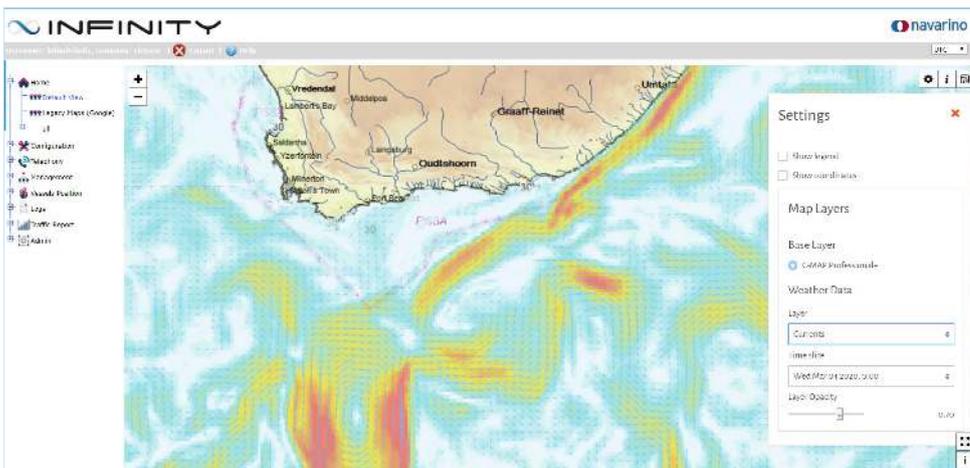


• Cover Page	• Events and News	• Market News	• Out of the office
<ul style="list-style-type: none"> <li>• Infinity update 2.4.3 brings nautical charts, weather and news for all users</li> </ul> <p style="text-align: right;"><b>Page 01</b></p>	<ul style="list-style-type: none"> <li>• New GX satellites expand FX capacity</li> <li>• Intelsat, Inmarsat approve NX</li> </ul> <p style="text-align: right;"><b>Page 02</b></p>	<ul style="list-style-type: none"> <li>• Expanded coverage for the Intelsat Ku-band</li> <li>• Visit Navarino for a Spectrum demo</li> </ul> <p style="text-align: right;"><b>Page 03</b></p>	<ul style="list-style-type: none"> <li>• Supporting a high-school space experiment</li> <li>• Navarino volunteers reforest Athenian mountain</li> </ul> <p style="text-align: right;"><b>Page 04</b></p>

## The latest Infinity update 2.4.3. goes live, bringing nautical charts and a news service to the Mainhub



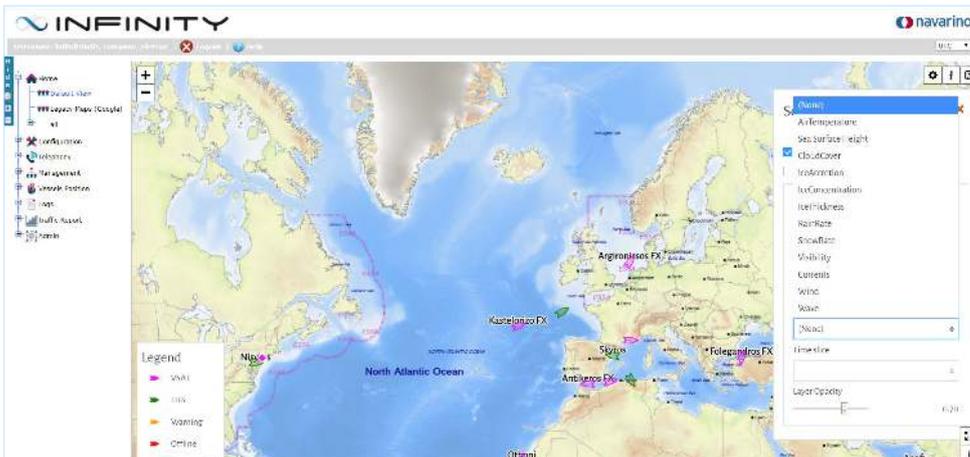
Infinity update 2.4.3. was pushed out to all Infinity units this quarter, bringing with it some significant new features for Infinity.

