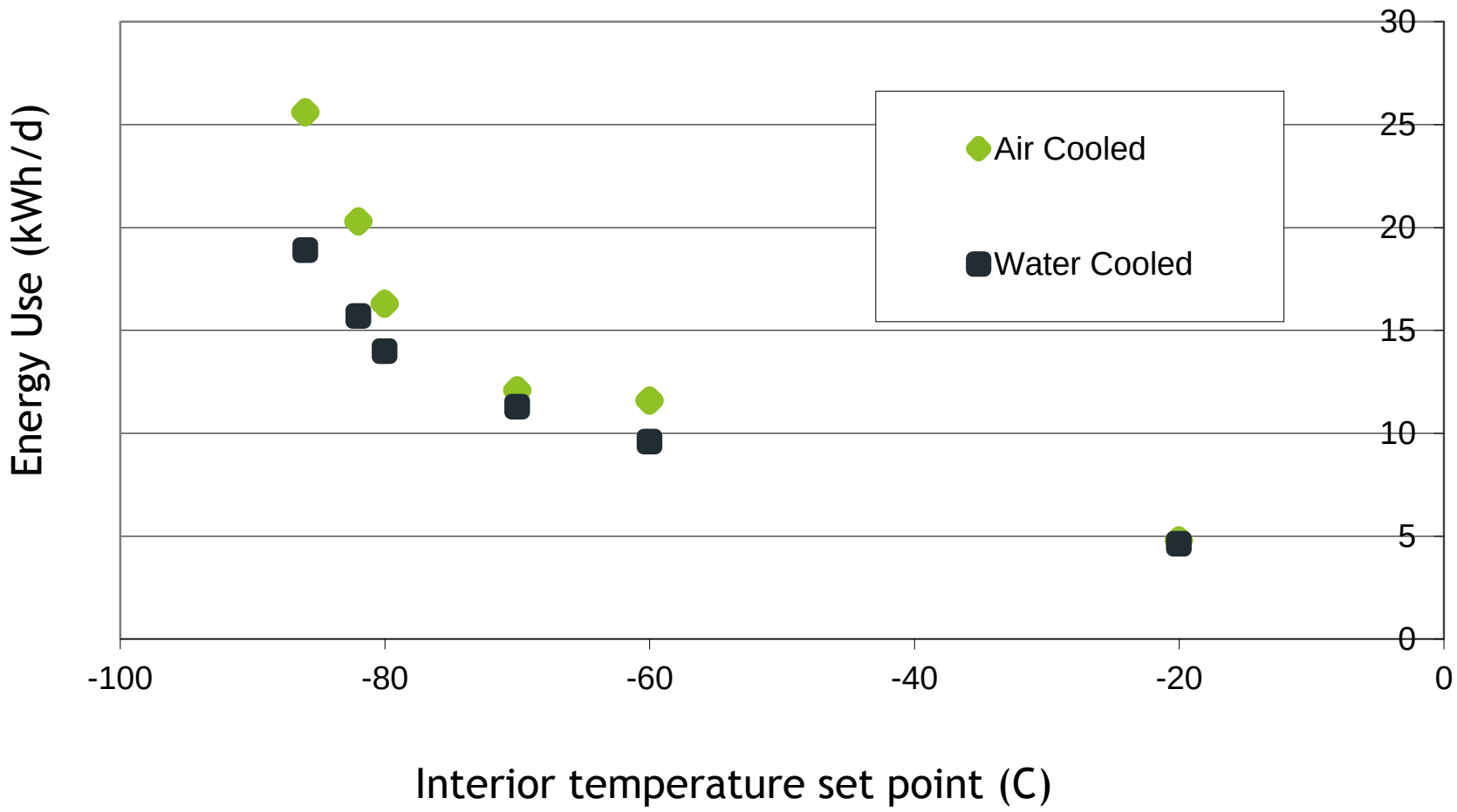


- Source: http://labs21.lbl.gov/wiki/equipment/index.php/UC_Davis_Chill_Up



More metering data at ecenter.colorado.edu/greenlabs→ Resources for Labs

Compressor Ultra Low Freezer Energy Use (kWh/d)



Obstacles/Concerns from Scientists

- Scientists do not pay energy bills

So why change?

- Many lab members do care

An Important Focus of CU Green Labs:
Engaging & Collaborating with Lab Members

LAB ECO-LEADER
a volunteer who acts as the eyes, ears, and voice for conservation in their lab

In numerous labs, CU Green Labs has laid the cultural foundation necessary to have success with getting labs to step back and consider what temperature they really need

Obstacles/Concerns from Scientists

- It works at -80 ^{0}C

So why change?

- Extend the life of your freezer

Obstacles/Concerns from Scientists

- "Colder must be better"

So why change?

