

Nordic meeting on Aerial Photography and Laser Scanning/DEM

There have been an annual meeting in this group since 2010. Last year the meeting were in Copenhagen hosted by SFDE with 22 participants from 8 countries.

- Norway 4
- Sweden 5
- Finland 3
- Estonia 2
- Latvia 2
- Iceland 1
- Faroe Isl. 1
- Denmark 4

It was 2 days workshop with National reports and technical lessons with these topics:

- Aerial Nadir Photography
- Oblique imagery
- Lidar scanning
- Sentinels 1 + 2
- Single Photon Lidar
- Deep learning – raster classification
- DTM from images – 3D models

From the short report from the meeting, the corporations for 2018 are as follows:

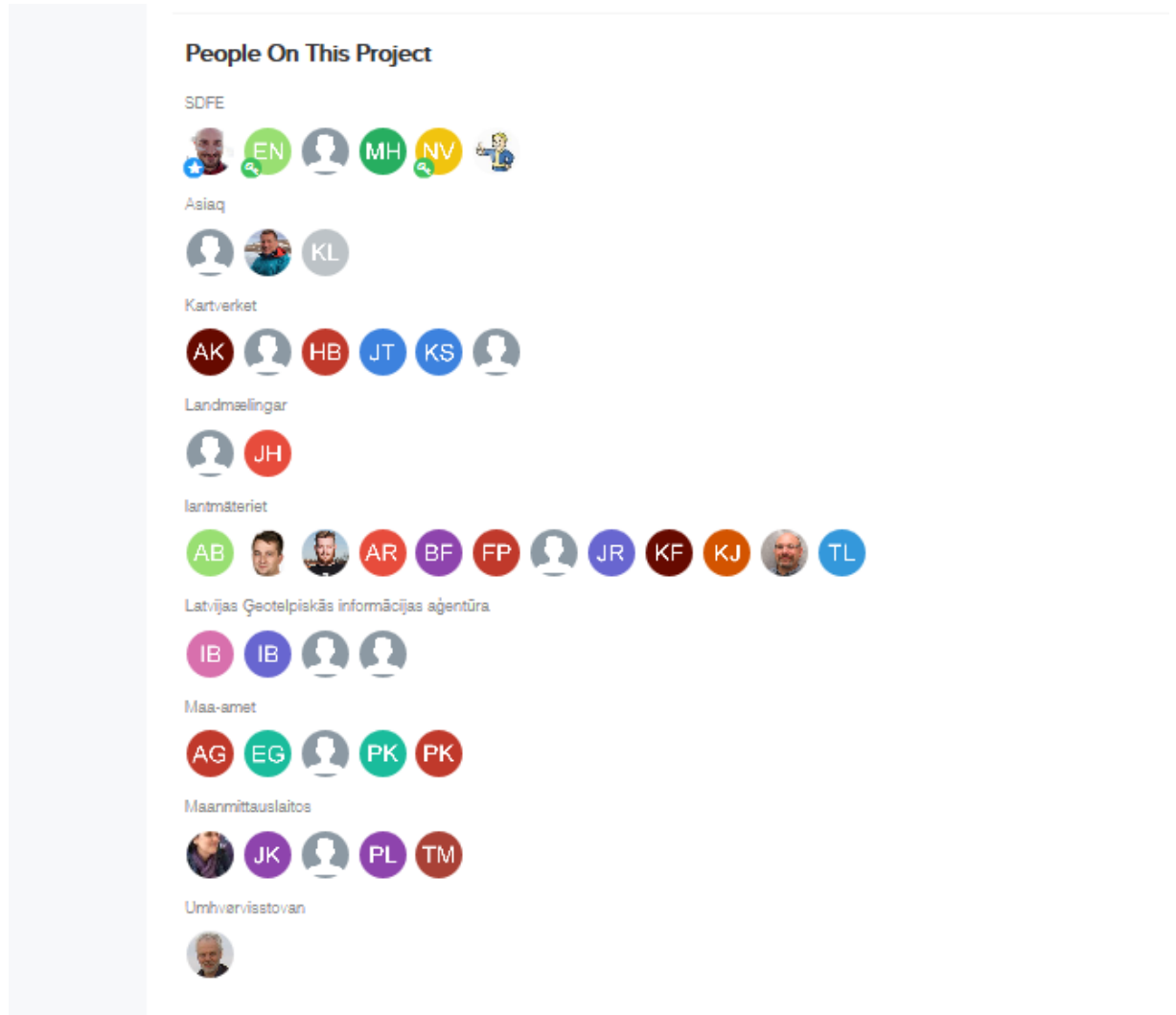
1. Joint collection of data - questionnaire (Iceland) As presented by Johan, our directors requested we look into collaborating on data acquisition. A questionnaire to further shed light on this is necessary
2. Single Photon LiDAR and storage challenges (Finland) SPL is coming, but is it useful? A joint micro seminar to look at our tests would be very good
3. Procurement/Tender documents (Denmark) Different countries have different ways of procurement, but all under the same EU legislation. Being able to be inspired by each other could be very useful
4. Sensor orientation and standards (Sweden) More free data means more use and new users which in turn enhances the need for standards for storing and distributing data. Harmonising the way of describing orientation parameters being the first stop

The group use a Temwork for common access to the documents.

