Testimony
StormQuant Inc.

House Committee on Science, Space, and Technology
Subcommittee on Environment

"Protecting Lives and Property: Harnessing Innovative Technologies to Enhance Weather Forecasting"

July 16, 2025

Chairman Franklin, Ranking Member, and Members of the Subcommittee:

Thank you for the opportunity to submit this written testimony, to discuss the role of innovative technology in enhancing weather forecasts.

The recent devastation in Kerr County, Texas, where flash floods tragically took more than 100 lives, weighs heavily on our entire team. StormQuant joins all Americans in mourning this loss. What makes this tragedy even more painful is that much of this loss could have been prevented. Many communities did not have access to timely, hyperlocal alerts that could have enabled earlier evacuations or emergency responses.

StormQuant Inc. is a U.S.-based and built weather technology company developing the most advanced commercial-grade Radar-and-Software-as-a-Service (RSaaS) platform in the world. From its inception, StormQuant's scalable platform was engineered to continuously evolve, avoiding the obsolescence that plagues today's legacy systems. At StormQuant, we believe it is unacceptable that in 2025, our country continues to rely on a weather monitoring infrastructure built for the 20th century, which is often slow, centralized, and disconnected from the real-world needs of local emergency managers and citizens. We are here to change that.

The Problem with America's Current Weather Tracking Infrastructure.

- Lack of real-time hyper-local radar coverage leaves most regions of the United States blind to low-level weather events.
- Significant NEXRAD limitations, including radar beam overshoot and gaps at long distance from radar (100+ km). These shortcomings mean that NEXRAD often fails to detect extreme rainfall at lower elevations, as tragically happened in Kerr County.
- No localized user-defined alerts leave communities fully reliant on multiple generic NWS alerts which are often not applicable at the specific local level.
- Generic NWS warnings fail to reflect specific flood triggers that vary by location, including terrain, soil, infrastructure, and recent conditions.
- Lack of integration between radar data, no localized alert thresholds and outdated protocols slows response times and puts lives at risk.

StormQuant's Solution

StormQuant has already developed and deployed, in Florida, a commercial RSaaS solution addressing radar coverage gaps, especially in low-altitude, high-population, and high-risk regions. Our proprietary X-band dual-pol radar system combined with our patented radar meshing technology (U.S. Patent No. 11,815,619) and Weather Viewer software surpasses the capabilities of today's legacy systems. Our RSaaS platform compliments the existing NOAA/NWS system with the long-term goal of enabling a modular national rollout as the current system ages out at a fraction of the existing system's annual operating and maintenance budget.

RSaaS Platform Highlights:

- Dual-polarization volumetric scanning

- Sub-minute refresh rates with sector scanning

- Seamless data integration into StormQuant's Weather Viewer, our patented 3D software

- Proven deployments in Florida and active rollout to Gulf Coast and DoD partners

- Mesh patent allows visualization software to mitigate concerns when radars go down or due to signal attenuation. Takes the best data from all radars available regardless of band

In addition to technical readiness, StormQuant has a detailed expansion plan designed to meet NOAA's CONUS coverage needs over the next 6 years. Our radars can be installed in flexible configurations (fixed, rooftop, mobile trailer-mounted) and operational support including 24/7 monitoring, on-site diagnostics, cloud-based upgrades and guaranteed uptime.

Our software platform, which synchronizes and visualizes all StormQuant nodes alongside NEXRAD, TDWR and other third-party radar data, ensures full interoperability with current NOAA systems while providing superior low-altitude and geographical insights. The system is already available for state emergency agencies for hurricane, tornado and extreme weather monitoring and wildfire risk mitigation.

