Army cutworms (*Euxoa auxiliaris*) consume winter annual plants and shrub foliage

Cindy Salo
February 2, 2017

Sage Ecosystem Science
Society for Range Mgt.

Why do we care about army cutworms?

THE INTEGRATED RANGELAND FIRE MANAGEMENT STRATEGY ACTIONABLE SCIENCE PLAN

October 2016

Why do we care about army cutworms?

Invasives Science Need #6: Investigate cheatgrass die-off and potential biocontrols for cheatgrass to provide effective tools for site preparation.

Subtopic: Biological Control; Associated Strategy Task: 7(b)vii

Background

Cheatgrass and other nonnative annual grasses present a major obstacle to successful post-fire restoration of the sagebrush ecosystem. Seeding without some form of invasive plant control is often unsuccessful except occasionally immediately after wildfire removes the shrub canopy and reduces the nonnative annual grasses' seed bank (Hardegree et al., 2011). Once nonnative annual grasses have established dominance, as has happened over millions of acres of former sagebrush vegetation, these areas are often written off as hopelessly difficult to restore. However, in order to achieve the goal of no net loss of sagebrush habitat, it will be necessary to develop methods for restoring nonnative annual grass monocultures to structurally diverse native vegetation.

In June 2003, the BLM noticed missing cheatgrass near Winnemucca, NV

