ANNUAL REPORT 2012

European Severe Storms Laboratory e. V.

c/o IPA, Institut für Physik der Atmosphäre
Münchner Str. 20, Geb. 120
82234 Weßling, Germany

Tel.: +49 151 5903 1839
Fax: +49 8151 9659 999 11

eb@essl.org
http://www.essl.org
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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 Center 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.
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

Without doubt, 2012 was a spectacular year in which ESSL expanded its terrain by opening an activity that brings research into operational meteorological practice: the ESSL Testbed.

The first ESSL Testbed was carried out in June and July
Association *European Severe Storms Laboratory – Science & Training*, in cooperation with the Austrian Central Institute for Meteorology and Geodynamics (ZAMG), and is planned to be an annually returning event. At the Testbed, new forecast-supporting tools are evaluated and training is provided to weather forecasters. Through the Testbed, ESSL was able to intensify relations to the World Meteorological Organization (WMO), EUMETSAT and several National HydroMeteorological Services, among others.

More details on the relation between ESSL and its Austrian subsidiary can be found in the Administrative Report in Chapter 4. We have chosen to include all activities of ESSL in the broadest possible sense in this report, including those carried out by the subsidiary in Wiener Neustadt, which are marked with a star throughout this report.

Venue of the Testbed was the Research and Training Centre in Wiener Neustadt, which was opened officially on 21 June. Strategically located close to the central station of Wiener Neustadt, the Centre is also the venue of several workshops and seminars, the first of which took place in September 2012, a
by Charles Doswell III.

Besides these new activities that closely relate to the application of science to operational forecasting, several research projects with a focus on climatology were carried out in 2012. These included the last phase of the FP7 Project Extreme Weather impacts on European Networks of Transport (EWENT), a continuation of the cooperation with the U.K. Met Office on the future climate of hail storms, and the first full year of

, important first steps have been set that will enable climate models to be evaluated with regard to the occurrence of severe thunderstorms. Another interesting novel project was carried out in cooperation with EUMETSAT in which climatology of severe (sub-)tropical storms across the seas surrounding Europe was established.

Besides these scientific activities, ESSL has also shown a continued commitment to *support* research. For example, in 2012 more severe weather reports were added to the European Severe Weather Database (ESWD) than in any single year before: 8967 reports, of which more than 80% could be confirmed by reliable sources. The value of the ESWD for research is underlined by a large number of requests for ESWD data that was received during 2012, which often come from academic. Another form of support to science that ESSL provides are the several secretarial functions that the *European Severe Storms Laboratory – Science & Training* has started to provide to the Convection

Working Group (CWG). The CWG is a joint initiative of EUMETSAT and its member states and ESSL. Finally, support to science was also provided by starting preparations for a new edition of the European Conferences on Severe Storms. This conference is to be held in Helsinki in June 2013 and organized jointly with the Finnish Meteorological Institute.

With regard to external relations, we were happy to prolong the cooperation of the ESSL with the European Meteorological Society (EMS) through a prolongation of the existing cooperation agreement. ESSL was also happy to welcome two new institutional members, the Institute for Hydrometeorology and Seismology of Montenegro and NKSJ Risk Management. Moreover, four personal members joined ESSL in 2012.

Internally, an important change was that Deputy Director Dr. Víctor Homar Santaner regretfully resigned from his Executive Board post in March. In addition to that, Dr. Aurora Bell announced that she would not be a candidate upon re-election of the Board by the General Assembly in Sopot on 6 September.

Before re-election of Alois M. Holzer, Kathrin Riemann-Campe and yours truly to the Board, new Articles of Association were accepted by the General Assembly that allow

Council also saw a change in 2012, with Daniel Rosenfeld leaving the Council at the end of his term, and Pertti Nurmi joining. I refer to Chapter 4 of this Report for more information.

As you will read in Section 4, ESSL set important steps towards making its operations sustainable in the near future, as its medium-term objective is to make ESSL less reliant on unpaid work. The ESSL Testbed, and by extension all activities at the Centre in Wiener Neustadt, have been very beneficial to that aim. The great success of the Testbed in 2012 demonstrates that ESSL has found a way to pursue its statutory goals for which a great demand exists. In addition, ESSL will continue to engage in new projects of high scientific quality. High priority will also be given to expanding ESSL membership, as member contributions are of crucial importance to goals.

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

Pieter Groenemeijer
ESSL Director

Weßling, 29 April 2013

2 Science

2.1 The European Severe Weather Database

main statutory purposes is to operate and extend the European Severe Weather Database, which 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.

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 contri
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.

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. In 2011 and 2012 this was demonstrated in particular by the Trusted Spotter Network in Austria, a collaboration between ESSL, ZAMG and Skywarn Austria. As a final application, the ESWD is used for forecast verification, for example at the ESSL Testbed.

2.1.1 Development of the dataset

For the year 2012, a total number of 8967 severe weather events were reported, which is a new record high of reports in any single year, shown on the map overleaf. Moreover, the absolute number of reports exceeded 50000 last September. In addition to the large spatial coverage, the ESWD altogether reports cover almost two millennia in time. The

Sea coast in June in the year 15 AD. Over 95 % of the 2012 related reports passed the fi
meaning QC1 or higher. This level of quality is sufficient for most scientific purposes.

