Atmospheric Science: A Key Player in the Quantification & Mitigation of Insurance Risk

Dan Hartung (BS ’07, MS ’09)
Associate Director – Catastrophe Management
Aon Benfield – Analytics

November 10th, 2017
Aon Benfield: An Overview

Aon Benfield, a division of Aon, is the world’s leading reinsurance intermediary and full-service capital advisor—providing coverage for insurance companies against catastrophic claims and helping to grow their business.

Our colleagues empower insurers and reinsurers globally to…

- Better understand and transfer risk
- Utilize innovative data and analytics to quantify exposures
- Access customized capital across the global treaty, facultative and capital markets
- Optimize capital performance to improve operational effectiveness and achieve business growth

**Beauty in Numbers**

<table>
<thead>
<tr>
<th>#1</th>
<th>Reinsurance intermediary based on global annual revenues</th>
</tr>
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<tbody>
<tr>
<td>USD32bn</td>
<td>Premium placed in the global reinsurance marketplace annually</td>
</tr>
<tr>
<td>USD1trn</td>
<td>Investment grade capital made available to clients</td>
</tr>
<tr>
<td>#1</td>
<td>Broker in every region—Americas, Asia Pacific, EMEA and UK</td>
</tr>
<tr>
<td>80</td>
<td>Offices in 50 countries</td>
</tr>
<tr>
<td>100+</td>
<td>Industry awards since 2009</td>
</tr>
<tr>
<td>USD130m+</td>
<td>Invested annually in analytical capabilities</td>
</tr>
</tbody>
</table>

**Client Promise**

- Partnership
- Expertise
- Innovation
- Excellence
- Results

Trusted advisors focused on your needs and priorities

Industry-leading experience and people you can trust

Comprehensive and tailored solutions that anticipate your needs

Distinctive service every day

Superior client value delivered
Challenges Our Clients Face

How do I grow my business?

How can you help me understand the risks I bear? How can I transfer these risks and into what market:
- Traditional Markets
- Non Traditional Markets
- Capital Markets

How do I improve my balance sheet strength?

How do I maintain a competitive position and financial strength under global regulatory regimes?

How do I increase underwriting profitability through innovation?

How do I get the best premiums?
Aon Benfield offers global knowledge and access combined with local presence with more than 80 offices in 50 countries around the world.

- We have over 3,200 colleagues globally including 500 Analytics experts.
Aon Benfield is The World’s Leading Reinsurance Broker

- Aon Benfield’s size and expertise, coupled with industry-leading data and insight, enables us to deliver a unique level of value to our clients not found anywhere else
- Value as our clients define it. Value that helps them achieve their goals and “empower results”

<table>
<thead>
<tr>
<th>Rank</th>
<th>Reinsurance Broker</th>
<th>2013 Reinsurance Gross Revenues</th>
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<tbody>
<tr>
<td>1</td>
<td>Aon Benfield</td>
<td>$1,505,000,000</td>
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<tr>
<td>2</td>
<td>Guy Carpenter</td>
<td>$1,131,267,000</td>
</tr>
<tr>
<td>3</td>
<td>Willis Re</td>
<td>$860,000,000</td>
</tr>
<tr>
<td>4</td>
<td>JLT Reinsurance Brokers Ltd</td>
<td>$375,869,460</td>
</tr>
<tr>
<td>5</td>
<td>Cooper Gay Swett &amp; Crawford Ltd.</td>
<td>$158,466,000</td>
</tr>
<tr>
<td>6</td>
<td>Miller Insurance Services</td>
<td>$93,528,000</td>
</tr>
<tr>
<td>7</td>
<td>UIB Holdings (U.K) Ltd.</td>
<td>$67,463,114</td>
</tr>
<tr>
<td>8</td>
<td>THB Group Ltd.</td>
<td>$58,094,136</td>
</tr>
<tr>
<td>9</td>
<td>BMS Group</td>
<td>$54,300,000</td>
</tr>
<tr>
<td>10</td>
<td>Lockton Re</td>
<td>$46,028,536</td>
</tr>
</tbody>
</table>

Source: Business Insurance, October 2014

Other Reinsurance Brokers: TigerRisk Partners, Holborn
Aon Benfield’s Teams and Expertise

