

# Galileo Programme Status Update

UN ICG Workshop on GNSS Applications

12 December 2016, Kathmandu, Nepal



# PROGRAMME PRIORITIES



Deploying the infrastructure

Providing services as they come on stream

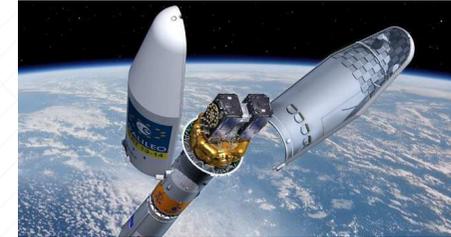
Establishing Galileo in the market

Preparing for the future

## 2016 HIGHLIGHTS



- **SUCCESSFULLY COMPLETED** two **GALILEO** launches including the recent quad launch on Ariane 5
- Procurement of final **GALILEO** satellites
- Service **OPERATOR** Selection
- Galileo Service **VALIDATION** Campaign + Initial **SERVICES**
- Set-up and start a Galileo User **CONSULTATION FORUM**
- Galileo and EGNOS contribution to the **SPACE STRATEGY** for Europe
- Prepare strategic goals for Galileo **2<sup>nd</sup> GENERATION**



# GALILEO SPACE SEGMENT



FIRST FOUR SATELLITES (IOV)  
LAUNCHED IN 2011 AND 2012

SATELLITE 5 & 6 RECOVERED  
AND ON IMPROVED ORBITS

SATELLITE 7 & 8 LAUNCHED  
ON 27 MARCH 2015

SATELLITE 9 & 10 LAUNCHED  
ON 11 SEPTEMBER 2015

SATELLITE 11 & 12 LAUNCHED  
ON 19 DECEMBER 2015

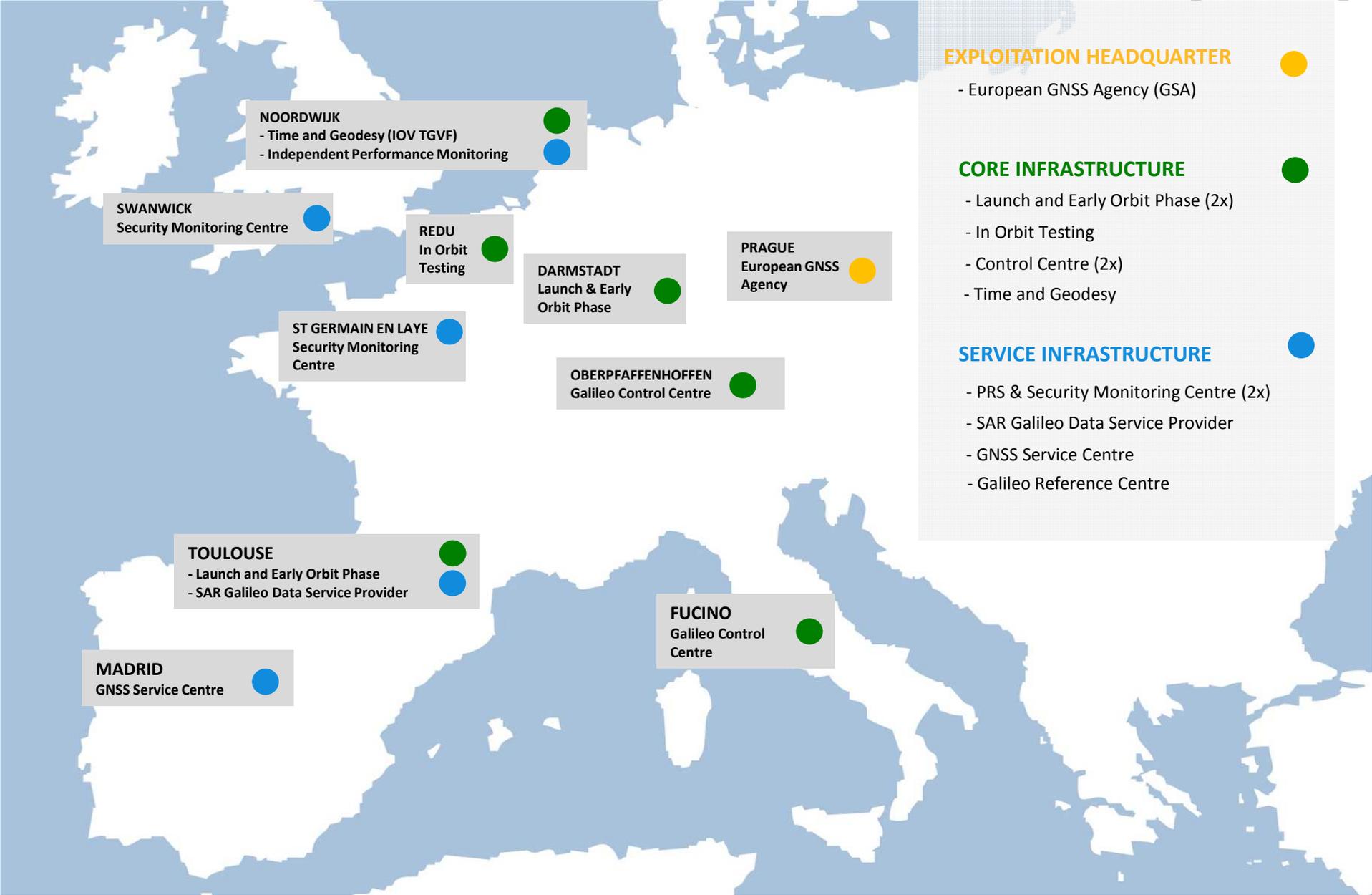
SATELLITE 13 & 14 LAUNCHED ON  
24 MAY 2016

