

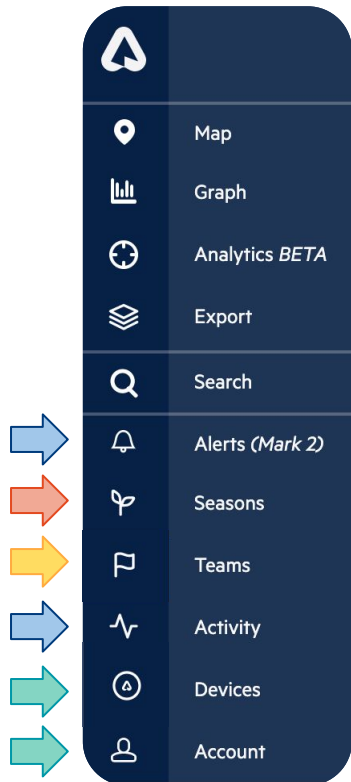
WELCOME TO ARABLE

WEB ONBOARDING GUIDE
FEBRUARY 2021





When devices ship, the **Org Admin** will receive an email with account details, including how to log in from the web, and how to download the mobile app. When you deploy your device and log into the web app (<https://app.arable.com>), you will land on the **Map** screen. The deployed device will populate the **Map** as “New” and will need a name for the location. If you are invited to the account by an **Org Admin**, you will land on the **Teams** page first. Let’s get started with these four key pages:



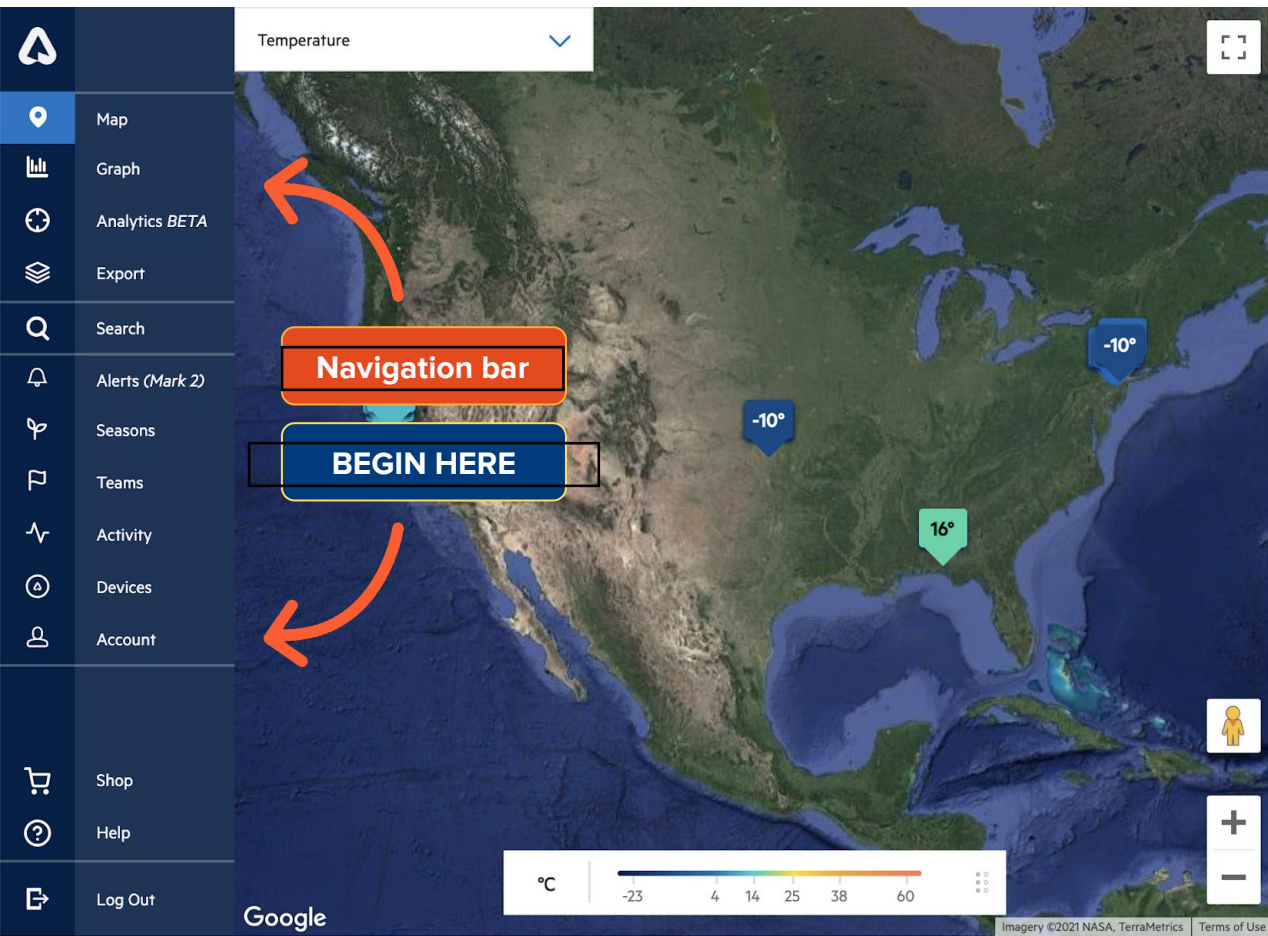
**1. Account
& Devices**

3. Seasons

2. Teams

**4. Alerts
& Activity**

YOU ARE HERE: Arable Overview



Sort By A to Z					Now	Today's Forecast
Location	Temp	Rain	W/m ²			
4 Mac Ranch	16°C	17.2mm	245	13 mins ago		
A001320	12°C	0mm	96	4 mins ago		
Berg Enclave	-2°C	0mm	104	33 mins ago		
Blueberry Corner	12°C	0mm	131	17 mins ago		
By the creek	11°C	0mm	84	26 mins ago		
Geiger Compound	11°C	0mm	83	30 mins ago		
Hardy Homestead	-1°C	0mm	7	13 mins ago		
Jans Backyard	12°C	0mm	82	49 mins ago		
Lupine Lane	-1°C	0mm	39	46 mins ago		
Mount Tamalpais	11°C	0mm			Help	



First, head over to [Account](#). On this page, you should change your password, plus find a copy of the [Terms of Service](#) (covering Warranty and Replacement) and the [Arable Data Privacy Statement](#). You can also generate API Keys and ensure that you have access to the right account.

Here you will also add your mobile phone number to receive SMS- and phone- based alerts (in addition to push notifications), find the [Data Privacy Agreement](#), [API Key](#), and change [Unit Preferences](#).

Company Name
Your company's name

Arable Data Science

datasci.arable.com
Company Arable Link

[datasci.arable.com](#)
Version v8.2.3.build-g5d6bddf5

Agreements & Policies
Latest versions

[Terms of Service](#)
[Privacy Statement](#)

API Key
Generate or refresh

[Generate Key](#)

Name *
First & Last

Arable

Demo

Email Address
Email Address

demo@arable.com

Username *
Usernames must be all lowercase and cannot be longer than 20 characters.

arable.demo

Phone Number
e.g. +1 999 999 9999

+1 510-992-4095

Size

Inches

or

Millimeters

Temperature

Fahrenheit

or

Celsius

Pressure

Millibars

or

Kilopascals

Speed

Miles per hour

or

Kilometer per hour

or

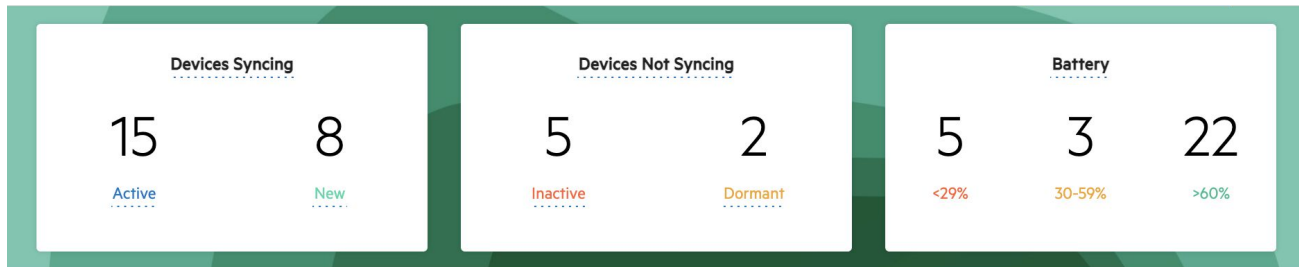
Meter per second

To get started with the API, visit
<https://developer.arable.com/>





The **Devices** page is meant to help you manage the status of each of your devices and monitor connected sensors.