StormQuant's capabilities to support NOAA/NWS's Radar Next program include:

- Hardware flexibility for rapid deployment in hard-to-reach areas

- The latest in Hardware technology to allow significant improvements to computational capabilities

- AI-enhanced meshing to ensure resilience during node outages

- Full cloud data pipelines for immediate analytics and model ingestion

- Ability to evaluate weather on the edge and limit data transmission vs current systems (i.e. critical during national disaster)

- Scalability to expand from state-installed systems to a national network

- Efficient and cost-effective path to bridging the coverage and temporal gaps in the current NEXRAD system

System Overview

StormQuant Radar Highlights (See Exhibit C for Comparisons to WSR-88D)

- Dual-pol X-band

- Up to 33 RPM full-volume scan

- 150+ km range, 110V power draw

- Rooftop, tower, or mobile deployment (<350 lbs) (See Exhibit A)

Weather Viewer Platform Highlights (See Exhibit C for Software Features)

- Patented AI-driven radar meshing and stitching

- Smart Intra-Storm Wind Velocity combines radial velocity data from multiple radars to compute real-time true wind speed and direction at all altitudes

- Multi-radar fusion (e.g. NEXRAD, TDWR, Baron's, Climavision or other third-party)

- Real-time 3D imaging, wind field vectors, hazard overlays, chart overlays, lightning

- We provide hyper-local user defined alerts with tailored API support

- 3D mapping to allow additional understanding of geographic and topographic concerns

System Architecture

- Patent-protected node synchronization (U.S. Patent No. 11,815,619)

- Modular, redundant data ingestion

- Edge GPU processing to eliminate noise and transmit only actionable weather intelligence which significantly reduces communication bandwidth requirements

Use Case Performance

StormQuant's platform has been tested and deployed across a diverse range of mission-critical environments, demonstrating the versatility and impact of our X-band RaaS technology. These use cases span civilian, defense, aerospace, and emergency management applications:

- **Florida Division of Emergency Management (FDEM)**: Operational deployment for hurricane and tornado tracking, flood detection, and localized wind field monitoring. The system integrates directly into emergency operations centers, enabling real-time situational awareness and predictive hazard analysis.

- **NASA & Space Force Launch Operations**: StormQuant's platform is being evaluated for application in pre-launch weather tracking and wind shear detection at coastal based

launch facilities. The rapid refresh rate, low-level wind profiling and lightning tracking supports go/no-go decisions and ground safety.

- **White Sands Missile Range (DoD/Range Ops)**: StormQuant's platform is being evaluated to track surface-level wind fields, convective activity and weather across large range areas. StormQuant's high-resolution Weather Viewers improves both range and trajectory safety.

- **Titusville Airport**: Multiyear support in evaluating real time weather monitoring as part of a potential FAA testing site which includes our latest hyper-local weather radar and viewer technology

These varied deployments highlight the operational flexibility, software maturity, and environmental adaptability of the StormQuant platform. (See **Exhibit B**)

Why StormQuant's Radar and Software Platform Is Radar Next Now

StormQuant's platform is not a future concept, it is a fully operational solution delivering many of the key attributes outlined in NOAA's Radar Next objectives. Our combined hardware-software system is engineered to close near-surface blind spots, increase temporal and spatial resolution, and provide rapid-deployment infrastructure that is resilient, scalable, and data-rich.

1. Near-Surface Performance Where NEXRAD Falls Short: Our cost-effective, compact radars provide high-resolution volumetric scans below 3,000 feet AGL and can be easily deployed in difficult geographies, the most critical regions for tornadic, flash flood, and convective storm detection, where NEXRAD coverage degrades. This capability enables forecasters and emergency managers to act faster and with greater precision.

2. Refresh Rate and Dynamic Scanning: Our X-band radar system can refresh volumes every 15-30 seconds when using adaptive sector scanning to concentrate on areas of interest.

3. Resilient, Self-Healing Network: Each StormQuant radar is an additional node in a dynamic StormQuant mesh network of all radar types, manufacturers and bands. If one node goes down or is obstructed, our patented proprietary software automatically compensates. This creates a self-healing, redundant radar mesh network ideal for continuity of operations.

4. Integrated Software for Visualization, Fusion, and Analysis: Our patented Weather Viewer software ingests all radar types, satellite, and model data into a single 3D display. Features include true wind velocity and user-defined audible and visual alerts. Route and chart overlays for ground and air assets including drones and future VTOL aircraft. StormQuant exceeds the data accessibility and fusion goals outlined in the Radar Next program.

5. Fast and Flexible Deployment: During national emergencies when critical radars are damaged, StormQuant systems can be deployed and running in as little as 12 to 24 hours.

