

INTRODUCING

Bobby Shackelton

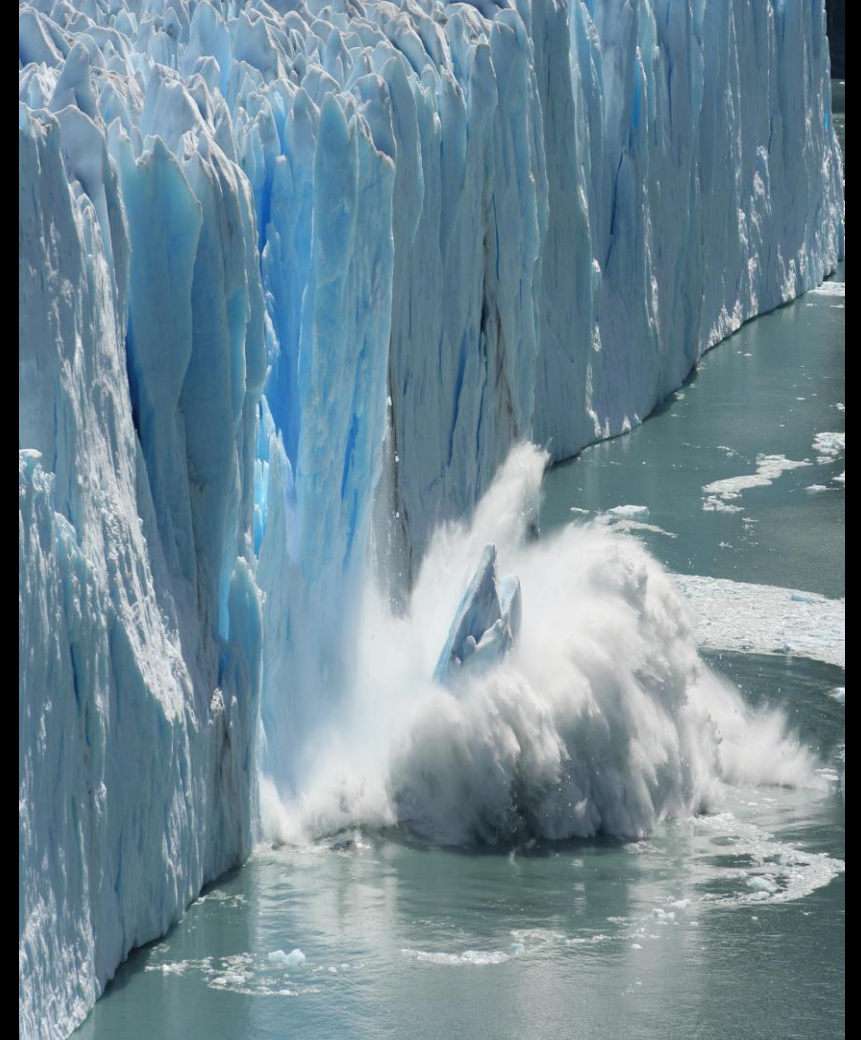
- Head of Geospatial, Bloomberg LP
- U.S. Air Force Veteran (00-08)
- Mars City Design Ambassador
- New York Map Society Board Member
- Space and Technology Enthusiast



BETTER DATA WILL LEAD TO A MORE SUSTAINABLE FUTURE

THE IMPACT OF CLIMATE

- As global warming begins to affect business, market transparency is more important than ever
- In 2018, Climate related natural disasters caused \$91 Billion in damage in the United States alone, according to NOAA
- Ruining crops, disrupting supply chains and destroying buildings and equipment
- Understanding and pricing climate-related threats, and opportunities, has become essential for valuing company and efficiently allocating capital



What are Investors saying about weather and climate change?



MEASURING THE IMPACT OF THE PHYSICAL RISK AND CLIMATE

Case study

New dimensions for climate-change analysis.

The Bloomberg Terminal's geospatial solutions add eye-opening geographic context to financial analysis.

As markets grow more interested in the impact of global warming on business, we're building out our collection of mapping tools to help companies, investors and researchers better visualize climate-related risks and opportunities. With our quick-create maps – Custom Map (MAP <GO>) and Company Map (CMAP <GO>) – or our advanced mapping technology – Geo Insights (MAPS <GO>) – users can overlay financial and environmental data sets from the Terminal, including up-to-the-minute data from the World Bank, the World Resources Institute, the U.S. Geological Survey and more. Layering geographic data showing current or projected climate change with asset locations and financial and production data can generate thought-provoking visuals that provide insights into the impact of climate change against an investor's assets, portfolio and industry.

A growing number of companies are using Bloomberg's mapping tools to help them disclose the potential impacts of climate change on their businesses, in line with recommendations from the FSB Task Force on Climate-related Financial Disclosures. In 2018, the UN Environment Finance Initiative convened a working group of 16 banks to help develop a rigorous methodology for assessing physical risk, the risk resulting from climate variability, extreme events and longer-term shifts in climate patterns.

As part of this project, Bloomberg collaborated with the group on using our mapping technologies to assess the physical impacts of climate change on company assets in their portfolios.