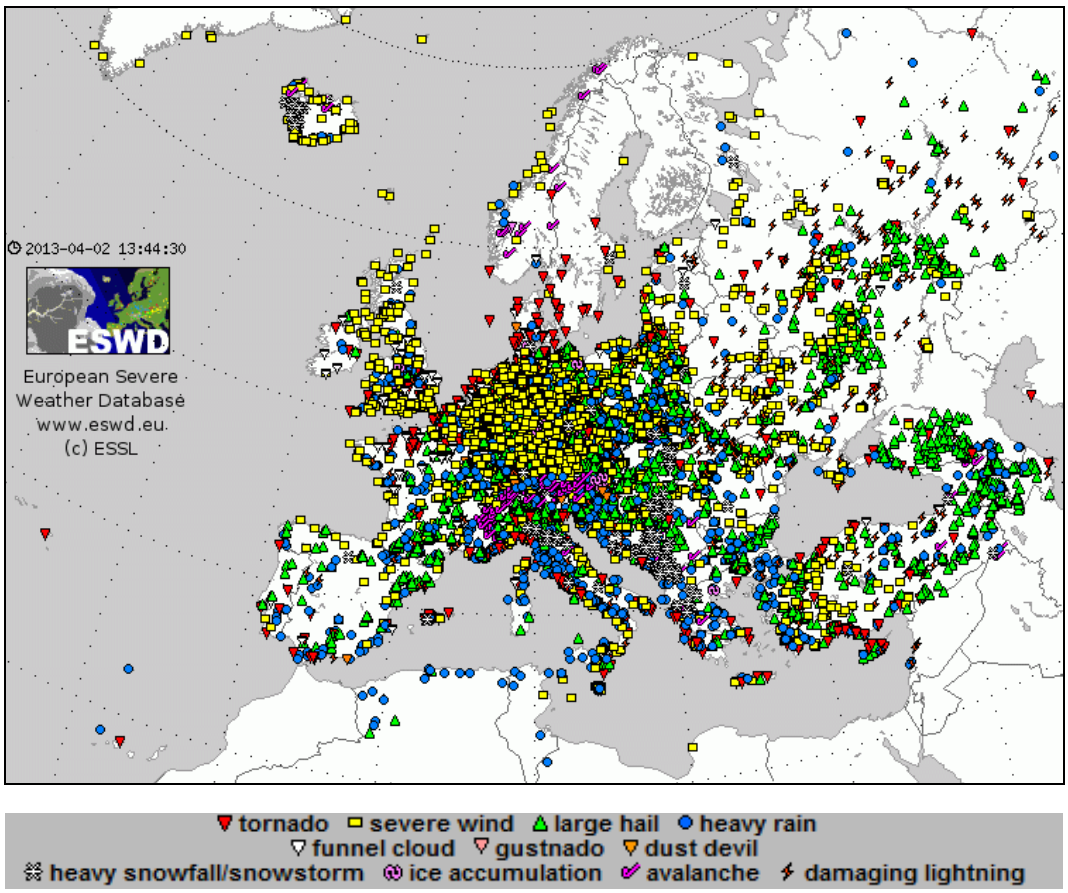


Figure 2.1. All 8967 ESWD reports from 1 January to 31 December 2012. Symbols of severe weather events overlap in some areas.

Number of reports 2012	Quality control applied to report
421	QC0, as received
1262	QC0+, plausibility checked
7144	QC1, report confirmed by reliable sources
140	QC2, event fully verified
Total: 8967	

Table 2.1. Number of ESWD reports for the year 2012 per quality control category.

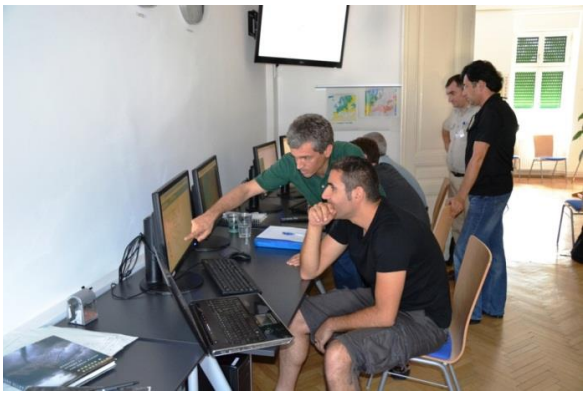
2.1.2 Technical ESWD enhancements

In 2012 no major new features were introduced to the ESWD. However, some important work was done by optimizing performance with large data requests and developing a better back-up system for the database. Plans to introduce a zoomable map function were conceived and are planned to be implemented in 2013.

2.2 ESSL Testbed*

From 4 June to 6 July 2012, the first ESSL Testbe
newly-opened Research and Training Centre in Wiener Neustadt, Austria.

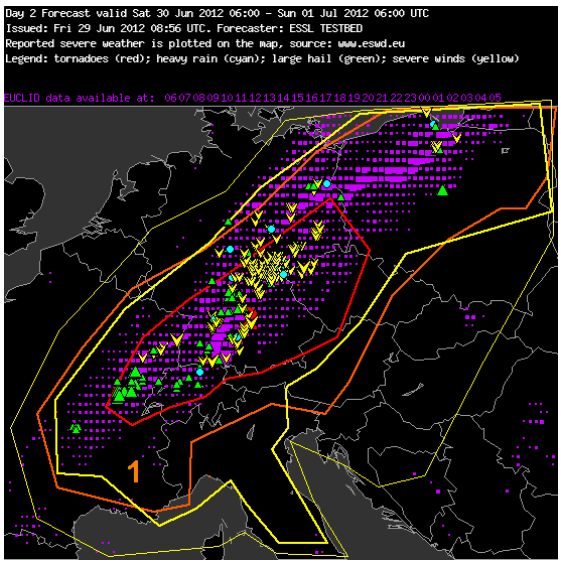
At the Testbed, 67 participants from 21 countries, including both researchers and forecasters, worked closely together on putting new forecast supporting products and methods to the test. The main activities were to prepare experimental forecasts for severe weather for day 1, 2, 3, 4 and 5 as well as the available Testbed tools and standard meteorological data. Subsequently, a verification of these forecasts was performed using the European Severe Weather Database, followed by an evaluation of forecasting tools and techniques.



