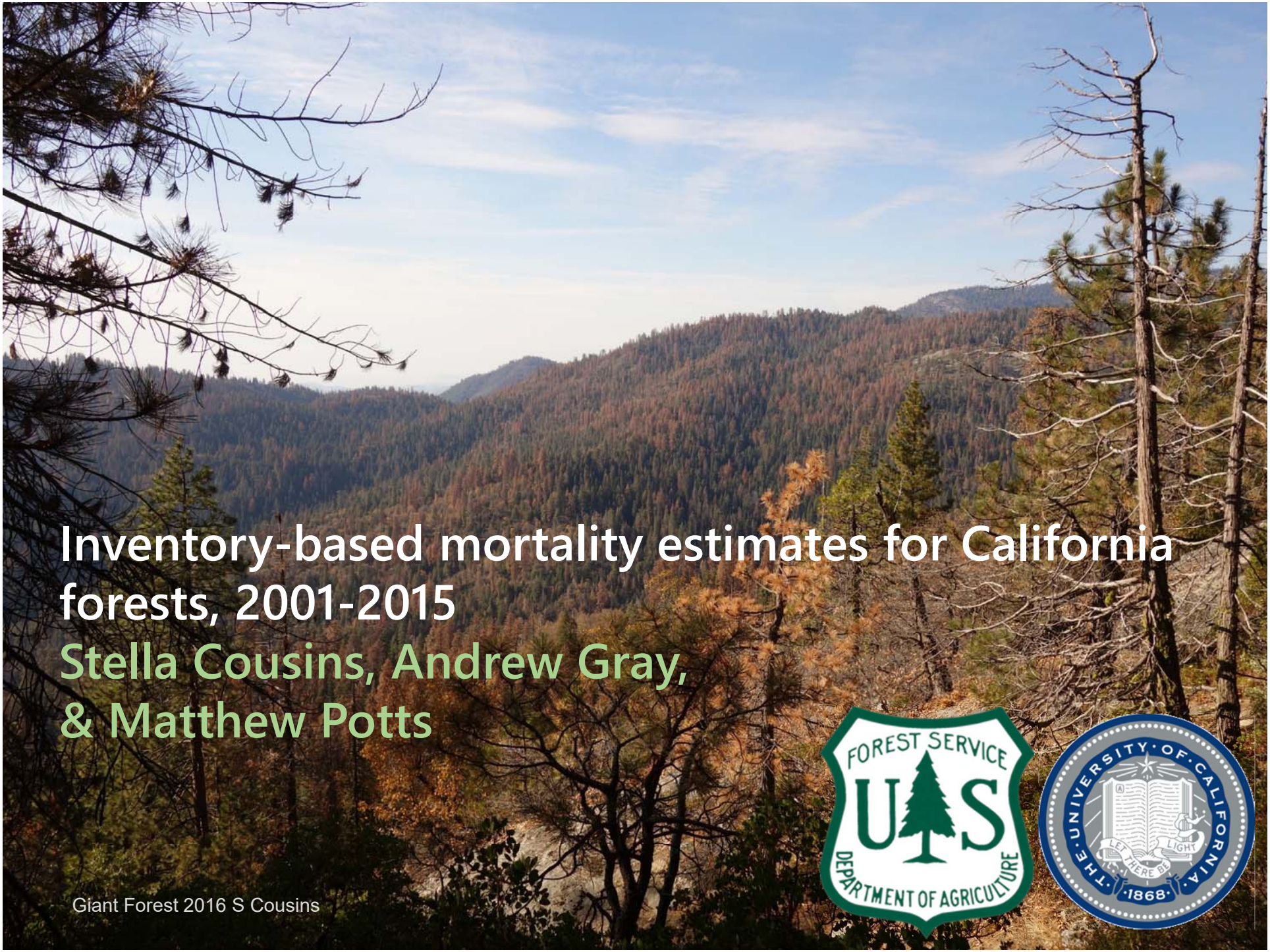
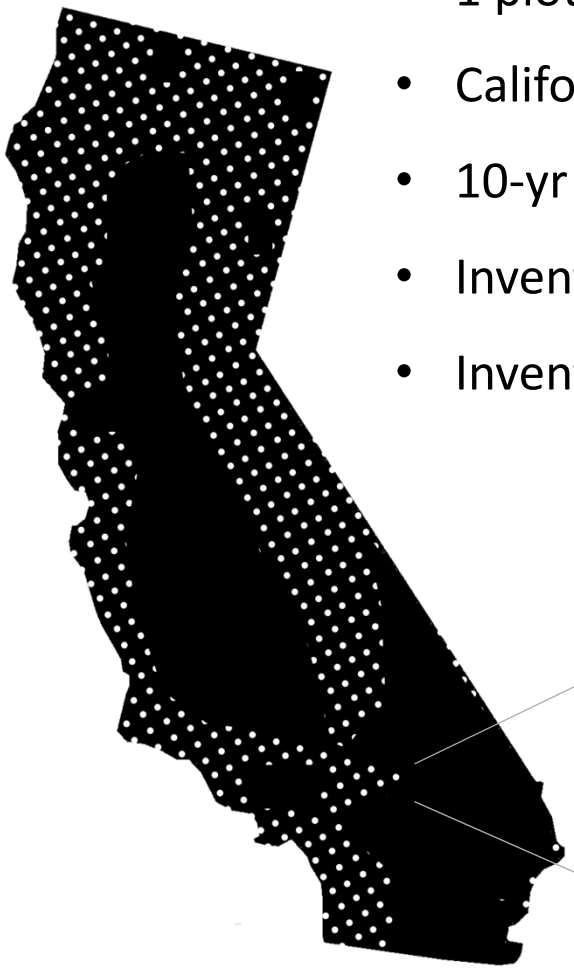

