Agenda

ANR Staff Meeting
October 20, 2016

University of California
Agriculture and Natural Resources

Welcome	Chris Greer
Open Enrollment for 2017	John Fox
Second Street Operations Committee Update	Lauren McNees
Pest Update	Rhett Woerly
Rat Facts	Karen Ellsworth
New Faces in New Places	Chris Greer
Open Discussion/Kudos	Chris Greer
Safety Training – Preparedness	David Alamillo
Drone Safety and Demonstration	Sean Hogan

University of California
Agriculture and Natural Resources

Open Enrollment for 2017

From **10/27/16** *8:00 AM* to **11/22/16** *5:00 PM*

http://ucnet.universityofcalifornia.edu/oe

Disability Plan

http://ucnet.universityofcalifornia.edu/compensation-and-benefits/disability-life-accident/disability/index-2017.html

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Food Drive

October 20 – November 17

Collection bins located in the Break Room.

- Tuna and canned meats
- Canned fruit
- Canned vegetables
- Canned or dry beans
- Canned soup
- Canned or boxed meals
- Cereal
- Fruit juice
- Rice
- Pasta
- Peanut butter
- Shelf-stable milk

Non-canned goods or dried goods must be placed in the metal bin provided to protect our donations from the Second Street pests!

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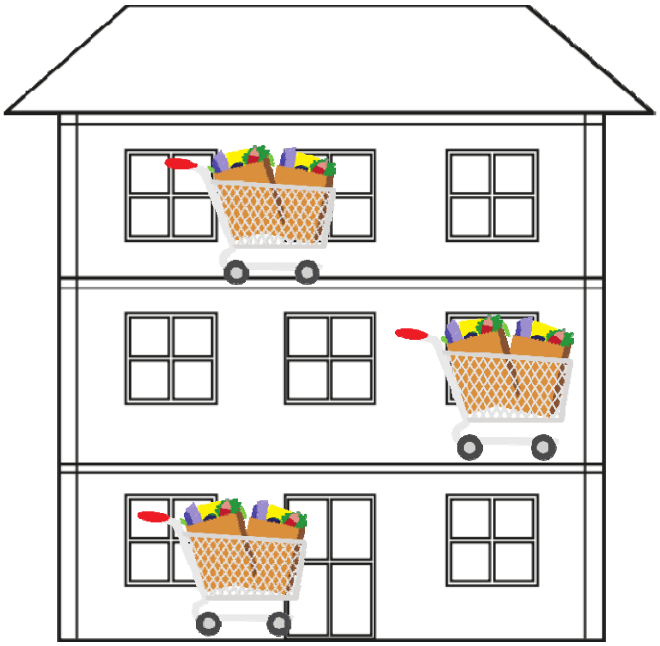
Fall 2013-Summer 2016

Reality

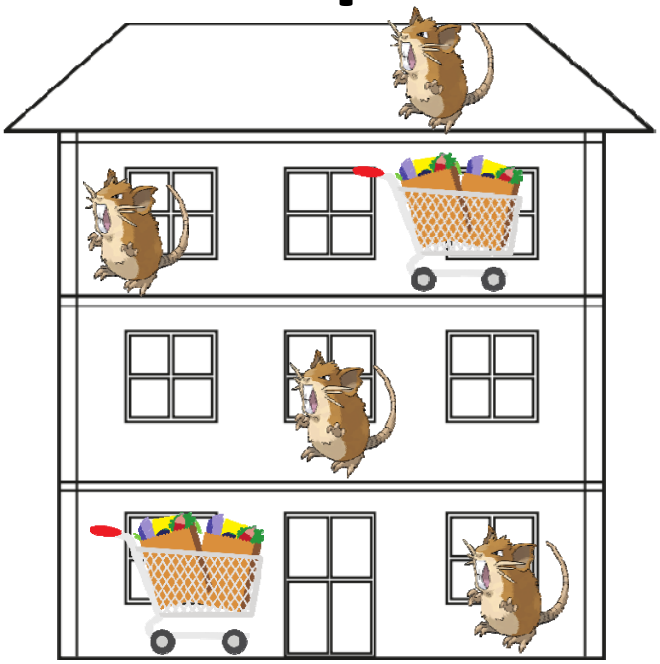
Perception



Summer 2016

Reality

Perception



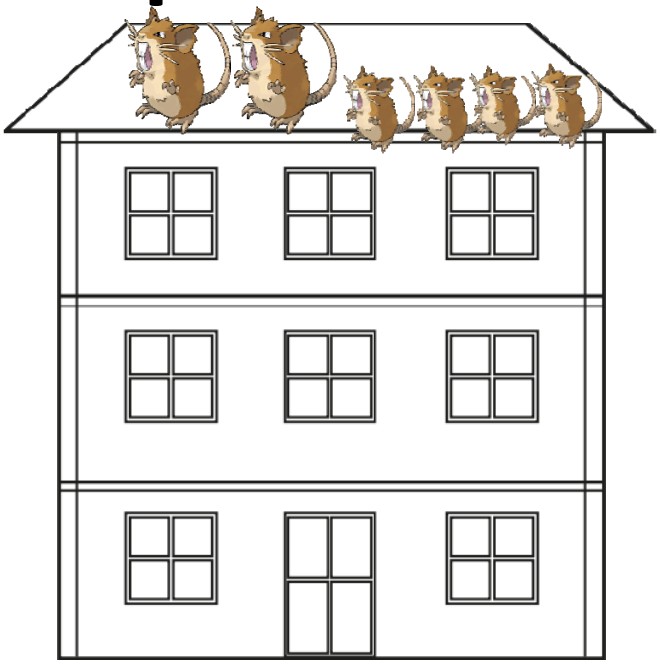
What Happened?

Summer 2016 --Response

What did not happen

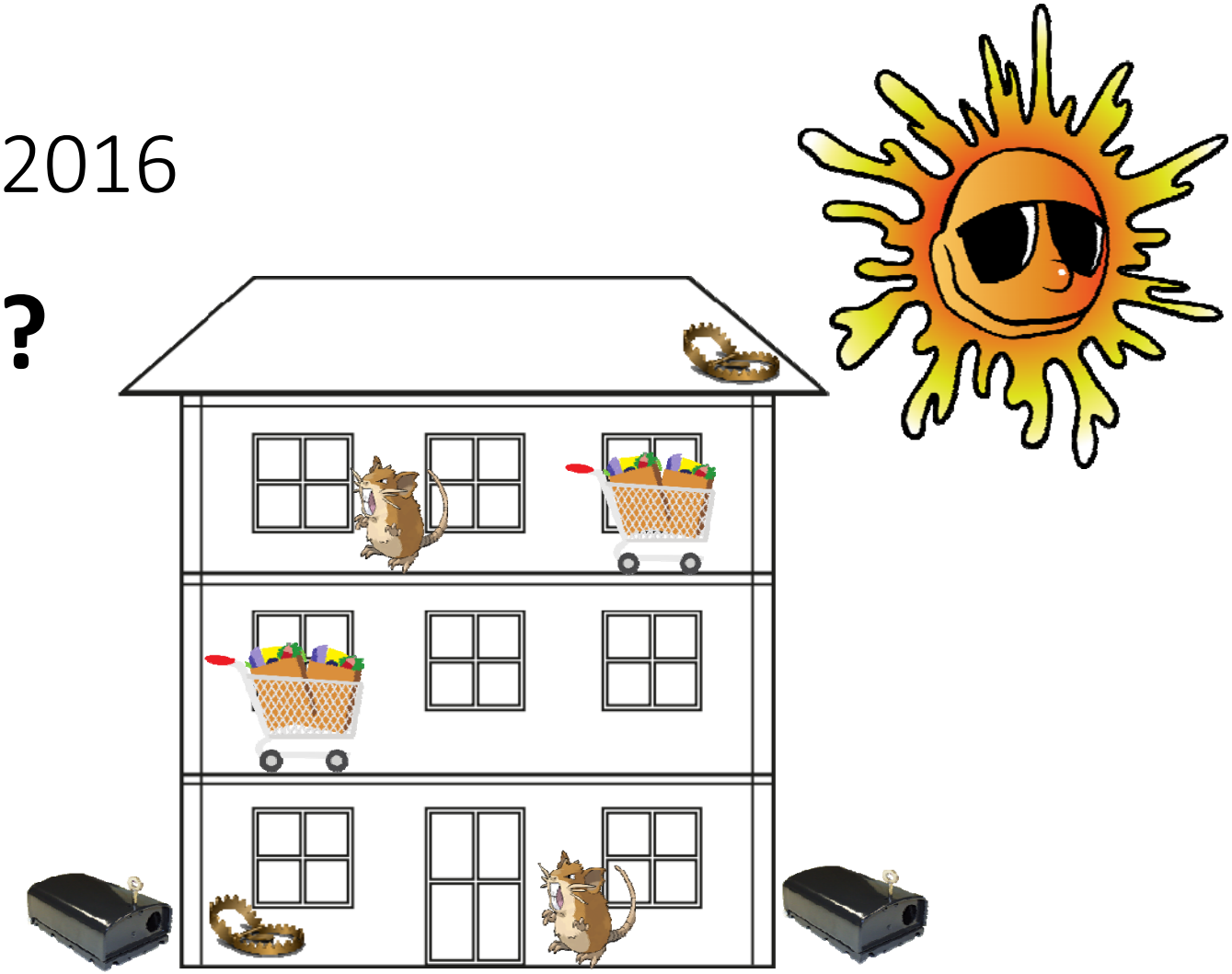
Large Invasion

Reproduction



Summer 2016

Why?