SATELLITES, 15-17 launched  
November 2016

30 SATELLITES IN ORBIT BY 2020



# GALILEO SERVICES INFRASTRUCTURES (in the EU)



# Galileo Service Provision



- Hand Over of exploitation phase to the **European GNSS Agency (GSA)**
- On-going selection of the **Galileo Service Operator (GSOp)**
  - Contract signature before end 2016
  - Handover of operations by mid 2017
- New **GNSS Service Center** building in Madrid
  - One-stop shop for Galileo customers
- New **Galileo Reference Center** in Noordwijk
  - Independent monitoring of Galileo performance based on EU Member States infrastructure and competences

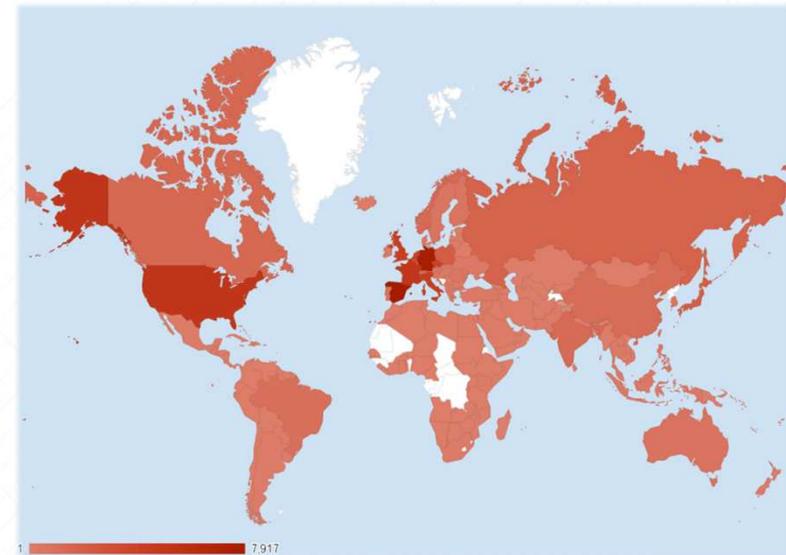
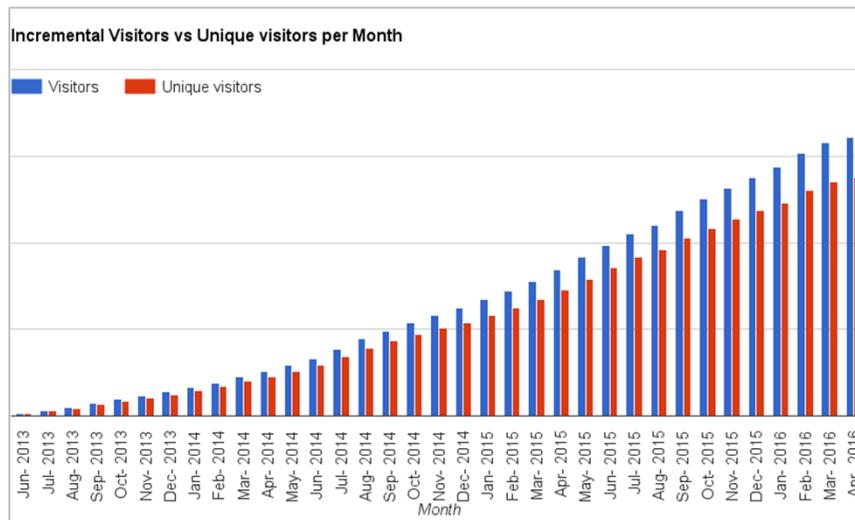