Mike Zielenski

I saw missing cheatgrass when I visited; I asked at a ranch

Cindy Salo

Rancher photographed army cutworms feeding near Winnemucca in January 2003

Jim Christison

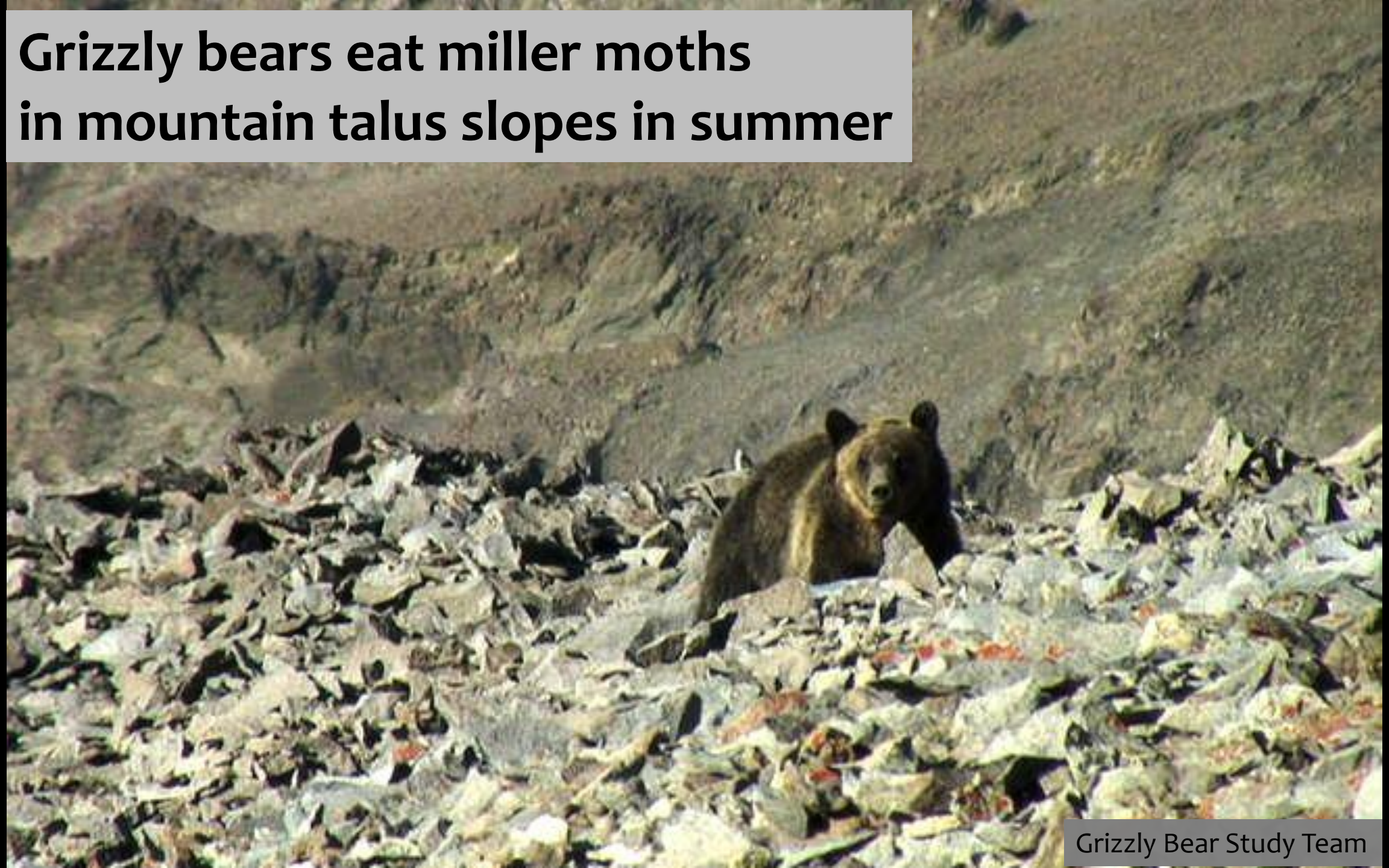
Euxoa auxiliaris

Larvae up to 1.5 inches

Adults are miller moths
1.5-2.0 inch wingspan

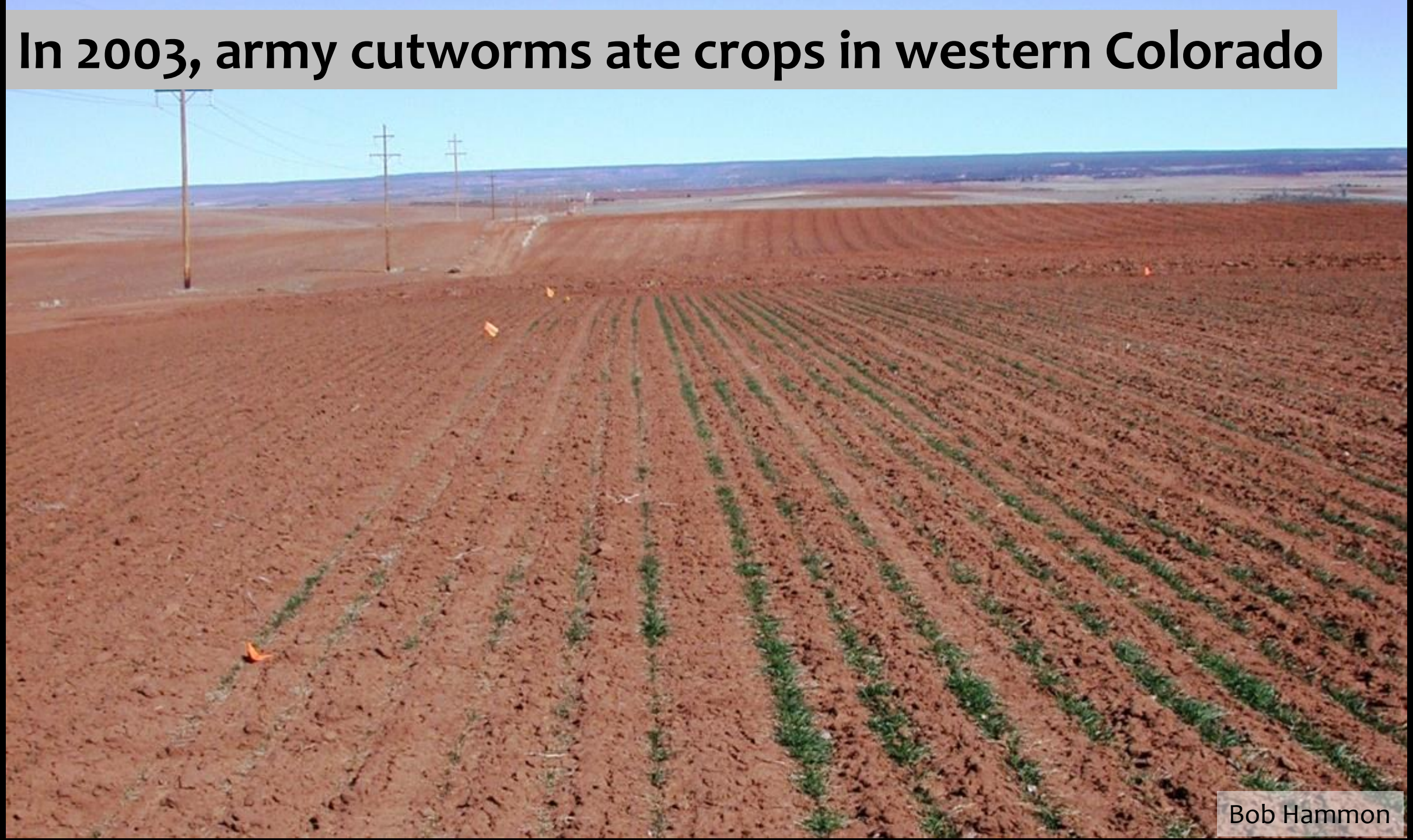
J.W. Hagadorn

Grizzly bears eat miller moths in mountain talus slopes in summer



Grizzly Bear Study Team

In 2003, army cutworms ate crops in western Colorado

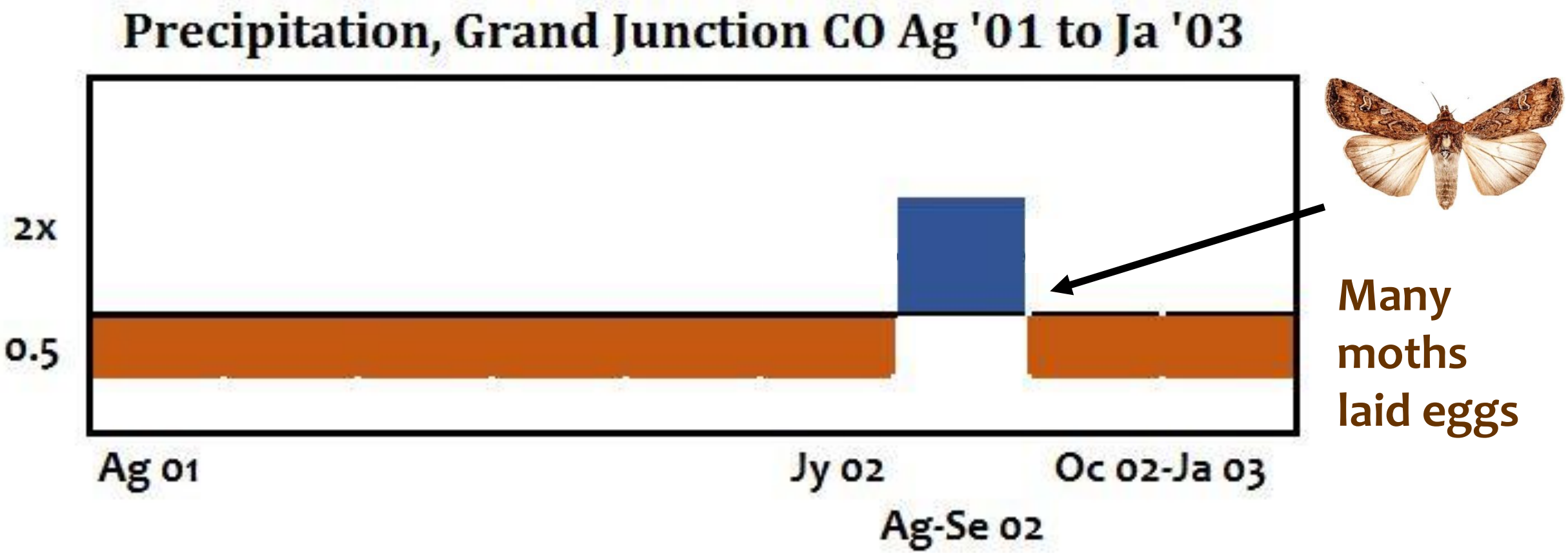


Bob Hammon

Army cutworms ate rangeland plants, too

Bob Hammon

Why so many army cutworms in 2003?



