1

2

DATA NEEDS FOR WILDFIRE ANALYTICS
Excess Liability

- Service Territories
- Transmission
- Distribution
- Continuous Hazard Gradient
  - U.S. and Canada
- Visualization (Map)
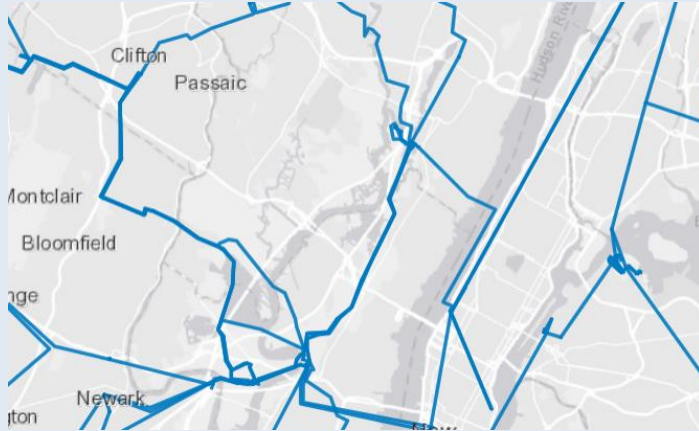
Transmission Line Map https://hifld-geoplatform.opendata.arcgis.com/datasets/

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AEGIS VIEW OF WILDFIRE EXPOSURE FOR EXCESS LIABILITY
Guy Carpenter customized diagnostic using Wildfire Risk Rating 2.0 and Advantage Point

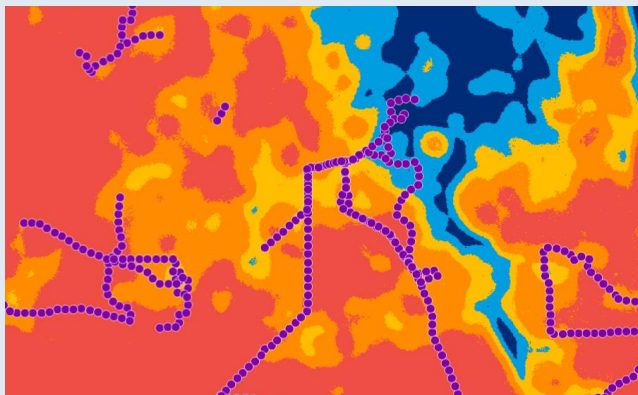- U.S. Wildfire severity scores for transmission line segments
- Microsoft Buildings Database used as proxy for distribution
- MSDB structure scores by county, state and owner

Very Low	Low	Moderate	High	Very High	Extreme	Grand Total
			3	21		24
		8	24	47		79
30	4	2	4	14	1	55
352	99	50	30	31	130	692
2	10	24	28	46	60	170
12	18	24	72	45		171
7	42	64	54	71	27	265
	3	21	42	13		79

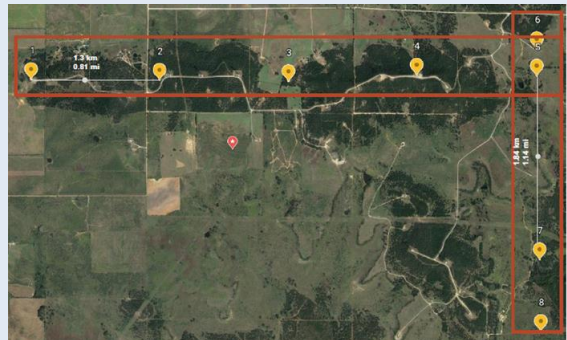Guy Carpenter Advantage Point Interface

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EXPOSURE DATA ENRICHMENT FOR RENEWABLE ASSETS USING U.S. WIND TURBINE DATABASE

Improve Geocoding Accuracy

Capture Layout Site

5

SEVERE CONVECTIVE STORM MODELING

Javon Pratt

Senior Catastrophe Modeler

AEGIS Insurance Services, Inc.

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WHAT IS AN SCS EVENT

Severe Convective Storm

- Severe convective storms (SCS)
  - Thunderstorms that generate damaging **hail, tornados and high wind gusts (straight-line wind)**
- An SCS Event is not an individual tornado, hail swath or wind gust
- Events arise from a set of environmental conditions that lead to a high potential of tornados, hail, and straight-line wind gusts
- Events typically occur over multiple days

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COMPLEX PERIL MODELING CAPABILITIES FROM KCC

*Karen Clark and Company: Risk Insight Model*

- KCC SCS model
  - Over 48,000 stochastic events and 300 historical events
  - Perils modeled are hail and wind/tornado
- Model uses a physics-based approach, not statistical
  - Stats are skewed
  - Reporting varies based on regions
  - Using physics of storm creation, more accurately model an SCS event

Historical Hail Reports
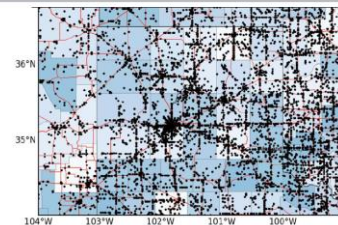
The Physics of SCS: Updrafts, Downdrafts, Wind Shear, and Rotation

- Rising warm air → updrafts
- Sinking cool air → downdrafts
- Wind shear influences processes that leading to organized storm cells

Vertical Wind Shear
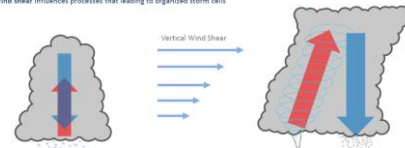
SCS Environment = Convection + Shear + Rotation

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CUSTOM VULNERABILITY CURVES FOR RENEWABLES

Consulting study based on AEGIS Claims Data for Solar Farms and Wind Farms

- Claims study to create custom vulnerability curves in the SCS model
  - Karen Clark and Company looked at a variety of AEGIS Claims
  - Hours of interviews with Loss Control team

KCC Construction codes established to differentiate damageability

Vulnerability of Single PV Unit to Wind

- Wind Damage Modes for Solar Panels
  1. If panel connection fails (DM 1)
     o Loss on panel and partial ELEC
  2. If support partially fails (DM 2)
     o Loss on panel, partial support and partial ELEC
  3. If support totally fails (DM 3)
     o Loss on panel, support and ELEC

Fixed-tilt Support

Single-axis Tracker

Dual-axis Tracker

Increasing Wind Vulnerability

DM 1   DM 2

Source: AEGIS claims   Source: AEGIS claims

KC &co The Innovation and Technology Leader in Catastrophe Risk Modeling   CONFIDENTIAL   © 2022 Karen Clark & Company

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CAPACITY DATA FIELD ESTABLISHED TO REPRESENT SIZE

Accommodate Variety of Size and Layouts

- Capacity field introduced
  - Capacity field created to account for amount of wattage plant produces
  - If unknown, TIV can be used as a proxy to infer capacity

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JEVON'S PARADOX

**An increase in efficiency leads
to an increase in consumption…**

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STEPS TO MAINTAIN AND CONTINUE ADVANCEMENTS

Invest in Aging Infrastructure

- Updated Exposure Platform
- Updated Reporting Platform
- Exposure Modeling Data Management (EMDM)

Increase Efficiency

- Leverage new platforms
- Reduce redundancies
- Digitize Manual Processes
- Automate

Identify Alternatives

- Off-shore consulting teams
- Auto-start processes
- Self-service
  - Underwriters
  - Member Portal

**Serve as gate agents
to understanding
catastrophe risk**

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