Free Food!

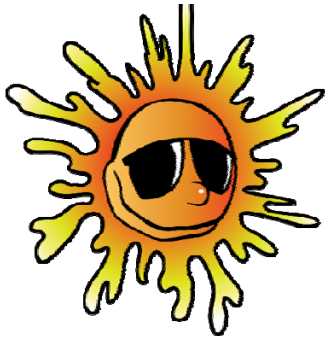

water


SEEDS!
SEEDS!
Seeds.


Coffee-mate

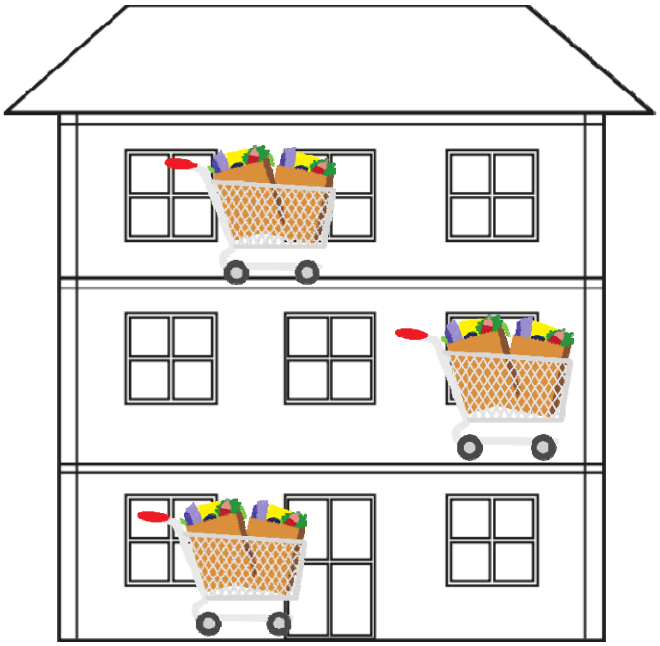

NATURAL CALIFORNIA
RAISINS

Fall 2016-Future



Reality

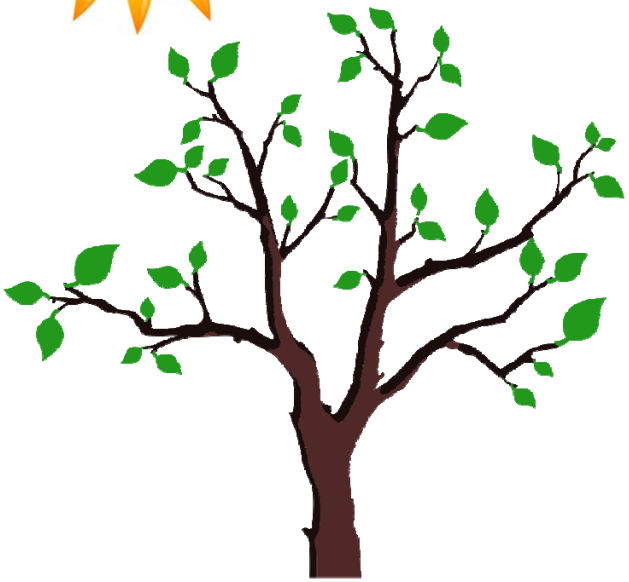
Unreality

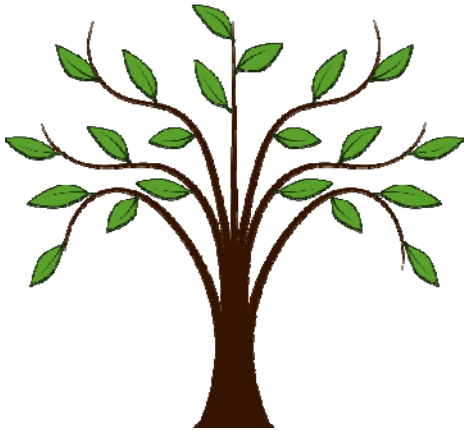


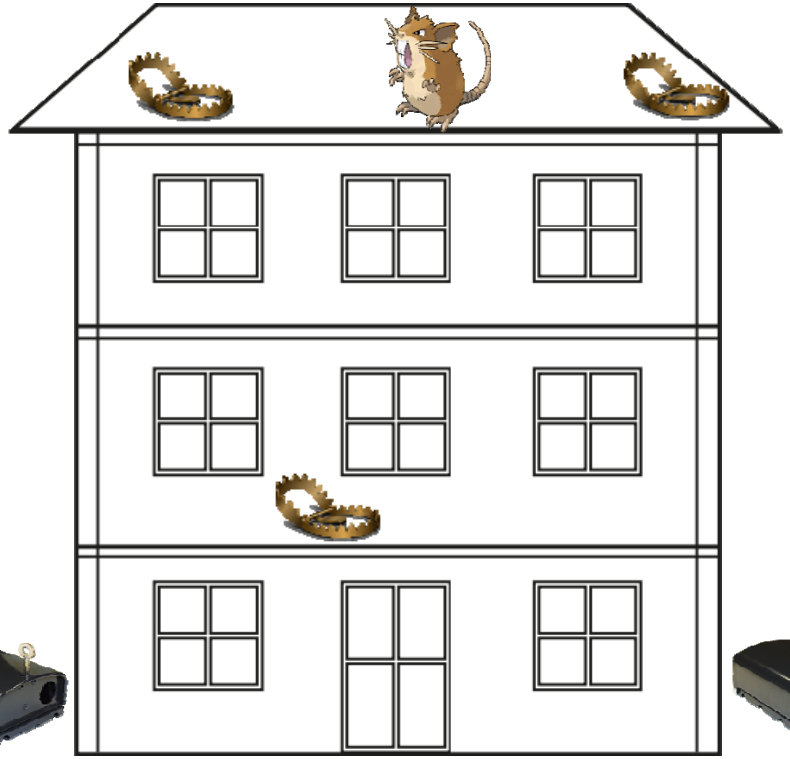
Unacceptable/Unsustainable

Fall 2016 – Future

Alternate Reality







Choose Happy!

