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Dear Reader,

We are pleased to present you with our latest Newsletter. In this edition, we cover recent PERILS data developments, the use of PERILS in risk transfer products, the inclusion of Australia in the PERILS Industry Exposure & Loss Database, and more.

Although the European winter 2016/2017 saw a below average number of named depressions, PERILS still investigated seven events for their potential to exceed our loss capturing threshold of a EUR 200m market loss. Three in fact did, but none of the events look likely to exceed EUR 300m. Likewise, our data collection for the earthquakes in 2016 in Central Italy showed moderate industry losses, despite their massive overall economic impact. The situation is quite different for Tropical Cyclone Debbie in Australia, where Cat insurance penetration is high and the majority of losses are covered by insurance.

To increase the value of PERILS Industry Loss data, we update the sums insured exposed to natural perils on an annual basis. This means that losses can accurately be compared against exposures, which is required for impact comparison and damageability assessment. This year's update of the PERILS Industry Exposure Database was

released on 1 April 2017 and, as in previous years, is based on TSI data collected anew from data-providing insurance companies.

A major recent highlight was the inclusion of Australia in the PERILS Industry Exposure & Loss Database. The fact that the majority of the Australian market has agreed to provide us with their data proves that the PERILS value proposition is robust and globally applicable. It also encourages us to cover even more markets in the future, and our work with CatIQ of Canada and Nanyang Technological University of Singapore shows our continued commitment to expanding our global reach.

But let me stress that PERILS would not exist without the support of our data-providing insurance companies and our subscribers. We are, as ever, grateful to our partners and strive to provide value in return for their efforts. **PERILS is for the industry, by the industry.**

Best regards,

Luzi Hitz
CEO PERILS AG

Figures & Facts

>65	PERILS overall market coverage as measured in % of property premium
16	number of countries covered: AUS, AUT, BEL, CAN (loss data only), CHE, DEU, DNK, FRA, GBR, IRL, ITA, LUX, NLD, NOR, SWE, TUR
6	number of perils covered: bushfire, earthquake, extratropical and tropical cyclone, flood, hail
8	number of industry exposure databases released since 1 Apr 2010
32	number of captured events in the PERILS loss database
214	number of event gust footprints in the PERILS-UKMO European winter storm catalogue (more about this in our next Newsletter)
218	number of PERILS-based transactions placed since 1 Jan 2010
29	number of PERILS-based transactions at risk per 31 Mar 2017
USD 14.2bn	total of PERILS-based capacity placed since 1 Jan 2010
USD 3.3bn	total of PERILS-based capacity at risk per 31 Mar 2017

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Cat Events

This section provides an overview of the events captured by PERILS since August 2016. These include: three European extratropical cyclones which occurred during the winter 2016/2017; two earthquake events in Central Italy from 2016; and tropical cyclone “Debbie” which made landfall in eastern Australia on 28 March 2017.

Between August 2016 and May 2017, PERILS collected loss data from insurance companies for a total of six Cat events: European

winter storms Egon, Thomas and Zeus; two earthquakes in Central Italy and Tropical Cyclone Debbie in Australia (see Figure 1).

