



SUNRISE

Supply Chain Solutions



Riskpulse



About Us

Our mission: To synchronize commerce and climate

With Riskpulse, decision-makers confidently navigate risks to the pricing and movement of goods, through probabilistic intelligence, data visualization, and recommendations embedded in our web-based platforms. Lead by our team of experienced meteorologists, Riskpulse provides pioneering research and analyzes weather risk at lead times longer than any numerical guidance can provide alone.

Our suite of intuitive and dynamic software products provides the market's most sophisticated weather guidance in a one-stop shop. It optimally blends our unique, objective temperature output with numerical guidance for the full spectrum of temperature probabilities up to 40 days in advance. Our web platforms, developed entirely in-house, utilize historical data, machine learning, and predictive analytics to objectively project weather risk. Through our mobile platforms, nodes of the supply chain are connected in order to share real-time, operational and weather status updates and facilitate more efficient transactions.

Some of the largest global energy producers, commodity investment firms, food shippers, consumer packaged goods corporations, auto manufacturers, and retailers trust Riskpulse products to support their daily operations. References available upon request.



Why Sunrise?

Any company that makes and/or sells physical goods has a supply chain. Supply Chain Management (SCM) describes monitoring and facilitating the movement of materials, work-in-progress inventory, finished goods, information and capital from the original supplier to the end consumer, and is comprised of the following steps:

- Supply Chain Strategy and Demand Planning
- Procurement and Sourcing
- Inventory Management / Warehousing
- Fulfillment
- Transportation and Logistics

Our supply chain solutions, **powered by Riskpulse Sunrise**, unlock actionable value in each step of this continuum. We are using a unique combination of predictive analytics, advanced data visualization, and sophisticated meteorological expertise to help our clients look at SCM risk in ways not previously possible.

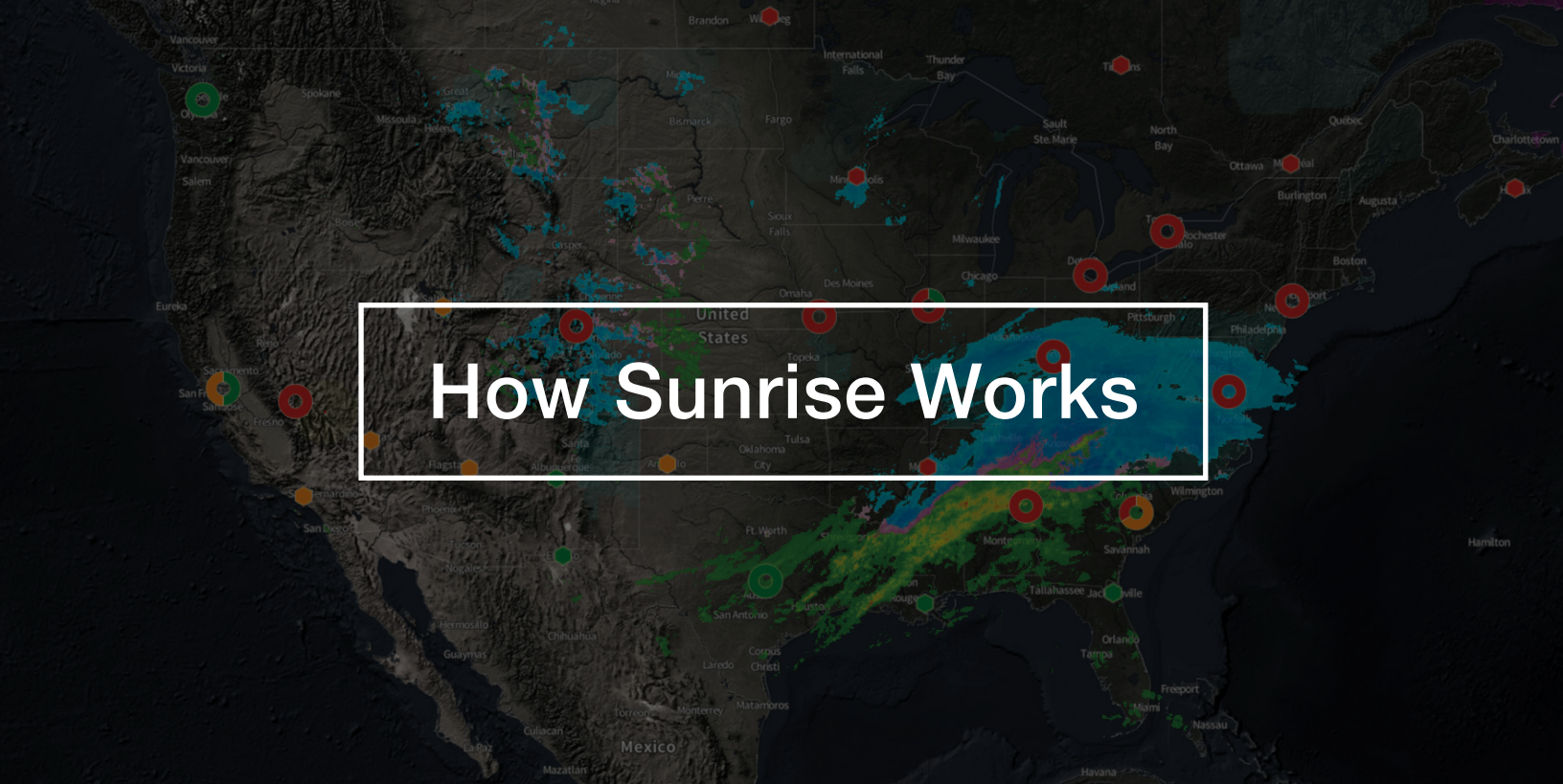
What actions can your supply chain take to align operations with environmental conditions? Our desire is to provide our enterprise adopters with the ability to:

- | | |
|---|---|
| #1 Centrally and proactively define event-based risk through shareable profiles, | #5 Establish a data-driven baseline of a shipper's exposure across its network, |
| #2 Proactively identify and log high-risk scenarios and collaboratively task its vendors with responding, | #6 Automate quantitative analysis to scale intelligence while preserving human auditing, |
| #3 Integrate supply chain data – routes, origins, destinations, as well as track-and-trace with real-time and historical environmental observations, | #7 Control and expand the outbound dissemination of intelligence, |
| #4 Collect and log observations from on-the-ground personnel, | #8 Harness new threads of communication as a data-rich asset rather than a context-less liability. |

These eight capabilities and the corresponding results we expect to create for enterprise adopters of Sunrise are outlined in the pages that follow.

We believe that a joint effort between Riskpulse, shippers, and carriers will create more agile and anti-fragile organizations by accelerating the observe-orient-decision-action loops driven by #1) new events and #2) creating more experts within each organization. By using technology to improve the performance of personnel and vendors, we will reduce damages and delays and unearth new, untapped gains for the entire network.

In short, we believe there is a gap between environment- and communication-agnostic transportation management systems (TMS) and the real world of operations and crisis management. This is the role of Sunrise—bringing technology and systems to bear on the challenge of risk management.



Event/Signal Processing	Page 4
Demand Management	Page 6
Distribution Network Planning	Page 7
Production Planning	Page 9
Transportation Planning	Page 10



Event / Signal Processing

How We Turn Event Data into Relevant Signals

At the center of the Riskpulse platform is the Riskpulse Score (RpS). The central idea behind the RpS is to follow the rule of representation, “folding knowledge into data, so logic can be stupid and robust.”

By aggregating and filtering through an immense amount of climate, weather, and hazard data, we provide our clients with an encapsulation of their concerns through a numeric score that is tailored to their specific tolerances by location, shipping lane, supplier, receiver, and commodity, and changes over time as new information is received and processed. Using a non-linear scale from 1-25 (1-8 green, 9-16 orange, 17-25 red), the RpS is a sensible addition to the family of scales including the Richter, Saffir-Simpson, and Fujita.

