

# **Drone-Based Iceberg Tow Monitoring Market Forecasts to 2032 – Global Analysis By Drone Type (Fixed-Wing Drones and Rotary-Wing Drones), Mode of Operation, Sensor Technology, Application, End User and By Geography**

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## **Abstracts**

According to Statistics MRC, the Global Drone-Based Iceberg Tow Monitoring Market is accounted for \$881.37 million in 2025 and is expected to reach \$2613.72 million by 2032 growing at a CAGR of 16.8% during the forecast period. Drone-Based Iceberg Tow Monitoring involves deploying unmanned aerial systems to oversee and evaluate the movement of icebergs being towed at sea. Equipped with advanced sensors, drones deliver real-time visuals, navigational insights, and environmental assessments to enhance operational safety. This technology minimizes risks to personnel, improves route planning, and supports effective decision-making. By providing reliable aerial monitoring, drones ensure efficient and secure towing processes, particularly in harsh marine environments and unpredictable weather conditions.

Market Dynamics:

Driver:

Increased emphasis on maritime safety and environmental protection

Governments and environmental agencies are enforcing stricter regulations to prevent collisions and minimize ecological damage in polar regions. Drone-based systems offer real-time surveillance, route optimization, and early warning capabilities, enhancing operational safety. Technological advancements in thermal imaging, LiDAR, and AI-powered navigation are improving detection accuracy and response times. As climate

change accelerates iceberg drift patterns, proactive monitoring becomes essential for safeguarding shipping lanes and offshore infrastructure. The integration of autonomous drones into maritime protocols reflects a broader commitment to sustainable ocean management.

#### Restraint:

##### Harsh environmental conditions

Low temperatures, high winds, and limited visibility can impair drone performance and reduce flight endurance. Specialized hardware and ruggedized components are required to withstand these conditions, increasing production and maintenance costs. Battery efficiency and signal transmission are also compromised in icy environments, limiting operational range. Despite technological improvements, consistent performance in harsh climates remains a barrier to widespread adoption. These environmental constraints necessitate ongoing innovation in drone design and deployment strategies.

#### Opportunity:

##### Expansion into broader maritime applications

Drone-based iceberg tow monitoring technologies are finding new applications across the wider maritime domain. Beyond iceberg tracking, drones are being deployed for port surveillance, oil spill detection, and marine wildlife observation. The convergence of satellite data, IoT sensors, and cloud-based analytics is enabling multi-functional maritime platforms. Emerging trends include swarm drone operations and hybrid aerial-aquatic systems for Comprehensive Ocean monitoring. As shipping routes expand and offshore activities increase, the need for versatile and scalable monitoring solutions grows. This diversification opens up new revenue streams and fosters cross-sector collaboration in maritime innovation.

#### Threat:

##### Competition from alternative technologies

The market faces growing competition from satellite imaging, autonomous underwater vehicles (AUVs), and radar-based systems. These alternatives offer broader coverage or deeper penetration in certain scenarios, challenging the dominance of aerial drones. Continuous improvements in satellite resolution and real-time data transmission are

narrowing the performance gap. AUVs provide subsurface insights that drones cannot capture, especially in iceberg fragmentation analysis. Cost-effectiveness and integration with existing maritime infrastructure also influence technology selection. To maintain relevance, drone-based systems must evolve with enhanced capabilities and interoperability.

#### Covid-19 Impact:

The pandemic disrupted global supply chains and delayed deployment of drone-based iceberg monitoring systems. Travel restrictions and lockdowns hindered field operations and maintenance schedules in remote Polar Regions. However, the crisis accelerated the adoption of autonomous and remote-controlled technologies, reducing reliance on human presence. Manufacturers pivoted toward modular designs and contactless diagnostics to ensure operational continuity. Post-pandemic strategies now emphasize resilience, automation, and decentralized control in maritime drone operations.

The rotary-wing drones segment is expected to be the largest during the forecast period

The rotary-wing drones segment is expected to account for the largest market share during the forecast period, due to its superior maneuverability and vertical takeoff capabilities. These drones are ideal for hovering over icebergs and capturing detailed imagery in confined or unstable environments. Advancements in rotor efficiency, payload capacity, and stabilization systems are enhancing their utility in maritime operations. Their ability to operate from ships and offshore platforms makes them highly adaptable for iceberg tow monitoring. Integration with AI-based flight planning and real-time analytics is further boosting their effectiveness. As demand for precision monitoring grows, rotary-wing drones continue to lead in deployment scale and versatility.

