

ANNUAL REPORT 2013



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Severe Storms
Laboratory** e.V.

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Contents

1	INTRODUCTION	4
2	SCIENCE	5
2.1	7 th European Conference on Severe Storms - ECSS2013	5
2.2	European Severe Weather Database.....	7
2.3	ESSL Testbed.....	10
2.4	Wind speed scale and ESWD discussion.....	11
2.5	Convection Working Group	12
2.6	Severe Thunderstorm Evaluation and Predictability in Climate Models (STEPCLIM)	12
2.7	Evolution of Hail Storms over Europe in Changing Climate.....	13
2.8	Joint Project with RCEC on Validation of Storm Model Physics	14
3	PUBLICATIONS, COURSES AND SEMINARS	15
3.1	Forecasting Severe Convection I (Basic Course).....	15
3.2	List of publications	15
3.3	List of presentations and conference contributions.....	15
4	FINANCIAL AND ADMINISTRATIVE REPORT	18
4.1	Auditing and employment.....	18
4.2	Financial status 2013	18
4.3	ESSL members.....	20
4.4	Executive Board.....	20
4.5	Advisory Council	21
	APPENDIX A1: ANNUAL ACCOUNTS 2013	23
	APPENDIX A2: MEMBER LIST 2013	26

The European Severe Storms Laboratory - ESSL

The *European Severe Storms Laboratory e.V.* (ESSL) was founded as a private, non-profit research organisation in December 2006. It is a spin-off of German Aerospace Centre DLR in Oberpfaffenhofen, and relies on the long-term expertise of its international team. The ESSL office is located at the DLR-Institute for Atmospheric Physics.

Each year, severe thunderstorms inflict an estimated total damage of about 5 billion Euro and lead to many fatalities. ESSL's mission is to make Europe more resilient to severe weather. It does so by

- Performing fundamental and applied research on severe convective storms in Europe;
- Operating the European Severe Weather Database, ESWD;
- Organizing the European Conferences on Severe Storms, ECSS.

ESSL closely cooperates with its Austrian subsidiary *European Severe Storms Laboratory – Science & Training*, which pursues similar goals and operates the Research and Training Centre which is the venue of various seminars, workshops and the ESSL Testbed.

1 Introduction

The year 2013 was a successful year for ESSL in many respects. The highlights of the year include a very successful European Conference on Severe Storms (ECSS2013) organized jointly with the Finnish Meteorological Institute. The ECSS2013 that saw an attendance of more than 200 persons from almost 40 countries.

Furthermore, the second edition of the ESSL Testbed was organized after the great success of its first edition in 2012. Once again, several groups of people worked together to find out how to best forecast severe weather from convective storms using new tools and techniques supported by forecasting experts. Although the organization of the ECSS and the Testbed in two subsequent months created a very high workload for ESSL personnel, both events could be managed well.

In addition to these events, ESSL continued its climate research activities within the project STEPCLIM, funded by the German government and part of the decadal prediction programme MiKlip. First results from the project that focuses on using climate models to predict severe convective events, were presented at the ECSS conference, the EGU General Assembly and at several other occasions.

Great progress was made with the European Severe Weather Database that has grown with more than 10,000 reports within a single year. In addition, the web interface was enhanced so that it allows users to zoom to their particular region of interest when requesting severe weather events. The overall success of the ESWD and its acceptance within the scientific community is reflected by the impressive statistic that since 2006 **no fewer than 60 peer-reviewed publications in scientific literature have used the ESWD!**

On the financial side, ESSL managed to have a balanced budget, but it was not without challenges. Two projects expected to start in 2013 were delayed, which required cuts in personnel expenses during the last months of the year. This stresses that ESSL needs to further reduce its dependency on individual projects and to further increase income from members, especially by finding additional institutional members. It is also important that ESSL grows further so that the relative impact of any single project on the organization becomes smaller. These will be high priorities in the upcoming years.

It is my pleasure to present you this Annual Report which constitutes a review of ESSL's achievements in its seventh full business year.



Pieter Groenemeijer
ESSL Director

Weßling, 25 August 2014

2 Science

2.1 7th European Conference on Severe Storms - ECSS2013



From 3 to 7 June 2013 ESSL co-organized another edition of the European Conference of Severe Storms together with the Finnish Meteorological Institute. The venue of the conference was the Scandic Marina Congress Center in the harbour of Helsinki.

The Scientific Programme Committee of the conference was chaired by renowned severe weather researcher Dr. Harold Brooks from the National Severe Storms Laboratory in Norman, Oklahoma, USA.

In total, the conference attracted 210 participants from 38 countries to present their recent findings in severe storm research. The participants included researchers from academic institutions, from weather services and delegates from emergency management organizations and the reinsurance sector. The ECSS was attended by 40 persons from non-European countries, a fact which emphasizes that both severe storms and their study occur worldwide. The largest group, 22 people, of the non-European participants came from the United States of America. Other non-European participants travelled to the ECSS from the continents of Africa, Asia and South America. The attendance of some participants was supported by WMO, EUMETSAT and the Finnish Federation of Learned Societies.



Group picture of the ECSS 2013 participants in front of the conference venue in Helsinki. Photo by Pauli Jokinen.

The ECSS2013 was supported by these organizations:



The next ECSS will take place in Wiener Neustadt, Austria, from 14 to 18 September 2015.

Awards presented at ECSS 2013

The ESSL proudly presented the second Nikolai Dotzek Award and the fourth Heino Tooming Award at the ECSS in Helsinki. The ESSL awarded Dr. Charles A. Doswell III with the second Nikolai Dotzek award for his *lifetime achievement*.



The ESSL board presents the Nikolai Dotzek Award to Dr. Charles A. Doswell III.
(photo: Pauli Jokinen).

Nikolai Dotzek Award

In honour of ESSL founder Nikolai Dotzek, the ESSL board established the Nikolai Dotzek award to acknowledge a scholar for an outstanding contribution to the science of severe storms. The award may be given for a breakthrough discovery presented at the conference, for an accumulation of important accomplishments during a scientific career, or as an encouragement to an outstanding young scientist with great potential. The Award is endowed with a prize of € 1000, offers free participation to the next ECSS.



Trophy in form of an artificial large spiked hailstone.

