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
- Obique 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://sdfe.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)

Country Sweden - 2016 Denmark - 2016 Finland - 2016 Extonis - 2016 Norway - 2016 Latvia - 2016 Iceland-2016

County	Sweden - 2010	Demmark-2010	Filling - 2010	E300818 - 2010	1402 W X Y - 2020	Latvia -2010	100000-2010
Specifications Ord domons	National DEM (NII) In (covering 97% of the country) Old National DTM 50m	National DEM 0.4 m Old National DEM 1.5 m	Existing Nucleon DEM (MMEAF) Mon Existing Nucleon DEM (MML10) Don New Nucleon DEM (MML2) 2n	Existing DTM Sn, 10n, 25m, 50m, 100m DEM (co-production with aerial photography) 2.5m Models for urban and open miles areas Im	Lawer 10-20 From 2013: Ins (GaoTHT) both DTM and DSM. National program from 2015: Im	DEM 29 DEM 5	Laser for evaluation for 15.5% of the country (some 16000 km2). New boat data, 10m, for 30% of loaland (some 39000 km2) has been upgended.
Methods for production	National DEM (NB) Lawroanning (2009-2017) Old National DTM Photogramosity (~1992)	National DIM Lawr scarning 2014-2015 Old National DEM Lawr scarning 2005-2007	Editing National DEM (MML 25) Editing National DEM (MML 10) Policyanumstry (~2010) New National DEM (MML 2) Lawrongning (2010-)	DBM I Round 1: Laser scanning (2008–2011) Round 2: Laser scanning (2013–2015) Round 3: Laser scanning (2016–) Models for sarban and open makes areas Laser scanning (2009–.)	Lawer 10-20 Lawroanning 2005- From 2012: Tarting of Danae Image Matching from 03D 25 cm in mountain areas. New National DEM from 2015- Lawr scanning and image matching	DEM 20 for all country Photogrammetry from year 1994-2016. DEM 5 from Laser scanning data (2006 -)	Lawr-scanning for key areas: 2006-2016. A 10 m DEM of Icoland with bot available data (but data in 3000 line); new completed. Underway is a new 2 m DEM of Icoland (Arctic/DEM) band on photogrammetry of assilite imagery (a.g. WorldView), to be foculated in 2017.
How much do you plan for each year?	National DEM (NII) 2014 52:000 km2 and 2015 20:0000m2 2016 20:000 km2 2017 10:0000km2 Old National DTM No activities	National DEM Looking into the possibilities of updaring smaller areas with various forms of collected data 2014-28 000 km2 (opting and switzmit) 2014-16 000 km2 (opting)	Existing National DEM Vio activities New National DEM (MML2) 20 003-60 000km2 year 20 162 approx. 40 000km ⁹ (Quality class 1 approx. 27 000 km ⁹ and quality class 2 approx. 13 000 km ⁹)	New DRIM Approx. 13 000 km ² year Models for urban and open make areas At the request of municipality or for internal use (cadatry) and at the request of Ministry of the Environment, -100 areasyster	National DEM (7008) 00 000 (are) year (2016: 45 000 (are ²)	DEM 29 Update 22000 km ³ DEM 5 14 000 km ³	
Dela optico personare	National DEM (NII) Lawrenchig, 4 as 25 Vita, 0.5 postrik Vita, 0.5 postrik validizan 0.5 postrik validizan 0.5 postrik validizan vapatelon minimum 0.25 postrik. Pootpris macionan In Militipis entaria on auch lawr pulse Macinan Kaning angle 329 Oktober Status Carlo Device between exercise per 200n Charle potter measure on power 200n	Nutriend DIM <u>Paint denty</u> : 4-5 pointies ¹⁰ <u>Paint</u> : 24-5 point <u>Paint</u> : 24	New National DEM (MML2) Lawrenning Souning resus, sorraully of an 1152 - 3000 internation of a sound of the sound of the Sound of the sound of the Mathematical Sound of the M	DEM Lawr exampling 2016: Point density minimum (sl.5 point) (max point spacing 2.6m) Despite tracellater Methylic for the second Scaling angle of (sl.32) Point attack states Scaling angle of (sl.32) Point attack states Article branes plays Article branes plays Article branes plays Mitter Lifeks Prove 2017	Nutineal DEM (NDR) Prior density Michaems 7, point W (5) point W (7) scena search point W (7) scena search michaems 7, point W (7) Michaems	DBM 30 Phologrammetric methods DBM Lawer warning - Average point deary: Pron 1.5 point of damy: - Mathema saming angle - Mathema saming angle - Area points: 2 points per 100 km ³	DTM 5 Point density: 0.3 pointwint ⁶ for 15.5% of the country.