Year of dry weather created many egg-laying sites

Heavy rain Ag-Se germinated many winter annuals

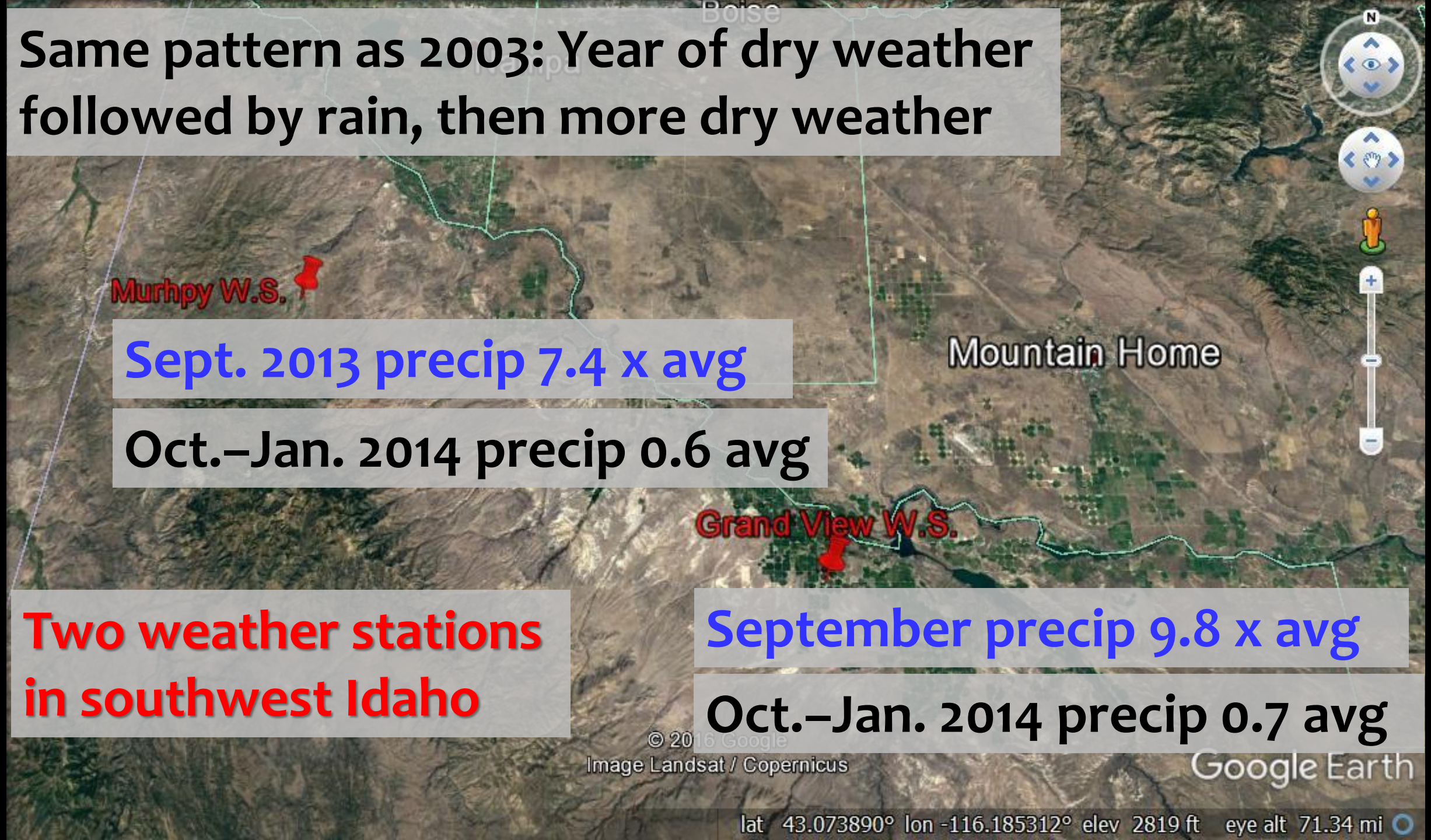
Dry Oct.-Jan. let many larvae survive

Ten years later, many moths trapped at Boise, ID in fall 2013

Chemtica

Cindy Salo

Same pattern as 2003: Year of dry weather followed by rain, then more dry weather



