



# Unmanned Aerial Systems for Air Quality Monitoring

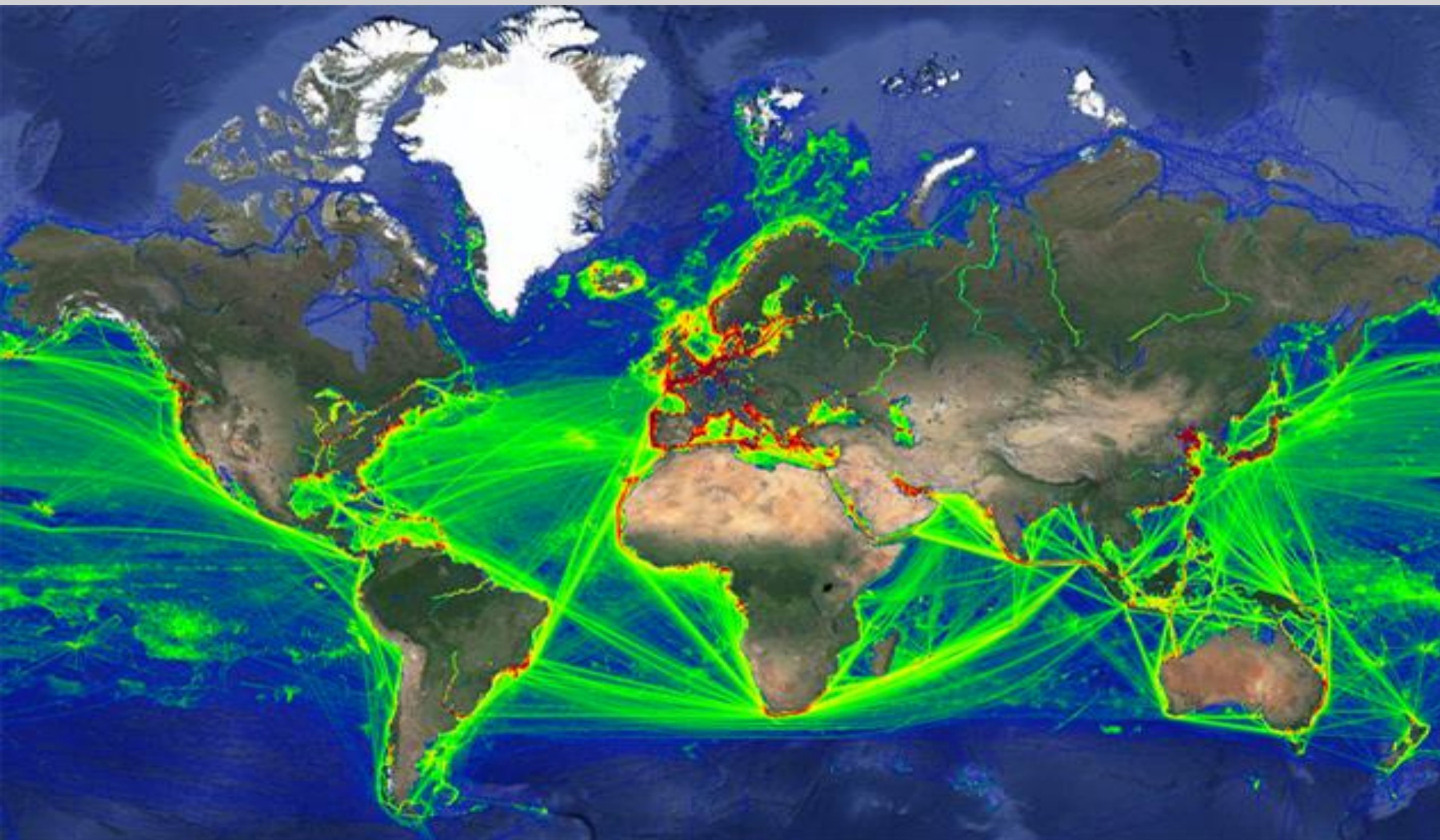
## The rise of a new sector

# The problem



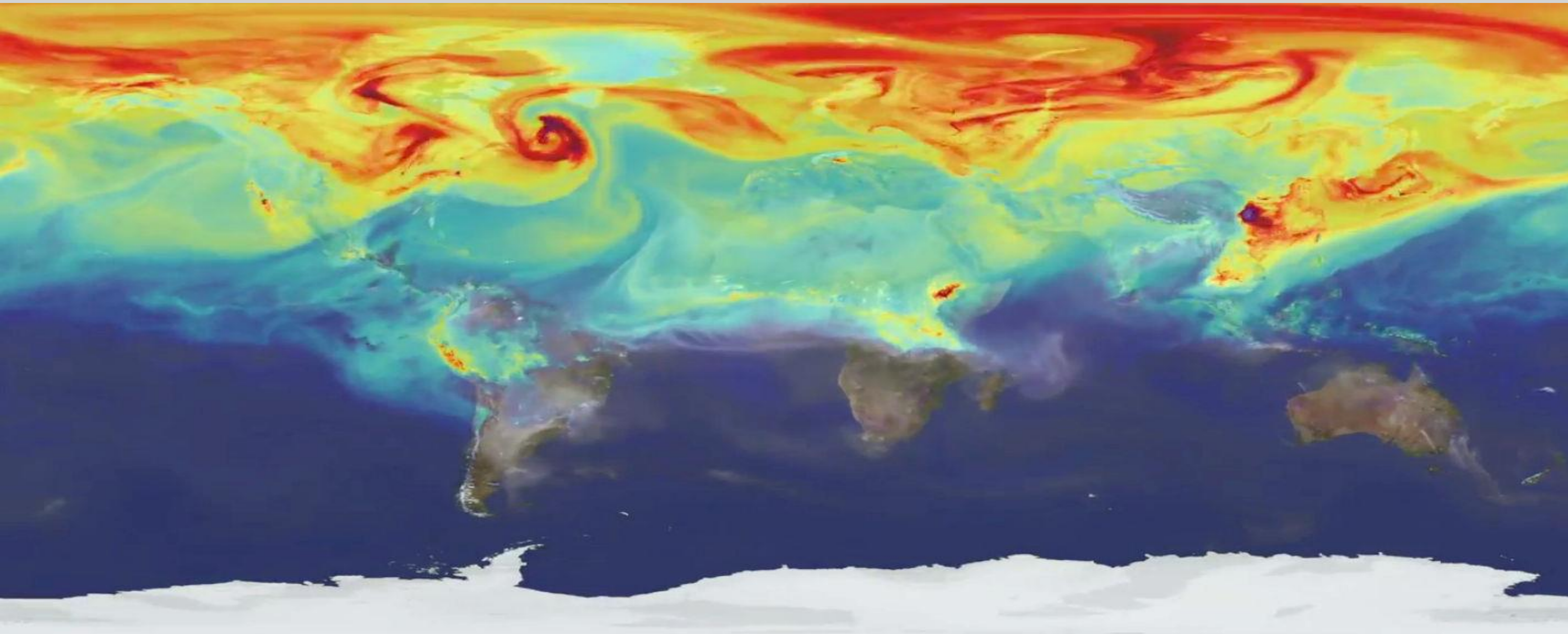


# Marine Traffic Density



Some reports suggest **one container ship** using low-grade ship bunker fuels can cause the same amount of cancer and asthma-causing chemicals as **50 million cars**. The same calculations would mean **15 of the world's biggest tankers** would emit the same amount of pollutants as all cars on the planet.

