ANNUAL REPORT 2014

European Severe Storms Laboratory e.V.

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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 expertise of its international team. The ESSL office is located at the DLR-Institute for Atmospheric Physics.

In Europe, severe thunderstorms inflict an estimated annual damage of about 5 billion euro and lead to dozens of 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

In 2014, ESSL engaged in a number of new activities, many concerning the relation between severe storms, climate and climate change. ESSL scientists are studying the representation of convective severe weather events in climate models within several projects. These are the ongoing project STEPCLIM on decadal forecasting of convective hazards, a joint project with Munich RE and a new EU-funded project called RAIN. Within RAIN (*Risk Analysis of Infrastructure Networks in response to extreme weather*), ESSL leads the work package *Hazard Identification* and works closely together with partners from Germany, Finland and the Netherlands.

Another novel activity of ESSL was the organization of a *Tornado and Wind Damage Assessment Workshop*. This workshop brought together experts and student participants from Europe and the USA and had a theoretical as well as a practical component. During the workshop, the team visited two villages in Slovenia and Italy and interpreted the wind damage recently produced by a convective storm. This way, ESSL seeks to build the expertise to be prepared to perform damage assessment in case a major tornado or convective wind disaster, should one occur.

In June, ESSL organized another edition of the *ESSL Testbed* in which meteorologists of many of Europe's weather services participated. The Testbed participants worked during 4 weeks with ESSL staff to evaluate a number of forecast and nowcast-supporting products. ESSL also organized a workshop on forecasting convective storms. Besides the Testbed, ESSL also reconfirmed its engagement with the satellite community in the joint EUMETSAT-ESSL Convection Working Group, for which ESSL will host the secretariat for at least until 2017.

For an organization like ESSL, it is important to communicate the results of all of its activities. We were present at several conferences, workshops and other occasions. In 2014, ESSL researchers gave 23 oral presentations, prepared three conference posters and submitted one formal publication. Although one is not a high number of formal publications, the one that was published, "*A Climatology of Tornadoes in Europe: Results from the European Severe Weather Database*"**,** rapidly became the most read article in the last 12 months in the journal to which it was submitted, *Monthly Weather Review*.

ESSL's continuing efforts in collecting and checking severe weather data in Europe have continued at an ever increasing pace, thanks to its data collection team led by Thilo Kühne. 2014 saw an expansion of the ESWD with 12687 reports, so that the total number almost reached 80 000. We were able to give dozens of scientists and other users access to the data through our user support activities.

Financially, 2014 still had a particularly difficult start, as clarity regarding the start of the RAIN project was not given until March. Before then, considerable uncertainty existed regarding the financial budget. Generally, ESSL puts much time and effort into project acquisition, at European, national and regional funding agencies, but progress is usually slow. Although ESSL is a small organization that must seize every opportunity to obtain funding to pursue its statutory goals, human resources that can be spent on this are limited. It is therefore key to ESSL's success to

ensure it acquires more tasks of a more permanent nature rather than projects with a duration of 2 - 4 years. With the knowledge that ESSL's highly committed team can achieve impressive results such as those mentioned above, I am convinced that we will succeed in this in the somewhat longer term.

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

Pieter Groenemeijer
ESSL Director

Weßling, 21 April 2015

2 Science

2.1 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 many scientific studies carried out at ESSL and elsewhere. Members of ESSL can obtain access to the ESWD (*see: ESWD Data Policy*).

ESWD data use and user support

The studies for which the ESWD is used include investigations of the severe weather climate and risk assessment, forecasting and calibration of new radar and satellite detection techniques. Furthermore, the ESWD is used for forecast verification, for example at the ESSL Testbed (see Figure 2.1).

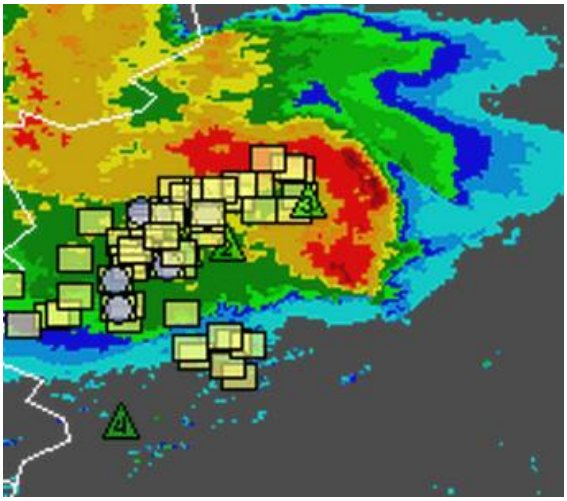


Figure 2.1. ESWD reports overlain onto a radar image at the ESSL Testbed. The images shows a bow-echo on 9 June 2014 across West Germany. Yellow rectangles are wind damage reports, green triangles large hail (with size in cm) and blue circles extreme rainfall. Radar data source: DWD.

External ESWD users are assisted by ESSL's User Support, lead by Mr. Thomas Schreiner. In 2014, Mr. Schreiner opened 13 new User Accounts, so that at present 76 users have a personal account with which they can access ESWD data. In addition, 8 users received a data set tailored to their specific needs.

ESWD Data Policy

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.

Development of ESWD data in 2014

In 2014, the ESWD has been expanded by 12 687 severe weather reports, which is a **new record** for the number reports in any single year (Figure 2.3). The majority of reports that was collected in 2014 consisted of severe wind gusts 4331 (34 %), followed by heavy rain with 3438 reports (27 %) and large hail with 2432 reports (19 %). The absolute number of reports in the ESWD up to 2014 is approaching **80 000**.