Devices Syncing: Active

Named devices that are posting measurements to our servers at least once every 8.5 hours.

Devices Syncing: New

Devices from the factory will show up as Untitled upon first deployment. Once given a location name the status is updated to Active.



Inactive

Deployed devices experiencing a field problem. Main causes are battery <15% or the device has not posted measurements to our servers for 8.5 hours.

Dormant

Devices that have sent an undeployment message to the Arable system and are no longer collecting data.



Battery

Grouped by low, medium, and high percentage. Under 30% is in danger of losing power, and may need to be plugged into a power source to charge, then moved to a permanent location with more direct sunshine. Medium should be monitored for future dips in charge. High is fine, no action required.





Next, to get everything set up, navigate to the **Teams** page. This will allow you to set up your team, add additional users, change account permissions, and ensure that you have the right level of access to account information.

The screenshot displays the Arable platform's 'Teams' page. The left sidebar contains navigation icons, with the 'Teams' icon highlighted by a yellow arrow. The top navigation bar shows 'Alerts (Mark 2)', 'Seasons', 'Teams' (selected), 'Activity', 'Devices', and 'Account'. The main content area features three summary cards for 'Teams', 'Members', and 'Devices', each showing 0 Assigned and 0 Unassigned. Below these cards is a dropdown menu for 'Arable Data Science'. Underneath, there are three columns: 'Team Name', 'Members', and 'Devices'. The 'Team Name' column shows 'Administrators' and '(7) Total'. A 'View Team' link is visible on the right.

We've designed the Arable platform to be flexible enough to serve users with different needs, from granular operations to large-scale data collection across multiple geographies. On the **Teams** page, the **Org Admin** will be able to see all the **Teams**, **Devices** and **Members** associated with the account. **Teams** tie together users with devices. Within each team, Members will have access to the subset of devices associated with that **Team**. Please check this page and make sure you have access to the right **Teams** and right subset of **Devices/Locations**.



Select “View Team” to see any of the **Members** associated with each **Team**. You will be able to see Members, their email address, and their level of access. At Arable, we take data privacy very seriously. To make it easy for you to manage permissions, we have four levels of access: **Org Admin**, **Org Reader**, **Team Admin** and **Team Reader**.

Team Name		Members
Administrators		(5) Org. Admin (2) Org. Reader
Team Members Information		
Name	Email	Role
Levon Minassian	levon@arable.com	Org. Admin
Loreli Carranza	lorel@arable.com	Org. Admin
Adam Wolf	adam@arable.com	Org. Reader

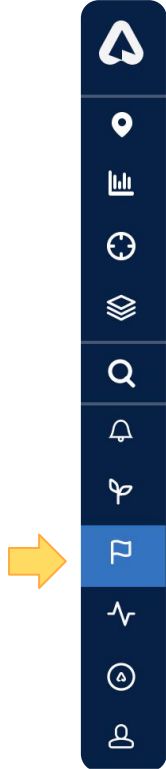
Org Admin will be able to see all the Devices associated with the account, can add **Members** to any **Team** and create new **Teams**.

Org Reader can see all the Devices, but cannot move Members, Teams and Devices.

Team Admins can invite New **Members** to their Teams.

Team Readers can view **Device**, **Team** and **Member** data for only their **Team**, and cannot invite new **Team Members**.

TEAMS: Inviting Members & Creating New Teams



Invite Member to Organization

Current New

Select Member

Select Member

Select Role

Select Role

Select Team(s)

Select Team(s) Add

Teams & Roles

Please select a member, assign a role and select a team or teams from the drop down above and click "add".

Cancel Confirm

Unlimited users can join the Arable Platform. Click on “Invite Member” to add new **Members** (New) and to move existing **Members** to new **Teams** (Current).

Create New Team

Team Name

Type the team's name

Add or Remove Members

Type Name or Email Address and press Enter

Add or Remove Devices or Locations

Type Device ID or Location Name and press Enter

Cancel Confirm

By clicking “Create New Team” you can organize a new set of **Users** and subset of **Devices/Locations**. If you need help adding **Members** or **Teams**, please get in touch with support@arable.com.



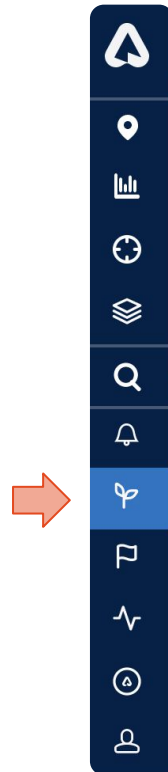
Then, navigate to **Seasons** to add details about the crop at your location. We have variety-specific growth stages that will allow for growth-stage based alerting. It will also enable seasonal archives for year-over-year comparisons.

Even if a device is not deployed at a location at the start of the season, setting up a season retroactively will enable us to backfill with remotely sensed data to provide a better snapshot of the season as a whole.

We built Arable to understand interactions between the climate and crop productivity. To maximize the benefits of the system, we encourage users to add in their **Seasons** and track **Growth Stages**.

By inputting seasonal start dates, harvest dates and growth stages, we can combine measurements to allow users to monitor water availability during critical stages, or if different fields are maturing faster.

We have pre-populated the system with a standard list of varieties and growth stages, but can easily add custom varieties, temperature thresholds and growth stages for you if you let us know.



Create New Season

Please select a location and assign it a crop type and varietal.
Once your new season has been created you will need to add growing dates and growth stages

Location

Select Location

Crop Type

Select Crop

Varietal

Select Varietal

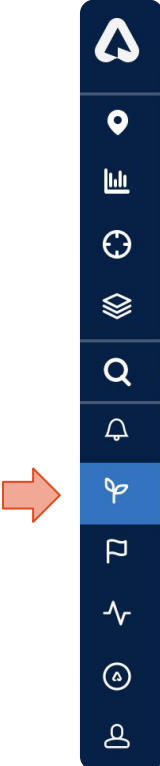
Cancel

Confirm



If the standard growth stages for a Varietal does not match your specific needs or experience, you can easily add or remove growth stages yourself.

Once you enter your **Varietal** and **Growth Stages**, it's also easy to apply the same **Growth Stages** to multiple **Devices/Locations**. Make sure the Season start date is correct, even if it is in the past. Note that the absolute value of cumulative growing degree days will vary based on preferred unit ($^{\circ}\text{C}$ or $^{\circ}\text{F}$).



Crop
Choose your crop type
Threshold: Low 10 $^{\circ}\text{C}$ - High 30 $^{\circ}\text{C}$

Corn

Varietal
Choose your varietal type

RM109

Growing Season

01-Apr-2021

27-Oct-2021

01-Apr-2021 / 27-Oct-2021

Growth Stages

GDDs ($^{\circ}\text{C}$)

Growth Stages

There are no growth stages that you can access on this season.

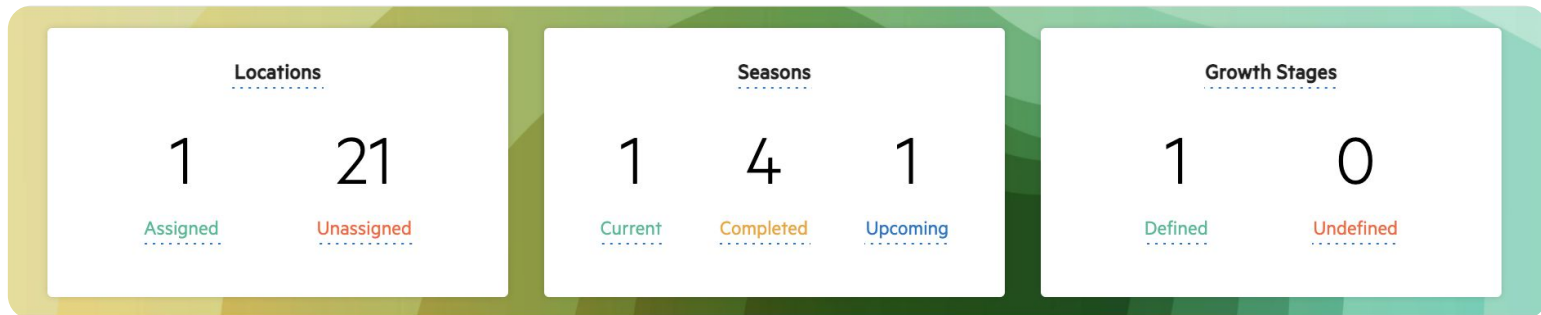
+ Add New Stage

x Delete All Stages

Copy Growth Stages to New Season

Save Season

SEASONS: Understanding the Dashboard



Locations: Assigned

The number of locations assigned to at least one season in the organization.