All presentations can be found on Teamwork:

<https://sdfc.teamwork.com/#/projects/242977/files?catid=945379>

For the moment over 40 people, share the information on teamwork



In addition we update information about Aerial photography and orthophotoproduction and Digital Elevation Model and laser-scanning (yearly for each country)

(This information are only for internal use)

2017 Digital Elevation Model and laser-scanning (only for internal use)
 New submissions for 2018 in RED are welcome

Country	Sweden - 2016	Denmark - 2016	Finland - 2016	Estonia - 2016	Norway - 2016	Latvia - 2016	Iceland - 2016	
Specifications	National DEM (NEM) 2m covering 97% of the country Old National DEM 15m	National DEM 4 m Old National DEM 15 m	Existing National DEM (NEM) 10m New National DEM (NEM) 2m	Existing DEM 5m, 10m, 25m, 50m, 100m DEMs for production with aerial photography (2.5m) Models for urban and open urban areas	Laser 10-20 From 2017: 1m (DEM) both DTM and DEM National program from 2015 on	DEM 5m DEM 4	Laser for available for 15.5% of the country (area 10000 km ²) New National DEM 5m. Use laser data, 50m, for 10% of Iceland (area 10000 km ²) has been updated	
Methods for production	National DEM (NEM) Laser scanning (2005-2017) Old National DEM Photogrammetry (~1992)	National DEM Laser scanning 2014-2015 Old National DEM Laser scanning 2003-2007	Existing National DEM (NEM) 10m New National DEM (NEM) 2m Laser scanning (2005-)	DEM (DEM) 1: Laser scanning (2005-2011) DEM (DEM) 2: Laser scanning (2012-2015) Laser scanning (2016-...) Models for urban and open urban areas Laser scanning (2005-...)	Laser 10-20 Laser scanning 2005- From 2017: Testing of DEMs. Mapping from DEM 25m in mountain areas. New National DEM from 2012 Laser scanning and image matching	DEM 5m for all country Photogrammetry from year 1994-2016. DEM 4 from Laser scanning data (2006-...)	Laser scanning for key areas 2005-2015 A 3D DTM of Iceland with four metadata files (DEM data, DEM data, DEM data, DEM data) is available. DEM data is available in 2 m DEM of Iceland (DEM data) based on photogrammetry of satellite imagery (e.g. WorldView) is available in 2017	
How much do you plan for each year?	National DEM (NEM) 2014-2017: 42 500 km ² and 2015-2017: 10 000 km ² Old National DEM No activities	National DEM 2014-2015: 42 500 km ² and 2016-2017: 10 000 km ²	Existing National DEM No activities New National DEM 2014-2017: 42 500 km ² and 2016-2017: 10 000 km ²	New DEM 13 000 km ² per year Model for urban and open urban areas At the request of municipality or for internal use (industry) and at the request of Ministry of the Environment, ~100 km ² per year	National DEM (DEM) 2014-2017: 42 500 km ² and 2015-2017: 10 000 km ²	DEM 5m Update 13000 km ² DEM 4 14 000 km ²		
How urban parameters	National DEM (NEM) Laser scanning • Scanning area, normally of size 25 x 70 m • Point density minimum 5.0 points/m ² and for registration minimum 0.25 points/m ² • Pointwise maximum 1m • Maximum scanning angle 120° • Checky between runs 20% • Checky between scanning area 20m • Check points measured on ground in every	National DEM Laser scanning 4-4.5 points/m ² • Scanning area, normally of size 25 x 70 m • Point density minimum 5.0 points/m ² and for registration minimum 0.25 points/m ² • Pointwise maximum 1m • Maximum scanning angle 120° • Checky between runs 20% • Checky between scanning area 20m • Check points measured on ground in every	New National DEM (NEM) 2m Laser scanning • Scanning area, normally of size 112-2000 m ² • Point density minimum 5.0 points/m ² • Pointwise maximum 1m • Maximum scanning angle 120° • Checky between runs 20% • Checky between scanning area 20m • Check points measured on ground in every	DEM Laser scanning 2006 • Point density minimum 5.0 points/m ² and for registration minimum 0.25 points/m ² • Pointwise maximum 1m • Maximum scanning angle 120° • Checky between runs 20% • Checky between scanning area 20m • Check points measured on ground in every	National DEM (DEM) Laser scanning • Scanning area, normally of size 112-2000 m ² • Point density minimum 5.0 points/m ² • Pointwise maximum 1m • Maximum scanning angle 120° • Checky between runs 20% • Checky between scanning area 20m • Check points measured on ground in every	DEM 5m Photogrammetry methods • Average point density: From 1.5 points/m ² to 10 points/m ² • Multiple returns on each laser pulse • Maximum scanning angle 120° • Checky between runs minimum 7% • Number of checkpoints: 2 points per 100 km ²	DEM 5m Photogrammetry methods • Average point density: From 1.5 points/m ² to 10 points/m ² • Multiple returns on each laser pulse • Maximum scanning angle 120° • Checky between runs minimum 7% • Number of checkpoints: 2 points per 100 km ²	DEM 5m Photogrammetry methods • Average point density: From 1.5 points/m ² to 10 points/m ² • Multiple returns on each laser pulse • Maximum scanning angle 120° • Checky between runs minimum 7% • Number of checkpoints: 2 points per 100 km ²

