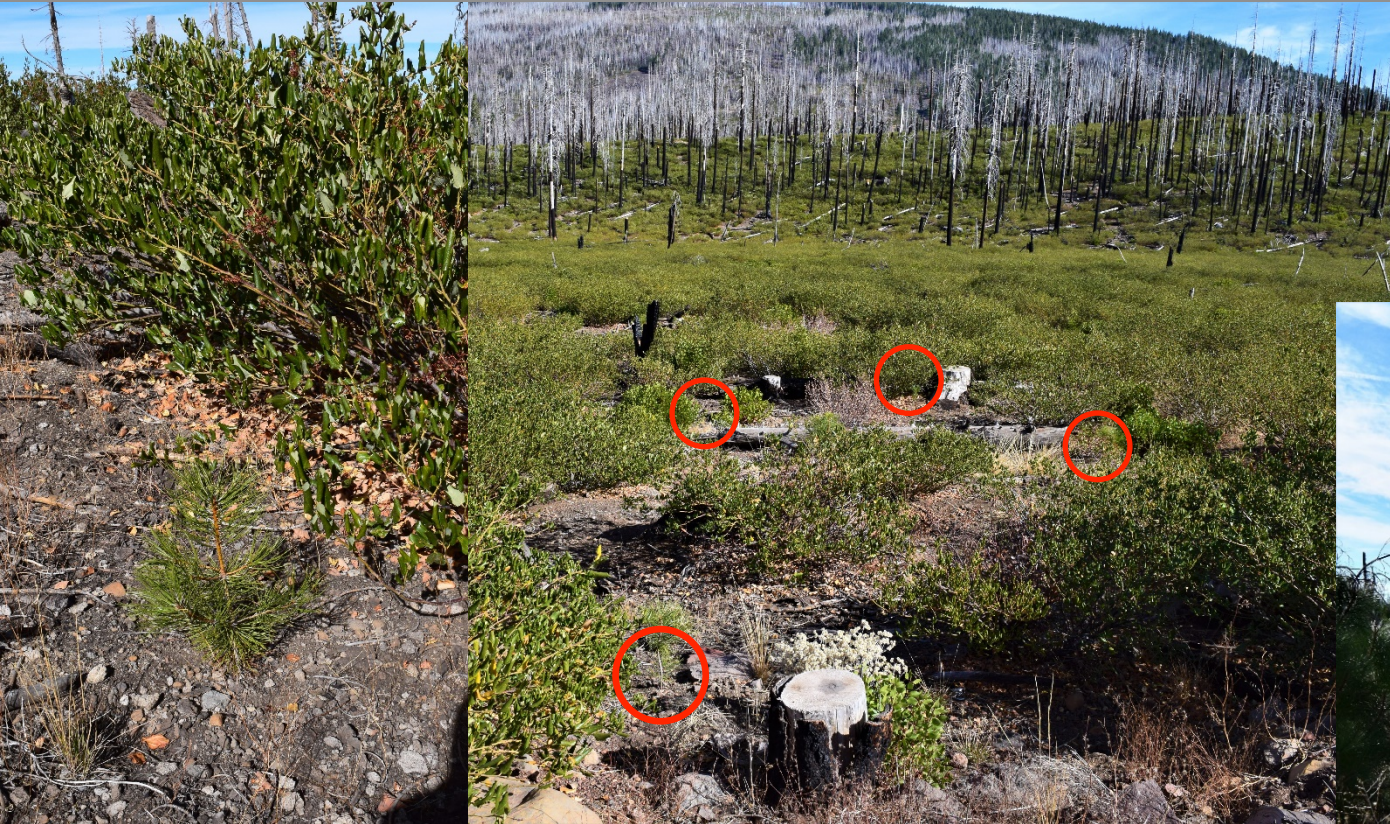


What does reforestation look like in the future?

Martin Ritchie, PSW

- Some context: over 2 million acres of large-scale, high severity wildfire in just the last 2 years in California. 5.4 in the last 5 years.
- Equal opportunity disturbance:
 - Fed, NIPF, PI

6 years since disturbance Ponderosa Fire Plantation
Effective CV Control (Private Industry)



6 years since disturbance Reading Fire Plantation
Ineffective CV Control (and delayed planting)

What does reforestation look like in the future?

