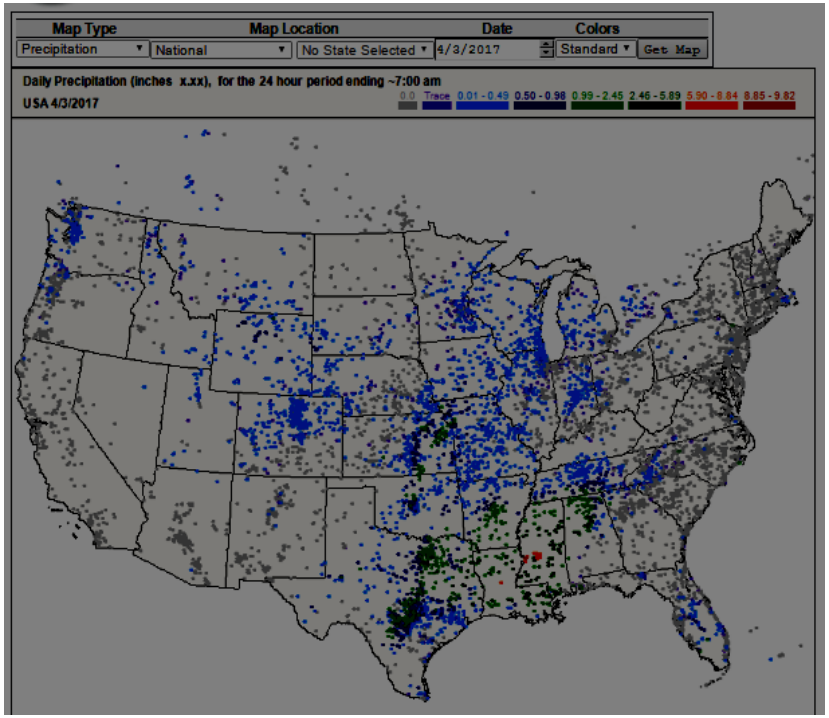
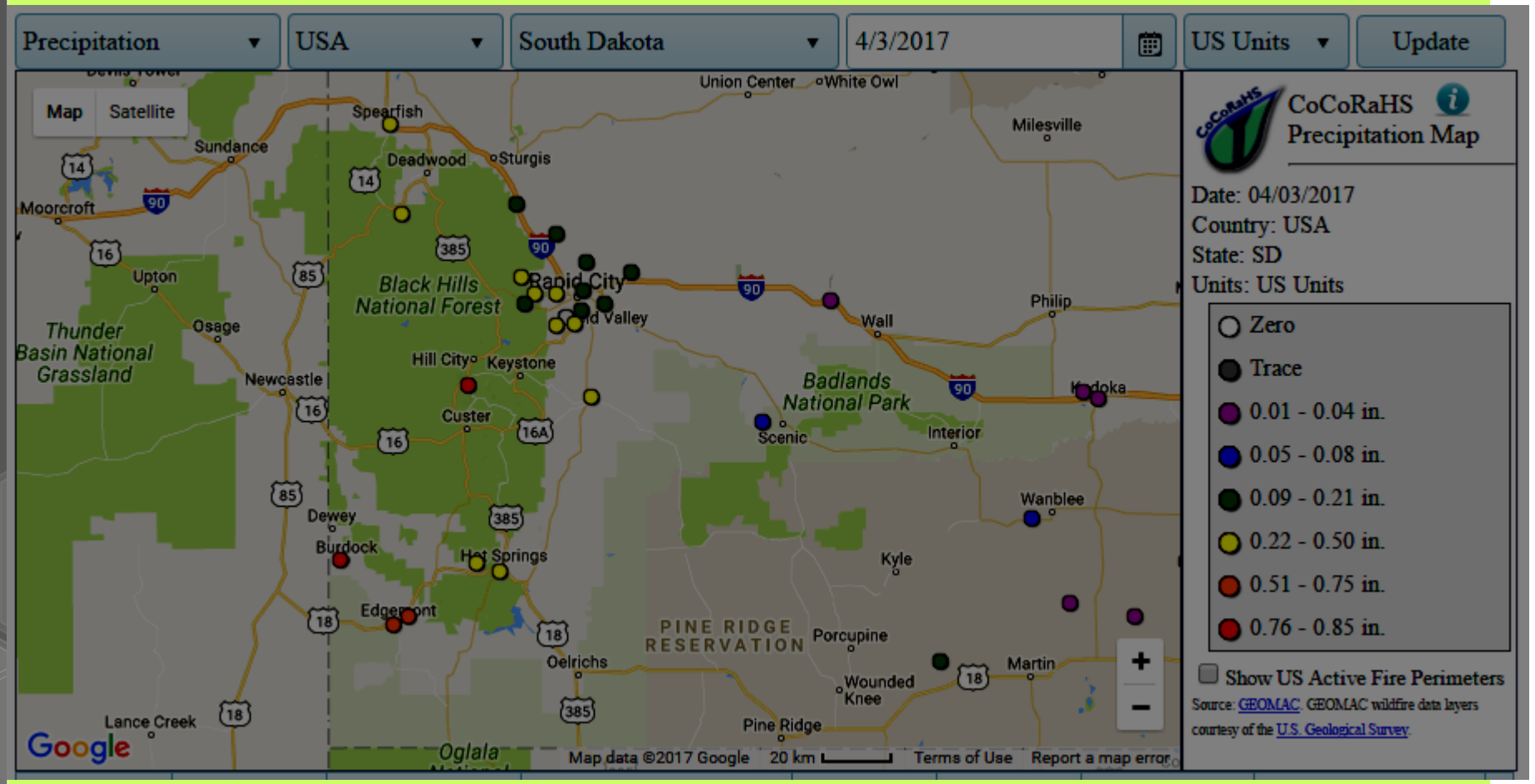
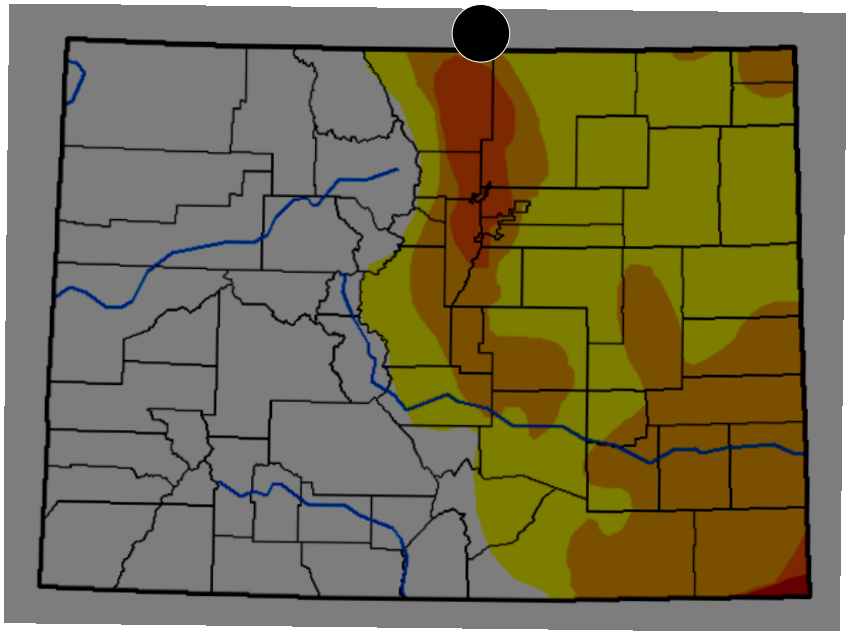


