

ESA/CNES/ARIANESPACE-ServiceOptique CSG, S. Martin

SBAS in the world:

Export and extension of EGNOS outside EU



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European Commission - Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs

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EGNOS is part of a worldwide SBAS coverage system

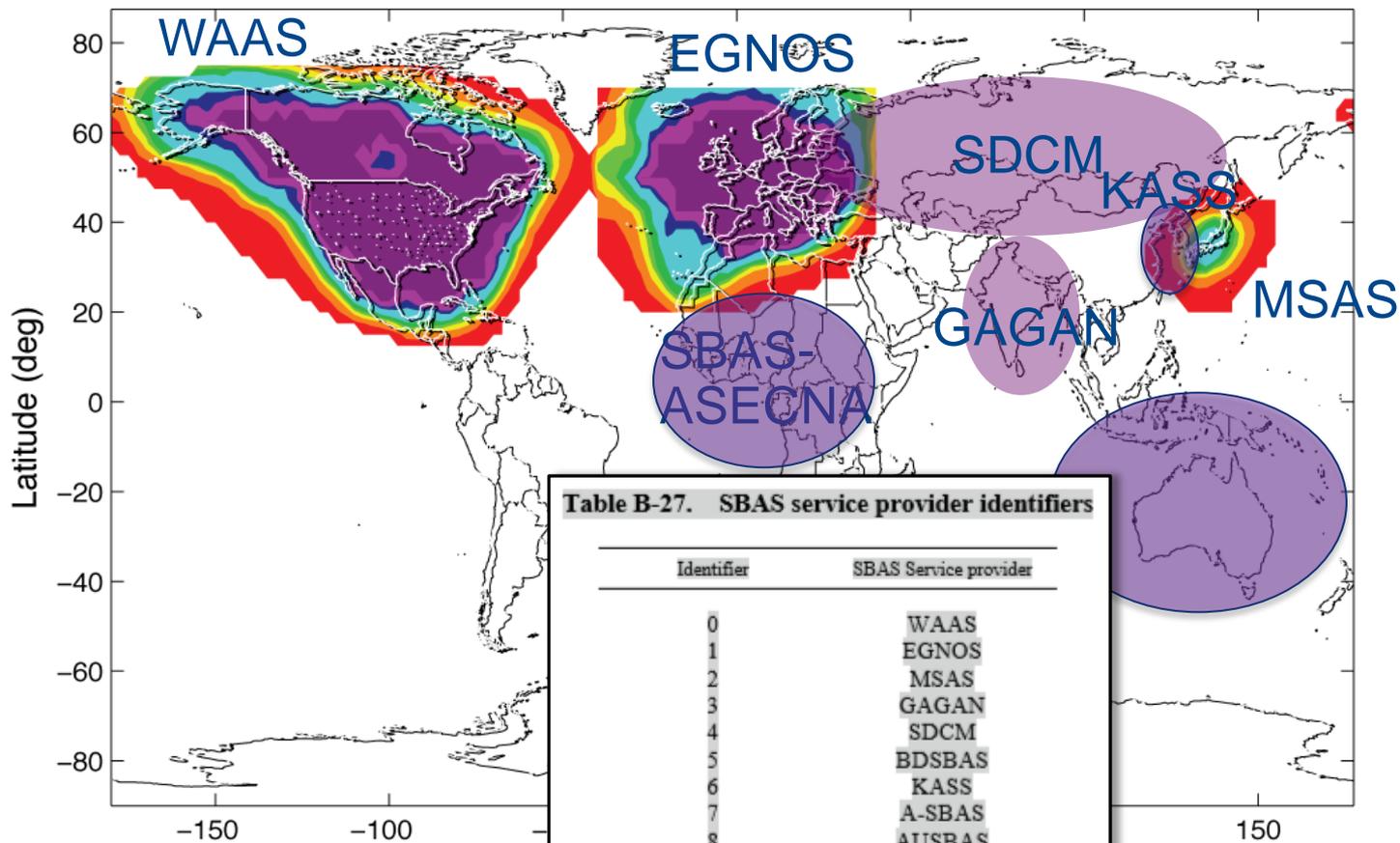


Table B-27. SBAS service provider identifiers

Identifier	SBAS Service provider
0	WAAS
1	EGNOS
2	MSAS
3	GAGAN
4	SDCM
5	BDSBAS
6	KASS
7	A-SBAS
8	AUSBAS
9 to 13	Spare
14 to 15	Reserved
16 to 31	Spare for additional SBAS L5 provider only

WAAS – Wide Area Augmentation System
 EGNOS – European Geostationary Navigation Overlay Service
 MSAS – Multi-functional Satellite Augmentation System
 СДКМ – Система дифференциальной коррекции и мониторинга
 GAGAN – GPS Aided Geo Augmented Navigation

EGNOS beyond EU: the drivers (1/2)

For the European Union



Promotion of the EU industry, maintaining industrial competences on GNSS

- Opportunities for the European GNSS technologies and application industries (upstream and downstream)

Ensure coherence with EU developments

- Optimise infrastructure and service provision

Promote the uptake of **SBAS**, especially for air transport, and of Galileo (with DFMC)

Support the interests of EU users (airlines, ...)