2002 Cone Fire Plantation



16 yrs since disturbance,
No CV Release; Shrubs 60+%
Trees ~6.8 ft



16 yrs since disturbance
2x Manual Grubbing; Shrubs ~50+%
Trees ~7.3 ft
Double aboveground Tree C!

16 years since disturbance
Effective Chemical Release; Shrubs ~6%
Trees ~18 ft
30x aboveground Tree C



What does reforestation look like in the future?



We are effectively converting significant acreage of California's NFS and NIPF forest land to brush fields because of ineffective cultural practice in plantations.

- US Forest Service —————> US Shrub Service
- Sacrificing productivity (volume; Carbon etc)
- Planted trees in brushfield will not survive the next fire

Other issues are pretty irrelevant if we won't (or can't) deal with the 800 lb gorilla in the room.

53 years since disturbance
Shrubs not controlled
Shrubs 4-10 feet tall,
Trees 10-40 feet tall.
SI~90-95 base age 50

Treatment options limited

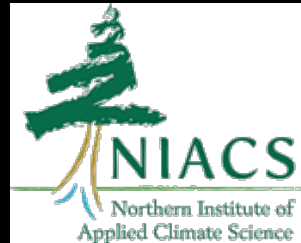




Resistance

Resilience

Transition



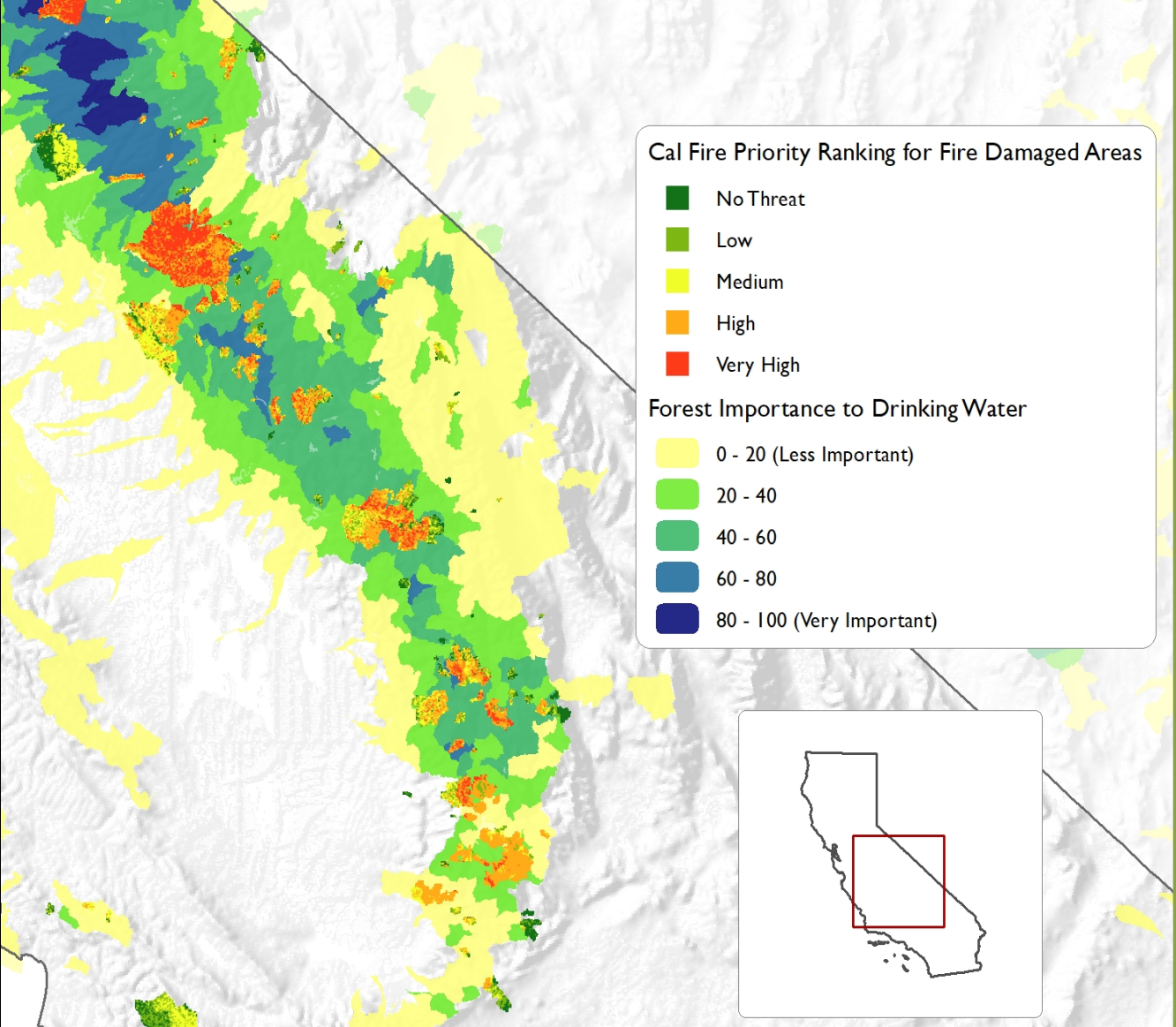
Integrate Climate Science



National Reforestation Initiative AF, NFF, ADF, TNC, USFS NFS

- **Funding:** Private/CSR, federal appropriations, Reforestation Trust Fund
- **Capacity:** Partnerships, agreements

Strong Supporting Policy and Funding



So What?

Drinking water

Air quality

Save money

Habitat

**Lessons
learned**

Tell Stories to Build Support

Reforestation after wildfire



Non-industrial private landowners

- Own 27% of CA forest
 - 90% of landowners own less than 50 acres