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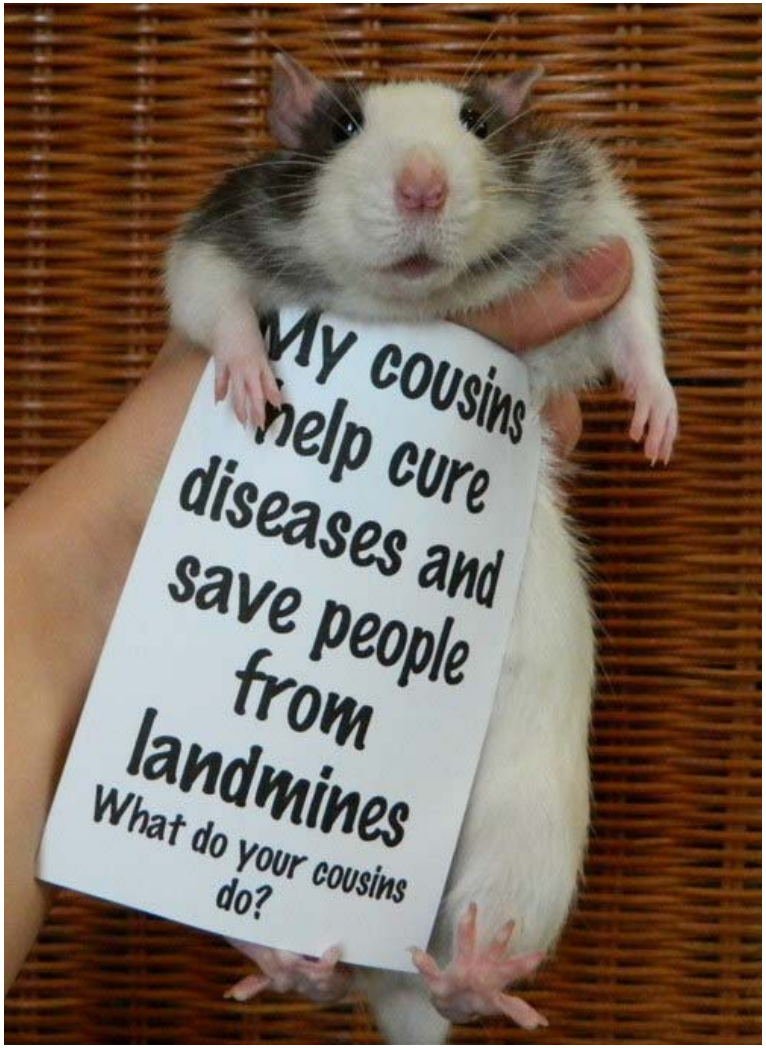
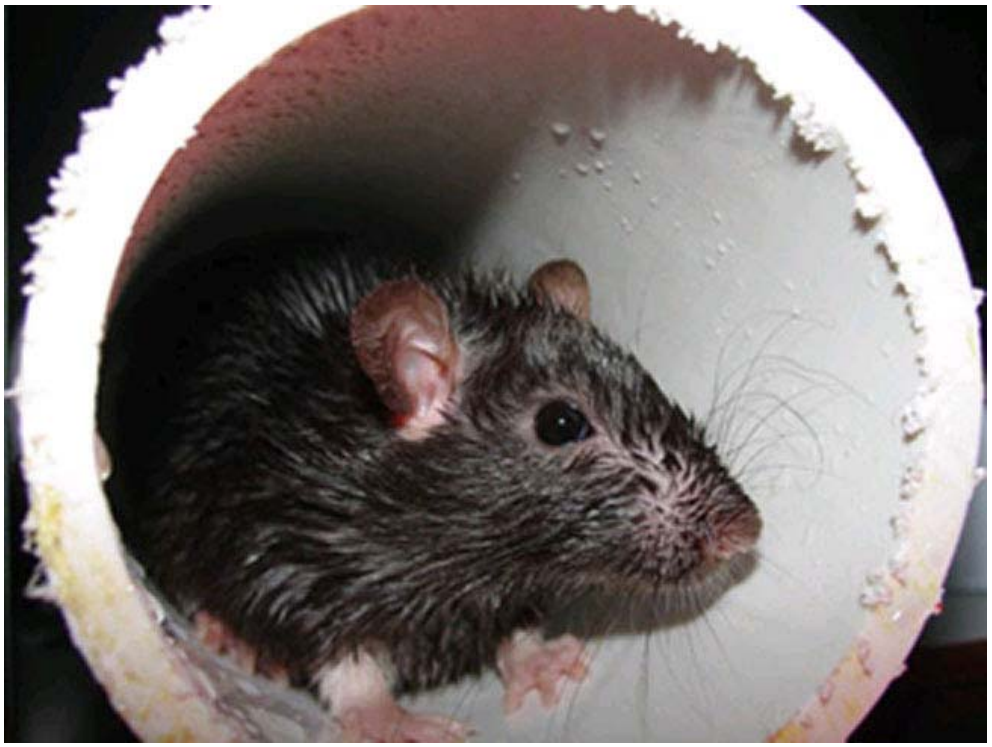
“A rat is neither good nor evil. A rat does what a rat has to do.” Jo Nesbo

We are social, and love attention and affection.


My cousins
help cure
diseases and
save people
from
landmines
What do your cousins
do?



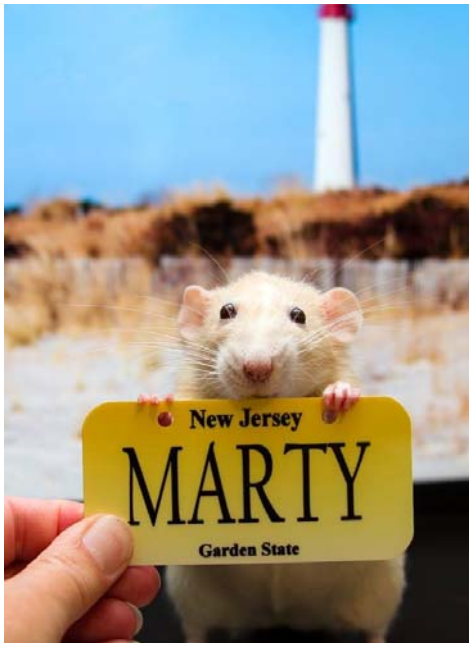
Chocolate in moderation. Yummm

We love small, snug places and to explore.

We eat anything, and especially love what humans eat.

We have traveled all over the world.

America or bust



I am good at hiding

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Earthquake & Evacuation Exercise

ANR Building, Davis
All Staff Meeting
October, 2016

University of California
Agriculture and Natural Resources

Fire Drill / Evacuation Video

- The Office – Fire Drill
  - Viemo: https://vimeo.com/136822167
  - Dailymotion: http://www.dailymotion.com/video/x2u2mzy

Either/or:

- Seinfeld – George and the Fire
  - YouTube: https://www.youtube.com/watch?v=_u1cbZTwBx4

If Near a Desk or Table

If NO Desk or Table is Nearby

When you are Driving

The Great California **ShakeOut**

Annual Statewide Earthquake Drill

Why ShakeOut?

- The Great California ShakeOut is an annual opportunity to practice how to be safer during earthquakes, and to improve preparedness

- Over 10.5 million Californians participated today

- The occasion is also used as an opportunity to:
  - rehearse Drop, Cover, & Hold On
  - secure our space to prevent damage & injuries
  - review & update our emergency plans & supplies
  - discuss emergency preparedness & response
  - hold a fire drill / building evacuation exercise

- What we do now will determine our quality of life after our next big earthquake. Are you prepared to survive and recover for the *first 72 hours*?

What to Do During an Earthquake

"*Drop, Cover, and Hold On*" is the appropriate action to reduce injury during earthquakes

- **DROP** to the ground (before the earthquake drops you!)
- **COVER** your head and neck with your arms and seek shelter by getting under a sturdy desk or table if nearby; and
- **HOLD ON** to your shelter and be prepared to move with it until the shaking stops

- What ***NOT*** to do:
  - Do *NOT* get in a doorway
  - Do *NOT* run outside
  - Do *NOT* believe the so-called "triangle of life"—see EH&S FAQs website for info

DROP! COVER! HOLD ON! continued

- The main point is to not try and move, but to immediately protect yourself as best as possible where you are

- If there is no table or desk near you, drop to the ground in an inside corner of the building and cover your head & neck with your hands & arms

- If you must move to get away from heavy or falling/breaking items, first drop to the ground, then crawl only the shortest distance necessary

- As you spend time in areas new to you, take a moment to look around:
  - What is above & around you that could move or fall?
  - What are your various routes of evacuation?
  - Identify safe places, & use your best judgment to stay safe!

Anytime the Fire Alarm sounds… don't wait, Evacuate!

- Look around, do you see the hazard?
- Quickly grab any absolutely necessary items (Go-Bag, keys, cell, wallet/purse)
- Evacuate the building via the nearest unblocked route/exit
- Assemble across Pena Dr. and in front of the Davis Musical Theater Company
- Line up by department, check-in with your Safety Contact, wait for instruction
- When released by your Safety Contact or Incident Commander, return safely to work or follow other instructions

Stay Informed, Be Alert:

Text First. Talk Second.

- Text First. Talk Second. During large-scale emergencies, mobile call volume may simply overwhelm provider capacity. Experts recommend communicating via SMS text messaging as your first choice during the immediate aftermath (a single one-minute call takes up the same bandwidth as 800 text messages)

- UC Davis WarnMe emergency notification service provides employees and students with timely information and instructions during emergencies. WarnMe uses employee's work contact information from the UCD online directory, students' email addresses; **AND** personal contact information you voluntarily provide. Register & update at: warnme.ucdavis.edu

- Sacramento-Yolo-Placer ALERT –these three counties have partnered to Provide a community notification system to alert residents about emergency events and other important public safety information. www.yolo-alert.org

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Be Informed

BEFORE an emergency

- Be informed about hazards and risks in your area
  - Ready.gov: http://www.ready.gov/be-informed
  - CalEMA MyHazards: http://myhazards.calema.ca.gov/
- Be Trained – in First Aid and CPR, at least one member of the household

- Be Notified – Sign-up for:
  - Nixle: www.nixle.com
  - UC Davis WarnMe: warnme.ucdavis.edu
  - Sacramento-Yolo-Placer ALERT: www.yolo-alert.org

DURING & AFTER an emergency

- Stay alert – no matter where you are
  - TV, Social Media, Radio (KFBK 1530 AM, 93.1 FM)
  - Reverse 911, Emergency Alert System (ESA), Wireless Emergency Alerts (WEA), Integrated Public Alert & Warning System (IPAWS)

Department Safety Contacts

- Safety Contacts
  - ✓ Each Unit has assigned a safety contact
  - ✓ This will be the person the Unit reports to during an evacuation
- ✓ Liaison to EH&S
- ✓ Identifies potential hazards
- ✓ Shares safe work practices, near misses/hits

UNIT	CONTACT Primary/Secondary
BOC-D	P: Marcie Valenzuela
	S: Emily Schutzman
Contacts & Grants	P: Kimberly Lamar
	S: Suzanne Burton
CSIT	P: Sherrell Cline Richmond
	S: Sueanne Johnson
Development Srvcs.	P: Joan Warren
	S: Maria Fernandez
EFNEP	P: Trisha Dinh
	S: Michelle Doré
Facilities	P: Mark Barros
	S: Michael Zwahlen
Human Resources	P: John Sims
	S: Tina Jordan
	S: Fiona Wei
IPM	P: Danny Won
	S: Fernanda Rosa
OPPE / PSU	P: Lauren McNees
	S: Michelle Hammer Coffer
Master Gardeners & Master Food Preserv.	P: Missy Gable
	S: Lauren Snowden
	S: Trisha Dinh
Risk & Safety	P: Mark Barros
	S: David Alamillo
Senior Leader Depts.	P: Joan Warren
	S: Maria Fernandez
YFC / 4-H	P: Trisha Dinh
	S: Michelle Doré

ANR Resources

Safety Notes Series on Emergency Preparedness

http://safety.ucanr.edu/Safety_Notes/

#166: OFFICE PREPAREDNESS

employees likely spend near 8 hours each day at the office, so the possibility of being at work during a major catastrophe is likely.