CoCoRaHS and the Drought Monitor (Help us help you!)

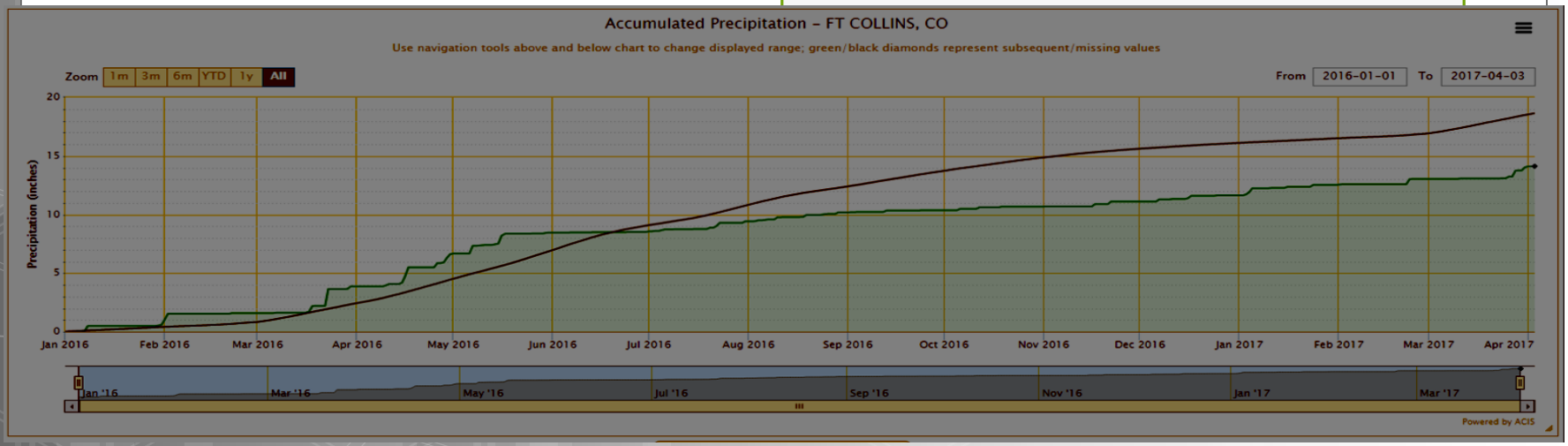
Colorado Climate Center



Anybody bring a rain gauge?!



A sight for sore eyes



What is CoCoRaHS?

- The Community Collaborative Rain, Hail, and Snow (CoCoRaHS) networks is a nationwide citizen science team of precipitation data collectors
- One could argue the acronym should be longer to include ice accretion, evapotranspiration, condition monitoring, and soil moisture. CoCoRaHSIETCMSM?
- Over 10,000 precipitation reports come in every day!