6. Lower Cost and Higher Scalability: Our entire StormQuant platform—radar, hardware, software, and support—operates at a fraction of the cost of today's legacy S-band systems. This enables NOAA to immediately provide coverage to underserved areas.

7. Patent-Protected Innovation: StormQuant's U.S. Patent No. 11,815,619 secures core architecture innovations, including radar meshing, dynamic synchronization, and 3D meso-scale modeling. This IP forms the backbone of a differentiated solution designed for persistent weather surveillance.

Together, these features make StormQuant's platform a proven, mature, and cost effective and practical pathway toward fulfilling the NOAA Radar Next mission.

Conclusion

StormQuant is ready to support the Country with a scalable, adaptive, and real-time weather radar platform based on our proven X-band radar and software. We respectfully submit that our combined radar and software solution can complement and exceed legacy infrastructure capabilities particularly in low-level, short-range domains where lives are most at risk.

The Path Forward

As you consider how Congress can support American readiness for floods, hurricanes, wildfires, and other natural disasters, we urge you to support:

1. Adoption of next-generation weather platforms that allow for localized, user-defined thresholds and real-time 3D radar analysis.
2. Incentives for state and municipal adoption of hyperlocal radar infrastructure through matching grants or procurement pathways.
3. Partnerships with private-sector innovators like StormQuant that bring both proven performance and rapid scalability.

We believe that each American life lost to preventable weather events is one too many. We must act now to empower communities with localized, actionable data. The future of weather safety is not just about prediction, it's about precision, speed, and resilience.

We are proud to be part of the solution, proud to be American made, and proud to help lead the charge toward a safer, more prepared United States.

Thank you for your time and your continued leadership.
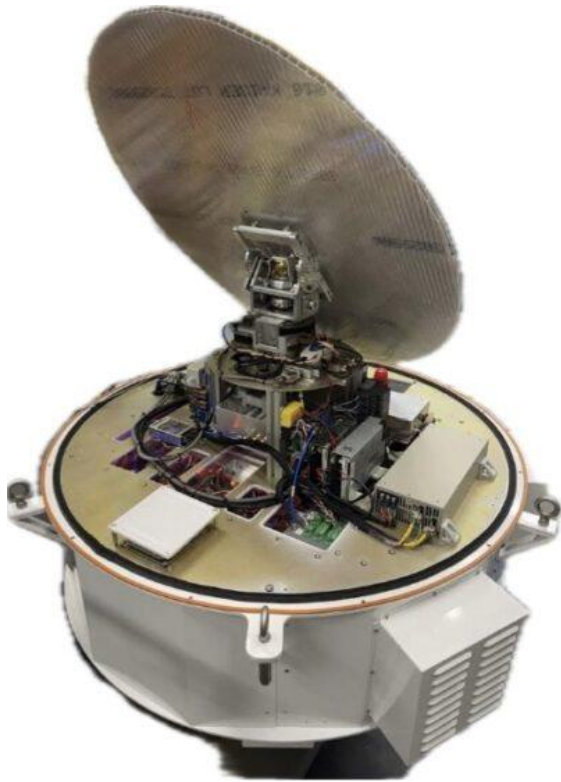
Sincerely,