ESSL Testbed participants discussing NWP model output.

Given the various backgrounds of the participants, an important goal of the Testbed is to acquaint its participants with severe weather forecasting methods and techniques that work universally.

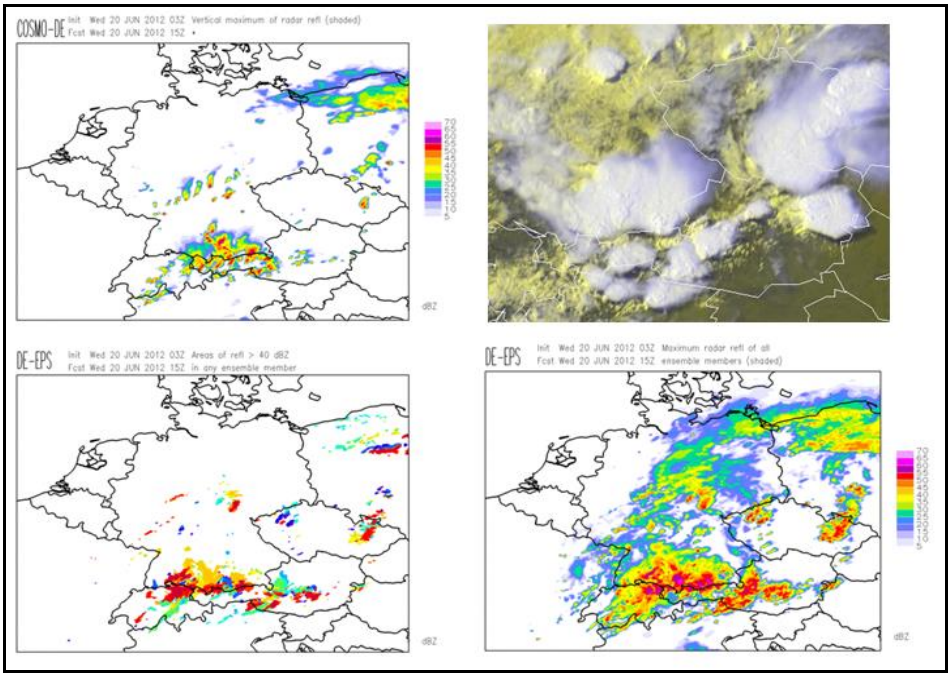
Among the tools that were evaluated were visualizations of high-resolution ensemble NWP (COSMO-DE-EPS), the satellite-based cloud top cooling and overshooting Index, cell-tracking algorithms (Cb-TRAM and Rad-TRAM), an automated nowcast system (NowcastMIX). The participants also worked with several global and regional NWP models (GFS, ECWMF IFS, ALARO5, COSMO-EU) and various satellite products (e.g. the sandwich product).



Experimental forecast (lines) produced at the Testbed with observations to verify the forecast (symbols).

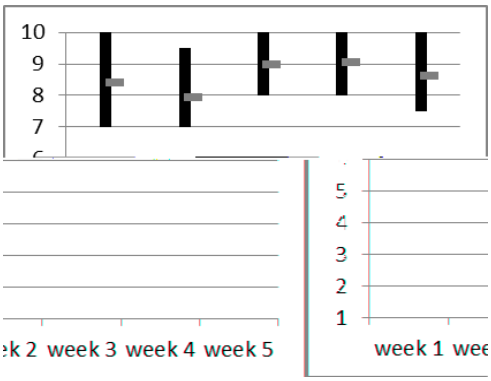
to remote participants, researchers provided background information on their products and internationally renowned experts in forecasting presented their viewpoints on storm forecasting and its scientific roots.

The 2012 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 German Aerospace Center DLR, the City of Wiener Neustadt, the state of Lower Austria, EUMETCAL, EUCLID, ECMWF, CHMI, Austro Control, -R programme.



Visualizations of high-resolution ensemble NWP data (COSMO-DE-EPS, source: DWD). Visible satellite image for comparison (source: EUMETSAT/ZAMG)

The Testbed was evaluated very positively by the participants, some forecasters, some researcher/developers, who were all requested to hand in an anonymous evaluation form at the end of each Testbed week. On a scale from 1 (terrible) to 10 (excellent), the participant graded the Testbed 8.6 on average, with the lowest grade given being a 7, the



Grades given by participants in each week (lowest, average, highest) on a scale from 1 (terrible) to 10 (excellent).

These are some of the comments of the participants on anonymous feedback-forms:

"I participated in a few workshops before, but this gave me real lively exchange. I learned more about the practical use of the ingredients-based method."

"It is a great balance between theoretical and practical training."

Asking whether the participants future work would benefit from their Testbed participation prompted these replies:

"(..) it will help me to suggest new model fields and techniques to my institution's product developers and forecasters."

"Definitely. The Testbed offers a chance for forecasters to learn from developers and scientists and scientists/developers to learn from forecasters. We need more of this in our field!"

2.3 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.