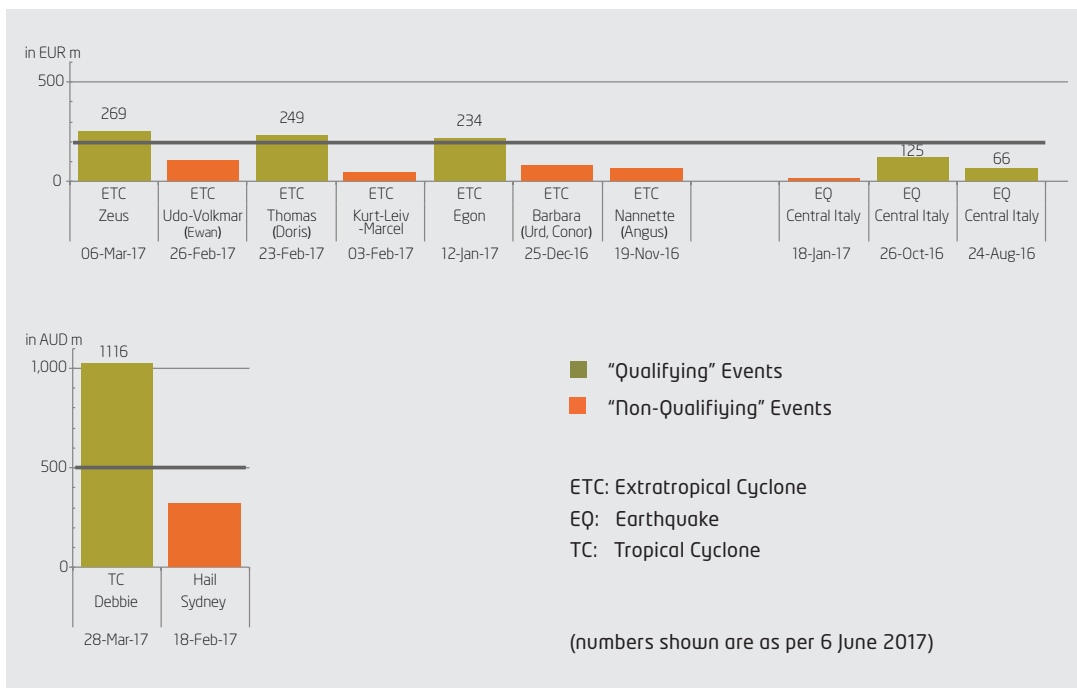


Figure 1: PERILS industry event loss estimates since August 2016. There were three European extratropical cyclones which exceeded the PERILS reporting threshold of EUR 200m and one tropical cyclone in Australia which exceeded the AUD 500m threshold. All other events investigated and included in the chart were “non-qualifying” meaning they remained below the respective loss reporting triggers. The earthquakes in Italy form an exception to this approach because of their very significant economic impact.

European extratropical cyclones

The European winter season 2016/2017 was generally dry and mild, with December and February being warmer than normal. In terms of the North Atlantic Oscillation (NAO) Index – a measure for the pressure gradient

between polar and subtropical regions and therefore the strength of the jet stream – the winter was slightly above the 2007-2017 ten year-average. However, measured based on the number of named depression systems, the 2016/2017 season saw a below average frequency of low-pressure systems (see Figure 2).

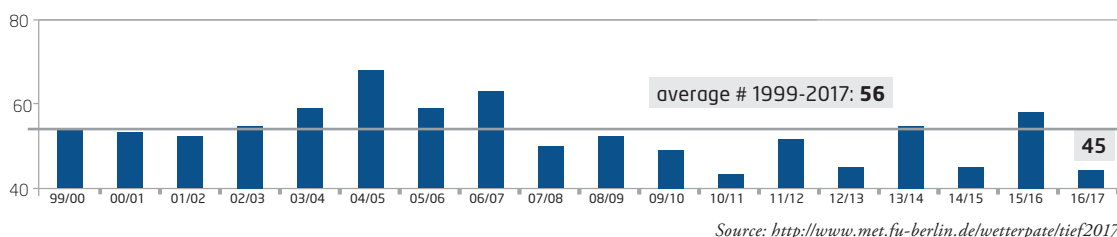


Figure 2: Number of named depressions given by the Freie-Universität Berlin: With 45 named depressions the period 1 Nov 2016 to 28 Feb 2017 showed slightly below average extratropical cyclone activity.

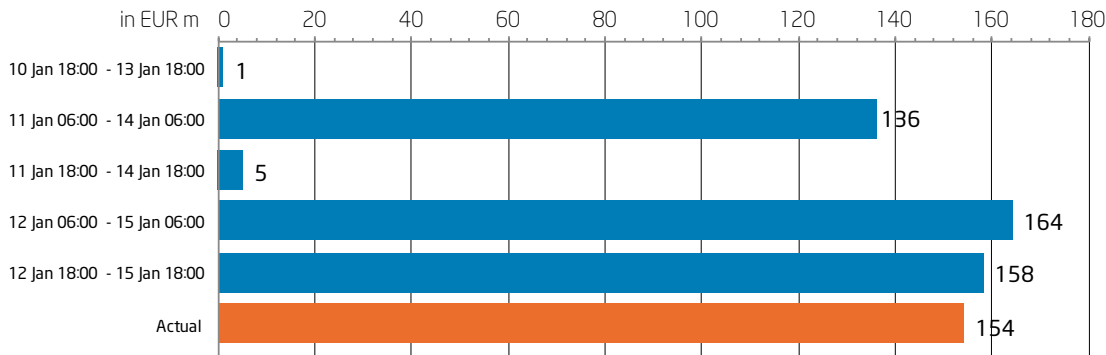


Figure 3: Development over time of industry loss forecasts in France for Windstorm Egon (12 Jan 2017). The blue bars show successive Wind-Jeannie loss forecasts over time. The orange bar shows the actual loss based on actual loss data collected by PERILS from insurance companies.

