



## The European GNSS Applications in precision agriculture and mapping

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European Commission – DG ENTR GP3 – GNSS Applications, Security and International aspects

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Directorate-General  
for Enterprise  
and Industry



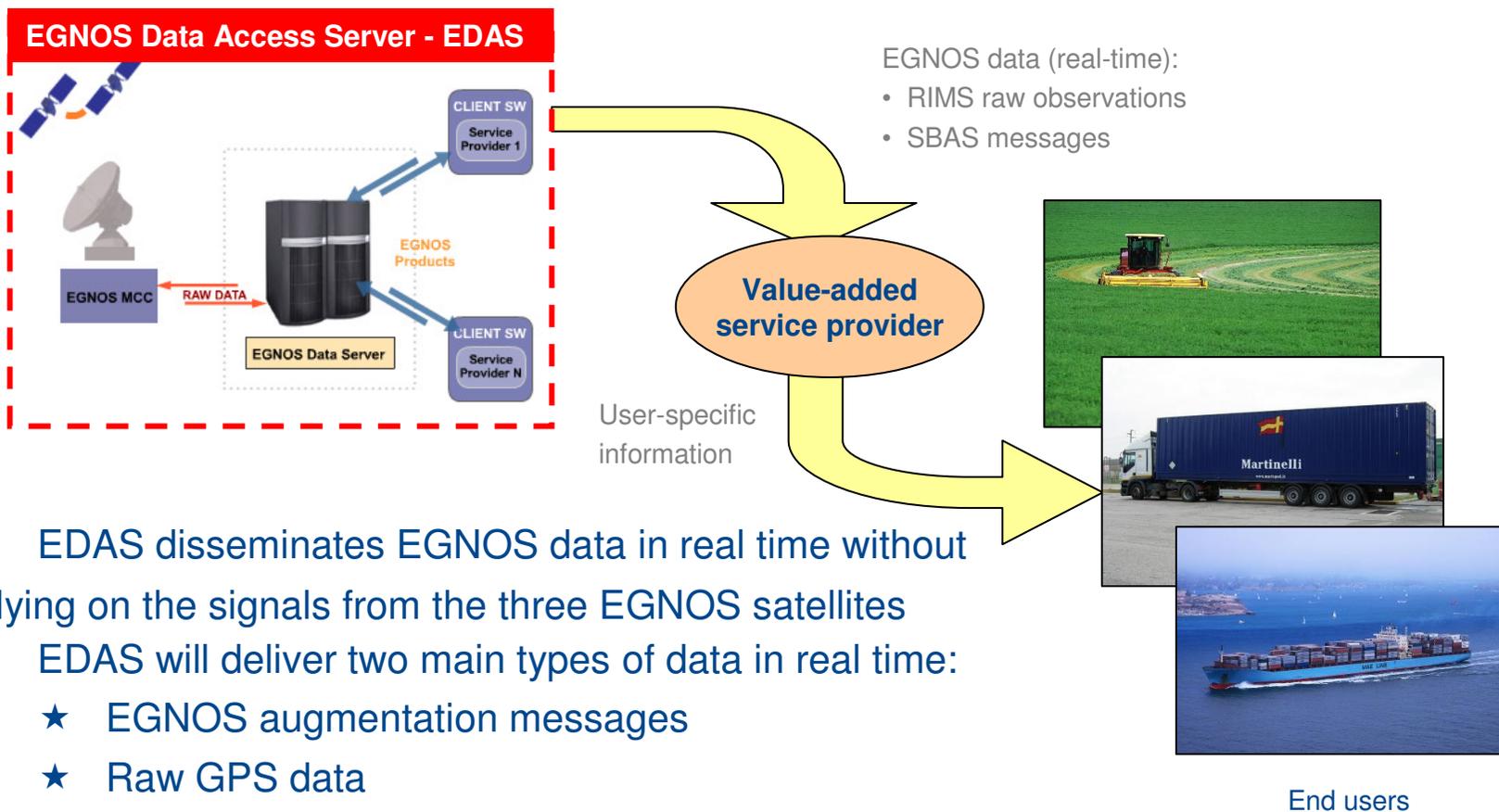
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**EGNOS will deliver its services on a long-term basis (>20 years).**