Today's Roadmap

- What is CoCoRaHS Condition Monitoring?
- Condition Monitoring Limitations
- What about CoCoRaHS Drought Impact Reports?
- CoCoRaHS and the Drought Impact Reporter
- The Carolinas' use of Condition Monitoring
- Future Condition Monitoring Plans
- Other CoCoRaHS Drought Monitoring Resources

What is your landscape's current

CONDITION?

WET?
NORMAL?
DRY?

Tell us by submitting a "CoCoRaHS Condition Report"

Dry ⟷ Normal ⟷ Wet

A Guide to Monitoring your Local Conditions

RISA
Regional Integrated Sciences and Assessments

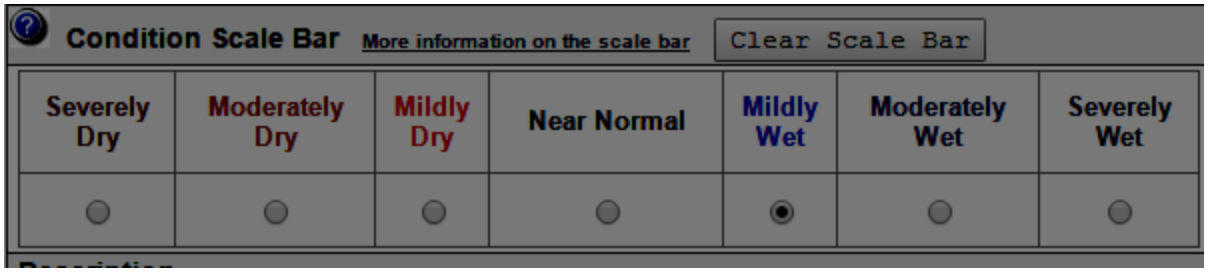
National Drought Mitigation Center

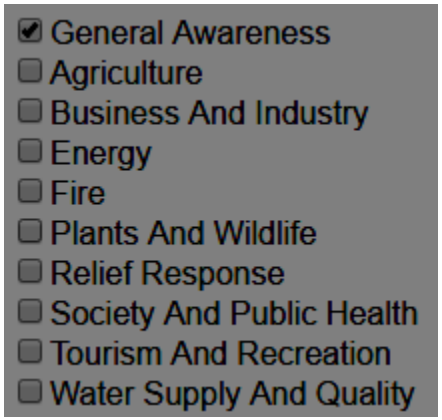
NIDIS

CoCoRaHS

Condition Monitoring Reports

- A CoCoRaHS reporting option that does not include a measurement, but a brief written assessment
- Officially began fall 2016
- Current condition reported (with reference to location and season) from "Severely Dry" to "Severely Wet."
- Observers report sectors where impacts are known
- Recommended frequency of once/week





DRY CONDITIONS

DRY CONDITIONS
MILDLY DRY
MODERATELY DRY
SEVERELY DRY

DRY CONDITIONS

MILDLY DRY

Growth may have slowed for plants, crops or pastures.

Soil is somewhat dry.

Local plants, pastures, or crops may have not fully recovered if conditions are changing from drier to wetter.

Precipitation or water deficits may be present.

DRY CONDITIONS

MODERATELY DRY

Plants may be brown due to dry conditions.

Streams, reservoirs, or well water levels may be low.

Voluntary water use restrictions may be in place.

Water shortages may be present.

Plants, crops, or pastures may be stressed.

Soil is dry.

DRY CONDITIONS

SEVERELY DRY

Soil moisture is absent.

Ponds, lakes, steams and wells may be nearly empty or dry.

Crop or pasture losses may be experienced.

Mandatory water restrictions may be in place.

Water shortages or water emergencies are present or possible.

Condition Monitoring Report Examples (Some are concise and informative)

3/31/2017	NC-HR-2	NC	Harnett	Mildly Dry	General Awareness Fire	Another below normal month, even with about 1" of rain Mar 31-Apr 1. Spring growth is emerging but needs moisture. Several days in March of fire danger due to dry conditions and wind.	

Condition Monitoring Report Examples (Some may not offer much)

4/1/2017	NC-HK-7	NC	Hoke	Near Normal	General Awareness	General reports about local conditions, events, or news	

Condition Monitoring Examples (The Novel)

Plants/wildlife: on 3/21/17 in the afternoon I observed a straight-line row of more than 70 holly bushes spanning more than 250 feet oriented in a NW to SE direction serving as a well cultivated border between a paved parking lot, a nearby apartment complex grassy grounds, and public park facilities. The bush heights ranged approximately two feet to six feet tall above ground level. The plump bright red berries contrasted sharply with the lush green prickly holly leaves. Some of the bushes were affected by non-flowering vines intertwined through their branches and trunks. Approximately 20 of the mature holly bushes had many more than 50 bright red berries in clusters yesterday. Most of the border bushes (~50 bushes) only had 5 or less bright holly berries on each bush. The ground on the southern side of the bushes consisted of all natural grassy area with some shade trees and stagnant rain/drain water a few feet away and down a steep incline. The northern ground edge of the row of

