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GreenSight Overview

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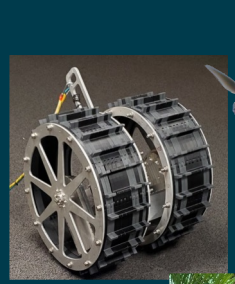
GreenSight Company Overview

- Founded in 2015, GS is a small business headquartered in Boston, MA, focused on developing robotics and avionic solutions targeting agriculture, defense and weather.
- Team of ~50 with a wide-range of expertise including: UAS, engineers across mechanical, electrical and advanced software, as well as AI/ML scientists.
- 300+ VTOL UAS developed and manufactured in house since 2015 ranging from 100g to 100kg.



Plus 5000+ subscription customers!

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WeatherHive System Overview

WeatherHive (WxHive) produces on-demand targeted environmental monitoring at a high spatial, temporal, and vertical sampling rate throughout the lower troposphere.

Description

- AI coordinated swarms of 10 or more Weather Intelligence Sensing Platforms - WISPs (nanodrones) automatically launched from their 'Hive'
- Span a 300 square kilometer area
- Reach up to 5 km in altitude
- ~1 hour of sampling per flight

Key Capabilities

- Observables: Temperature, Relative Humidity, Barometric Pressure, 3D-Winds
- Rapid deployment or routine observations
- Reusable and customizable
- Applications: Nowcasting, wildland fire monitoring, Planetary Boundary Layer (PBL) studies, model training, etc.

Status

- Initial Validation Nov 23 - March 24
- Validation Campaigns and End User Testing April-November 2024
- US volume production beginning 2024

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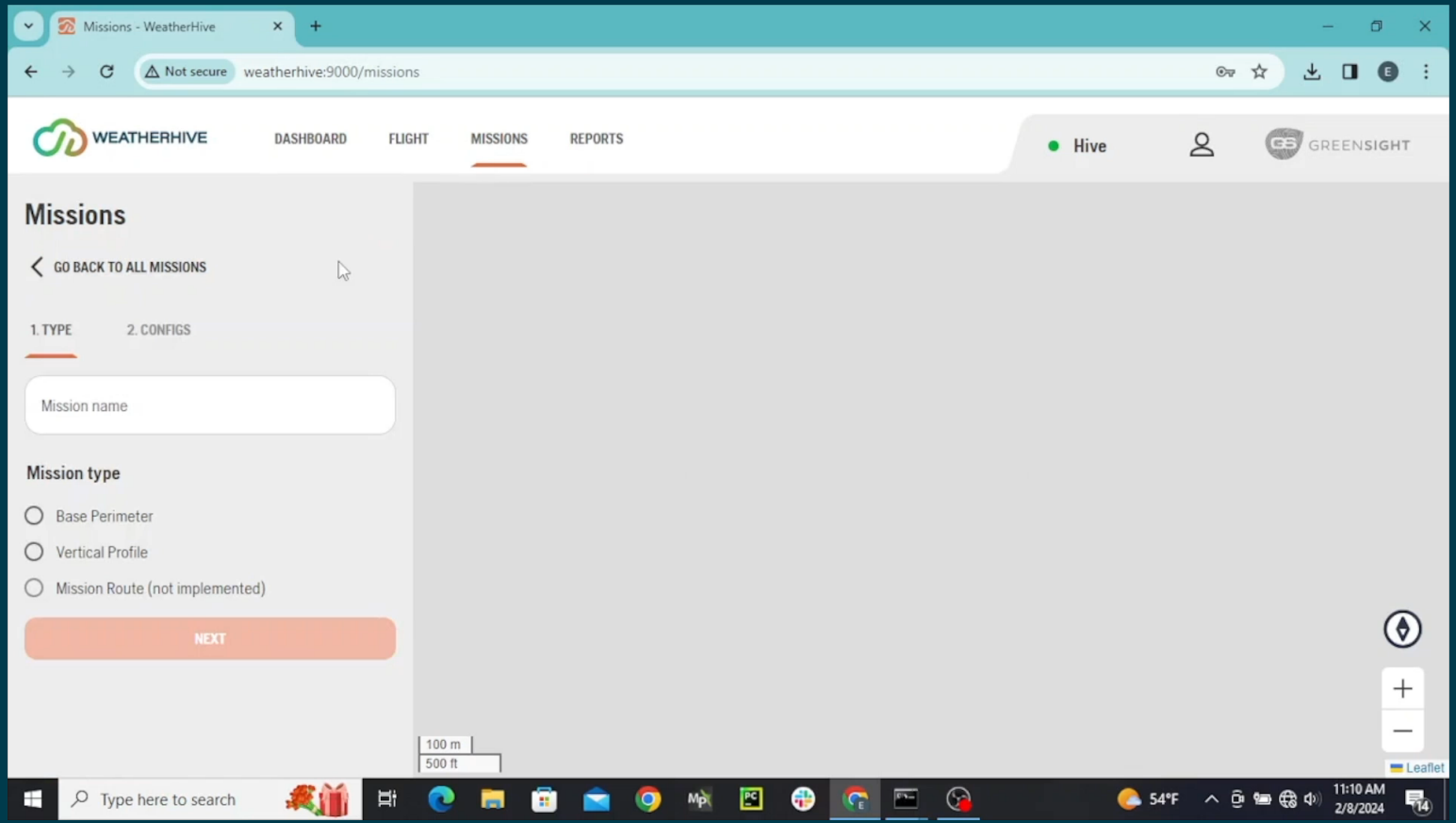
WxHive Demo