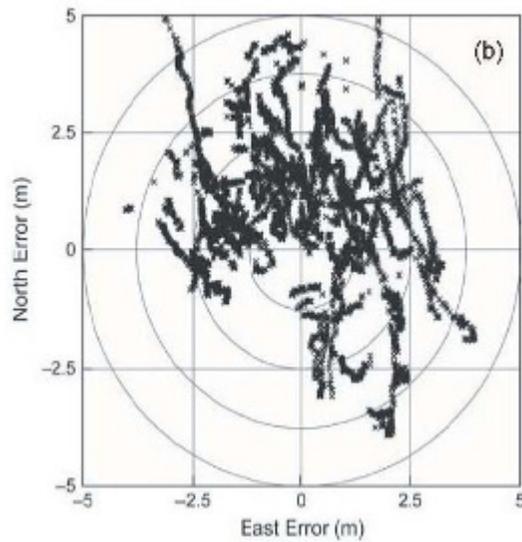
Service	Characteristics	Service Status	
<b>Open Service</b>	accuracy ~1m, free	available since October 2009	
<b>Safety of Life Service</b>	accuracy ~1m, compliant to aviation standards	to be made available end of 2010	
<b>Commercial Service (EDAS)</b>	accuracy <1m, corrections are provided by terrestrial networks	experimental service since 2008; official service to be made available in 2012	

EDAS: EGNOS Data Access Server

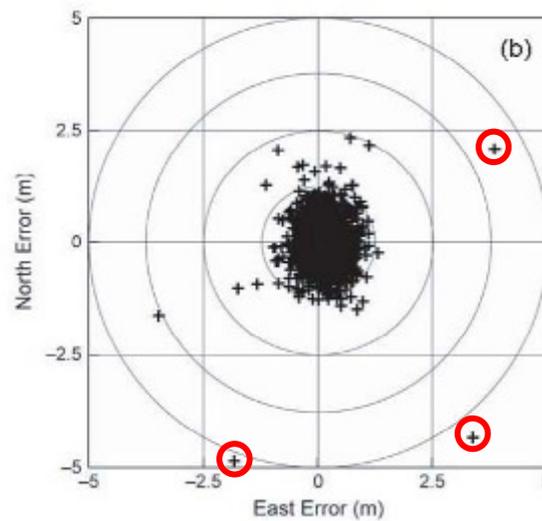
# The EGNOS commercial service (EDAS) will be made available in 2012



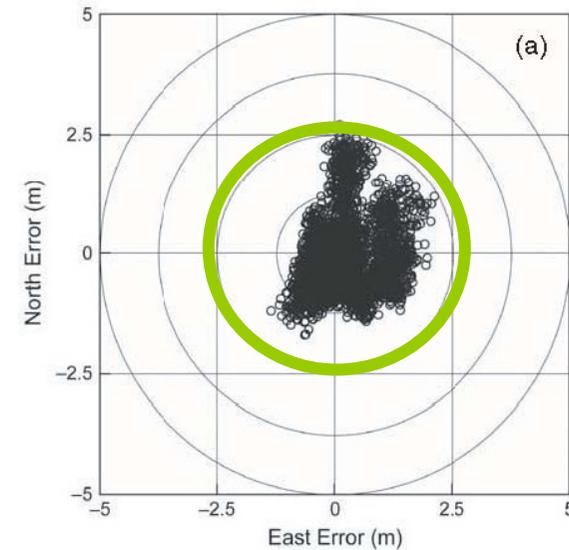
**EGNOS improves GPS accuracy and guarantees an error limited to a certain buffer.**



