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Ny-Ålesund Newsletter

39th Edition – July 2017

Updates from the four Ny-Ålesund Flagships

by Christina A. Pedersen (NPI), Roland Neuber (AWI), Jack Kohler (NPI), Kai Bischof (University of Bremen) and Maarten Loonen (University of Groningen)

Image1: Please check out new news and old documents at the Ny-Ålesund Flagship webpages at http://nysmac.npolar.no/research/flagships/

The four Ny-Ålesund flagships are still gaining momentum. The best way to stay updated is to visit the webpages at http://nysmac.npolar.no/research/flagships/.

We are working on establishing email-lists for all the flagships. The Atmosphere Flagship has a well-developed email-list with more than 100 interested atmospheric scientists listed (complete list given under Documents), but for the others we have a longer way to go. If you would like to be on one of the email-list for one of the flagships, please email the flagship chair.

Upcoming activities include the Svalbard Science Conference in Oslo 6-9 November 2017. The four flagship chairs will be in charge of the parallel sessions linked to each of the flagship disciplines for the 8-9th November. See the separate article about the conference by Carina Leander at SSF.

Atmosphere Flagships Activities

The Atmosphere Flagship has had a busy spring with coordinated field-work activities that started already in March. On 22nd March, the researchers on-site gathered for fruitful scientific discussions and visits to the AWI Observatory and Rabben Station.

In May, the third Arctic Metrology Workshop was arranged in Ny-Ålesund, targeting the scientists already present in town, and acting as a starting point for the development of a metrology laboratory facility in Ny-Ålesund. Facilities in the Vaskeriet lab currently allow for calibration of temperature and pressure instruments.

Next is to prepare a survey for potential users to identify their needs.

In May, the Flagship allocated 120 kNOK of its SSG funding for seven guest visits for scientists within the flagship to visit one another to work on common data analysis and/or publications. The flagship science committee are looking forward to the common results and publications from these groups.

Kongsfjorden System Flagship Activities

Based on the discussions during the SSF funded workshop on "Adaptation to environmental change in the Arctic", the future research priorities for marine biological research in Kongsfjorden have been defined, and will be published in the perspective paper by Kai Bischof and colleagues entitled "*Kongsfjorden as harbinger of the future Arctic: knowns, unknowns and research priorities".* This paper is in press in Haakon Hop and Christian Wiencke's review book "*Advances in Polar Ecology: The Ecosystem of Kongsfjorden, Svalbard".*

The scientific committee of the flagship is still in the planning phase regarding the SSG funds for arranging a series of topical workshops within the flagship. It will use the opportunity of the Svalbard Science Conference to organize side meetings related to the different research priorities in order to prepare for the workshops, which will be conducted in 2018. The science committee has also prepared a poster summarizing the current state of the Kongsfjorden Flagship. This poster will be set up in June in the Marine Lab in Ny-Ålesund.

Terrestrial Ecosystems Flagship Activities

One of the main developments in the flagship in the past year has been the involvement in the EU-financed project INTERACT. Four Ny-Ålesund institutions are part of the project (NPI, CNR, NERC and UoG) and the first three participate in INTERACT transnational access programme. This progamme will bring more terrestrial researchers to Ny-Ålesund, and already this summer a handful of new INTERACT projects will come to Ny-Ålesund. Further, the Norwegian project COAT (Climate ecological observatory for Arctic tundra) is in the process of establishing a large monitoring site on Brøggerhalvøya.

The Terrestrial Flagship has been presented during a special NySMAC session in Xiamen (China) in October 2016, at the INTERACT meeting in Iceland in January 2017 and at a meeting of the Svalbard Science Forum in Oslo in April 2017.

Glaciology Flagship Activities

The glaciology group managed to secure funding from The FRAM Centre (Tromsø) for the Liestøl Symposium with focus on integrating field measurements, remote sensing, and models of Svalbard glacier mass balance.

The workshop is named in honor of the pioneering Norwegian glaciologist Olav Liestøl (1916-2002), who initiated mass balance measurements in Svalbard in the 1950s, including the record from Austre Brøggerbreen, which in autumn 2017 will be 50 years long. The Liestøl Symposium will be an integrated part of the Svalbard Conference.