Geopolitical factors

- **EU positioning** in the GNSS arena
- counter Chinese and Indian influence

Pursuing other **EU policies** (i.e. cooperation, external relations, neighbouring, transport harmonisation)



WAAS available in Mexico and Canada since 2007



Volume 32, November 2007



Federal Aviation Administration

SatNav News

FAA Satellite Navigation Product Teams

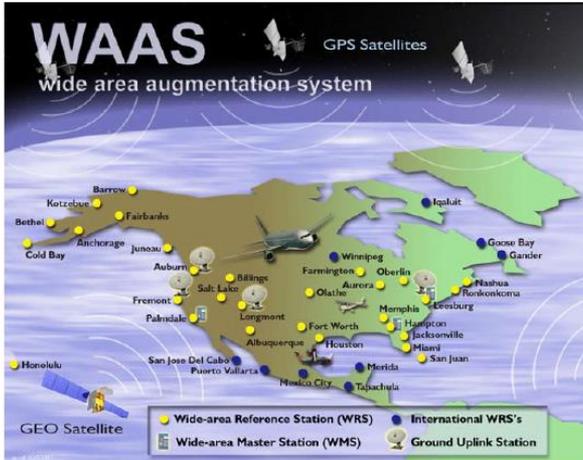
WAAS Now Available in Canada and Mexico

In this issue:

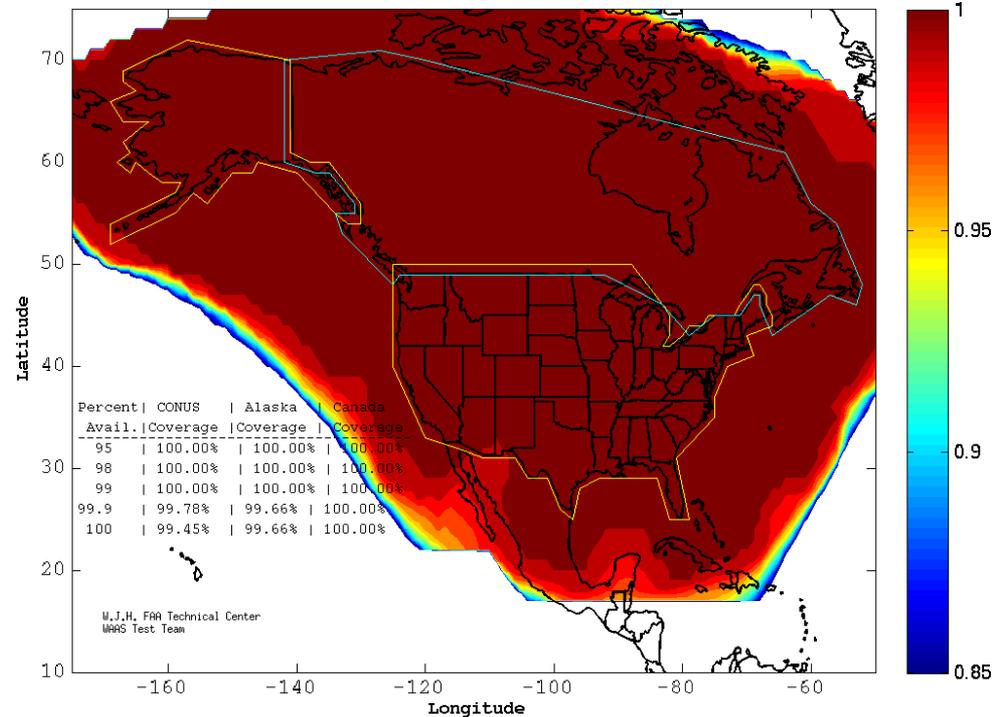
WAAS Now Available in Canada and Mexico

TODAY (Sept. 2019):

WAAS LPV Coverage Contours
09/17/19
Week 2071 Day 2



Thirty-eight wide-area reference stations (WRS) are located throughout the U.S., Canada. These stations monitor GPS satellites and collect the data used to create the WAAS signal which is broadcast by the two WAAS geostationary satellites.