The new nautical maps feature allows users to view worldwide data for air temperature, sea surface height, cloud cover, ice concentration, rain rate, snow rate, visibility, wind speed, currents and more in a user friendly dashboard accessible from the Mainhub.

In addition, the news feature delivers the latest news updates from around the world directly to crews onboard ships via a ticker on their login page. The crew can then choose to open articles in full.

Infinity is now on more than 8,000 vessels and is constantly updated. We welcome any suggestions for features that you would like to see implemented, in fact a large part of its development is thanks to excellent suggestions from its users.

If you have any features or solutions to propose to us, please contact your Navarino Account Manager.



*Infinity users can now access global data on sea surface height, rainfall, wind, currents, wave height and many other parameters designed for maritime use.*

### Editor's note



by Christian Vakarelis

Welcome to another Navarino Newsletter! We begin this edition with good news for the GX network, as Inmarsat added another satellite to its HTS constellation that brings a huge boost to Fleet Xpress capacity.

It has been a very busy period for our Infinity team as they have been developing and rolling out the latest Infinity update, version 2.4.3. This introduces nautical maps to the Hub interface, as well as a news service for seafarers that brings the latest reports from around the world to their personal Infinity portal.

Intellian's new NX series of antennas has received certification from both Inmarsat and Intelsat, which means we have another high speed piece of hardware in our portfolio that offers future-proof connectivity to our customers.

In this edition we are also excited to announce that Spectrum, our maritime ICT tool is now ready for demonstrations. If you would like to see what it offers, please just contact your Navarino account manager and they will arrange it for you.

We are immensely proud of the Zanneio high school students whom we supported as they built an experiment to measure mass in low gravity which was blasted into space on one of the Blue Origin rockets. This remarkable accomplishment has impressed us all.

And finally, some of our team spent a Sunday planting trees on Hymettos mountain as part of the reforestation project, well done to all of them!

## Market News

# Inmarsat launches fifth GX satellite, adding more capacity to its global Fleet Xpress constellation

Arianespace has launched Inmarsat's GX5 satellite, the first of its second-generation constellation for Global Xpress (GX) on 26 November. The Ariane 5 launch vehicle placed GX5 into geostationary orbit from the Ariane Launch Complex 3 in Kourou, French Guiana. This Thales Alenia Space-built satellite will augment Ka-band communications already provided to shipping through the existing GX1-GX4 network, which was the fifth Inmarsat satellite constellation.

Inmarsat provides ship connectivity through Fleet Xpress (FX), combining GX with L-band backup from its Fleet Broadband service. GX5 is the first of a new generation of GX satellites that will represent a sixth constellation. Inmarsat intends to launch another seven advanced GX payloads in the next four years for global coverage of its well established, high throughput Ka-band service.

Inmarsat chief executive Rupert Pearce says GX5's launch "marks the first of eight launches in the coming four years that will grow our services to meet rapidly expanding demand", speaking from London's Inmarsat Headquarters.

Inmarsat Maritime president Ronald Spithout says second-generation GX will enable ships to boost their connectivity capabilities four-fold. Fast-growing demand for digitalised services has led to a ship's data consumption averaging 270 GB per month in mid-2019, compared to 5 GB five years ago, says Mr Spithout.

"As data use and demand for vessel and crew applications continues to grow, we are already seeing data volumes of more than 1 terabyte [1,000 GB] per month per ship," he explains. "Launching GX5 heralds a major step forward in meeting that demand with capacity for shipping in one of our main markets and the next step in Inmarsat's commitment to the future of maritime connectivity,"



*Arianespace Ariane 5 launched Inmarsat's GX5 satellite from Kourou, French Guiana*

# Intellian's next generation Ka/Ku technology secures approval from Intelsat and Inmarsat for its NX antenna series



*Intellian's NX series are now certified for both Ka and Ku-band*

In good news for Navarino's Intellian customers, both Inmarsat and Intelsat have approved Intellian's NX series of antennas. Intelsat has certified Intellian's NX series of products for operation on its High Throughput Satellite (HTS) network. This technology will enable faster connection and higher bandwidth for crew welfare services, operational information and data transfers, plus charterer requirements.