Heino Tooming Award

For the fourth time, the ESSL Board also awarded the Heino Tooming award for the best collaborative work done by scientists from different European countries. It was presented to the following authors of the presentation of 'An overview of the electrical activity recorded during PEACH, the atmospheric electricity component of HYMEX ': Eric Defer, Sylvain Coquillat, Jean-Pierre Pinty, Serge Soula, Jean-Michel Martin, Serge Prieur, Evelyne Richard, William Rison, Paul Krehbiel, Ronald Thomas, Daniel Rodeheffer, Veronique Ducrocq, Olivier Bousquet, Odile Roussot, Laurent Labatut, Thomas Farges, Christian Vergeiner, Wolfgang Schulz, Graeme Anderson, Stephane Pedebay, Hans-Dieter Betz, Kostas Lagouvardos, Pascal Ortega, Gilles Molinie and Patrice Blanchet.



EMS Young Scientist Travel Award



The European Meteorological Society (EMS) awarded Maria Tous from the University of the Balearic Islands with the "EMS Young Scientist Travel Award" for her presentation "Medicane risk in a changing climate".

2.2 European Severe Weather Database

The operation and extension of the European Severe Weather Database (ESWD) is one of ESSL's three statutory purposes. The ESWD forms the basis for scientific studies carried out at ESSL and by several researchers worldwide. These scientific applications include studies on severe weather climate and risk assessment for which ESSL gets several requests each month from people around the world.



The ESWD is also used to assess the performance of new tools to support severe weather, such as radar- and satellite based detection algorithms. In addition to these applications, the ESWD is becoming more and more established as an aid for severe weather warning purposes. For example, the Trusted Spotter Network was created in Austria in 2011, which is a collaboration between ESSL, ZAMG and Skywarn Austria. Furthermore, the ESWD is used for forecast verification, for example at the ESSL Testbed.

Development of the ESWD dataset

In 2013, the ESWD has been expanded by 10,754 severe weather reports, which is a new record high of reports in any single year (Fig. 2.1.). Most of these reports, 4459 (41 %), are related to the weather type severe wind gusts, followed by the types heavy rain with 2122 reports (20 %) and large hail with 1977 reports (18 %). The absolute numbers and percentage in terms of weather type are listed in table 2.2. The spatial distribution of all reports is shown on the map below.

At time of writing, more than 98 % of the 2013 related reports passed the first quality control level QC0+ and now fewer than 87 % are considered “confirmed by reliable sources”, i.e. QC1 or higher and thereby usable for most analyses. The absolute number of reports in the ESWD up to 2013 approaches 70 000.

ESWD Data Use

ESSL provides ESWD data free-of-cost to individual academic scholars who carry out small studies, but will request a contribution for data usage within large or (partly) commercially-funded projects. This contribution serves to cover ESSL’s expenses for the collection and quality-control of the data and to finance further database enhancements. The preferred form of contribution is a multi-year supporting membership of ESSL, which includes ESWD access as a benefit.

quality control applied to report	number of reports in 2013	percentage
QC0, as received	144	1.3
QC0+, plausibility checked	1181	11
QC1, report confirmed by reliable sources	8958	83.3
QC2, event fully verified	471	4.4

Table 2.1. Number of ESWD reports for the year 2013 per quality control category.

<i>weather type</i>	<i>number of reports in 2013</i>	<i>percentage</i>
tornado	432	4.0
severe wind gust	4459	41.5
large hail	1977	18.4
heavy rain	2122	19.7
funnel cloud	234	2.2
gustnado	4	0.04
dust devil	13	0.1
heavy snowfall	395	3.7
ice accumulation	398	3.7
avalanche	260	2.4
damaging lightning	460	4.3
total	10754	100

Table 2.2. Number of ESWD reports for the year 2013 per severe weather type.

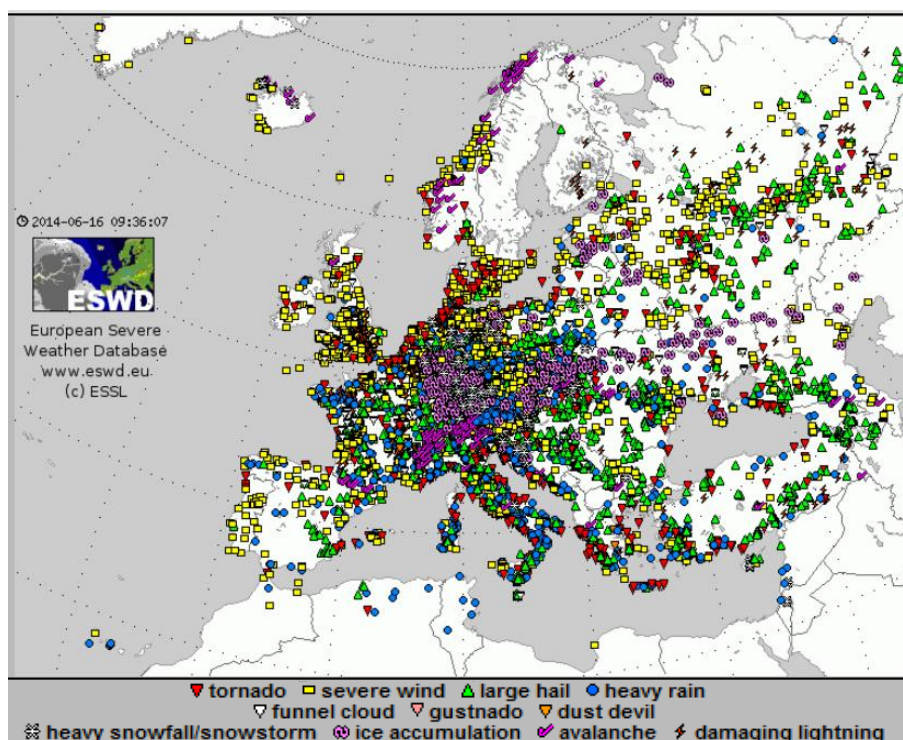
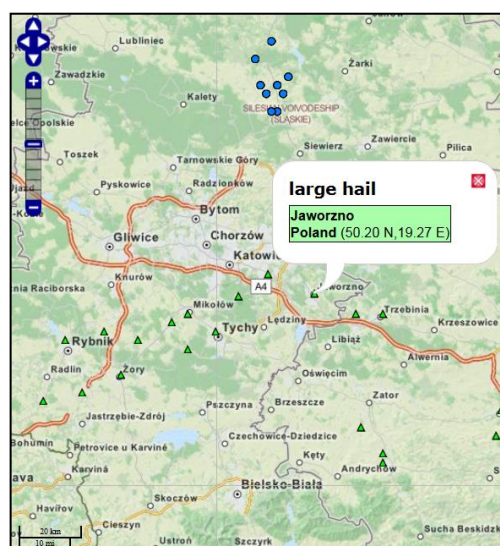


Figure 2.1. All 10,754 ESWD reports from 1 January to 31 December 2013. Symbols of severe weather events overlap in some areas.

