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| Time | 20 May 2015, 9–12 |
| Place | U37, Geoscience building, Stockholm University |
| Attending board members | <i>Cynthia de Wit, Chair</i> <i>Karin Holmgren, Head, Dep. of Physical Geography, Stockholm University</i> <i>Martin Jakobsson, Head, Dep. of Geological Sciences, Stockholm University</i> <i>Erik Kjellström, Head of Rossby Centre, Swedish Meteorological and Hydrological Inst.</i> <i>Marianne Lilliesköld, Swedish Environmental Protection Agency</i> <i>Michael McLachlan, Head, Dep. of Env. Science and Anal. Chemistry, Stockholm U.</i> <i>Johan Nilsson, Deputy Dep. Head, Dep. of Meteorology, Stockholm University</i> |
| Other participants | <i>Leonard Barrie, Director of Research, Bolin Centre for Climate Research</i> <i>Karin Jonsell, Science Coordinator, Bolin Centre for Climate Research</i> <i>Alasdair Skelton, Director, Bolin Centre for Climate Research</i> |
| Absent | <i>Dan Henningson, Professor, Royal Institute of Technology</i> <i>Max Holmström, Student representative</i> <i>Michael Tjernström, Head, Dep. of Meteorology, Stockholm University</i> |
| Secretary | <i>Karin Jonsell</i> |

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| § 1 | Meeting opens The chair welcomed everyone. |
| § 2 | Appointment of attester Johan Nilsson was appointed as attester. |
| § 3 | Approval of the agenda The agenda for this meeting was approved, with the addition of 11 e. |
| § 4 | Protocol from the previous meeting The protocol from the previous meeting was approved. |
| § 5 | Short presentation of the outcome of the Climate Modelling SRA (SFO) evaluation The Chair Cynthia de Wit and Director Alasdair Skelton summarized the outcome of the evaluation of the modelling initiative SRA (Strategic Research Areas, SRA, also named Strategiska Forsknings-Områden, SFO) made by the research councils of Sweden. The modelling part of the Bolin Centre named KlimSU, got a good grade, see Appendix 1a. The full report is given in Appendix 1b. The Bolin Centre Board noted that the evaluators especially commended the added value of the communication activities, the Climate Research School, the employment of 7 international senior climate modelling scientists and the true integration of modelling activities in the Centre. The 2013 restructuring of the Centre and the ambition to become an internationally recognised centre was also praised. Stockholm University was however criticised for its bottom up approach of managing its SRAs. The Board discussed how to move the Bolin Centre from okay to outstanding, how we can raise the |

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| | <p>quality of both scientific output and impact, how to better integrate and give added value to society and how we could work more coherently as a centre.</p> <p>Based on both criticisms of Stockholm University’s strategy for managing its SRAs and poor scores of one of its SRAs a recommendation to reduce Stockholm University’s total SRA funding by 16.4 MSEK stepwise over a period of 5 years has been made to the government. Following the government’s response to this recommendation, the University Board will decide how to handle this reduction in funding. The Dean has advised the Bolin Centre to continue with its budget work “as normal”.</p> |
| <p>§ 6</p> | <p>The future organization of the Climate Research School, including dimensioning of the CRS director of studies, organization of database coordination and of climate modelling</p> <p>The Directors Alasdair Skelton and Leonard Barrie and Head of Department Martin Jakobsson reported on the investigation of the coordination activities in the Bolin Centre, see Appendix 2 a-d.</p> <p>The Board had an extensive discussion about dimensioning staffing of the Climate Research School, the database management and the modelling coordination. The need for better organisation, usage of resources and higher visibility for these coordination activities was stated.</p> <ul style="list-style-type: none"> • The Board made a unanimous decision to maintain the present level of staffing and operational costs of its coordination activities during 2016 and 2017 and to include these costs in the coordination part of the Bolin Centre budget. • The Board will review these staffing and funding needs at the end of 2017. |
| <p>§ 7</p> | <p>Discussion and decision on a final future financing scenario for the Bolin Centre</p> <p>Director Alasdair Skelton presented a suggestion for the future distribution of funds, see Appendix 3. The current allocation of the SRA funds at the Bolin Centre is 10 % to KTH, 10 % to SMHI and 80 % to Stockholm University. After some of the central activities and staffing costs have been deducted, the remaining part of this 80% allocated to Stockholm University has been distributed to the departments as follows: IGV 16.7 %, NG 16.7 %, MISU 35.3 % and ACES 31.3 %.</p> <ul style="list-style-type: none"> • The Board decided to allocate funding annually for Bolin Centre coordination activities as presented in Appendix 3, version 5, sheet “future Bolin model 2” starting in 2016: <ul style="list-style-type: none"> ○ Combined directorship of 50 %, science coordinator of 100 %, funding for the research areas of 6 x SEK 300 000, funding for the combined directorship of SEK 400 000, SEK 500 000 for communication activities as recommended in the protocol from the previous board meeting (2015-03-09). ○ A director of studies for the Climate Research School of 50 %, database coordination of 100 % (2 x 50 %), climate modelling coordinator of 30 %, funding for the Climate Research School of SEK 500 000, funding for database management of SEK 100 000, funding for climate modelling of SEK 100 000, budgeted for 2016 and 2017, continuation thereafter subject to review. ○ The remaining funds after these allocations from Stockholm University’s share of 80% of the SRA funds will be used to co-finance salaries of staff members recruited at IGV, NG, MISU and ACES using Bolin Centre funds. The Board agrees on equal co-financing for each department from 1 January 2021. ○ From 1 January 2016 to 31 December 2020, the Board agrees that MISU and ACES will receive co-financing equivalent to 33.3% of remaining SRA funds after the allocations for coordination activities and that IGV and NG will receive co-funding equivalent to 16.7% each of these funds. ○ The Board further agrees that remaining funds from the Linnaeus grant will be used to provide additional co-financing of these salaries to IGV and NG such that co-financing received by these Departments is equivalent to 25% of remaining SRA |