Intelsat has endorsed using marine antennas v85NX and v100NX over its IntelsatOne Flex service that provides connectivity through the EpicNG HTS, its existing fleet of satellites and IntelsatOne terrestrial fibre optics networks.

Both antennas transmit and receive using Ku-band over wide beams and spot beams of high intensity signal. The v85NX has an antenna of 80 cm diameter and the v100NX is a 1-m diameter antenna.

Inmarsat has also approved the Intellian NX series for its Ka-Band Fleet Xpress service. Intellian's highly efficient next-generation GX100 NX antenna supports 2.5GHz Ka wideband networks out of the box and is supplied with a 5W BUC as standard, with the option to upgrade to a high power 10Q unit. This makes the GX100 NX upgradeable and

futureproof for Inmarsat's next generation high-capacity, high-speed constellation and future network upgrades.

Extensive sea trials demonstrated the significant advantages over previous GX100 models, with faster satellite acquisition and a 1dB (25%) signal increase. These advantages combine to deliver substantial improvements in network efficiency and availability. Terminal testing also proved the effectiveness of the GX100 NX Below Deck Unit, which integrates the Antenna Control Unit, GX modem and mediator function for dual antenna configuration in a single unit.

Intellian developed additional automated parts and processes and improved system performance for the NX series. The NX platform's modular concept contains fewer components, removing the need for spares by up to 40% and increasing reliability, said Intellian.

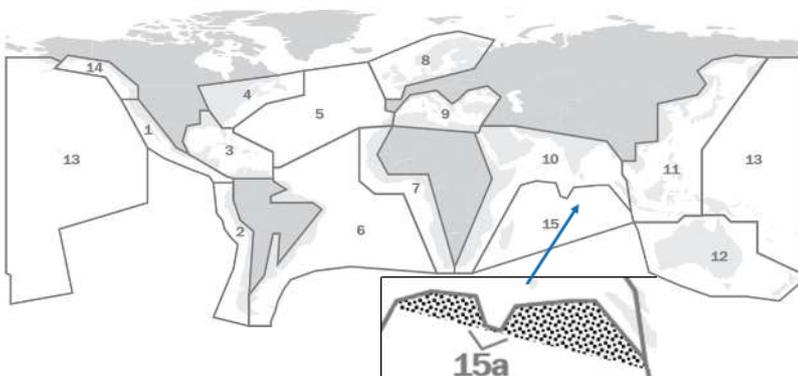
The South Korean-headquartered company also reduced installation time and costs for shipping companies with the NX series featuring a single cable for power and signal to below-deck terminal equipment. It added a process wizard in the antenna's AptusNX operating software for simplicity in commissioning and remote maintenance.

## Events and News

# Intelsat expands its High Throughput Satellite coverage in the Indian ocean to cover more ocean routes

Intelsat, the HTS satellite network operator that provides the backbone to Navarino's Ku-band service Prodigy, has announced its plan to update the FlexMaritime service region 15 (Southern Indian Ocean region):

- The current Southern Indian Ocean Best Efforts subregion (sub-region 15a) will no longer exist, and a full Quality of Service will be available across the entire Southern Indian Ocean Region
- The new regional coverage map will no longer include a sub-region 15a, but instead show the updated region 15



Prodigy is Navarino's hybrid Ku-band/L-band service that combines Intelsat's FlexMaritime network with the Iridium Certus L-band network. It is a new concept in connectivity and evolves together with your applications and needs.

FlexMaritime's multi-layered design provides a cost-efficient solution for ship operators without having to sacrifice speed or throughput to each ship, even in the most densely populated shipping lanes. This means that ships have access to multiple satellites in most place across the globe, greatly reducing and even eliminating blockages from vessel structures or land-based obstructions. Ship operators can also maintain connectivity, even when their routes and bandwidth demand shift unexpectedly.

Prodigy provides high performance connectivity, ultra reliability and true redundancy based on it's core advantages, namely that it is based on a dual satellite constellation as Intelsat FlexMaritime and Iridium are independent networks, and combined with Infinity this means that there is no single point of failure for the Prodigy service.



## Contact us to register for a live demonstration of Spectrum, our new maritime ICT tool for Information Tranquility

Our new ICT tool for maritime, Spectrum, is now available for live demonstration and we would like to invite all our Infinity customers to let their account manager know if they would like to see the service in action.

