ANNUAL REPORT 2008

European Severe Storms Laboratory

ESSL e. V.
Münchner Str. 20
82234 Wessling

Tel.: +49-8153-28-1845
Fax: +49-8153-28-1841

nikolai.dotzek@essl.org

http://www.essl.org

Wessling, 5 October 2009

CONTENTS

1. INTRODUCTION

Severe thunderstorms inflict a total damage of 5 to 8 billion € all over Europe each year.

Even without any climate change impact, this annual amount of damage is far too high to be neglected. The European Severe Storms Laboratory, ESSL, tackles this problem by:

- Fundamental and applied research on severe convective storms in Europe;
- Operation of the European Severe Weather Database, ESWD;
- Organisation of the European Conferences on Severe Storms, ECSS.

The European Severe Storms Laboratory e. V. 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. Presently, the ESSL office is located at DLR-*Institut für Physik der Atmosphäre*.

ESSL recruited further part-time collaborators in 2008 and enhanced the ESWD database. The second half of 2008 saw the start of the organisation of the 5th European Conference on Severe Storms, ECSS, to be held from 12-16 October 2009.

The present Annual Report reviews ESSL's achievements in its second full business year.

Nikolai Dotzek, ESSL Director

The Annual Report was approved by the

- ESSL Advisory Council on 15 October 2009, and by the
- ESSL General Assembly on 15 October 2009.

2. SCIENTIFIC REPORT

2.1. SCIENCE

One major building block of ESSL's scientific activities is the application of its European Severe Weather Database (ESWD) to climatological studies of severe thunderstorms in Europe. Other potential applications of the ESWD lie in the verification of forecast and nowcast products, or warnings. The latter applications must be done in collaboration with national weather services or research organisations involved in forecasting or warning, as these are not within the scope of ESSL's activities. Verification studies of this kind, also in cooperation with the German weather service DWD have been described by Dotzek et al. (2009). Here, we highlight climatological results which had been unavailable before the establishment of the ESSL.

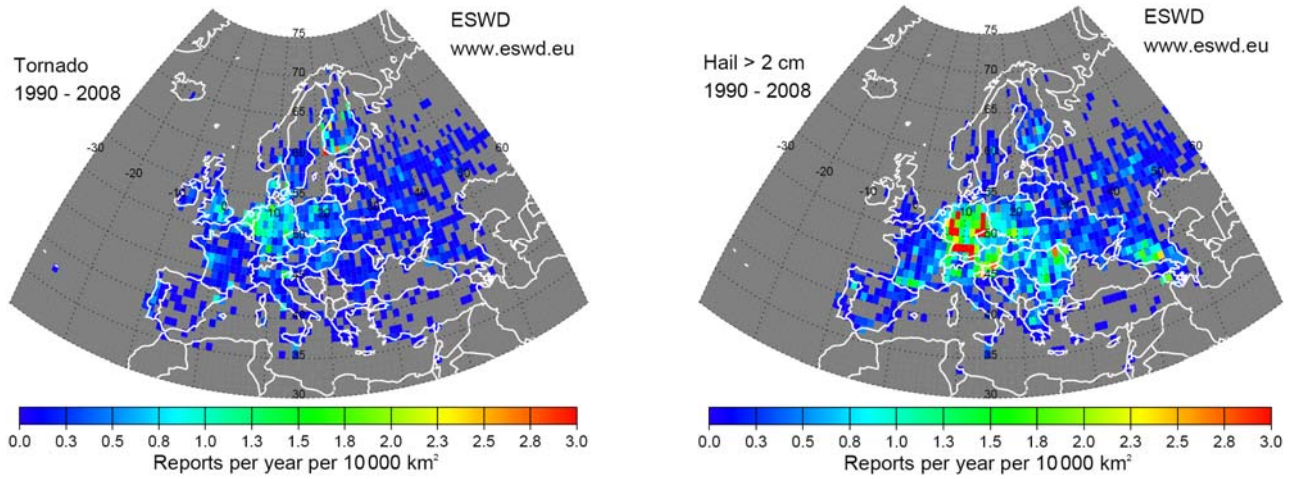

Figure 1: Shorter-term (1990-2008) climatologic maps of tornado (left) and hail (right) incidence in Europe as a primary metric of hazard are given in number of ESWD reports per year per 10,000 km^2 on a 1° x 1° latitude-longitude grid.