border bushes is a few inches away from a mixture of concrete/asphalt paved parking surface and natural grassy lawn. In the brief initial observation, the most striking feature of the long row of bushes was the inequitable “all or nothing” pattern of berry distribution. Most holly bushes were displaying a dearth of red berries and only a few bushes adorned with a multitude of bright red holly berries. Reasons for the inequity could include: selective availability/accessibility of berries as a bird/mammal food source, pavement runoff, car exhaust fumes, water quality/quantity, selective pesticide application, selective fertilizer application, parasitic vines. or any number of other botanical speculations that could be the object of future observation throughout the upcoming years. The bushes are not dry or wilted from drought and the ground is not flooded, which is why I selected "near normal" for today. On 3/22/2017 at 9 am, I grasped a handful of soggy material from a

nearby residential gutter and loosely packed it into a 16-ounce capacity plastic drinking cup. The weight of the contents (after tare of electronic kitchen scale, not legal for trade) was 2.7 ounces. After two hours of drying time, I looked at and counted the following organic plant matter: 100 pine straws that were completely intact and undamaged. Each pine straw consisted of three individual strands (total 300 strands) held together by a darker terminal hull. A total of eight soggy and wilted leaves. Three of the leaves were identified as oak leaves. Four leaves were more round shaped and measured approximately 2 inches by two inches. One narrow 3-inch-long leaf was also observed. I counted 25 small (1/2 inch or less) white colored flowered petals apparently fallen from a nearby blooming tree. A few hulls, twigs and other plant matter was in the gutter as well. I did not observe any moving insect life, standing water, or inorganic matter in this gutter sample. The gutter sample is in contrast with

some similar brown pine straw manually removed from curbside drain grates this week. The accumulation observed on storm grates included some full-grown living earthworms, ants, some newly budding sprouts with roots, some inorganic matter (cups. bottles, rags, straps, etc.) and a general earthier dirty odor.

Condition Monitoring Limitations

3/18/2017	CO-LR-273	CO	Larimer	Severely Dry	General Awareness Agriculture Fire Plants And Wildlife	Another week of abnormally warm and totally dry, windy weather. Vegetation is starting to try to come out of dormancy Soil moisture remains in areas that were irrigated last year. Surface is now becoming dusty and some dust is picked up when we get wind gusts over 30 mph. another grass fire or two in the county this week and fire weather advisory already posted for tomorrow. Municipal water supplies remain in great shape - fortunately.	
3/18/2017	CO-LR-825	CO	Larimer	Moderately Dry	General Awareness	Watering the plants and grassy areas.	

- USDM decisions must be made based on objective data
- Condition monitoring reports are subjective, based on the observers' perceptions of conditions

Condition Monitoring Limitations

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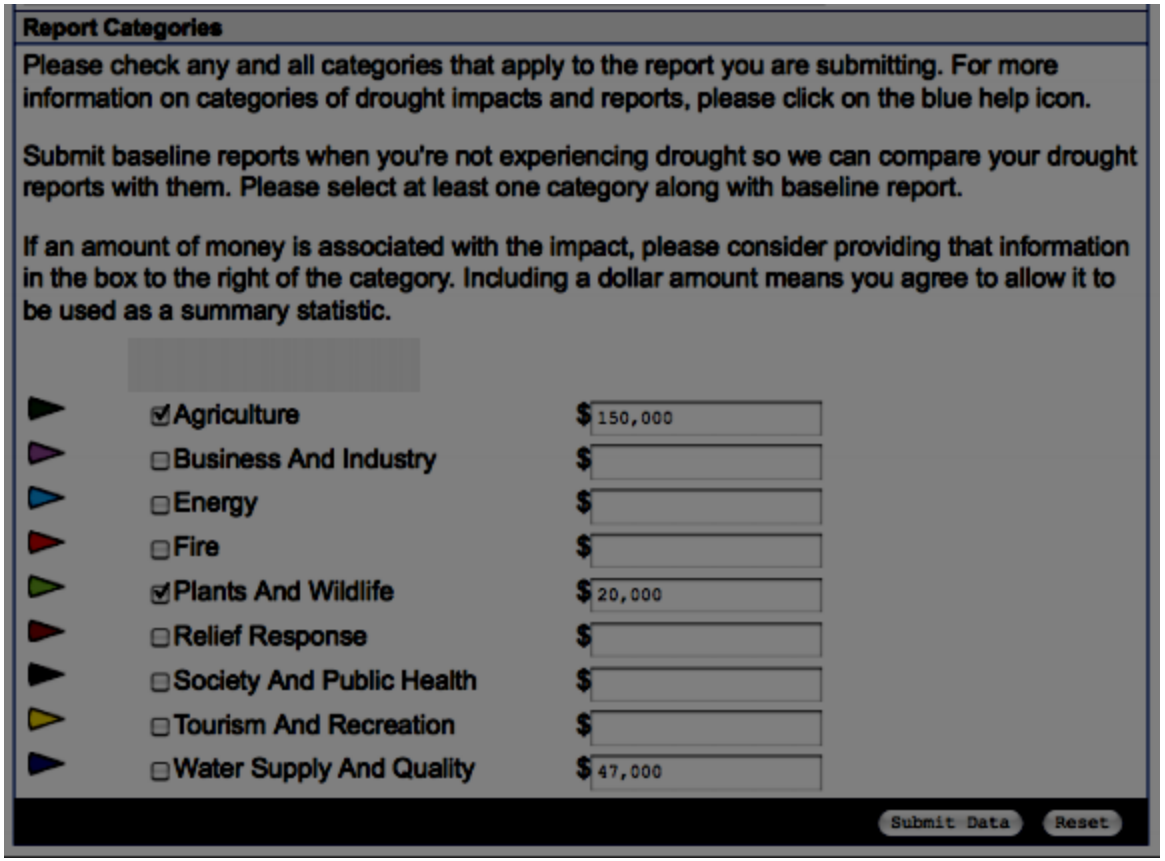
In this case, I'll take Nolan's word for it!