Tristan Rizzi

Tristan G. Rizzi
Capt. SEAL, USN (Ret)
President, StormQuant

Space Coast Operations: 1430 Chaffee Dr. Titusville FL 32780
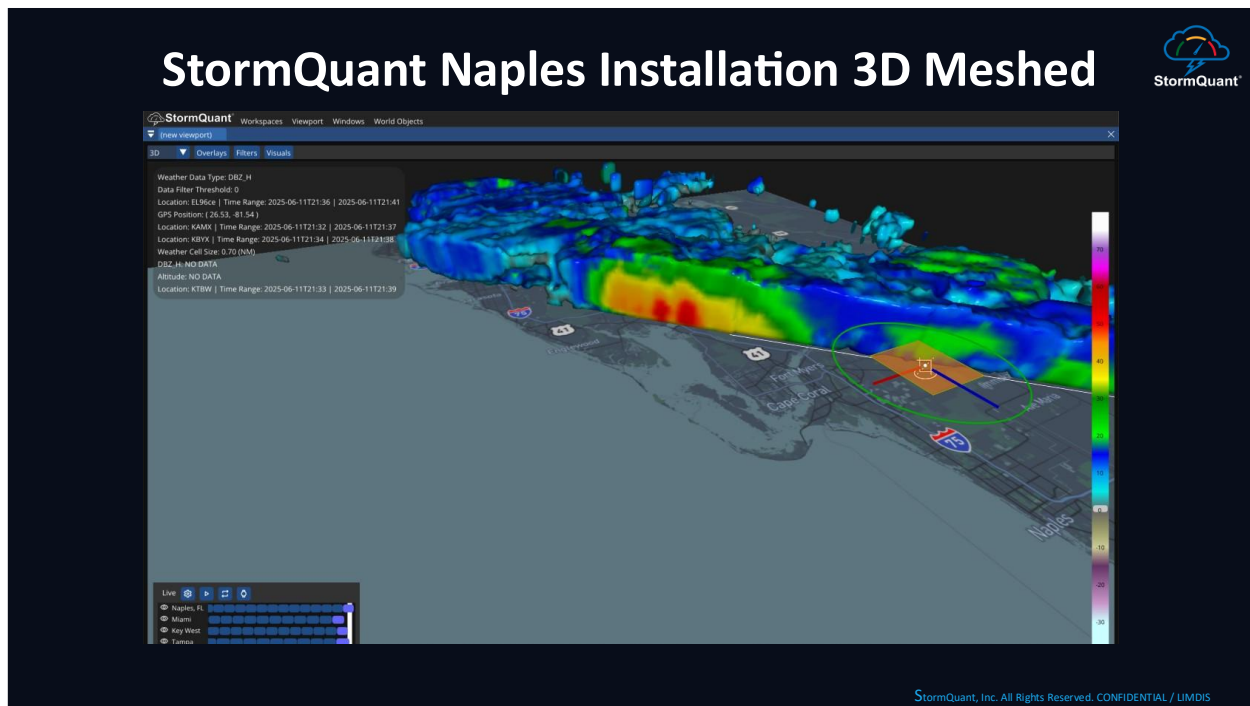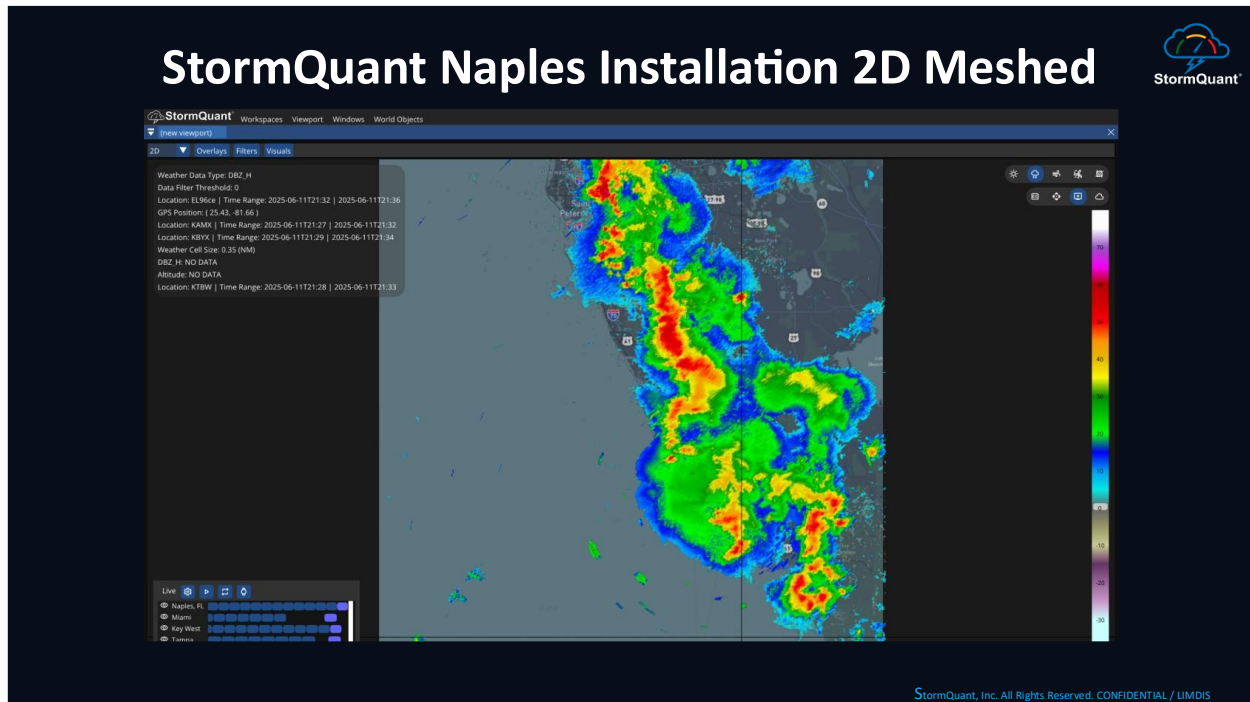
www.stormquant.com