Sept. 2013 precip 7.4 x avg

Oct.–Jan. 2014 precip 0.6 avg

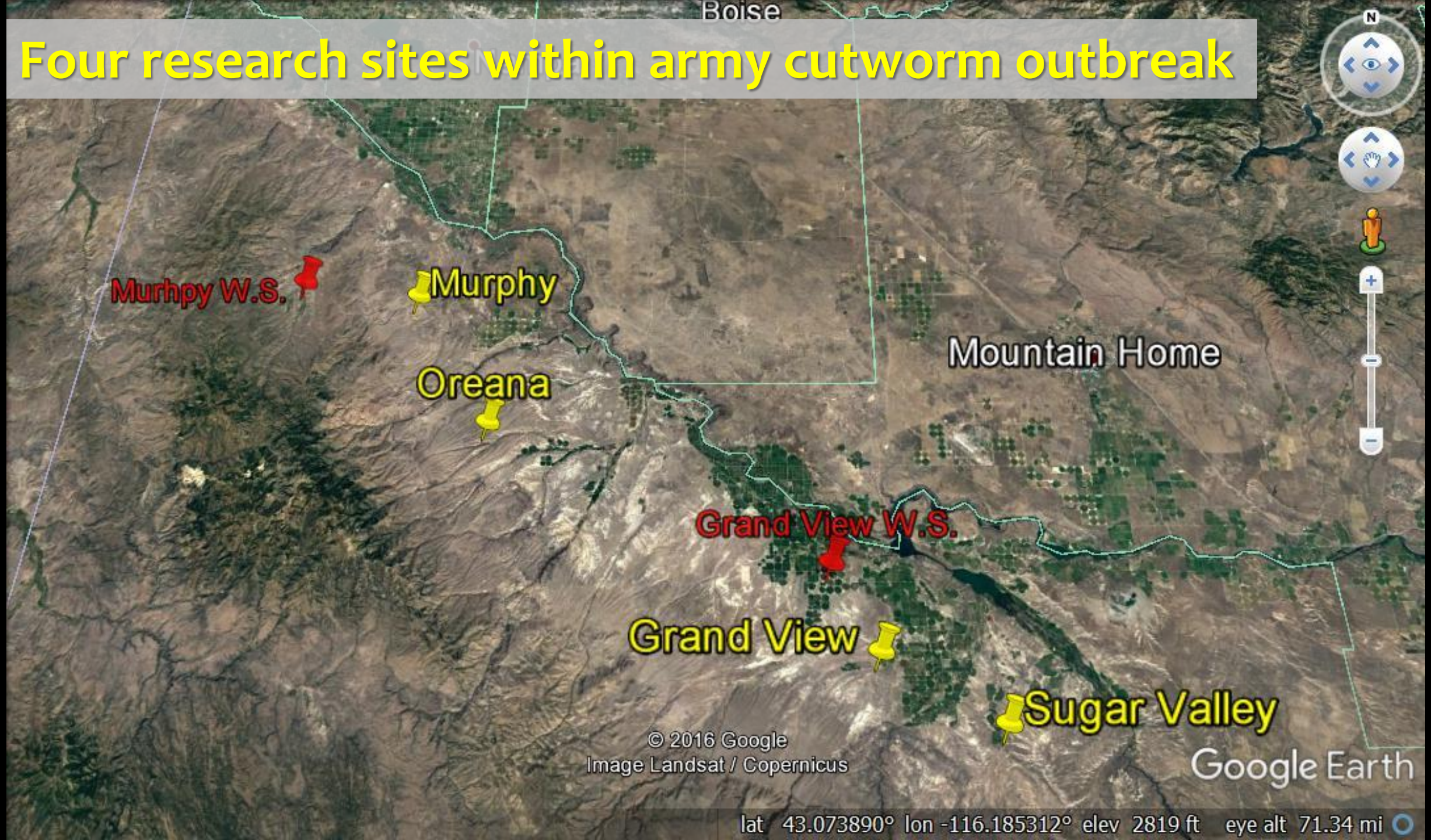
Two weather stations in southwest Idaho

September precip 9.8 x avg

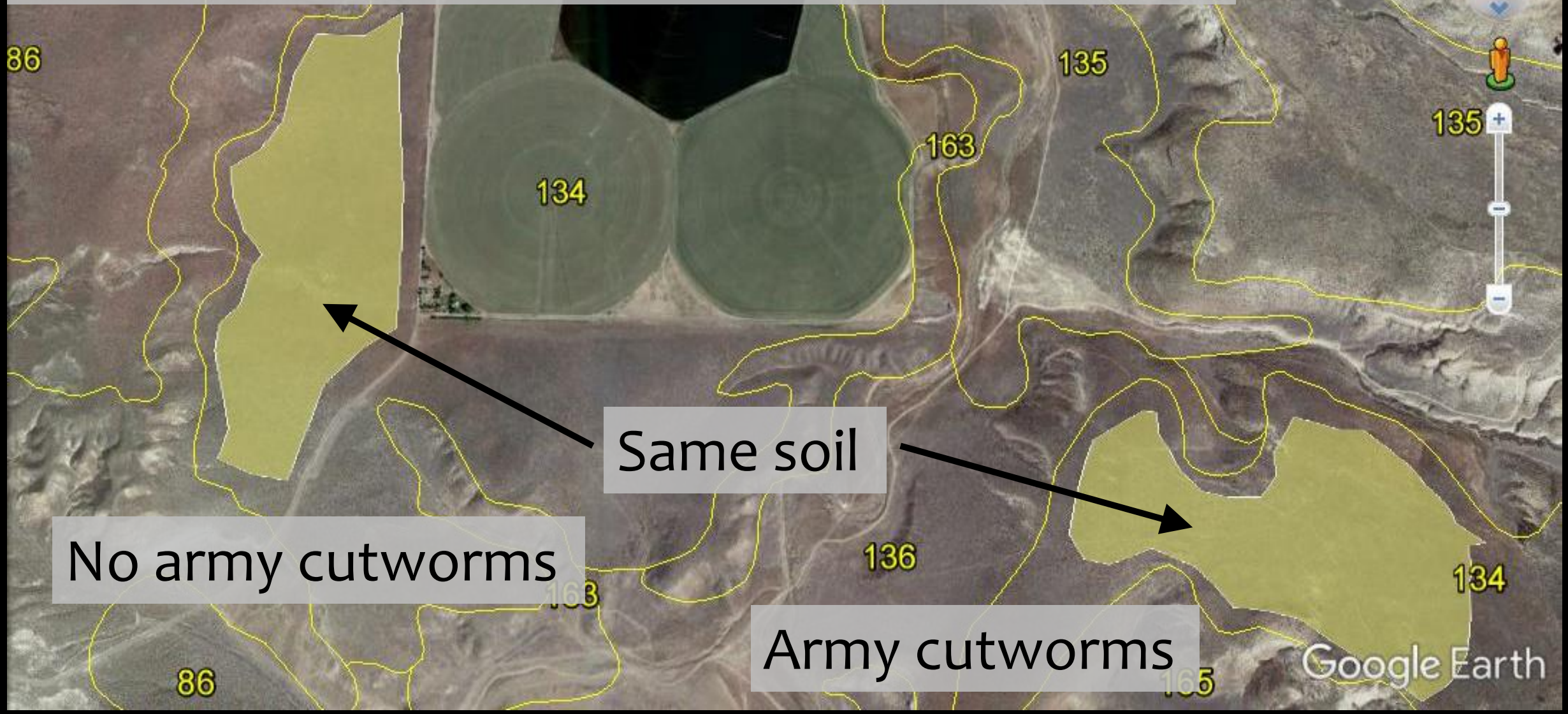
Oct.–Jan. 2014 precip 0.7 avg

Area most affected by army cutworms in 2014

Four research sites within army cutworm outbreak



Sugar Valley research site: Paired transects on affected/unaffected sites on same soil



Army cutworms on cheatgrass die-off

March 1, 2014

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Army cutworms feeding on native shrubs

March 1 and 4, 2014

All, Cindy Salo

Army cutworm damage to native shrubs

April 19, 2014

All, Cindy Salo

Cheatgrass regrew on some die-offs later the same spring

April 19, 2014

Army cutworms pupated in May

Rob McChesney

Cindy Salo

Chenopod shrubs produced new leaves later the same spring

Sagebrush flowered on branches with surviving leaves

July 21, 2014

All, Cindy Salo

Grand View research site:

Chenopod shrubs recovered later the same spring

Cheatgrass had not recovered two years later

July 21, 2014

April 26, 2014

Grand View research site:

Chenopod shrubs recovered later the same spring

Cheatgrass had not recovered two years later

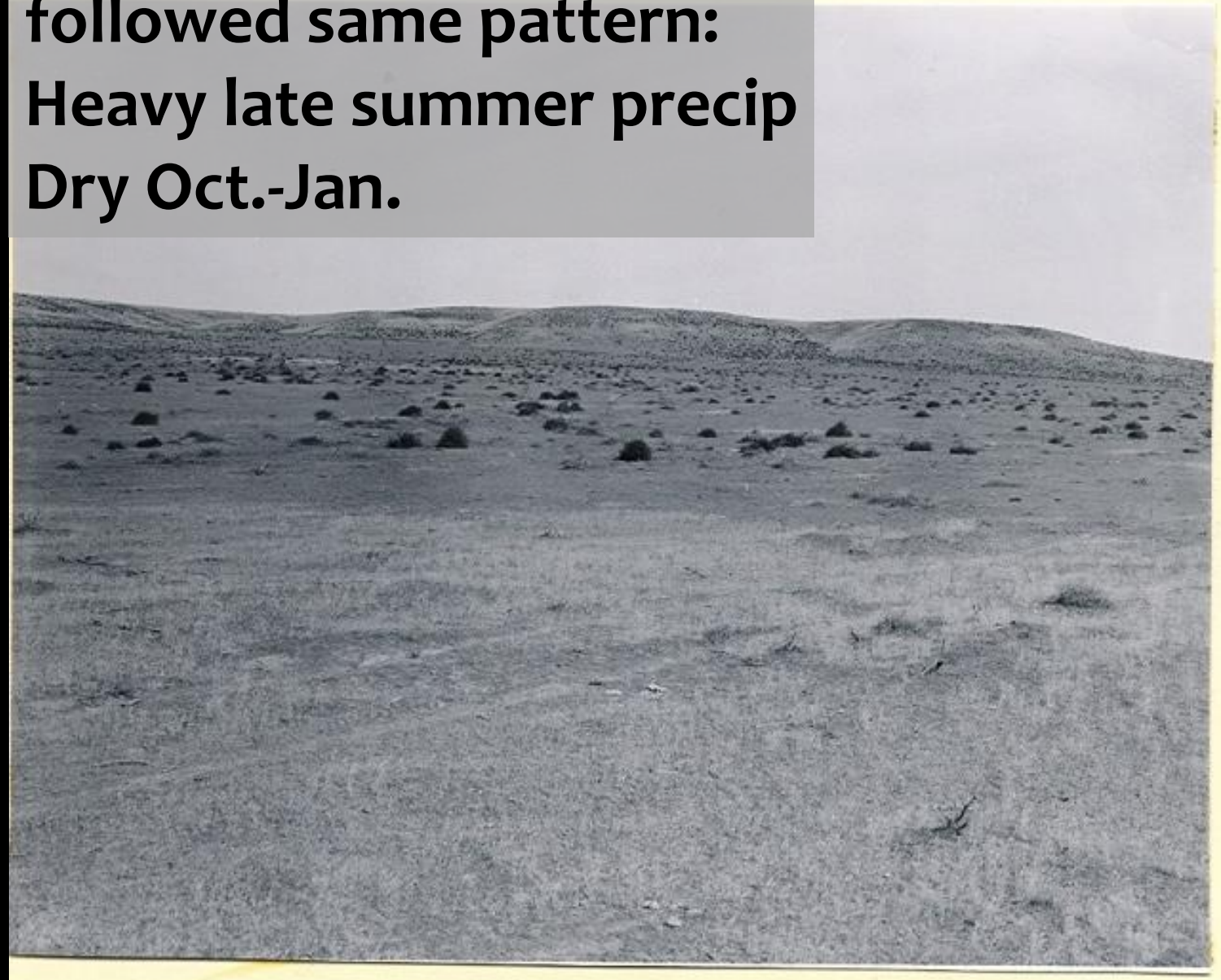
April 26, 2014

July 21, 2014

Sugar Valley research site:

Sagebrush and cheatgrass recovered by the following year

Earlier cheatgrass die-offs followed same pattern:
Heavy late summer precip
Dry Oct.-Jan.



R-665

9/21/60 J. O. Klemmedso

Deadman Flat, 3½ mi. east o
Saylor Cr. Experimental
Range, Idaho

Photo shows extensive winte
kill of cheatgrass on the
north edge of Deadman Flat.
Slopes in the background ar
predominately south. Light
areas in immediate foregrou
and left center are patches
of cheatgrass which did not
winterkill. Russian thistl
is the only living plant in
the winterkill area.

Earlier cheatgrass die-offs followed same pattern:
Heavy late summer precip
Dry Oct.-Jan.