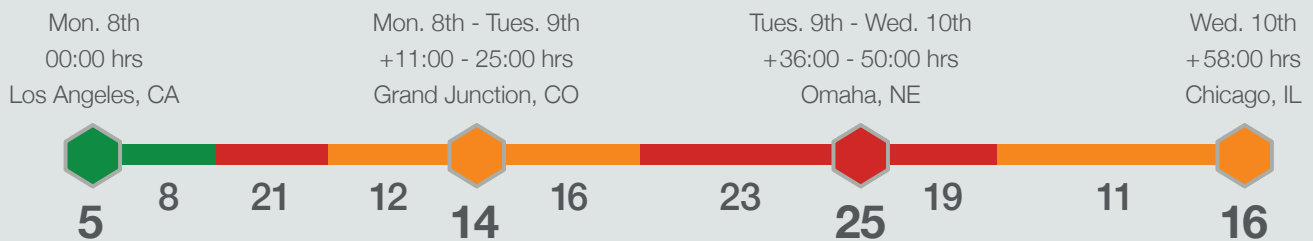
In isolation, it is a green light, red light metaphor that provides decision-makers (or algorithms) with a simple encapsulation of business rules. In aggregate, it provides an index into the larger picture of environmental conditions impacting a network or even an entire industry.

The Riskpulse platform (and the RpS) is extensible and has already been extended beyond weather to include events below the atmosphere (wildfires, earthquakes) as well as events within the realm of human agency (major highway accidents, road closures, county-level emergencies). These events can be provided through an API or through a crowdsourced (manual entry) interface. In all cases, this data can be retrieved through an API that provides clients with the score, the chief reasons for the score, and – as future development – recommendations. We believe this simple interface is the abstraction necessary to provide clients with smart data (which clients need) over big data (which we process on their behalf).



Risk scoring example: Calculate risk for a shipment across your network

Input



Output

The shipment is scheduled to depart at 5:00 am on Monday the 8th. The risk at the origin at this planned departure time is 5 on a scale from 1 (min) - 25 (max). This risk score is customized to the shipment's in-transit vulnerabilities and duration of exposure.

The risk to the shipment is highest during its 14-hour stop in Omaha, 27 hours from the time of departure, which triggers a risk score of 25.

The shipment arrives in Chicago on Wednesday at 3:00 pm, 3 days after departing. Conditions at the destination are moderately hazardous. Because prolonged exposure is a concern, the shipper may use this information to request cargo be moved indoors upon arrival.



Demand Management

Multi-Model Statistical Forecasting

Riskpulse is trusted by the world's leading forecasters and largest financial institutions as a reliable information source to identify demand risks and mispriced markets driven by anomalous temperatures.

Our temperature forecasting guidance dashboard is powered by TempRisk, an objective and probabilistic full-distribution model that predicts the long-range risk of heat waves and cold snaps through advanced data analysis and machine learning.

Our Aurora Terminal product integrates and displays a unique blend of weather data, including our own proprietary models and external models, such as the GFS and European Center for Medium Range Forecasts (ECMWF). With visualized, quantified weather risk, our clients can feel confident making critical buy or sell decisions.

We also bring more than 30 years of experience to the world of agricultural commodities risk, providing forecasts and support for traders that want to understand the relationships between events and prices downstream. How can thunderstorms in the Pacific Ocean affect corn yield in Iowa, rice markets in Asia, or soybean planting in Argentina? How can temperatures in the stratosphere affect the planting, transportation, and sale of grains in the US? How does snow cover impact cattle farms in Texas, coffee harvests in Brazil, or wheat production in Russia? In an era of increasingly volatile weather, Riskpulse helps our clients understand the non-intuitive relationships between weather and global agriculture pricing risk.

"Riskpulse crunches massive amounts of data to identify and quantify non-intuitive signals about weather patterns—often with valuable and surprising results."

