Norway regional seepage study

NPA’s satellite seepage detection project contains extensive coverage across offshore Norway. Seepage detection by SAR (Synthetic Aperture Radar) is a proven technique for mapping surface oil seeps which could provide the first indication of petroleum systems in these basins:

- 501 interpreted SAR scenes over offshore Norway
- Currently increasing the number of scenes in areas of sparser coverage

Background

According to the Norwegian Petroleum Dictatorate (NPD), 56 exploration wells were drilled in 2014 with an impressive 22 new discoveries - eight in the North Sea, five in the Norwegian Sea and nine in the Barents (including Lundin’s giant Alta oil discovery in the Loppa High, 20km NE of the existing Gohta oil discovery), and four new fields were also brought into production. The present 23rd licensing round is therefore likely to be well supported, especially in the central Barents and the newly opened SE Barents.

Vast areas, particularly in the Norwegian Arctic, remain undrilled or are not yet open to exploration, where satellite seep data could be of considerable value in source de-risking. Even in many of the more mature basins, the mix of oil and gas fields in close proximity demonstrates the complex nature of interacting petroleum systems where source type (i.e. oil vs gas) and maturity remain a critical risk factor, which NPA’s satellite seepage study directly addresses.

NPA seep data has also been combined with a new Geolab surface geochemistry study over the Central Barents to help validate our results and tie them to mapped Permian and Triassic source kitchens.

Temporally repeating slicks have been detected offshore Norway and additional sites of repetition could be expected with increasing coverage levels. This key information for offshore Norway is now available from NPA.
Comprehensive mapping and categorization of offshore oil seeps is essential for efficient offshore oil and gas exploration. Enhanced and interpreted SAR satellite imagery is capable of identifying key regions of seepage, thus focusing exploration efforts and reducing costs.

**Coverage**
- Multiple scene coverage - up to 10x coverage levels becoming standard
- Optimal satellite SAR data selected from weather screening of the world’s SAR archives
- Data integrated and interpreted with supporting geological, geophysical and geochemical data from Robertson, where available
- New high-resolution data from TerraSAR-X, Radarsat-2 and COSMO-SkyMed satellites used for license studies

**Deliverables**
- Full ArcGIS® deliverables with all scenes and slick images geo-referenced and hyperlinked
- Unique repeats database comparing seep locations using multi-date coverage
- Results overlaid and compared to collateral data layers including: bathymetry, gravity, sedimentary thickness, magnetics, shipping lanes and shipwrecks
- New ship and rig layers available for all scenes to complement the interpretation

**Additional unique features**
- Repeat database and seepage intensity maps - related to basin leakiness parameters
- Purchased seep data accessible via the Robertson Tellus geological database
- Complete validation chain available - seeps - multibeam - drop cores - geochemistry - surface sampling

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