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| | funds, after the allocations for coordination activities, for the period 2016 to 2020. |
| § 8 | <p>Terms of reference for climate modelling coordination from 2015 onwards</p> <p>The Directors Alasdair Skelton and Leonard Barrie presented the terms of reference for climate modelling coordination in Appendix 4.</p> <ul style="list-style-type: none"> The Board approved the terms of reference in Appendix 4 with the addition of a change in item 3 to “100 kSEK annually during 2016 and 2017”, based on the decisions made under agenda items 6 and 7. |
| § 9 | <p>Research education in Climate Science</p> <p>Director Alasdair Skelton and Head of Department Karin Holmgren related their discussion of the possibility of a common research education for the departments of the Bolin Centre. The proposed program would be “Climate science with a specialization in [e.g. Physical Geography]”.</p> <p>Karin Holmgren informed that the Department of Physical Geography is unable to implement such a program due to the recent restructuring of the Department.</p> <p>Alasdair Skelton suggested the idea of a common masters program. The Board will discuss the idea at a later meeting.</p> |
| § 10 | <p>Discussion on Bolin Centre sponsorship of seminars and seminar series</p> <p>This item was tabled to a later board meeting.</p> |
| § 11 | <p>Information</p> <ol style="list-style-type: none"> Follow up on undergraduate teaching in Climate Science MISU will be represented by Gunilla Svensson in the working group that has been tasked with encouraging the development of an undergraduate course in climate science. This group which is led by Director Alasdair Skelton, will meet in the beginning of June. Follow up on joint workshop with the Baltic Sea Centre Research Director Leonard Barrie related the plans for closer collaboration with the Baltic Sea Centre, see Appendix 5. In the short term, the Science Advisory Group, SAG, will have their first meeting of the autumn term at the Askö Laboratory and there are plans for a joint “Let’s Talk Earth” event. In the long term the joint utilization of the Askö facility will be explored and the SAG has an idea of creating a permanent summer school with a possible location at Askö. Letter of intent for ACTRIS Chair Cynthia de Wit presented a letter of intent for a collaboration in setting up the ACTRIS Consortium as a European research infrastructure, see Appendix 6. Research area (RA) co-leaders for the period 2016-2018 The Directors have made a decision to keep the present research area leaders after consulting with the SAG. NEO continuation Head of Department and NEO Director Karin Holmgren related the successful event of signing a further 5 year agreement for the research station NEO in Greece. The President of Greece was there along with the President of the Royal Swedish Academy of Sciences. NEO |

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| | is looking for new associated partners and funding. |
| § 12 | Any other business There was no other business. |
| § 13 | Next meeting Next meetings will be 28 September 13-16 and 20 November 13-16 in the Geoscience building. |

Karin Jonsell,
Secretary

Johan Nilsson,
Attester

Cynthia de Wit,
Chair of the Board

been particularly strategic and has encouraged the community to develop 'flagship' projects not included in the original proposal.

MolbioKTH (SciLifeLab)

Performance: Excellent

Strategy: Excellent

Added value: Excellent

There seems little doubt that the SRA funding has been critical to developing a genuine collaboration between the 3 participating (Stockholm) universities. This initiative receives funding from several sources, but none of the other sources seem to incentivise the collaboration between partners to the extent that the SRA funding has achieved. The scientific publications coming out of this initiative rank competitively internationally and there is clear added value for Sweden in creating a centralised facility housing the expensive infrastructure required for molecular biology. The external expert evaluations of SciLifeLab expressed concern over management of the KTH part of the SRA as the Scientific Advisory Board has never met in full. However, this appears to have been a conscious and justified decision to delay the meeting until a single SAB across all participating universities could be created. The first physical meeting of this common SAB is scheduled (Feb. 2015). Both clinical and environmental genomics are areas that will hopefully be developed in coming years.

2.2.8 Stockholm University (SU)

Basic facts

Stockholm University (SU) applied for five SRAs and received three. Furthermore, SU receives funding as a co-applicant from four other funded SRAs.

In total, SU was allocated approximately 359 million Swedish Crowns by the government for the SRAs (2010–2014).

During 2014, the SRA funding corresponded to 3% of the basic funding for education and research given to SU from the government.

General comments

SU is the leader in three SRAs, all within the Climate theme. It is also a partner in SciLifeLab, focusing its interest in that SRA on life science and bioinformatics, and on environmental applications, in the eResearch SRA, EvetKth, and in CancerUU. Given SU's long-term strength in science, the University is pleased that its SRAs are in complementary fields as this should significantly strengthen and broaden the University's already well-established environmental and climate science capacity. The SRA money is 10% of the SU's base research funding in science.

While the expert assessors in their consolidated reports did not give any of the SRAs which SU leads top rating for research output, they were awarded all three top ratings for integration with education.

Strategic management and use of the SRA funding – *Good/inadequate*

SU offered an unapologetically different approach to the strategic management of its SRAs as compared to all the other universities interviewed. The University does not give special treatment to SRAs per se but successful research entities such as SRAs attracting significant funding can establish new university positions, which are decided at the faculty level. The university (faculty) underwrites these positions long-term. One example is the seven associate professor positions created in the SRA, KlimSU.

Thus the default aim of the university strategy for supporting SRAs is underwriting recruitments for them. Appointments to SRAs followed international recruitment. The recently introduced tenure-track process helps ensure high quality appointments.

Management of SRAs, including recruitment, is decentralised, being left to the relevant Departments and Faculties. The University stresses that for basic research the prioritisation has to be bottom-up. Management's role is to manage the process, ensuring that new funding does not simply support old areas.

As the SRAs that SU leads are all cross-faculty, they each have a cross faculty council that includes relevant deans. These councils determine how the SRA funds are distributed. Other University support mechanisms for the SRAs include:

- the University's emphasis on efficient university administration – in this regard it offers management-training programmes
- the Research Liaison Office created in recent years provides assistance with grant applications
- the Innovation Office helps with commercialisation
- the appointment of a new Vice-President for research cooperation at SU and the establishment of a new Communications Office. The University has recognised the need (not least in the Baltic Sea SRA, HavSU) to report the basic research that SU does more effectively.

With regard to education, the University puts strong emphasis on teaching by staff at all levels.

The strategy of recruiting high-quality tenure track staff is a good use of SRA funds that was adopted by many universities. The actual management of the SRAs seems to have been more problematical with EffnatSU, and has yet to settle into a satisfactory centre structure within the University.

University outcomes and excellence – *Good*

The University is wary of the use of bibliometrics and believes it is too soon to see the true impact of SRA funding. Nevertheless with regard to present outcomes, it noted at interview that the bibliometric scores of the SRAs have increased over the last 5 years and the SRAs have attracted increased external funding.

SU sees the prime stakeholders for outputs from the SRAs as government and trans-governmental bodies. Thus it was pleased that KlimSU findings were referred to in the most recent IPCC report.

Because the SRAs are cross-faculty entities, the University notes that impact on education is not significant to date although some new (Masters) courses have been developed.

Added value of the SRA funding instrument – *Good*

The University was clear that the greatest added value of the SRA funding has been stimulation of new research which is more strongly focused on the needs of society and that it has led to collaboration across departmental and faculty boundaries in ways that are hard to achieve with the University's current funding-distribution mechanisms. In the next 5 years, SU will continue to use the SRA funding in the same areas, but will vary the allocation of funds to encourage yet more collaboration across faculty boundaries including humanities and law.