- Before ULT freezer reached -80 ^{0}C, they only reached -70 ^{0}C
- No scientific reason to switch to -80 ^{0}C

Two units in a long row of ULT freezers at Univ. of Minnesota that can only reach -70 ^{0}C

Obstacles/Concerns from Scientists

- Will -70 ^{0}C jeopardize my samples?

So why change?

- Some scientist never switched
- Database of practices

Biological Samples Stored Long Term at -70C or Warmer : ULTs at -70

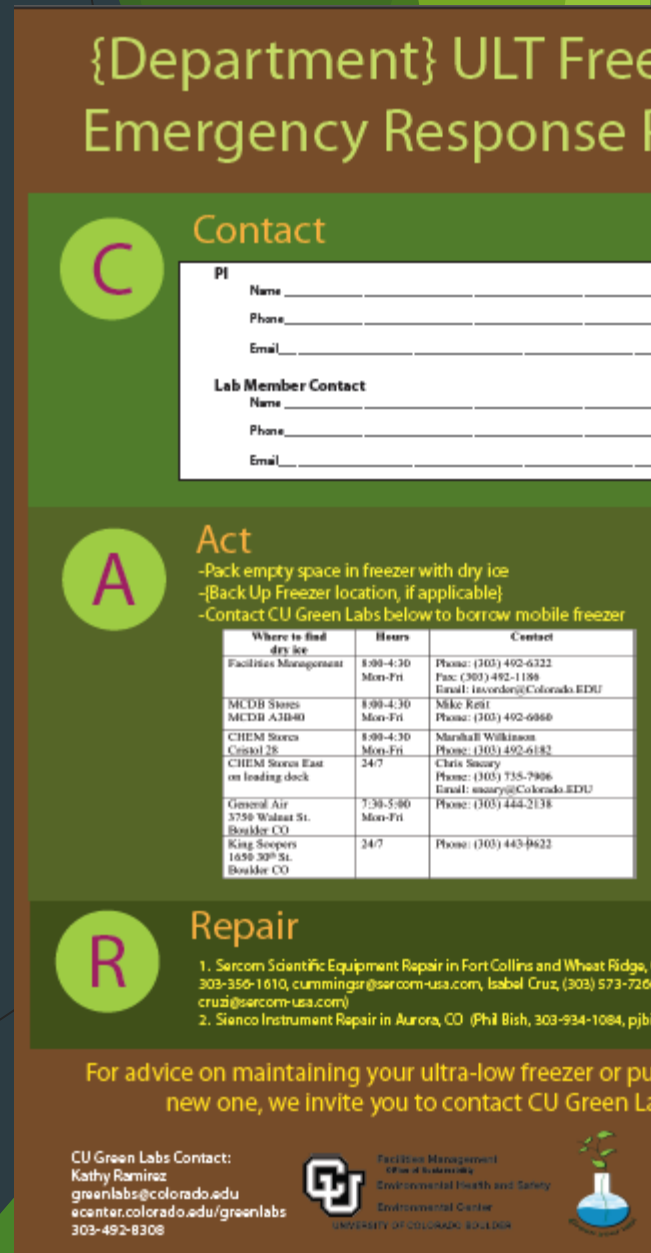
Entry Date	Sample Type	Temp (degrees C)	Duration sample stored in freezer	Duration freezer at indicated temp	University	Dept	Lab PI	Lab Contact	Freezer Type
2015- Feb	Growth Chambers, LED lights	-70	0-4 years	3-4 years	CU-Boulder	Ecology and Evolutionary Biology	Adams, William	Jared Stewart	
2015- Feb	DNA and RNA samples	-70	1-3 years	since 2010	CU- Boulder	Ecology and Evolutionary Biology	Schmidt, Steve	Ryan Lynch	Revco/Thermo
2015- Feb	DNA samples	-60	0.5-8 years	since 1998	CU- Boulder	Ecology and Evolutionary Biology	Martin, Andy	Kyle Keepers	Forma Scientific
2015- Feb	DNA, antibodies, peptides,	-70	2-7 years	since purchase	CU- Boulder	Ecology and Evolutionary Biology	Tsai, Pei		Forma Scientific
2015- Feb	bacteria, leaf disks	-70	<6 years	since purchase	CU- Boulder	Ecology and Evolutionary Biology	Tsai, Pei		Forma Scientific
2015- Feb	RNA	-70	0-2 years	since purchase	CU- Boulder	Ecology and Evolutionary Biology	Tsai, Pei		Forma Scientific
2015- March	DNA and RNA Tissue samples, enzymes	-70	2-10 years	since purchase	CU-Boulder	Ecology and Evolutionary Biology	Mederios/Stock	David Jandzik	Iso Temp

Obstacles/Concerns

- If my freezer fails, I will have more time at -80 ^{0}C

So why change?