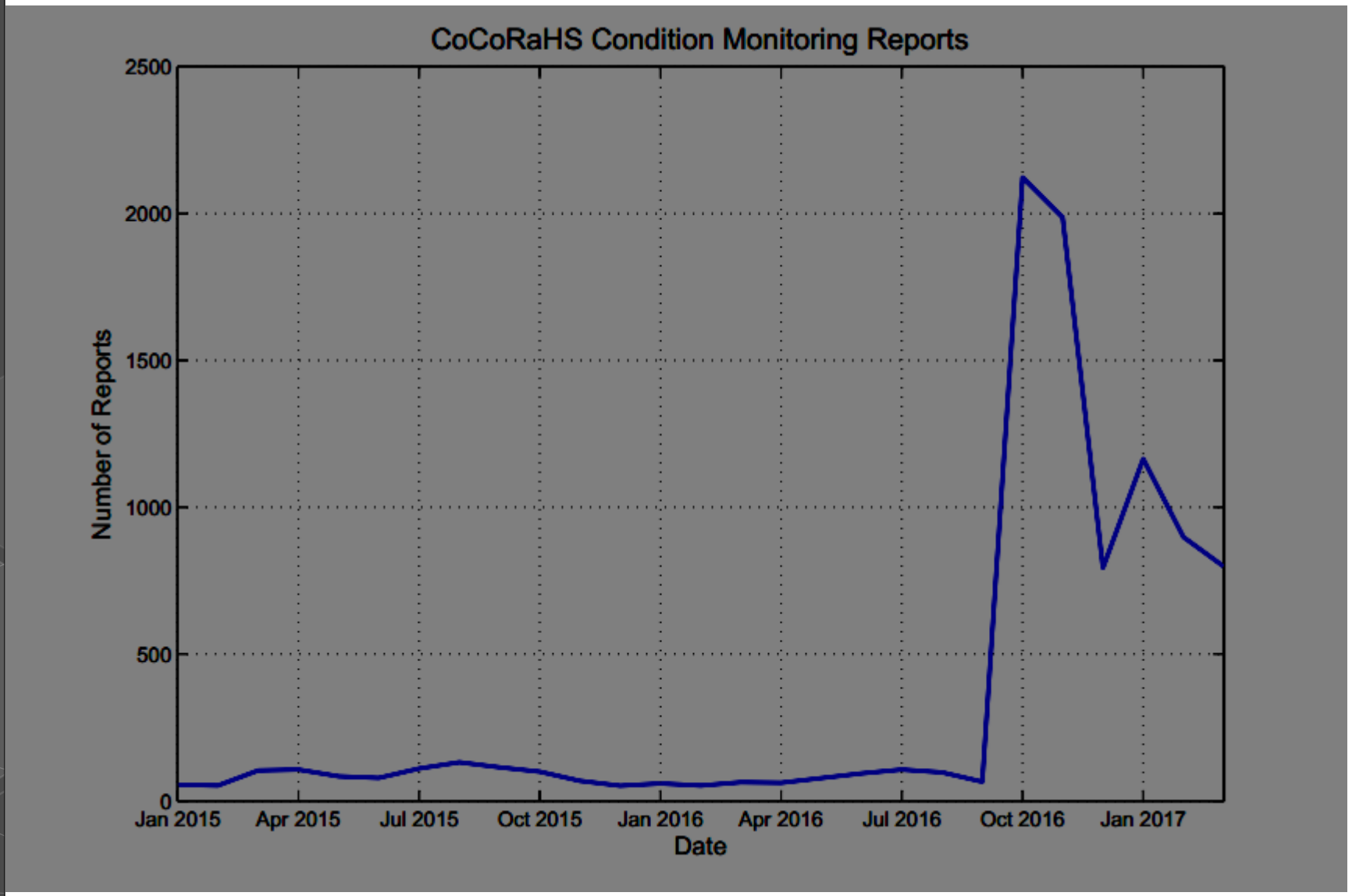
Drought Impact Reports

- Started in 2010
- Also fed the USDM drought impact reporter
- Were drought-specific
- Included option for damage reporting in $.



Why Switch Report Types?