Summaries of the individual SRAs

KlimSU

Performance: Good

Strategy: Good

Added value: Good/inadequate

KlimSU is an extension of a structure (Bolin Center) involving four SU Departments that came together for a Linnaeus Grant awarded some years ago. With the SRA funding it has, through 7 new appointments, built up its competence in climate and Earth system modelling. The purpose of the SRA is to stimulate the comparative use of climate models in research and to provide feedback on these models. Accordingly KlimSU has studied several models, has links to many other modelling groups, and works closely with HPC groups at KTH. Its societal impact is largely managed through its partnerships with the Rossby Centre and SMHI, but it also runs a

programme for schools. KlimSU is working with others to build a stronger Nordic climate-modelling capacity and it has held a joint seminar with HavSU on Baltic Sea matters. While its work has been picked up in the latest IPCC report, the KlimSU leadership group notes that the research impact to date has been modest as the last 5 years have been primarily about getting people and models into place. Now that a foundation has been laid, its impact over the next 5 years should be considerable.

EffnatSU

Performance: Inadequate

Strategy: Inadequate

Added value: Inadequate

The goal of EffnatSU is to create integrity and coherence in ecosystem services especially by acquiring comprehensive and quality environmental data and seeking to transfer scientific knowledge to organisations, especially governments, who could make more informed decisions with this data and knowledge. To date, EffnatSU's main contacts have been in hydrology and through contacts with the water management industry. As yet it would not claim to be doing frontline research, as the focus over the last 5 years has been to establish the centre, with the funding used mainly to appoint several postdoctorates and PhD students. The next 5 years should see EffnatSU functioning as a centre. It intends to grow the number of partners including adding competence in political science. It will also build tools mentioned in the original proposal. Nevertheless it has had some achievements including a Master's course, 7 PhD graduations, and the building of a very large multi-factor environment database in collaboration with a nuclear waste repository institution.

HavSU

Performance: Good

Strategy: Good

Added value: Inadequate

HavSU inspired the creation of the University's Baltic Sea Centre and will in the future be a component of that Centre. It received comparatively low amounts of SRA funding that it devotes primarily to new appointments. It does not claim frontline research status but it has some publications in top journals and many in good journals in relevant fields. It notes that an indicator of success will be when it sees its work significantly being used to manage the Baltic. It already has some impact on ICES fish stock assessments and its models of the eutrophication process being used as the basis of decisions by Helcom. With regard to education outcomes, HavSU already cooperates with the SU Baltic Sea Centre. It also contributes to a Master's programme on ecosystem management and its researchers teach at all levels. It aims to get ecosystem management taught as an integral component of many other courses.

2.2.9 Swedish University of Agricultural Science (SLU)

Basic facts

Swedish University of Agricultural Science (SLU) applied for four SRAs and received one. Furthermore, SLU receives funding as a co-applicant from two other funded SRAs.

In total, SLU was allocated approximately 143 million Swedish Crowns by the government for the SRAs (2010–2014).

During 2014, the SRA funding corresponded to 2% of the basic funding for education and research given to SLU from the government.

General comments

Following an externally moderated review of research quality and priorities at SLU, the SRA initiative was well-aligned with the SLU goals and structure. In response to the SRA call, SLU senior management chose

Evaluation Report for KlimSu, SU (Modelling Initiative of the Bert Bolin Centre for Climate Change)

Research output

The overall grading of research output for KlimSU in an international perspective is reaching *international standards*.

Since the SRA has been supported, the number of publications of the Bert Bolin Centre for Climate (BBCC) has doubled from 100 publications/year to 200 publications/year. This may not only be due to the SRA, but certainly the SRA contributes strongly to this increase. Indeed, the SRA has allowed the recruitment of 7 tenured climate modelers, which, in 2013, contributed 36 peer review papers, an excellent score showing a great success of the SRA strategy. The bibliometric analysis also exhibits average scores for top 1% and top 10% just above average. Importantly, recent publications have been relatively equitably distributed among the Bolin Centre SRA tracks: circulation variability and decadal predictability (24), unresolved scales (42), paleoclimate modelling (22), and Arctic climate change (24). Several very interesting results have been obtained for each of those four tracks. They involve cross-disciplinary work between the SRA team of climate modelers and the other departments of the BBCC working on aerosol and carbon measurements, atmospheric circulation observations, process studies with clouds and aerosols, and paleoclimate estimates from proxydata. They concern climate variability and predictability, process studies involving unresolved scales such as those associated with clouds, understanding of past climates and evaluation of model capabilities for the past millennium, Arctic changes such as the polar amplification and fluxes of methane. This increase in cross-departmental studies has been emphasized by a BBCC internal review and it confirms the expected transverse role of modeling.

The Bolin Centre SRA has its vision fixed on becoming a significant global competitor in climate modeling and with interacting as peers with the world's best centres. For a variety of reasons Sweden should develop such a globally significant capability and, while perhaps not fully on the frontline yet, the Bolin Centre initiative is well on its way. The selection of the four aforementioned tracks shows strong reasoning and discipline. All are particularly appropriate for Sweden.

Utilization and benefits

The overall grading of utilization and benefits of the KlimSu in an international perspective have *developed with great satisfaction*.

The impact on society or business of the research environment is essentially through advice and guidance on mitigation options and on future climate change, through assessment reports, contacts and solicited lectures. The research environment has already allowed strong steps in enhancing the impact of their research on society, in particular by strengthening the interactions between Stockholm University departments and the Rossby Centre at SMHI.

Indeed, SRA funding was used to considerably enhance communication about the Bolin Centre's climate modeling and about climate change more generally. A professional communicator has been retained and scientists are given training and opportunities to engage in public communication. Interestingly, and probably appropriately, the Centre has strategically targeted decision and policy makers and the future generations of adults for this communication. In the former case, engagement with the SMHI Rossby Centre in global climate modeling, and through participation in IPCC processes are the principal mechanisms. They have, for example, recorded.

70 of their papers cited in the last IPCC report, which is quite good. The scientists have also produced an impressive number of communication events (over 100 in 2013, the year of the publication of the IPCC working one 5th Assessment report). They have also given advice to the government and agencies through their partner at SMHI, the Swedish Meteorological Service. For the latter audience, educational materials and programs appropriate to schools, targeting especially schoolteachers, are very good.

Collaboration

The overall grading of collaboration of KlimSu is *effective in several dimensions*.

Collaboration is quite strong between co-applicants and emphasizes a very positive impact of the research environment. Co-applicants are located at Stockholm University, KTH and the Rossby Centre (SMHI). This collaboration appears to be effective in many directions, in particular through co-advised PhDs. On the science, KTH brings expertise to Stockholm University on paleoclimate modeling, chemical properties of aerosols, atmospheric turbulence. The Rossby Centre collaboration with SU has been very efficient on the development of the global climate model and the realization of the internationally coordinated experiments in support to the World Climate Research Program (CMIP) as described in the case study. Common publications are produced between co-applicants. Moreover, as already mentioned, the Rossby Centre brings a strong link to society and industry. One difficulty is the physical distance between Stockholm and SMHI (Norrköping) but the coordination has ensured regular communication to cope with this difficulty.