**GPS**



**D-GPS**



**EGNOS**



**EGNOS**

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**EGNOS**  
FOR AGRICULTURE

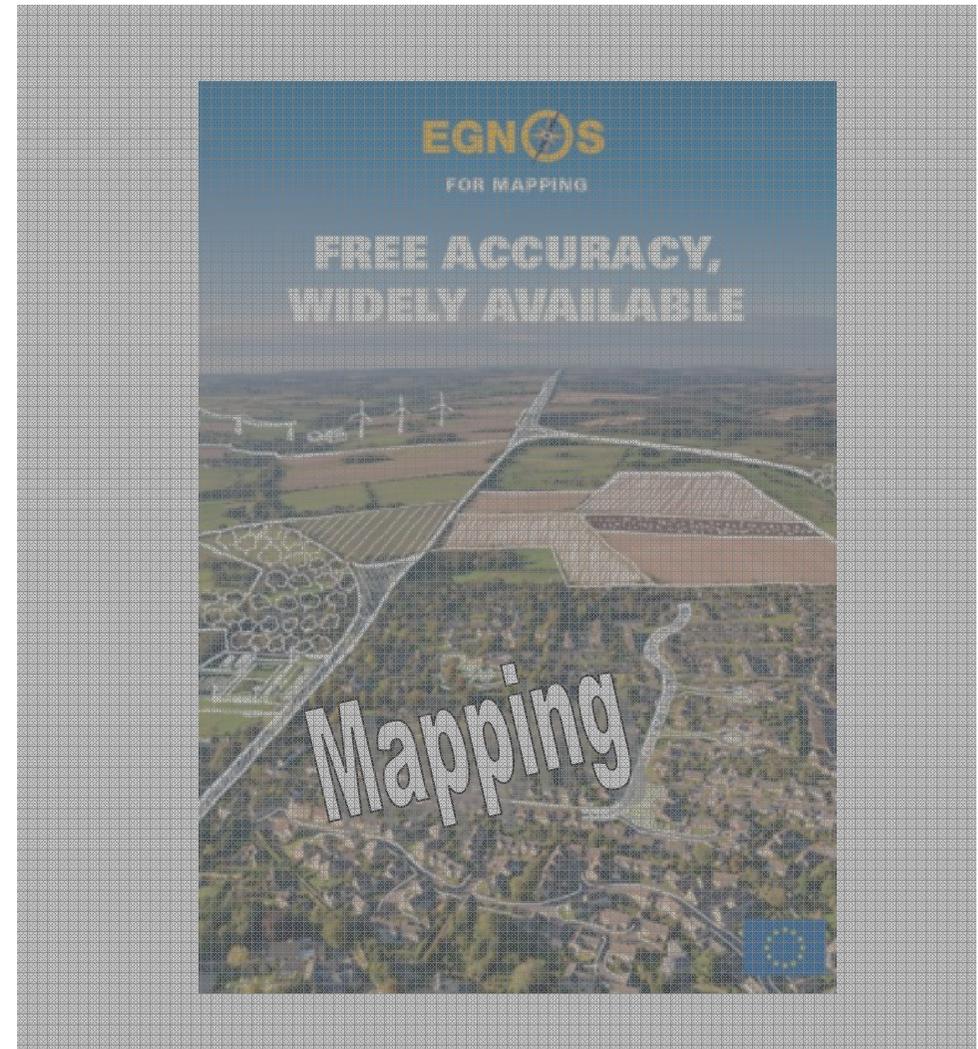
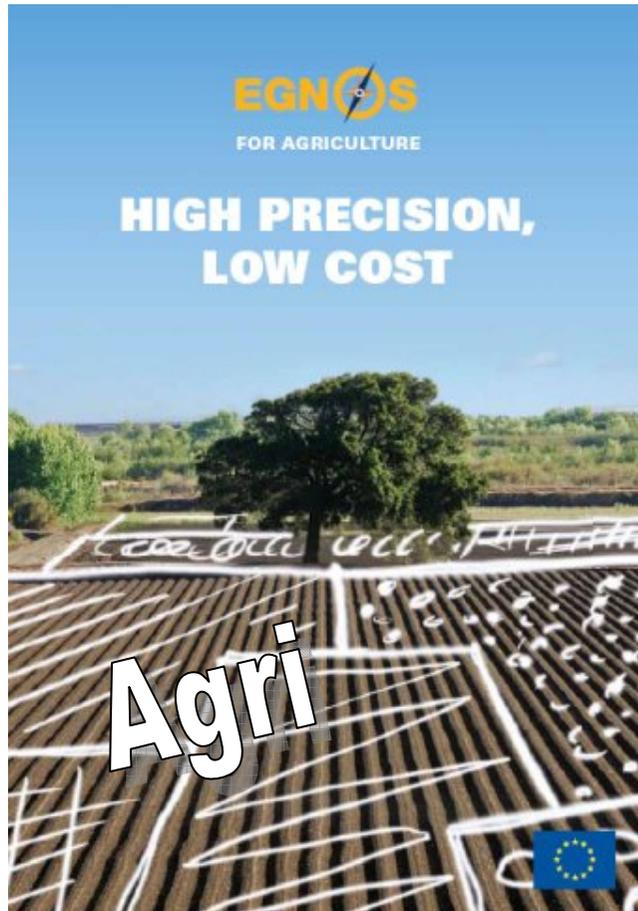
**HIGH PRECISION,  
LOW COST**