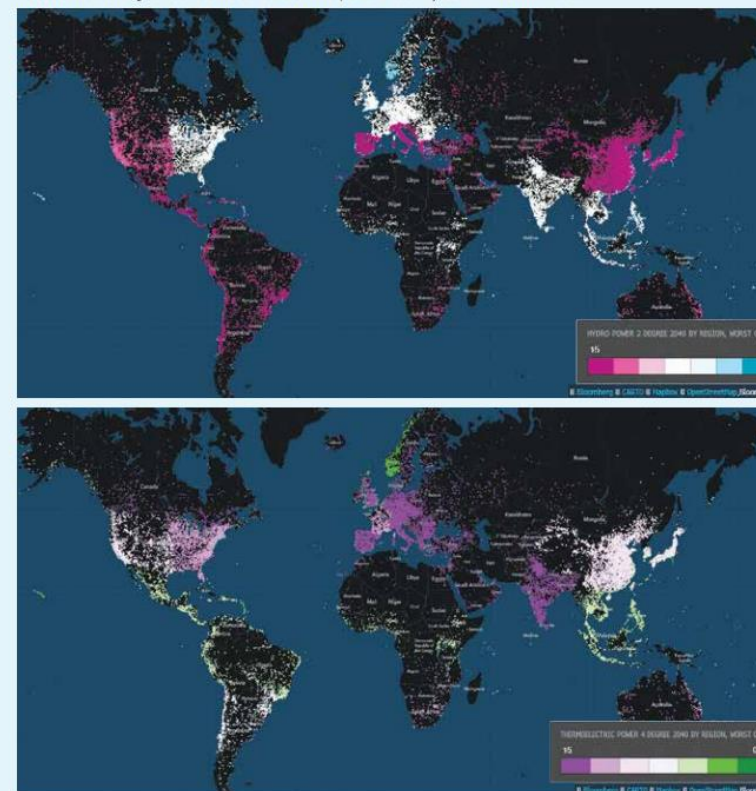
For example, we helped TD Bank North America analyze 20 borrowers from TD Bank's North American power and utilities portfolio under three climate scenarios. While we didn't evaluate specific extreme events, the analysis yielded several intriguing findings – including that decreases in borrower revenues were primarily driven by incremental climate change, not extreme weather events. The visual approach was also useful for quickly pinpointing areas for further study and facilitating discussions with stakeholders.

Top map: The incremental impact of a 2°C scenario on annual hydroelectric power production by the 2040s. Pink indicates more hydropower production loss (dark pink is the most loss) and blue indicates less loss (dark blue is the least loss).

Bottom map: The incremental impact of a 4°C scenario on annual thermal power production by the 2040s. Lavender indicates more thermal power production loss (dark lavender is the most loss) and green indicates less loss (dark green is the least loss).

The future in black and white (and color)

Created with Bloomberg's MAPS tool, these maps helped our client, TD Bank, better assess the physical risks of climate change on some of its borrowers in the power and utility sector in North America.



Source: UNEP Finance Initiative (2018). Navigating a New Climate.

WEATHER IMPACTS MARKETS BUT INVESTORS STUGGLE TO QUANTITY IT

Extreme Weather

- Cyclones
- Earthquakes
- Wildfires
- Drought
- Flood
- Extreme Heat
- Extreme Cold

Standard Weather & Climatology

- Temperature, Heat Index
- Rainfall, Snowfall, & Probability
- Wind Chill, Wind Speed
- Wet Bulb Temp, Soil Moisture
- Humidity (RH), Dew Point
- Cloud Cover, Air Pressure