Locations: Unassigned

The number of locations that are unassigned in the selected organization. *To best archive your historical crop data, this number should be zero.*



Seasons: Current

The number of seasons where today's date is currently within a growing season's start and stop dates.

Seasons: Completed

The number of seasons with stop dates in the past.

Seasons: Upcoming

The number of seasons with start dates in the future.



Growth Stages: Defined

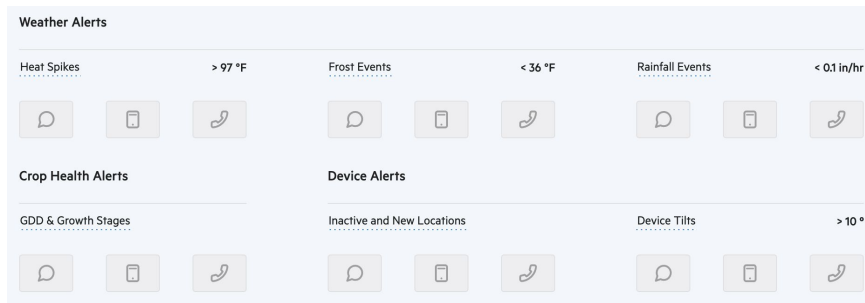
The number of locations with Seasons (planting and harvest date defined) that have incremental growth stages enabled, and therefore are able to receive Growth Stage based alerts.

Growth Stages: Undefined

Those without defined growth stages.



Now, select **Alerts**. Since you've already added your phone number, crop and season information, it will be easy to select different thresholds for unique locations to make sure you don't miss an event in your field!



Only **Org Admins** can change/set the Global Alert thresholds. There are options to receive alerts on the following Parameters:

- **Heat Spikes**
- **Frost Events**
- **Precipitation Rate**
- **Growth Stage / GDD** (new growth stage transition)
- **Device Alerts** (Tilt/Inactives)

All users can opt in to receive alerts three different ways, and will receive alerts for ALL devices assigned under their permissions:

- **SMS-based Text Alerts**, enter phone number on Account page.
- **Phone Calls**, enter phone number on Account page.
- **Push Notifications**, via the mobile app.



ALERTS: Location-Specific (1 of 2)



The Alerts system defaults to **Global Alerts**, setting the same thresholds across Devices/Locations.

By clicking “Add Alerts for Specific Location,” Org Admins will be able to set own thresholds for specific Devices/Locations. Similarly, any user can customize the method for receiving alerts with the same mechanism.

Notifications Settings Created for a Specific Location

Your new specific notification settings have been created for **Untitled Location**. You can now set specific parameters and notification channels for this location.

Close

Add Notifications Settings for a Specific Location

Please choose the location you would like to add specific notification settings

↓ Name | Date

Device ID
C005196
Deployment Date
November 21, 2020

Device ID
C005310
Deployment Date
January 5, 2021

Device ID
C004681
Deployment Date
January 2, 2021

Device ID
C004798
Deployment Date
September 25, 2020

Device ID
C005391
Deployment Date
October 24, 2020

Hardy Homestead

Device ID
C005430
Deployment Date
October 28, 2020

Lupine Lane

Device ID
C004527
Deployment Date
December 13, 2020

Mount Tamalpais

Device ID
C003985
Deployment Date
July 7, 2020

Neelys

Device ID
C005135
Deployment Date
November 30, 2020

RD Backyard

Device ID
C004863
Deployment Date
December 3, 2020

Untitled Location

Device ID
C005137
Deployment Date
November 15, 2020

Cancel

Confirm



For each location, the alert settings will mirror the Global Settings as the default setting. Once a specific Location is selected, it will appear below the Global Settings (as shown for Weather Alerts on the right). Initially, both the Parameters and Channels boxes will be checked, indicating that that Location will mirror the Global Settings by default.

To set Location-Specific Alerts, uncheck the Parameters and Channels boxes. This will allow the user to change the thresholds and select different methods for receiving the alerts.

By rechecking the Parameters and Channels boxes, the user overrides the local settings and reverts to the default Global Settings.

Weather Alerts

Heat Spikes

96 °F



Crop Health Alerts

GDD & Growth Stages



Untitled Location

Weather Alerts

Heat Spikes

93 °F



Make Same as Default: ☐ Parameters ☐ Channels



The **Activity** page is an easy way to check on current and historical alerts across Locations/Devices in your Org. Alerts on device location (movement > 200 meters), crop health and growth stage, weather threshold alerts and device and account activity will be logged here.

Alerts can be sorted by type:

- **Date** (chronological)
- **Weather**
- **Crop Health**
- **Device**
- **Account**

To get additional detail on each alert, click the + sign next to it.

Here, there will be a quick link to change Alert settings. Already read alerts will change to gray.

Alerts (Mark 2) Seasons Teams Activity Devices				
Date	Detail	Date		
GDD Alert Crop Health	Growth stage "stage_5" started at 51 Federal St .	08:00 AM	+	
Frost Alert Weather	The temperature is below 36 F at PAM-garden M2.	04:34 AM	+	
Frost Alert Weather	The temperature is below 36 F at Neelys.	03:41 AM	+	

Date
Date
Weather
Crop Health
Device
Account

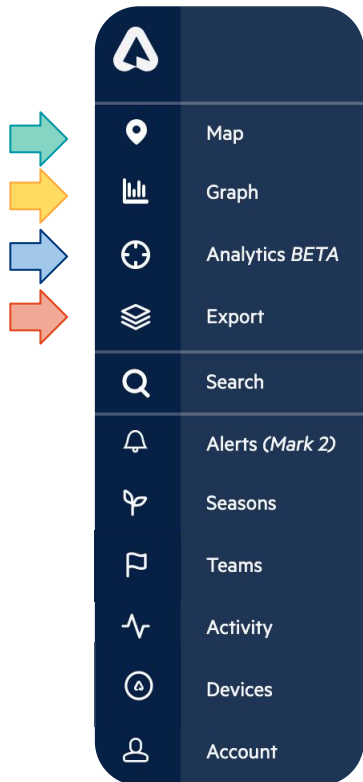
Type: Frost Alert
Category: Weather
Detail:
01/18/2021 04:34 AM
The temperature is below 36 F at PAM-garden M2.

Change subscription settings: [Account Settings](#)





Once you have the basics set up, you can begin to explore more functionality in the app.