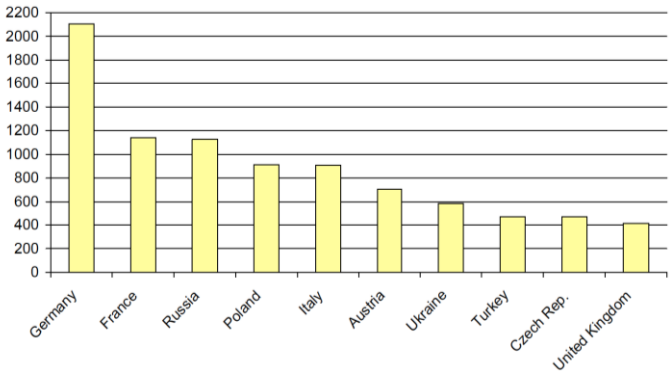


Figure 2.2. Number of severe weather reports in 2014 per country.

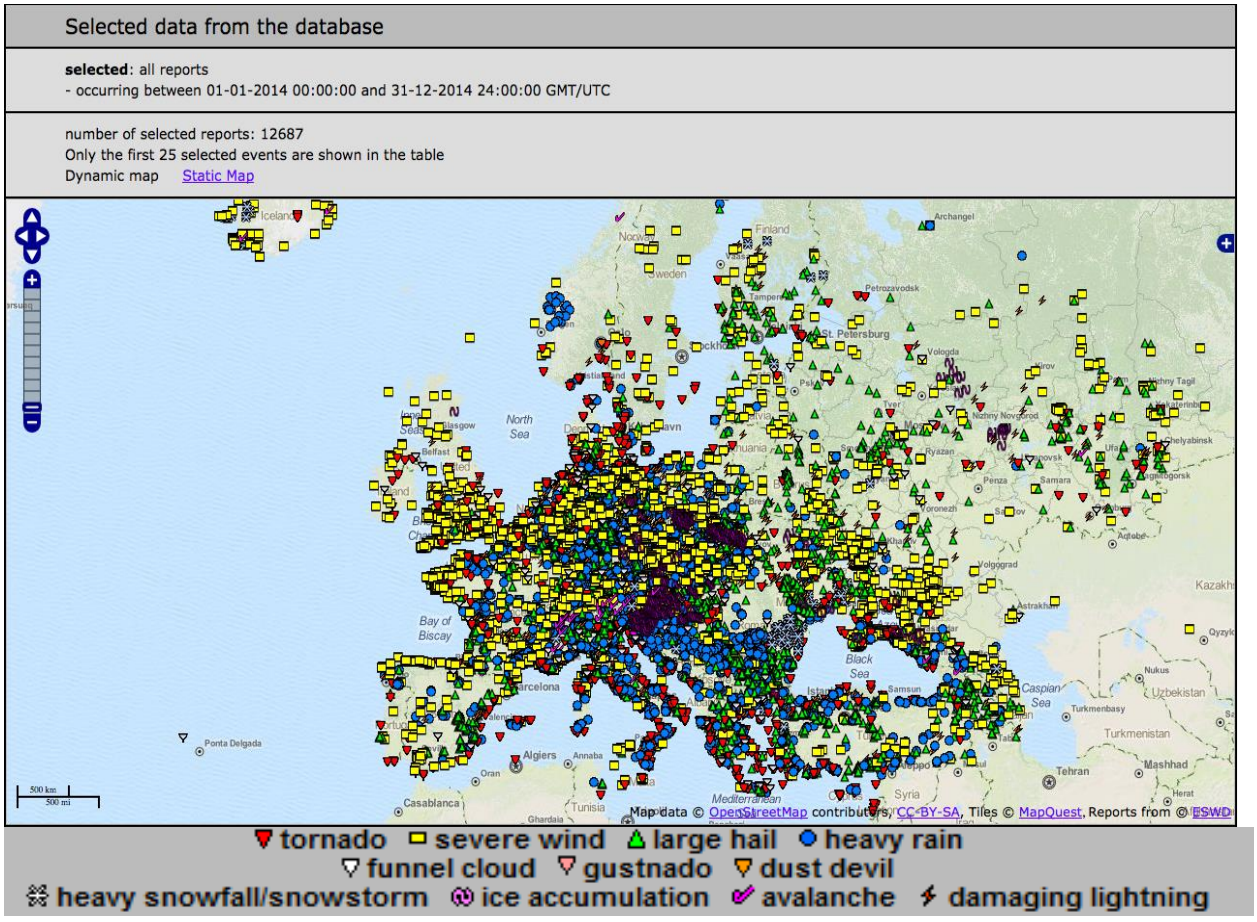


Figure 2.3. All 12 687 ESWD reports in 2014.

The absolute numbers and percentage in terms of weather type are listed in Table 2.1. All reports of 2014 have passed the first quality control level QC0+ and 91% are considered "confirmed by reliable sources", i.e. QC1 or higher and thereby usable for most types of analyses (Table 2.2). Table 2.1. Number of ESWD reports for the year 2014 per severe weather type.

Event Type	*Number of reports*	*Percentage*
tornado	806	6.35
severe wind gust	4331	34.13
large hail	2432	19.16
heavy rain	3438	27.09
funnel cloud	421	3.31
gustnado	1	0.007
dust devil	11	0.08
heavy snowfall	155	1.22
ice accumulation	487	3.83
avalanche	54	0.42
damaging lightning	551	4.34
total	**12687**	**100**

Table 2.2. Number of ESWD reports in 2014 per Quality Control category.