Technical ESWD enhancements

Substantial changes have been made to the graphical user interphase of the ESWD towards the end of 2013. Version 4.2.2 includes a zoomable map with a resolution of up to 500 m. Upon clicking on a event with the mouse, the event's metadata are shown. For those with a member account, this includes photo and video material.

Figure 2.2. ESWD 4.2.2 example map (southern Poland for June 10 2013) with higher resolution and pop-up-function. Hail with a diameter of 6.5 cm was observed on that day.



2.3 ESSL Testbed

From 1 to 26 July 2013, the second edition of the ESSL Testbed took place at ESSL's Research and Training Centre in Wiener Neustadt, Austria. Over 50 participants from 20 different

countries, including both researchers and forecasters, worked closely together on putting new forecast supporting products and methods to the test.



In 2013, the following new products were evaluated: the Mesocyclone Detection Algorithm and the Convective Initiation product from DWD as well as the Nearcast Model of Ralph Peterson of the University of Wisconsin. New versions of the products NowcastMix, GLD360 and COSMO-DE-EPS were once more part of the Testbeds product evaluations.

Figure 2.3 Testbed participants discussing a severe weather event

The Testbed 2013 featured an upgraded workstation-like “Data Interface” for the participants to work with. It featured new possibilities to combine model satellite and radar data and to use it for severe convective storms forecasting using the ingredients-based method. For example, maps of low level moisture and mid tropospheric lapse rates could be used to track these two basic ingredients for deep moist convection which combine to form CAPE.

Given the variety of backgrounds of the participants, an important goal of the Testbed was again to acquaint its participants with severe weather forecasting methods and techniques that work universally. The cooperation with EUMETCAL made it possible to broadcast 19 “Expert Lectures” online to remote participants all over Europe, in the USA and even to Hongkong. The participating researchers and developers provided background information on their products and internationally renowned experts in forecasting presented their viewpoints on storm forecasting.

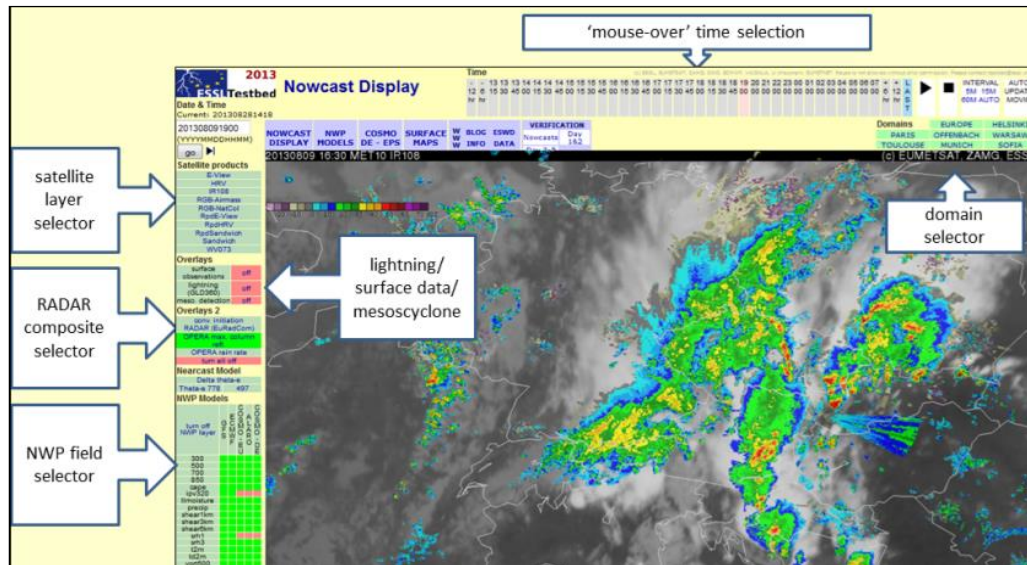


Figure 2.4. Testbed ‘Nowcast Display’

The 2013 Testbed was organized in close collaboration with the Austrian Central Institute for Meteorology and Geodynamics (ZAMG) and supported by EUMETSAT, DWD, WMO Region VI, VAISALA, the state of Lower Austria and EUMETCAL.

2.4 Wind speed scale and ESWD discussion

In a workshop early September 2013, ESSL staff and guests discussed the mid-term future of the ESWD and discussed wind speed damage scales. Among the topics under discussion were the criteria for inclusion of events into the ESWD and the use of Enhanced-Fujita (EF)-Scale for estimating tornado damage.

The group discussed whether some event categories should be discontinued or definitions updated. This resulted in the decision to ask avalanche warning services if they found the inclusion of this category useful. It was also decided that the category “funnel cloud” will be removed from the ESWD in the medium term. Several possibilities to improve data collection by ESSL were also discussed, including a plan to use social media.

The discussion on the EF-scale resulted in a position paper that was sent to the stakeholders group of the EF scale in the USA (see <http://essl.org>). The discussion is important since ESSL has not started to implement this scale in Europe. The position paper states that although the new method allows more objective assessment of wind damage, there are a number of problems preventing an easy application in Europe. These include poor knowledge of the relation between wind speed and damage, which a problem that is not solved by the EF-scale. Moreover, the scale is incompatible with the original F-scale and much work needs to be done to extend the EF-scale method so that it can be used in Europe, by defining new objects (damage indicators) and associated levels of damage to which a wind speed (range) can be assigned.

2.5 Convection Working Group

The Convection Working Group, consisting of scientists from more than 40 countries, has the aim to make a full inventory and evaluation of the existing convection nowcasting products that have been (and are being) developed in the Meteosat Second Generation era. In order to arrive at a “Best Practices” guideline for future use the Working Group meets regularly to exchange results and to broaden the scientific expertise. ESSL was mandated to set the secretariat of the CWG. Following an offer by ESSL in 2013, EUMETSAT decided that ESSL is going to fill the position of the secretariat for three further years.