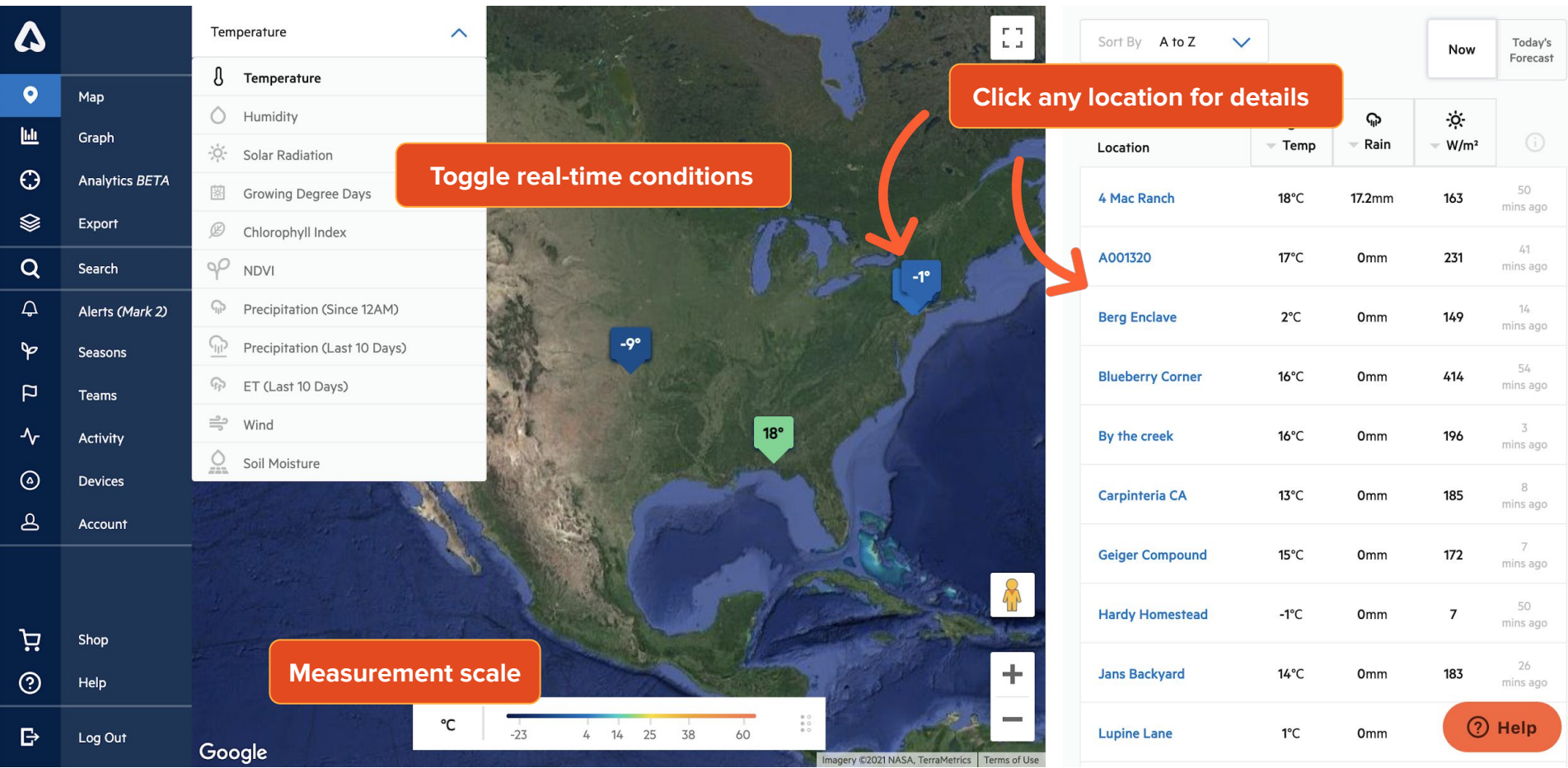
5. Map & Details

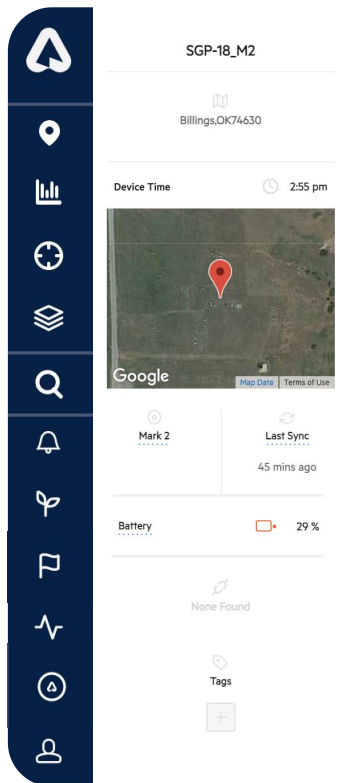
7. Export

6. Graph & Rank

8. Analytics

MAP: Overview





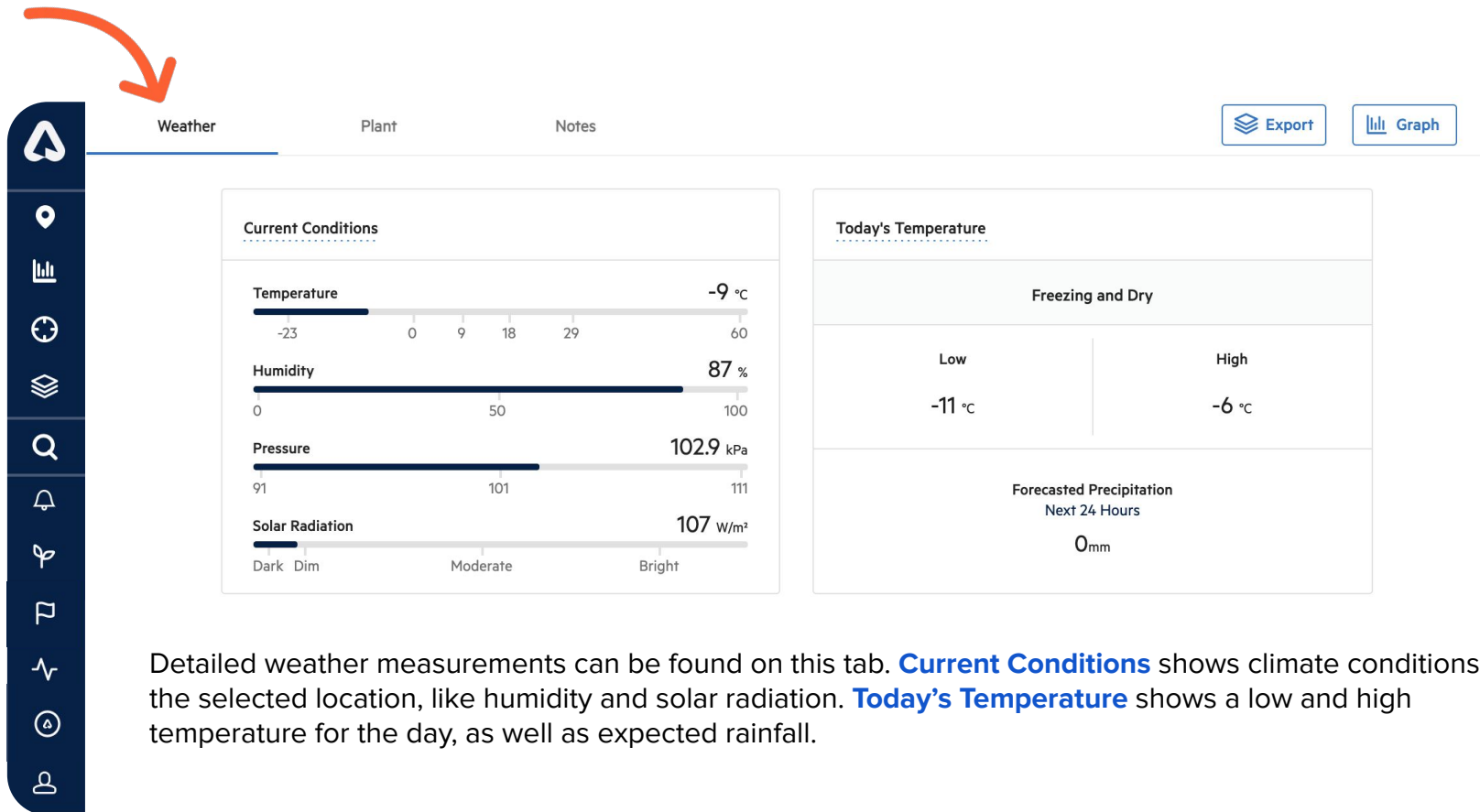
On the Map, click a location's name from the list on the right to be taken to that location's complete details page. A **Location** is a named Mark device; if you need to name your new device, this is where you do it.

All of the device's information can be found on the right side of this page, including the location name, device ID, GPS location, battery percentage, time of last sync, and any connected external sensors such as soil probes or anemometers.