File Formats

- Excel
- CSV

ID	BB	COMPANY	dateValidStart	dateValidEnd	assetCount	assetType	observationSubject	observationValue	unitOfMeasure	metric
44	100001		8/4/2019	8/4/2019	6	Administration, Operations, Sales, Headquarters, Marketing, Management, Support	Wind Speed 100m	12.6 Miles per Hour		Average Maximum
45	100001		8/4/2019	8/4/2019	6	Administration, Operations, Sales, Headquarters, Marketing, Management, Support	Wind Direction 10m	134.8 Degrees		Average Average
46	100001		8/4/2019	8/4/2019	6	Administration, Operations, Sales, Headquarters, Marketing, Management, Support	Wind Direction 80m	184 Degrees		Average Average
47	100001		8/4/2019	8/4/2019	6	Administration, Operations, Sales, Headquarters, Marketing, Management, Support	Wind Direction 100m	180.7 Degrees		Average Average
48	100001		8/4/2019	8/4/2019	6	Administration, Operations, Sales, Headquarters, Marketing, Management, Support	Precipitation	0.6 Inches		Average Total
49	100001		8/4/2019	8/4/2019	6	Administration, Operations, Sales, Headquarters, Marketing, Management, Support	Snowfall	0 Inches		Average Total
50	100001		8/4/2019	8/4/2019	6	Administration, Operations, Sales, Headquarters, Marketing, Management, Support	Snowdepth	0 Inches		Average Total
51	100001		8/4/2019	8/4/2019	6	Administration, Operations, Sales, Headquarters, Marketing, Management, Support	Total Cloud Cover	16.8 Percent		Average Minimum
52	100001		8/4/2019	8/4/2019	6	Administration, Operations, Sales, Headquarters, Marketing, Management, Support	Total Cloud Cover	33.2 Percent		Average Average
53	100001		8/4/2019	8/4/2019	6	Administration, Operations, Sales, Headquarters, Marketing, Management, Support	Total Cloud Cover	51.2 Percent		Average Maximum
54	100001		8/4/2019	8/4/2019	6	Administration, Operations, Sales, Headquarters, Marketing, Management, Support	Total Solar Radiation	0 Watts per Square Meter		Average Minimum
55	100001		8/4/2019	8/4/2019	6	Administration, Operations, Sales, Headquarters, Marketing, Management, Support	Total Solar Radiation	219.3 Watts per Square Meter		Average Average
56	100001		8/4/2019	8/4/2019	6	Administration, Operations, Sales, Headquarters, Marketing, Management, Support	Total Solar Radiation	739.2 Watts per Square Meter		Average Maximum
57	100001		8/4/2019	8/4/2019	6	Administration, Operations, Sales, Headquarters, Marketing, Management, Support	Total Solar Radiation	5263.8 Watts per Square Meter		Average Total
58	100001		8/4/2019	8/4/2019	65	Distribution, Logistics, Warehousing, Shipping	Asset Count	65 Tally		Total
59	100001		8/4/2019	8/4/2019	65	Distribution, Logistics, Warehousing, Shipping	Air Temperature	66 Degrees Farenheit		Average Minimum
60	100001		8/4/2019	8/4/2019	65	Distribution, Logistics, Warehousing, Shipping	Air Temperature	74.7 Degrees Farenheit		Average Average
61	100001		8/4/2019	8/4/2019	65	Distribution, Logistics, Warehousing, Shipping	Air Temperature	84.7 Degrees Farenheit		Average Maximum
62	100001		8/4/2019	8/4/2019	65	Distribution, Logistics, Warehousing, Shipping	Wet Bulb Temperature	63.4 Degrees Farenheit		Average Minimum
63	100001		8/4/2019	8/4/2019	65	Distribution, Logistics, Warehousing, Shipping	Wet Bulb Temperature	67.7 Degrees Farenheit		Average Average
64	100001		8/4/2019	8/4/2019	65	Distribution, Logistics, Warehousing, Shipping	Wet Bulb Temperature	71.4 Degrees Farenheit		Average Maximum
65	100001		8/4/2019	8/4/2019	65	Distribution, Logistics, Warehousing, Shipping	Dew Point Temperature	59.7 Degrees Farenheit		Average Minimum
66	100001		8/4/2019	8/4/2019	65	Distribution, Logistics, Warehousing, Shipping	Dew Point Temperature	63.1 Degrees Farenheit		Average Average
67	100001		8/4/2019	8/4/2019	65	Distribution, Logistics, Warehousing, Shipping	Dew Point Temperature	66.6 Degrees Farenheit		Average Maximum
68	100001		8/4/2019	8/4/2019	65	Distribution, Logistics, Warehousing, Shipping	Feels Like Temperature	67.1 Degrees Farenheit		Average Minimum
69	100001		8/4/2019	8/4/2019	65	Distribution, Logistics, Warehousing, Shipping	Feels Like Temperature	77.3 Degrees Farenheit		Average Average
70	100001		8/4/2019	8/4/2019	65	Distribution, Logistics, Warehousing, Shipping	Feels Like Temperature	88.9 Degrees Farenheit		Average Maximum
71	100001		8/4/2019	8/4/2019	65	Distribution, Logistics, Warehousing, Shipping	Wind Chill Temperature	65.9 Degrees Farenheit		Average Minimum
72	100001		8/4/2019	8/4/2019	65	Distribution, Logistics, Warehousing, Shipping	Wind Chill Temperature	74.6 Degrees Farenheit		Average Average
73	100001		8/4/2019	8/4/2019	65	Distribution, Logistics, Warehousing, Shipping	Wind Chill Temperature	84.7 Degrees Farenheit		Average Maximum
74	100001		8/4/2019	8/4/2019	65	Distribution, Logistics, Warehousing, Shipping	Heat Index Temperature	67.2 Degrees Farenheit		Average Minimum
75	100001		8/4/2019	8/4/2019	65	Distribution, Logistics, Warehousing, Shipping	Heat Index Temperature	77.4 Degrees Farenheit		Average Average
76	100001		8/4/2019	8/4/2019	65	Distribution, Logistics, Warehousing, Shipping	Heat Index Temperature	88.9 Degrees Farenheit		Average Maximum
77	100001		8/4/2019	8/4/2019	65	Distribution, Logistics, Warehousing, Shipping	Relative Humidity	49.6 Percent		Average Minimum

Message

4.80 / 1844.880 2x1
 5.85D L 1818.90D Val 6.631B

Custom Map

Map Content

Suggested Functions BTMM Assess worldwide interest rates BI Get up to speed on companies & industries