Olav Liestøl on Austre Brøggerbreen 1980. In 1960, a glacier was named after him – the Liestøl-bréen between Wijkberget and Artheniusfjellet in Torell Land. Photo: G.W. Gabrielsen, NPI

ASSW session on spring changes as observed in Ny-Ålesund

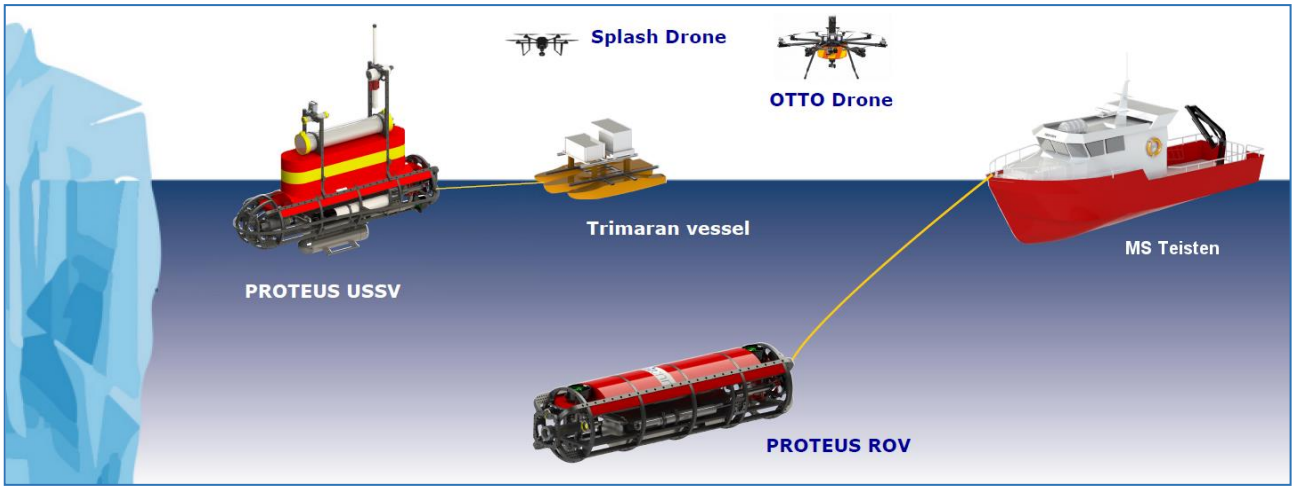
During the Arctic Science Summit Week (ASSW) in Prague in April, a session on *Spring Changes in the Arctic as Observed in Ny-Ålesund* was arranged. The sessions consisted of 8 talks from all four flagships, of which two were keynotes: H*ow barnacle geese adapt their timing to earlier springs* (Maarten Loonen, University of Groningen, NL) and *The Oceanographic Spring determined by a Marine Observatory* (Finlo Cottier, SAMS, UK) and clearly showed the diversity of disciplines and actors present in Ny-Ålesund.

F. Cottier, SAMS, giving the keynote talk at the ASSW in Prague 2017. To the right, one of the session chairs Christina A. Pedersen, NPI.
Photo: Nalân Koç, NPI

The UVASS project (Unmanned Vehicles for Autonomous Sensing and Sampling) collecting data near marine glacier fronts in Kongsfjorden by using unmanned vehicles

By Gabriele Bruzzone, National Research Council - Institute of Studies of Intelligent Systems for Automation, Italy (CNR-ISSIA)

In the global warming process, the Arctic region is heating up faster than other places on Earth. Constant monitoring of processes occurring in this area is crucial to identifying appropriate strategies that may limit the damage caused by climate change. The Svalbard Archipelago is considered by scientists a particularly interesting region for exploring the impact of possible climate changes, because of Atlantic water influx and melting of tidal glaciers, phenomena which are both strictly linked to climate variability. The retreat of tidal glacier fronts in this area has been particularly pronounced in recent decades and has led to an accumulation of sediments in the inter-moraine depressions near the sea-ice interfaces. Particularly interesting is the case of Kongsfjorden, an Arctic glacial fjord located on the west coast of Svalbard (79°02′44.95″N, 11°34′57.03″E), where high sedimentation rates have been recorded in the past few years. In the inner part of this fjord, many glaciers reach the sea with marine fronts that form a sheer vertical wall of ice protruding above seawater. In this situation, as well as in similar cases, direct measurements in the proximity of glacier fronts are often lacking because the possibility of sudden falls of massive ice blocks makes data acquisition in these areas extremely dangerous.