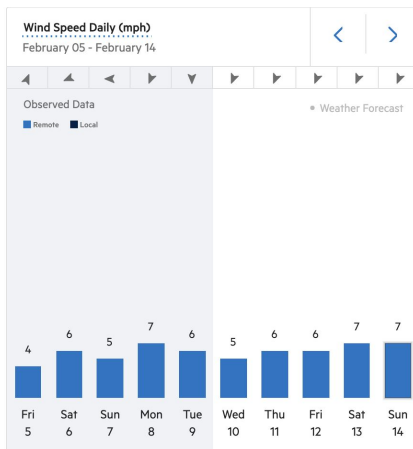
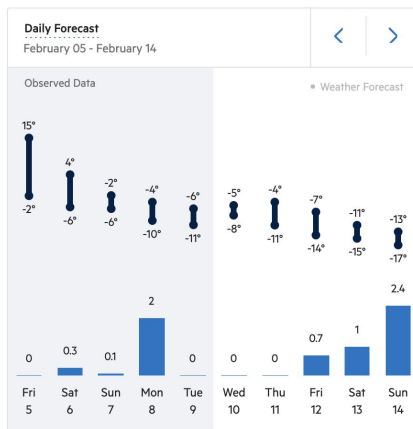
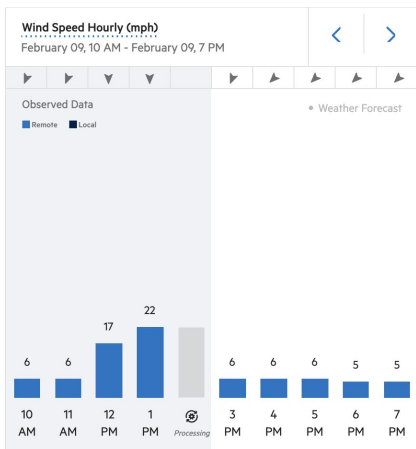
Here you can add tags (e.g., alfalfa, strawberries, greenhouse) to the location; these tags can searched and referenced via the Search page.

Top right are quick links to the **Export** and **Graph** pages.

In the following slides we'll explore the **Weather** and **Plant** tabs. Click on any of the words underlined in blue (e.g., Current Conditions) to see detailed descriptions of the measurements and other helpful information.



LOCATION DETAILS: Weather Tab (2 of 2)



The graphs at the bottom show **Hourly & Daily Rainfall** and **Hourly & Daily Wind Speed**. Without an attached anemometer, we will show remotely sensed wind.

Both observed (grayed, to the left) and forecasted (white, to the right) data are shown for the day selected. You can scroll to the left or right to see past and forecasted values. For hourly, we show 48 hours' observed data and 48 hours' forecast. For daily, we show 14 days' observed and 10 days' forecast data.

Use the blue <> arrows at the top of each graph to change the time/date.

LOCATION DETAILS: Plant Tab (1 of 2)



Weather

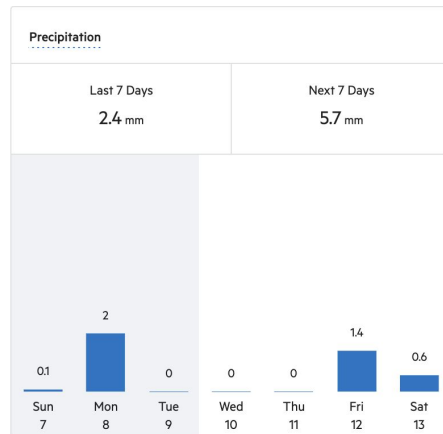
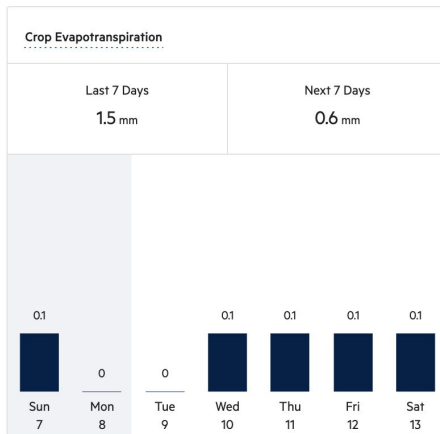
Plant

Notes

Export

Graph

Irrigation Overview								
								06 Feb 2021 12 Feb 2021 < >
Type	Sat 6	Sun 7	Mon 8	Tue 9	Wed 10	Thur 11	Fri 12	Weekly Insights
ETc	0.1 mm	0.1 mm	0 mm	0 mm	0.1 mm	0.1 mm	0.1 mm	0.5 mm Total
Precipitation	0.3 mm	0.1 mm	2 mm	0 mm	0 mm	0 mm	1.4 mm	3.8 mm Total

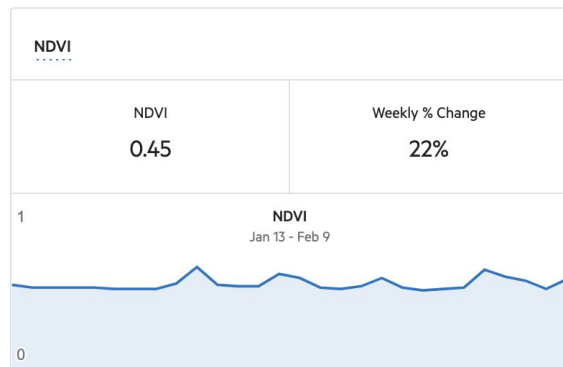
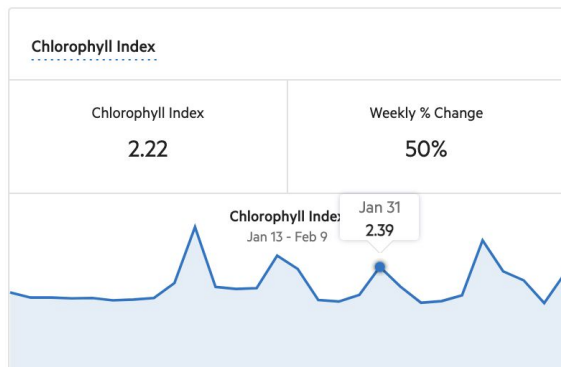
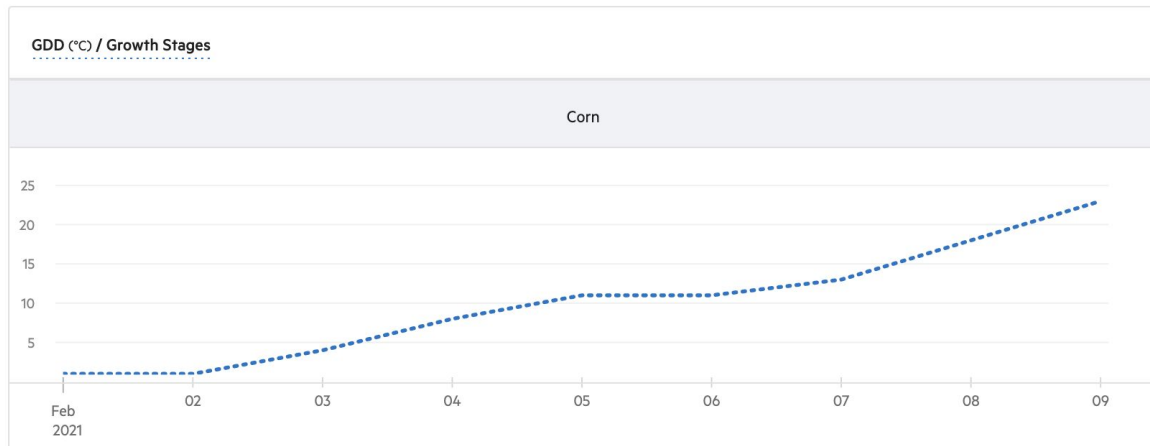


The **Plant** tab shows a location's plant measurements, a critical component to understanding crop outcomes.

The **Irrigation Overview** provides a daily summary of both **Evapotranspiration** and **Precipitation**.

These two measurements are also shown below, with observed and forecasted accumulations.

LOCATION DETAILS: Plant Tab (2 of 2)



If a season has been defined for the location (set on the Seasons page), **Cumulative Growing Degree Days** and **Crop Growth Stages** will be displayed on this page.