**Agri**

**EGNOS**  
FOR MAPPING

**FREE ACCURACY,  
WIDELY AVAILABLE**

**Mapping**



# Why Precision Agriculture?

- ★ **Agriculture challenges:**
  - ★ **Rise in the demand of crops:**
    - Population increase
    - Chemical industry diversification
    - Bio-fuel demand
  - ★ **Limited resources**
    - Limited increase of the cultivable land
    - Water shortage
    - Energy prizes rise



- ★ **Precision Agriculture has an answer:**
  - ★ **Provides:**
    - Increase yield production
    - Better management of resources
  - ★ **Reduces:**
    - ★ Chemical pollution
    - ★ Energy consumption
    - ★ Time

## 2. EGNOS has a wide range of applications for agriculture...



'It's there, use it'



Application category	Application field	Required accuracy level
<b>Arable</b>	High-value crop cultivation and/ or precision operations	c.2cm
	Low-value crop cultivation and low-accuracy operations	c.1m
<b>Dairy</b>	Individual livestock positioning and virtual fencing	2-5m
<b>Agro-logistic</b>	Land parcel identification/ geo-traceability, supervised tracking of livestock, etc.	c.2.5m
<b>Management</b>	Field measurement and boundary mapping and updating	c.2.5m

EGNOS application domain



## EGNOS value added

- Traditionally, precision agriculture has been characterised by significant equipment investment and costs related to usage
- EGNOS can offer an affordable precision solution by enhancing the benefits of Precision Agriculture



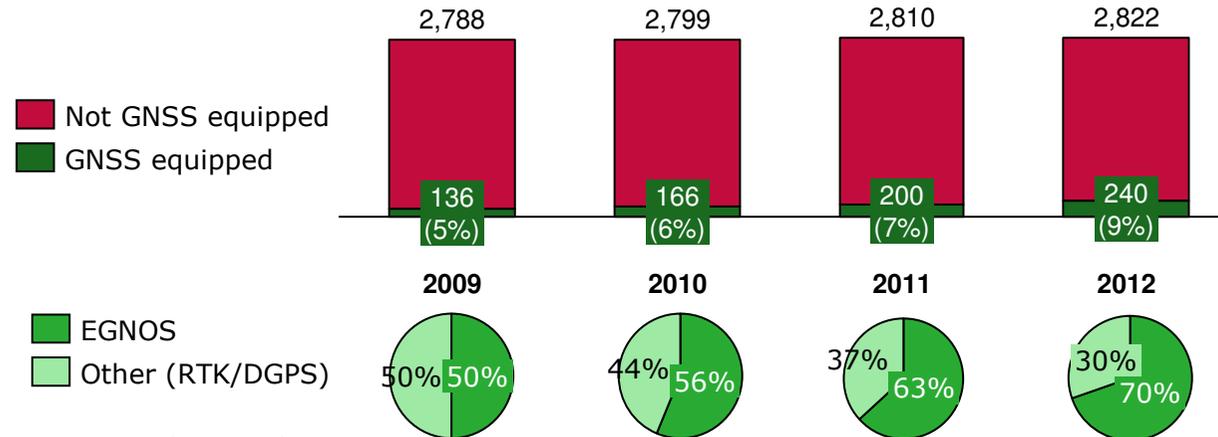
- Enhance precision
- Eliminate waste and over-application of fertilisers and herbicides
- Save time and money
- Reduce fatigue
- Optimise crop yields
- Increase profit margins