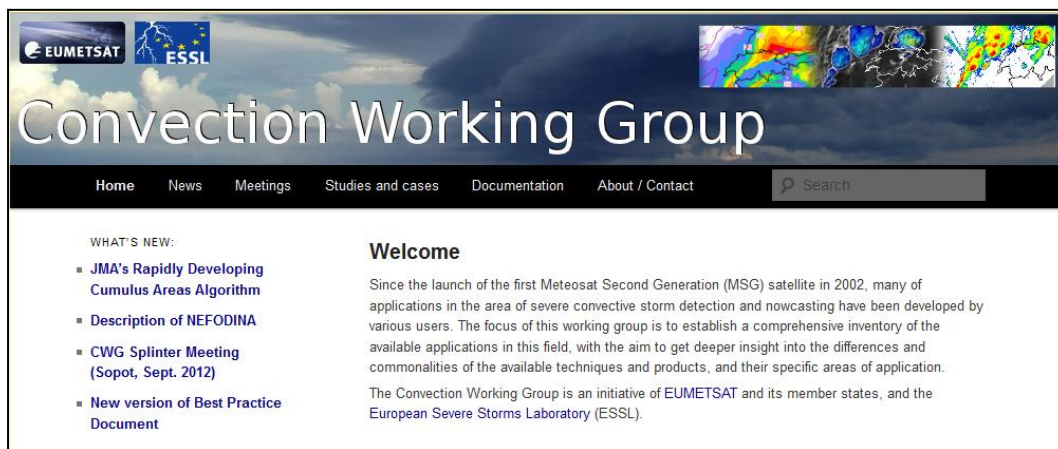


Figure 2.5. Convection Working Group website

2.6 Severe Thunderstorm Evaluation and Predictability in Climate Models (STEPCLIM)



STEPCLIM is part of the MiKlip (decadal climate predictions) programme, funded by the German Ministry of Education and Research and started in 2011. The aim of

the project is to develop a suite of physical metrics to assess the frequency and intensity of severe thunderstorm hazards from climate model data. The results and conclusions drawn in STEPCLIM will serve as one of several process oriented validation tools for the MiKlip decadal prediction system.

In 2013 ESSL employees Georg Pistotnik, Thilo Kühne and Pieter Groenemeijer work on developing a method to evaluate the frequency of convective severe weather from coarse numerical models. Based on the fundamental physical ingredients required for the development, such as CAPE and wind shear, *proxy* variables have been developed (and continue to be improved). When applying these to reanalysis data, the spatial distribution of such events, like large hail, tornadoes or severe wind gusts, can be

developed. As a preliminary result, the illustration shows the modelled frequency of large hail in the 1990s.

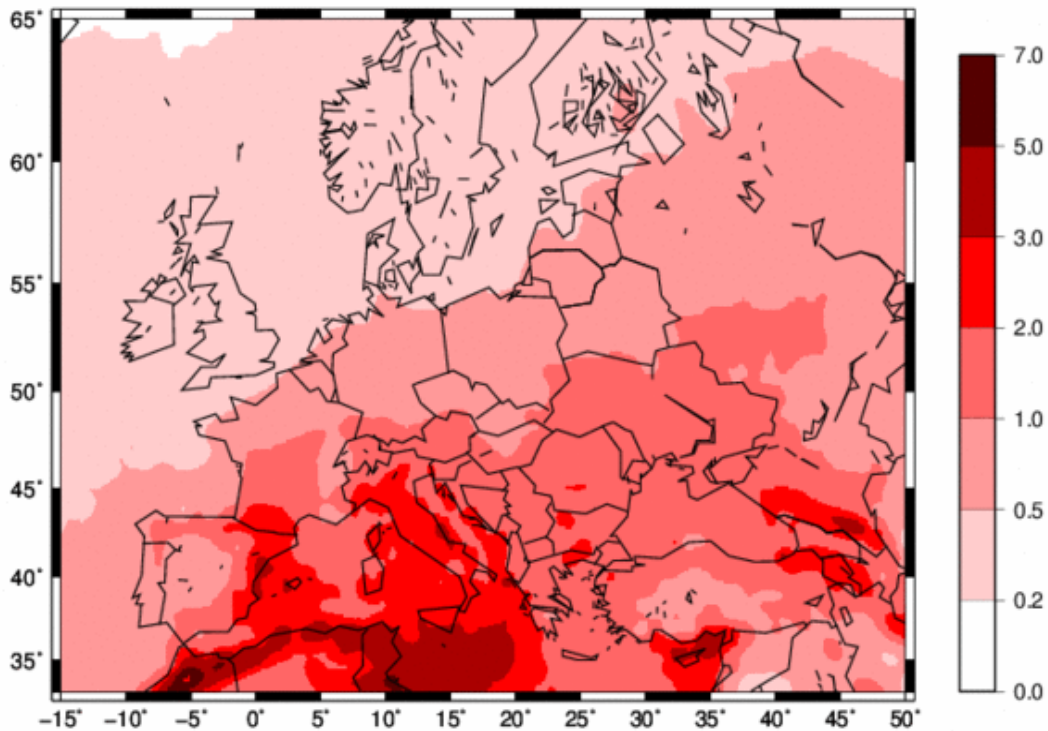


Figure 2.6. Averaged number of large hail events (> 2 cm) per 0.75 x 0.75 degree box per year for the 1990ies.

2.7 Evolution of Hail Storms over Europe in Changing Climate



ESSL and the UK Met Office cooperated in the project 'Evolution of Hail Storms over Europe in a Changing Climate', which was funded by the AXA Research Fund. ESSL provided a consulting role and supported the Met Office with enhancements to the hail model. During the project, a climate model has been coupled to a simple hail model to simulate hailfall over Europe. The enhanced climate model was used to simulate the present climate and a possible future scenario (SRES A1B scenario, see IPCC Assessment Report 4 for further details) until the middle of the twenty-first century. In general, the simulated distribution of large hail events, with diameters exceeding 2 cm, agrees well with the observed distribution from the ESWD. However, the model simulates too many hailstorms. The following conclusions can be drawn from simulating the future:

- (1) The frequency of large hail decreases across most of northern Europe except Norway and Sweden. Increases were projected over southern Europe.
- (2) The increased hail frequency over southern Europe is likely caused by increased sensible heat input to the boundary layer. Increased frequency of convective rainfall over Norway and Sweden is responsible for the projected rise in numbers of large hailstones

in those areas. The frequency of hail producing storms decreases over northern Europe causing the fewer occurrences of large hail.