Of the 45 named depressions, PERILS investigated seven systems which generated strong winds. Three of these caused a market-wide insured property loss of more than EUR 200m: Egon, Thomas (Doris) and Zeus.

All three events were forecasted by the PERILS loss-forecasting tool “Wind-Jeannie” (WJ – www.wind-jeannie.org). WJ makes available insured property market loss forecasts for windstorm events across Europe for the forthcoming 72-hour period. The expected insured loss estimates are computed using gust forecast data provided by the German Weather Service (DWD). The loss forecasts are updated twice a day, at 06:00 and 18:00 CET.

Figure 3 shows the losses forecast by WJ for windstorm Egon in France, starting 48 hours before the event actually occurred. The two forecasts immediately preceding the actual event compare favourably to the actual loss of Egon in France of EUR 154m. Earlier loss forecasts did, however, vary significantly, mainly due to strong variations in gust-speed forecasts.

Earthquakes in Italy

In August and October 2016, a number of earthquakes affected the regions of Marche and Umbria in Central Italy, an area known for high seismicity. The last significant earthquake in this region occurred in April 2009

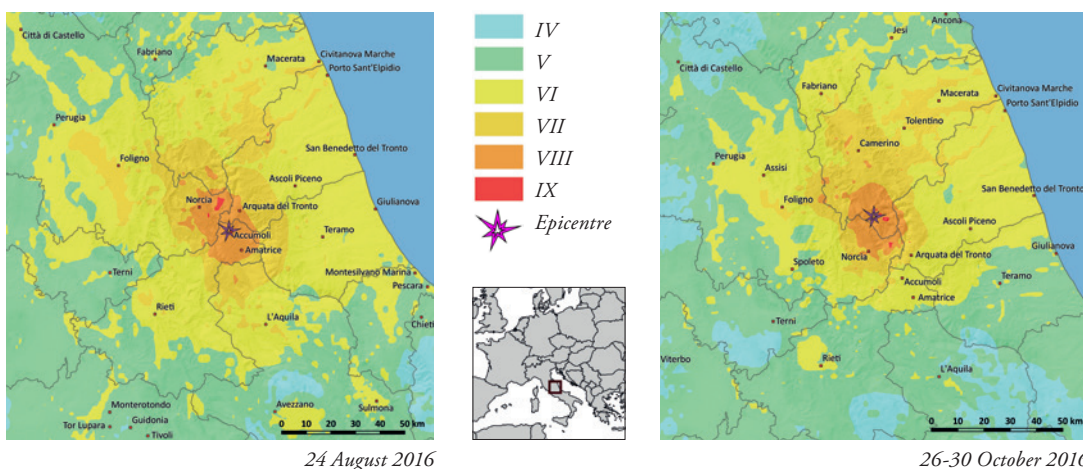


Figure 4: Modified Mercalli Intensities of the two main earthquakes which affected Central Italy in 2016. All of the events hit similar areas in the regions of Marche and Umbria. Based on PERILS’ second loss estimates, the combined impact of the earthquakes caused a market-wide insured property loss of EUR 191m (24 Aug: EUR 66m, 26-30 Oct: EUR 125m, per 6 June 2017).

and severely affected the town of Aquila which is situated only some 70 km to the south of the 2016 events (see Figure 4).

The main event in August occurred on the 24th and had a moment magnitude of Mw 6.0, according to the Italian National Geophysical Institute. It caused a market-wide insured loss of EUR 66m. Only two months later, between 26 and 30 October 2016, a further series of three major earthquakes with moment magnitudes of Mw 5.4, 5.9, and 6.5 caused a market loss currently estimated at EUR 125m. These amounts pale in comparison to the economic damage which is estimated at several billion Euros, highlighting the low insurance penetration for natural perils, particularly in rural areas of Italy.

Tropical cyclone Debbie in Australia

The situation in Italy is in marked contrast to Australia, where insurance penetration for natural perils is very high and where, according to PERILS' first loss estimate, Tropical Cyclone "Debbie" caused a market loss of AUD 1,116m.