# The number of GNSS devices is increasing and EGNOS is the preferred technology



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# of tractors in use in EU-27 (000' units)



Source: Tractor & Device Manufacturers/MMFP

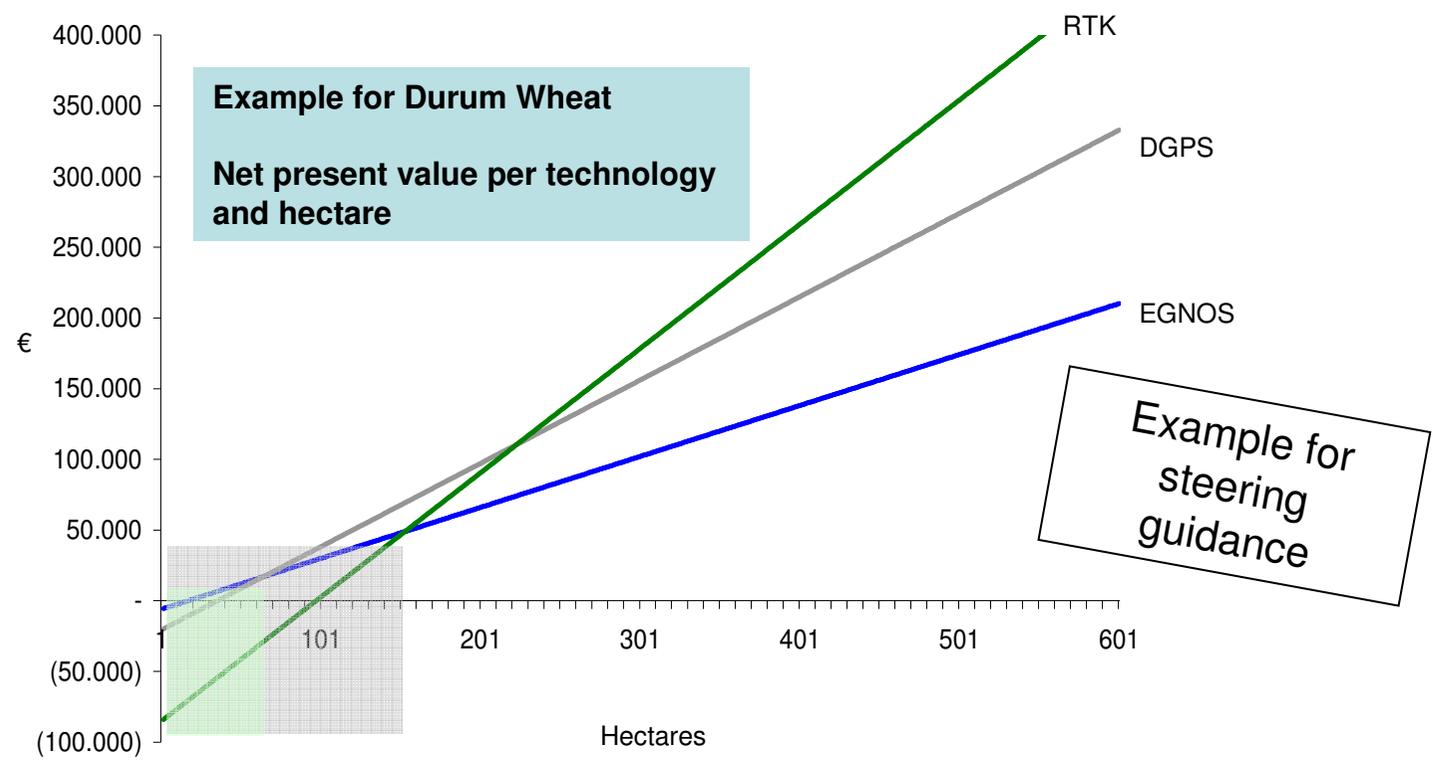
## Product characteristics

- Pass to pass accuracy of +/- 15 cm
- EGNOS-only corrections
- Ideal for fertilising, seeding and spraying
- Entry price, affordable for all farmers