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WeatherHive Specs

WISP	Body	GF ABS
	Diagonal	240mm
	Height	45 mm
	Weight	220 g
	Flight Controller	microBlue
Communications	Telemetry Frequency	900 MHz
	Transmission Distance	10 km
Propulsion System	Motors	3000kV BLDC
	Maximum Thrust	600 g
	Maximum Power	140 W
Power	Battery Type	2S 18650
	Capacity	3500 mAh
	Endurance	50 minutes
Hive	Dimensions	250 x 250 x 900 mm
	Weight	20 kg
	Battery	3x BB 2590
	Drone capacity	10 WISPs

Operation	Maximum Wind Resistance	22 m/s
	Maximum Operating Speed	16 m/s
	Maximum Flight Ceiling	5 km
	Recommended Operating Temperatures	20 to 50 C
	Typical Ascent Rates	16 m/s
	Typical Descent Rates	10 m/s
In Situ Variables		Air Temperature (T)
		Relative Humidity (RH)
		Barometric Pressure (P)
Derived Variables		3D Wind Speed (WS)
		3D Wind Direction (WD)
Accuracy Goals*		T: within 0.5 Kelvin
		RH: within 2%
		P: within 1 hPa
		WS: within 1 m/s
		WD: within 2 degrees
Logging Rate		10 Hz

For sensor absolute accuracy see TMP117 datasheet and BME280 datasheet

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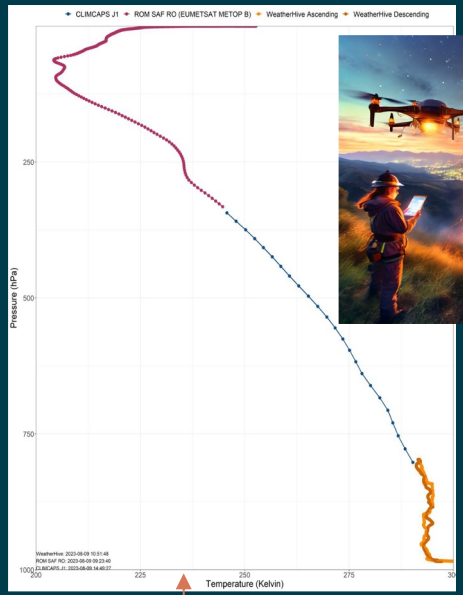
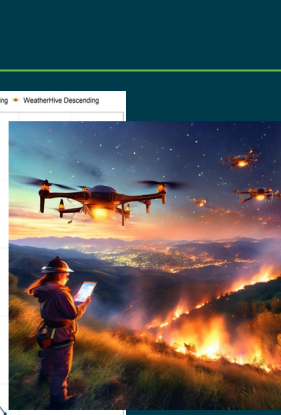
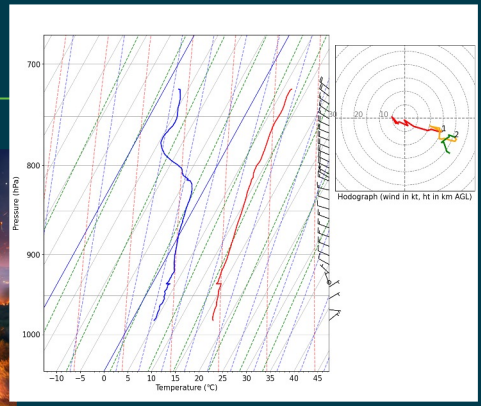
WxHive End User Applications