2017 Asrial photography and orthophotoproduction. (only for internal use) New interasts & 2016 a Ribertonian (Commun) Swedes - 2016 | Dremark - 2016 | Finland - 2016 | Estenis - 2016 | Norwar- 2016 | Larvis - 2016 | Greenland - 2016 |

Country	Sweden - 2010	Denmark - 2010	Finishd - 2010	Litonia - 2010	Norway - 2010	Larvia - 2016	Greeniand - 2016
							(A) = Asiaq
Specifications							(0) = Danish Geodata Agency
Oround sample distance (OSD) for actial images.	0.25 meter for south part and along the coart in the northern part and 12 cities in 0.50 meter areas. 0.50 meter for the inland area of the northern part	GaoDaemark: 0,15m onantry wide apring 20 on sammer country wide	0,50 meter for country wide 0,40 meter (foresty) 0,25 meter for laser scattring areas	0.25 meter for country wide (mapping and forestry) 0.10.16 meter for urban areas 0.1 meter for open mining areas	0,25 meter for country wide (three 2012) 0,07 - 0,12 meter uthan arress and main roads	0,25 m. for whole country	0,10 meter in cities and antiferrouts (A) 2,25 meter in open land – scanned IVW images from 1980's, scale 1:150.000 (C)
How much do you plan for each your?	6,25 meter: 130 000 km2 6,59 meter: 40 000 km2	the whole country, i.e. appr. 46.000 km ²	0,50 m 58-600 km2 0,40 m 58 000 km2 0.25 m 6 800 km2	8,25 meter: 23 000 km ² 8,193,16 meter: 1800 km ²	0,25 mater 100-000 km2 0,1 meter: • - 10.000 km2	 0,25 meter km- appre.21 550-22 400 km² 	The 3 major towns and 1 exits town according to demand. Twery 2 nd year. (all other towns and settlements are updated using termstrial methods)(A)
This approx parameters-Forward accepted deviation	6.25 meeter: 60% forward 25% latend 15 scies case extra runs for awar in cities with tail buildings. 6.50 meeter: 60% forward 25% latend	60% forward 20% latent Chedind in AT	4.50 m 6.50 m 65 % forward 30 % fatend +- 5 % 0.60 m 35 % forward 35 % forward 35 % forward 35 % fatend ton 20 ⁸ Area to 20 ⁶ Araget 0.25 m 60 % both forward and latend Examine bootier sits overlaps might be different	8.25 meter: 100% (ADS100) forward, 30% lateral 6.108.168 meter: 100% (ADS010) forward, 30- 50% lateral	6,25 meter: 180% forward 20% latend 6,1 meter: Normally 60% forward 25-40% latend	60% forward 40% lateral	40% forward 20 % loward 20 % loward 80% forward 45% loward 45% loward 50% forward Fbwy woord image scenad with 2,25 m GSD (0)
Rying conditions' netrictions	30 degree sun devation angle but for none cases 25 degree sun elevation angle. No clouds Haza to some degree is accepted.	25 dagrees No clouds, but images taken under light clouds sometimes accepted.	Min 25 degrees sun elevation angle. 10 % clouds are accepted, no big coss, prefer no clouds. Haze might be, visible in the air at least 15 km.	30° sun angle for mapping 25° sun angle for forestry No clouds Hans to some degree is accepted.	0,25 mc 27 degree (25) 0,1 meter: 30 (25) degree nun elevation angle No cloude. Mac shadown from cloude: 3 No of orthophoto ana	30 degree nus elevation angle No clouds	30 degree sur elevation angle No shadows in built-up arous. No clouds. No unove on roads & buildings Max. 20 % overall mow cover (A)
Aartal photography maace	Normal mid April to mid September	15. March - 30. April No snow, no leaves on trees	1* April to the end of September.	Mid April to mid Suptamber (mid April to mid Jun – mapping, mid Jun to mid Suptember – forestry, April to	0,25 m: May to end of September 0,1 m: 15. March to end Sept.	1* April to and October	July 15 th to argust 31 th (A)