Convection Working Group website

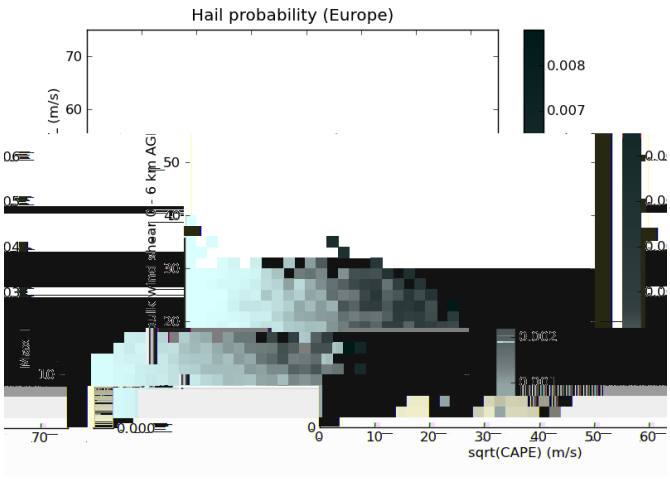
subsidiary European Severe Storms Laboratory - Science and Training has taken on a number of activities in support of the CWG. Most visible is perhaps the activity of developing and maintaining its newly designed website. This web

site serves as a tool to support the exchange of knowledge as an interface to the broader scientific community and can be accessed at the URL: **www.essl.org/cwg**

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

In 2011, ESSL started with the STEPCLIM project, funded by the German Ministry of Education and Research. 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. From March 2012, a new ESSL employee, Mag. Georg Pistotnik joined the STEPCLIM team and pursues a doctorate with this work.

STEPCLIM is part of the MiKlip research programme that focuses on improving decadal climate projections. Within MiKlip, STEPCLIM evaluates the decadal predictions regarding their capability to represent severe thunderstorms, and assesses their predictability using proxies. These proxies are developed using reanalysis data and hindcasts of a developmental decadal climate modelling system MiKlip, and quality-controlled severe storm reports from the European Severe Weather Database (ESWD).



Probability of hail in Europe as function of two parameters: 0-6 km bulk wind shear and the square root of CAPE

In order to characterize the local state of the atmosphere, a set of parameters is defined which have a physical meaning in the dynamics of convective storms. These include instability, vertical wind shear, and measures for lifting support or possible trigger mechanisms, as well as other quantities which describe the vertical profiles of temperature, moisture and wind.

A first raw version of these metrics is developed by comparing ECMWF (ERA-Interim) reanalyses with ESWD storm reports in order to distinguish between situations with and without an occurrence of local severe weather phenomena. Subsequently, the set of metrics is refined by the use of regionalized reanalyses and hindcasts of the MiKlip climate model.

STEPCLIM extends earlier work conducted by other research groups that mainly focused on the severe weather climate in the USA, re-calibrating the parameter space developed therein with respect to the European thunderstorm and severe weather

climate. It is shown that severe weather in Europe frequently occurs in environments that can be considered relatively benign compared to North American standards. This can be attributed to geographic differences, like the different distributions of land and sea, of flatlands and mountains, and their effects on the availability of the ingredients for deep moist convection and severe weather.

Further novel aspects of the present study comprise a stratification of the developed metrics with respect to different types of severe weather (tornadoes, severe wind gusts, hail, and excessive precipitation), the development of a proxy for convective initiation, the investigation of the influence of different resolutions of the underlying climate model, and the application of the developed metrics on future regionalized climate projections.

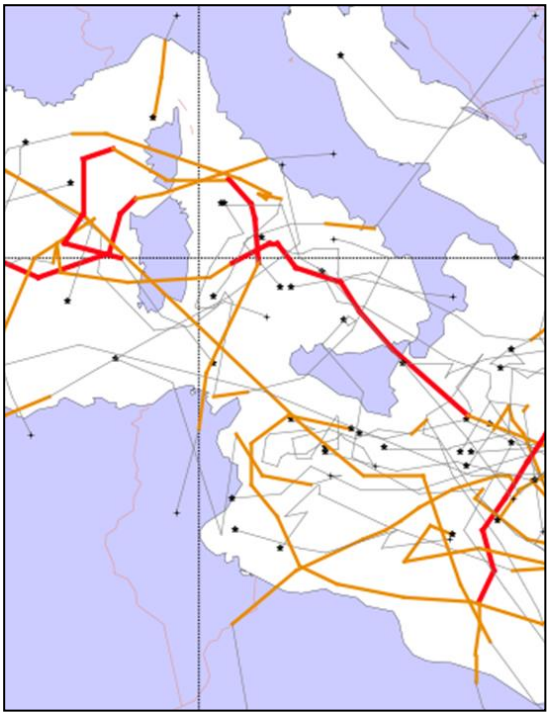
2.5 Evolution of Hail Storms over Europe in Changing Climate

Within the project Evolution of Hail Storms over Europe in a Changing Climate funded by the AXA Research Fund, ESSL cooperates with the UK Met Office to develop a hail model to be used with the regional climate model. In 2012, ESSL continued to provide a consulting role and supported the Met Office with enhancements to the hail model. The project will end early 2013.

2.6 Satellite-Based Climatology of (Sub-)Tropical Cyclones in Europe

This EUMETSAT funded project started in November 2011. It focuses on storms that reveal a high level of subtropical or tropical cyclone type organization and can be observed on occasion on satellite imagery covering the Mediterranean Sea, the Black Sea, and the Atlantic Ocean southwest of the Iberian Peninsula.

the development of an automatic detection of such systems, was to establish a baseline climatology of their occurrence for the waters surrounding Europe. To obtain such climatology, the manual Dvorak-Method was applied to Meteosat 1 imagery, from 2006



Right: Tracks of (sub-)tropical cyclones in the central part of the Mediterranean (1982-2006). Hurricane strength systems are in red, (sub)tropical storm strength in orange and others in gray colour.