Debbie made landfall in the Whitsunday Region of Queensland on 28 March 2017 and caused significant wind and flood damage across Southeast Queensland and Northeast New South Wales. The maximum gust speed during Tropical Cyclone Debbie was recorded on Hamilton Island at 263 km/h (see Figure 5). Storm surge was moderate, mainly due to the fact that landfall occurred between low and high tide. Rainfall was, however, exceptional (e.g. 643 mm within 24 hours in Clarke Range, west of Mackay) and led to surface water and river flooding which affected many communities in Southeast Queensland and Northeast New South Wales.

PERILS' first loss estimate for Debbie of AUD 1,116m will be updated on 28 June 2017, three months after the event start date. The third and subsequent loss reports will provide loss figures per 4-digit postcodes (high-resolution CRESTA Zones). Loss numbers will be split into private and commercial property lines.

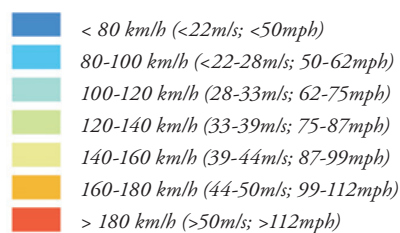
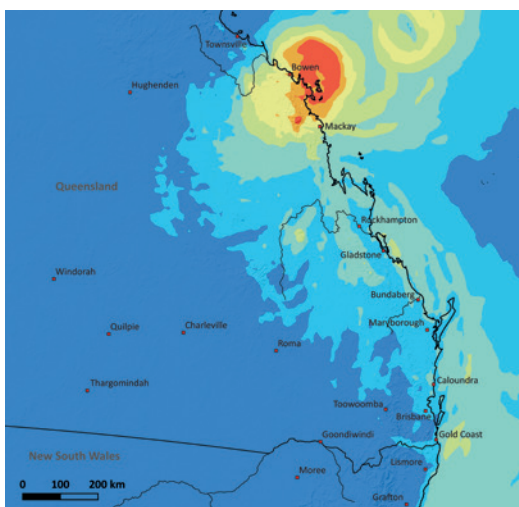
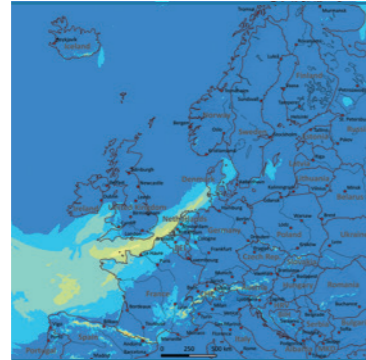
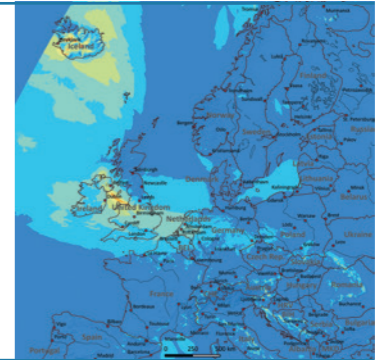


Figure 5: Tropical Cyclone "Debbie", maximum gusts. Debbie made landfall on 28 March 2017 near Airlie Beach in the Whitsunday Region of Queensland. It caused significant wind and water damage across Southeast Queensland and Northeast New South Wales. PERILS' initial property market loss estimate is AUD 1,116m.

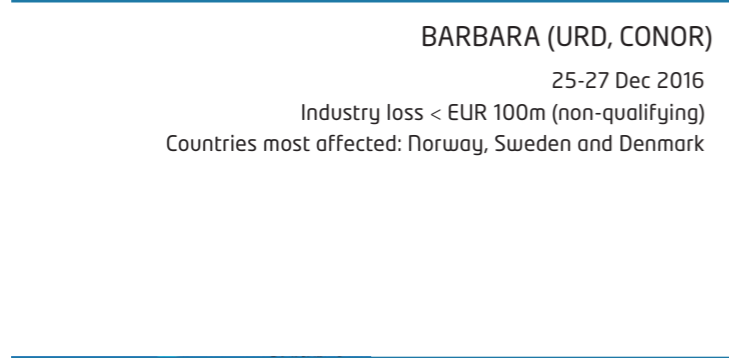
2016/2017 Europe Windstorm Season



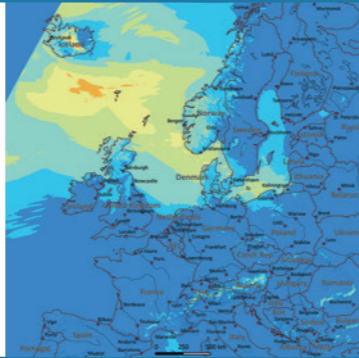
NANNETTE (ANGUS)
19-20 Nov 2016
Industry loss < EUR 100m (non-qualifying)
Countries most affected: France, Belgium, Germany and the Netherlands