- The Carolinas Integrated Sciences and Assessments did extensive evaluation to figure out how to (CISA) make the form as user-friendly as possible while still being informative.
- The number of reports speak for themselves…


CoCoRaHS Condition Monitoring Reports
Number of Reports
2500
2000
1500
1000
500
0
Jan 2015
Apr 2015
Jul 2015
Oct 2015
Jan 2016
Apr 2016
Jul 2016
Oct 2016
Jan 2017
Date

CONNECTING WEATHER AND CLIMATE WITH THE ENVIRONMENT

Your knowledge about the local environment and how weather influences it can reveal much more than can be learned from recording daily rainfall alone.

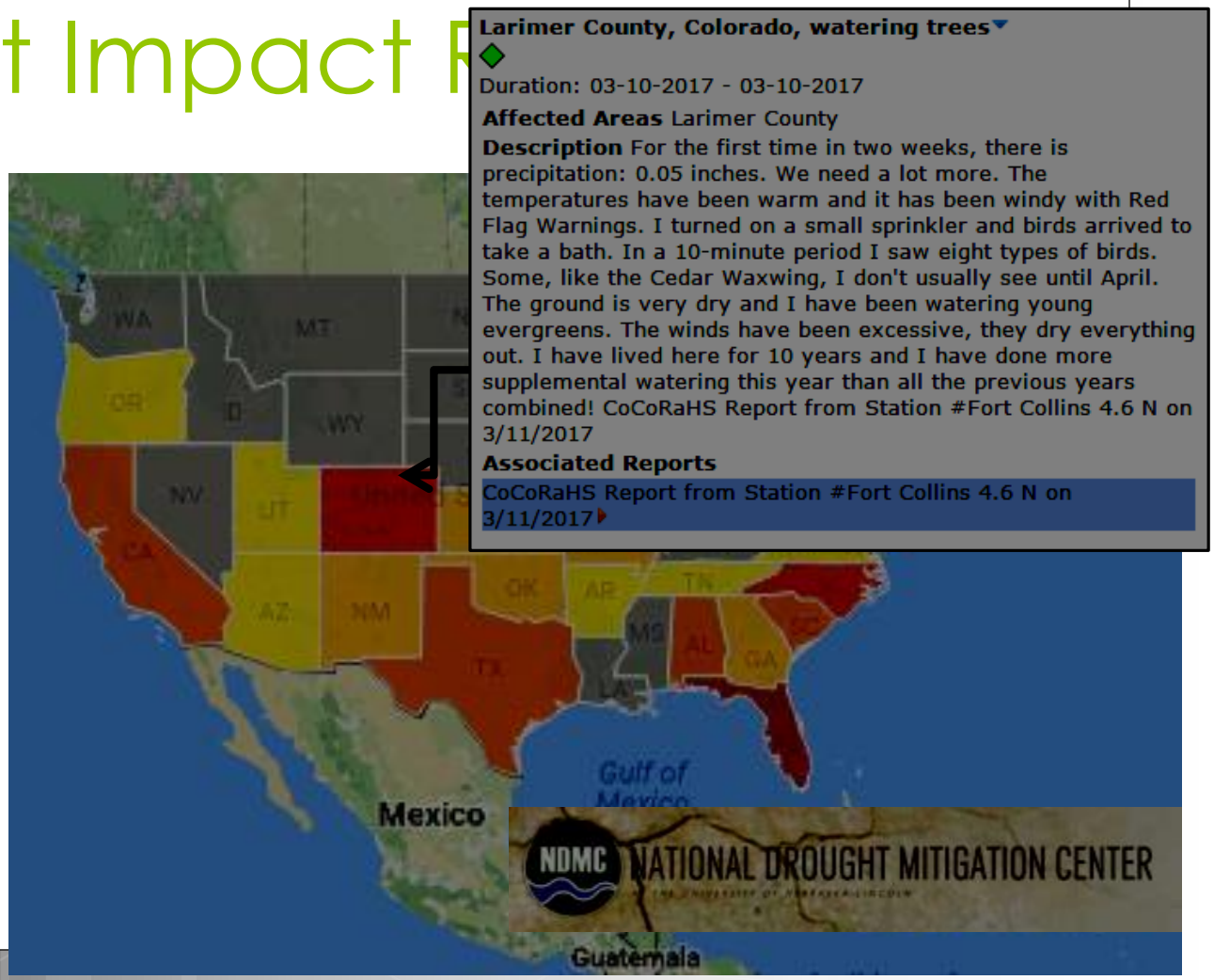
Can Condition Monitors Educate the US Drought Monitor?

- Yes!
- The drought monitor map must be fundamentally based in objective data (ie SPIs, PDSI)
- The drought monitor is ideally tuned such that indicators predicting the most severe impacts are weighted most heavily. Condition monitoring reports can help us tune our convergence of evidence approach by location.