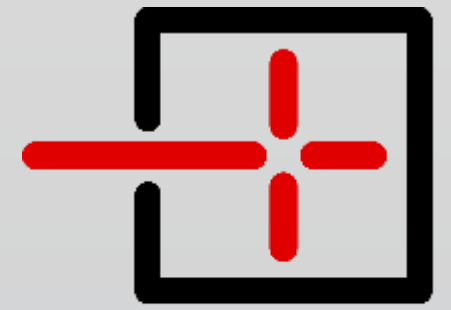




Shipping has been found responsible for emitting around **1000 million tones of CO<sub>2</sub>** annually (IMO, 2014) and is responsible for contributing to about **3%** to the world's total **GHG** emissions, with increasing trends. It is projected that unless significant initiatives are undertaken, shipping might contribute to **6% of the global GHG** emissions by 2020 and **15% by 2050** (Helfre & Boot, 2013).



# Non GHG



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**Regarding non-GHG** emissions the contribution of shipping industry is calculated to be at levels of **10 to 30%** (Corbett & Koehler, Eyring et al). Compared to other transport modes, the emission from shipping, especially regarding **Sulphur**, are substantial and have been found to surpass those of road transport by **two to three times**. (ICCT). Also **international shipping produced approximately 80 times more Sulphur emission compared to aviation** (Eyring et al).



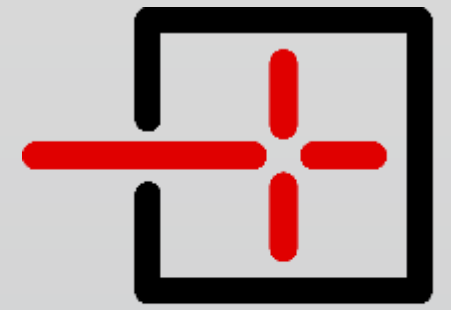
# Impact - quality of life



The health impact on the populous is enormous and there are an array of studies measuring the impact. Indicatively, research from America says pollution from the world's cargo ships leads to **60 000 premature deaths per year** in America, while European research suggests the figure could be **39 000 in the EU**.

Danish environmental agency says shipping emissions cost the health service over €4.5 billion per year, mainly treating cancers and heart problems.

# Problem of Enforcement in Emission Control Areas ECAs



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As of 2018, during all voyages from and to EU ports as well as stays at EU ports an emission report is required for each ship annually

Enforcement of the regulations in place has proven difficult and costly

**Currently in Europe only one in 1,000 ships is inspected**



# Reasons not to comply



0.1% Sox limits on SECA areas from 2015 onwards.  
0.1 % Sulphur content not reachable with heavy fuel oil (HFO)

Marine gasoil (MGO) must be used or exhaust gases must be washed (scrubbers)

MGO is about 2x the price of HFO

Benefit from non-compliance at the magnitude of:

**10 000 €/day**

States must have a credible method for emission monitoring to enforce the regulation and prevent the market from being distorted by non-complying companies.



# The EMSA project

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EMSA is the EU body overlooking shipping and the maritime industry. The Agency's main objective is the proper development and implementation of EU legislation on maritime safety, pollution by ships and security on board ships.

EMSA initiated a tender process to improve environmental surveillance capabilities of member states using sensors mounted on UAS

ALTUS LSA, December 2017 awarded this RFP –  
Missions to start May 2018



# A few words about ALTUS LSA



Since 2011:

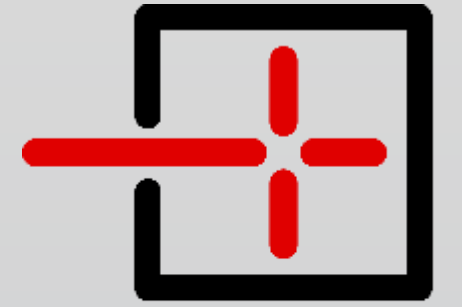
- ✚ ALTUS LSA is a technology integrator providing turnkey solutions in the field of Unmanned Systems and innovative technology programs with worldwide service capabilities.
- ✚ The Company's experience and expertise extends to: land & maritime border surveillance, intelligence gathering, airborne ISR, environmental monitoring, natural disaster management, GIS applications, protection of critical infrastructure, SAR missions, and aerial target drone applications.