#167: BE INFORMED

Be Informed about the potential hazards and risks in your area and learn the appropriate ways to respond to them.

#168: MAKE A PLAN

Make a Plan with your family or household members to discuss how to prepare and respond to emergencies that are most likely to happen where you live, learn, work and play.

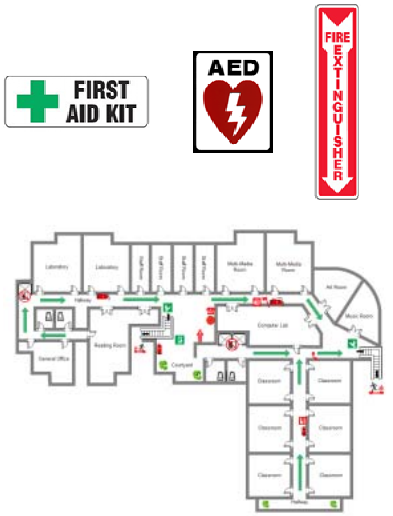
#169: BUILD A KIT

Build a Kit full of disaster supplies and basic items your household may need in the event of an emergency - be prepared to be self-sufficient for *at least three days*.

ANR Resources

Emergency Action and Fire Prevention Plan

- Identifies the steps to take in an emergency
  - Emergency notifications/alarms
  - Location of emergency equipment
    - Fire extinguishers
    - First aid kits
    - Automated External Defibrillator (AED)
  - Evacuation routes and assembly area
    - Plan ahead, know the exits around you

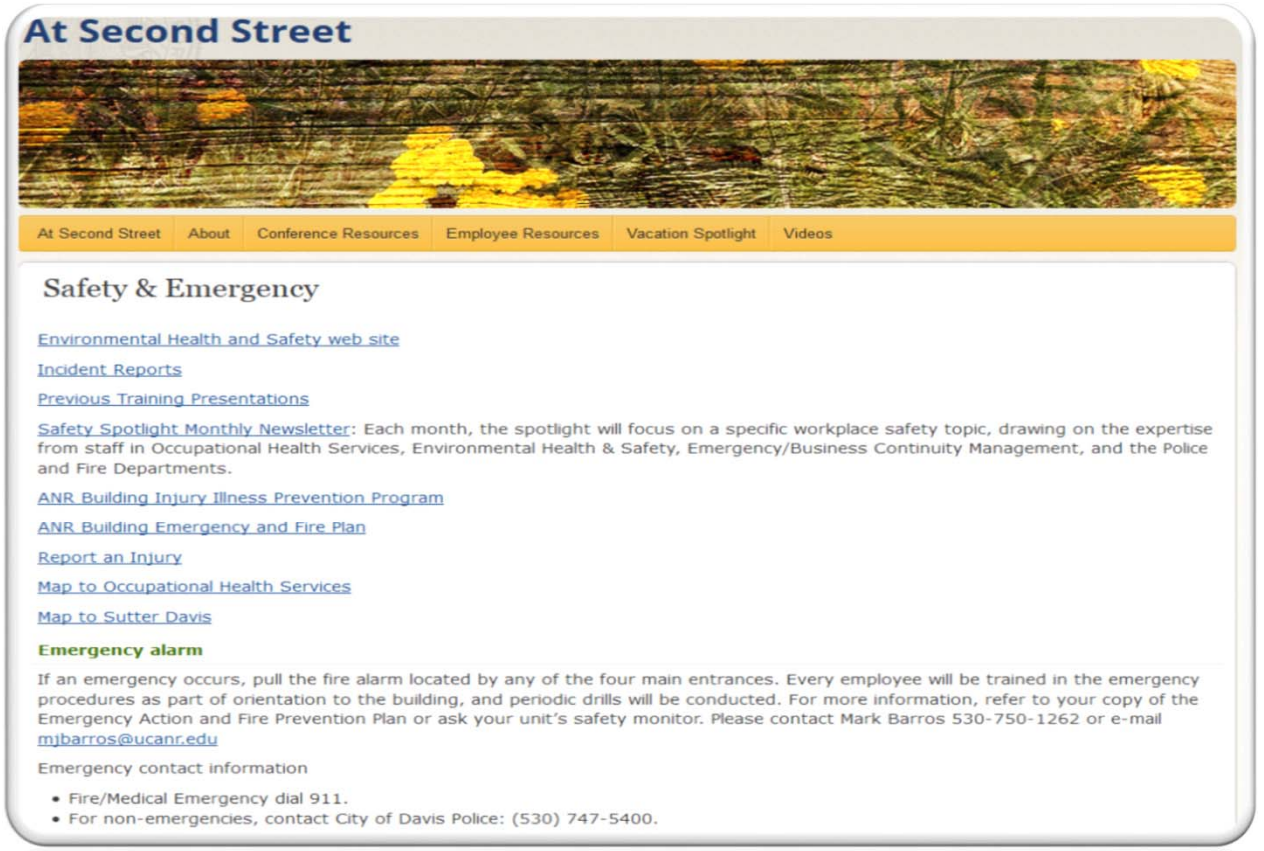


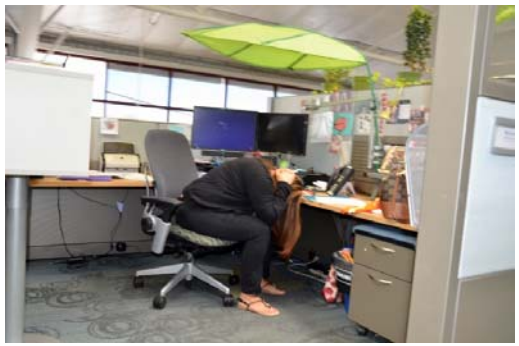
Safety Spotlight Newsletter

- UC monthly newsletter focusing on Safety
- September's topic is often "Preparedness"

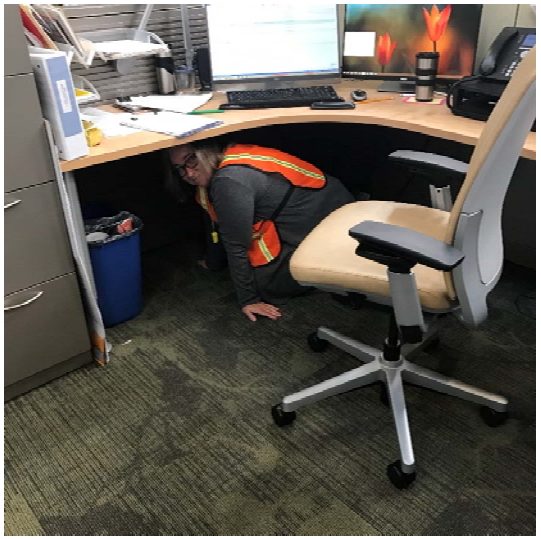
http://www.ucop.edu/environment-health-safety/resources/safety-spotlight.html

Internal Bldg. Resources http://ucanr.edu/2ndstreetsafety





The Traditionalist



What's Your Version of Drop, Cover, and Hold on?

Casual

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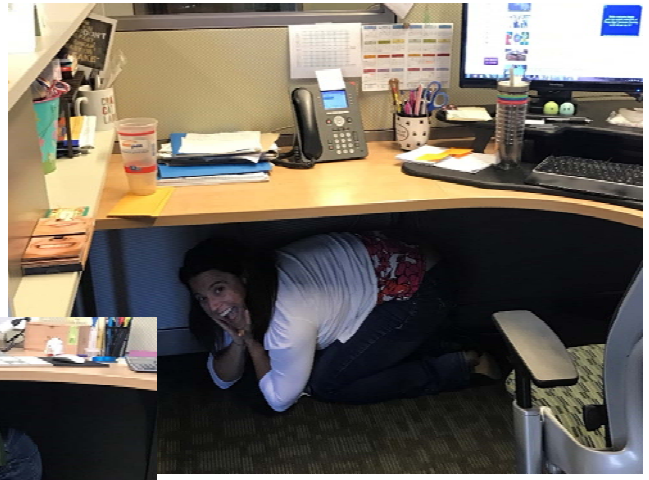
Agriculture and Natural Resources

Casual



What's Your Version of Drop, Cover, and Hold on?