Fig. 1 shows an enhanced tornado hazard extending from the United Kingdom over the Benelux countries, Germany and Poland towards the Baltic States. For large hail of more than 2 cm diameter, still a regional maximum of the incidence in Germany is seen due to the long time series of dense reporting. But there is also an emergence of other "hot spots" close to mountain ranges, like the Pyrenees, Eastern Alps, Carpathian and Caucasus mountains. This needs further substantiation as the ESWD records grow. Presently, more than 4000 reports are added to the ESWD each year, with growing homogeneity all over Europe. So while the years before 2005 are still subject to an inhomogeneous reporting also reflected in Fig. 1, this should improve quickly in the future. Similar results follow for other main ESWD phenomena, see www.essl.org/research/.

In 2008, ESSL was involved in one proposal to the European Commission for research projects. The rules of EU-projects specify that the ESSL has to cover up to 25% of its total costs in the project from its own resources. This proposal was coordinated by the Finnish research centre VTT, and ESSL's role is development of the ESWD database to enable better assessment of extreme weather impact on European transport (EWENT, FP7 collaborative project). Fortunately, the EWENT proposal was invited for grant agreement negotiations in late 2008, and the project is expected to start in the fall of 2009.

In addition, other collaborative actions on a smaller scale continued to be successful as well. First of all, climatologic research results based on the ESWD data for Germany contribute to the BMBF-funded project RegioExAKT. A further collaboration within a small research and development project with German weather service DWD terminated in late 2008. This DWD-funded project enabled the development of a major upgrade of the ESWD-Software and in addition creation of software to read and apply ESWD reports in the verification of severe weather forecasts and warnings issued by DWD (see Sec. 3).

2.2. ECSS CONFERENCE AND HEINO TOOMING AWARD

The ESSL hosts (and has initiated) the web pages for the 5th European Conference on Severe Storms (ECSS) 2009, see www.essl.org/ECSS/2009/. The ESSL Director is the main organiser of this conference which will take place from 12-16 October 2009 in the *Stadtsäle Bernlochner* in Landshut, Germany. The ECSS expects about 150 participants from Europe, the USA and other countries. From 8-10 October 2009, the ESSL will be co-organiser of EUMETSAT Convection Working Group workshop. All members of the ESSL Executive Board contribute to the scientific programme committee (SPC) of the ECSS and so will help to assure the quality of the submitted conference presentations as well as of the proceedings prepared later on as refereed publications, likely again in the journal *Atmospheric Research*.

The Heino Tooming award to be presented for the second time at the ECSS 2009 commemorates this late Estonian tornado researcher (22 Oct 1930-18 Sept 2004) who had inspired so many younger scientists at the ECSS conferences in 2000 and 2002. The Tooming award is endowed with a prize of 300 €.

Eligible for the award is any outstanding scientific presentation at the ECSS conference by a group led by a European scientist and involving collaborators from at least one other European country, fostering in this way collaboration across this continent in the field of severe weather research.

2.3. PUBLICATIONS AND OUTREACH

The ESSL web site (www.essl.org) has been further developed and partly reorganised. In December 2008, the ECSS 2009 conference website www.essl.org/ECSS/2009/ was launched. Main emphasis of the web site in general is to present the ESSL and its progress and to raise awareness of the ESWD database with its public web interface www.essl.org/ESWD/. The new ESWD version 3 became operational in October 2008. Its public interface supports 10 languages (English, French, German, Italian, Dutch, Czech, Polish, Finnish, Slovenian, and Bulgarian).