EXHIBIT A

**Radar Images (Bat v3.0 Naples Florida)**

EXHIBIT B

**Weather Viewer Dashboard Screenshots and Capabilities**

StormQuant's Radar and Software Solution

Our patented mesh technology   provides an innovative dashboard to visualize 2D/3D weather images from multiple radar sources on a single display. The dashboard gives users the ability to interrogate hyperlocal weather data collected by StormQuant's mesh-network of radars and the existing national radar network.
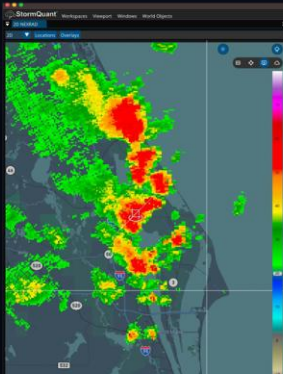
Standard NEXRAD 2D Data
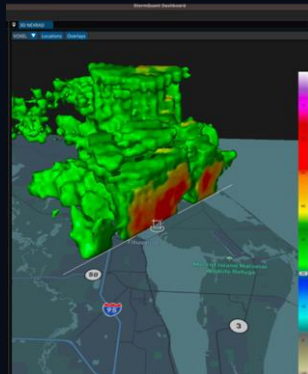
StormQuant & NEXRAD Meshed 3D Data

Features and Products

- Meshing data from StormQuant, NEXRAD,TDWR, and 3rd party sources
- Interrogate multiple radars simultaneously
- Adjustable scan strategies: PPI, RHI, sector
- Real-time or historic data
- Distance and storm tracking tools
- User defined audible and visual alerts
- Storm interrogation through 3D voxel slicing
- Pan, zoom, and rotate reflectivity data in 3D
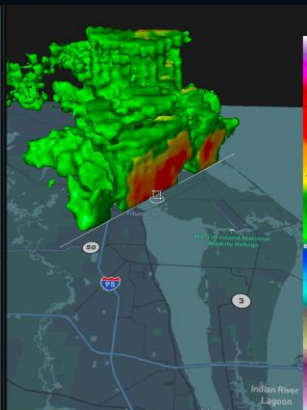- Convert radial data to true wind velocity
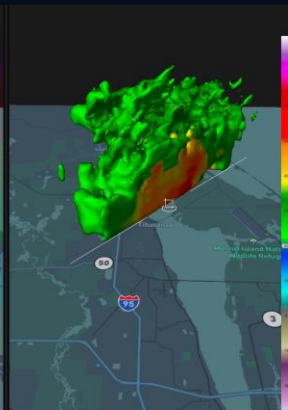
High Resolution Display of Meshed Radars