Inventory-based mortality estimates for California forests, 2001-2015
Stella Cousins, Andrew Gray, & Matthew Potts
Giant Forest 2016 S Cousins

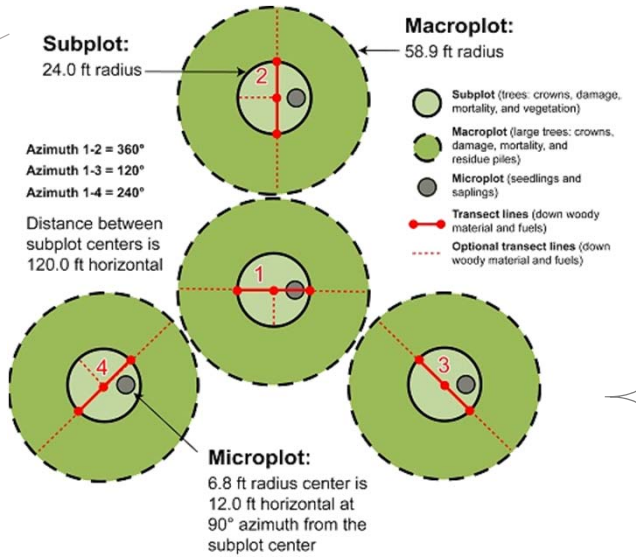
Inventory-based mortality estimates for California forests

- Use new & improved FIA remeasurement data for **comprehensive, ground-based estimates of mortality**
- Characterize forest **structural, management, and climatic conditions** in light of mortality patterns - using FIA attribute data and other resources
- Use **relationships** between forest conditions and mortality to describe **implications:**
  - Carbon balance
  - Key species, classes, and/or conditions of concern
  - Early warning signs
  - Trajectories of recovery and future mortality

Forest Inventory & Analysis (FIA) Program



- 1 plot every ~6000 acres of forest (n>2800)
- California plots est. 2001-2006
- 10-yr remeasurement 2011-2016
- Inventory = everything (almost)
- Inventory ≠ everywhere



Cause of death
Diameter
Species
Canopy class
Live crown
Damage
Height
Volume
Veg type
Disturbances
Regeneration
Site class
Ownership
Region
Forest density
Woody debris
Mgmt units
… and more!