Quality Control level	*Number of reports*	*Percentage*
QC0, as received	0	0.00
QC0+, plausibility checked	1148	9.04
QC1, report confirmed by reliable sources	11151	87.89
QC2, event fully verified	388	3.05

Cooperation with Voluntary Observer Networks

The increasing number of reports is partly due to the ever more efficient collection efforts of ESSL, lead by Mr. Thilo Kühne, and in part because of the expanding network of partners across Europe. In 2014, great effort was put into formalizing ESSL's relation with such Voluntary Observer Networks and with individuals. In 2015, ESSL will conclude formal agreements with these partners, as was already the case with many weather services.

2.2 ESSL Testbed

The **third edition** of the ESSL Testbed took place in the ESSL Research and Training Centre from June 2 to 27 June 2014.

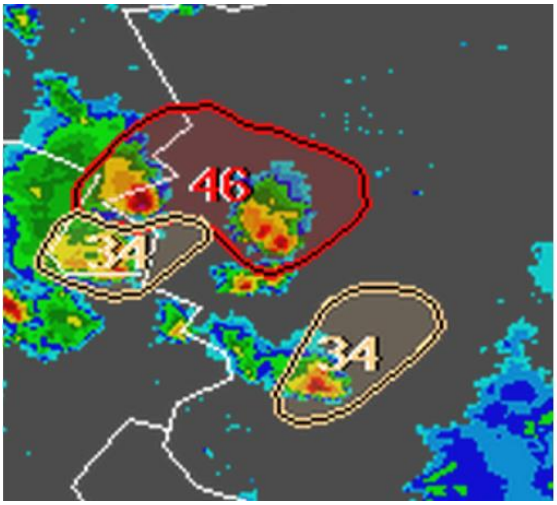


Figure 2.4 Testbed display showing reflectivity and automatic nowcast of DWD's NowcastMIX. 46 is severe thunderstorm with large hail, 34 is moderate thunderstorm with heavy rain.

The ESSL Testbed is a project to enhance severe weather forecasting across Europe. The Testbed provides forecaster training, testing of forecasting tools, and is a platform for interaction for researchers and forecasters.

The Testbed was very successful with an attendance of **50 participants** from **14 countries**. The participants and ESSL staff were full of vigour exchanging their knowledge about forecasting convective severe weather.

in 2014, two new products of the DWD were under evaluation: the **vertically integrated liquid water (VIL) and VIL-track** and the **rotation and rotation-track**. A new version of the **Mesocyclone Detection Algorithm** product was evaluated as well as an integrated visualisation into the Testbed nowcast display of the products: NowcastMix by DWD (Figure 2.4) and the Overshooting Top Detection by Kristopher Bedka. The following products are once more part of the Testbeds product evaluations: **GLD360** lightning detection system by VAISALA and DWD's **COSMO-DE-EPS** ensemble model, now including vertically integrated total water and total graupel.

The Testbed activities were posted on the Testbed blog (on a daily basis: http://www.essl.org/testbed/blog/

In 2015 the Testbed will take place from 25 - 29 May, 1 - 5 June, 15 - 19 June and 22 - 26 June at our ESSL Research and Training Centre in Wiener Neustadt, Austria.

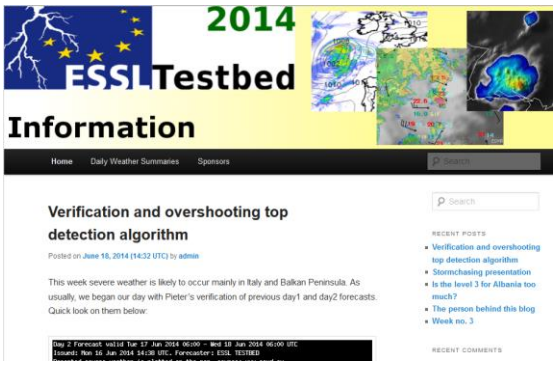


Figure 2.5 Testbed Blog.

The 2014 Testbed was made possible by:

2.3 Preparations for the 8th Conference on Severe Storms, ECSS 2015 in Wiener Neustadt

Preparations have started for the 8th European Conference on Severe Storms (ECSS), 14 - 18 Sept. 2015 in Wiener Neustadt, Austria. The venue, a baroque style ballroom, which has been recently renovated glistens in its renewed splendour.

The Scientific Programme Committee is formed by Prof. Dr. **David Schultz** (University of Manchester, co-chair), Dr. **Johannes Dahl** (Texas Tech University, co-chair), Dr. **Bogdan Antonescu** (University of Manchester, co-chair) and Dr. Pieter Groenemeijer (European Severe Storms Laboratory, vice-chair).

Figure 2.6. Sparkassensaal in Wiener Neustadt, venue of ECSS 2015.

2.4 Convection Working Group

In 2014, ESSL continued its support to the EUMETSAT-ESSL Convection Working Group (CWG). The CWG met twice in 2014: a one-week workshop was held in Zagreb, Croatia in April 2014.

In addition, the CWG met for a splinter meeting in Geneva, Switzerland in September 2014. Among several topics, the CWG updated their 'Best Practice Document' in diagnosing and monitoring of convective storms using satellite remote sensing, with an emphasis on the use of geostationary satellites, specifically Meteosat Second Generation'. The meeting minutes and the best practice document can be seen on the CWG's website http://www.essl.org/cwg/ .

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

Funding agency: Education and Reseach Ministry, Germany
Grant: 389 424 euro
Personnel: 0.5 Ph.D. student, 0.5 Researcher, 0.25 Data quality manager
Period: 1 Nov 2011 – 31 October 2015

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 2014, considerable progress was made on the development of the method, which was presented at the AMS conference on Severe Local Storms in Madison, Wisconsin, in November. An example of a two-dimensional model is shown in Fig. 2.7.