Its three quality control (QC) levels (see Dotzek et al., 2009) are clearly indicated in the ESWD event list: If a report passed the plausibility check (QC0+), it is highlighted in the web-based output table by its corresponding colour in the background (red = tornado, yellow = severe wind gusts, green = large hail, blue = heavy rain, white = funnel cloud, pink = gust front vortex = gustnado, orange: dust devil). New incoming QC0 reports have a grey background. This colour code enhances the clarity of the table and helps the user in identifying specific types of events.

The information flyer and a poster addressing mainly potential new ESSL members or registered ESWD data users as well as tailored presentations for NMHS and private-sector users were further developed, updated and presented at various meetings, workshops and conferences.

In addition to the list of meetings in Sec. 2.3.1, ESSL members also attended the 3rd Extreme Weather Congress (26-28 March 2008) in Hamburg, Germany, with its special audience of scientists and weather services as well as the public and the media. Here, a talk about the ESSL was given at the special Skywarn Symposium. Several ESSL Executives and founding members had presentations at national and international meetings or forecaster training and public educational workshops. Based on an invited talk at the German Meteorological Society (DMG) workshop “Convective weather systems and their impact” (6 March 2008) in Leipzig, Germany, an article about the ESSL was published in “DMG Mitteilungen 03/2008”. The ESSL also contributed to the EMS Meteorological Calendar 2008. A number of manuscripts (submitted, in press or printed) for formal publications have been prepared (Sec. 2.3.2). Those which have appeared in print in 2009 by the time of finalising this Annual Report have been listed with their final citations.

In a joint project with Skywarn Germany, the verbal description of the TORRO and Fujita scale for Central Europe was supplemented by illustrative photos of typical damage to weak and strong buildings as well as vegetation. Building structure and vegetation characteristics were considered in the description developed by ESSL, Skywarn Germany and Munich Re in 2004, which so far has only been available in German. An illustrated English version is scheduled for presentation at the ECSS 2009.

Severe tornadic events like the windstorm “Emma” (1 March 2008), the F4-Hautmont tornado in France (3 August 2008) or the Poland tornado outbreak (15 August 2008) increased the awareness of severe weather in the public resulting in interviews with ESSL members published in various media.

On 21 November 2008, ESWD was elected one of "365 Landmarks in the Land of Ideas 2009", see http://www.land-of-ideas.org/. The Award will be presented to ESSL at the opening ceremony of the 5th ECSS in Landshut, Germany, on 12 October 2009.

2.3.1. PRESENTATIONS AND POSTERS

Dotzek, N., 2008: Adaptation of airport operations and reinsurance business to severe thunderstorm hazard in a changing climate - the RegioExAKT project. *8th Annual Meeting of the EMS / 7th ECAC*, Amsterdam, 2 October 2008.

Dotzek, N., 2008: Assessment of high-wind events from convectively driven downdrafts. *8th Annual Meeting of the EMS / 7th ECAC*, Amsterdam, 3 October 2008.

Dotzek, N., and C. Forster, 2008: Use of the European Severe Weather Database to verify satellite-based storm detection or nowcasting. Proc. *2008 EUMETSAT Meteorological Satellite Conference*, Darmstadt, 8-12 September 2008.

Feuerstein, B., 2008: Das European Severe Storms Laboratory e. V. (ESSL). *3rd Extremwetterkongress*, Hamburg, 26 March 2008.

Feuerstein, B., 2008: Tornados und Superzellen in Deutschland. *DMG Workshop: Konvektive Wettersysteme und deren Auswirkungen*, Leipzig, 6 March 2008.

Groenemeijer, P., N. Dotzek, Z. Liang, T. Kühne, 2008: Enhanced capabilities of the European Severe Weather Database ESWD to monitor extreme weather events. *8th Annual Meeting of the EMS / 7th ECAC*, Amsterdam, 1 October 2008.

2.3.2. REFERENCES

Doswell, C. A. III, H. E. Brooks, and N. Dotzek, 2009: On the implementation of the Enhanced Fujita scale in the USA. *Atmos. Res*., **93**, 554-563.

Dotzek, N., 2009: Derivation of physically motivated wind speed scales. *Atmos. Res*., **93**, 564-574.