- After a large wildfire
 - Have varying level of expertise to reforest
 - All competing for same contractors
 - Salvage logging proceeds variable
 - Have other priorities besides reforestation for salvage receipts
 - Rebuilding homes (may be uninsured)
 - Repurchasing burned up assets like tools/equip
 - Retirement income

Study of large 2014 Sierra wildfire

- With Lulu Waks & Lynn Huntsinger UC Berkeley
- Local non-profit applied for Greenhouse Gas Reduction funds to reforest all non-industrial private parcels together – area approach
- Of 46 landowners, 38 participating own 1,390 ac
 - Interviewed 27, Acreage <10 to 160, most 10-40
 - Age 41-80, majority 60s -70s, Some college to PhD,
 - Income variable <\$20,000 to >\$250,000
 - Used land for primary/secondary residences, recreation, investment, limited timber production
- Effects both emotional and financial
 - Feel on-going emotional distress from forest loss (solastagia), especially those that live on site



Desire for reforestation universal – ability not

- Individual grants available to landowners (CFIP/ EQIP) require expertise, persistence and cost share/ payment then reimbursement
- 1/3rd said they would have taken no reforestation actions on their own because lacked equipment, funds, energy or knowhow

Reforestation strategy without area wide grant	# saying they would have done this	Acres those people own
Sign up for an individual grant program (CFIP/EQIP)	8	470
Do the work themselves or hire contractors	9	240
Take no reforestation action	9	250