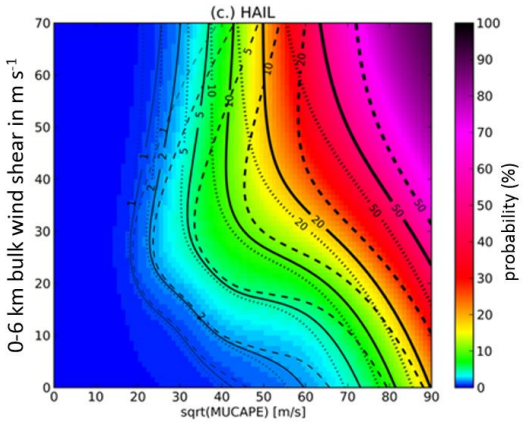


Figure 2.7. Model of hail probability as a function of two predictors. From Pistotnik et al, 2014.

2.6 EU 7th Framework project on extreme weather impact on critical infrastructure started

Funding agency: European Commission
Grant: 327 720 euro
Personnel: 0.5 Researcher, 0.5 Researcher
Period: 1 May 2014 – 30 April 2017

Since May 2014, the ESSL is engaged in the new FP7 EU-project RAIN. ESSL leads Work Package 2, **Hazard Identification**.

The EU-project on Risk Analysis of Infrastructure Networks (RAIN) in response to extreme weather aims to minimize the impact of extreme weather events on these networks.

The project plans to develop early warning systems, decision support tools and engineering solutions to ensure rapid reinstatement of the network. This will improve reliability of critical

infrastructures and reduce disruption for citizens. Further information can be found on the RAIN website (http://rain-project.eu/).

2.7 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. The project is funded by the Academia Sinica and will continue for two years.

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.

In 2014, the storm model physics were validated and documented. In total 29 cases of U/V - shaped or ring signatures from the summers of 2012 and 2013 within Europe were provided by ESSL and analysed. Three U/V cases and three ring cases were highlighted as being particularly suitable for the model simulations. The cases were rated regarding the strength of the signature and the availability of proximity soundings. In addition, radiosonde data of these cases were provided.

2.8 ESSL's work with students

One of ESSL's statutory purposes is to support and educate young scientists. In 2014, the following five students were supervised at ESSL by Pieter Groenemeijer:

First, Georg Pistotnik, PhD student at Munich University (LMU), employed at ESSL in the STEPCLIM project, studied decadal prediction of severe thunderstorms. Second, Anja Westermayer, PhD student at Munich University (LMU), who is employed by Munich Re, studies how to use reanalysis and climate models to predict the occurrence of thudnerstorms. Third, Tomáš Pučik, PhD student at Masaryk University of Brno, investigates the occurrence of severe storms in vicinity of mountain ranges. He is employed at ESSL for work on regional climate models within the RAIN project. Fourth, Lars Tijssen, MSc student at Utrecht University, started a study on tornado outbreaks in Europe. Last, Mathias Schindler of Munich University had a two-week internship at ESSL during which he made analyses of the ESWD.

3 Publications, courses and seminars

A wide range of outreach and PR activities has taken place in 2014. ESSL was well represented with scientific contributions at several conferences. 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 several major events: The ESSL Testbed, a Forecasting Severe Convection seminar by Dr. Charles A. Doswell III and a Tornado and Windstorm Damage Assessment workshop.

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/). An ESSL Newsletter was released in 2014 to keep its members informed of the Association's activities.

3.1 Tornado and Windstorm Damage Assessment workshop in September 2014

From 1 to 5 September 2014 ESSL organized a workshop dedicated to the field of *forensic meteorology* to determine the type of a past damage event (windstorm or tornado) and to estimate the strength of the maximum wind. The workshop had two goals, both to educate novices to the subject and to establish a platform for discussion among experts on optimal approaches in Europe.

Figure 3.2. ESSL Damage Assesment Workshop out in the field in Mahnici, Slovenia (Photo: Thomas Schreiner).

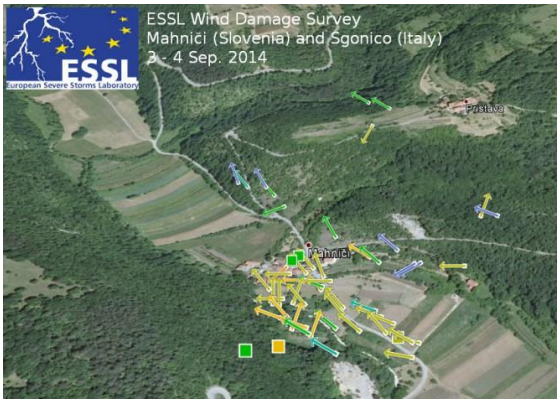


Figure 3.1. Overview of directions of fallen trees (with color-coded damage intensity) in Mahnici, Slovenia. Background imagery: Google Earth

The workshop started with presentations and discussions of the theoretical background of forensic meteorology by several experts from ESSL and overseas (Jim LaDue – NOAA and Dr. Charles Doswell III). On day three and four, the group travelled to Slovenia and Italy to visit

recent damage sites. Participants split up into four groups, three persons each group, and went into the field in order to assess damage to buildings and trees. Fig. 3.1. shows a map of a survey of one of the sites (Mahnici, Slovenia).

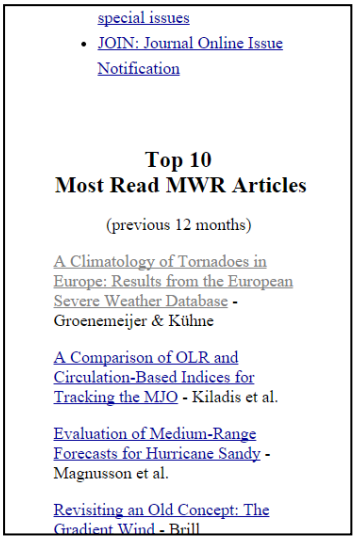
3.2 Forecasting Severe Convection I (Basic Course)

Dr. Charles A. Doswell III gave the seminar at the ESSL Research and Training Centre in Wiener Neustadt, Austria. 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.