Dotzek N., and B. Feuerstein, 2008: Das Europäische Unwetterlaboratorium (ESSL) und die europäische Unwetter-Datenbank (ESWD). *DMG Mitteilungen*, **3**, 2-4.

Dotzek, N., and K. Friedrich, 2009: Downburst-producing thunderstorms in southern Germany: Radar analysis and predictability. *Atmos. Res*., **93**, 457-473.

Dotzek, N., R. E. Peterson, B. Feuerstein, and M. Hubrig, 2008: Comments on "A simple model for simulating tornado damage in forests". *J. Appl. Meteor. Climatol.*, **47**(2), 726-731.

Dotzek, N., S. Emeis, C. Lefebvre, and J. Gerpott, 2008: Waterspouts over the North and Baltic Seas: Observations and climatology, predictability and reporting. Submitted to *Meteorol. Z.*

Dotzek, N., P. Groenemeijer, B. Feuerstein, and A. M. Holzer, 2009: Overview of ESSL's severe convective storms research using the European Severe Weather Database ESWD. *Atmos. Res*., **93**, 575-586.

IPCC (Eds.), 2007: *Climate Change 2007 – The Physical Science Basis*. Cambridge University Press, Cambridge, 996 pp.

Kaltenböck, R., G. Diendorfer, and N. Dotzek, 2009: Evaluation of thunderstorm indices from ECMWF analyses, lightning data and severe storm reports. *Atmos. Res*., **93**, 381-396.

Llasat, M.C., L. López, M. Barnolas, M. Llasat-Botija, 2008: Flash-floods in Catalonia: the social perception in a context of changing vulnerability. *Adv. Geosci*., Special Issue 9th EGU Plinius Conference on Mediterranean Storms (2007), Vol. **6**, 1-8.

Llasat, M.C., M. Llasat-Botija, M. Barnolas, L. López and V. Altava-Ortiz, 2009: An analysis of the evolution of hydrometeorological extremes in newspapers: the case of Catalonia, 1982-2006. *Natural Hazards Earth System Sciences*, **9**, 1201-1212

Llasat, M.C., A. Atencia, L. Garrote and L. Mediero, 2009. The hydrometeorological forecasting in the framework of the European project FLASH. *Houille Blanche*. In press

Palencia, C., A. Castro, D. Giaiotti, F. Stel, F. Vinet, R. Fraile, 2009: Hailpad-based research: A bibliometric review. *Atmos. Res*., **93**, 664-670.

Pucillo, A., D. B. Giaiotti, F. Stel, 2009: Ground wind convergence as source of deep convection initiation. *Atmos. Res*., **93**, 437-445.

Rauhala, J., and D. M. Schultz, 2009: Severe thunderstorm and tornado warnings in Europe. *Atmos. Res*., **93**, 369-380.

3. TECHNICAL REPORT

3.1. ESWD VERSION 3

In 2008, ESSL's work on the European Severe Weather Database (ESWD) has continued. At the beginning of the year, the development of Version 3 of the database was in progress. This encompassed a redesign of the ESWD database to make it compatible with established professional database packages such as Oracle and MySQL. New features of the database are

1. The configuration of customised user accounts, with likewise customized privileges.
2. The option of transferring data to or from the database in a csv-based data format. In particular, an operational synchronisation procedure of the German data subset has been established between the German Weather Service's (DWD) operational database system and the ESWD.
3. The possibility of making more detailed queries through the web interface.
4. The option of requesting the data to be plotted on zoomed maps of different regions within Europe.

The completion of ESWD Version 3 and the launch of operational data-exchange with DWD took place at DWD in Offenbach, Germany on 21 November 2008.

3.2. ESWD CSV DATA FORMAT

The csv-based V1.40 data format (csv = comma separated values) that is now operationally used for data exchange with the DWD has been published in ESSL Technical Report 2009-1. The original ESWD V1.40 data format description was given in ESSL Technical Report 2006-1. Both reports are available from the ESSL website under “Publications”.