Summary: causes of death & removal 2001-2015

Draft of 03/12/2018
contact for updates:
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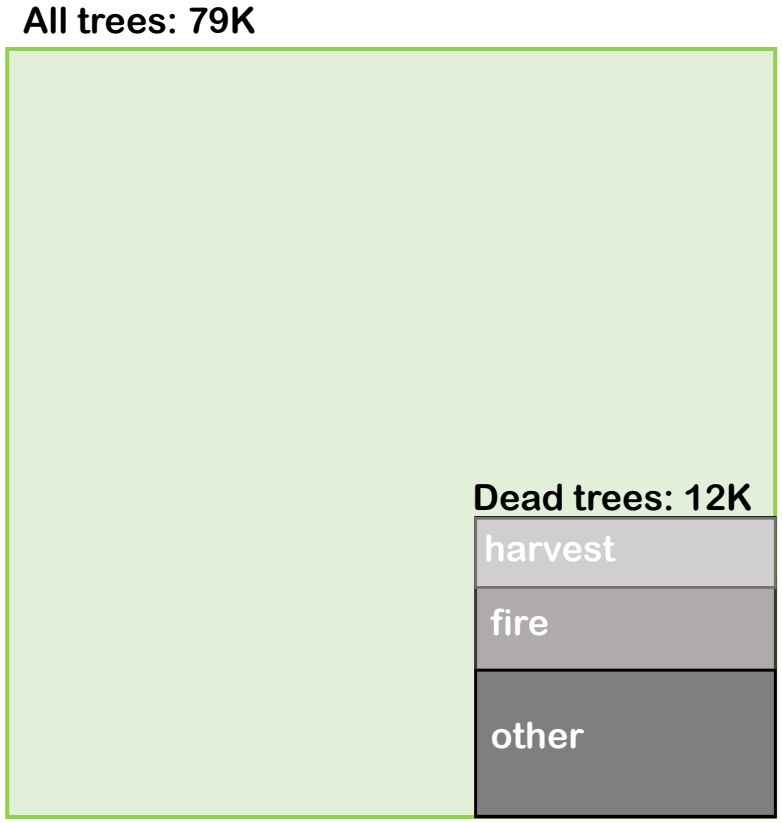
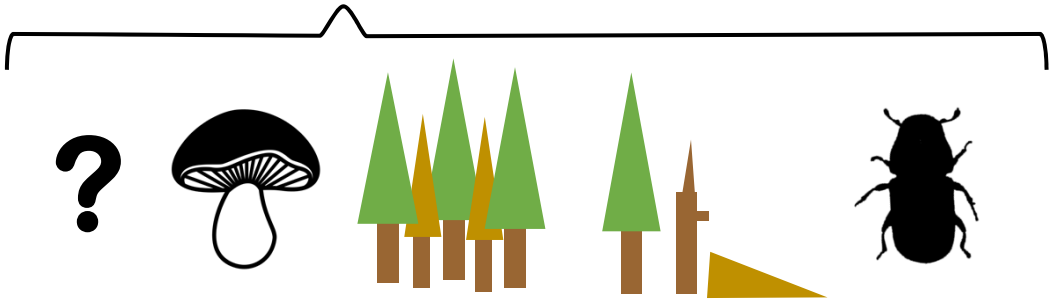


	% of non-live	% of dead
Fire	30%	39%
Harvest	23%	--
Unknown	15%	20%
Disease	15%	19%
Competition	8%	11%
Weather	5%	6%
Insects	4%	5%