The research environment collaborates with other SRAs: at Stockholm University with BEAM on the Baltic, KlimSu (Ekoklim) on the impacts of climate change on ecosystems, at Lund University with KlimLu (MERGE) through SMHI on the modeling of ecosystems in the climate models, and on e-science with SeRC (at KTH). These collaborations are indeed important to allow the research environment to develop interdisciplinary collaborations on the impacts of climate change on one side and on the computing and e-science on the other side. As BBCC strengthens its modeling activities, these collaborations should also strengthen, especially with KlimLu (MERGE) as both SRAs address common or overlapping issues (e.g. paleoclimate reconstructions) and for the overall stature of Swedish climate modeling in general.

The research environment has many international collaboration, as emphasized by the 73% of publications done in international collaboration. These collaborations are particularly important as concern climate modeling since BBCC do not (and do not want to) develop its own model. They collaborate for this mainly with the US NCAR modeling group and more and more within the European EC-Earth Consortium, which develops the EC-Earth global climate model. The research environment has a clear strategy on climate modeling and their increasing involvement in EC-Earth is very positive, as it is consistent with the choice made by Sweden to invest on the EC-Earth consortium through the Rossby Centre and Lund University (MERGE).

The strategic collaboration with SMHI is essential to foster interactions outside academia as it provides the interface with the intergovernmental use of models for decision-making.

Connections with business per se are more scarcely developed, although they are occurring in the fields of air-quality measurements, ocean bathymetry and nuclear waste management.

Integration with education

The overall grading of integration with education is *developed with internationally high standards*.

The Bolin Centre has strengthened university education at all levels through its Climate Research School (CRS), primarily on master and PhD level (almost 100 PhD students) but also on post-doctoral positions and education for schools and teachers. SRA funded recruitments have been through international campaigns. On all the PhD and post-doctoral at the Bolin Centre and/or the CRS, above one third comes from abroad. The CRS also organizes international summer schools. The SRA plays a key role on developing courses on climate modeling with a strong contribution of the seven SRA-funded lecturers/professors. On this excellent base the Bolin Centre is well positioned to train more PhD recipients and postdoctoral fellows in climate modelling in order to reach the stature of leading modeling centres in Europe and North America.

Management

The overall grading for management of the KlimSu in an international perspective is *on target and developing with high standard*.

The management of the SRA has strongly evolved in 2013, which seems to reflect the success of the SRA in integrating climate modeling within the Bolin Centre as well as the recognition of the strong collaborations with KTH and the Rossby Centre. Indeed, all three participating research institutes (SU, KTH and SMHI) are

now represented in the new Bolin Centre Structure, both as part of the research areas and as members of the Bolin Centre Board. Climate modeling, supported by the SRA, is recognized as a crosscutting activity across the six research areas. Moreover, each of the new research areas is co-led by SRA-funded modelers and scientists working on climate observations and/or processes.

A crucial element for the success of this SRA appears to be the recruitment of seven lecturers/professors as part of the modeling initiative of the Bolin Centre. These recruitments have been done internationally and have brought new expertise and new competence in the SRA. They ensure a strong long-term impact of the SRA. The Bolin Centre approach is been truly international in its recruitment of funded positions, not only for lecturers but also for postdocs and research students. The SRA has also done an exemplary job on increasing the representation of women: 3 of 7 core theme leaders are women, as is one-half of the PhD students and postdocs.

This SRA is definitely headed in the right direction. They are addressing essential, and maybe even existential, issues for society and they realize that this science must be conducted in a public context of responsiveness and awareness. The SRA has strongly enhanced climate modeling at BBCC which now very well integrated in the overall activities.

Proposed model for future financing of the coordination activities of the Bolin Centre for Climate Research

The Bolin Centre for Climate Research has three coordination activities. These focus on climate modeling, database management and a climate research school. These activities are central to the present and future Bolin Centre. Our climate modellers rely on access to high power computing and programming support, our climate research school coordinates education activities for its 110 PhD student members and open access requirements make database support an essential part of a research environment. We thus recommend that all three coordination activities are continued in a future Bolin Centre.

In the recent evaluation of the Bolin Centre, our overall grading for integration with education was “developed with internationally high standards”. This was the highest grade we received in the evaluation and our Climate Research School was cited as the reason. Also, our post-2013 structure with its coordination functions was commended highly. In the light of this evaluation, we advise the Board against making any financial cuts which affect our coordination activities. These activities require investment rather than reduced funds.

Alasdair Skelton, Leonard Barrie and Martin Jakobsson

Climate Research School: Survey of usage and needs.

Prepared for the Bolin Centre Board by Björn Gunnarson

1. How many courses do we hold annually on average and how are these distributed between IGV, NG, ACES and MISU?

On average 4-5 courses annually (summer schools every second year). Most are joint courses which are coordinated by B. Gunnarson and hosted as follows:

IGV - 0

NG -2

Aces -1

MISU- 2

3. How many students attend these courses on average and how are these distributed between IGV, NG, ACES and MISU?

On average 40 students/year distributed as follows:

IGV 10%

NG 30%

ACES 25%

MISU 35%

4. How many grants do we award to students annually on average and how are these distributed between IGV, NG, ACES and MISU?

From start 2011 we have awarded 150-250 tkr./year distributed as followed:

IGV 15%

NG 35%

ACES 20%

MISU 30%

5. We have held 3 summer schools (?). How many of our students have participated and how are these distributed between IGV, NG, ACES and MISU?

Ca 26 student in total for each summer school and about half of the students has been from the Bolin Centre. These are equally distributed between our Departments:

IGV 25%

NG 25%

ACES 25%

MISU 25%

6. How many students are presently members of the CRS and how are these distributed between IGV, NG, ACES and MISU?

About 100 members distributed as follows:

IGV 18%

NG 27%

ACES 15%

MISU 29%

KTH 5%

SMHI 3 %

Bolin Centre Database: Needs and Uses

Purpose and aims of the database

The Bolin Centre Database aims to provide an open access infrastructure for the preservation, exchange and publication of climate and other Earth system research data produced within the Bolin environment. The service is available through a web interface at <http://bolin.su.se>. The main goals with the database initiative have been to:

1. Provide a data management resource for members of the Bolin Centre and their collaborators and also to work as an open access service (under Creative Commons licenses) to our data for the wider scientific community and to the public.
2. Meet the demands from funding organizations of data storage and open access
3. Provide personnel that are capable of giving expert advice and guidance on data management and assist in design of new databases as well as data curation and storage.
4. Link data in the Bolin Centre to nationally or internationally recognized central repositories.