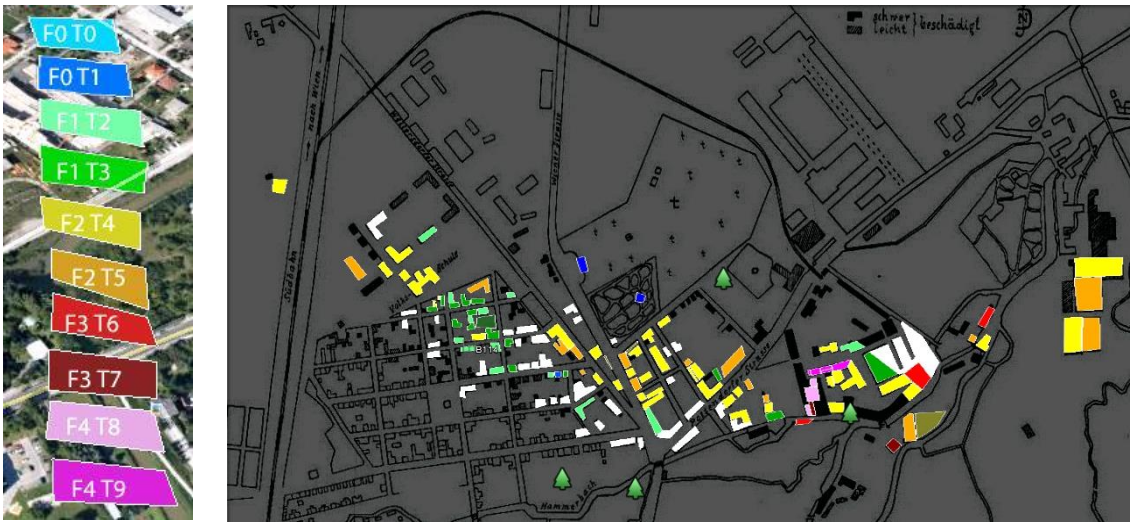
back to the onset of the operational meteorological satellite era in Europe in the year 1982. According to the Dvorak method, suspect systems were classified as tropical depressions, storms or cyclones via assigning T-numbers (T for tropical) related to the satellite appearance of the systems and for subtropical systems the Hebert and Poteat method was used to this aim. The results have been presented in an invited talk at the EUMETSAT Meteorological Satellite Conference in September 2012.

2.7 TORNeustadt*

On the 10 July 1916, a large tornado passed over the northern neighbourhoods and industrial zones of the town of Wiener Neustadt, Lower Austria. This resulted in 35 fatalities and 328 wounded people among massive structural damage to residences and industrial buildings. According to the European Severe Weather Database (ESWD) this event is the fourth-deadliest tornado in Eur

For the City of Wiener Neustadt, ESSL performed a careful reassessment of this historic

precisely, we collected and reanalysed historical material, including more than 100 damage pictures and performed a damage assessment based on the available damage images and descriptions. This was done by assigning an F-/T-Scale rating to every damage indicator based on the respective degree of damage. The individual ratings were used to compose a detailed map of the damage path across the city and allowed us to determine



Top: Damage track produced by the tornado on 10 July 1916 across the northern part of Wiener Neustadt.

While an earlier estimate of the maximum F-Scale rating of the Wiener Neustadt tornado of 1916 was F3, the reanalyses resulted in an upgrade to F4, based on several damage indicators in the area of a locomotive factory, where brick walls with a thickness close to one metre collapsed.

2.8 EWENT

The EU FP7 project EWENT (Extreme Weather impacts on European Networks of Transport) concluded in 2012. The objective of the EWENT project was to assess the impacts and consequences of extreme weather events on the EU transport system. The project also evaluates the efficiency, applicability and finance needs for adoption and mitigation measures which will dampen and reduce the costs of weather impacts.

Within the 9-partner consortium lead by the Technical Research Centre of Finland VTT, was on meteorological studies, carried out jointly with the Finnish Meteorological Institute. The bulk of ESSL s analyses within the project, that formed the basis of the assessments of economic impacts, had already been carried out in 2011. The same holds for the work on improvements to the European Severe Weather Database that included the addition of winter weather types, and updated data format and translations into several languages. The EWENT project was concluded with a Final Dissemination Seminar at WMO Headquarters on 29 May 2012, where ESSL presented its contribution alongside the other project partners.

3 Publications, courses and seminars

ESSL in 2012 worked hard at disseminating the results of its activities in various ways. ESSL employees participated in several conferences, such as the European

Conference, the AMS Conference on Severe Local Storms and the germanophonic Extremwetterkongress. At several other occasions the ESSL Board was invited to present the organization.

The ESSL website is the main dissemination channel for announcements of its science-supporting services and general information on the organisation. Many additions and

ESSL organized two one-week Forecasting Seminars*, which were taught by Charles Doswell III.
the Research and Training Center on 21 June, which also included a press conference. The ESSL Testbed and the ESSL received considerable exposure in Austrian national, regional and local press.

3.1 Forecasting Seminar*

In October 2012 ESSL offered two one-week courses in forecasting severe convective storms in our new ESSL Research and Training Centre in Wiener Neustadt, Austria. The focus was on ingredients based forecasting, and no less a person than Dr. Charles A. Doswell III gave the lectures in the mornings and led the exercises in the afternoons. 18 persons (some of them already senior forecasters) attended the courses and were hopefully enriched by this unique experience in learning and discussion. A similar course is planned for September 2013.

3.2 Grand Opening of the ESSL Research and Training Centre*

On 21 June 2012, the ESSL Research and Training Centre celebrated its Grand Opening in Wiener Neustadt, Austria.

The opening ceremony was led by the ESSL Director of Operations, Alois M. Holzer. He welcomed the guests with an introduction to the ESSL. In the course of the evening, several speakers stressed the need of an international focus on severe weather and climate change.

The audience was addressed by Dr. Michael Staudinger (Director of

ZAMG and ESSL Advisory Councillor), Dr. Dimitar Ivanov (Chief of the World Meteorological Organisation (WMO) Regional Office for Europe, representing WMO Region VI President Ivan Cacic), Dr. Fritz Neuwirth (President of the Austrian Meteorological Society and representing the president of the European Meteorological Society, Dominique Marbouty), Bernhard Müller (Mayor of the city of Wiener Neustadt) and Klaus Schneeberger (Chairman of Club in the provincial parliament of Lower Austria and representing the Governor of Lower Austria, Dr. Erwin Pröll).