3.3. ESWD QUALITY-CONTROL

The possibility of configuring customised ESWD accounts has enabled an easier and more secure cooperation with partner organisations, as well as simplifying quality-control. We were able to provide accounts to national meteorological and hydrological services (NMHS) and other organisations with appropriate privileges. Severe weather reports can now be given four quality levels: QC0, QC0+, QC1, and QC2, depending on the extent to which they can be verified. As a standard, NMHS's have the unique privilege (shared only with the ESWD management at ESSL) to give the 'fully verified' or QC2 status to severe weather reports occurring in their country. Details of the quality-control procedure were outlined by Dotzek et al. (2009).

3.4. NEW PARTNERS AND USERS

The previous ESWD partners DWD and ZAMG (Austria) now have direct access to the ESWD database through near-real-time synchronisation or through the web-interface respectively. The new NMHS partners were welcomed in 2008 are FMI (Finland) and NIMH (Bulgaria), both of which access the database through a web account. Noteworthy is

the fact that FMI, upon becoming a partner, has entered a large quantity of high-quality reports from their own severe weather database, so that Finland now has the highest coverage of fully verified severe weather reports, second only to Germany.

Besides NMHS, we were able to welcome a number of other organisations as collaboration partners. These are Skywarn CzechoSlovak, Keraunos (France) and Skywarn Slovenia.

In 2008, additionally a number of academic and commercial users have registered, so that there were 3 commercial and 2 academic users as of January 2009.

3.5. ECSS CONFERENCE WEBSITES

The ESSL has provided the web space and resources on its server for the websites of the 5th ECSS conference that will take place in Landshut, Germany from 12-16 October 2009 (www.essl.org/ECSS/2009/). These allow attendants to register for the conference, obtain information about the conference, and submit their abstracts.

3.6. ESWD DATA VOLUME 1950-2008 AND 2008 ALONE

Fig. 2 demonstrates the growth in the ESWD data volume since the last Annual Report. When including the reports prior to 1950, the total number of ESWD reports until the end of 2008 is n = 21326.

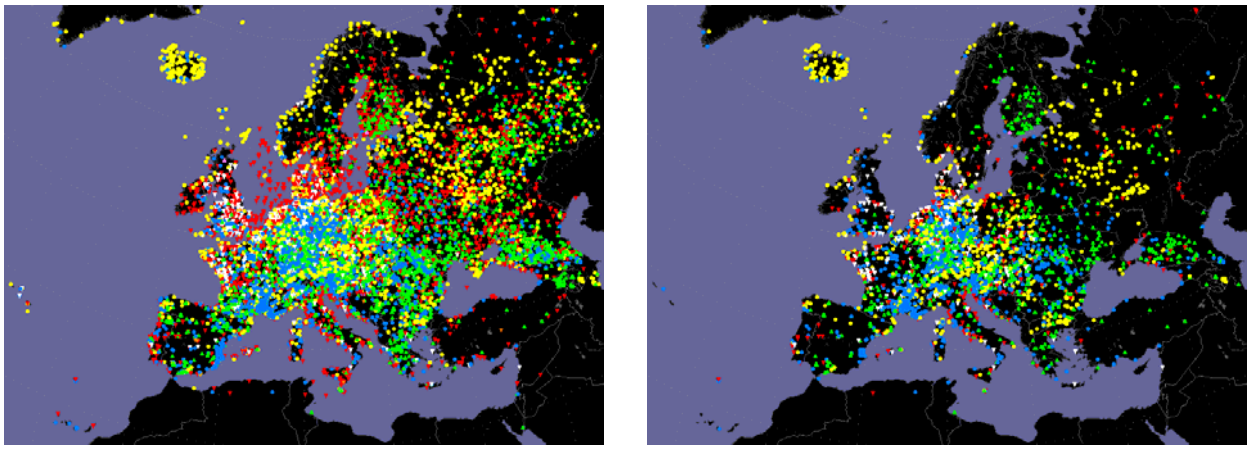

Figure 2: All ESWD reports from 1 January 1950 to 31 December 2008 (*n = 18707*, **left**) and for the year 2008 (*n = 4423*, **right**). Red: tornadoes, yellow: straight-line winds >25 m/s, green: hail >2 cm, blue: heavy precipitation / flash flooding, white: funnel clouds, pink and orange: lesser whirlwinds (gustnadoes and dust devils, respectively). Database enquiry: 17 February 2009.