# GALILEO SERVICE CENTRE for Users



Some GSC figures (from 1<sup>st</sup> Jun 2013 to 15<sup>th</sup> April 2016):

- More than **71k visits** from **181 different countries!**



- **143 user requests** handled and **91 advisory notices (NAGU)** published
- **383 registered users** on the GSC web portal

# REGULATED APPLICATIONS



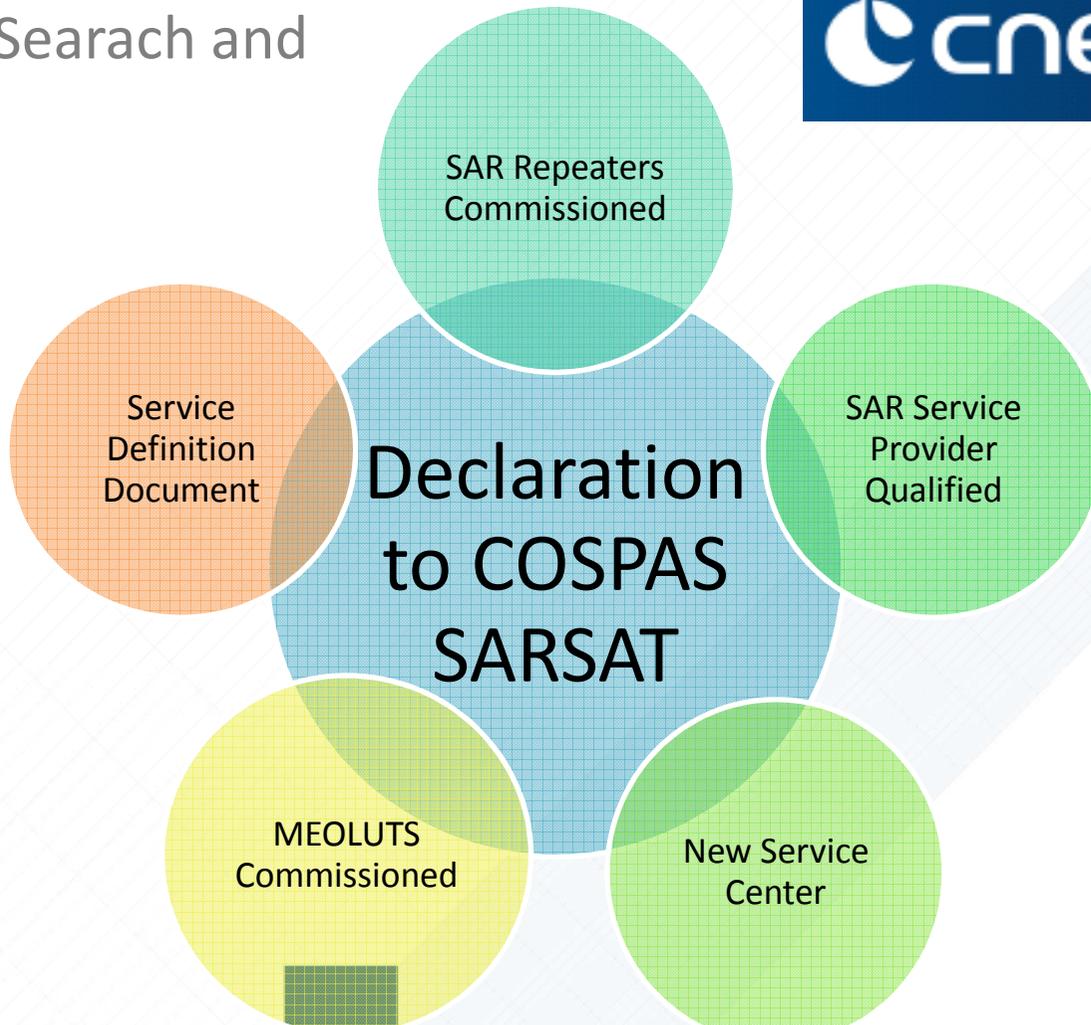
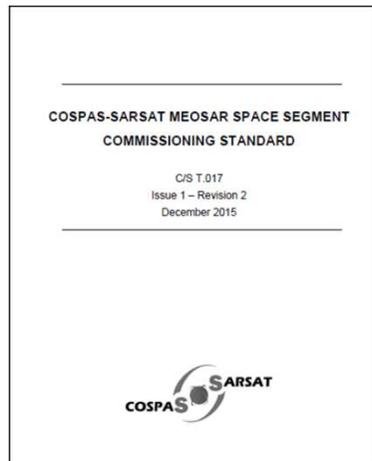
- **Digital Tachograph**
  - Adopted in March 2016
  - Foresees use of Galileo and EGNOS
  - Same wording as in eCall
- **World Wide Radio Navigation System**
  - Recognition of Galileo as WWRNS
  - Maritime and Safety Committee – 11-20 May 2016
- **Use of Galileo in Critical Infrastructures**
  - Under analysis for timing and synchronisation
- **Use of EGNOS and Galileo to improve safety and performance in automated driving**



# Search and Rescue – Almost There



Galileo fully incorporated into the Cospas-Sarsat Search and Rescue System



# EVOLUTIONS - ROADMAP



**Consult**

- Users
- Industrial Stakeholders
- Member States and Institutional actors

2015-2016

**Consolidate**

- Mission needs established by EC
- System scenarios established by ESA
- Cost Benefit Analysis conducted by GSA

2016-2017

**Decide**

- Space Stratgy
- Budgetary Authority

2018

**Implement**

- G2G Design and First launch

FROM 2020



## EGNSS in the **SPACE STRATEGY** FOR EUROPE



- The European Commission develops a **Space Strategy** for Europe
- Regarding European GNSS, the main aims are:

Deliver reliable and state of the art services matching the user needs

Ensure long term continuity of EGNOS and Galileo services and plan their evolutions

Accompany market uptake

Secure European industrial capacity



# INTERNATIONAL



- Targeting excellence and compatibility
- Extensive bi-lateral cooperations
- Continuous involvement in multilateral discussions in UN-ICG, ITU, Cospas Sarsat
- Cooperation in international standardisation bodies
- Partnership with other SBAS providers for future multiconstellation solutions