Since 2017:

- ✚ Moreover, aiming to the development of a European center of excellence in the field of Unmanned System, ALTUS LSA has been approved as a UAS training academy by Hellenic Civil Aviation Authority, with registration number EL-UAS-TC-3
- ✚ For more info: [www.altus-lsa.com](http://www.altus-lsa.com) & [www.dronepilot.gr](http://www.dronepilot.gr)



# Global Engagements



## ➞ North America

- US Aerospace Industries

## ➞ Europe

- EU
- EC
- EMSA
- NATO – Various regions
- OSCE
- IOM
- Ministry of Defense – GR
- Ministry of Civil Protection - GR
- Police Authority – CY
- FRONTEX

## Asia & Pacific

- Qatar gov.
- Israel gov.
- India gov.





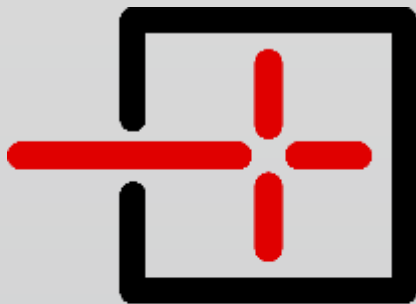
# A few words about our team



**Management Team** with global entrepreneurship experience  
**Engineering team** with more than 15 years of experience in UAS R&D projects  
**Operations team** with accredited by Hellenic Civil Aviation Authority for UAS operators



# Ouranos System Composition



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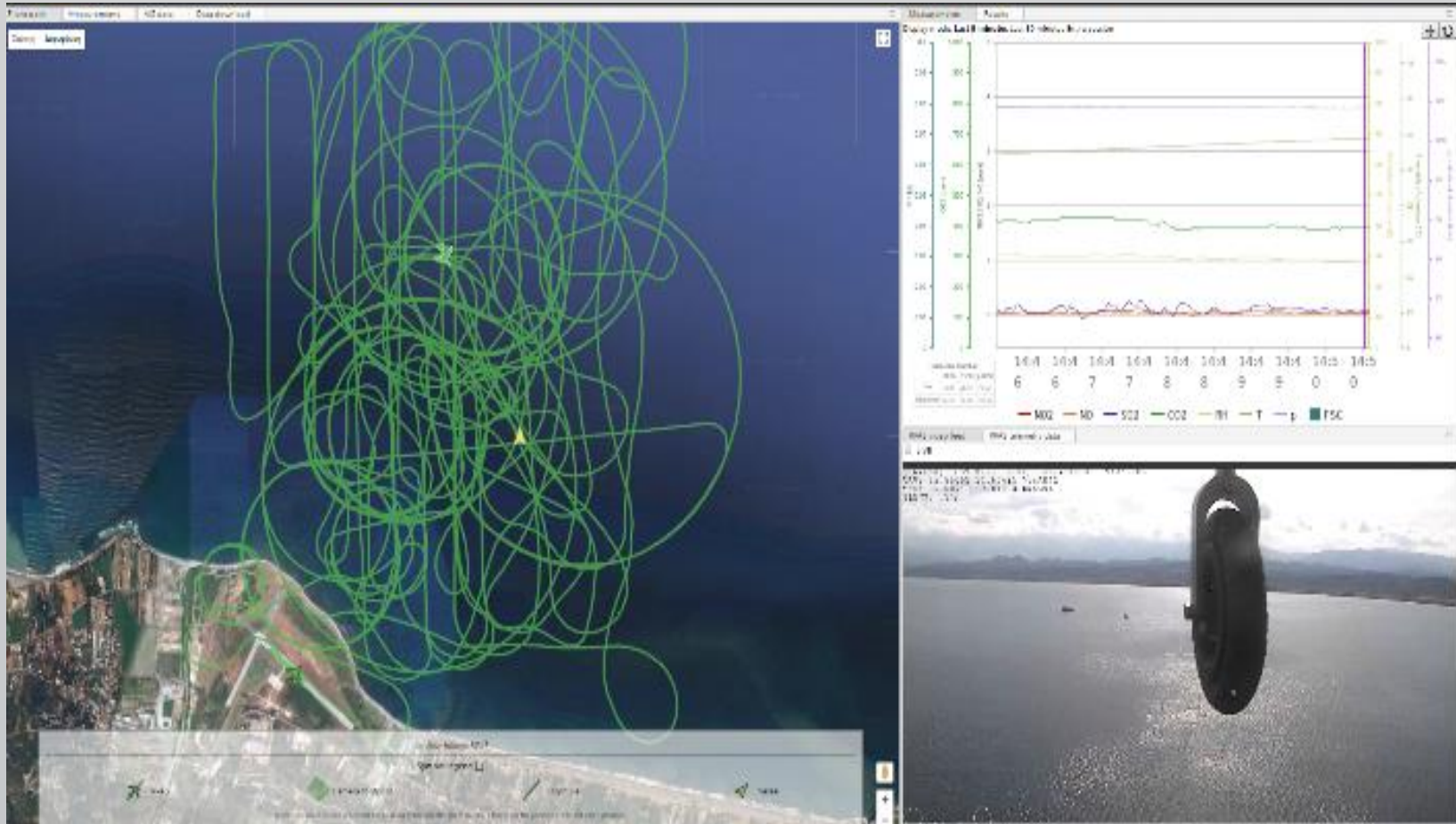
Aerial Platform