Spectrum is a suite of software integrated within Infinity, designed for shipping companies' IT and Operations departments. The suite of software includes an **Asset Management** component, suitable for the IT and OT equipment of a vessel, as well as **Remote Monitoring** and **Remote maintenance and management** components, which can be used to ease daily operations. With its shore-side central management system, Spectrum provides efficiency to fleet-wide operations while ensuring that all data is fully synchronized between the vessel and the shore side dashboard.

Spectrum can be used by vessels with any connectivity solution on board, via an Infinity unit. A dashboard which displays all available information, is accessible from both the shore and vessel side. In addition to the dashboard, all information is available via a complete API which can be used for integration with other systems.

The Asset Management component supports any asset category with an emphasis on those categories that are specific to the maritime sector. The Remote monitoring and the Remote management and maintenance components are designed to cover all the needs of a modern ship operators' IT department. Key functionalities, like monitoring the health of each PC and server, utilization graphs, performance metrics, maintenance actions, remote execution of scripts and an application store will all help to ease the daily operations of IT managers on shore.

Spectrum demonstrations can be done in person or online, please just ask your account manager.



*Spectrum will provide a broad range of tools for maritime IT managers, including asset management, remote monitoring, software deployment, patch management and much more. You can ask your Navarino account manager for a demo, which can be carried out either at our premises or online.*

## Out of the office

# Sponsoring Zanneio High School's experiment launch into space on Amazon's Blue Origin rocket

Navarino is very proud to sponsor the remarkable Zanneio high school team who managed to get their experiment blasted into space onboard one of Amazon's Jeff Besos Blue Origin rockets.

The experiment, designed by Zanneio school students, was presented at the Eugenides Foundation on the 24<sup>th</sup> of February 2020, following the successful launch on the 11<sup>th</sup> of December from Texas, USA. This rocket is owned by Blue Origin, who believe that true operational reusability is the only way to lower the cost of access to space.

Blue Origin rockets have been designed with reusability in mind from the beginning. Their vertical take off, vertical landing architecture enables them to reuse the first stage of their launch vehicles with minimal refurbishment. This allows for high asset



utilization for all their space vehicles which decreases the costs and increases availability of space travel. This was the sixth time that the same rocket was used making it a world record for Blue Origin.

The students' experiment was "Mass measurement in conditions of micro – gravity" was housed inside the rocket capsule, so after a year of hard work, with many hours of designing, construction and testing, the students had the unique experience to see their experiment launched in space.

Their experiment was aimed at answering the question: "How can we weigh an object in space's micro – gravity conditions?" Obviously, a normal scale wouldn't work, but the answer which the students finally concluded is that while mass measurement in space cannot be weighed, the period of an object's oscillation can be measured independent from its mass.

Everyone at Navarino would like to congratulate these students on their tremendous work and we look forward to their next experiments!



# Navarino's reforestation weekend at Hymettos mountain saw 100 trees planted by our team of volunteers

In February, the Navarino team volunteered to plant 100 trees on Mount Hymettus to support ongoing reforestation efforts in that area. Navarino worked with the Philodasiki Association of Athens who manage that part of the mountain.

Studies have found that spending time in forests provides emotional rejuvenation, reduces stress, and creates a sense of peace. It has also been shown that being among trees reduces stress-related hormones and in the stressful city life of Athens, a few trees can make the world of difference.



Furthermore, during heavy rainstorms, root systems hold soil in place, which prevents erosion, flooding, and mudslides. Additionally, these root systems improve water quality by filtering out impurities and retaining water in the soil. It allows water tables to be recharged with less water going to sewers and diminishing the amount of stormwater carrying pollutants to Greece's beautiful seas.

A single, one hundred foot tree can take as much as 11,000 gallons of water out of the soil during its growing season, releasing the water as healthy oxygen and clean water vapour, which is especially important in Athens which can suffer heavily from air pollution.

A single tree can absorb about 21kg of CO2 per year, meaning Navarino's efforts have meant 2,100kg more CO2 will be absorbed each year.

By taking steps to support the local and international community, we hope to pave the way for a sustainable industry, stepping outside of our normal tasks to look after what's most important.