4. FINANCIAL AND ADMINISTRATIVE REPORT

The goal of the financial management in 2008 was to ensure a stable development, to secure the non-profit-status of the ESSL, and before all, to provide the necessary funds for the three statutory purposes of the ESSL:

- Advance meteorology and related sciences in the field of research on severe convective storms and extreme weather events on a European level;
- Operate and extend the European Severe Weather Database (ESWD);
- Support or organise the European Conferences on Severe Storms (ECSS).

4.1. OVERVIEW

2008 was dominated by finally determining the accounting structures, and by the first need for payroll accounting, which resulted in increasing paperwork and work with online authority forms of the German social insurance institutions.

In 2008 the ESSL has been employer for one so-called "*Übungsleiter*" and one so-called "*Mini-Jobber*". These are both forms of minor employment according to the German law.

According to the three main statutory purposes of ESSL, the accounting and controlling and planning have been carried out on the basis of cost centres. As required by the tax authorities, these distinguish also 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*). Thus, the cost centres comprise:

- Cost centre 0: Ideational field of activity;
- Cost centre 1: ESSL fundamental and applied research;
- Cost centre 2: ESWD data and research;
- Cost centre 3: ECSS conferences.

4.2. FINANCIAL STATUS 2008

The second full accounting year was dominated by further establishing administrative structures and the further build-up of a thorough accounting, conforming to the law and tax regulations and allowing efficient controlling by the Treasurer. The cash-based accounting for 2008 can be found in the "Statement of revenues and expenditures" below. Both, most of the income (EUR 25,918.34) and most of the costs (EUR 15,422.63), were generated within cost centre 2, ESWD activities.

The figures show a double to threefold monetary flow compared to the previous year 2007.

ESSL e.V.

Statement of revenues and expenditures 2008

Cash at bank on 1 January 2008		**6.799,61 €**

A. Ideational field of activity

Cost center 0a		
Income		**8.325,55 €**
	Membership fees	8.205,00 €
	Compensation for travelling	120,55 €
Expenditure		**4.807,74 €**
	PR costs	438,97 €
	Travel costs	2.614,79 €
	Taxes, legal advice	634,28 €
	Office expenses	500,20 €
	Ancillary wage costs	602,00 €
Balance ideational field		**3.517,81 €**

B. Asset management

Cost center 0b		
Income		**117,79 €**
	Interest and capital yield	78,83 €
	VAT	38,96 €
	Advance turnover tax return	
Expenditure		**- €**
	Input VAT	
	Advance turnover tax return	
Balance Asset management		**117,79 €**

C. Zweckbetriebe (business branches pursuing the purpose of the association)

Cost center 1 - ESSL research		
Income		
Expenditure		
Balance ESSL research		**- €**
Cost center 2 - ESWD data and research		
Income		**17.475,00 €**
	Data use and software development	8.025,00 €
	Research	9.450,00 €
Expenditure		**10.564,95 €**
	Third party services, data protection	4.879,00 €
	Travel costs	360,95 €
	Salaries and wages	5.325,00 €
Balance ESWD data and research		**6.910,05 €**
Cost center 3 - ECSS conferences		
Income		**- €**
Expenditure		**49,94 €**
	Third party services	49,94 €
Balance ECSS conference		**- 49,94 €**
Income total		**25.918,34 €**
Expenditure total		**15.422,63 €**
Balance total		**10.495,71 €**
Cash at bank on 31 December 2008		**17.295,32 €**

In summary, the financial figures for 2008 show a further stable upward trend. The annual result is a positive EUR 10,495.71 based on cash and EUR 10,744.16 based on the fiscal regard.

The financial planning for 2009 gives us confidence that ESSL will be able to securely bear the costs for participation in proposed scientific projects as well as for support of the ECSS conference 2009 in Landshut, Germany.