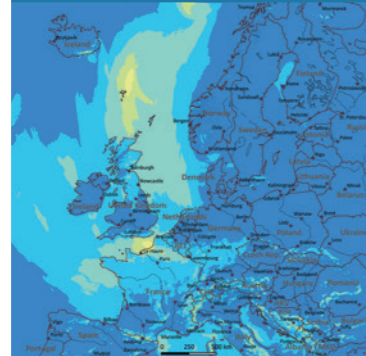
THOMAS (DORIS)
23-24 Feb 2017
Industry loss = EUR 249m (as at 23 May 2017)
Countries most affected: British Isles, the Netherlands, Belgium and Germany



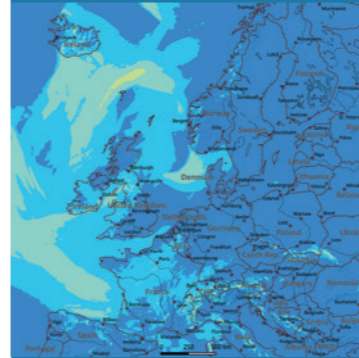
BARBARA (URD, CONOR)
25-27 Dec 2016
Industry loss < EUR 100m (non-qualifying)
Countries most affected: Norway, Sweden and Denmark



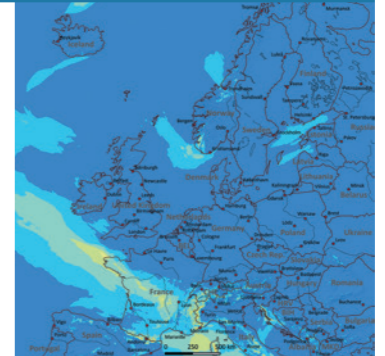
UDO-VOLKMAR (EWAN)
26-28 Feb 2017
Industry loss < EUR 200m (non-qualifying)
Countries most affected: France and Switzerland



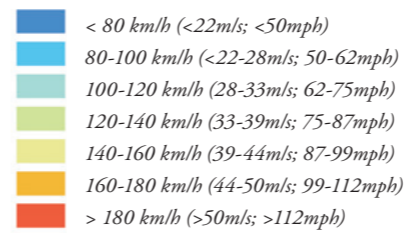
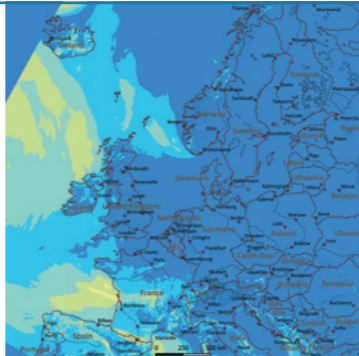
EGON
12-13 Jan 2017
Industry loss = EUR 234m (as at 12 April 2017)
Countries most affected: France and Germany



ZEUS
6-7 Mar 2017
Industry loss = EUR 269m (as at 6 June 2017)
Country most affected: France



KURT-LEIV-MARCEL
3-6 Feb 2017
Industry loss < EUR 100m (non-qualifying)
Country most affected: France



Maximum gust speeds in km/h
Source: ICON-EU, DWD

Business Update

Release of PERILS Industry Exposure Database 2017. Use of PERILS data in risk transfer products. Strategic alliance with CatIQ in Canada.

Release of the PERILS Industry Exposure Database for 2017

On 1 April 2017, PERILS released its Industry Exposure Database (IED) for 2017. It contains updated market-wide property sums insured exposed to:

Australia

- Bushfire
- Earthquake
- Extratropical Cyclone
- Flood
- Hailstorm
- Tropical Cyclone

Austria, Belgium, Denmark, France, Germany, Ireland, Luxembourg, Netherlands, Norway, Sweden, Switzerland

- Extratropical Cyclone

Italy, Turkey

- Earthquake
- Flood

UK

- Extratropical Cyclone
- Flood

The in-force date of the sums insured is 1 January 2017. The IED consists of more than 200,000 individual data entries defining the natural perils exposed sums insured per peril, CRESTA zone, property line of business (residential, commercial, industrial, agricultural) and coverage type (building, content, business interruption). Information about prevailing deductibles and limits has also been updated.