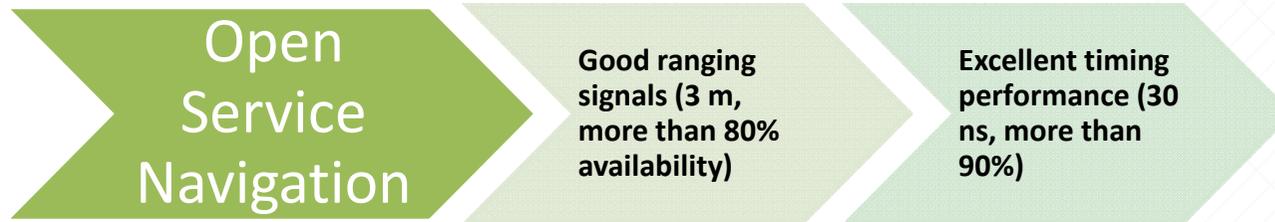
## GALILEO INITIAL SERVICES



- Declaration of services will be gradual based on already deployed infrastructure
- Like GPS, Galileo will provide free signals to users – the Open Service
- A Search and Rescue Service, fully incorporated into the international Cospas Sarsat system – to help locate emergency distress beacons
- An encrypted signal for governmental users such as the police, civil protection, customs control – the Public Regulated Service
- Expected performance to be published at the time of declaration. See here: [www.gsc-europa.eu](http://www.gsc-europa.eu)
- Galileo already incorporated into many smartphone chipsets, just needs to be activated by the manufacturer/operator
- When? This week! Expected declaration for first Galileo operations – the **Initial Services**: 15 December 2016

# PERFORMANCE LEVELS

BASED ON AVAILABLE INFRASTRUCTURE IN 2016



# The EU's other Space Programme: Copernicus

<http://emergency.copernicus.eu/>



European Commission Emergency Management Service

Home >>

Home | What is Copernicus | EMS - Mapping | EMS - Early Warning System News

LATEST NEWS · 2016-10-12 | [EMSR187] Floods in Romania

## EMS - MAPPING

- Service Overview
- Who can use the service
- How to use the service
- Products: Rapid Mapping
- Products: Risk and Recovery
- Quality control / Feedback
- New phase in brief
- User Guide

## RAPID MAPPING

- List of Activations
- Map of Activations
- GeoRSS Feed 84 readers

## RISK AND RECOVERY

- List of Activations
- Map of Activations
- GeoRSS Feed 23 readers

## OTHER

## EMSR125: Earthquake in Nepal

**Event Time (UTC):** 2015-04-25 11:45

**Event Time (LOC):** 2015-04-25 16:45

**Event Type:** Earthquake

**Activation Time (UTC):** 2015-04-25 12:20

**Reference maps produced:** 22

**Delineation maps produced:** 14

**Grading maps produced:** 8

**Activation Status:** Closed

**Affected Countries/Territories:**

Federal Democratic Republic of Nepal

**Area Descriptor:** Katmandu, Bidur, Pokhara, Bharatpur

**Authorized User:**

EC Services|DG ECHO

**Activation Reason:**

An earthquake in Nepal with a magnitude of 7.9M, 10km depth occurred with at least one consequent aftershock of 7.1M, 10km depth. The epicenter is located between the capital Kathmandu and the city of Pokhara, and was also felt in northern parts of India. Extensive damage to buildings and injuries have been reported.