NEXRAD 2-D Data
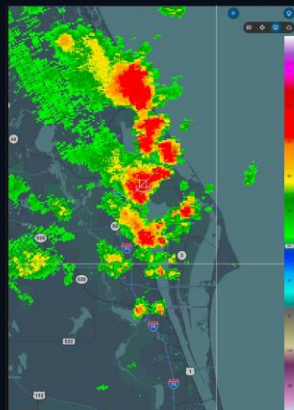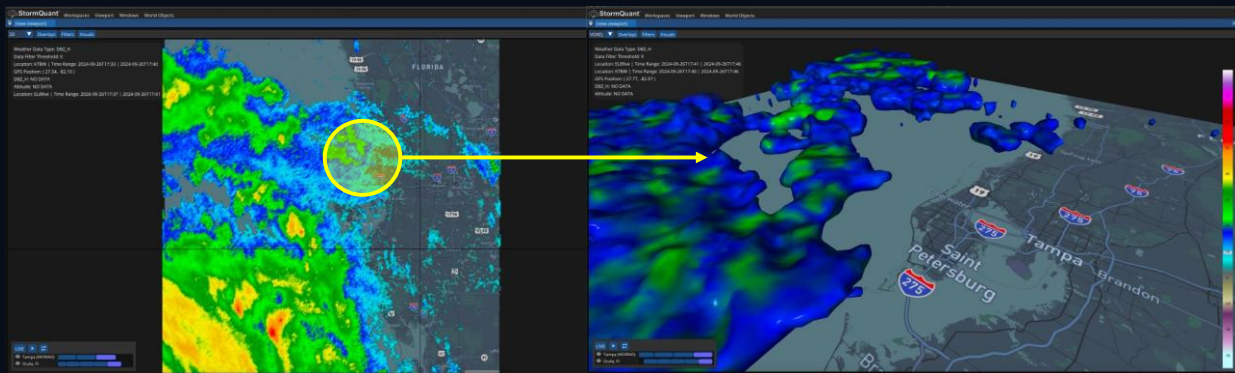
StormQuant Processing NEXRAD 2-D into 3-D

StormQuant meshed with NEXRAD in 3-D

Instant meshing of radar data by StormQuant c onverts
2-D weather data into high resolution **3-D data**

# Hurricane Helene through SQ Weather Viewer

StormQuant

Selected section of Hurricane Helene over Tampa Bay Area, meshed with StormQuant's Ocala installation and Tampa's NEXRAD. Shown in StormQuant's Weather Dashboard in 2D on the left and in 3D on the right

Converting Radial Data to True Wind Velocity

StormQuant

StormQuant's Weather Viewer takes radial data from 3 separate radars (right) into one integrated display to show true wind speed and direction (left) at user defined altitudes

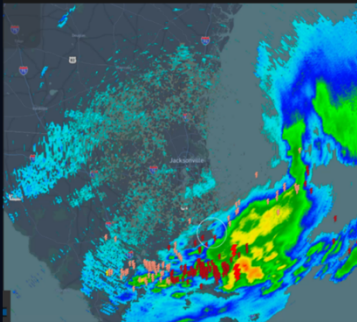# StormQuant Radar Mesh Network
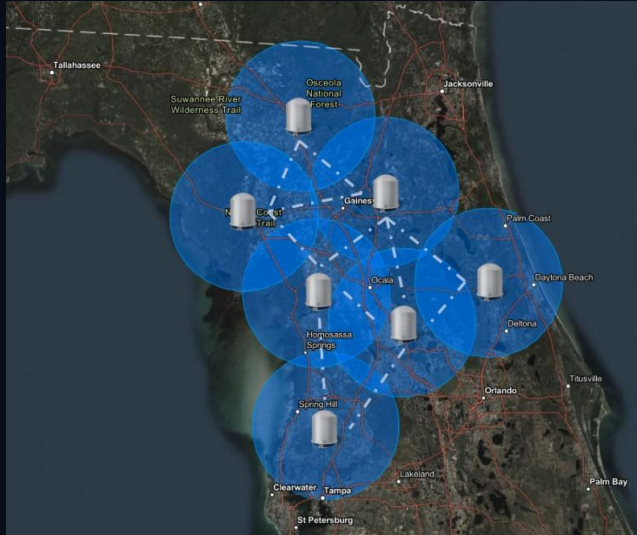
StormQuant Automated Alerts