The 2017 IED was once again produced from scratch, based on insurance data freshly collected from insurance companies repre-

senting more than 65% of the market in the covered territories, and spanning more than one hundred national insurance companies. This ensures that the database contains the latest data available. In addition, and as in previous years, the latest IED benefited from a slightly higher market coverage compared to the 2016 release.

The exposure data are useful for a number of applications, including TSI market share analysis and the validation of other commercially available IEDs. In addition, the combination of the PERILS exposure data with the PERILS event loss data – both of which are based on identical sources and methodologies – enables users to validate vulnerability functions and to calibrate event losses produced by models. For insurance risk transactions based on industry losses, the database enables users to create custom-made triggers which help reduce basis risk for protection buyers. PERILS exposure data are also being used to carry out risk assessments of such transactions, thereby ensuring consistency with the trigger definition.

Stable use of PERILS data in industry-loss-based risk transfer

At 31 March 2017, there were USD 3.3bn of PERILS-based limits at risk, of which more than 90% were based on structured triggers with a weighted index, and more than 80% were used for retrocessional purposes. Out of the total capacity at risk, 75% was in the form of Cat bonds (144A ILS) with the remaining 25% in the form of private transactions (Figure 6). Compared to the end of March 2016, this means an increase in limits

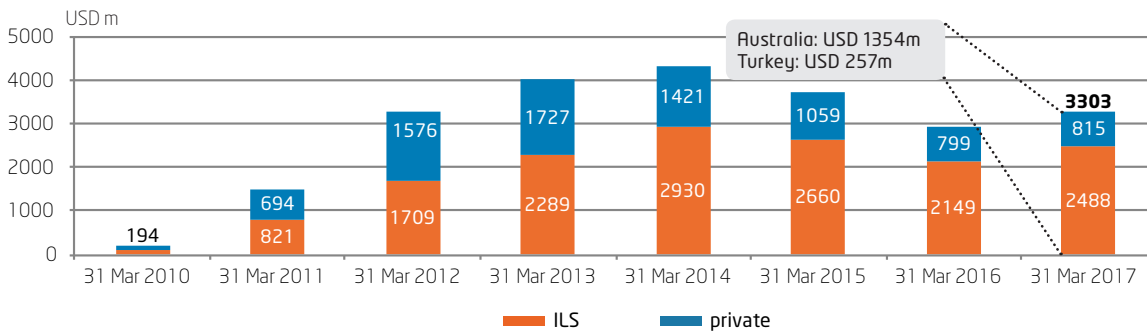


Figure 6: PERILS-based limits at risk 2010 to 2017 (per end March). As at 31 March 2017, a total of USD 3.3bn of PERILS-based limits were at risk. Of this, USD 2.5bn (75%) related to 144A ILS and USD 0.8bn (25%) to private transactions. The cumulated total of limits issued since 1 Jan 2010 was more than USD 14bn.

of 12%. Included in the USD 3.3bn at risk are limits exposed to European Windstorm (USD 3,273m), Australian Natural Perils (USD 1,354m), and Turkish Earthquake (USD 257m).

Strategic alliance with CatIQ of Canada

To facilitate the use of industry loss data for Canadian Cat risk transfer, earlier this year PERILS entered a strategic alliance with Toronto-based Catastrophe Indices & Quantification Inc. (CatIQ). As a result, PERILS is now able to provide industry loss data for Canada via the PERILS Industry Loss Index Service.

The industry loss data provided by PERILS are compiled by CatIQ. Similar to PERILS, CatIQ collects event loss data on catastrophic events from affected insurers and produces an independent industry loss estimate. It is guided by a ten-member advisory board which includes senior representatives from

three major Canadian primary insurers and one global reinsurer on a rotation basis, as well as permanent representatives from: Aon Benfield, Guy Carpenter, JLT Re, the Insurance Bureau of Canada (IBC), the Institute for Catastrophic Loss Reduction (ICLR) and Canada's federal agency, Environment and Climate Change Canada.

PERILS makes available industry loss data for any natural catastrophe event causing a market loss in Canada of CAD 300m or above (earthquakes, floods, various types of storms, wildfires and volcanic eruptions). The loss data are made available by Canadian province and by Private Property, Commercial Property and Motor Hull (Auto). Loss reporting for qualifying Canadian events follows the standard PERILS reporting schedule, with the first loss report being made available 6 weeks after the event, followed by a minimum of three updates 3, 6 and 12 months after the event.