Unmanned vehicles used in the 2017 data acquisition scientific campaign of the UVASS project
Synthetic generated picture - Authors: Angelo Odetti and Roberta Ferretti

The goal of the UVASS (Unmanned Vehicles for Autonomous Sensing and Sampling) project is to fill this gap by performing air, water and ice data sensing and sampling close to the marine fronts of glaciers using UMVs (Unmanned Marine Vehicles), i.e ROVs (Remotely Operated Vehicles), AUVs (Autonomous Underwater Vehicles), USVs (Unmanned Surface Vehicles), USSVs (Unmanned Semi-Submersible Vehicles) and UAVs (Unmanned Aerial Vehicles).
In the last 20 years, the “Field and Interaction Robotics” research group at CNR-ISSIA has developed a small fleet of UMVs (Romeo/R2 ROV, Charlie USV, Shark USSV, e-URoPe ROV, P2-ROV, PROTEUS USSV/ROV/AUV) which have extensively been used for collecting data during scientific campaigns performed in various areas, including Polar Regions. A preliminary scientific data collection campaign was carried out by CNR-ISSIA in 2015 in Kongsfjorden, where for the first time marine unmanned vehicles proved to be very effective for collecting water samples and multi-probe CTD data in the proximity of the water front of the Kronebreen glacier.

A subsequent, more complex data acquisition campaign involving simultaneous operation of three unmanned vehicles was performed during summer 2017 (from June 13th to June 26th) by CNR-ISSIA in cooperation with researchers from other institutes of the National Research Council (IAMC, ISMAR, ISAC, IBIMET) and Tuscia University. The purpose of this campaign was robotic-aided monitoring of Arctic ice, water and air to improve our understanding of major chemical, physical, biological, meteorological, etc. phenomena occurring near the water fronts of tidal glaciers.

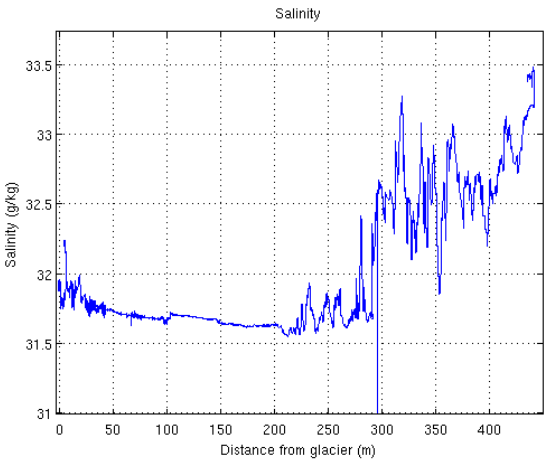
The newly developed unmanned marine vehicle PROTEUS (Portable RObotic TEchnology for Unmanned Surveys), designed and built by CNR-ISSIA, is a portable (45-60 kg weight and 1.5 m long, 0.35-0.5 m wide and 0.35-1.5 m high), highly modular and reconfigurable vehicle which is able to operate as a ROV, an AUV or a USSV. During the 2017 campaign it was equipped with manifold sensors and samplers, i.e. an echo-sounder, two multi-parametric CTD probes, a turbidimeter and surface and underwater videocameras, which were used to perform water data collection in the stretch of sea facing the Kronebreen and Blomstrandbreen glaciers.

PROTEUS, OTTO and Splash unmanned vehicles operating near the Blomstrandbreen glacier (June 2017). Photo: Giorgio Bruzzone

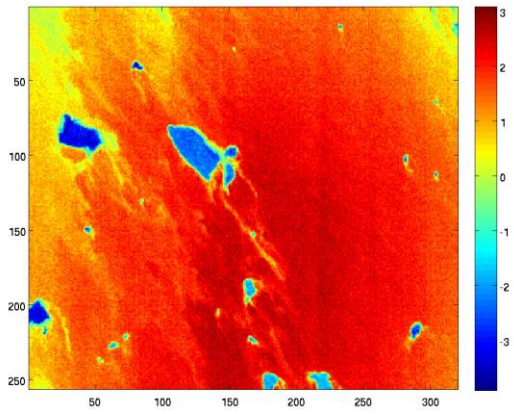
Path followed by PROTEUS during data acquisition near the Blomstrandbreen glacier. Synthetic generated picture obtained by superimposing PROTEUS's latitude and longitude telemetry data on a satellite photo provided by Google Maps. Author: Roberta Ferretti