2.8 Joint Project with RCEC on Validation of Storm Model Physics



In November 2013, ESSL started a new collaboration with Dr. Pao K. Wang, Director of the Research Center for Environmental Changes (RCEC), Academia Sinica in Nankang Taipei, Taiwan (ROC). The project is funded by the Academia Sinica and will continue for two years. As the name of the project 'Validation of Storm Model Physics' indicates, the goal of the work is to validate scientific interpretations made based on storm model simulations. Observational meteorological data, especially the remote sensing type such as satellite and radar data will be used for the validation. As a first step, several case studies with adequate coverage of observational data including radiosonde, radar, satellite (visible and IR) and other have to be identified. Of particular interest is the availability of upper level wind data associated with the storm.

3 Publications, courses and seminars

A wide range of outreach and PR activities have taken place in 2013. ESSL was well-represented with scientific contributions at several conferences including its own European Conference of Severe Storms. At various other occasions, ESSL employees and members engaged in interaction with particular interest groups and the general public.

The ESSL Research and Training Centre was used to host two major events: The ESSL Testbed and Forecasting Severe Convection seminar by Dr. Charles A. Doswell III.

The ESSL website was further developed to include more downloadable information such as upcoming activities. Furthermore, an interactive blog was established during the Testbed (<http://www.essl.org/testbed/blog/>). Two ESSL Newsletters were released in 2013 to keep its members informed of the Association's activities.

3.1 Forecasting Severe Convection I (Basic Course)



Dr. Charles A. Doswell III gave the seminar at the ESSL Research and Training Centre in Wiener Neustadt, Austria from 9 to 13 September 2013. The scope of this seminar was the application of meteorological diagnosis to the problem of forecasting severe deep convection. The ingredients-based forecasting methods were in the focus. Some case studies were used to illustrate the application of these principles and short, hands-on exercises were provided to illustrate the techniques presented.

More information about forecasting severe convection and about Dr. Doswell can be found here: <http://www.flame.org/~cdoswell/>.

3.2 List of publications

ESSL Technical Report 2013, Testbed Operations Plan.

This publication can be found online at <http://www.essl.org/testbed>

3.3 List of presentations and conference contributions

Oral presentations:

STEPCLIM: achievements 2012. Georg Pistotnik, Pieter Groenemeijer, and Thilo Kühne, MiKlip Status Seminar, 13 February 2013, Berlin, Germany.

Severe weather research at the European Severe Storms Laboratory. Georg Pistotnik, and Pieter Groenemeijer. EGU General Assembly, 08 April 2013, Vienna, Austria.

Severe Thunderstorm Evaluation and Predictability with CLimate Models (STEPCLIM). Georg Pistotnik, Seminar at the Institute for Atmospheric Physics, German Aerospace Center, 15 May 2013, Wessling, Germany.

The European Severe Storms Laboratory. Pieter Groenemeijer, Invited presentation at VAISALA, 31 May 2013, Vantaa, Finland.

Assessment of the European severe convective storm climatology using reanalysis data. Georg Pistotnik, Pieter Groenemeijer and Thilo Kühne, European Conference on Severe Storms, 03 June 2013, Helsinki, Finland.

Obstacles and barriers in research work on historical tornadoes in Central Europe. Thilo Kühne, Georg Pistotnik, Emmanuel Wesolek, Pierre Mahieu and Artur Surowiecki, 7th European Conference on Severe Storms, 03 June 2013, Helsinki, Finland.

Experimental forecasting of severe storms in Europe: a summary of the first ESSL Testbed. Pieter Groenemeijer, Alois M. Holzer, Georg Pistotnik and Kathrin Riemann-Campe, European Conference on Severe Storms, 04 June 2013, Helsinki, Finland.

Satellite-based climatology of (sub-)tropical cyclones in Europe. Alois M. Holzer and Pieter Groenemeijer, European Conference on Severe Storms, 07 June 2013, Helsinki, Finland.

Training and forecast tool evaluation at the ESSL Testbed in 2012 and 2013. Pieter Groenemeijer, Alois M. Holzer and Georg Pistotnik, Annual Meeting of the European Meteorological Society, 10 September 2013, Reading, UK.

Assessing the European severe convective storm risk from ERA-Interim reanalysis data and historic severe weather reports. Georg Pistotnik, Pieter Groenemeijer and Thilo Kühne, Annual Meeting of the European Meteorological Society, 11 September 2013, Reading, UK

Hindernisse und kommunikative Hemmnisse in der Aufarbeitung historischer Tornadofälle in Mitteleuropa. Thilo Kühne, Georg Pistotnik, Emmanuel Wesolek, Pierre Mahieu and Artur Surowiecki, 8. ExtremWetterKongress, 25 September 2013, Hamburg, Germany.

Preliminary evaluation of the European severe thunderstorm climate 1979-2011 with ERA-Interim and MiKlip. Georg Pistotnik, Pieter Groenemeijer and Thilo Kühne, MiKlip Module E Meeting, 16 October 2013, Berlin, Germany.

Modelling the risk of severe convective storms in Europe. Georg Pistotnik and Pieter Groenemeijer, Invited presentation at the Wegener Center, 28 October 2013, Graz, Austria.



Unwetterforschung im Europäischen Kontext – das ESSL in Österreich. Alois M. Holzer, Pieter Groenemeijer and Georg Pistotnik, Österreichischer Meteorologentag, 07 November 2013, Feldkirch, Austria.

Poster presentations:

STEPCLIM: achievements 2012. Georg Pistotnik, Pieter Groenemeijer, and Thilo Kühne, MiKlip Status Seminar, 13 February 2013, Berlin, Germany.

Assessment of the European severe convective storm climatology using reanalysis data. Georg Pistotnik, Pieter Groenemeijer and Thilo Kühne, EGU General Assembly, 09 April 2013, Vienna, Austria.

Re-Analysis of the fourth-deadliest Tornado in European History. Alois M. Holzer; Mathias Stampfl; Thomas M. E. Schreiner; Pieter Groenemeijer and Georg Pistotnik, 7th European Conference on Severe Storms, 04 June 2013, Helsinki, Finland.

Using the European Severe Weather Database for climatological analyses. Pieter Groenemeijer and Georg Pistotnik, European Conference on Severe Storms, 04 June 2013, Helsinki, Finland.

Verification of multi-categorical thunderstorm forecasts at the European Storm Forecast Experiment over the period 2009-2013. Oscar van der Velde, Pieter Groenemeijer, Helge Tuschy, Christof Gatzen, Johannes Dahl, Oliver Schlenczek, Tomas Pucik, Marko Korosec, Georg Pistotnik and Thilo Kühne: European Conference on Severe Storms, 06 June 2013, Helsinki, Finland.

Can a physics-based algorithm correctly analyze severe wind gusts? Georg Pistotnik, European Conference on Severe Storms, 06 June 2013, Helsinki, Finland.