Australia

In September 2016, PERILS extended its market coverage to include Australia and now provides market-wide property sums insured and event loss data for bushfire, earthquake, flood, hail, and tropical and extratropical cyclone in the country.

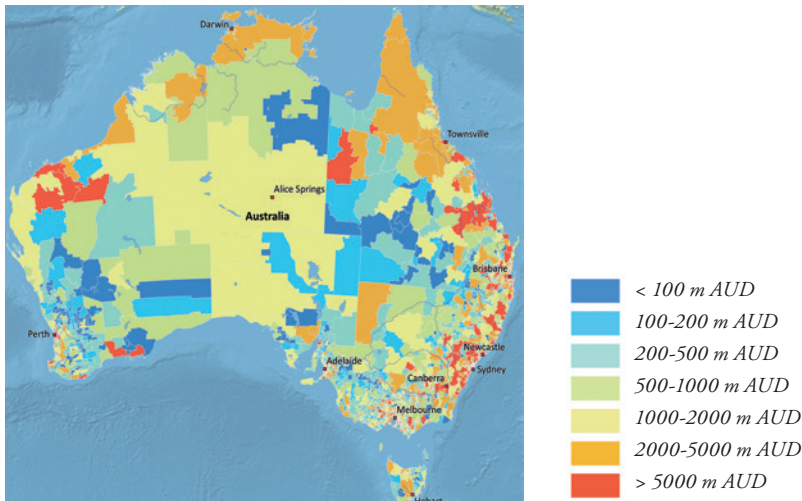


Figure 7: PERILS Industry Exposure Data 2017 for tropical cyclone Australia. The map shows market-wide tropical cyclone property sums insured down to 4-digit post code level (high-resolution CRESTA) for 2,646 zones. The in-force date of the exposure is 1 January 2017.

In September 2016, PERILS announced the extension of its database to include Australia. This was quite an achievement, with PERILS actively engaging with Australian insurers to demonstrate the value of establishing such a database. It has been especially pleasing to see that, due to a large percentage of the primary insurance market recognising the benefits of high quality industry data, market penetration in the region was significantly above two thirds. The take-up and subsequent usage of the PERILS market data in the risk transfer market demonstrate the strong value proposition and high acceptance of PERILS market data.

The database provides detailed exposure data down to a 4-digit post code level (high resolution CRESTA Zones) for each of the six perils covered being bushfire, earthquake, flood, hail, and tropical and extratropical cyclone (see Figure 7 and Table 1 for the example of tropical cyclone).

In addition to exposure data, the database will also include event loss data for Cat events with a property market loss in excess of AUD 500m – Cyclone Debbie is the first event to be covered by the database. As with all other territories covered by PERILS, the

Aggregate Exposure Data - Tropical Cyclone Australia - in National Currency High-Resolution CRESTA Format											
Agricultural and Industrial are included under COMMERCIAL						Total Sum Insured per Coverage			Insurance Conditions		
Peril	Country	CRESTA ID	CRESTA Description	Property LOB	Currency	Number of Risks	Buildings Value	Contents Value	BI Value	Loss Limits	Deductibles
TCXX	AUS	AUS_0800	Darwin	COMMERCIAL	AUD	2'183	3'363'281'376	1'701'494'516	1'191'839'127	6'069'013'094	6'342'574
TCXX	AUS	AUS_0800	Darwin	RESIDENTIAL	AUD	5'882	279'553'821	160'049'386	7'337'714	425'455'373	2'856'170
TCXX	AUS	AUS_0810	Darwin	COMMERCIAL	AUD	2'015	1'294'522'869	585'375'340	430'513'066	2'086'213'283	3'333'509
TCXX	AUS	AUS_0810	Darwin	RESIDENTIAL	AUD	23'560	5'466'973'589	1'103'155'448	66'719'698	6'206'099'341	15'564'173
...

Table 1: Extract from the PERILS Industry Exposure Database for Tropical Cyclone Australia. The database includes market-wide numbers of risks, sums insured for building, content and business interruption, loss limits and deductibles. The data is available per high-resolution CRESTA zone (4-digit post code) and property occupancy type. The third and following loss reports for qualifying Cat events are in the same format.

first two loss reports are on a country level, while subsequent loss reports are on the same granularity level as the exposure data (Table 1).

Model comparison using PERILS IED for Australia

Australia ranks as one of the biggest Cat markets globally. As such, the value of having an independent industry database and reporting agency for Australian Cat risk is clear, as it facilitates the ongoing improvement of models and the development of a professional industry-loss risk transfer market for the region.