Treaty Reinsurance
Comprises professionals across all major reinsurance product groups and regional markets to ensure expertise meets specific client needs. Unrivalled placement capabilities with more than 20 specialty areas from construction and terrorism to aviation, liability and healthcare

Facultative Reinsurance
More than 500 colleagues in 43 offices worldwide, who place USD4 billion of premium into the global reinsurance and capital markets annually

Investment Banking
Aon Securities is consistently named the industry leader in both capital markets (catastrophe bond, contingent capital, sidecar) and financial advisory (capital-raising, new company formation, and merger and acquisition deals)

Analytics
Receives USD130+ million annual investment and comprises 500 experts in specialist teams including Catastrophe Management, Actuarial, Impact Forecasting, Rating Agency Advisory, Market Analysis, Risk and Capital Strategy, Aon Benfield Research

Client Services
Contract, accounting and claims services

Inpoint
A strategy, claims and operations consultancy dedicated to helping insurers and reinsurers improve their performance
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<th>Aon Benfield Analytics – Practice Groups</th>
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<tr>
<th>Catastrophe Management</th>
<th>Actuarial</th>
<th>Rating Agency Advisory</th>
<th>Risk and Capital Strategy</th>
<th>Market Analysis</th>
<th>Products and Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-House Multi-Model Risk Assessment</td>
<td>Experience &amp; Exposure Rating</td>
<td>Rating Agency Implications of Reinsurance</td>
<td>Risk Tolerance and Risk Appetite</td>
<td>MarketReView®</td>
<td>Impact Forecasting</td>
</tr>
<tr>
<td>Risk Transfer Structuring</td>
<td>Reinsurance as Capital</td>
<td>BCAR/SPCAR Pro Formas</td>
<td>Enterprise Risk Management</td>
<td>Market News &amp; Updates</td>
<td>Catastrophe Models</td>
</tr>
<tr>
<td>Catastrophe Actuarial and Cat Score®</td>
<td>Reinsurance &amp; Portfolio Optimization</td>
<td>Communicating with Rating Agencies</td>
<td>Economic Capital Adequacy and Allocation</td>
<td>Market &amp; Group Profiles</td>
<td>ImpactOn Demand®</td>
</tr>
<tr>
<td>Academic &amp; Industry Collaboration</td>
<td>Insurance Risk Study</td>
<td>Criteria Changes</td>
<td>Solvency II</td>
<td>Training &amp; Short Courses</td>
<td>Risk Intelligence</td>
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<td>ReMetrica® Risk and Capital Modeling</td>
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ImpactOn Demand® Risk and Capital Modeling

Annuity Solutions Group PathWise℠
Catastrophe Management and Modeling
Individuals typically work on several clients throughout the year depending on
- Placement timelines
- Expertise
- Client resource demands

Cycle is traditionally a yearly process but can vary based on client need

Each portion of the cycle involves collaboration between divisions of Aon Benfield
What is a Catastrophe Modeling?

- Catastrophic events are extreme events (low frequency; high severity) which go beyond normal occurrences and are thus unpredictable.

- Catastrophe Modeling (also known as CAT modeling) is the process of using statistical models to assess the loss which *could* occur to an insurer’s portfolio in a catastrophic event.

![Diagram](attachment:image.png)
The Need for Cat Modeling

- Potential for severe losses creates the necessity to prepare for such events
- Unpredictable and infrequent nature of catastrophes
- In cases, lack of historical information to accurately predict yearly losses
- Increase in development within disaster prone areas
- Catastrophic events have caused billions of insured losses bringing the importance of modeling to attention

- 2005: Hurricane Katrina¹ - > $76.3 billion
- 2011: Tohoku Earthquake¹ - $35.7 billion
- 2012: Hurricane Sandy¹ - $35.0 billion

¹: Source: NOAA, includes insured losses from government insurers (ex: NFIP)
What is a Catastrophe Modeler?

In a sentence…

Catastrophe modelers assess catastrophic risk using computer models to support the placement of reinsurance and add value to our clients.

1. Computer models
   - Cat model output estimates
   - Size and probability of catastrophic losses on client’s exposure
   - How much cat loss our client can expect in an average year

2. Placement of reinsurance
   - Typically catastrophe excess of loss treaties
   - Support placements with modeled data

3. Add Value
   - Exposure management
   - Portfolio optimization
   - Pricing and cost recovery
   - Much, much more
• Probable Maximum Loss (PML): The largest economic loss likely to occur at a specified probability of occurrence.