- CU Green Labs help labs with freezer-related items
- Many labs are connected with Green Labs through freezers
- Green Labs helped develop Emergency Action Plan


{Department} ULT Free
Emergency Response

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: invordor@Colorado.EDU
MCDB Stores MCDB A3B40	8:00-4:30 Mon-Fri	Mike Reit Phone: (303) 492-6060
CHEM Stores Central 28	8:00-4:30 Mon-Fri	Marshall Wilkinson Phone: (303) 492-6182
CHEM Stores East on loading dock	24/7	Chris Sneary Phone: (303) 735-7906 Email: sneary@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, 303-356-1610, cummingsr@sercom-usa.com, Isabel Cruz, (303) 573-726 cruzi@sercom-usa.com)
2. Sienco Instrument Repair in Aurora, CO (Phil Bish, 303-934-1084, pjb

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

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

Obstacles/Concerns

- If my freezer fails, I will have more time at -80

So why change?

- Story from UC-Santa Cruz

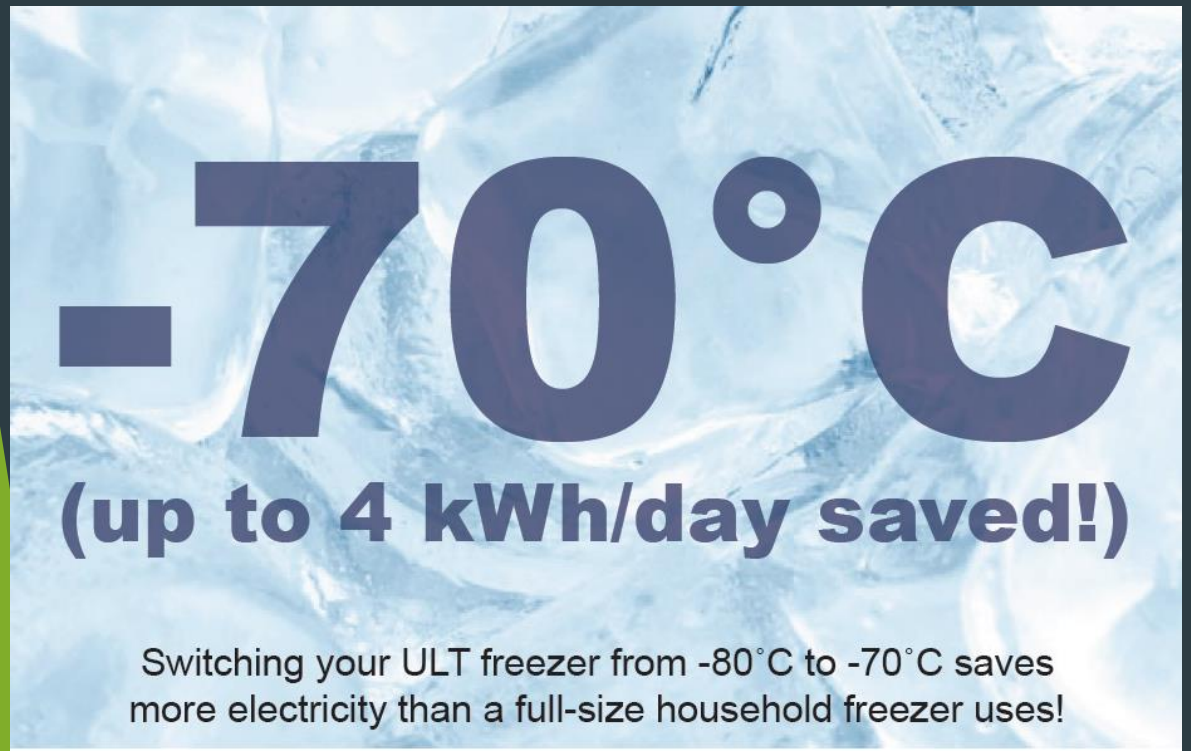
Strategies to Encourage Change

- Contests
  - First ran a contest specifically focused on raising the temperature to -70C
  - Then conducted Freezer Challenge on campus three times
- Information (database)

Graphic from UC-Davis

Strategies to Encourage Change

- Positive Public recognition
  - Poster (Give your compressor a break) had significant impact
  - Signage on freezers to identify labs at -70 ^{0}C



Background graphic from Univ. of Michigan

Results

- 50% (70 freezers) on campus at -70 ^{0}C
- Savings of appx 76,650 kWh/year (assuming 3 kWh/day savings per freezer)

Additional Informational & Resources

- CDC changing freezers to -70 ^{0}C
- Posters from Seracare
  - Genomic DNA is stable at -20 ^{0}C or -80 ^{0}C
  - Stability of various samples and uses -70 ^{0}C instead of -80 ^{0}C
- Roslin Institute in UK
  - Impact of temperature on biosamples of various types

Moving Forward

- Freezer Challenge
  - Needs to become national challenge hosted by I2SL
- Database- get access from CU-Boulder and add your own data

Questions

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