A database coordinator (50%) and a technical database manager (50%) currently makes up the staff.

The External Science Advisory Group of the Bolin Centre (ESAG) pointed out (in their report of 9 December 2014) the need to increase the capacity of the Centre Database. As a response, a Database Advisory Group with representation from each of the four departments has been set up. Their task is to work with the database staff to provide strategic direction, leadership, support for service delivery and budgetary planning advice. The Terms of Reference for the Database Advisory Group was approved by the Bolin Centre Board in February.

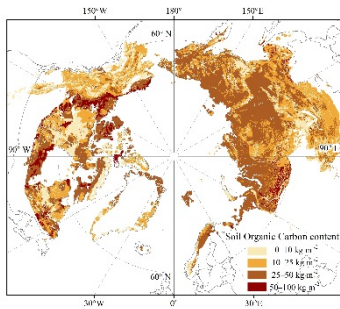
The Bolin Centre Database has collaboration with the national data services ECDS (Environment Climate Data Sweden) <http://www.smhi.se/ecds> and SND (the Swedish National Data Service) <http://snd.gu.se/sv>. The Bolin Centre (through the database coordinator) is also a member in several Working and Interest Groups of the Research Data Alliance <https://rd-alliance.org/>

Current uses of the Bolin Centre database

The main users of the database to this point consist of longer-term large research projects that required a solid host for their data observations. These projects include Bolin Centre scientist from more than one department and they have required specifically designed data portal entries. In common for the data produced in these projects is that they are all comprised of compilations of observations required by the broad scientific community. Some of these data compilations have been released in conjunctions with high profile papers.

Design and management of specific data portals for large datasets has been a request from many research groups within the Bolin Centre, and this has consumed most of the personnel resources. The database also functions as a repository for smaller datasets. All data is stored with detailed metadata that enables search and interoperability with other data repositories.

Specific data portals in the Bolin Centre Database:



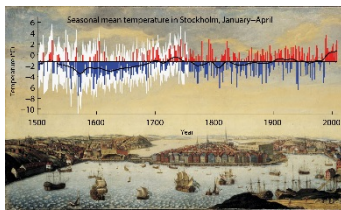
The Northern Circumpolar Soil Carbon Database (NCSCD version 2) is a spatial dataset created for the purpose of quantifying storage of organic carbon in soils of the northern circumpolar permafrost region. The map shows the extent of the northern circumpolar permafrost region and soil organic carbon content to a depth of 1 m, estimated using the Northern Circumpolar Soil Carbon Database. [NG]



Swedish glaciology data: These are actually two separate portals.

Photos, maps, and other information from about 200 Swedish glaciers, with the earliest accounts from the 19th century. [NG]

Data from Tarfala Research Station covering meteorology, hydrology, glaciology, permafrost, vegetation, and more, from 1946. [NG]



Historical climate in Stockholm: Daily weather observations have been carried out since 1754 at the Stockholm old astronomical observatory and the measurement series is one of the world's longest unbroken records. This record was combined with documentary data on ships entering and leaving Stockholm harbor to make a reconstruction of winter temperature for the last 500 years. [NG]



Oceanographic and bathymetric data from the Arctic and the Antarctic, compiled during expeditions with icebreaker Oden since 1980. [IGV and MISU]

Please visit the database web pages to explore the full content of the portals <http://bolin.su.se/data>

There are also portals currently under construction:

- A sediment database, including clay-varves. [NG and IGV].
- Arctic Summer Cloud Ocean Study. [MISU]
- Zeppelin Mountain Research Station. [ACES]
- Navarino Environmental Observatory. [ACES, IGV, NG]
- The Nordic Dendro Database [NG]
- Swedish Historical Climatology, documentary data of crop yields, etc [NG and History]

Other datasets stored in the database include :

| Dept. | Number of datasets |
|----------|--------------------|
| IGV | 27 |
| MISU | 1 |
| NG | 14 |
| ACES | 1 |
| External | 5 |
| Total | 48 |

Research data produced at the Bolin Centre represent values far beyond the initial projects and fields of application. It is therefore crucial that our data can be shared and re-used within the Centre as well as within national and international research communities. Furthermore, the Swedish research councils proposes “national guidelines for open access to scientific data” with the principle that research data forming the basis for scientific publications must be freely and openly available. The VR proposal has been submitted to the Swedish government and the first steps towards implementation will probably be taken in 2016. The Bolin Data Base fulfills a basic requirement of all funding agencies for sound practices in data management and open access.

BOLIN CENTRE DATABASE ADVISORY GROUP (DAG)

TERMS OF REFERENCE

1. Preamble

The main objective of the Bolin Centre Database initiative is to ensure the preservation, interoperability and open access of climate and other Earth system research data for Members of the Centre. Data and metadata stored in the database are made available through a web interface at <http://bolin.su.se>. A database coordinator and a technical database manager currently makes up the Database Team.

The External Science Advisory Group of the Bolin Centre (ESAG) pointed out (in their report of 9 December 2014) the need to increase the capacity of the Centre Database: *“The Bolin Centre collects unique datasets, some of which are very large. The capacity to organize an efficient and user-friendly databank is too limited. Archiving of the data cannot be left over to international databanks only. The ESAG proposes that action is taken to increase the capacity.”* From a discussion with the ESAG chair during the 21 Nov 2014 the following action was initiated: *“The [Bolin Centre] Board agreed that a more structured approach to data base services in the Centre is needed that has stronger participation of the Departments and their data base personnel. As a start, the [Bolin Centre] directorate is asked to prepare terms of reference for a possible Database Advisory Group to be discussed at the next board meeting. This document is in response to this request.*

2. Purpose

Working as a team, the Bolin Centre Database Advisory Group will provide strategic direction, leadership, support for service delivery and budgetary planning advice. This will ensure an increased capacity and a refined operability of the Bolin Centre research database.

3. Term

This Terms of Reference are effective from 29 January 2015 and will be ongoing until terminated by agreement between the parties.

4. Membership

The Bolin Centre Database Advisory Group will consist of one representative from each of the four Bolin Centre partner Departments at Stockholm University and the Bolin Centre partner institutions KTH and SMHI. The Data Base coordinator will chair the group. A rapporteur to assist in preparing minutes will be elected from amongst the members on an annual basis.

5. Objective and Responsibilities

To ensure the delivery of data base management service and support that in turn, ensures the preservation, interoperability and open access of climate research data generated by Bolin Centre Activities. The Data Base Advisory Group reports through the coordinator to the Directors of the Bolin Centre who in turn work with Bolin Centre partners to ensure the effective functioning of this team.