3.3 List of publications

- Pieter Groenemeijer and Thilo Kühne, 2014: **A Climatology of Tornadoes in Europe: Results from the European Severe Weather Database**. *Mon. Wea. Rev.*, 142, 4775–4790. doi: http://dx.doi.org/10.1175/MWR-D-14-00107.1

In Spring 2015, this article was the most read Monthly Weather Review article in the last 12 months, according to the journal's website.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(previous 12 months)

A Climatology of Tornadoes in Europe: Results from the European Severe Weather Database - Groenemeijer & Kühne

A Comparison of OLR and Circulation-Based Indices for Tracking the MJO - Kiladis et al.

Evaluation of Medium-Range Forecasts for Hurricane Sandy - Magnusson et al.

Revisiting an Old Concept: The Gradient Wind - Brill

- ESSL Technical Report 2014, Testbed Operations Plan. This publication can be found online at http://www.essl.org/testbed/2014/op_latest.pdf

3.4 List of presentations and conference contributions

Oral presentations:

- **Neuigkeiten zur Europäischen Unwetterdatenbank (ESWD)**. Georg Pistotnik, Skywarn Trusted Spotter Network Training, 25 January 2014, Vienna, Austria.
- **Modeling the European Severe Thunderstorm Climate since 1979 with ERA-Interim and Miklip Baseline 1**. Georg Pistotnik, Pieter Groenemeijer and Thilo Kühne, MiKlip Status Seminar, 12 February 2014, Karlsruhe, Germany.
- **The ESSL testbed in 2012, 2013, 2014 and beyond**. Pieter Groenemeijer, Alois M. Holzer and Georg Pistotnik, Convection Working Group Workshop, 11 April 2014, Zagreb, Croatia.

- **The ESSL testbed in 2012, 2013, 2014 and beyond: What can be do better as a community rather than independently?** Pieter Groenemeijer, Alois M. Holzer and Georg Pistotnik, Nowcast Conference, 30 April 2014, Vienna, Austria.

- **Modeling convective severe weather occurrence using observations, reanalysis data and decadal climate predictions.** Georg Pistotnik, Pieter Groenemeijer and Thilo Kühne, European Geophyiscal Union General Assembly, 30 April 2014, Vienna, Austria.

- **Ingredients Based Nowcasting or Nowcasting as part of Scientific Forecasting**. Alois M. Holzer, Pieter Groenemeijer and Georg Pistotnik. European Nowcasting Conference, 29-30 April 2014, Vienna, Austria. http://www.zamg.ac.at/ENC2014/

- **The ESSL Testbed's role in forecaster training**. Pieter Groenemeijer, Alois M. Holzer and Georg Pistotnik, WMO DRR-SEE Meeting (remote presentation), 6 May 2014, Geneva, Switzerland.

- **Modelling of convective storm hazard occurrence using climate models, taking convective initiation explicitly into account**. Anja Westermayer, DLR seminar, 07 May 2014, Oberpfaffenhofen, Germany

- **The European Severe Weather Database as a resource for hail research in Europe**. Pieter Groenemeijer, Georg Pistotnik, Alois M. Holzer and Thilo Kühne, 1st European Hail Workshop, 25-27 June 2014, University of Bern, Bern, Switzerland.

- **TORNeustadt, Beurteilung der Tornadogefährdung Wiener Neustadts anhand der Aktualisierung des Falls vom 10. Juli 1916**. Alois M. Holzer, Mathias Stampfl, Thomas M. E. Schreiner, Pieter Groenemeijer and Georg Pistotnik, AV Symposium, 14 June 2014, ESSL Research and Training Centre Wiener Neustadt, Austria.

- **Assessing tornado and wind damage**. Pieter Groenemeijer, ESSL Workshop, Tornado and Windstorm Damage Assessment, 01 September 2014, ESSL Research and Training Centre Wiener Neustadt, Austria.

- **Site survey after an F3 downburst in Austria**. Georg Pistotnik and Alois M. Holzer, ESSL Workshop, Tornado and Windstorm Damage Assessment, 01 September 2014, ESSL Research and Training Centre Wiener Neustadt, Austria.

- **TORNeustadt - Studying a historical F4 tornado with the Feuerstein et al. DI-DoD method for central Europe**. Alois M. Holzer, Mathias Stampfl, Thomas M. E. Schreiner, Pieter Groenemeijer and Georg Pistotnik, , ESSL Workshop, Tornado and Windstorm Damage Assessment, 01 September 2014, ESSL Research and Training Centre Wiener Neustadt, Austria.

- **Historical approaches in Europe with focus on the work of Johannes Letzmann**. Alois M. Holzer, ESSL Workshop, Tornado and Windstorm Damage Assessment, 01 September 2014, ESSL Research and Training Centre Wiener Neustadt, Austria.

- **Engineered and natural DIs and norms (building codes/standards) in Europe**. Alois M. Holzer, ESSL Workshop, Tornado and Windstorm Damage Assessment, 01 September 2014, ESSL Research and Training Centre Wiener Neustadt, Austria.

- **Localization and visualization of tornado damage as part of site investigations**. Thilo Kühne, Tornado and Windstorm Damage Assessment, 01 September 2014, ESSL Research and Training Centre Wiener Neustadt, Austria.

- **European Severe Storms Laboratory and its research activities**. Tomáš Púčik, Pieter Groenemeijer, Georg Pistotnik and Alois M. Holzer, Severe convection and forecasting of extreme phenomena. Seminar of the Czech Meteorological Society, 15 September 2014, Czech Republic.