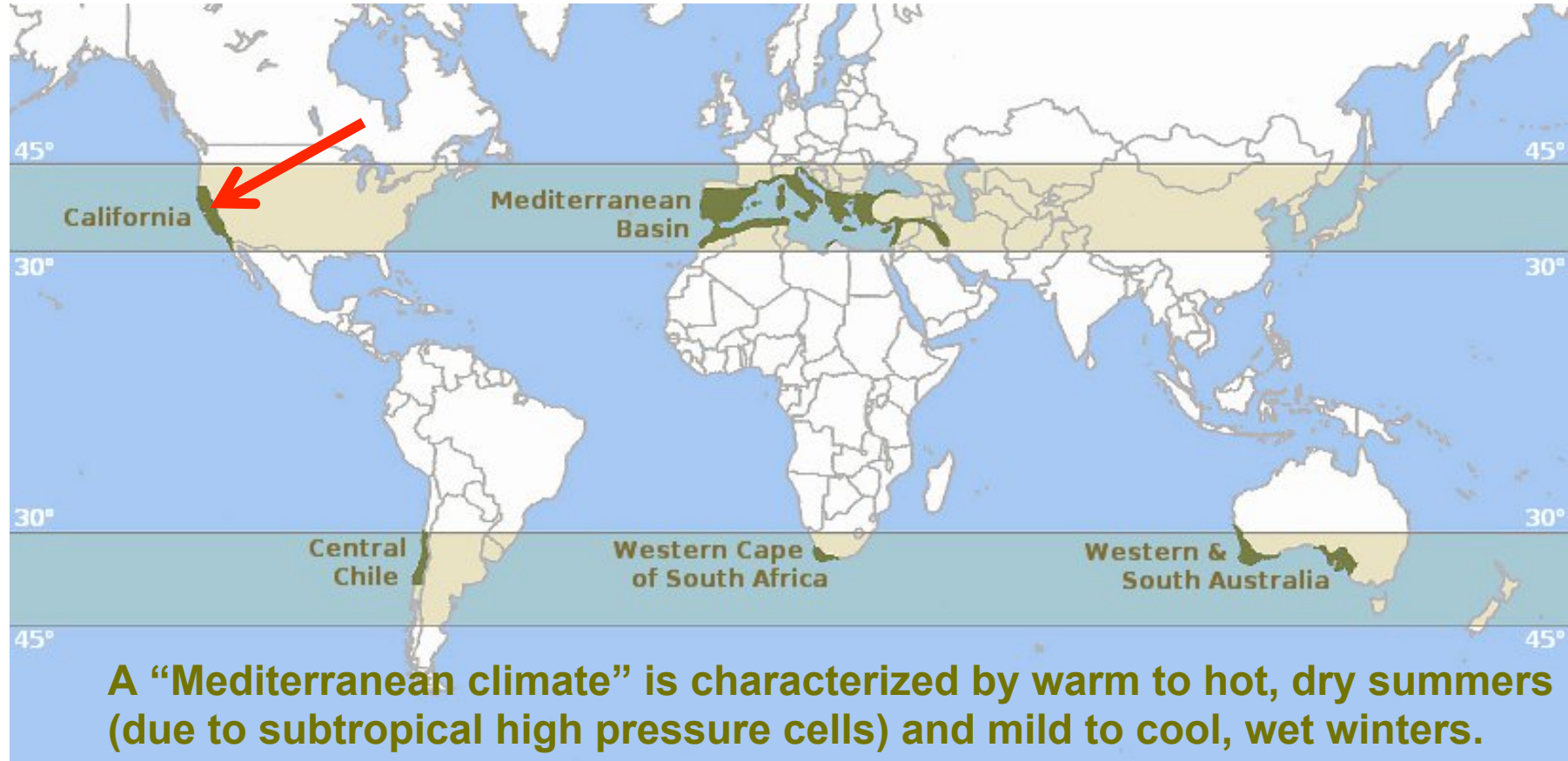
Conclusion: We found

- The area wide approach likely doubled the number of acres reforested compared to individual assistance programs
- A third of landowners would have taken no reforestation action without special help

Recommendations: To respond to mega fires, reforestation on private land needs to:

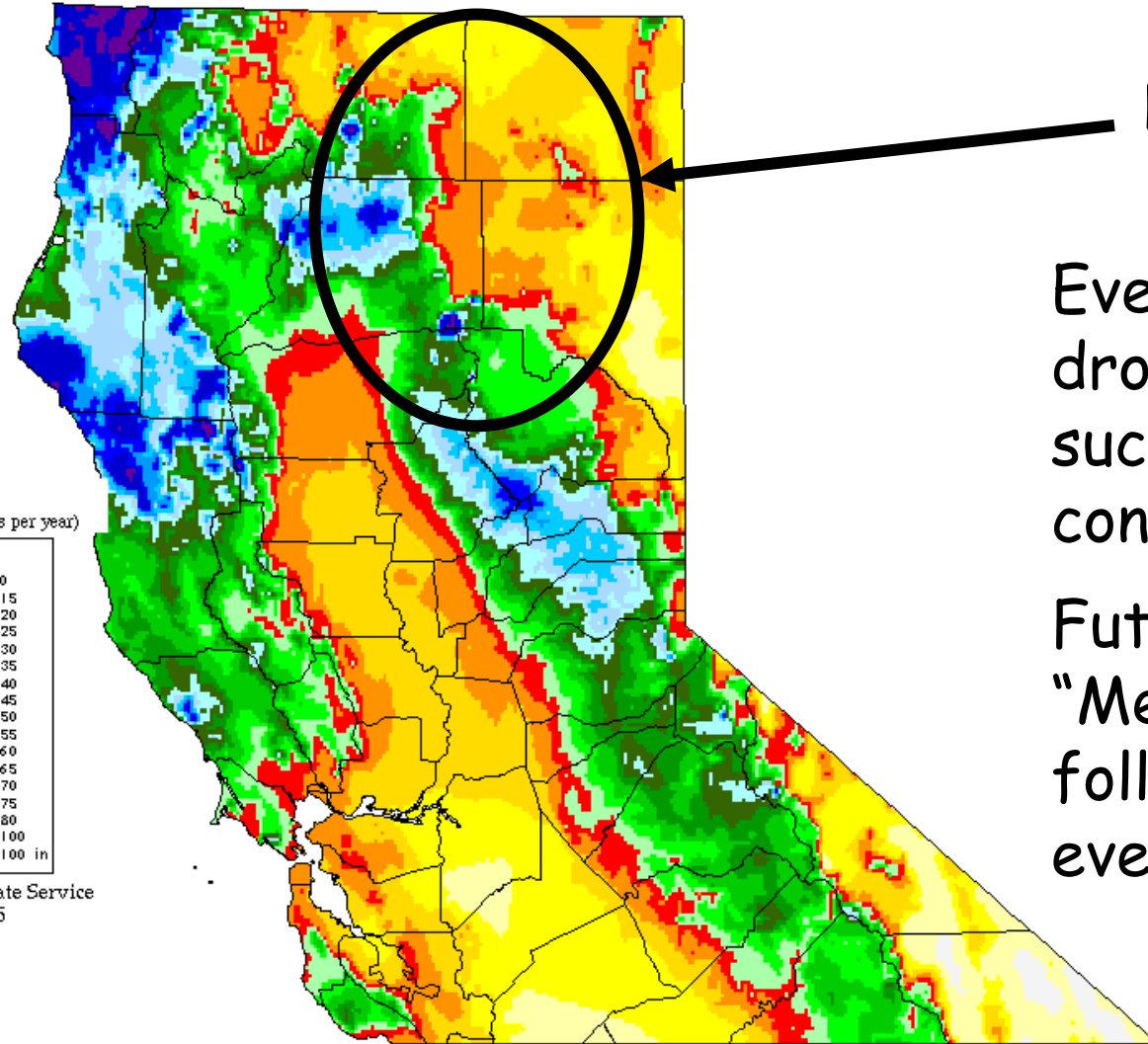
- Be nimble / quick
- Rapid response team
- Area wide approach
- Tie together climate change mitigation with climate change adaptation, explain and educate on connections

Lessons Learned for Establishing Resilient Forests (Now & Into the Future)



- Soil moisture is limiting factor for seedling establishment
- Fire is a key factor to consider (long term)
- Managing tree spacing & forest fuels is critical (long term)

Lessons Learned for Establishing Resilient Forests (Now & Into the Future)



Dry summers + very low daytime RH
14" to 65" PPT / year

Even on the harshest sites in the worst drought years our reforestation has been successful.....IF all the key factors are considered & steps are followed.

Future: Climate will continue to be "Mediterranean" (& then some) so following all key steps on all sites will be even more critical

Annual Average Precipitation (Inches),
Northern California

Period: 1961-1990

Keys to Successfully Establishing Resilient Forests (now & into the future)

Timely completion of many essential & sequential steps over many years. So landowner's objectives must be clear & decisions timely w/ funding for all steps.

Use professionals w/ extensive reforestation & vegetation management experience.

Use appropriate species & seed sources.

Use quality seedlings.

Site Preparation is Critical (mechanical, chemical, Rx Fire, manual):

- Control competing vegetation
- Reduce future fuel loading - (salvage logging is 1st of many steps)
- Enable access for planters

Properly handle, transport, store, and plant seedlings.

Follow-up: long term management of tree spacing & forest fuels.