Chlorophyll Index and **NDVI** are also shown on this page in absolute value and weekly percent change.

Hover your cursor over the graph to see daily values.

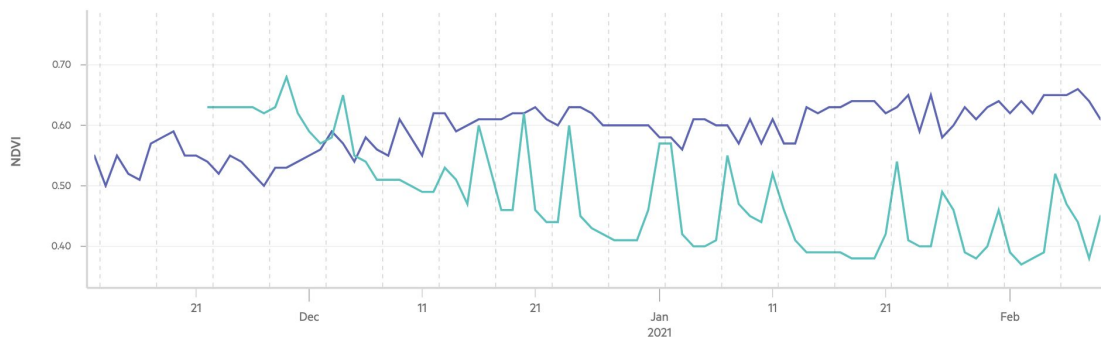


Time Rank

2 locations ▼ NDVI ▼ 📅 12-Nov-2020 09-Feb-2021 Graph

Mount Tamalpais × 4 Mac Ranch ×

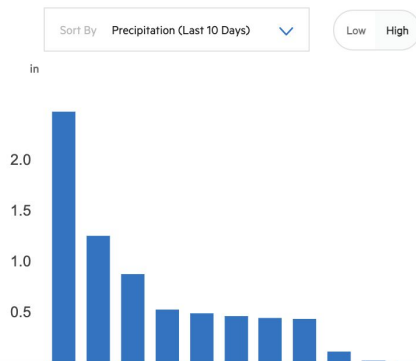
30D 90D YTD ALL



Select **Graph** from the left-hand menu to visit this page. Here you can combine weather and plant data at one or several locations, all in one view.

In the **Time** view, pick your location(s), measurement(s), and date range (e.g., last 30 days) before clicking Graph to view your data.

Most measurements have an Hourly option and allow the use of a slider at the bottom to focus in on specific time events.



Time Rank

To see how each location ranks against the others, toggle to **Rank** at the top of the page. Select your preferred measurement (e.g., growing degree days, solar radiation, NDVI, etc.) from the Sort By dropdown to rank your locations by that measurement.

	Rank	Location Name	Tags	GDD Start Date	GDD (°F)	Last Sync	Current Temp	10 Day Precip
	11	4 Mac Ranch		11/21/2020	41	49 mins ago	64°F	2.47"
	10	Mount Tamalpais	corn	07/07/2020	--	14 mins ago	61°F	1.25"
	9	Blueberry Corner		01/02/2021	--	53 mins ago	61°F	0.87"
	8	Lupine Lane		12/13/2020	--	20 mins ago	32°F	0.52"
	7	Berg Enclave		01/05/2021	--	17 mins ago	31°F	0.49"



Export

Locations
Select location: active, inactive, or dormant.

Select Location

▼

Granularity
Select all, hourly, or daily data tables.

All

Hourly

Daily

Measurements
Will change dependent upon granularity.
[Download Data Dictionary in PDF](#)

All

Date Range
From first deployment date to today.

-/-/-

-/-/-

Units
Select your measurement units.

Inches

or

Millimeters

Fahrenheit

or

Celsius

Millibars

or

Kilopascals

Miles per hour

or

Kilometers per hour

or

Meters per second

Format
Select export format.

CSV

To export raw data, visit the [Export](#) page and select the location, granularity, date range, and preferred units, then click Export to download data as a CSV. The file can be opened with all CSV-compatible platforms, e.g., Excel or Google Sheets.

The export contains summary information at the top (e.g., Date Range and Number of Records) and detailed time-series data below.

Select multiple locations in the Locations drop-down in order to export data for more than one location at the same time.



Select **Analytics BETA** from the left-hand menu to access the two dashboards we have recently written about, [Location Deep Dive](#) (single location) and [Compare Across Locations](#) (multi-location). Toggle between them here.

The screenshot shows the Analytics Beta interface. On the left is a dark blue vertical sidebar with various icons. A light blue arrow points to the icon representing the 'Compare Across Locations' dashboard. The main content area has a white background. At the top, there are two dropdown menus: 'Organization' (set to 'arable-team') and 'Team' (set to 'All Dashboards'). Below these are three tabs: 'Water', 'Weather', and 'Plant'. The 'Water' tab is selected. Below the tabs is a 'Controls' panel with a light gray background. It contains several filters: 'Location [ALL]', 'Start Date' (set to 'Sun Mar 01 202...'), and 'End Date' (set to 'Wed Mar 31 20...'). A large orange arrow points from the text 'On both dashboards, you can select your Org and the Team(s) you want to graph.' to the 'Organization' and 'Team' dropdowns. Another large orange arrow points from the text 'On the Controls panel, you should also select which Devices/Locations you want to graph, and indicate a Start Date and End Date.' to the 'Location', 'Start Date', and 'End Date' filters. A third large orange arrow points from the text 'There are three tabs we will explore in the next slides, Water, Weather, and Plant.' to the 'Water', 'Weather', and 'Plant' tabs. At the bottom right, there are two toggle buttons: 'Compare Across Locations' (which is active) and 'Location Deep Dive'. A large orange arrow points from the text 'Toggle between them here.' to these toggle buttons. At the bottom of the page, there is a paragraph of text.

On both dashboards, you can select your **Org** and the **Team(s)** you want to graph.

Organization: arable-team Team: All Dashboards

Water Weather Plant

Controls Location [ALL] Start Date: Sun Mar 01 202... End Date: Wed Mar 31 20...

Compare Across Locations Version 1.0.0: Select multiple devices or locations and enter your date range in the control panel. Use Group By on X axis to drill up or down to view different time scales.

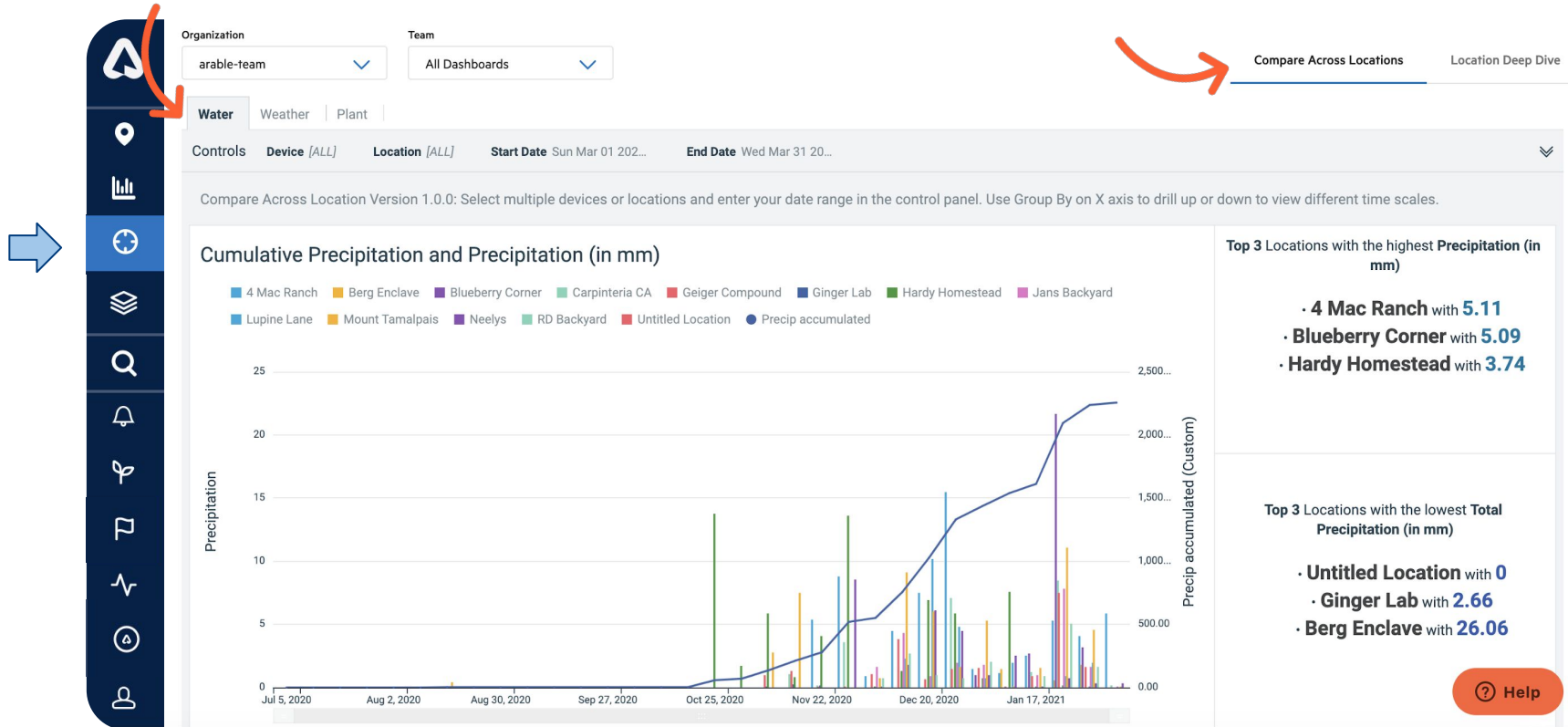
There are three tabs we will explore in the next slides, **Water**, **Weather**, and **Plant**.