The environmental organizations segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the environmental organizations segment is predicted to witness the highest growth rate. These groups are increasingly leveraging drones to track iceberg migration, assess climate impact, and support conservation efforts. The rise of data-driven environmental advocacy is fueling demand for high-resolution aerial imagery and geospatial analytics. Partnerships with research institutions and tech firms are enabling customized drone platforms tailored to ecological missions. Emerging trends include open-source data sharing and collaborative monitoring networks across polar regions. As environmental stewardship gains global momentum, these

organizations are becoming key drivers of innovation and adoption.

Region with largest share:

During the forecast period, the Asia Pacific region is expected to hold the largest market share, driven by expanding maritime trade and regional investments in ocean safety. Countries like China, Japan, and South Korea are deploying drones to protect shipping lanes and offshore assets from iceberg threats. Government-backed initiatives are promoting indigenous drone manufacturing and maritime surveillance programs. The region is also witnessing rapid adoption of AI-powered monitoring and real-time data integration across coastal infrastructure. Strategic collaborations between local firms and global technology providers are accelerating market penetration. With growing emphasis on maritime sustainability, Asia Pacific leads in both deployment volume and technological adoption.

Region with highest CAGR:

Over the forecast period, the North America region is anticipated to exhibit the highest CAGR, fuelled by robust R&D and early adoption of autonomous maritime technologies. The U.S. and Canada are investing heavily in Arctic surveillance and climate resilience programs using drone-based systems. Regulatory agencies are streamlining approvals for experimental drone operations in polar zones. Integration of machine learning, edge computing, and satellite connectivity is enhancing operational efficiency and data accuracy. The region also benefits from strong academic-industry partnerships driving innovation in drone hardware and software. As climate challenges intensify, North America remains at the forefront of technological advancement in iceberg tow monitoring.

Key players in the market

Some of the key players in Drone-Based Iceberg Tow Monitoring Market include Pix4D, DragonFly UAS, Wingtra, ZenaDrone Inc., Alpine Solutions, Percepto, AgEagle, Birds Eye Aerial Drones, CLS Group, Avacam, SCS Engineers, GeoNadir, FlyPix AI, Servicon, and Carbonix.

Key Developments:

In August 2025, Draganfly Inc. announced the expansion of its U.S. manufacturing footprint, capability, and capacity across multiple locations in the United States. This will

provide resiliency and redundancy within its manufacturing and supply chain ecosystem. The expansion includes additional AS9100%- %and ISO9001-certified manufacturing facilities and logistics locations, via its contract manufacturing partner, strengthening the Company's ability to respond to rising demand for U.S.-made drones.

In July2025, Wingtra has announced its new drone, WingtraRAY. The only drone designed specifically for surveyors, it breaks down limits that have held them back thanks to waiver-free operations over people (OOP)\*, and a wider range of hot-swap sensors. Driving a complete plan-capture-process-share solution, WingtraRAY opens access to surveyors of all experience levels to tackle urban infrastructure, massive mines and time-sensitive sites without waiver delays or equipment changes.

#### Drone Types Covered:

Fixed-Wing Drones

Rotary-Wing Drones

#### Mode of Operations Covered:

Remotely Piloted

Fully Autonomous

Optionally Piloted

#### Sensor Technologies Covered:

Optical Sensors

LiDAR

Thermal Sensors

Multispectral Sensors

Other Technologies

### Applications Covered:

- Iceberg Tracking
- Glacier Calving Detection
- Research and Data Collection
- Environmental Monitoring
- Other Applications

### End Users Covered:

- Research Institutes
- Government Agencies
- Maritime and Shipping Companies
- Environmental Organizations
- Other End Users

### Regions Covered:

- North America
  - US
  - Canada
  - Mexico
- Europe

Germany

UK

Italy

France

Spain

Rest of Europe

Asia Pacific

Japan

China

India

Australia

New Zealand

South Korea

Rest of Asia Pacific

South America

Argentina

Brazil

Chile

Rest of South America

## Middle East & Africa

Saudi Arabia

UAE

Qatar

South Africa

Rest of Middle East & Africa

### What our report offers:

- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2024, 2025, 2026, 2028, and 2032
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

### Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

#### Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

#### Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as

per the client's interest (Note: Depends on feasibility check)

## Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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