One of the most important features of PROTEUS is its open-frame chassis which is especially designed for quick installation and shifting of tools, equipment and sensors. Its thrusters are also interchangeable, displaceable modules. In this way the vehicle can be reconfigured upon each expedition according to specific needs. Thanks to its open hardware and software architectures, PROTEUS can easily be fitted on board with a number of different sensors and actuators. In the 2017 campaign, additionally, a small trimaran vessel was towed by PROTEUS during its surveys. This trailer was used to host particularly heavy or bulky sensors i.e. an automatic water multi-sampler, a plankton multi-sampler, a Sea-Bird multi-probe CTD. Besides PROTEUS, two drones were also used during the surveys for different purposes: the OTTO drone collected pictures and videos of the area and was equipped with additional payloads (thermal camera as well as humidity, temperature and air quality sensors) to collect atmospheric parameters. The Splash drone was used to record videos and images of the coordinated operations performed by PROTEUS and OTTO for documentary and dissemination purposes. All three vehicles were operated by personnel on board a little (31 ft) work boat (MS Teisten) which was kept at safety distance from the glacier front. A customized plywood platform (2.5 x 2.5 m) was mounted on the stern of the boat for drone take-off and landing.

The atmospheric data collected by OTTO, together with the marine data acquired by PROTEUS, will allow scientists to obtain a complete characterization of the whole water-air column close to the glacier fronts. All the collected data will be available shortly on the IADC (Italian Arctic Data Center) web site.



Salinity trend near the Blomstrandbreen glacier. Synthetic generated picture obtained by plotting PROTEUS's salinity telemetry data.
Author: Roberta Ferretti



Example of image acquired by the thermal camera mounted on board OTTO.
Synthetic generated picture obtained by elaborating the data acquired by OTTO's thermal camera.
Author: Roberta Ferretti

The scientific campaign carried out in Kongsfjorden in 2017 demonstrated that unmanned vehicle technology is mature and can be of great help to scientists involved in acquiring atmospheric and marine data near the water fronts of tidal glaciers.

A video showing PROTEUS and OTTO unmanned vehicles in operation on June 23rd 2017 in the stretch of sea in front of the Blomstrandbréen glacier is available here: https://www.youtube.com/watch?v=R-ypCpjtd3M&feature=youtu.be or by using the following QR code:

News from Svalbard Science Forum

By Carina Leander, SSF

Registration for Svalbard Science Conference

The Research Council of Norway and Svalbard Science Forum, in collaboration with The Norwegian Polar Institute and The Ny-Ålesund Science Managers Committee (NySMAC), invites researchers, research managers and others interested in polar research to a conference on research in and about Svalbard.

This year the bi-annual Ny-Ålesund Seminar will be an integrated part of the conference.

We invite you to give presentations from ongoing and planned projects, contribute to poster sessions and participate in discussions.

Please see call for abstracts here. Contributions will emphasize cooperative, integrative and innovative research on Svalbard and beyond.

We encourage all contributors to reflect on *how their own work could contribute to other's research and what the specific needs from the others would be in order to advance and improve interaction between disciplines and Svalbard research in the Pan-Arctic.*

The conference will take place in Oslo 6-8 November 2017.

Reporting and booking through RiS

The Governor now requests all reports on permissions to be sent in through the RiS Portal only. On the project page there is a section called "Research applications and reports", where the project owner has the possibility to fill in reports on the various applications that they have submitted.

Please remember that The Governor and Kings Bay AS do not accept research applications and research bookings that do not come through the RiS Portal.

Make it easy for yourself and avoid problems in RiS

Always make a new fieldwork period, covering the period you are actually out in the field (not a period covering many years). Multi-year fieldwork periods mess up statistics quite a lot.

Never "recycle" an old fieldwork period by changing the dates to make a new one. This makes a mess in the back-end of the database and will give you lots of trouble with bookings later on. The bookings and applications are generated from the fieldwork period, so it is important not to skip steps there.