- **Crowdsourcing bei Unwetterdaten sowie Warnungs-Test und - Trainings-Aktivitäten im ESSL**. Alois M. Holzer and Pieter Groenemeijer, Extremwetterkongress, 06 October 2014, Hamburg, Germany

- **Satellite Based Climatology of (Sub-) Tropical Cyclones in Europe**. Alois M. Holzer and Pieter Groenemeijer, 07 October 2014, EMS ECAC Prague, Czech Republic.

- **Development of a calibrated proxy for thunderstorm occurrence using lighting and reanalysis data**. Anja westermayer, Georg Pistotnik and Pieter Groenemeijer, 27th AMS Conference on Severe Local Storms, 2-7 November 2014, Madison, Wisconsin, USA.

- **Probabilistic Modelling of the European Severe Thunderstorm Climate**. Georg Pistotnik, Pieter Groenemeijer, Thilo Kühne, Anja Westermayer and Henning Rust, 27th AMS Conference on Severe Local Storms, 2-7 November 2014, Madison, Wisconsin, USA.

- **The European Severe Weather Database (ESWD) as a data resource for severe weather research**. Pieter Groenemeijer, Thilo Kühne, Georg Pistotnik, Alois M. Holzer and Zhongjian Liang, 27th AMS Conference on Severe Local Storms, 2-7 November 2014, Madison, Wisconsin, USA.

Poster presentations

- **Development of a calibrated proxy for thunderstorm occurrence using lighting and reanalysis data**. Anja Westermayer, Georg Pistotnik and Pieter Groenemeijer, 27th AMS Conference on Severe Local Storms, 2-7 November 2014, Madison, Wisconsin, USA.

- **Probabilistic Modeling of the European Severe Thunderstorm Climate.** Georg Pistotnik, Pieter Groenemeijer, Thilo Kühne, Anja Westermayer and Henning Rust, 27th AMS Conference on Severe Local Storms, 2-7 November 2014, Madison, Wisconsin, USA.

- **Severe Weather Environments in Central Europe as characterized by proximity soundings**. Tomáš Púčik, Pieter Groenemeijer, David Rýva and Milan Kolař, 27th AMS Conference on Severe Local Storms, 2-7 November 2014, Madison, Wisconsin, USA.

4 Financial and administrative report

4.1 Auditing of the Annual Accounts

ESSL's finances for 2014 were audited by the independent and sworn certified financial auditor Andreas Schnaubelt, Loewenstrasse 5, 86956 Schongau, Germany.

The Annual Accounts for 2014 are shown the way the financial auditor prepared and delivered them to the Executive Board. Appendix 2 contains all details. Summarizing our certified financial auditor states on page 7 of the Annual Accounts (see Appendix A2):

"Record of Income and Expenses

… during our work no indications occurred which would give raise for objections against the correctness of the record.

Financial Statements

… during our work no indications occurred which would give raise for objections against the correctness of the financial statements."

The original was duly forwarded to the Advisory Council.

4.2 Employment and Payroll accounting

An external payroll accountant (Andreas Schnaubelt in Schongau, Bavaria) was mandated during 2014 to take care of paperwork and bureaucratic handling of taxes and social insurances, which would otherwise have exceeded ESSL's internal administrative capacity.

In 2014, the ESSL employed **one full time employee** (ESSL Director) and **six 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) at least for periods, 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 (*Idealistic Purpose*, i.e. management of the association and its core activities) and its branches directly serving the statutory purposes of the ESSL (Dedicated Activities). No activities had to be booked under the commercial type branch (Economic Activities) and also no activities in the Asset Management in 2014, thus fulfilling the requirements of the tax authorities (see Attachment VII in the Appendix A2).

4.3 Financial status 2014

European Severe Storms Laboratory e.V.

The accounting year was dominated by the STEPCLIM project, the starting RAIN project and by the absence of the ECSS turnover (as in every second year). The detailed accounting for 2014 can be found in the Appendix A2, in particular within Attachments V and VI (in English).

The financial situation was extremely difficult in the first few months of the year 2014 because of an about half-year delay of the start of the anticipated EU-FP7-project RAIN, and this after an already difficult earlier period.

The following figures from the annual accounts underline the tight business conditions:

ESSL obtained EUR 62,253.11 (2013: EUR 66,666.37) in membership fees and donations, EUR 165,485.77 (2013: EUR 107,718.82) from scientific projects, EUR 0.00 (conference year 2013: EUR 97,873.54; non-ECSS year 2012: 2,159.33) from scientific conferences, and EUR 8,950.00 from ESWD data sales. Other sources of income amount to EUR 2,523.25 (VAT on sales and refund).

Including taxes, **total income** amounts to **EUR 239,112.13** (ECSS year 2013: 277,752.71 and non-ECSS year 2012: 160,998.39).

Including taxes, **total expenses** amount to **EUR 243,069.28** (ECSS year 2013: 275,126.82 and non-ECSS year 2012: 195,364.06).

The major cost factors were personnel costs with EUR 193,874.12 (2013: EUR 147,206.15) including taxes and social security and travel expenses with EUR 24,148.94 (2013: EUR 25,028.87). Tax advisor and external bookkeeping costs sum up to EUR 10,860.00 (2013: EUR 11,830.00).

Personnel costs still pose a challenge to ESSL, because the STEPCLIM project covers almost no overhead costs. The tight cooperation with the Austrian based association “European Severe Storms Laboratory – Science and Training” reduces 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.

At the end of the business year, liquid assets at our bank accounts amounted to EUR 116,067.64 (2013: EUR 5,438.13), while 120,920.00 must be called “deferred income”, because it is budget already received for the RAIN work in 2015. At the end of the year 2014 accounts receivables amounted to EUR 6,206.34 (2013: EUR 0.00; 2012: 7,000.00), see Attachment V in Appendix A2.