- Severe Weather
  - Provide on demand targeted data for Weather Forecast Offices (WFO) to reduce warning lead time
- Wildland Firefighting
  - Provide 24/7 wildland fire weather monitoring to improve situational awareness and reduce time from ignition to detection and response
- NWP Modeling
  - Data assimilation to increase forecast accuracy of extreme weather events
- Date Fusion
  - Integrating data for a wide range of earth science studies
- Portable Research Facility
  - Increase knowledge of our earth system processes to improve model parameterization and/or validation of new instruments through field campaign participation

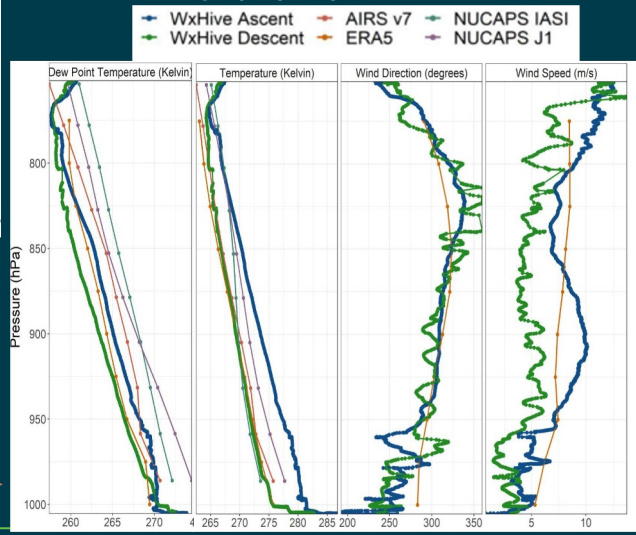


Example of fused product using RO, IR+MW Sounders, and WeatherHive





Skew T from recent WxHive flight on 02 07 2024



Intercomparison from January 4th Test

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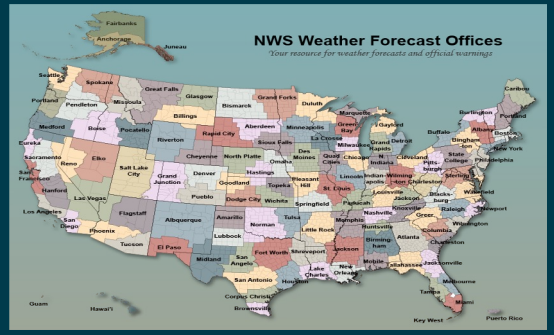
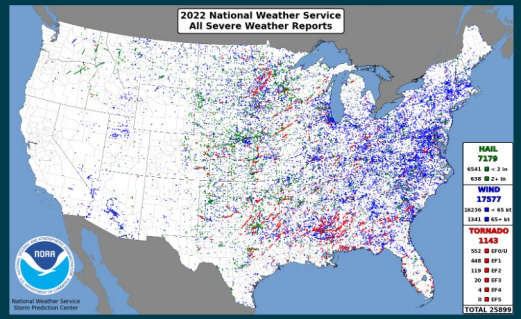
Example of Public/Private Collaboration (NOAA CRADA)

GreenSight and NOAA will collaboratively work toward the goal of improving research, testing and evaluation of uncrewed aircraft systems for environmental observations and prediction through deployment of WxHive at a WFO.



1. Special Soundings
2. High-Altitude Sampling
3. Data Integration
4. Expansion of Regulatory Allowance

The proposed collaboration directly aligns with ***NOAA's Mission*** to build a ***Weather/Climate Ready Nation*** through the enhancement of observations and monitoring systems by ***demonstrating*** the advantage of ***WeatherHive*** data to ***support the NWS mission of protecting life and property***.



Depending on the location, the phenomena will be different. WxHive's flexibility can target these locally specific phenomena

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Upcoming Activities/Partnerships

- WMO UAS Demonstration Campaign
- Participation in the Eclipse Campaign
- Field Campaigns

- Reach out!
- Small Business Innovation Research (SBIR)
- Small Business Technology Transfers (STTR)
- Traditional Research Funding

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