In the context of risk modelling, PERILS is grateful to have received the support of the main model vendors to carry out a model comparison for Australian earthquake and tropical cyclone risk using the PERILS IED 2016. The results of this model comparison are shown in Figure 8 and demonstrate

material differences in modelled market losses. For example for earthquake, the 250-year PML ranges from AUD 10bn to AUD 29bn (USD 7.5bn to USD 22bn). The same measure for tropical cyclone is AUD 9bn to AUD 15bn (USD 7bn to USD 11bn). Because all models analysed used the same PERILS IED, the differences in model outputs should be mainly driven by different views of the hazard and/or the vulnerability components of the respective models.

Given the differences in model results, our expectation is that the PERILS Industry Exposure and Loss data for Australia will contribute to a more realistic and robust risk assessment over time. In addition, with market PMLs in the tens of billions, there is a clear need to utilise various risk transfer solutions and capital sources. Our aim is that PERILS data will serve as an enabler in this respect and will contribute to the successful management of Australian Cat risk.

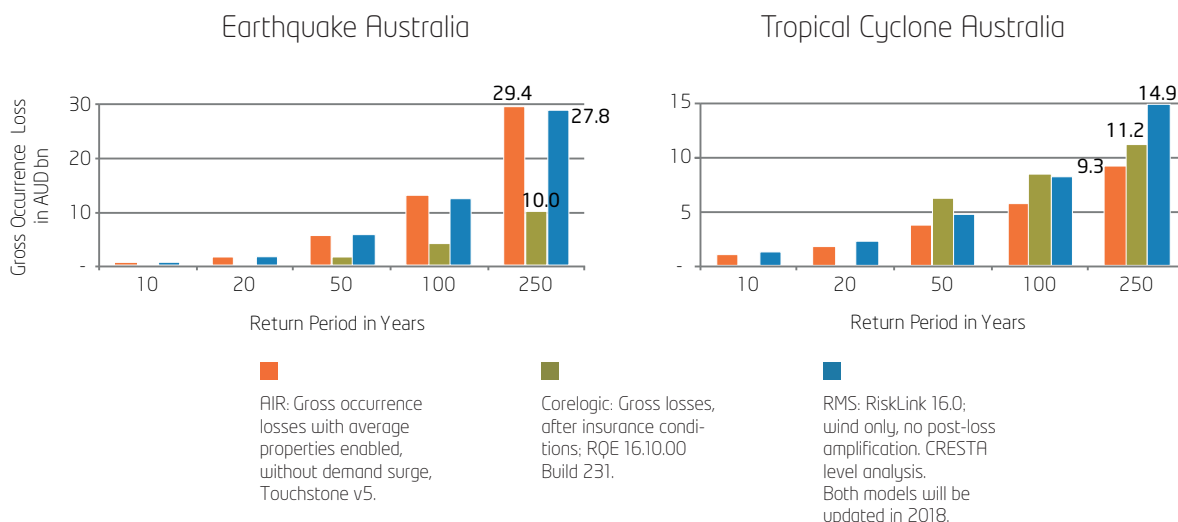


Figure 8: Market Losses for earthquake and tropical cyclone Australia based on different vendor models. The PERILS IED enables the computation of market losses and the direct comparison of the outputs of three different vendor models for Australian earthquake and tropical cyclone risk.

Outlook

In the coming months, we will be busy collecting detailed loss data for Extratropical Cyclones Egon, Thomas and Zeus, Tropical Cyclone Debbie, and the Earthquake events in Central Italy. Our goal is that the resulting industry loss footprints, in conjunction with PERILS Industry Exposure data, will enable our user community to further enhance their understanding of insured Cat risk in the respective territories.

We will also continue to work with our partners at CatIQ in Toronto and Nanyang Technological University in Singapore to further broaden our coverage scope.

The past eight years of PERILS activity have shown that having an independent source of Cat-related industry data greatly benefits all insurance stakeholders. We want to continue down this road, always recognising the simple fact that PERILS, as mentioned earlier, is “For the Industry, by the Industry”.

We thank all of you for your continued support and welcome any feedback you may have.

With our very best regards,
Your PERILS Team

Zurich, June 2017



Darryl Pidcock, our latest addition to the PERILS Team. Darryl is based in Sydney and oversees the expansion of PERILS data coverage in the Asia-Pacific region. He has 26 years of experience in the financial sector out of which he spent 18 years in the reinsurance industry.