Laid-Back

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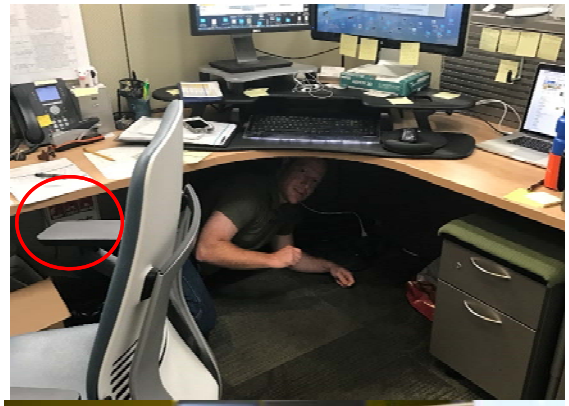
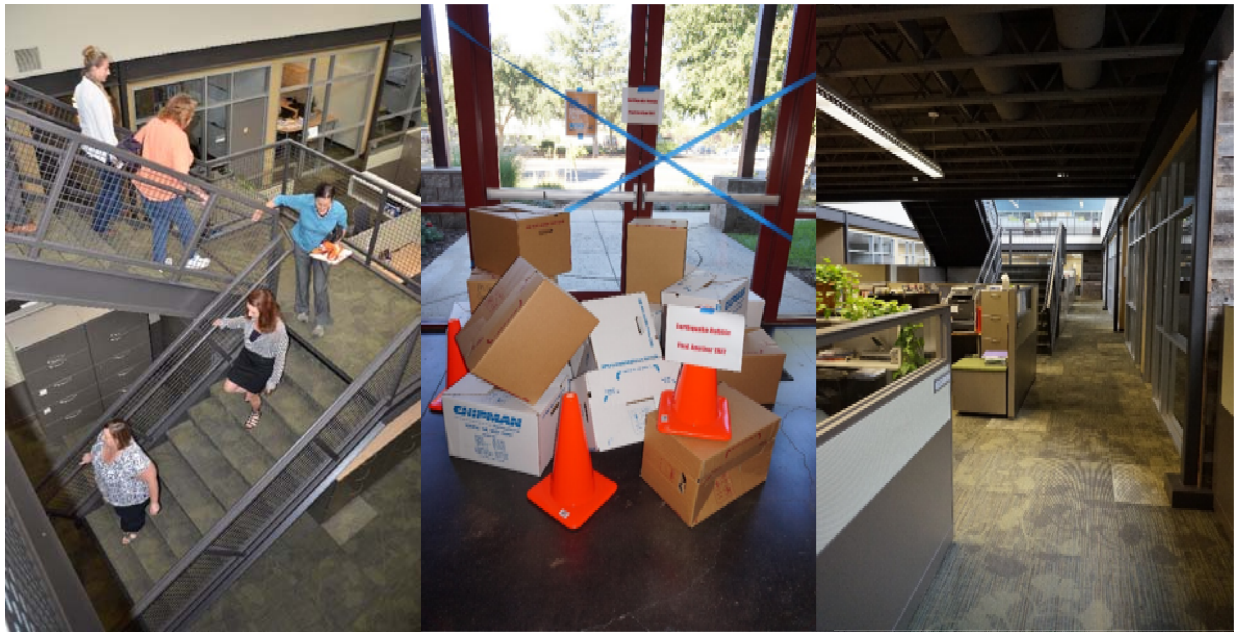


Laid-Back

When the Shaking Stops, Find a Safe Route Out



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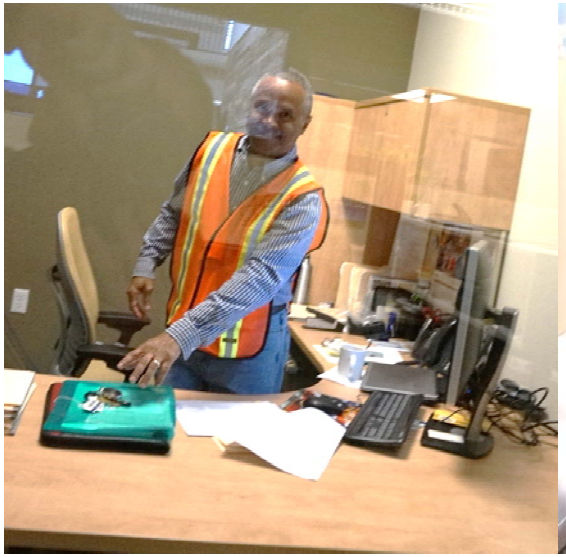
Find the Orange Vest, your Department Safety Contact:



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Line Up in Our Safe Assemble Area, Wait to be Released:

Feedback / Questions?

please remember to sign-in

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Drone Safety with Demonstration (grass lot 3031 Second Street) Sean Hogan	

Unmanned Aerial Systems for Agriculture and Natural Resources

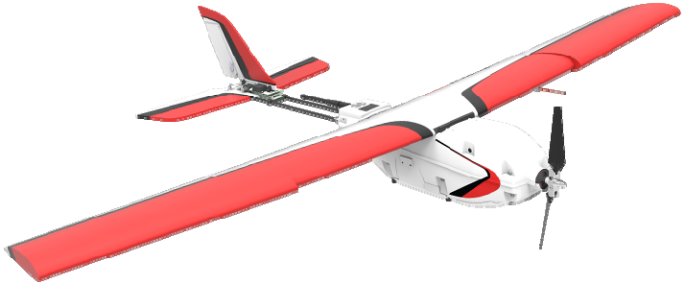
By Sean Hogan, PhD. sdhogan@ucanr.edu
UC Agriculture and Natural Resources, Davis CA

IGIS | University of California
Agriculture and Natural Resources | Informatics and GIS Statewide Program

Platforms

Multi-rotor Copters

- Generally 18-25 minute flight time with
- Vertical take off and landing
- Typically < 2 pound payload
- Can cover > 50 acres per flight

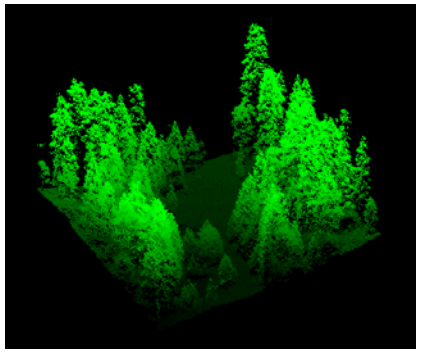


Fixed-Wing

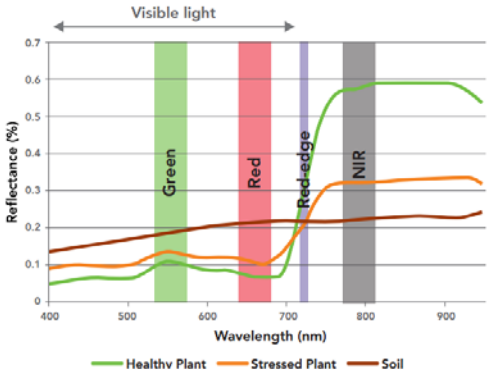
- Longer flight time (> 40 min)
- Moves faster and can cover > 100-200 acres per flight
- Typically can carry more payload