Mortality rates & totals by group: species

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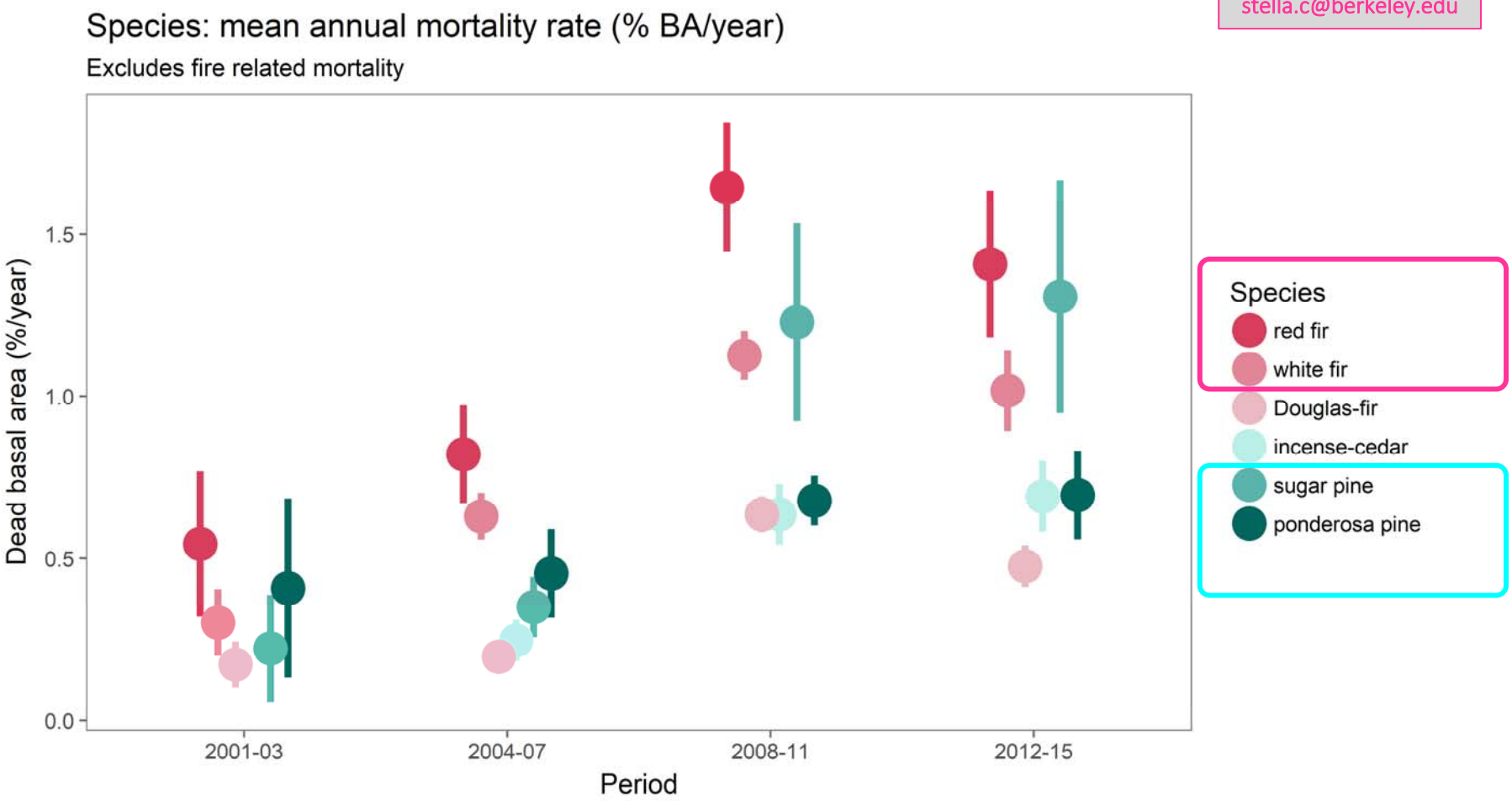
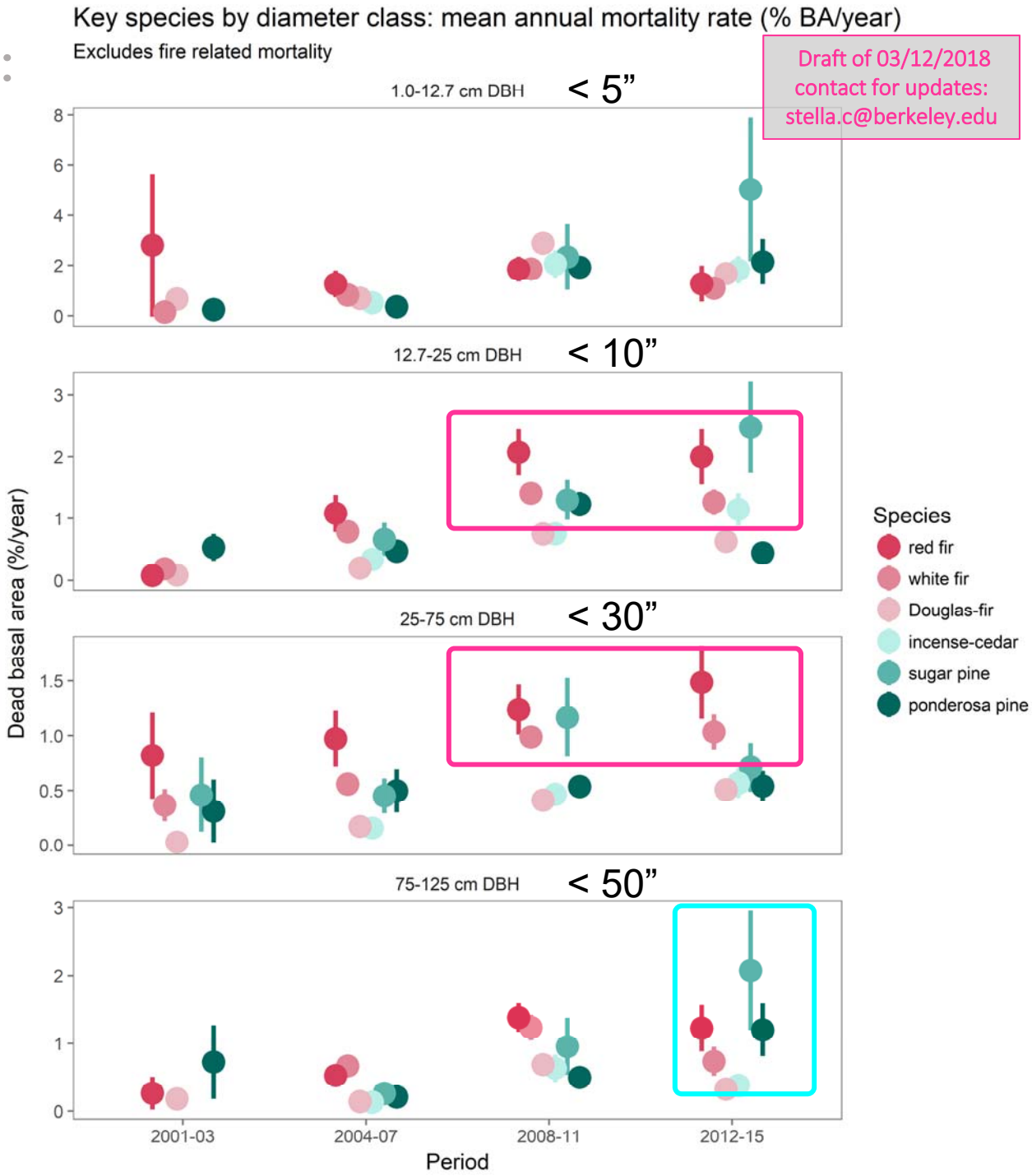