2017 Aerial photography and orthophotoproduction (only for internal use)
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Country	Sweden - 2016	Denmark - 2016	Finland - 2016	Estonia - 2016	Norway - 2016	Latvia - 2016	Greenland - 2016	
Specifications	0.25 meter for each part and along the coast in the southern part and 12 inches in 0.50 meter area. 0.50 meter for the inland area of the northern part	0.50 meter for each part and along the coast in the southern part and 12 inches in 0.50 meter area. 0.50 meter for the inland area of the northern part	0.50 meter for country wide (except for some areas) 0.25 meter for some urban areas	0.25 meter for country wide (except for some areas) 0.10 meter for some urban areas	0.25 meter for country wide (except for some areas) 0.10 meter for some urban areas	0.25 meter for country wide (except for some areas) 0.10 meter for some urban areas	0.25 meter for country wide (except for some areas) 0.10 meter for some urban areas	0.25 meter for country wide (except for some areas) 0.10 meter for some urban areas
How much do you plan for each year?	0.25 meter: 150 000 km ² 0.50 meter: 40 000 km ²	0.25 meter: 150 000 km ² 0.50 meter: 40 000 km ²	0.25 meter: 150 000 km ² 0.50 meter: 40 000 km ²	0.25 meter: 150 000 km ² 0.50 meter: 40 000 km ²	0.25 meter: 150 000 km ² 0.50 meter: 40 000 km ²	0.25 meter: 150 000 km ² 0.50 meter: 40 000 km ²	0.25 meter: 150 000 km ² 0.50 meter: 40 000 km ²	0.25 meter: 150 000 km ² 0.50 meter: 40 000 km ²
How urban parameters	0.25 meter: 60% forward 20% lateral In some case extra runs for extra in urban areas 0.50 meter: 60% forward 20% lateral	0.25 meter: 60% forward 20% lateral In some case extra runs for extra in urban areas 0.50 meter: 60% forward 20% lateral	0.25 meter: 60% forward 20% lateral In some case extra runs for extra in urban areas 0.50 meter: 60% forward 20% lateral	0.25 meter: 60% forward 20% lateral In some case extra runs for extra in urban areas 0.50 meter: 60% forward 20% lateral	0.25 meter: 60% forward 20% lateral In some case extra runs for extra in urban areas 0.50 meter: 60% forward 20% lateral	0.25 meter: 60% forward 20% lateral In some case extra runs for extra in urban areas 0.50 meter: 60% forward 20% lateral	0.25 meter: 60% forward 20% lateral In some case extra runs for extra in urban areas 0.50 meter: 60% forward 20% lateral	0.25 meter: 60% forward 20% lateral In some case extra runs for extra in urban areas 0.50 meter: 60% forward 20% lateral
Flying conditions	30 degree sun elevation angle for some case 25 degree sun elevation angle. No clouds. No sun in some degree is accepted.	30 degree sun elevation angle for some case 25 degree sun elevation angle. No clouds. No sun in some degree is accepted.	30 degree sun elevation angle for some case 25 degree sun elevation angle. No clouds. No sun in some degree is accepted.	30 degree sun elevation angle for some case 25 degree sun elevation angle. No clouds. No sun in some degree is accepted.	30 degree sun elevation angle for some case 25 degree sun elevation angle. No clouds. No sun in some degree is accepted.	30 degree sun elevation angle for some case 25 degree sun elevation angle. No clouds. No sun in some degree is accepted.	30 degree sun elevation angle for some case 25 degree sun elevation angle. No clouds. No sun in some degree is accepted.	30 degree sun elevation angle for some case 25 degree sun elevation angle. No clouds. No sun in some degree is accepted.
Aerial photography season	From mid April to mid September	15 March - 30 April No sun on snow on trees	15 April to the end of September	Mid April to mid September (mid April to mid June - snowing, mid June to mid September - snowing, April to...)	Mid April to mid September (mid April to mid June - snowing, mid June to mid September - snowing, April to...)	Mid April to mid September (mid April to mid June - snowing, mid June to mid September - snowing, April to...)	Mid April to mid September (mid April to mid June - snowing, mid June to mid September - snowing, April to...)	Mid April to mid September (mid April to mid June - snowing, mid June to mid September - snowing, April to...)