## EGNOS effect on farmers

- They start with EGNOS
  - They appreciate the benefits
- In few years, some of them, migrate to advanced systems to cover new functions

# NPV per technology and farm's hectares – The case of durum wheat



NPV>0	EGNOS	DGPS	RTK
(HA)	17	35	97

Source: GSA CBA

## A practical example

EGNOS is free



- No installation costs neither annual subscription costs are required

EGNOS is widely  
available all over Europe



- 1 on 10 tractors in Europe are equipped today with GNSS receivers, most of them are EGNOS enabled

EGNOS is convenient



- The application of EGNOS involves:
  - 2,36% reduction in time, fuel and seed quantity
  - 2,49% reduction in fertilize and Plant Production Products quantities



EGNOS is an excellent GNSS technology that can be used for a number of applications on farms of the average European size (16 HA)

# R&D projects fill technical gaps and pave the way for high precision applications



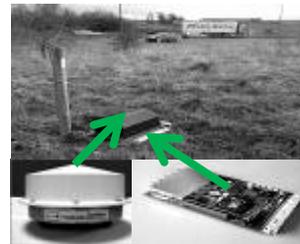
**FIELDFACT:** Promoting the benefits and opportunities of GNSS in agriculture.



**MowBySat;** GNSS in domestic robots to achieve greater precision at low cost.



1<sup>st</sup> Call



**I2GPS:** SAR calibrator with GNSS receiver for precision studies of geodynamics



**ASPHALT:** High precision applications in road construction, fleet management and logistics using EGNOS just-in-time process chain.



**GOLDEN-ICE:** improving the efficiency of salt-spreading (de-icing) services and emergency call management on winter professional vehicles using EGNOS



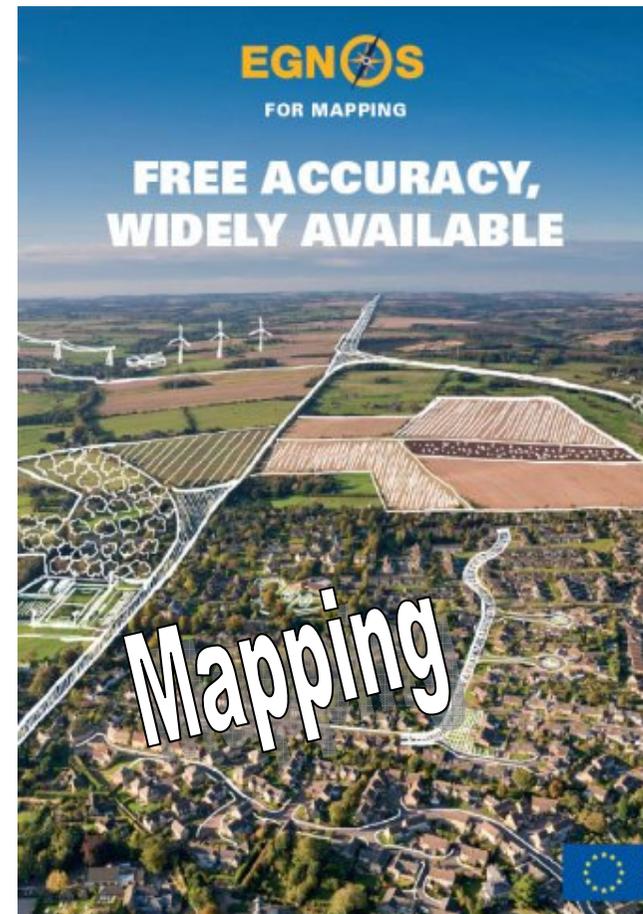
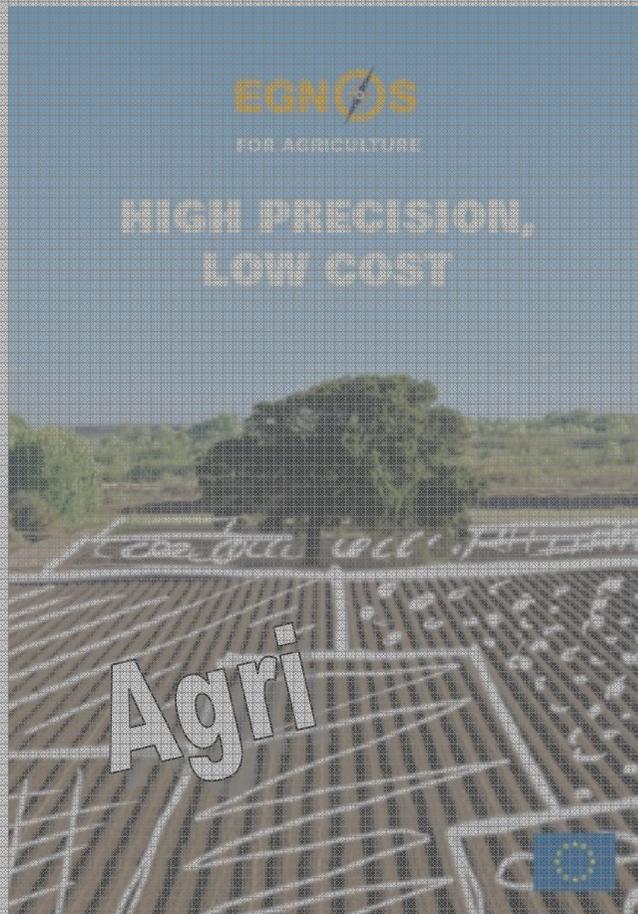
2<sup>nd</sup> Call