News from SIOS

By Christiane Hübner, SIOS

SIOS workshop focusing on the application of Copernicus satellite data for snow and ice research

We would like to remind all our colleagues that the SIOS-KC will be running a 3-day workshop in Longyearbyen from 11 - 13 September 2017 on how to use Copernicus Sentinel-2 data to monitor snow and ice (see https://www.sios-svalbard.org/News_20170303).

The workshop is being designed by Dr. Anna Maria Trofaier (SIOS remote sensing officer) and Dr. Gareth Rees (University of Cambridge), who will also be delivering the training sessions. It is intended to be an introduction course to remote sensing, and we would like to encourage all those interested in the applications of satellite data to scientific research to apply (no prior knowledge needed). The workshop is divided into both theory and practical sessions, and will start with the basics such as: What is a digital image and how can it be classified? This will give a thorough grounding in digital image analysis. The workshop will be held within the framework of SIOS's duties as a Copernicus Relay and will hence be free of charge.

Important dates:
Application submission opened on 12 June 2017. Application deadline will be on 21 July 2017. Participation is limited to 20 persons and is subject to selection of application.

Status web portal
The SIOS web portal is under continuous development. You can now read about the different SIOS working groups and committees that will support the services offered to the SIOS community (https://www.sios-svalbard.org/WorkingGroups) and learn about the annual science wheel that will culminate in the annual SESS report (https://www.sios-svalbard.org/SESSreport). This will summarise the work that has been done in the last year within the SIOS cooperation to optimise the observing system and gain fresh insight into unanswered questions in Arctic Earth System Science.

For more information about SIOS have a look at our web portal: www.sios-svalbard.org

New logistical offers in Longyearbyen for SIOS members

You need to keep your samples frozen or you would like to do some office work on your travel back from Ny-Ålesund? SIOS-KC can now offer short term storage facilities and a guest office in Longyearbyen to researchers from our member institutions. These services are provided by NPI and UNIS.

Storage (normal, cold and freezer)
SIOS members may use the facilities at Svalbard Science Centre for short term storage of samples (including samples frozen at -80°). Storage space cannot be guaranteed, so it is important send a request 3-4 weeks in advance if you would like to make use of this facility. Please send your request, including the volume of samples, storage requirements, time period of storage, and planned time of arrival/departure to logistics@sios-svalbard.org. This service is also available outside working hours.

Guest office in Longyearbyen
SIOS can offer visiting members access to a guest office in Svalbard Science Centre. The office is located in the SIOS Knowledge Centre and there is access to the UNIS guest WiFi and EduRoam. If you would like to take advantage of this offer, please email logistics@sios-svalbard.org with the time period of your visit.

News from Kings Bay AS

By Marzena Kaczmarska, KB AS

100 years of Kings Bay, 1916-2016.

Photo: Kings Bay AS

Kings Bay Coal Company was founded 14 December 1916 and is still going strong as Kings Bay AS, 100 years later. It has transformed from coal mining to logistics and infrastructure provider for research activities. The celebrations, including lectures and anniversary dinner, took place both in Oslo and Ny-Ålesund.

New research station & other projects

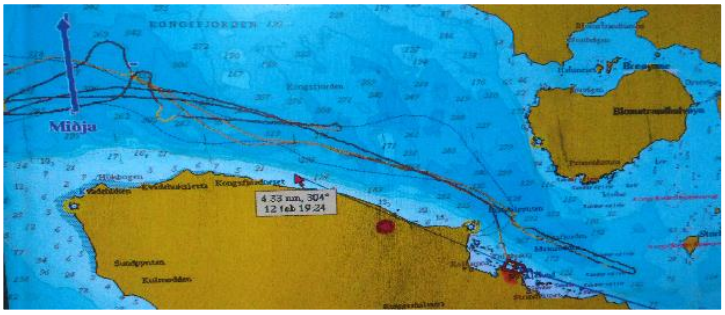
Kings Bay has received ear-marked funds to start building a new research facility to serve, first and foremost, the Japanese researchers, but it will also be a common facility with rooms, laboratories and an observation platform for other researchers. The Minister of Climate and Environment, Vidar Helgesen (2nd from the left on the picture below) visited Ny-Ålesund to unveil the first foundation pillar of the building on 8 May 2017.