Flight Computer  
(C2 Ground)



Cloud Server



Payloads



Gas Sensor



AIS Sensor

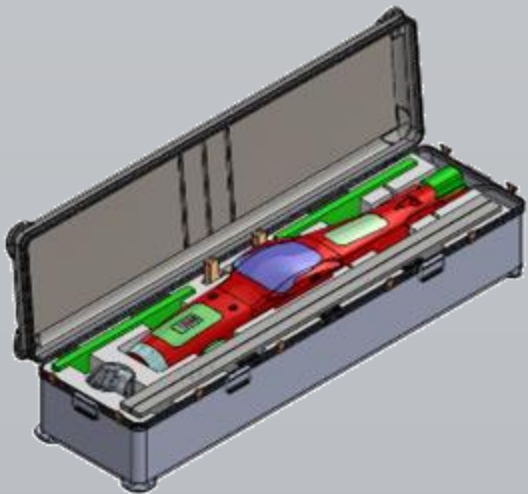


EO/IR Sensor

Command and  
Telemetry Link



Ground Support  
Equipment






# OURANOS in brief



## OURANOS:

- Is a pioneering Unmanned Aerial System [UAS] powered by ALTUS LSA
- Integrates advance sensors, sophisticated S/W & unique operational know-how
- Specialized in ships emissions measurement & monitoring

 ALTUS LSA was awarded by the European Maritime Safety Agency [EMSA] with the first contract worldwide for marine pollution detection & emissions monitoring using UAS.

 ALTUS aims to create an SPV devoted to fulfill the EMSA contract and become the market leader in Air Quality Monitoring Services

# The EMSA project

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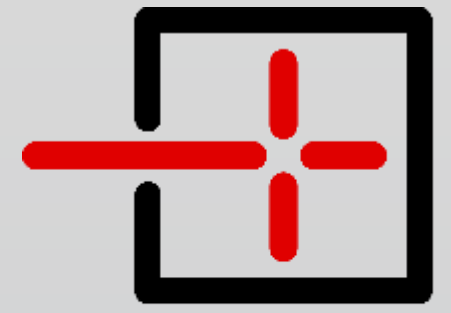
For EMSA's Acceptance Test visit:

[https://www.dropbox.com/s/z9n8no345sy002I/EMSA\\_VIDEO\\_02\\_03\\_NOV\\_17.mp4?dl=0](https://www.dropbox.com/s/z9n8no345sy002I/EMSA_VIDEO_02_03_NOV_17.mp4?dl=0)

[https://www.dropbox.com/s/s5jhzkfyxe6njda/ALTUS\\_EMSA\\_MARCH\\_2018.mp4](https://www.dropbox.com/s/s5jhzkfyxe6njda/ALTUS_EMSA_MARCH_2018.mp4)



# Thank you



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