4 Financial and administrative report

4.1 Auditing and employment

As in 2011 and 2012, ESSL's finances were audited by the independent and sworn certified financial auditor René Schaeffler GmbH in Munich.

The annual accounts for 2013 are shown the way the financial auditor prepared and delivered them to the Executive Board. Section 4.2 contains the details. Summarizing our certified financial auditor states in D.I. and II. (translation from the German original):

“Recording of income, expenditure and receipts:

... Our activities do not give reason for any doubt in formal and physical correctness and conclusiveness of bookkeeping.

Recapitulatory annual accounts:

... Our activities do not give reason for any doubt in correctness of the annual accounts.”

The original was duly forwarded to the Advisory Council.

An external payroll accountant (René Schaeffler GmbH in Munich) was mandated during 2013 to take care of paperwork and bureaucratic handling of taxes and social insurances, which would otherwise exceed ESSL's internal administrative capacity.

In 2013, the ESSL employed one full time employee (ESSL Director – part of salary covered within the STEPCLIM project) and three part time employees and/or so-called “Mini-Jobbers”, a form of minor employment according to the German law (scientific staff, ESWD quality control manager, IT – software engineer). The joint Secretariat of ESSL and the European Severe Storms Laboratory – Science and Training was paid by the latter. Other tasks were taken over by voluntary workers (without being paid), in particular the positions of the Deputy Director and the Treasurer.

As required by the tax authorities, cost centres distinguish between the ideational branch of ESSL (*Ideeller Bereich*, i.e. management of the association) and its branches directly serving the statutory purposes of the ESSL (*Zweckbetriebe*). Very few activities had to be booked under the commercial type branch (*wirtschaftlicher Geschäftsbetrieb*) in 2013, thus fulfilling the requirements of the tax authorities.

4.2 Financial status 2013

The accounting year financially was dominated by the STEPCLIM project and the ECSS (as in every second year). The accounting for 2013 can be found in the Appendix A.1.

As reported repeatedly (last named at the General Assembly in Helsinki), ESSL still is not running on a fully sustainable financial basis, which leads to narrow money year by year. Because membership fees arrive in the beginning of the year, the problem is always most noticeable towards the end of each year. The following figures from the annual accounts underline the tight business conditions:

ESSL obtained EUR 66,666.37 (2012: 48,053.00) in membership fees and donations, EUR 107,718.82 (2012: 104,482.98) from scientific projects, EUR 97,873.54 (2012: 2,159.33; conference year 2011: 88,127.82) from scientific conferences and meetings. Other sources of income amount to less than EUR 10.000,00.

Including taxes, **total income** amounts to **EUR 277,752.71** (2012: 160,998.39).

Including taxes, **total expenses** amount to **EUR 275,126.82** (2012: 195,364.06).

The major cost factors were personnel costs with EUR 147,206.15 (2012: 126.099,98) including taxes and social security, EUR 6,600.00 (2012: 8,800.00) for the external scientific services of DLR for the STEPCLIM project, and travel expenses with EUR 25,028.87 (2012: 8,901.56; ECSS year 2011: 25,559.74). Tax advisor and external bookkeeping costs sum up to EUR 11,830.00 (2012: 12,697.00).

Personnel costs still pose a challenge to ESSL, because the STEPCLIM project does not cover any overhead costs. The tight cooperation with the Austrian based association “European Severe Storms Laboratory – Science and Training” reduced costs for administrative work substantially, since both, the personnel costs for the Treasurer and for the Assistant to the Board, were paid through the ESSL subsidiary. Also the fees for the online payment service (needed for the ECSS and other activities) are shared between the two legal bodies and disburden the pressure from the ESSL e. V.

Further bookkeeping details can be found in the expenditure section of Appendix A.1.

At the end of the business year, liquid assets at our bank accounts amounted to EUR 5,438.13 (2012: 36.14). Accounts receivables of EUR 0.00 (2012: 7,000.00) fronted at the end of the year 2013 accounts payable of EUR 0.00 (2012: 4,328.90).

In summary, the ESSL managed to stay solvent during 2013 on a very low level (and without any noteworthy reserves). The **annual result is a positive EUR 2,625.89** (compare: negative 34.365,67 in 2012, positive EUR 7.093,32 in 2011, negative EUR 46.859,77 in 2010, positive EUR 60.599,84 in 2009).

After a very tough situation at the beginning of 2014, the financial planning for 2014 foresees higher financial liquidity levels during summer, autumn and winter (mainly because of the start of the new FP7 project RAIN). This will allow ESSL to build up a current reserve for 2015, when RAIN working expenses are foreseen, but no income from this project can be expected.

The financial result of the subsidiary association “European Severe Storms Laboratory – Science and Training” can be summarized as follows:

At the end of the business year, liquid assets at its bank accounts amounted to EUR 851.60 (2012: 10,808.17). The annual result for the subsidiary association in 2013 is a negative 9,691.57 (2012: positive EUR 3,808.17). The most prominent donation was received from our ESSL member Helge Tuschy (EUR 750.00). The financial planning for 2014 foresees a moderate positive result. Internal auditors (according to Austrian law) for 2013 were Dr. Kathrin Riemann-Campe and Prof. Dr. Robert Sausen.

4.3 ESSL members

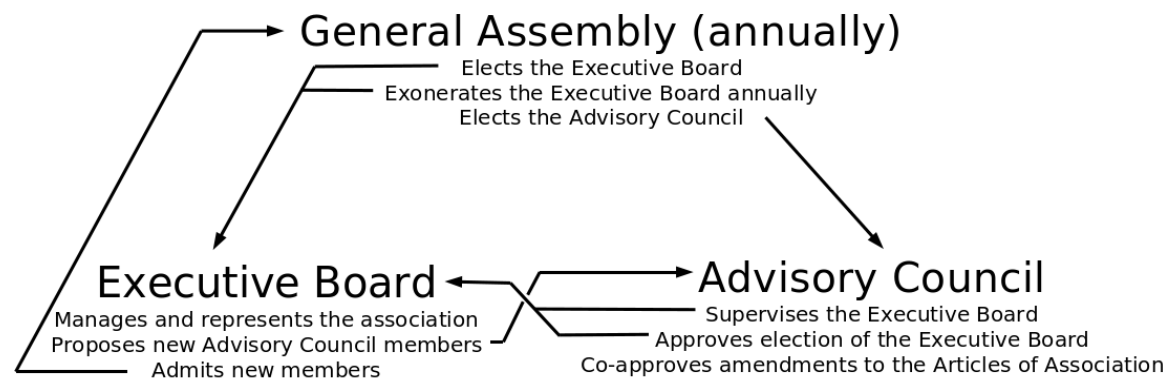
Members are at the core of ESSL and provide essential support to ESSL activities. Membership fees form an important source of income for ESSL. However, ESSL members are also important in catalysing the pursuit of the Association's goals. This type of support is sometimes provided in-kind and sometimes by financial support. Examples include the Austrian Central Institute of Meteorology and Geodynamics (ZAMG) co-organizing the ESSL Testbed. Important support to the Testbed was also provided by EUMETSAT, Deutscher Wetterdienst (DWD) and the German Aerospace Center (DLR). Furthermore, MunichRe has sponsored recent ECSS conferences, and the Finnish Meteorological Institute was ESSL's co-organizer for the ECSS conference in 2013. As can be seen from Appendix A2, all these organizations are ESSL members.