Photo: Marion L. Nødseth, KB AS

Kings Bay AS has started renovation of the old hospital, known as “skutergarasjen”. It will house 12 new rooms when finished. The London House IV is still undergoing renovation, but it should be ready for inhabitants later this year.

Animation made by “Multiconsult”

Illegal trawling in Kongsfjorden.



Sea map made by the Norwegian Coast guard

On 2 March 2017 an illegal trawling took place in Kongsfjorden. The Governor of Svalbard and the Norwegian authorities dealt with this case. However, the bottom fauna and flora along the trawling route was most probably severely disturbed. The research community should avoid bottom sampling in the affected area.

Research-related activities so far…

The construction of the Clean Air Observatory "Gruvebadet" has been stabilized, and the building is in full use again. KORPI has moved the wind lidar to a new platform close to the Climate Change Tower and CNR will install a sodar next to it after the summer. These two instruments will complement the atmospheric monitoring with the wind distribution data.

Kings Bay has renewed the agreement with NILU about the monitoring of air quality in Ny-Ålesund until 2021. This activity is part of the project "Limits of Acceptable Change" that KB supports.

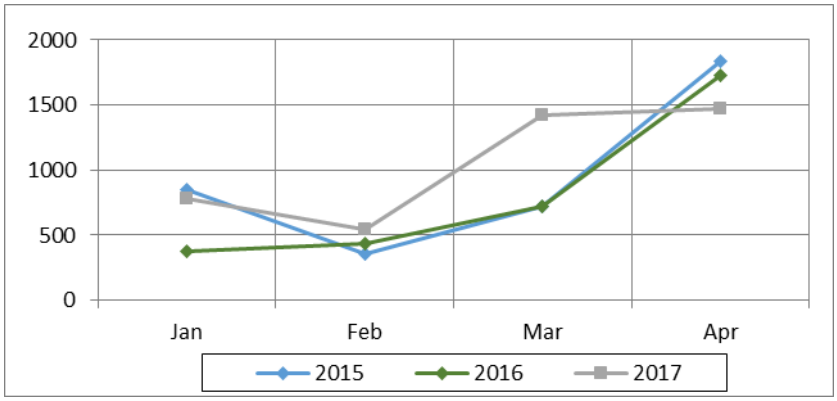


Fig.1 Total research days in Ny-Ålesund Jan-Apr 2017 (source: KB)

March 2017 saw more researchers in town than was a norm in the previous years (Fig.1) thanks to activities in the marine biology (mostly AWIPEV) and the atmospheric flagship field measurements campaign (most research stations).

New common facility: Metrology & Calibration Laboratory

Photos: Marzena Kaczmarska, KB AS

CNR, the metrology network METEOMET (Metrology for Meteorology) and Kings Bay AS have jointly contributed to establishment of the Metrology & Calibration Laboratory. This is yet another common research infrastructure that hopes to meet the needs of the scientific monitoring in Ny-Ålesund. The concept is to find out the difference between different sensors, reduce uncertainty in data, comparison of data between the groups but also, on the practical level to coordinate the calibration of the air temperature sensors between all stations in town. CNR and METEOMET will be the main coordinators of the calibration campaigns, open to all groups and starting with air temperature sensors (followed by soil, permafrost and finally water temperature sensors).

The Metrology Lab was opened on 10 May 2017 in one of the rooms at the "Vaskerilab". More details can be found here:
http://kingsbay.no/news/metrologylab/

Topics from the 46th NySMAC meeting in Prague

Topics from the previous NySMAC meeting held in Prague, Czech Republic 31 March and 1 April 2017:

- Status reports and planned activities from member institutions
- News from the flagships
- SSF work report
- RiS user service/possibilities
- SIOS
- Information from Kings Bay AS
- Interact II update
- NySMAC businesses
- Election of chair
- Upcoming meetings

Nick Cox' two periods as NySMAC chair has come to an end, and Maarten Loonen, University of Groningen, is elected as new chair for NySMAC for the coming two years.
The photo shows the hand-over of the NySMAC gavel.
Photo: Carsten Falck, GFZ.

Input to Ny-Ålesund Newsletter

If you would like to contribute to future editions of this newsletter, please e-mail nysmac@npolar.no. Any ideas or suggestions for topics are also welcome.
Editor: Ingrid Halsebø Storhaug, NySMAC Secretariat. Next edition: December 2017.

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