4.3. ADMINISTRATIVE REPORT

As anticipated, following the ESSL founding process, many administrative documents had to be drafted and completed in 2008, in order to build up the necessary tools for business operations. This reached from simple documents like updated membership application forms to more advanced ones, like the rules of procedure for the Executive Board and cooperation agreements for users and NMHS partners. The process of finalising some documents, like a general ESWD user agreement, will extend well into 2009.

The regular ECSS General Assembly took place together with an Advisory Council meeting during the 8th EMS Annual Meeting, Amsterdam, The Netherlands, on 2 October 2008. The main topics were the report by the Executive Board, election of additional Advisory Council members and the resolution on new membership fees.

In 2008, the management activities of the Director and the Treasurer mainly comprised:

- Management of bank accounts;
- Fiscal reports, social security system handling and tax handling;
- Accounting and costing management;
- Financial staff administration;
- Continuous and long-term budgeting;
- Management of the member-, staff- and cooperation partner-database.

Three Individual Full Members, one Institutional Full Member and one Institutional Supporting Member joined ESSL in 2008. So in total at the end of the year, the ESSL had

- 18 Individual Full Members,
- 2 Institutional Full Members,
- 2 Institutional Supporting Members.

The complete member list is shown in the Appendix.

4.4. EXECUTIVE BOARD AND ADVISORY COUNCIL

The Executive Board and the Advisory Council are two of the three bodies forming the ESSL. Fig. 3 outlines these and their responsibilities.

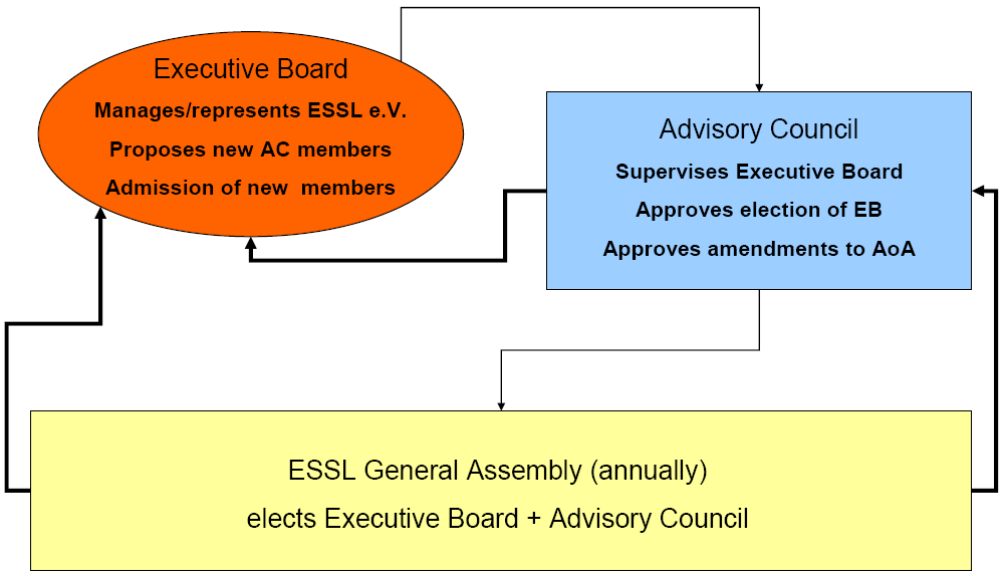

Figure 3: Bodies of the ESSL. The Advisory Council in final form will consist of nine members from three groups (three members each): (1) Science, (2) NMHS / EUMETNET, (3) other ESSL user groups.

4.4.1. EXECUTIVE BOARD

The Executive Board members listed below were introduced in greater detail in the Annual Report 2007. Their current period of office will terminate by the end of 2010, with Executive Board elections at the 2010 General Assembly.

Dr. Nikolai Dotzek, Director.

Dr. Bernold Feuerstein, deputy Director.

M.Sc. Pieter Groenemeijer, Technical Director.

Mr. Alois M. Holzer, Treasurer.