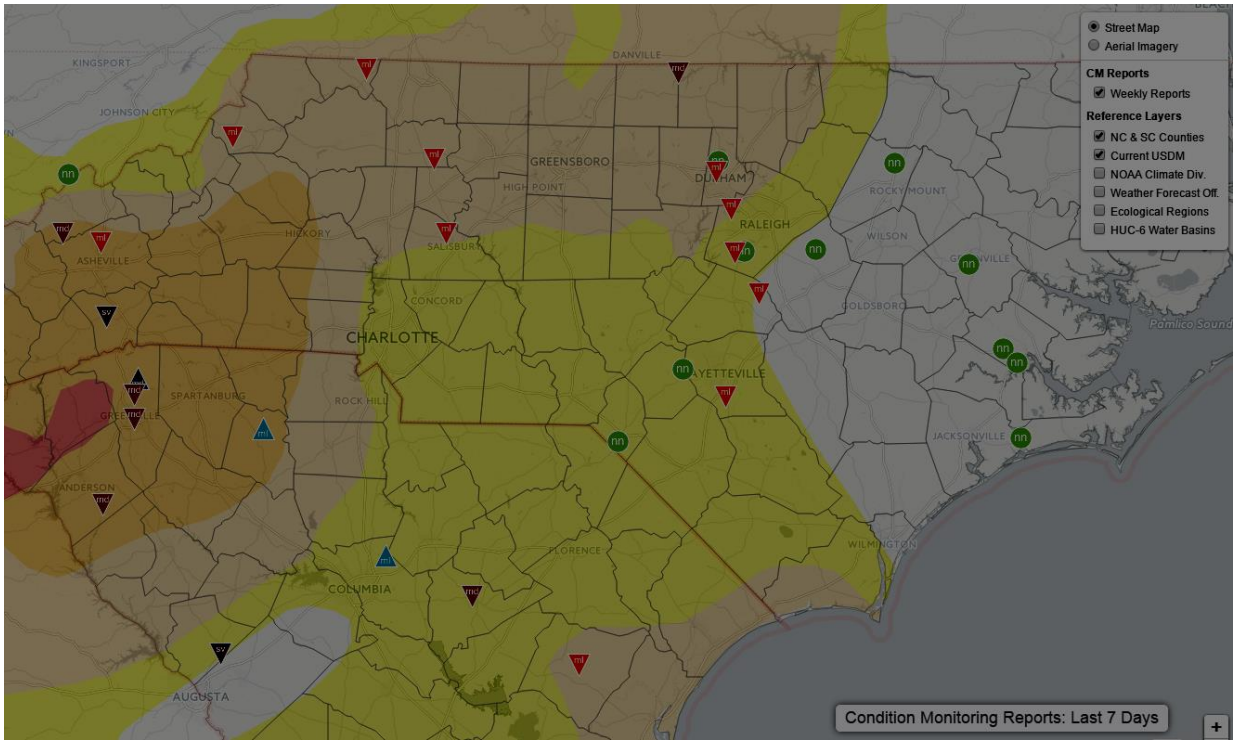
Photo Credit: National Severe Storms Laboratory

CoCoRaHS and the Drought Impact R

- Thanks to NDMC, CoCoRaHS condition monitoring reports can be fed directly into the drought impact reporter
- Over 250 condition monitoring reports have been used in the last 6 months
- The Carolinas lead the way!



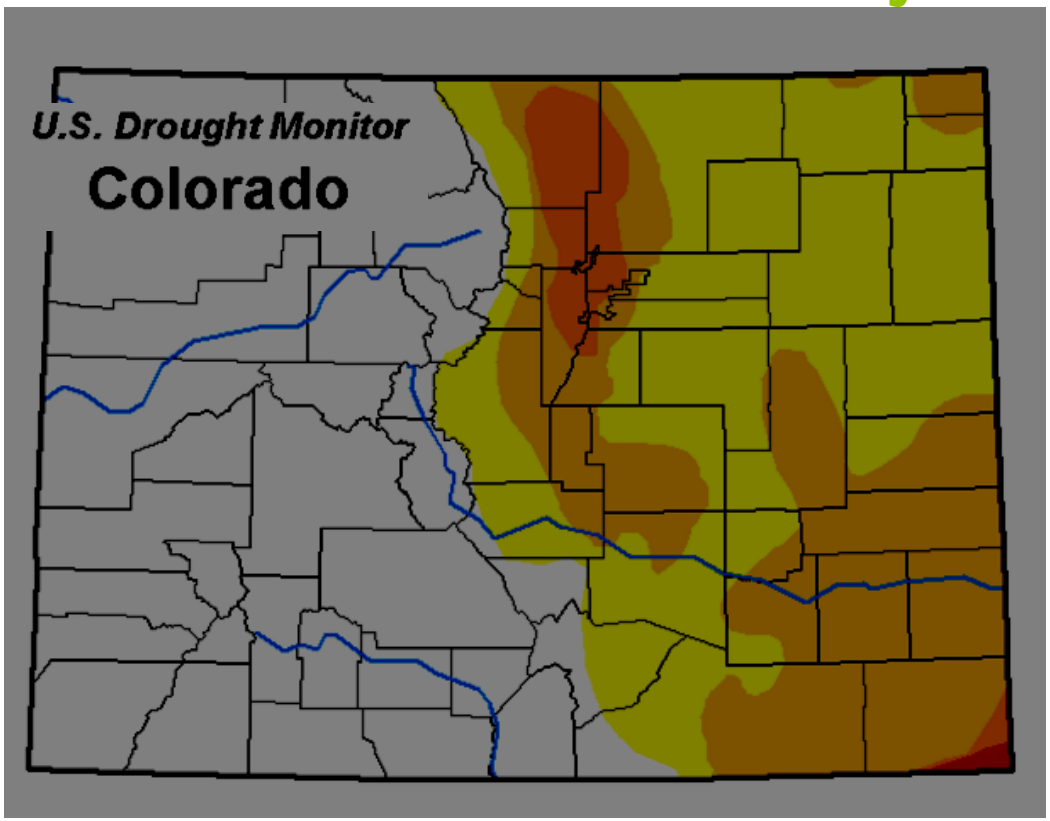
Condition Monitoring in the Carolinas



CISA has used condition monitoring extensively as a part of a project to monitor drought in coastal wetlands