6. Meetings

- All meetings will be chaired by the Bolin Centre Data Base Coordinator
- A meeting quorum will be the chair, and two thirds of the remaining members of the advisory group.

- Meeting agendas and minutes will be provided by the Data Base Coordinator and rapporteur, this includes:
 - preparing and distributing agendas and supporting papers at least one week before the meeting
 - preparing and distributing meeting minutes that are checked by a group member no later than two weeks after the meeting..
- Meetings will be held at a minimum of twice a year.

7. Amendment, Modification or Variation

This Terms of Reference may be amended in writing through consultation with the Directors of the Bolin Centre and approval by the Bolin Centre Board.

| IGV staff | Salary (2014) | % employment | Annual cost | LKP | 52,72% OH | 23% |
|-----------------|---------------|--------------|----------------------|---|-----------|-----|
| Christoph Sturm | SEK 44 970 | 100% | SEK 1 013 657 | Linnaeus | | |
| Rezwan Mohammad | SEK 37 460 | 50% | SEK 422 188 | Strategic | | |
| Agatha de Boer | SEK 48 140 | 80% | SEK 868 089 | Strategic | | |
| Total | | | SEK 2 303 934 | | | |
| | | | | | | |
| Bolin staff | | | | | | |
| Rezwan Mohammad | SEK 37 460 | 50% | SEK 422 188 | Linnaeus | | |
| Karin Jonsell | SEK 38 530 | 100% | SEK 868 494 | Strategic = SEK 500,000, Linnaeus = SEK 368,494 | | |
| Directors | | | SEK 477 546 | IGV | | |
| Total | | | SEK 1 768 228 | | | |
| | | | | | | |
| Total | | | SEK 4 072 162 | | | |

| NG staff | Salary (2014) | % Bolin Centre | Annual cost | LKP | 52,72% OH | 23% |
|------------------|---------------|----------------|-------------|-----------------------|-----------|-----|
| Nina Kirchner | SEK 42 930 | | 100% | SEK 967 674 Linnaeus | | |
| Li Quang | SEK 33 730 | | 100% | SEK 760 299 Strategic | | |
| Qiong Zhang | SEK 44 770 | | 80% | SEK 807 319 Strategic | | |
| Total | | | | SEK 2 535 292 | | |
| | | | | | | |
| Bolin staff | | | | | | |
| Håkan Grudd | SEK 39 760 | | 50% | SEK 448 110 Linnaeus | | |
| Björn Gunnarsson | SEK 38 120 | | 50% | SEK 429 626 Linnaeus | | |
| Directors | | | | SEK 477 546 INK | | |
| Total | | | | SEK 1 355 282 | | |
| | | | | | | |
| Total | | | | SEK 3 890 574 | | |
| | | | | | | |
| | | | | SEK 491 828 | | |

| MISU staff | Salary (2014) | % employment | Annual cost | LKP | 52,72% OH | 23% |
|-------------------|---------------|--------------|----------------------|-----------|-----------|-----|
| Kristofer Döös | SEK 50 440 | 100% | SEK 1 136 955 | Linnaeus | | |
| Laurent Brodeau | SEK 33 285 | 70% | SEK 525 188 | Linnaeus | | |
| Annica Ekman | SEK 43 200 | 80% | SEK 779 008 | Strategic | | |
| Rodrigo Caballero | SEK 53 150 | 80% | SEK 958 432 | Strategic | | |
| Frida Bender | SEK 39 860 | 80% | SEK 718 779 | Strategic | | |
| Total | | | SEK 4 118 361 | | | |
| Bolin staff | | | | | | |
| Directors | | | SEK 477 546 | MISU | | |
| Total | | | SEK 477 546 | | | |
| Total | | | SEK 4 595 907 | | | |

| ACES staff | Salary (2014) | % employment | Annual cost | LKP | 52,72% OH | 23% |
|---------------------|---------------|--------------|----------------------|-----------|-----------|-----|
| Ilona Riipenen | SEK 48 620 | 100% | SEK 1 095 930 | Strategic | | |
| Christian Beer | SEK 46 910 | 80% | SEK 845 909 | Strategic | | |
| Matthias Brakebusch | SEK 31 180 | 100% | SEK 702 820 | Strategic | | |
| Peter Tunved | SEK 38 840 | 100% | SEK 875 482 | Strategic | | |
| Total | | | SEK 3 520 141 | | | |
| Bolin staff | | | | | | |
| Directors | | | SEK 477 546 | ITM | | |
| Total | | | SEK 477 546 | | | |
| Total | | | SEK 3 997 687 | | | |

Bolin Centre - "business as usual"

| Staff | Total | Linnaeus | Strategic |
|----------------------------|-----------------------|----------------------|----------------------|
| IGV | SEK 2 303 934 | SEK 1 013 657 | SEK 1 290 277 |
| INK | SEK 2 535 292 | SEK 967 674 | SEK 1 567 618 |
| MISU | SEK 4 118 361 | SEK 1 662 142 | SEK 2 456 219 |
| ITM | SEK 3 520 141 | SEK 0 | SEK 3 520 141 |
| Total | SEK 12 477 728 | SEK 3 643 473 | SEK 8 834 255 |
| | | | |
| Bolin Centre Staff | SEK 3 123 510 | SEK 1 668 419 | SEK 1 455 091 |
| Bolin Centre Drift | SEK 4 770 374 | SEK 4 770 374 | SEK 0 |
| Total | SEK 7 893 884 | SEK 6 438 792 | SEK 1 455 091 |
| | | | |
| Total | SEK 20 371 611 | | |
| Faculty | SEK 18 907 000 | | |
| SMHI + KTH | -SEK 3 781 400 | | |
| Departments | SEK 5 246 011 | | |
| | | | |
| Remaining funds (Linnaeus) | SEK 6 622 529 | | |
| Remaining funds (CRS) | SEK 2 245 476 | | |
| Remaining funds (Total) | SEK 8 868 005 | | |

In this model funds are shared equally from January 1, 2021 and IGV and NG are compensated from remaining Linnaeus funds. THIS MODEL WAS APPROVED BY THE BOARD.

| | Cost 2015 | % employment | Annual cost |
|------------------------------|------------|--------------|----------------------|
| Director | SEK 50 000 | 50% | SEK 563 518 |
| Science coordinator | SEK 38 530 | 100% | SEK 868 494 |
| Director of studies | SEK 38 120 | 50% | SEK 429 626 |
| Database coordinator | SEK 38 610 | 100% | SEK 870 298 |
| Climate modeling coordinator | SEK 33 285 | 30% | SEK 225 080 |
| Staffing costs | | | SEK 2 957 017 |