In 2013, ESSL was happy to welcome new institutional members: the Meteorological and Hydrological Service of Croatia (DHMZ) and the Slovak Hydrometeorological Institute (SHMU) as new full institutional members, AIR Worldwide, Dents and Dings and Guy Carpenter as new supporting institutional members.

In addition two full individual members joined the Association: Dr. Charles A. Doswell (USA) and Lisa Schielicke (Germany).

4.4 Executive Board

The Executive Board and the Advisory Council are two of the three bodies forming the ESSL. The figure outlines these and their responsibilities.



Bodies of the ESSL. The Advisory Council consists of six members from two groups (three members each): (1) Science, (2) NMHS / EUMETNET.

In 2013, the Executive Board consisted of:

- Dr. Pieter Groenemeijer, Director
- Dr. Kathrin Riemann-Campe, Deputy Director.
- Mr. Alois M. Holzer, Treasurer
(serving as Director of Operations in the subsidiary).

4.5 Advisory Council

In 2013 the Advisory Council consisted of:

Robert Sausen, *chair* (DLR, Deutsches Zentrum für Luft- und Raumfahrt, Germany)

1 Jan. 2012 - 31 Dec. 2015 (second term)

Hans-Joachim Koppert, *vice-chair* (DWD, Deutscher Wetterdienst, Germany)

1 Jan. 2011 - 31 Dec. 2014

Vincenzo Levizzani (CNR, National Research Council, Italy)

1 Jan. 2013 - 31 Dec. 2016 (second term)

Pertti Nurmi (FMI, Finnish Meteorological Institute, Finland)

1 Jan. 2013 - 31 Dec. 2016

David Schultz (University of Manchester, United Kingdom)

1 Jan. 2013 - 31 Dec. 2016 (second term)

Michael Staudinger (ZAMG, Zentralanstalt für Meteorologie und Geodynamik, Austria)

1 Jan. 2012 - 31 Dec. 2015 (second term)

Appendix A1: Annual Accounts 2013

Allocation of Profit due to German Tax Regulations (Financial Reporting 2013)
and Verification of Compliance with Local Regulations for Non Profit Organisations
by the financial auditors René Schaeffler GmbH, Munich.

Tax profit statement for the period from 01.01.2013 to 31.12.2013
European Severe Storms Laboratory e.V., Wessling

Income and Expenditure	EUR	Year before EUR
1. Income		
Public Contributions:		
Project EWENT (EU)	11,390.00	7,593.00
Project STEPCLIM (Ministry of Research, Germany)	87,828.82	80,750.58
ECSS	17,990.54	26,500.00
	117,209.36	88,343.58
Income from		
Scientific meetings (ECSS)	79,883.00	390.00
Project RCEC	4,500.00	-
Project UKMO-AXA	4,000.00	-
Project EUMETSAT	-	16,139.40
Presentations	-	1,769.33
Interest	-	500.00
Other	-	2,743.60
	88,383.00	21,542.33
Membership Fees	66,666.37	48,053.00
ESWD data use	1,100.00	-
Donations	148.00	-
VAT	4,245.98	3,059.48
	<u>277,752.71</u>	<u>160,998.39</u>

Income and Expenditures	EUR	Year before EUR
2. Expenditures		
2.1 Personnel costs		
Salaries	122,614.97	106,304.65
Social Security	24,352.90	19,406.88
Social Security 'Mini-jobs'	238.28	388.45
	147,206.15	126,099.98
2.2 Depreciation		
Depreciation of fixed assets	905.00	1,027.94
Depreciation low value assets	199.00	260.00
	1,104.00	1,287.94
2.3 Other Expenditures		
ECSS conference	52,500.00	-
Support for ECSS participants	14,969.20	
Travel costs and other expenditures (ECSS)	25,028.87	8,901.56
Third party services ⁱ	10,949.16	33,151.72
Payroll accountant	1,440.00	1,440.00
Costs for the annual accounts	5,100.00	4,500.00
Legal and tax advice	5,290.00	6,757.00
Telephone and internet	2,081.71	1,529.33
Awards during ECSS	1,300.00	-
Membership fee ESSL – Science and Training	800.00	800.00
Licences	1,052.00	495.00
Postages	303.80	121.98
Advertising costs	1,031.00	566.00
Office costs	580.49	2,566.55
Bank costs	121.17	346.21
Magazines and books	49.46	-
Other	141.57	39.27
Neutral costs	3,926.24	4,841.02
Input VAT	152.00	1,920.50
	126,816.67	67,976.14
	<u>275,126.82</u>	<u>195,364.06</u>

ⁱ Third party services comprise of EUR 6,600.00 for the scientific service by DLR for the STEPCLIM project, EUR 3,629.16 for the online payment service PAYONE (mainly for membership and ECSS payments) and EUR 720.00 for other costs.