Condition monitoring reports are mapped in this region daily

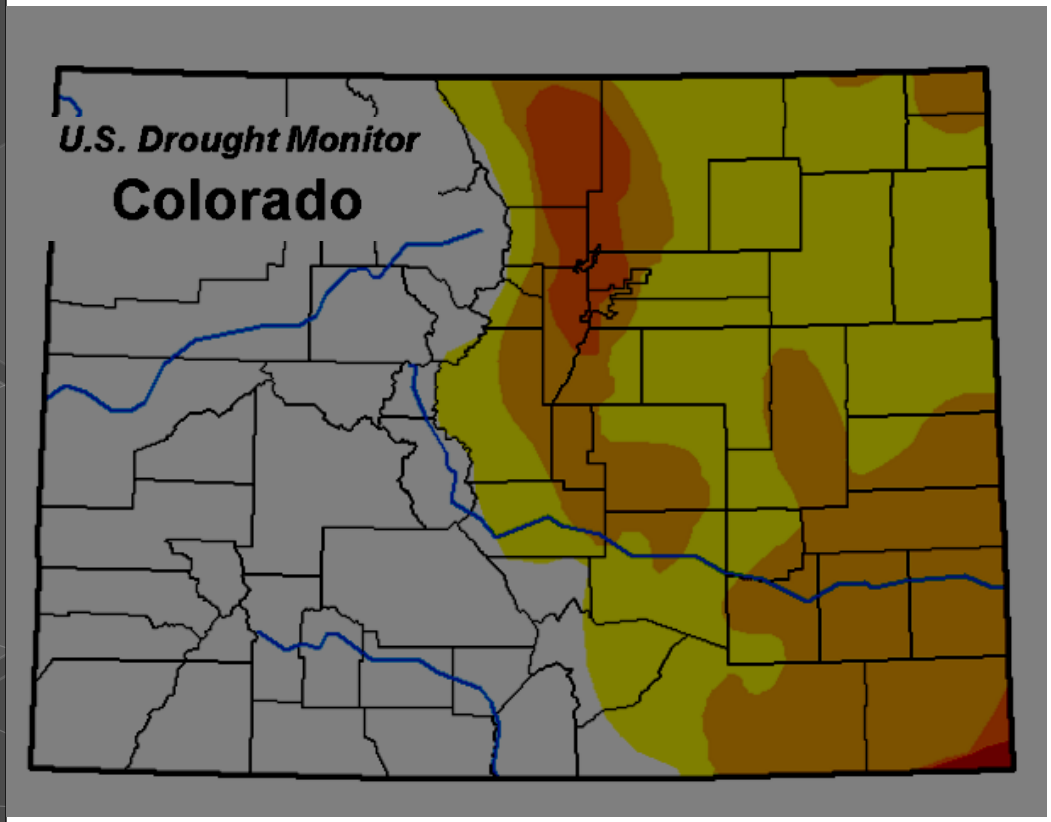
Condition Monitor Solicitation Project



- Currently, CoCoRaHS observers are suggested to do one condition monitoring report every weekend

- A pilot project will be performed in Colorado and New Mexico to solicit condition monitoring reports to observers in counties in D2 or worse (so prepare for CO and NM to be drought free!)

Condition Monitor Solicitation Project



- Condition monitoring reports will be promoted on a local level to known local experts such as extension agents, FSA employees, water conservancy districts. We encourage you to do likewise in your area!

Also Coming Soon…

- CoCoRaHS seeks to expand its nationwide mapping services to include condition monitoring!
-

- CoCoRaHS will be adding animated condition monitor training on YouTube
- This has already been done with other types of training, including understanding the drought monitor https://www.youtube.com/watch?v=i7F6QwRqyVI&t=42s (5:10)

CoCoRaHS Soil Moisture is Coming!

Showing 1 Records.

Report Date ▲	Time	Station Number	Station Name	Irrigation	0-2" VWC	7-9" VWC	State	County	Actions
3/30/2017	7:00 AM	CO-LR-1107	Fort Collins 4.5 WNW	False			CO	Larimer	

How Can You Help?

- We can always use more CoCoRaHS volunteers, especially in rural areas. Kee
- Encourage condition monitoring reports once a week
- Encourage reporting zeros
- Look for observers who may be interested in soil moisture measurement

- Signing up is easy!
- Any questions? Feel free to ask!
- Peter Goble
- Colorado Climate Center
- Peter.goble@colostate.edu peter@cocorahs.org
- 970-491-8312