LKP 52,715%

OH 23%

This OH level is to cover faculty "faktura".

| | | | |
|--------------------------|----------------------|-------------------|----------------------|
| Director/s | SEK 600 000 | <i>reduced to</i> | SEK 400 000 |
| Research areas | SEK 1 800 000 | | SEK 1 800 000 |
| Communication | SEK 600 000 | <i>reduced to</i> | SEK 500 000 |
| Research school | SEK 1 570 374 | <i>reduced to</i> | SEK 500 000 |
| Database | SEK 100 000 | | SEK 100 000 |
| Climate modeling | SEK 100 000 | | SEK 100 000 |
| Operational costs | SEK 4 770 374 | <i>reduced to</i> | SEK 3 400 000 |

| | | | |
|--------------------|--|--|----------------------|
| Total costs | | | SEK 6 357 017 |
|--------------------|--|--|----------------------|

| | | % allocation | Income | Permanent staff | Co-financing |
|------------------------|--|--------------|-----------------------|------------------------|-----------------------|
| Strategic funds | SEK 18 907 000 | 80% | SEK 15 125 600 | | |
| Remaining funds | | | SEK 8 768 583 | | |
| IGV | <i>These % allocations become 25% for each</i> | 16,7% | SEK 1 464 353 | -SEK 2 303 934 | -SEK 839 580 |
| NG | <i>Department on</i> | 16,7% | SEK 1 464 353 | -SEK 2 535 292 | -SEK 1 070 938 |
| MISU | <i>January 1, 2021</i> | 33,3% | SEK 2 919 938 | -SEK 4 118 361 | -SEK 1 198 423 |
| ACES | | 33,3% | SEK 2 919 938 | -SEK 3 520 141 | -SEK 600 203 |
| | | | | -SEK 12 477 728 | -SEK 3 709 145 |

These % allocations have been changed from 35.3/31.3% to 33.3% as agreed by ACES and MISU.

| | | |
|-----------------------------|---------------|-------------------------------------|
| Remaining funds (Linnaeus) | SEK 6 622 529 | <i>Numbers are valid only</i> |
| Remaining funds (CRS) | SEK 2 245 476 | <i>if budget is taken and</i> |
| Remaining funds (Total) | SEK 8 868 005 | <i>followed.</i> |
| Staff costs (Linnaeus) IGV | SEK 506 828 | for January 1, 2016 - June 30, 2016 |
| Staff costs (Linnaeus) NG | SEK 483 837 | for January 1, 2016 - June 30, 2016 |
| Staff costs (Linnaeus) MISU | SEK 831 071 | for January 1, 2016 - June 30, 2016 |
| Bolin staff (Linnaeus) IGV | SEK 0 | for January 1, 2016 - June 30, 2016 |
| Bolin staff (Linnaeus) NG | SEK 224 055 | for January 1, 2016 - June 30, 2016 |

C. Sturm

N. Kirchner

K. Döös, L. Bordeau (70%)

Model assumes no change to % employment for central Linnaeus-funded staff (i.e. K. Jonsell, H. Grudd, B. Gunnarsson and R. Mohammad) for this period. Changes can be compensated here.

| | | Compensated to (%) | Allocated (%) | % compensation | Number of years |
|-----------------------------------|---------------------|--------------------|---------------|----------------|-----------------|
| IGV compensation **, ** | SEK 3 638 962 | 25% | 16,7% | 100% | 5 |
| NG compensation **, ** | SEK 3 638 962 | 25% | 16,7% | 100% | 5 |
| Remaining funds (Total) ** | -SEK 455 710 | | | | |

* Compensation is calculated after subtracting the cost of the Bolin Centre.

** This compensation works so long as "Remaining funds (Total)" exceed zero and provided that the budget for 2015 is held. Director salaries must be charged retroactively to CRS.

Note that it doesn't!!! I propose that the negative balance is shared equally among our 4 Departments.

The following proposal was tabled at the last Board meeting on 9 March 2015

Decisions on Climate Modelling Coordination

1. Considering the need of the centre's modelling research for access to high performance computer resources and for networking, the Board approves the proposal that modelling coordination continue to be a key function supported by the Bolin Centre and administered by the Bolin Centre Directorate. The proposal was prepared by the Directorate after consultations involving input from the former Modelling Coordinator, the Bolin Centre's Scientific Advisory Group, computer programming technical experts and researchers that a Modelling Coordinator and Deputy Coordinator supported by a team of researchers and experts in applications of high performance computing to climate and Earth system research is needed.
 2. The Board approves the appointment of a team operating under the Terms of Reference (Appendix 1) consisting of a Modelling Coordinator, Rodrigo Caballero, a Deputy Modelling Coordinator, Kristofer Döös and a high performance computer modelling support group chaired by Laurent Brodeau consisting of technical experts from the Departments and Organizations that make up the Bolin Centre.
 3. The Board approves the proposal to allot 100 kSEK annually during 2016 and 2017 to cover ordinary costs of running the modelling coordination (mostly to cover travel to EC-Earth meetings, NorESM meetings or other such dedicated meetings for Laurent and/or other members of the team) and to allot additionally, funds to cover 30% of the salary of Laurent Brodeau. The Board noted that the Bolin Centre Directorate after consultation with the Modelling Coordination leaders will provide names of the expert team members at the next Board meeting.
 4. One issue regarding high performance computing that cannot be addressed well by only the Modelling Coordination Team is high-level lobbying for computer resources for the field of climate research. This is beyond the scope of the Modelling Coordination team although it needs to include the modelling coordination leaders. The former Modelling Coordinator, Gunilla Svensson, has noted in an early brief that this function is tightly connected to the goals of the SeRC Climate Community, the e-science Strategic Research Area that is a KTH based centre with SU, LU and KI as partners, and proposed that this task will be transferred to SeRC. The Board asked the Directors and Board Member from KTH Dan Henningson to consult further with all those involved and make a proposal for consideration at the next Board meeting.
-

On 9 March 2015, the final decision on the above proposal was deferred to the next Board meeting with one exception. In approving the Budget proposed by the Director of the Bolin Centre, the Board essentially approved item 3 above for 2015.