Statewide, all major conifer species have increasing mortality rates:

- by % of BA dead per period (trees > 1 cm DBH)
- by total dead BA per period
- Red fir, white fir, and sugar pine show largest shifts

Mortality estimates: key species by diameter

- Red and white fir mortality highest for trees < 75 cm/30 in DBH
- Sugar pine mortality highest for largest class



Mortality estimates: diameter class

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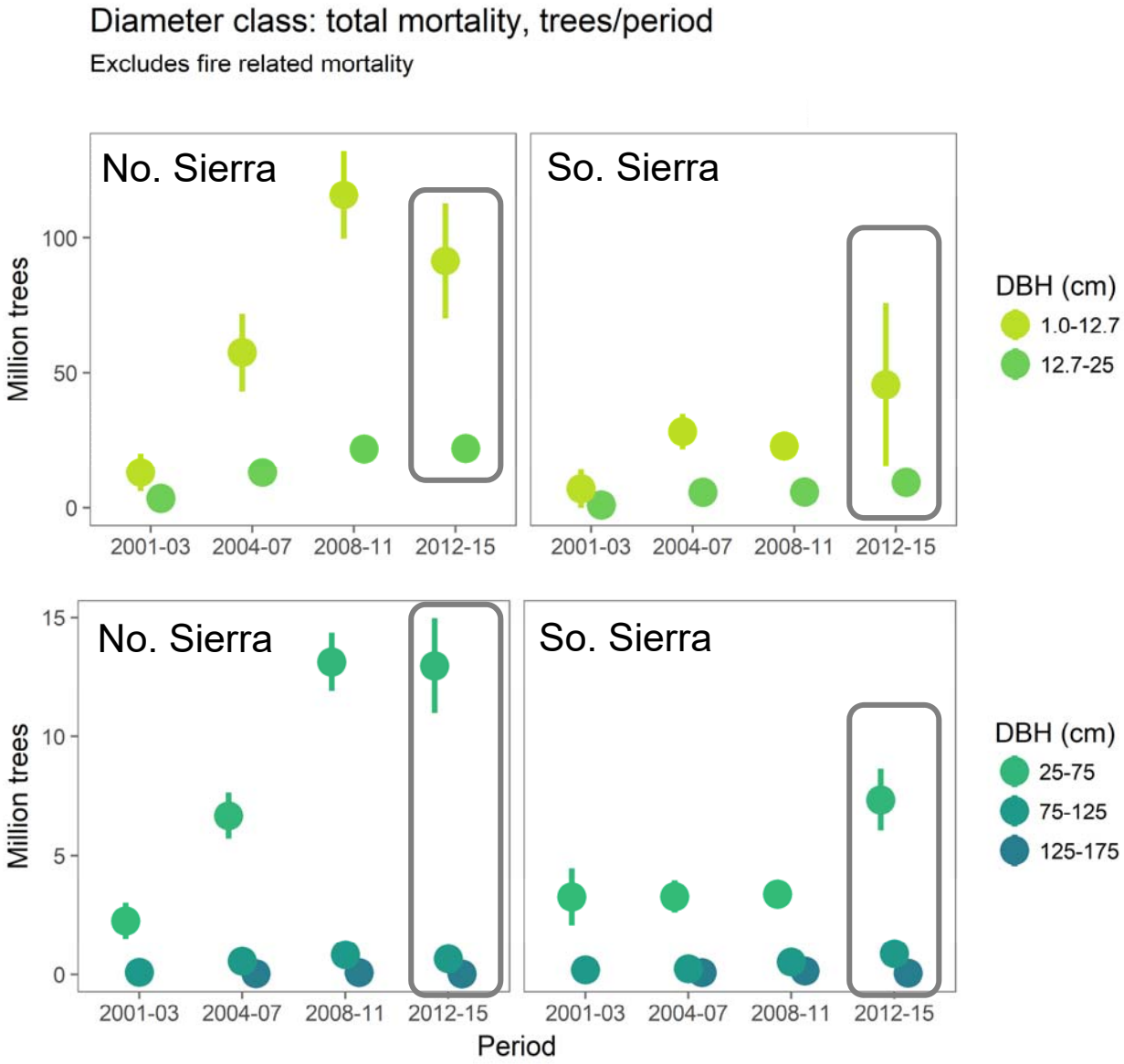

2012-2015
count estimates:

100 million North +
45 million South =

_____

145 million < 25 cm DBH

14 million North +
8 million South =

_____

22 million > 25 cm DBH

Mortality estimates: ecoregion

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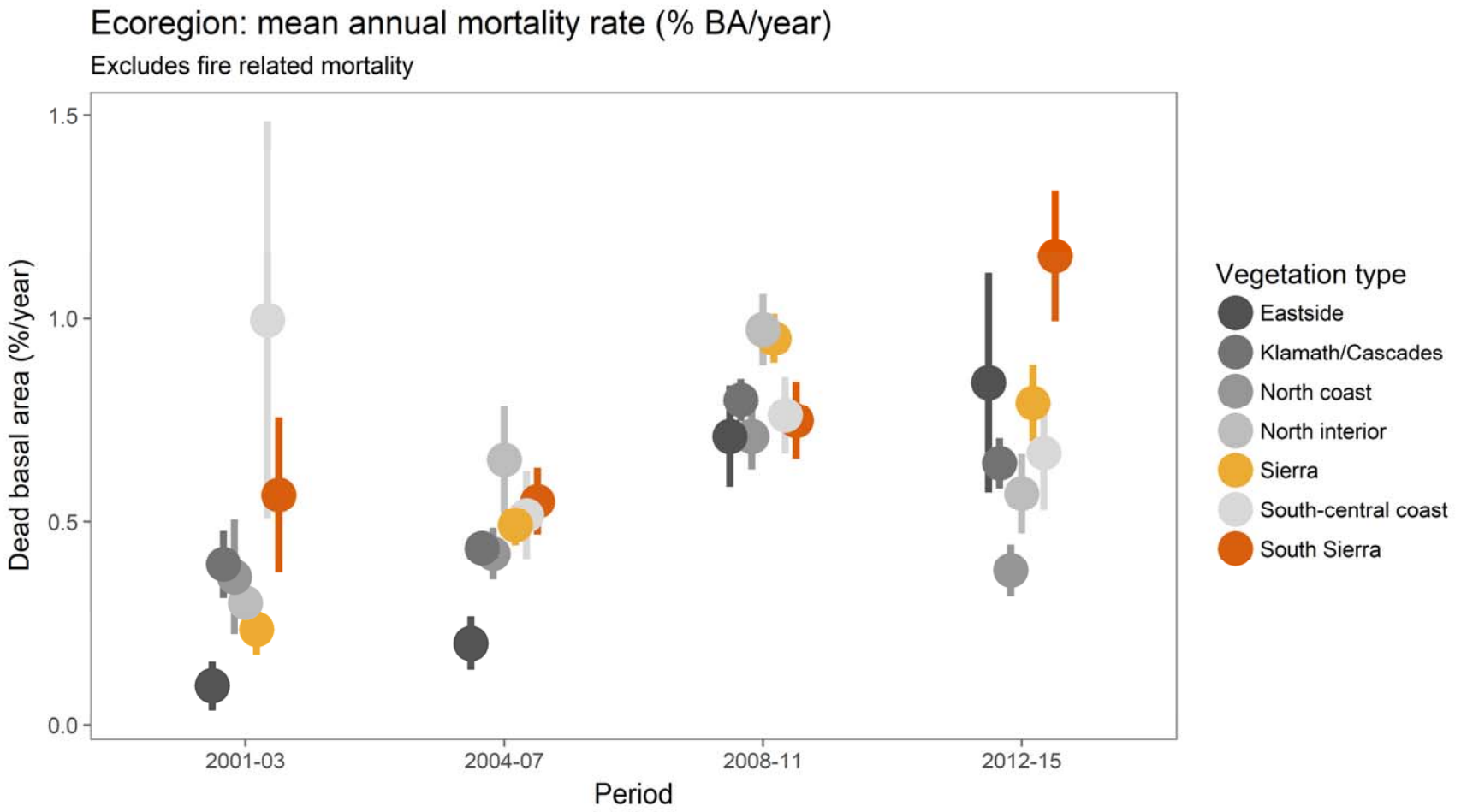