ESSL Director Dr. Pieter Groenemeijer formally opened the Research and Training Centre at the end of the official ceremony. The Centre is the venue for several workshops, seminars and, of course, the ESSL Testbed.

3.3 Peer-reviewed publications

Alexander G. Keul and Alois M. Holzer, 2013: The relevance and legibility of radio/television weather reports to the Austrian public, *Atmos. Res.*, **123**, 32 42. DOI: 10.1016/j.atmosres.2012.10.023.

3.4 Other publications

ESSL Technical Report 2012-1, Testbed Operations Plan.

Concise Report on the ESSL Testbed 2012.

These publications can be found online at http://www.essl.org/testbed

3.5 List of presentations and conference contributions

Hail climate modelling: questions and new approaches. Pieter Groenemeijer, Hail Workshop at Willis Re, London, 17 January 2012.

Die Gewitterlage vom 11.09.2011: Die Unwetter am 11.09.2011 - Was ist geschehen?, Thilo.Kühne, *7. Extremwetterkongress, 20.-23. March 2012, Hamburg, Germany*

Die Gewitterlage vom 11.09.2011: Die Unwetter am 11.09.2011 - Was können wir aus diesem Fall lernen?, Oliver Schlenczek, *7. Extremwetterkongress, 20.-23. March 2012, Hamburg, Germany*

Satellite Based Climatology of (Sub-) Tropical Cyclones in Europe. Pieter Groenemeijer and Alois M. Holzer, EUMETSAT, 21 March 2012.

The ESSL Testbed, 2012 Convection Working Group meeting, 27-30 March 2012, Prague, Czech Republic.

Enhancements of the European Severe Weather Database. Kathrin Riemann-Campe, Pieter Groenemeijer, et al. EWENT Final Dissimilation Seminar, WMO, Geneva, 29 May 2012.

The European Severe Weather Database: An introduction. Kathrin Riemann-Campe, Seminar of the Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany, 1 June 2012.

The ESSL Testbed 2012, or what forecasters and researchers can learn from each other when working together in one room. Pieter Groenemeijer, Alois M. Holzer, Georg Pistotnik, Kathrin Riemann-Campe. 2012 EUMETSAT Meteorological Satellite Conference, Sopot, Poland, 1 September 2012.

The ESSL Testbed 2012, or what forecasters and researchers can learn from each other when working together in one room. Pieter Groenemeijer, Alois M. Holzer, Georg Pistotnik, Kathrin Riemann-Campe. 12th *EMS* Annual *Meeting*, Lodz, Poland, 9 September 2012.

Experimental forecasting of severe storms in Europe: synthesis of five weeks of ESSL Testbed operations, Pieter Groenemeijer, European Severe Storms Laboratory, Wessling, Germany; and A. M. Holzer, G. Pistotnik, and K. Riemann-Campe, AMS Conference on Severe Local Storms, Nashville Tennessee, USA, 5 8 November, 2012.

STEPCLIM: Severe Thunderstorm Evaluation and Predictability in Climate Models:, Georg Pistotnik, P. Groenemeijer, K. Riemann-Campe, and T. Kühne, Poster and Extended Abstract , AMS Conference on Severe Local Storms, Nashville Tennessee, USA, 5 8 November, 2012.

Konvektives Extremwetter in Europa: Daten, Forschung, Vorhersagen: Daten, Forschung, Vorhersagen: Pieter Groenemeijer and Alois M. Holzer, Fortbildungstag 2012 DMG Zweigverein München / ÖGM, Salzburg, 16 November 2012.

Das europäische Unwetterforschungs-Institut ESSL: Alois M. Holzer and Pieter Groenemeijer, Wirtschaftskreis Wiener Neustadt, 12 December 2012.

4 Financial and administrative report

4.1 Auditing and employment

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

The annual accounts for 2012 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 2012 to take care of paperwork and bureaucratic handling of taxes and social y.

In 2012, the ESSL has been employer of one full time employee (ESSL Director part of salary covered within the STEPCLIM project) and five part time employees and/or so- - (ESSL Treasurer, scientific staff, ESWD quality control manager, ESWD quality controller and ESSL Assistant to the Board). So, in total 6 employees were engaged in ESSL operations for at least part of the year.

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 2012, thus fulfilling the requirements of the tax authorities.

4.2 Financial status 2012

The sixth full accounting year financially was dominated by the new STEPCLIM project. As 2012 was not an ECSS-year, the overall business volume was smaller than in the year before. The ECSS every second year leads to a higher business volume than in the years without a conference. The accounting for 2012 can be found in the Appendix A.1.

As reported at the General Assembly in Sopot, 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 noticable towards the end of each year. The following figures from the annual accounts underline the tight business conditions:

ESSL obtained EUR 48.053,00 (2011: 26.867,00) in membership fees and donations, EUR 104.482,98 (2011: 65.232,82) from scientific projects, 2.159,33 EUR (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** amount to **EUR 160.998,39** (2011: 209.635,19).

Including taxes, **total expenses** amount to **EUR 195.364,06** (2011: 202.541,87).

The major cost factors were personnel costs with EUR 126.099,98 (2011: 110.960,91) including taxes and social security, EUR 23.500,00 for the external scientific services of the ESSL Testbed, EUR 8.800,00 for the external scientific services of DLR for the STEPCLIM project, and travel expenses with EUR 9.467,56 (2011: 25.559,74). Tax advisor and external bookkeeping costs sum up to EUR 12.697,00 (2011: 12.175,51).