Payloads

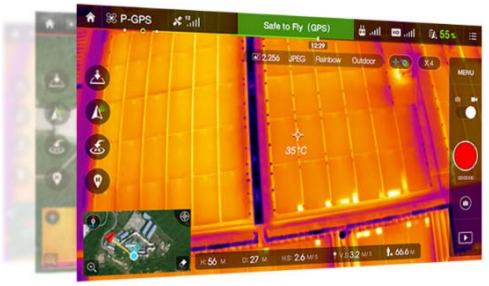
LiDAR



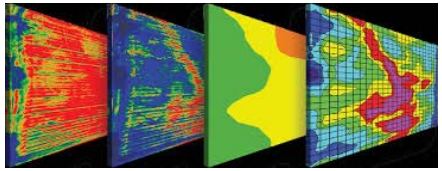
Multispectral

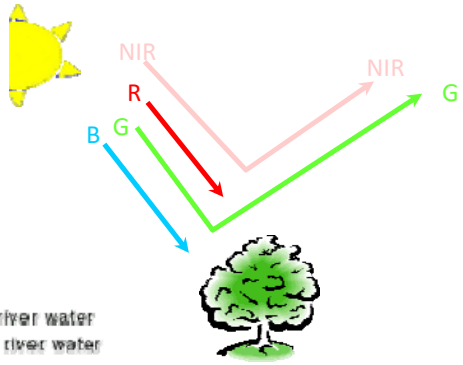


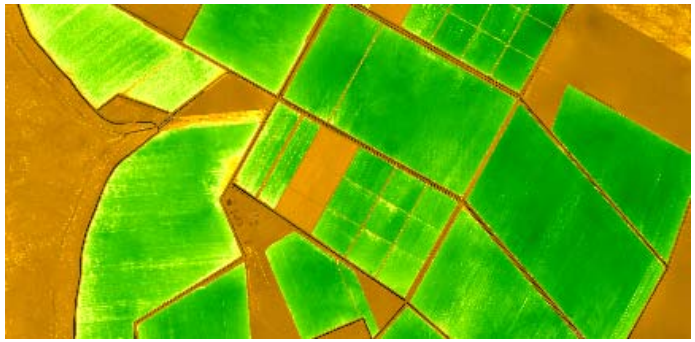
Thermal

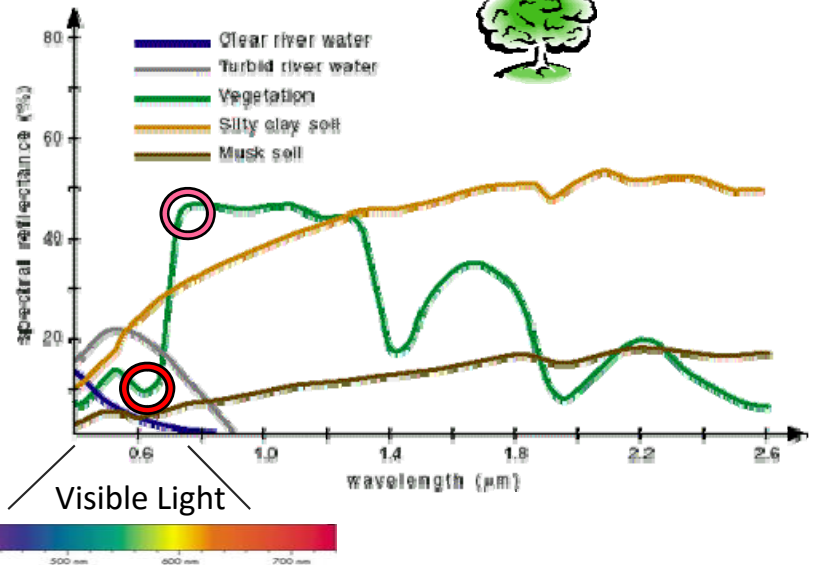


Applications - Crop Health





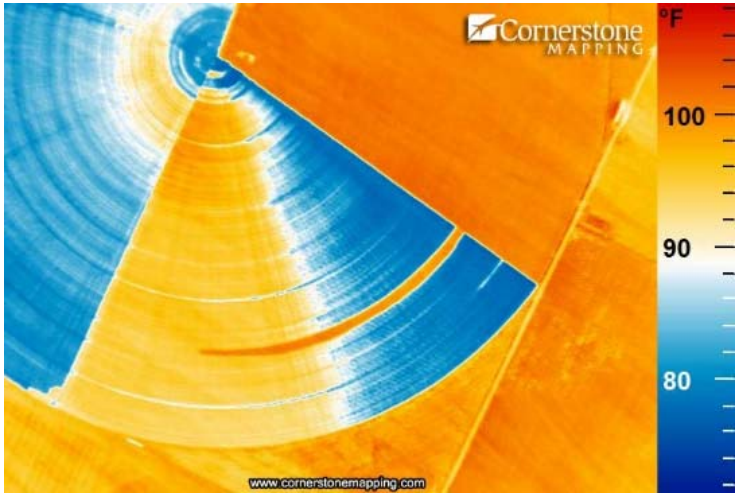




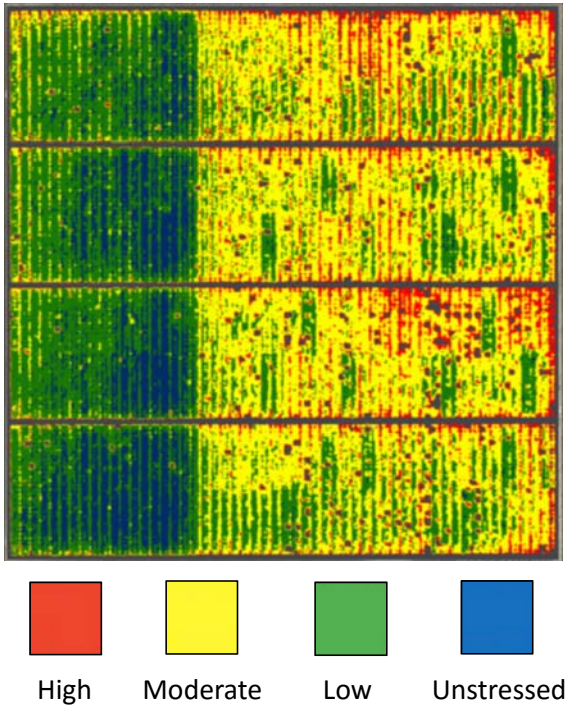
$$\text{NDVI} = \frac{\text{NIR} - \text{Red}}{\text{NIR} + \text{Red}}$$

Water Use Efficiency

ceresimaging

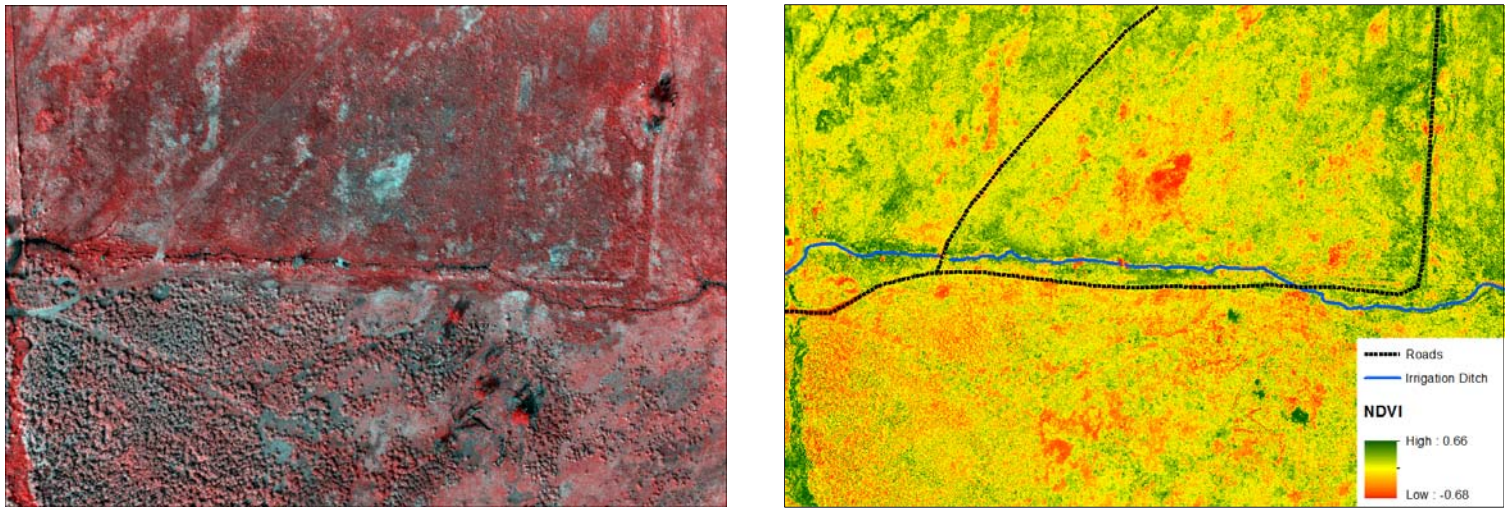


Water Stress Level



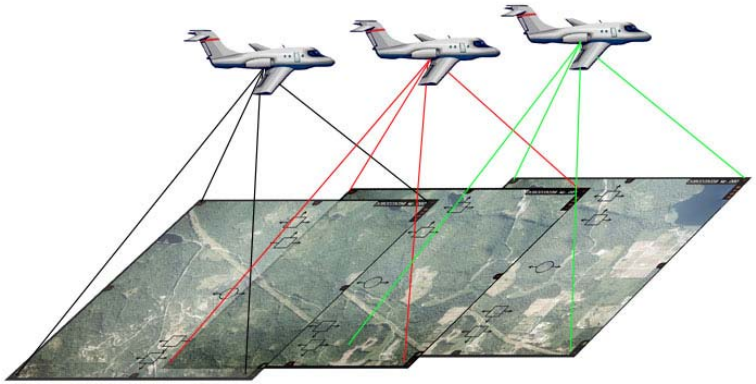
High Moderate Low Unstressed

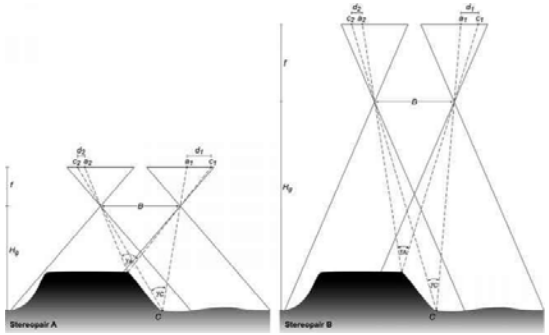
Rangeland Assessment

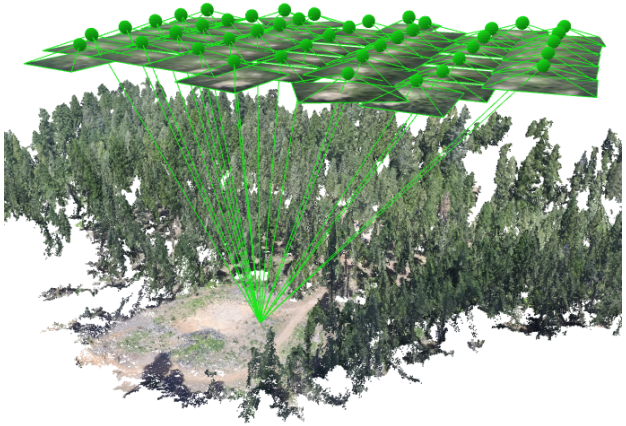


Color infrared image (left) and normalized difference vegetation index (right) from a UAS image mosaic collected in the Bishop CA area. This image was acquired from an altitude of 100 feet above ground level, using a 1.2 megapixel Micasense Sequoia camera. The pixel resolution is approximately 1.45 inches, over approximately 12 acres.