In summary, the ESSL managed to stay solvent during 2014, but in the first half of the year on a very low level. ESSL still runs without noteworthy reserves.

The **annual result is a negative EUR 3,957.15** (compare: positive EUR 2,625.89 in 2013, 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).

The financial planning for 2014 foresees sufficient financial liquidity levels (mainly because of the running STEPCLIM and RAIN projects).

Subsidiary European Severe Storms Laboratory - Science and Training

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 32,342.25 (2013: EUR 851.60; 2012: 10,808.17), out of this EUR 20,000.00 are a current reserve for the ECSS, and 9,500.00 are a current reserve for the ESSL Testbed. The remaining annual result for the subsidiary association in 2014 is a positive EUR 1,689.65 (2013: negative 9,691.57; 2012: positive EUR 3,808.17).

The financial planning for 2015 foresees a neutral annual result. Internal auditors (according to Austrian law) for 2014 were Dr. Kathrin Riemann-Campe and Prof. Dr. Robert Sausen.

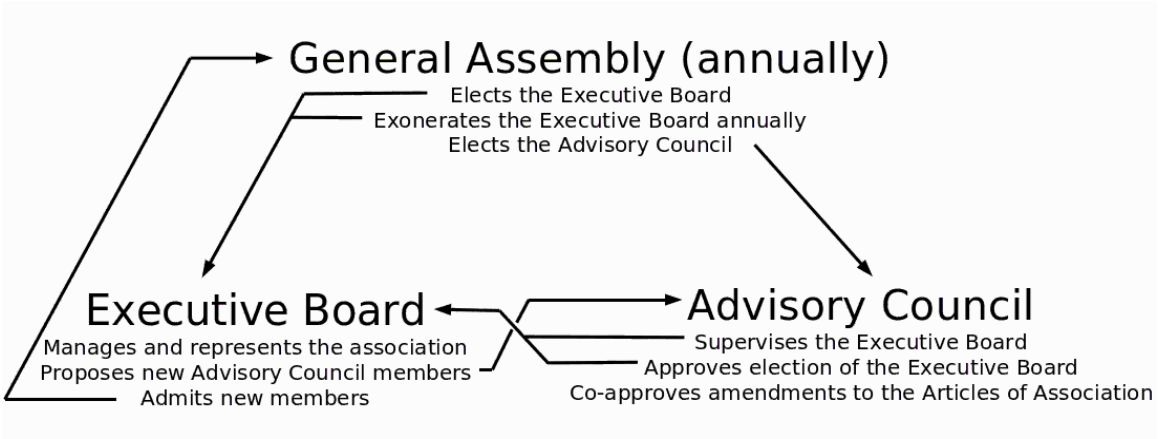
4.4 ESSL members

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 and Deutscher Wetterdienst (DWD). All these organizations are ESSL members.

In 2014, ESSL was happy to welcome a new full institutional member, the Consorzio LaMMA. Additionally, four individual supporting members joined the Association. See Appendix A1 for the full member list.

4.5 Executive Board and Advisory Council

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.

Executive Board

In 2014, the Executive Board consisted of:

- Dr. Pieter Groenemeijer, Director
- Dr. Kathrin Riemann-Campe, Deputy Director.
- Mr. Alois M. Holzer, Treasurer

Advisory Council

In 2014, 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 (first term, and already re-elected for a second term)
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 (first term)
David M. 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: Member list 2014

The following table shows all ESSL members as of 31 December 2014, 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

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

INDF	Dr. Volker Gärtner	GERMANY
INDF	Dr. Michael Kunz	GERMANY
INDF	Erik Dirksen	GERMANY
INDF	Emmanuel Wesolek	FRANCE
INDF	Christoph Gatzen	GERMANY
INDF	Dr. Alexander Keul	AUSTRIA
INDF	Dr. Kathrin Riemann-Campe	GERMANY
INDF	Tomáš Pučik	CZECH REPUBLIC
INDF	Patrick Marsh	USA
INDF	Marcus Beyer	GERMANY
INDF	Dr. Koji Sassa	JAPAN
INDF	Lisa Schielicke	GERMANY
INDF	Dr. Charles A. Doswell III	USA
INDS	Casper ter Kuile	NETHERLANDS
INDS	Stefan Meulemans	SWITZERLAND
INDS	Francesco Meneguzzo	ITALY
INDS	Jan Jacob Groenemeijer	NETHERLANDS
INDS	Christopher Claude Valois Barthe	FRANCE
INDS	Mathias Stampfl	AUSTRIA
INSF	DWD, Deutscher Wetterdienst	GERMANY
INSF	EUMETSAT	GERMANY
INSF	AUSTRO CONTROL	AUSTRIA
INSF	ZAMG, Zentralanstalt für Meteorologie und Geodynamik	AUSTRIA
INSF	NMA, National Meteorological Administration of Romania	ROMANIA
INSF	FMI, Finnish Meteorological Institute	FINLAND
INSF	CHMI, Czech Hydrometeorological Institute	CZECH REPUBLIC
INSF	Institute for Hydrometeorology and Seismology of Montenegro	MONTENEGRO
INSF	DHMZ, Meteorological and Hydrological	CROATIA

	Service of Croatia	
INSF	SHMU, Slovak Hydrometeorological Institute	SLOVAKIA
INSF	Consorzio LaMMA	ITALY
INSS	Münchener Rückversicherungs-Gesellschaft AG	GERMANY
INSS	Tokio Marine Technologies LLC	USA
INSS	Willis Ltd	UNITED KINGDOM
INSS	Deutsche Rückversicherung	GERMANY
INSS	DLR; Deutsches Zentrum für Luft- und Raumfahrt	GERMANY
INSS	SJNK Risk Management	JAPAN
INSS	Guy Carpenter Limited	UNITED KINGDOM
INSS	Air Worldwide	USA
INSS	Dents & Dings	USA
INSS	Research Center for Environmental Changes	TAIWAN

Appendix A2: Annual Accounts 2014

The following pages present in extract a copy of the “Report on the Preparation of the Financial Statements for 2014”, as prepared by the financial auditor.