Nearly two thirds of the personnel costs are covered by STEPCLIM project funds. Nevertheless, the remainder of the personnel costs still poses a challenge to ESSL, because the STEPCLIM project does not cover any overhead costs. The tight

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, starting in spring 2012. 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 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 36,14 (2011: 36.258,91, 2010: 29.130,59, 2009: 78.138,36). Accounts receivables of EUR 7.000,00 fronted at the end of the year 2012 accounts payable of EUR 4.328,90.

In summary, the ESSL dissolved its financial reserves in 2012 completely. The annual result is a negative EUR 34.365,67 (compare: 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 2013 foresees higher financial liquidity levels during spring and summer (membership fees and ECSS income), but again tight conditions towards the end of the year. From a legal perspective in Germany it is required for an association not to accumulate substantial gains. From the planning and risk perspective it would be

n important medium-range target of the Executive Board.

European Severe Storms Laboratory Science and Training t the end of the business year, liquid assets at its bank accounts amounted to EUR 10.808,17. Accounts receivables of EUR 0,00 at the end of the year 2012 fronted accounts payable of EUR 7.000,00. As this was the first business year, the annual result of 2012 is therefore a positive EUR 3.808,17.

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, that in 2012 amounted to EUR 48.053,00. However, ESSL members are also important in catalysing the pursuit ometimes 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 co-organizer for the ECSS conference in 2013. As can be seen from Appendix A2, all these organizations are ESSL members.

In 2012, ESSL was happy to welcome two new institutional members, the Institute for Hydrometeorology and Seismology of Montenegro as a full member, and NKSJ Risk Management as a supporting member. In addition four full individual members joined the Association: Tomás Pucik (Czech Republic), Patrick Marsh (USA), Marcus Beyer (Germany) and Dr. Koji Sassa (Japan).

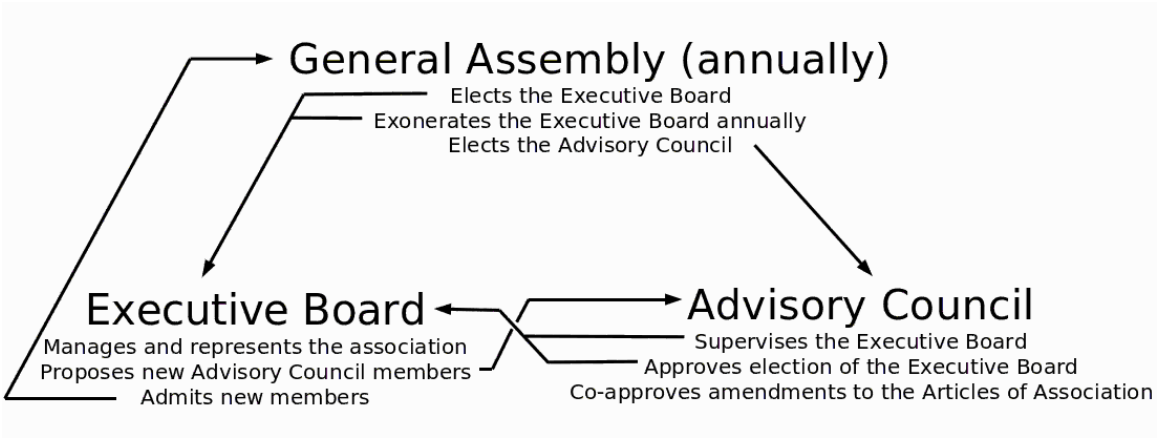
4.4 Prolongation of EMS cooperation

From left to right: Dominique Marbouty (EMS President), Pieter Groenemeijer (ESSL Director), and Alois M. Holzer (ESSL Treasurer)

During the 14th EMS General Assembly on 9 September 2012 in Lodz Pieter Groenemeijer, ESSL Director and Alois Holzer, ESSL Treasurer and the President of the European Meteorological Society (EMS) exchanged letters to extend the fruitful agreement on collaboration between the two organisations for further five years. The agreement arranges cooperation in the Organization of meetings, Representation at General Assemblies, Development and exchange of information material on severe weather and the mutual inclusion in distribution lists for publications.

4.5 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 2012, the Executive Board consisted of:

- Dr. Pieter Groenemeijer, Director
- Dr. Kathrin Riemann-Campe, deputy Director.
- Dr. Aurora Bell, deputy Director
- Dr. Victor Homar Santaner, deputy Director (until 21 March)
- Mr. Alois M. Holzer, Treasurer.

Dr. Víctor Homar Santaner stepped down from his position as Deputy Director, effective on 21 March. Dr. Aurora Bell, deputy Director stepped down on 31 December 2012.

After acceptance of new Articles of Association at the General Assembly in Sopot, Poland, on 6 September 2012, Pieter Groenemeijer, Kathrin Riemann-Campe and Alois M. Holzer were re-elected as Director, deputy Director and Treasurer, respectively.

4.6 Advisory Council

The terms of office of Prof. Dr. David Schultz, Prof. Dr. Vincenzo Levizzani and of Prof. Dr. Daniel Rosenfeld ended on 31 December 2012.

Prof. Dr. David Schultz and Prof. Dr. Vincenzo Levizzani were re-elected for another three year term by the General Assembly on 6 September 2012. Additionally, Dr. Pertti Nurmi of the Finnish Meteorological Institute was elected as new member of the Advisory Council.