Evaluations for 3<sup>rd</sup> Call currently under way



**EGNOS**

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# EGNOS and Mapping - providing free accuracy that is widely available

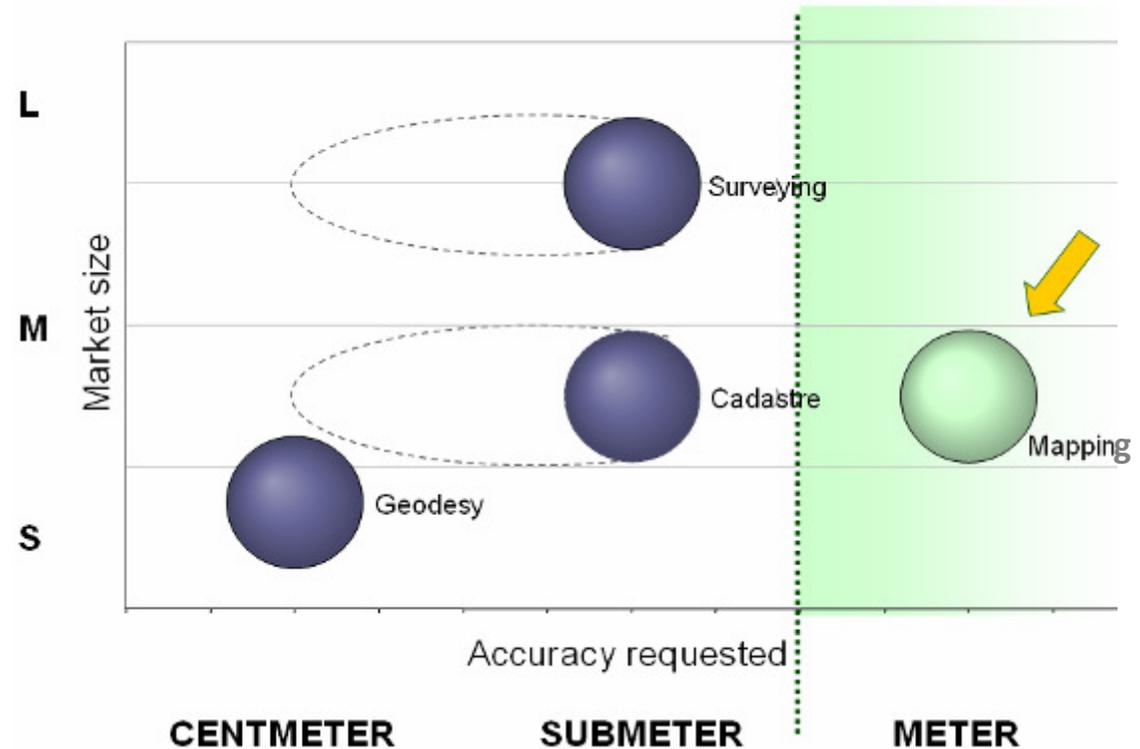


GNSS provide an efficient technology for mapping and are widely used by organisations such as utility companies as well as regional and local authorities.