4.4.2. ADVISORY COUNCIL

After the 2008 General Assembly, six ESSL Advisory Council members (of a maximum of 9) were in office in the Science and NMHS groups. The Advisory Council members are now introduced:

Science group

Dr. Vincenzo Levizzani (CNR, Italy): He is Director of Research at the Istituto di Scienze dell'Atmosfera e del Clima (ISAC) of CNR in Bologna. His research interests encompass Satellite multi-spectral studies of cloud top structure, Cloud physics studies of severe storms using radar and satellite techniques, Satellite rainfall estimations using combined VIS/IR and MW techniques, and Development of mesoscale analysis techniques including remote sensing data.

Prof. Dr. Daniel Rosenfeld (HUJI, Israel): His broad range of interests at the Hebrew University of Jerusalem covers cloud and rain physics and also satellite-based microphysical research. A special focus of his scientific achievements is on the short-term predictability of severe thunderstorms from satellite observations of cloud-top structures and microphysics.

Prof. Dr. Robert Sausen (DLR, Germany): He is head of the department "*Dynamik der Atmosphäre*" of the DLR-*Institut für Physik der Atmosphäre* in Oberpfaffenhofen, Germany. Since 1992 he is a member of the Fakultät für Physik of the Ludwig-Maximilians-Universität München, where he teaches meteorology with a focus on human impacts on climate, since 2000 as a professor.

The Advisory Council elected Robert Sausen as its Chair.

NMHS / EUMETNET group

Prof. Dr. David M. Schultz (FMI, Finland): His research interests include the Interaction between meteorological research and operational forecasting, Synoptic and mesoscale meteorological phenomena such as extratropical cyclones, fronts, banded precipitation, and instabilities, Convective morphology, Dual-polarimetric radar and precipitation processes, as well as Mesoscale observing networks.

Dr. Michael Staudinger (ZAMG, Austria): He heads the regional ZAMG office for Salzburg and Upper Austria. Since 1997 he is also responsible for the high altitude research observatory Sonnblick in the Austrian Alps. Since 2002 he managed the international EU – Alpine Space Interreg project METEORISK and since 2006 he is responsible for METEOALARM as a Program Manager in the framework of EUMETNET.

Dr. Gerhard Steinhorst (DWD, Germany): He is a member of DWD's Executive Board and heads the weather forecasting branch of DWD. His participation in bodies of international organisations comprises WMO with a focus on RA VI and CBS (Commission for Basic Systems) as well as EUMETSAT (Policy Advisory Committee).

A. APPENDIX

A.1 MEMBER LIST 2008

The following table shows all ESSL members as of 31 December 2008. The 10 founding member names are printed in italics.

	Member name	CC	Type	Status
1	*Nikolai Dotzek*	DE	Individual	Full
2	*Bernold Feuerstein*	DE	Individual	Full
3	Volker Gärtner	DE	Individual	Full
4	*Dario Giaiotti*	IT	Individual	Full
5	*Pieter Groenemeijer*	NL	Individual	Full
6	*Alois M. Holzer*	AT	Individual	Full
7	Marianne König	DE	Individual	Full
8	Thomas Krennert	AT	Individual	Full
9	Thilo Kühne	DE	Individual	Full
10	Zhongjian Liang	CN	Individual	Full
11	*Maria-Carmen Llasat*	ES	Individual	Full
12	Lionel Peyraud	CH	Individual	Full
13	Georg Pistotnik	AT	Individual	Full
14	*Jenni Rauhala*	FI	Individual	Full
15	*Romualdo Romero*	ES	Individual	Full
16	*Martin Setvák*	CZ	Individual	Full
17	*Fulvio Stel*	IT	Individual	Full
18	Helge Tuschy	DE	Individual	Full
19	Deutscher Wetterdienst	DE	Institutional	Full
20	EUMETSAT	EU	Institutional	Full
21	Münchener Rückversicherungs-Gesellschaft AG	DE	Institutional	Supporting
22	Tokio Marine Technologies LLC	US	Institutional	Supporting