• Average Annual Loss (AAL): An estimate of the annual premium need to cover losses for the modeled peril(s) over time, assuming exposure remains constant.

• Tail Value at Risk (TVaR): The probability-weighted average of all possible economic losses that are greater than or equal to the PML at a specified probability of occurrence.

• Standard Deviation

• Frequency
Preparing for a Career In Applied Atmospheric Sciences
Applied AOS Career: Risk, & Insurance Industry

What types of course electives should I take?

- Certificate in Business (CIB) (For Non-Business Majors - Business School)
  - 4 required classes and 2 electives to complete certificate
  - Focus 2 breadth electives on risk and insurance to enhance background knowledge and marketability
  - [https://bus.wisc.edu/degrees-programs/certificates/undergraduate/business#about](https://bus.wisc.edu/degrees-programs/certificates/undergraduate/business#about)
  - Risk Management and Insurance classes
  - Economics, Applied Statistics, Probability classes
  - Python and R programming / ARCGIS or QGIS programming
  - Intro to Finance or Accounting
  - Intro level Civil / Structural Engineering

Other Important Considerations:

- Utilize College of Letters & Sciences career resources for resume building and interview practice
- 1-page resume. Period
- Attend career fairs on campus and seek out companies you are interested in
- Private sector job interviews typically last for ½ day or longer, be prepared
- Once you land an interview, do your research beforehand and make sure you fully understand the company, the role, and have a set of questions ready to ask your interviewers
Certificate in Business (CIB)

The Certificate in Business (CIB) program provides non-business students the opportunity to earn a concentration in a clearly defined academic program in business. The coursework allows students to develop a foundational understanding of business and apply this to their specific field, such as international studies or engineering. In addition to careers related to their own fields, students who earn the certificate have also found job opportunities in management, marketing, and other business fields in the past.

The CIB program consists of six courses (four core courses and two additional breadth courses), for a total of 18 credits. Students are also responsible for any pre-requisite courses needed for core or breadth courses. Click here for pre-requisite information for core courses.

Students must take at least 12 of the 18 required credits in residence at UW-Madison. Study abroad courses taken through a UW-Madison sponsored program will count toward the 12 credits in residence.

Students must earn a grade of "C" or better in all required courses for the CIB.

- Accounting 100 or 300*, 3 crs
- Finance 300, 3 crs
- Management & Human Resources 300, 3 crs
- Marketing 300, 3 crs
- Breadth course**
- Breadth course**

*CIB students are strongly encouraged to take ACCT IS 300, unless ACCT IS 100 is required by their major. Please note, however, that ACCT IS 100 is a requirement for many other upper-level Accounting and Finance courses. Students planning to take additional Accounting of Finance courses, should consult with the CIB advisor.

**CIB Breadth Requirement information:

- Breadth Courses must be at least 3 credits
- Breadth Courses must be School of Business courses (or courses cross-listed with School of Business). Breadth Courses may be from the same department as the core courses
- Breadth Courses must be from two different School of Business departments (or cross-listed with two different School of Business departments)
- Courses taken at another institution must be directly equivalent to a UW-Madison business course and title (i.e. not elective credit)

Meet the academic and career advisors for prospective Certificate in Business students

Katie Derzolin
Academic Advisor
Jamie Hinze
Career Advisor
Private Sector Opportunities

Insurance Companies

Catastrophe Model Vendors

Risk Consulting / Brokers

Weather Risk Consulting

Reinsurance Firms

Aon Benfield | Analytics | Catastrophe Management
Proprietary & Confidential

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We are hiring!

Catastrophe Risk Analyst Positions available in Chicago and Minneapolis starting in June 2018!

Part of Aon’s Early Career Launch Program; Open to senior undergraduates completing a Bachelor’s degree by June 2018

Apply Here!


Minneapolis (Bloomington), MN Location: http://jobs.aon.com/aon/aon-campus-catastrophe-risk-analyst-bloomington-mn
Contacts

Dan Hartung
Associate Director
Aon Benfield Analytics | Catastrophe Management
(410) 547 2870
daniel.hartung@aonbenfield.com