Appendix 1

Terms of Reference for the Modelling Coordination Team of the Bolin Centre for Climate Research

1. Coordination activities that ensure a healthy climate modelling research environment are an important function of the Bolin Centre (see Strategic Plan) . A modelling coordination team proposed by the Directors and approved by the Board has been established to undertake the following tasks:
 - i. Coordination and support for applications for access to high performance computer resources in Sweden offered mainly by the Swedish National Infrastructure for Computing (<http://www.snic.vr.se/>) but also by other Swedish and European organizations.
 - ii. Coordination of scientific programmers in the Bolin Centre to improve service for all climate modellers within the Bolin Centre
 - iii. Organization of activities that foster the information exchange and networking of Bolin Centre climate modelling researchers internally within the Centre and internationally.
2. The team structure consists of:
 - a. a Modelling Coordinator and Deputy Modelling Coordinator who are research scientists involved in high performance computer modelling of climate and/or Earth system. They are responsible for overseeing the implementation of the tasks outlined above. They are appointed by the Board upon the recommendation of the Directors and report to the Director(s). They are also members of the Bolin Centre Scientific Advisory Group.
 - b. A High Performance Computer Modelling Support Group to specifically address task (ii) above and consisting of technical experts representing component departments and partner organizations of the Bolin Centre. It is chaired by technical experts appointed by the Director(s) upon the suggestion of the Modelling and Deputy Modelling Coordinators. The appointment of experts also involves consultation with the Scientific Advisory Group and the Board.

Follow up on joint activities with the Baltic Sea Centre

Background: Document is report of outcome of meetings BEAM and Bolin Centre tabled at Board Meeting January 29th.

Follow-up: Christoph Humbolt (a Director BEAM) and L. Barrie (a Director Bolin Centre) met to discuss future action strengthening interaction between the Centres.

In the short term we are scoping two activities:

1. A Joint "Lets Talk Earth" Science Forum in September 2015 along the lines of Climate Change and Regional Seas highlighting the Baltic and other Regional Seas like the Mediterranean and 'the Mediterranean of the North' the Arctic ocean.
2. A possible one day Bolin Centre SAG morning meeting in September on Askö followed by an afternoon workshop with BEAM staff to discuss future joint directions.

In the medium term we have in mind better utilization of the Stockholm University BEAM facility at Askö by the Bolin Centre. For instance research schools, workshops and symposia.

Appendix

(Tabled at Board Mtg of Bolin Centre 29 January)

Collaboration in Earth Science Research between the Baltic Sea Centre and the Bolin Centre for Climate Research

(Outcome of Directors' Meeting 20 January)

Background

The Baltic Sea Centre formed in 2013 is comprised of a group of approximately 41 people with 25 research scientists. Amongst the 25 scientists is a group of 7 physical oceanographers as well as several modellers, marine ecologist and biogeochemist. The Baltic Sea Centre is an entity within the Faculty of Science of SU with potential links to many departments and partners of the Bolin Centre. It has evolved into a well-structured organization with solid funding through international cooperation, Swedish research interests as well as strategic partnership with the Baltic 2020 foundation. One current source of funding is the Strategic Research Area (SFO) BEAM project which, like the Strategic Research Area for Climate Research of the Bolin Centre, is in a renewal phase. A cornerstone of the Baltic Sea Centre infrastructure is the Askö observatory on an east coast island near Stockholm and a new research vessel. This facility is supported by 5 staff. Details of the Centre and its research can be found at <http://www.su.se/ostersjocentrum/english/>.

Founded in 2006, the Bolin Centre for Climate Research (<http://www.bolin.su.se/>) is a multi-disciplinary consortium of researchers led by Stockholm University that conducts fundamental research on critical processes in the climate system. It involves approximately 270 researchers spread across the departments of Meteorology; Environmental Science and Analytical Chemistry; Physical Geography and Geological Science at Stockholm University together with FLOW at KTH Royal Institute of Technology and researchers at the Swedish Meteorological and Hydrological Institute.

Contact between the two centres began in 2014 with informal discussions, a presentation at Bolin Dagarna in November by Christoph and an ad hoc discussion of the leaders prior to the review of our respective strategic research areas. On 20 January, 2015, a meeting took place between Leonard Barrie, Director for Research of the Bolin Centre and Research Leaders of the Baltic Sea Centre: Tina Elfving, Bo Gustafsson and Christoph Humborg to explore cooperation before meeting with the Board of the Bolin Centre on 29 January 2015. This summary was prepared by all with later input from Bolin Centre Director who due to unforeseen circumstances could not attend.

Summary Statement

1. The group agreed that there are benefits to be gained in collaborations between the Centres that will (i) better integrate intellectual resources of Centres and (ii) better utilize the tremendous research and observational facilities offered by the Baltic Sea Centre and its new research vessel. It was felt that one important aspect of achieving this is to “pull together” the centres through common activities. Questions such as the following will help in doing this:
 - a) how will climate change affect the Baltic Sea environment, ecosystems and resources?
 - b) what can we learn about climate and Earth system processes in general from the natural laboratory that is the Baltic Sea?
 - c) How can regional climate and Earth system models be improved by collaboration between the Centres?
2. Both Centres have funding to support brainstorming joint workshops in 2015 to develop common research questions/projects as well as activities that result in better joint use of facilities. We are open to suggestions.
3. With regard to integrating intellectual resources, one obvious step that could be taken is to cross-appoint Baltic Sea Centre researchers in Bolin Centre partner departments and organizations.

LETTER OF INTENT

**For collaborating in setting up the ACTRIS Consortium as a European research infrastructure
and
for expressing interest to provide funding and support for that process**

The Bolin Centre for Climate Research at Stockholm University, Stockholm, Sweden (www.bolin.su.se), supports, develops and conducts interdisciplinary research in the fields of the climate and Earth system research. The Bolin Centre involves over 300 scientists at our University, KTH and SMHI.

With this Letter of Intent, the Bolin Centre:

1. Recognises the organisation's investments and work carried out so far to establish and develop the Aerosols, Clouds, and Trace gases Research Infrastructure Consortium (ACTRIS) and to determine the position of the ACTRIS in the ESFRI (European Strategy Forum on Research Infrastructures) roadmap.
2. Declares its willingness to work actively and constructively with other research organisations and stakeholders in other ACTRIS countries in order to set up the ACTRIS Consortium as a sustainable European research infrastructure and with the aim of creating a legal entity with legal personality and full legal capacity.
3. Declares that it shall encourage provision of resources to cover its organisation's share of the construction and operating costs in Sweden for the ACTRIS research infrastructure as estimated in the ACTRIS financial plan of the ESFRI proposal.
4. Recognises that the ACTRIS financial plan will be defined and agreed upon in future negotiations among ACTRIS members.
5. Recognises that the ACTRIS research infrastructure shall have the following structure:
 - Head Office
 - Distributed European Central Facilities, including but not limited to, ACTRIS Data Center, Calibration Centers for Aerosol instruments, Lidars, Sun-photometers and Trace gases
 - National ACTRIS facilities, such as observation stations, chambers and laboratories.
6. This letter of intent shall be in force until the final legal structure for the ACTRIS research infrastructure is established or ten (10) years from the date it was signed, whichever is earlier.

Stockholm, 19 March 2015



Cynthia de Wit
Chair of the Board of the Bolin Centre for Climate
Research