EGNOS beyond EU: the drivers (2/2)



For foreign countries and organisations

Use EGNOS/SBAS to comply with **ICAO requirements** on PBN



Use the EU SBAS technology in **other transports & non-transport** domains (agriculture, maritime, logistics, ...).



Cooperate with EU on space matters



Specific constraints, e.g.: autonomy, cost-effectiveness, timing for services



EGNOS beyond EU: the drivers (2/2)



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Specific constraints, e.g.: accurate timing for services

STUDY CASE: EAST AFRICA

1 EUR invested provides in return...



PBN for APV

ANSPs

> 12 EUR

Airspace users

> 63 EUR*



Precision Agriculture (machine guidance)

Small farmers

> 89 EUR

Large farmers

> 14 EUR**



Container inventory management in ports

Port operators

> 26 EUR

* Considering only increased efficiency of aircraft operations

** Considering only 63% of utilization rate of the tractors

Widespread political support

- *Partnership between the European Union and Africa. Connecting Africa and Europe: working towards strengthening transport cooperation COM(2009)301, June 2009 - Action Plan on Global Navigation Satellite Systems (GNSS) Applications COM(2010)308, June 2010 - Space for the African citizens, High-level Meeting under the Belgian EU Presidency, September 2010 - 7th Space Council, Resolution on "Global challenges: taking full benefit of European space systems", Brussels, November 2010 - Declaration of the 4th EU-Africa Business Forum, Tripoli, 27-28 November 2010 - 3rd Partnership: Regional Economic Integration, Trade and Infrastructure - Second Action Plan adopted at the Africa-EU Summit (November 2010) - Priority No 2: Support to Air Transport Sector and Satellite Navigation*
- *ICAO 12th Navigation Conference (Montreal, November 2012), AU Member States resolved to embrace GNSS - ACAC (Arab Civil Aviation Commission) formally expressed (May 2013) the intention to discuss institutional, financing and technical aspects*
- *'Roadmap 2014-2017' adopted by African and EU Heads of State at the 4th Africa-EU Summit (April 2014) - Recommendations of the 5th Africa-EU Business Forum (March 2014)*
- *Consideration of African Space Policy and Strategy as adopted by AU Summit in 2016 and proposed creation of an African Space Agency with Satellite Navigation and Positioning*
- *Declaration of the first Session of the AU multi-Sectorial STC in March 2017 in Lomé to conduct a continental CBA and strategy for Africa*
- *Conclusions of the Africa-Europe Alliance Transport and Connectivity Task of the 'Africa-Europe Alliance for Sustainable Investment and Jobs' (July 2019)*



26.10.2018

EN

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COUNCIL DECISION (EU) 2018/1603

of 18 September 2018

on the conclusion on behalf of the Union of the Cooperation Agreement between the European Union and the Agency for Aerial Navigation Safety in Africa and Madagascar (ASECNA) on the development of satellite navigation and the provision of associated services in ASECNA's area of competence for the benefit of civil aviation

Legal basis: GNSS REGULATION (EU)1285/2013



Geographical coverage of the EGNOS system may be extended to other regions of the world, in particular to the territories of candidate countries, of third countries associated with the Single European Sky and of countries in the European Neighbourhood Policy, provided certain conditions are met:

- subject to technical feasibility;
- on the basis of international agreements;
- the cost of such extension, including the related exploitation costs, must be covered outside the budget allocated to the EU GNSS programmes and
- extension must not delay the extension of the geographical coverage of the EGNOS system throughout the Member States' territories geographically located in Europe.

Text proposed in the new space regulation:

*"...The geographical coverage of EGNOS may be extended to other regions of the world, in particular to the territories of candidate countries, of third countries associated with the Single European Sky and of third countries in the European Neighbourhood Policy, subject to technical feasibility and in conformity with security requirements, **and for the SoL service, on the basis of international agreements.**"*

EGNOS beyond EU: three models

Service provision without additional infrastructure (non-EU countries within coverage area)

- West Balkans (Albania, Bosnia-Herzegovina, Kosovo, North Macedonia, Montenegro, Serbia);
- Switzerland, Iceland, Norway, etc.
- *Assessment of compliance with Single European Sky regulation*
- *Operational agreements ESP-local ANSP (EGNOS Working Agreement, EWA)*