On the **Controls** panel, you should also select which **Devices/Locations** you want to graph, and indicate a **Start Date** and **End Date**.

Interested in something specific? To request a specific model or dashboard (or to discuss feasibility for a data ingest/integration project), reach out your partnership manager.

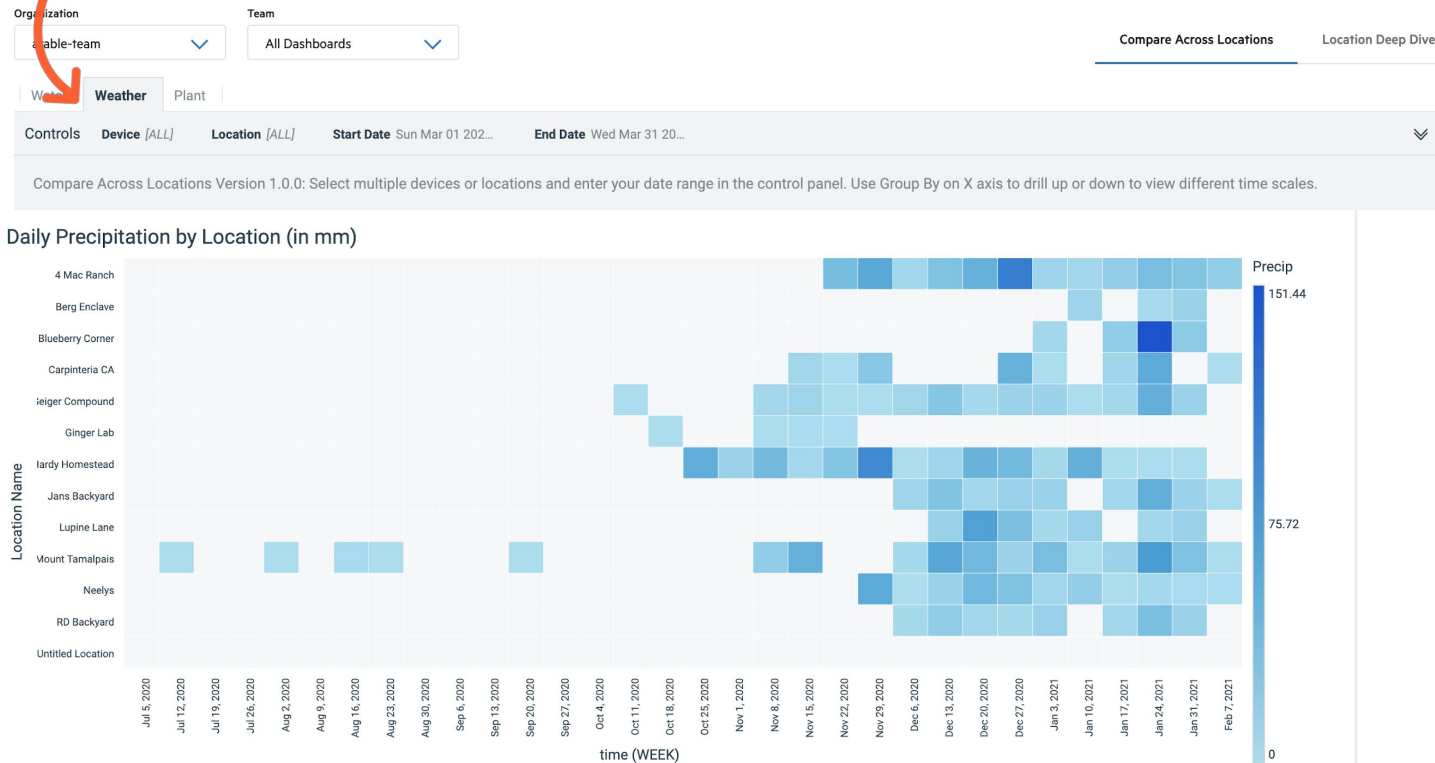


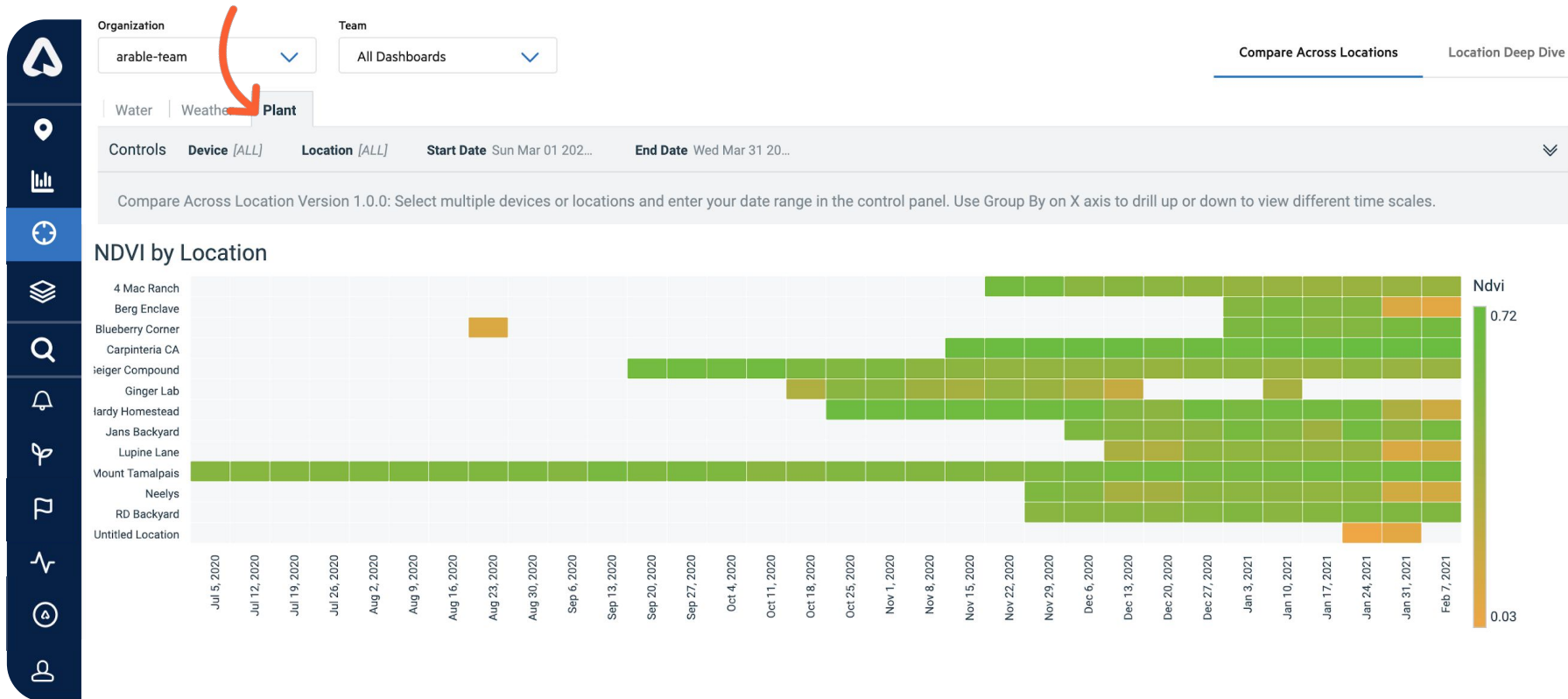
Compare Across Locations, Water displays Precipitation, ETc Accumulation by Location, Crop Water Balance by Location, and Average Soil Moisture at Top Depth by Location. Top 3 locations for each measurement are in the right-hand column.