W.O. 458357 R-448

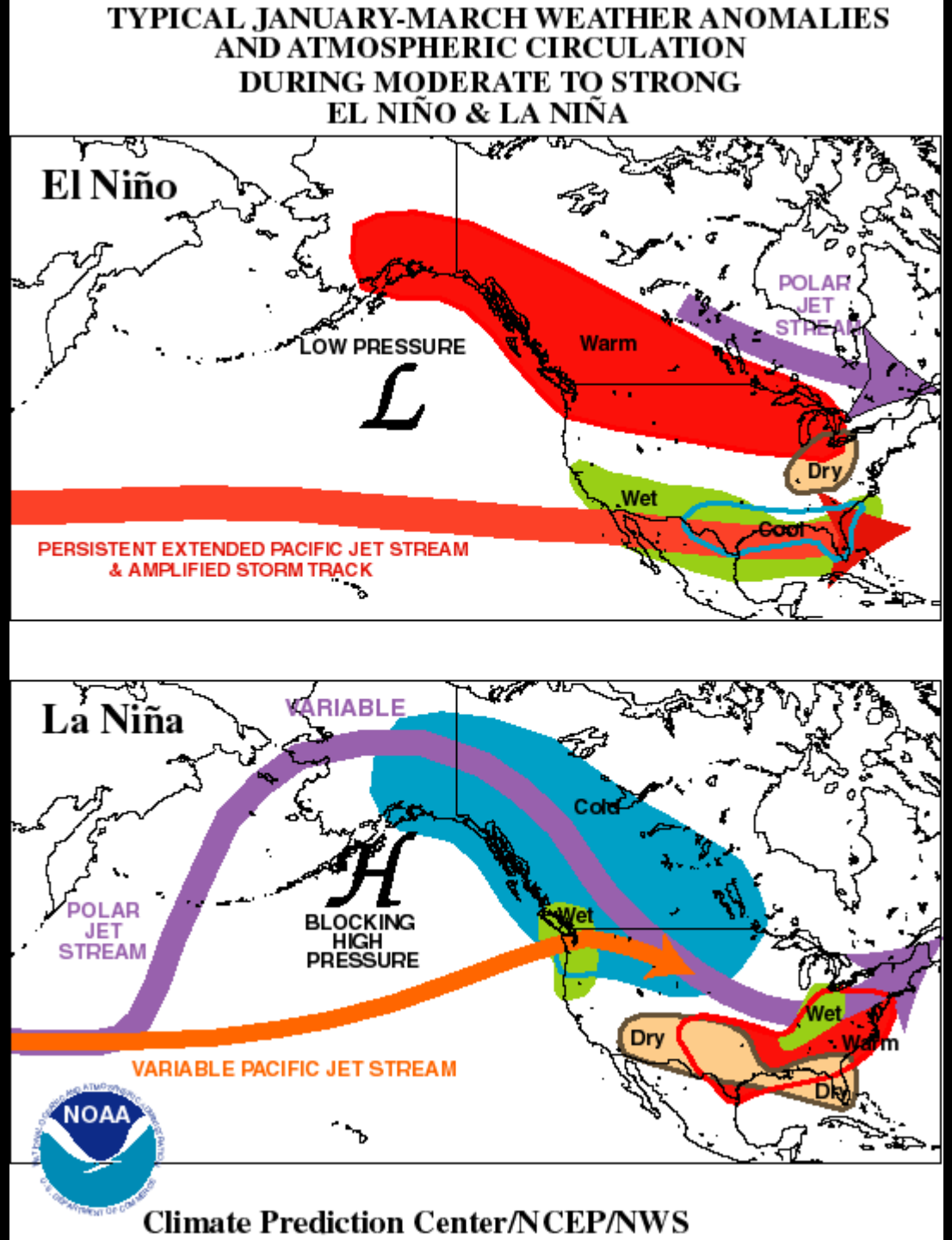
7/29/49 R.M.Hurd
Payette County, Idaho

Willow Creek

Cheatgrass (Bromus tectorum range on Willow Creek. 1949 was a poor year for cheatgrass in southwestern Idaho, it produced scant forage and much of the soil surface was bare. Sunflowers, mustard and other annual weeds present.

El Nino winters tend to be dry in PNW, army cutworm outbreaks more likely

La Nina winters tend to be wet in PNW, better time to reseed cheatgrass die-offs



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