Statement of assets per 31st December 2013

ASSETS	EUR	Year before EUR	EQUITY	EUR	Year before EUR
A. FIXED ASSETS			A. EQUITY		
Tangible Assets			I. Retained earnings		
Equipment	1,194.00	1,299.00	1. General reserves	-	-
			2. Current reserves	-	-
				-	-
B. CURRENT ASSETS			II. Profit to be carried forward	4,006.24	
Accounts receivables		7,000.00	1. Ideational Sector	2,784.20	14,603.59
Cash at bank	5,438.13	36.14	2. Other tax privileged special purpose activities	2,047.21	2,047.21
			3. Asset management	472.61	472.61
			4. Other business activities	-1,297.78	-1,297.78
			III. Remaining profit current year	2,625.89	-11,819.39
			B. Accounts payable	-	4,328.90
	6,632.13	8,335.14		6,632.13	8,335.14

Annual Accounts 2013	Ideational sector	Special purpose activities	Asset management	Other business activities	Total EUR
PROFIT/LOSS	-28,719.97	30,245.86	0.00	1,100.00	PROFIT 2,625.89
Release of current reserve	0.00	0.00	0.00	0.00	0.00
Exchange internal sectors	28,719.97	-28,719.97	0.00	0.00	0.00
Subtotal	0.00	1,525.89	0.00	1,100.00	2,625.89
Build-up of current reserve	0.00	0.00	0.00	0.00	0.00
Remaining PROFIT/LOSS according to tax regulations	0.00	1,525.89	0.00	1,100.00	TAX PROFIT 2,625.89

Appendix A2: Member list 2013

The following table shows all ESSL members as of 31 December 2013, sorted according to their ESSL-ID (which corresponds in ascending order to the beginning date of the ESSL membership). The 9 remaining founding member names are printed in italics. The given country corresponds to the main residence or statutory seat, not necessarily to the nationality.

INDF Individual Full Member

INDS Individual Supporting Member

INSF Institutional Full Member

INSS Institutional Supporting Member

<i>INDF</i>	<i>Dr. Bernold Feuerstein</i>	<i>GERMANY</i>
<i>INDF</i>	<i>Dr. Dario Giaiotti</i>	<i>ITALY</i>
<i>INDF</i>	<i>Dr. Pieter Groenemeijer</i>	<i>GERMANY</i>
<i>INDF</i>	<i>Alois M. Holzer</i>	<i>AUSTRIA</i>
<i>INDF</i>	<i>Dr. Maria-Carmen Llasat-Botija</i>	<i>SPAIN</i>
<i>INDF</i>	<i>Dr. Romualdo Romero</i>	<i>SPAIN</i>
<i>INDF</i>	<i>Dr. Martin Setvák</i>	<i>CZECH REPUBLIC</i>
<i>INDF</i>	<i>Dr. Fulvio Stel</i>	<i>ITALY</i>
<i>INDF</i>	<i>Jenni Rauhala</i>	<i>FINLAND</i>
<i>INDF</i>	Thilo Kühne	GERMANY
<i>INDF</i>	Helge Tuschy	GERMANY
<i>INDF</i>	Georg Pistotnik	AUSTRIA
<i>INDF</i>	Zhongjian Liang	GERMANY
<i>INDF</i>	Lionel Peyraud	SWITZERLAND
<i>INDF</i>	Thomas Krennert	AUSTRIA
<i>INDF</i>	Dr. Johannes Dahl	USA
<i>INDF</i>	Martin Hubrig	GERMANY
<i>INDF</i>	Oliver Schlenczek	GERMANY
<i>INDF</i>	Dr. Victor Homar Santaner	SPAIN
<i>INDF</i>	Dr. Sanjay Sharma	INDIA
<i>INDF</i>	Dr. Aurora Bell	ROMANIA
<i>INDF</i>	Sorin Burcea	ROMANIA
<i>INDF</i>	Bogdan Antonescu	ROMANIA
<i>INDF</i>	Dr. Marianne König	GERMANY

<i>INDF</i>	Dr. Volker Gärtner	<i>GERMANY</i>
<i>INDF</i>	Dr. Michael Kunz	<i>GERMANY</i>
<i>INDF</i>	Erik Dirksen	<i>GERMANY</i>
<i>INDF</i>	Emmanuel Wesolek	<i>FRANCE</i>
<i>INDF</i>	Christoph Gatzen	<i>GERMANY</i>
<i>INDF</i>	Dr. Alexander Keul	<i>AUSTRIA</i>
<i>INDF</i>	Dr. Kathrin Riemann-Campe	<i>GERMANY</i>
<i>INDF</i>	Tomás Pucik	<i>CZECH REPUBLIC</i>
<i>INDF</i>	Patrick Marsh	<i>USA</i>
<i>INDF</i>	Marcus Beyer	<i>GERMANY</i>
<i>INDF</i>	Dr. Koji Sassa	<i>JAPAN</i>
<i>INDF</i>	Lisa Schielicke	<i>GERMANY</i>
<i>INDF</i>	Dr. Charles A. Doswell III	<i>USA</i>
<i>INDS</i>	Casper ter Kuile	<i>NETHERLANDS</i>
<i>INDS</i>	Stefan Meulemans	<i>SWITZERLAND</i>
<i>INSF</i>	DWD, Deutscher Wetterdienst	<i>GERMANY</i>
<i>INSF</i>	EUMETSAT	<i>GERMANY</i>
<i>INSF</i>	AUSTRO CONTROL	<i>AUSTRIA</i>
<i>INSF</i>	ZAMG, Zentralanstalt für Meteorologie und Geodynamik	<i>AUSTRIA</i>
<i>INSF</i>	NMA, National Meteorological Administration of Romania	<i>ROMANIA</i>
<i>INSF</i>	FMI, Finnish Meteorological Institute	<i>FINLAND</i>
<i>INSF</i>	CHMI, Czech Hydrometeorological Institute	<i>CZECH REPUBLIC</i>
<i>INSF</i>	Institute for Hydrometeorology and Seismology of Montenegro	<i>MONTENEGRO</i>
<i>INSF</i>	DHMZ, Meteorological and Hydrological Service of Croatia	<i>CROATIA</i>
<i>INDF</i>	SHMU, Slovak Hydrometeorological Institute	<i>SLOVAKIA</i>
<i>INSS</i>	Münchener Rückversicherungs-Gesellschaft AG	<i>GERMANY</i>
<i>INSS</i>	Tokio Marine Technologies LLC	<i>USA</i>
<i>INSS</i>	Willis Ltd	<i>UNITED KINGDOM</i>

<i>INSS</i>	Deutsche Rückversicherung	<i>GERMANY</i>
<i>INSS</i>	DLR; Deutsches Zentrum für Luft- und Raumfahrt	<i>GERMANY</i>
<i>INSS</i>	RMS, Risk Management Solutions	<i>UNITED KINGDOM</i>
<i>INSS</i>	SJNK Risk Management	<i>JAPAN</i>
<i>INSS</i>	Guy Carpenter Limited	<i>UNITED KINGDOM</i>
<i>INSS</i>	Air Worldwide	<i>USA</i>
<i>INSS</i>	Dents & Dings	<i>USA</i>