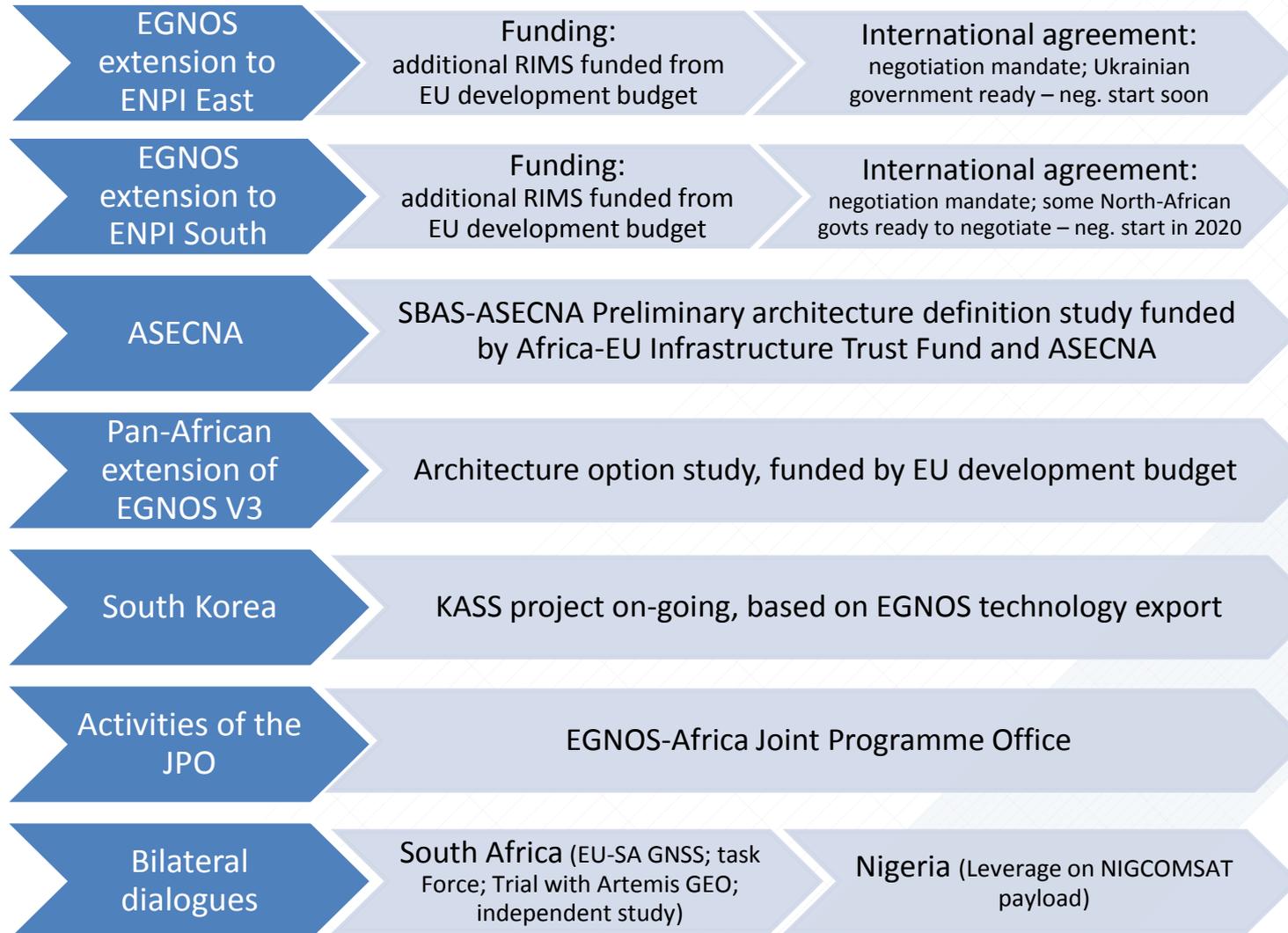
Extensions of core system, with expansion of ground segment (RIMS)

- Neighbouring countries South (Morocco, Algeria, Tunisia, Libya, Egypt, Jordan, Israel, Lebanon)
- Neighbouring countries East (Belarus, Ukraine, Moldova, Georgia, Armenia, Azerbaijan)
- Potential pan-African coverage
- *Funding to connect additional RIMS*
- *International bilateral agreements EU-each State*
- *Operational agreements ESP-local ANSP (EGNOS Working Agreement, EWA)*

Export of EGNOS technology for independent autonomous systems

- ASECNA (West and Central Africa)
- South Korea
- Potential export to other regions
- *License agreements for the use of EGNOS technology – in compliance with security requirements*
- *Accompanying measures (technical assistance, finance, etc.)*

State of play





Pan-African instrument in charge of supporting and coordinating the development of GNSS/EGNOS (based on the European solution) in Africa and the provision of related services

- Overseen by a programme Steering Committee co-chaired by EC and AUC with the participation of AFCAC/ACAC/ICAO/ASECNA and Regional Economic Communities
- Team of 10 experts
- Technical studies encompassing applications in aviation and non-aviation sectors
- Capacity building and awareness (workshops)
- Prepares Preliminary Programme proposals

THANK YOU

<http://ec.europa.eu/galileo>