Attachment V

Andreas Schnaubelt
Diplom-Betriebswirt (FH) I Wirtschaftsprüfer I Steuerberater I Fachberater für Internationales Steuerrecht

EUROPEAN SEVERE STORMS LABORATORY E. V.

WESSLING

STATEMENT OF ASSETS AND LIABILITIES AS OF DECEMBER 31, 2014

ASSETS

	€	€	Previous Year €
A. FIXED ASSETS			
Tangible fixed assets			
Office equipment		1.321,00	1.194,00
B. CURRENT ASSETS			
I. Receivables and other assets	6.206,34		0,00
II. Bank balances	116.067,64	122.273,98	5.438,13
		123.594,98	6.632,13

EQUITY AND LIABILITIES

	€	€	Previous Year €
A. EQUITY			
I. Retained earnings brought forward			
1. Idealistic purpose		2.784,20	2.784,20
2. Other tax free dedicated activities		3.573,10	2.047,21
3. Asset management		472,61	472,61
4. Economic activities		-197,78	-1.297,78
II. Remaining result of the year		-3.957,15	2.625,89
		2.674,98	6.632,13
B. DEFERRED INCOME		120.920,00	0,00
		123.594,98	6.632,13

Attachment VI

Diplom-Betriebswirt (FH)
Andreas Schnaubelt
Wirtschaftsprüfer I Steuerberater I Fachberater für Internationales Steuerrecht

EUROPEAN SEVERE STORMS LABORATORY E. V.

WESSLING

INCOME STATEMENT

FOR THE PERIOD JANUARY 1 THROUGH DECEMBER 31, 2014

		€	Previous year €
1.	Income	239.112,13	277.752,71
2.	Personnel expenses	-193.874,12	-147.206,15
3.	Depreciation	-684,00	-1.104,00
4.	Other operation expenses	-48.511,16	-126.816,67
5.	Result of the year	-3.957,15	2.625,89
6.	Deduction of reserves	0,00	0,00
7.	Allocation to reserves	0,00	0,00
8.	Remaining result of the year	-3.957,15	2.625,89

EUROPEAN SEVERE STORMS LABORATORY E.V.

WESSLING

INCOME STATEMENT FOR 2014

	Idealistic Purpose				Dedicated Activites	Asset	Economic	
	RAIN	STEPCLIM	General	Subtotal	(data base ESWD)	Management	Activites	Total
	€	€	€	€	€	€	€	€
1. Income								
Subsidies from / for								
European Union	64.926,00			64.926,00				64.926,00
Federal Republic of Germany		96.059,77		96.059,77				96.059,77
European Conf. on Severe Storms				0,00				0,00
others				0,00				0,00
Income from								
scientific meetings				0,00				0,00
lectures				0,00				0,00
project RCEC			4.400,00	4.400,00				4.400,00
interest				0,00				0,00
others				0,00				0,00
Membership fees / data base using fee			3.825,00	3.825,00	53.060,00			56.885,00
Donations			5.368,11	5.368,11				5.368,11
Income from sale of data base data				0,00	8.950,00			8.950,00
German VAT on sales				0,00	1.973,50			1.973,50
German VAT refund				0,00	549,75			549,75
	64.926,00	96.059,77	13.593,11	174.578,88	64.533,25	0,00	0,00	239.112,13
2. Expenses								
Personal expenses	72.334,76	82.851,24	14.479,26	169.665,26	24.208,86			193.874,12
Depreciations	136,00	333,00	215,00	684,00	0,00			684,00
Other expenses								
ECSS conference								0,00
Travel expenses	2.755,52	7.083,78	14.309,64	24.148,94	0,00			24.148,94
Remaining other expenses*)	1.743,37	7.869,00	7.821,33	17.433,70	4.358,43			21.792,13
German VAT deductible	189,65	856,00	850,82	1.896,47	673,62			2.570,09
German VAT payments								0,00
	77.159,30	98.993,02	37.676,06	213.828,38	29.240,90	0,00	0,00	243.069,28
3. Result of the year	-12.233,30	-2.933,25	-24.082,95	-39.249,50	35.292,35	0,00	0,00	-3.957,15

*) The allocation of the remaining other expenses were made as follows: 20 % to dedicated activites and 80 % to idealistic purposes (hereof 10 % for project RAIN, direct allocation to project STEPCLIM with € 7.869 and the remaining amout to general).

EUROPEAN SEVERE STORMS LABORATORY E. V.

WESSLING

APPORTIONMENT OF THE YEARLY INCOME AND DETERMINATION OF THE RESERVES 2014

	Idealistic Purpose	Dedicated Activities	Asset Management	Economic Activities	Total
Result of the year	-39.249,50	35.292,35	0,00	0,00	-3.957,15
Deduction of reserves	0,00	0,00	0,00	0,00	0,00
Equalisation between the activities	33.808,64	-33.808,64	0,00	0,00	0,00
Subtotal	-5.440,86	1.483,71	0,00	0,00	-3.957,15
Allocation to the free reserves	0,00	0,00	0,00	0,00	0,00
Allocation to the reserve for operating expenses	0,00	0,00	0,00	0,00	0,00
Remaining result of the year	-5.440,86	1.483,71	0,00	0,00	-3.957,15