**Requested Product:** Reference and Grading Maps



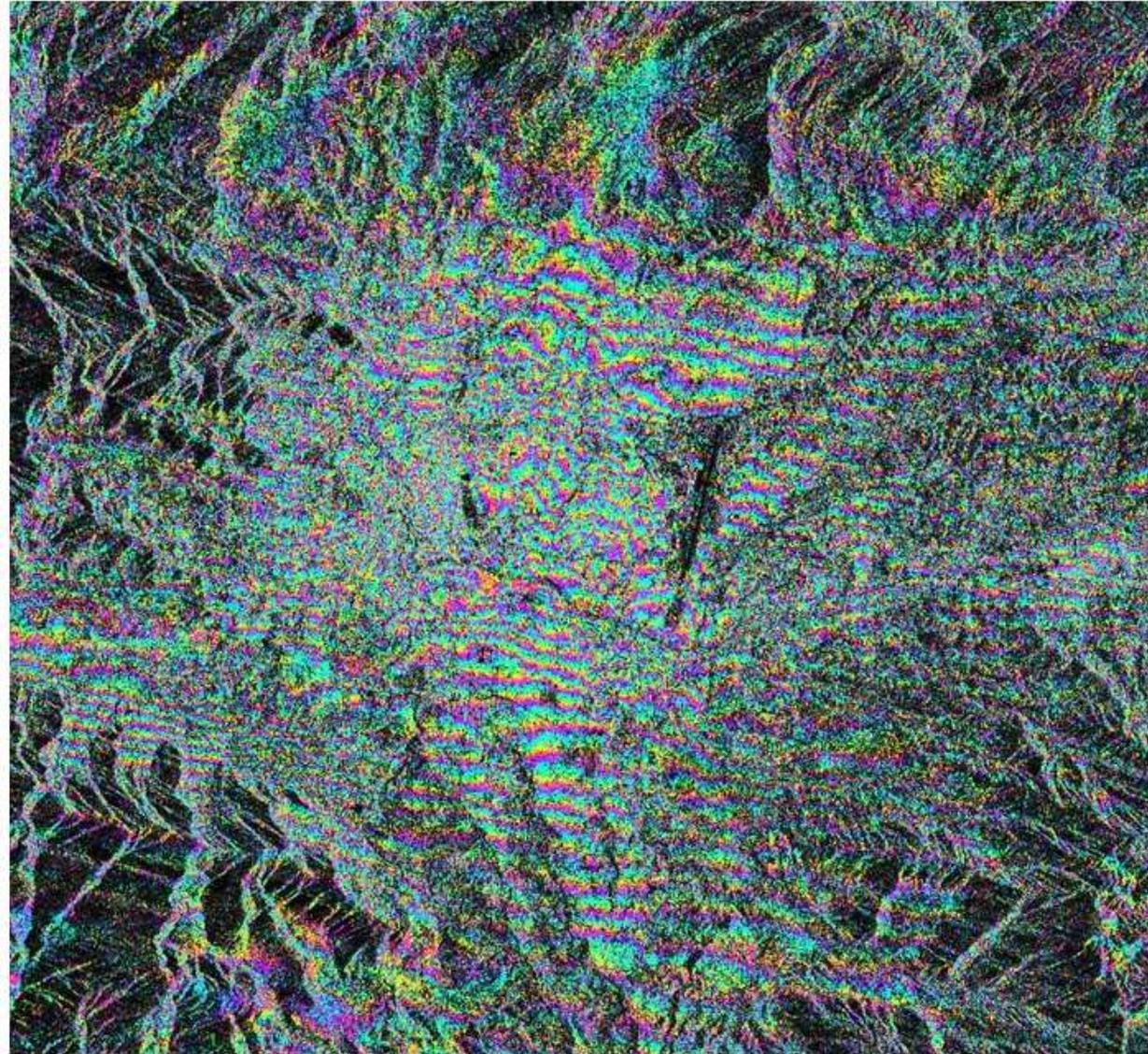
Tweet

Coverage map:

GeoRSS:



# Example Copernicus image Earthquake Deformation in Kathmandu

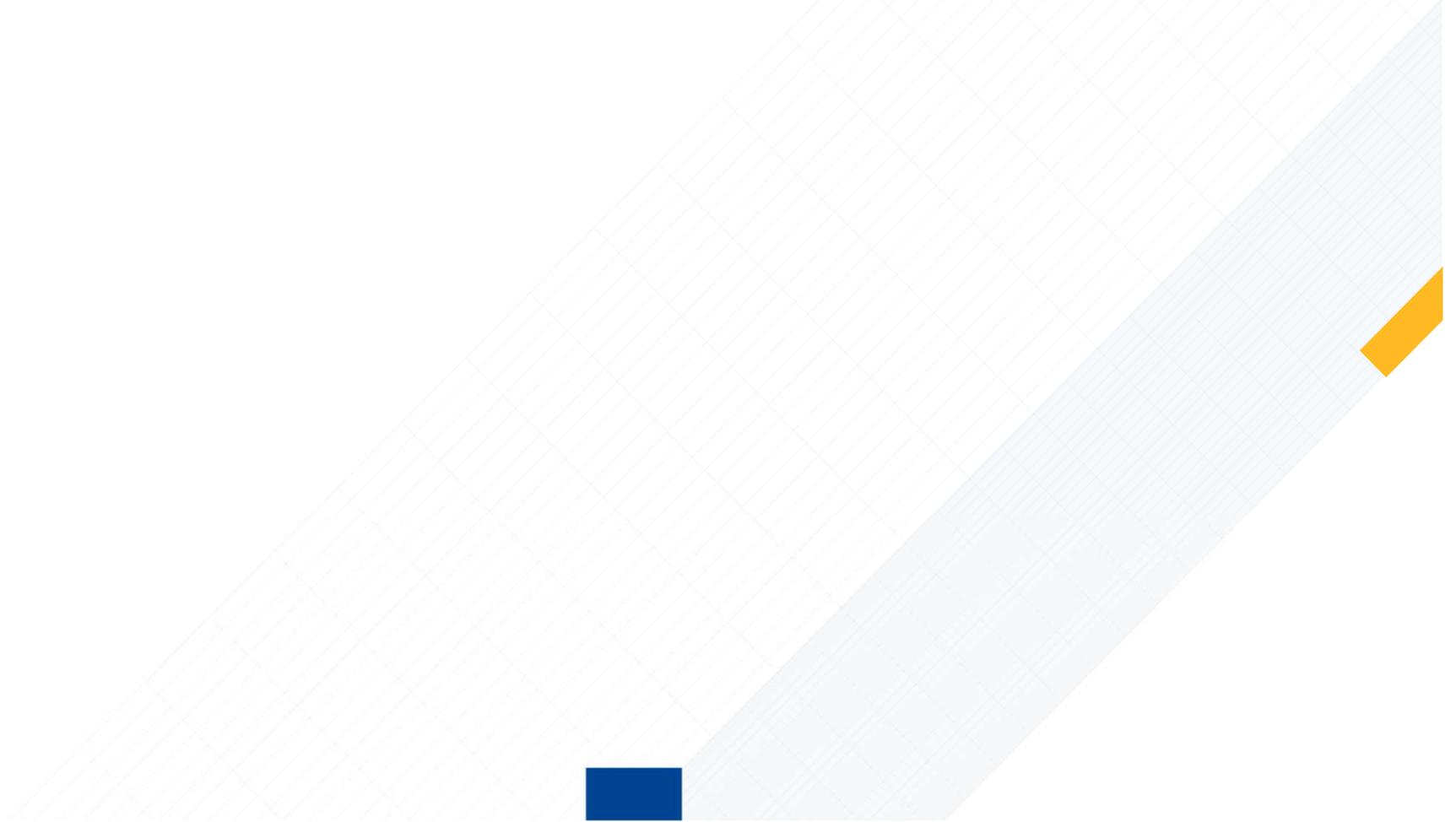


# Any Questions?



Biker Dom in Nepal, May 2016

# Overflow



# GALILEO REFERENCE DOCUMENTATION

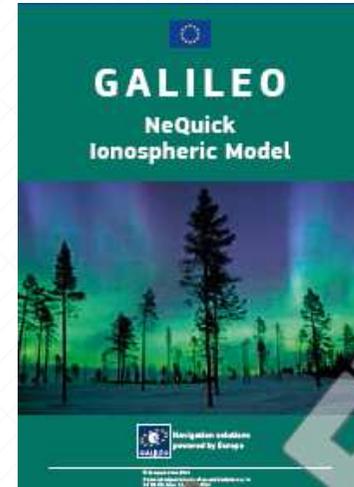


## Galileo Open Service Signal In Space Interface Control Document (OS SIS ICD)

Version 1.2 to be published end 2015

## Galileo NeQuick Ionospheric Model

Version 1.1 published in April 2015



## Galileo SIS Operational Status Definition

Version 1.1 published in July 2016



## Galileo OS Service Definition Document

First version in 2016 with Initial Service performance  
Updated version in 2017-18 with more consolidated FOC performance