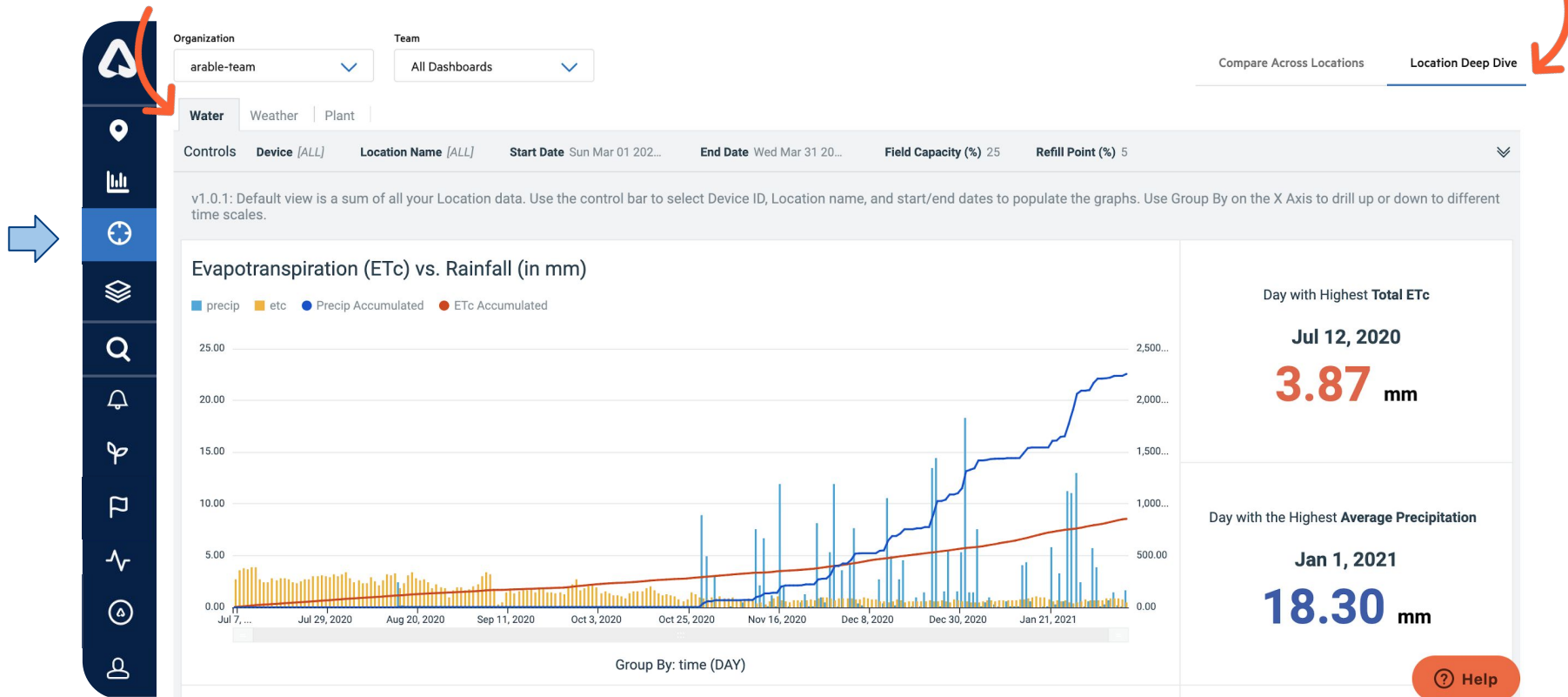
Compare Across Locations, Weather displays Precipitation by Location, Heat Stress Days, VPD, and Temperature Extremes. Top locations for each measurement are in the right-hand column.







Location Deep Dive, Water displays ETc plotted with Rainfall, Crop Water Balance, Top Depth of Soil Moisture with Refill Point and Field Capacity Lines, and Precip as a % of ETc. Extreme days are shown in the right-hand column.





Location Deep Dive, Weather displays Cumulative & Daily Rainfall, Daily Temperature Flux, VPD, Heat Stress Days Freeze Days, Sunshine Duration, and Warm Nights/Cool Days. Extreme days are shown in the right-hand column.

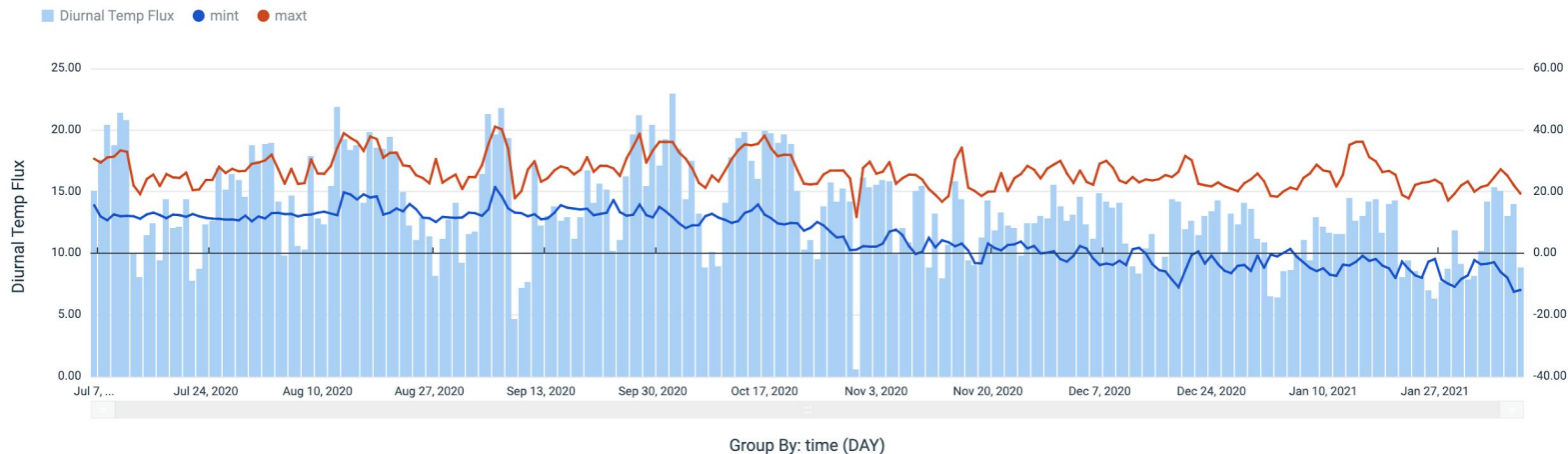
Organization: Team:

Water Weather Plant

Controls Device [ALL] Location Name [ALL] Start Date Sun Mar 01 202... End Date Wed Mar 31 20...

v1.0.1: Default view is a sum of all your Location data. Use the control bar to select Device ID, Location name, and start/end dates to populate the graphs. Use Group By on the X Axis to drill up or down to different time scales.

Daily Temperature Flux: Max minus Min Temperature (in C)





Location Deep Dive, Plant displays NDVI, Cumulative GDD & NDVI (if seasons are set up), Sunlight Duration & Quality, and a Seasonal Growth Overview. Extreme days are shown in the right-hand column.