Lightning Data Integration

StormQuant's Platform allows users to define alerts for extreme weather events
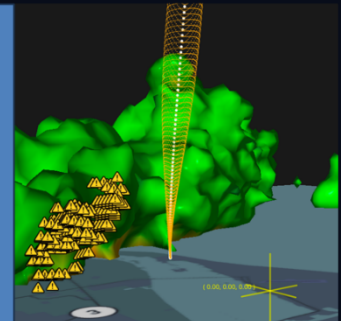
Smoke   Tornado/Wind   Storm   Lightning

StormQuant can push your defined alerts via text or email to emergency managers and first responders
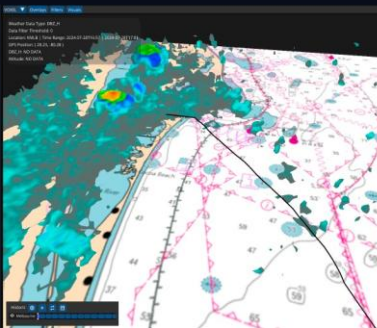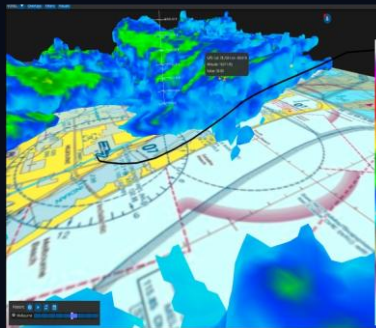
3-D Reflectivity Alerts

StormQuant's Map & Chart 3-D Weather Overlays
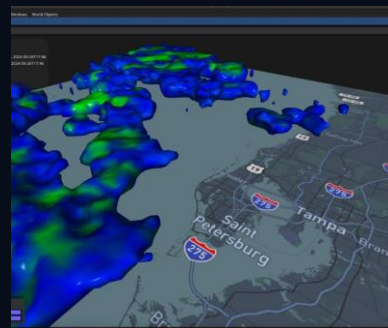Sea – Air – Land

Nautical Chart Weather Overlay   Aeronautical Chart Weather Overlay   Google Maps Weather Overlay

StormQuant's revolutionary weather platform allows users to
display 3-D weather over existing digital platforms

EXHIBIT C

Radar Capabilities Comparison and Software Features

	StormQuant Gen 3.0	NEXRAD
Introduced	2024	1988
Frequency	9.3-9.5 GHz (X Band)	2.7 to 3 GHz (S band)
PRF	2000 Hz@50µs, (Dual PRT Capable) up to 20,000Hz	320 to 1,300 Hz
Beamwidth	3.2° Effective Beam width: 1.6°	0.96° with 2.7 GHz 0.88° with 3.0 GHz
Pulse width	0.5 to 60 µs	1.57 to 4.57 µs
RPM	0 (sector radiate) variable up to 33	3
Range	192 km for reflectivity * Up to 192 km for Doppler velocity * Greater distance = reduced Vmax	460 km for reflectivity 230 km for Doppler velocity
Antenna Diameter	0.945 meters	8.54 meters
Azimuth	0 to 360º	0 to 360º
Elevation	-6º to +46º (operations)	-1° to +20° (operations) up to +60° (test)
Power	2.4KW (Solid State)	750 KW
Names	Bat Series v3.0	WSR-88D

	StormQuant Software Capabilities
Advanced Multi-Radar Gridded Mesh Visualization	✓
Intra-Storm "True" Winds Display at all altitudes	✓
Additional Weather Integration (e.g. lightning, field mill, etc.)	✓
Advanced Map-Wide 3D visualization	✓
One hour precipitation	✓
Rapid, Map-wide Vertical and Horizontal Cross-Sections	✓
Total Precipitation	✓
Dynamic updates	✓
Vertically integrated liquid	✓
Base Reflectivity	✓
Storm Relative Velocity	✓
CAPPI	✓
Echo Tops	✓
Composite Reflectivity	✓
KDP	✓
Correlation Coefficient	✓
Hail Size Indicator	✓
TVS/Meso Indicator	✓
Observation Place Files	✓
GIS Layers	✓
Predictive Storm Path	✓

We are a software defined platform; we have the ability implement any additions, changes and updates to our radars and Weather Viewers in days