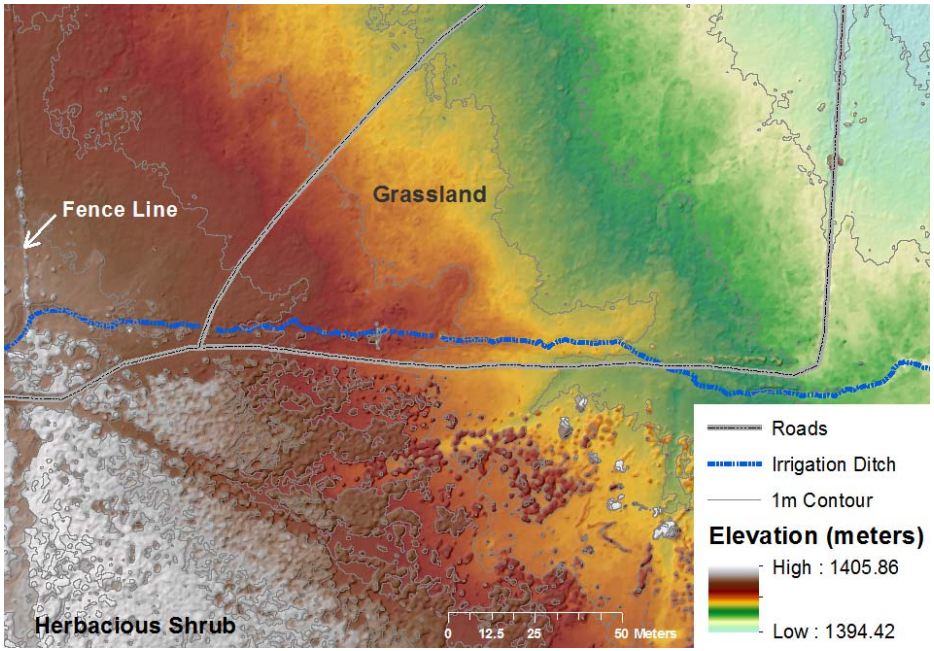
Photogrammetry





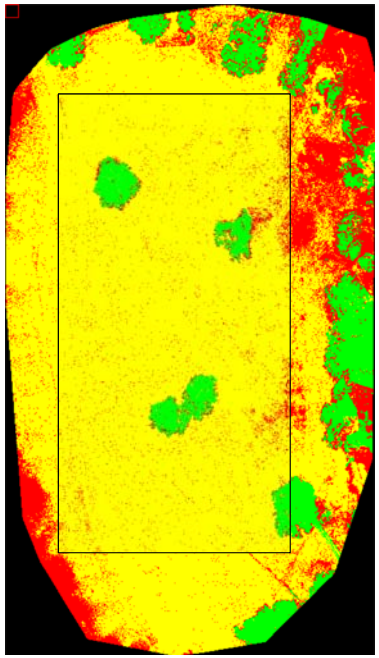


Digital Elevation Modeling



A digital terrain model derived from a UAS image mosaic in the Bishop Ca. area. The image was acquired from an altitude of 100 feet above ground level, and using a GoPro 12-megpixel digital camera. The pixel resolution is approximately 0.8 inches over approximately 12 acres.

Classifications



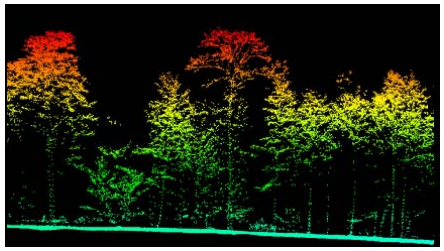
Fecal Pat

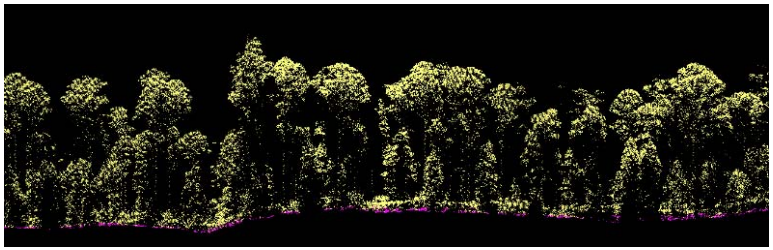
Grass

Tree

UAS color image mosaic (left) and maximum likelihood land cover classification (right) from the region of Lake Berryessa CA. The image was acquired from an altitude of 100 feet above ground level, and using a GoPro 12-megpixel digital camera. The pixel resolution is approximately 0.8 inches over 18 acres. Note – The peripheral area not directly underneath the flight lines are frequently misclassified.