Appendix A1: Annual Accounts 2012

Allocation of Profit 2012 due to German Tax Regulations (Financial Reporting 2012) 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 01.01.2012 to 31.12.2012
European Severe Storms Laboratory e.V., Wessling

Income and Expenditure	Year before EUR	EUR
1. Income		
Contributions:		
EU (EWENT) [i]	43.268,00	7.593,00
Stepclim (Ministry of Research, Germany) [ii]	21.964,82	80.750,58
ECSS Vaisala, Symposium Austrian Hail Insurance	16.500,00	
Other ECSS (Munich Re)	10.000,00	
	91.732,82	**88.343,58**
Income from		
Scientific meetings (ECSS with VATID)	30.310,00	-
Registration fees (ECSS with VAT 7 %) [iii]	31.317,82	390,00
Presentations (and consulting, DWD and UKMO)	16.600,00	1.769,33
Project EUMETSAT	8.600,00	16.139,40
Interest	135,87	500,00
Other	-	2.743,60
	86.963,69	**21.542,33**
Membership Fees [iii]	26.260,00	48.053,00
Donations	607,00	-
VAT	4.071,68	3.059,48
	209.635,19	**160.998,39**

i. The public contribution from the EU is related to a project with Teknologian Tutkimuskeskus VTT in Finland. The name of the project is EWENT.
ii. Income from Stepclim is related to a research project.
iii. EUR 2.975,00 of the Membership Fees are generated by personal members, EUR 45.078,00 by institutional members. EUR 44.178,00 are related to ESWD use. For an amount of EUR 21.100,00 of Membership Fees and for the Presentations VAT is applicable.

Income and Expenditures (footnotes overleaf)	Year before EUR	 EUR
2. Expenditures		
2.1 Personnel costs		
Salaries	87.572.82	106.304,65
Social Security	23.388,09	19.406,88
Social Security Minijobs	-	388,45
	110.960,91	**126.099,98**
2.2 Depreciation		
Depreciation of fixed assets	823,00	1.027,94
Depreciation collected items 2008	61,00	
Depreciation collected items 2009	200,00	
Depreciation low value assets	-	260,00
	1.084,00	**1.287,94**
2.3 Other Expenditures		
ECSS conference	**33.550,00**	-
Travel costs and other expenditures	25.559,74	9.467,56
Support for ECSS participants	5.920,00	-
Third party services [i]	5.078,52	33.151,72
Payroll accountant	-	1.440,00
Costs for the annual accounts	7.591,05	4.500,00
Legal and tax advice	4.584,46	6.757,00
Office material	2.134,64	2.566,55
Telephone and internet	1.471,51	1.529,33
Membership fee [ii]	-	800,00
Licences	449,00	495,00
Postages	448,71	121,98
Bank costs	170,21	346,21
Magazines and books	57,71	-
Other year before	-	39,27
	27.905,81	**51.747,06**
Neutral costs		
Input VAT	3.242,43	4.841,02
VAT prepayments	238,98	1.920,50
VAT not deductible	-	-
	3.481,41	**6.761,52**
	90.496,96	**67.976,14**

[i] Third party services comprise of EUR 23.500,00 for the scientific service at the ESSL Testbed and EUR 8.800,00 for the scientific service by DLR for the STEPCLIM project. 429,86 EUR are costs for an external online payment service, which handles credit card payments for the ECSS and for membership fees. 421,86 EUR are other costs.

[ii] The Membership Fee is for the membership in the partner association "European Severe Storms Laboratory – Science and Training" in Austria.

Statement of assets per 31st December 2012

ASSETS	Year before EUR	EUR	**EQUITY**	Year before EUR	EUR
A. FIXED ASSETS			A. EQUITY		
Tangible Assets			I. Retained earnings		
			1. General reserves	8.046,28	-
Equipment	2.113,00	1.299,00	2. Current reserves	14.500,00	-
				22.546,28	-
B. CURRENT ASSETS			II. Profit to be carried forward	15.532,31	15.825,63
Accounts receivables		7.000,00	1. Ideational Sector	14.603,59	14.603,59
			2. Other tax privileged special	1.889,76	2.047,21
Cash at bank	36.258,91	36,14	purpose activities		
			3. Asset management	336,74	472,61
			4. Other business activities	-1.297,78	-1.297,78
			III. Remaining profit current year	**293,32**	-11.819,39
			B. Accounts payable	-	4.328,90
	38.371,91	8.335,14		38.371,91	8.335,14

Annual Accounts 2012	**Ideational sector**	**Special purpose activities**	**Asset management**	**Other business activities**	**Total EUR**
PROFIT/LOSS	**-59.173,45**	**22.538,45**	**500,00**	**1.769,33**	**(LOSS) -34.365,67**
Release of current reserve	14.500,00	0,00	8.046,28	0,00	22.546,28
Exchange internal sectors	32.854,06	-22.538,45	-8.546,28	-1.769,33	0,00
Subtotal	-11.819,39	0,00	0,00	0,00	-11.819,39
Build-up of current reserve	0,00	0,00	0,00	0,00	0,00
Remaining PROFIT/LOSS according to tax regulations	**-11.819,39**	**0,00**	**0,00**	**0,00**	**TAX LOSS -11.819,39**

Appendix A2: Member list 2012

The following table shows all ESSL members as of 31 December 2012, 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

Institutional Supporting Member

INDF	*Dr. Bernold Feuerstein*	*GERMANY*
INDF	*Dr. Dario Giaiotti*	*ITALY*
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	Tomás Pucik	*CZECH REPUBLIC*
INDF	Patrick Marsh	*USA*
INDF	Marcus Beyer	*GERMANY*
INDF	Dr. Koji Sassa	*JAPAN*
INDS	Casper ter Kuile	*NETHERLANDS*
INDS	Stefan Meulemans	*SWITZERLAND*
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*
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	RMS, Risk Management Solutions	*UNITED KINGDOM*
INSS	NKSJ Risk Management	*JAPAN*

Tribute in memory of first ESSL Director Nikolai Dotzek at the Research and Training Centre in Wiener Neustadt