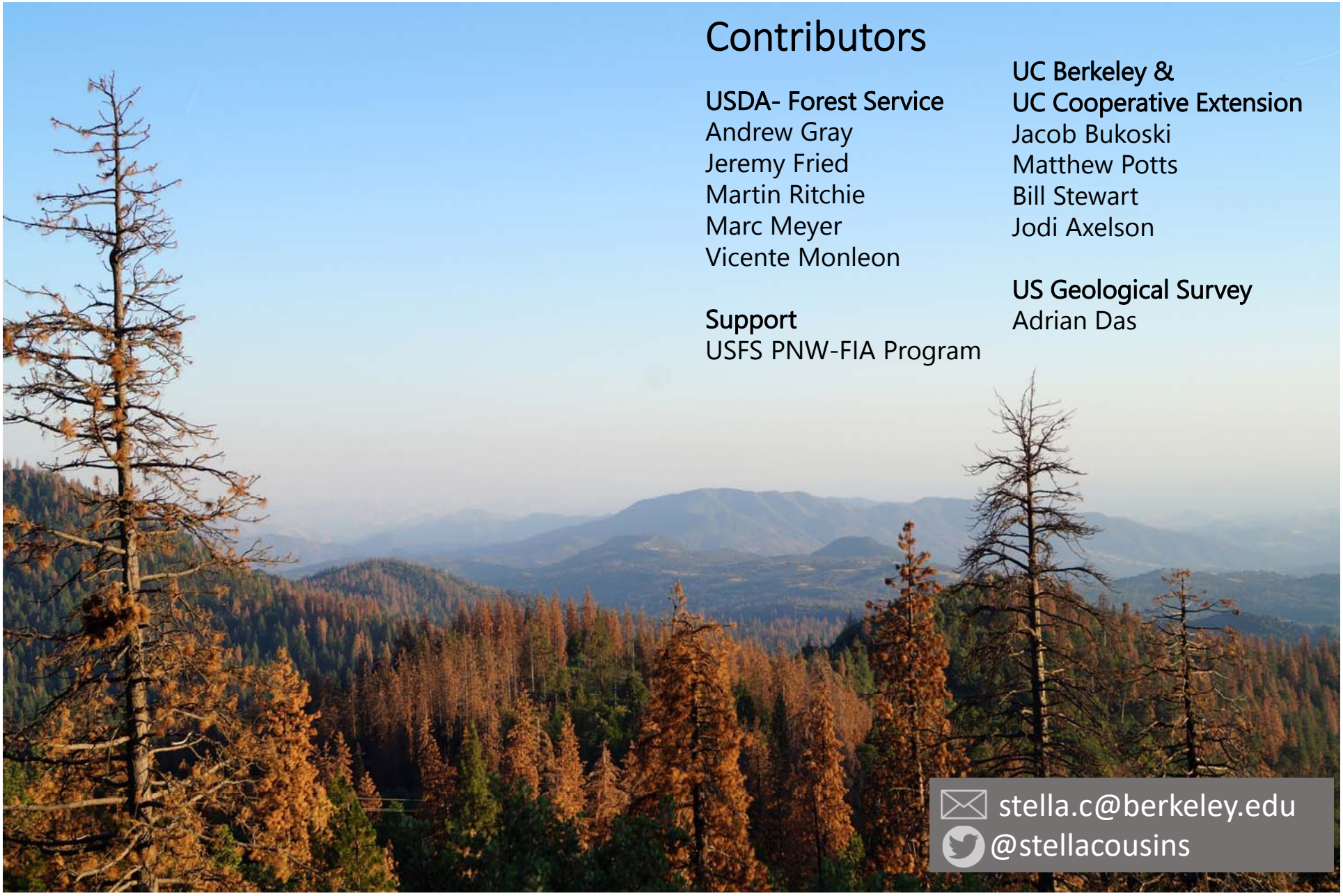


Sierra and Southern Sierra region-wide mortality rates are rapidly increasing
Vital rates vary between ecoregions, but trend together – and upward.



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USGS image