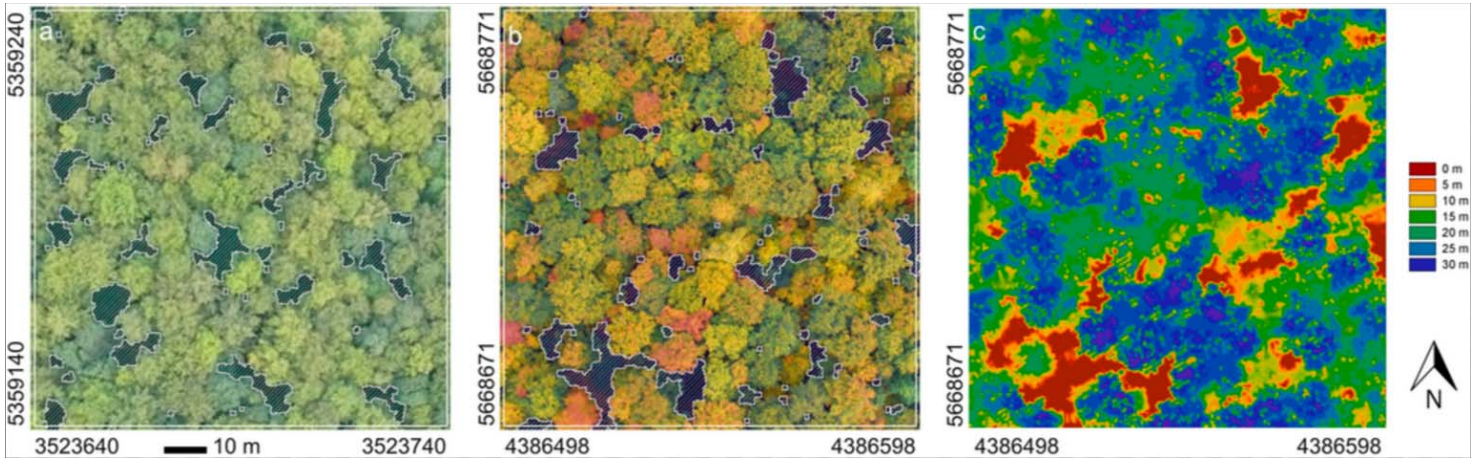
Forestry





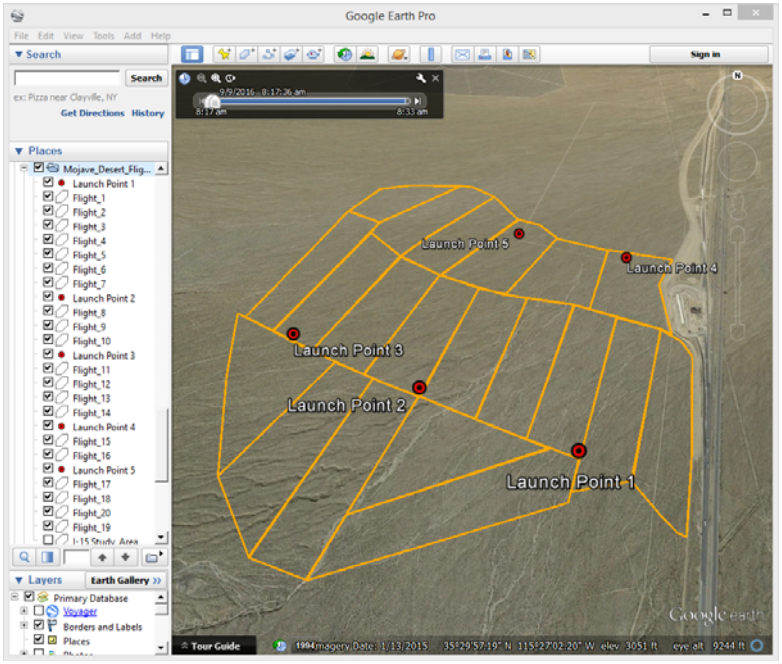
3 Dimensional Modeling

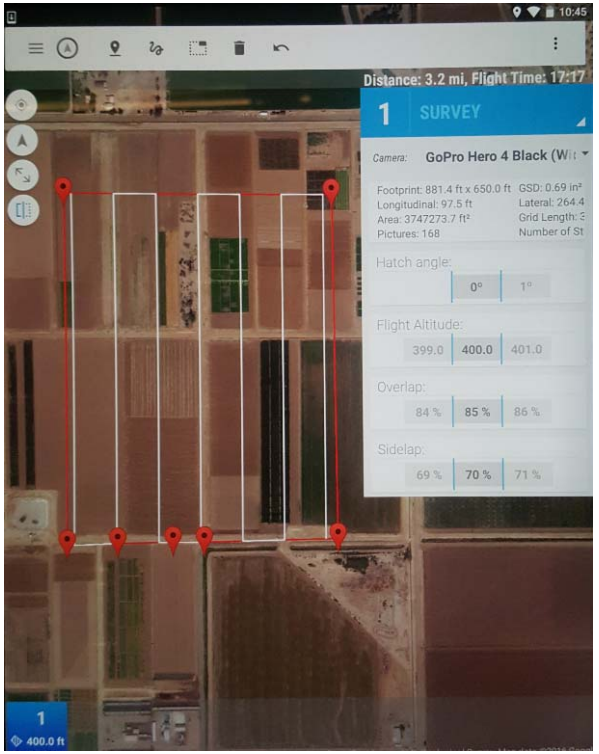
Forestry



Getzin 2014. Using Unmanned Aerial Vehicles (UAV) to Quantify Spatial Gap Patterns in Forests. *Remote Sensing.* **2014**, *6*(8), 6988-7004; doi:10.3390/rs6086988

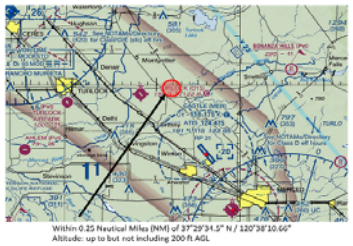
Replicate Missions





Regulations

Class A	No	Class D	No
Class B	No	Class E	No
Class C	No	Class G	Yes



Concerns:

- Liability!
- UC scrutiny
- FAA penalties

Solutions:

- Register your aircraft

  https://registermyuas.faa.gov/

- Take Remote Pilot Knowledge Test under the FAA's Part 107, subparts B and C, to be certified to fly

Regulations and Safety

Under the FAA Title 14 Part 107 – Remote Pilot License

- Fly below 400 feet and remain clear of surrounding obstacles
- Must keep the aircraft within visual line of sight at all times
- Remain well clear of and do not interfere with manned aircraft operations
- Don't fly within 5 miles of towered airports, 3 miles of controlled airports with no tower, and 2 miles of uncontrolled airports and helipads, without expressed permission of the local air traffic controller.
- Must operate in Class G uncontrolled airspace, unless an FAA waver has been granted
- Must not operate near or over nonparticipating persons, vessels, vehicles and structures
- Don't fly an aircraft that weighs more than 55 lbs
- Don't be careless or reckless with your unmanned aircraft

Valuable Online Resources

- New FAA rules (as of last week)
  https://www.faa.gov/uas/getting_started/fly_for_work_business/becoming_a_pilot/

- Frequently asked questions
  https://www.faa.gov/uas/faqs/

- Center of Excellence for Unmanned Aircraft Systems Safety (CoE UASS)
  http://www.ucop.edu/enterprise-risk-management/resources/centers-of-excellence/unmanned-aircraft-systems-safety.html

ANR Statewide Program: Informatics and Geographic Information Systems

Sean Hogan, PhD
sdhogan@ucanr.edu
http://igis.ucanr.edu

Flight Checklists

1. Plan your mission ahead of time, even if you don't intend to use the UAS's autopilot.
   - If you do intend to use the autopilot, you will need to design your flight plan at a location where you have WiFi access
2. When planning your flight, add at least two minutes to the flight time for your takeoff and landing; more if it is windy.
3. Set your Return-to-Home altitude as 400ft
   - If you ever lose sight of your UAS, or are at all concerned about your flight, press the Return-to-Home button immediately!
4. Check all of your UAS's settings to make sure that they are correctly configured
5. Check for damaged or loose components
   (you may want to make a list of your UAS equipment)

Before You Fly – Site Conditions

1. If you intend to fly multiple missions on autopilot at different altitudes, try to fly your highest altitude flight first, and then reassess your next lower altitude flight(s) accordingly
2. Pick a level site for your launch, with plenty of open space around it
   - You may wish to use a piece of plywood as a takeoff and landing platform, especially in dusty or wet areas
3. Consider launching from the highest elevation of your area-of-interest as possible, and position yourself at a vantage point to best observe the flight
4. Is it windy or raining?
   - If it is windy, you may want to change the bearing of your flight plan paths so that your UAS mostly flies in the same line/direction as the wind (either against it or with it), as this will typically be more stable and safer.
   - Don't fly in heavy winds or rain; particularly in forested areas
5. Are there any unexpected people or animals in the area

Before You Fly - Equipment

1. Are your batteries fully charged?
   - You may want to label each battery to know them apart
2. Calibrate your UAS's level and bearing (northing) prior to any new set of flights
   - Be sure to un-block your gimbal and install your camera/imager on the UAS before any calibrations
   - After the calibrations are complete, power the UAS completely down and restart it.
3. Make sure that all of your equipment is turned on and properly linked, including your UAS, controller and tablet/iPad
4. If you intend to fly using the autopilot, make sure that the correct flight plan is in fact loaded into the UAS
   - When you launch your UAS, watch closely to make sure that it flies in the correct direction per your expected flight plan

Pre-Launch

1. If you intend to fly a relatively long mission on autopilot, consider positioning yourself near and/or down wind of your final waypoint
2. Also consider positioning yourself with the sun to your back when you observe your pre-programed flight plan(s)
3. Make sure that your camera is turned on and pointed in the proper direction in preparation for your flight
   - It is recommended that you have your camera facing forward during launch and landings, but don't forget to turn it down if you intend to collect images for mapping
4. Wait until you have sufficient GPS satellite fixes for
   (5 is barely ok, 6-8 is good, 10 is very good, 13 is the most I have ever seen)
   - Remember, both your UAS and the controller need to have GPS fixes before you launch
   - Expect to wait several minutes until both the UAS and controller get a good GPS lock

Launch and Flight

1. Launch with the UAS facing away from you, and down wind if possible
2. After you take off, have your UAS loiter at about 10 to 30ft above the ground (AGL) and make sure that it is stable and does not drift around
3. Bring your UAS to a sufficiently high altitude considering your surroundings before you engage the autopilot
4. If you intend to fly a relatively long autonomous flight, don't waste time before getting the autopilot engaged; however at the same time, always proceed slowly and carefully
5. Start your return-to-home any time that your battery gets down to 25-30% (consider 10-15% as 0%)
6. Turn your camera up and forward before you land
7. As soon as your UAS has landed and the propellers have stopped, power down the UAS

Some Final Suggestions

1. If you have any trouble linking your controller and UAS, power everything down and restart all of your equipment
2. Be careful if you are surrounded by trees.
   - If your UAS suddenly loses its GPS lock it might suddenly start drifting in one direction or another
3. The lithium ion/polymer batteries in your UAS and controller are prohibited on all airlines.
   - If you intend to travel with your UAS, plan accordingly
4. Don't fly in an area where there are dogs that might chase your UAS
5. Always face your UAS while it is in flight
   - You may want to use the position of your controller as a sight reference to keep track of the UAS in the sky
6. If you ever lose your UAS, report it to the UCOP CoE for UAS Safety, and via the NOTAM automated system

Typical UAS Project Work Flow

1. Get your UAS registered
2. Get authorizations to fly the UAS
3. File your flight plan(s) with the UC and NOTAM
4. Fly your mission(s)
5. Download your UAS's complete telemetry log from your UAS's Flash memory, (e.g. using Mission Planner version 1.3.34):
   http://firmware.ardupilot.org/MissionPlanner/
   Directions are available via YouTube at:
   https://www.youtube.com/watch?v=QFpvcEDC7Eg
6. Process your imagery using one of the popular mosaic and photogrammetry software such as Pix4D, Agisoft, or SimActive
7. Load your imagery into GIS or remote sensing software to analyze and map your area(s) of interest