Mapping addresses services with submeter and centimeter level accuracy.

Centimeter level applications usually require substantial investment (e.g., infrastructure, equipment, software, service).

For meter and certain submeter applications EGNOS is an excellent and inexpensive solution.



# Free accuracy...

## For many mapping applications meter level accuracy is sufficient

Applications such as thematic mapping for small and medium municipalities, forestry and park management as well as surveying of utility infrastructures can benefit from EGNOS.

Most of the devices used for mapping are already EGNOS-ready. Thus, EGNOS also allows more and more non-professionals to access GNSS mapping technologies.



# Mapping: a new promising EGNOS segment

Positioning, delivering 50 cm - 1m accuracy, is well received in general (INTERGEO)

- Device manufacturers give positive feedback
- Users, i.e. Surveyors, municipalities..., show strong interest
- SBAS is already used for sub-meter mapping (US), with similar potential in EU

**Jean-Yves Pirlot**  
President of the  
Council of the  
European Geodetic  
Surveyors



“We think EGNOS can play a role in the Mapping sector and are happy to help exploring this by promoting the **GSA-survey** amongst our partners across Europe.”



**Eric Gakstatter**  
GPS World Editor  
Survey &  
Construction

“GSA folks provide a **dynamic and effective service** in educating the community of ground users (...) Yes, my European brethren, EGNOS can be used reliably for sub-meter mapping.”



**GPS World**  
The Business and Technology of Global Positioning and Positioning

### INTERGEO Conference: Final Thoughts

October 14, 2010  
By: Eric Gakstatter

The final count, 17,500 attendees against an estimated 16,500 as reported by INTERGEO. That's pretty impressive given that conference attendance, in general, has been in decline the past two years. Is it a sign of economic recovery? I don't think so.

In fact, I think the outlook of the North American economy looks pretty bleak. The unemployment rate is going to stay where it's at for the foreseeable future. Companies are making money, but as you've seen reported, they are not spending it on hiring people.

The good news is that we are in an industry that's growing, and ripe for growth for the foreseeable future. What industry am I talking about? It's not so easy to define. I wrote an article about a year ago entitled "Who is Geospatial?". No matter how you apply location, whether it's a municipal GIS or the location component of Facebook, it involves geospatial data and it's red-hot.

The Portable Navigation Device (PND) market wouldn't exist without the geospatial data (e.g. digital maps) that run in the background. The navigation app on your mobile phone wouldn't have any value either.

... have to. It covers the so-called LBS (Location-Based Services) spatial topic altogether.

... geospatial products and service showing. As I mentioned in my earlier GE Smallworld, Bentley, Carlson, The largest presence was from the massive displays, as big as I've seen at C Nav, FDI, Ashtech, Geneq.

... andes: It's the most complete at includes the ION GNSS conference I the manufacturers said it's their biggest

... It's a stark contrast to the ESRI User basis is on the technical sessions.

... ay, Oct. 6. My presentation was surveying". Click on the image below if the list of presentations until you see

## In summary: why EGNOS?

EGNOS is...

...an effective option for a wide range of mapping applications with meter accuracy

...free; it does not require installation of hardware nor ongoing subscriptions.

...in most of the new GNSS devices

...covers the majority of Europe - no white spots

...permitting real time positioning.

...thanks to EDAS, also receivable by terrestrial communication means, (e.g., internet or GPRS)

...providing system integrity, supplying information on the reliability of GPS signals.



**EGNOS, it's there. Use it.**

For more information, please visit:  
**[www.egnos-portal.eu](http://www.egnos-portal.eu)**



Precise navigation, powered by Europe

*EGNOS is Europe's first venture into the field of GNSS and a precursor to Galileo, Europe's global satellite navigation system, currently under development.*

*EGNOS is an open system, now operational and available for use.*



'It's there, use it'



Navigation solutions  
powered by the  
European Union

★ **Thank you for your attention !**