Director of Meteorology
Commodities Hedge Fund with \$1B assets under management



Distribution Network Planning

Inventory Allocation & Optimization

The media typically reports the generalized impact of supply chain events, and it's intuitive that that big storms mean big money in aggregate, but as a single organization, what can you do to avoid these disruptions? How can a large wholesale grocery supply company with more than 75 facilities from coast-to-coast keep bread and milk on its customers' shelves? How does an extensive dairy producer with over 8,000 supply chain nodes in the US keep its operations in sync during a storm? How can a multi-billion-dollar global food manufacturer with a transportation network exceeding 8 million miles prevent temperature-sensitive product from being stuck on roads and rails?

These are the questions that the Riskpulse team answers each and every day for some of the most complex supply chains in the automotive and food and beverage industries.

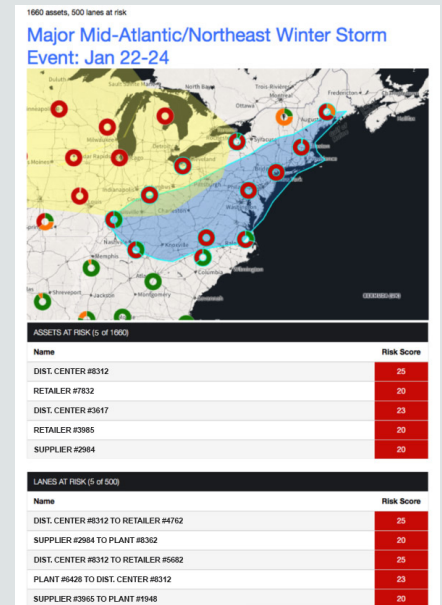
For an example of how Riskpulse optimizes inventory during critical events read, "Swinging into action before the first flakes fall" on the next page.

Swinging into action before the first flakes fall

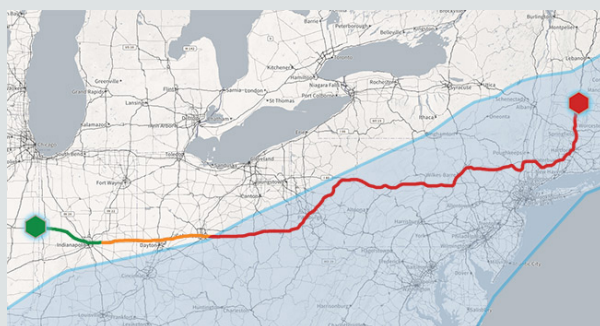
On Monday, January 18th, nearly five full days before record-setting snowfall, **our customers saw every supply chain intersecting the Midwest and Northeast U.S. had an “actionable” level of risk.** The example to the left is an alert for a single company within a grocery supply chain. Over 1,500 individual supply chain nodes (i.e. store locations, processors, manufacturing plants, warehouses, etc) needed to begin preparing for Jonas.

The transportation manager identified “over 170,000 miles of road/rail in Jonas’s path are expected to shut-down across our network between Friday and Saturday.” He then started coordinating across his transportation network by speeding up deliveries to distribution centers (DCs), asking suppliers if they should pull safety stock due to delays, and rerouting impacted over-the-road (OTR) shipments.

Another one of our Food & Beverage Shipping Solution customers proactively addressed the threat of Jonas thanks to a daily shipping lane risk report that identified nearly 30 deliveries to a single large customer that would almost certainly suffer storm delays. Due to the advanced notice, the transportation team notified customer service reps of potential delays who then worked with their clients to adjust shipment timing. DCs and stores stayed as well-stocked as possible ahead of the storm.



	A	B	C	D	E	F	G
1	Location	City	State	Date	Risk Score	Risk Category	Threats
9	[Dist. Center #70]	POTTSVILLE	PA	1/22/16	25	High	Snow
10	[Dist. Center #70]	POTTSVILLE	PA	1/23/16	25	High	Snow
16	[Dist. Center #14]	LEWISTON	ME	1/23/16	24	High	Snow
19	[Dist. Center #14]	LEWISTON	ME	1/24/16	24	High	Snow
26	[Retail Store #23]	WASHINGTON COURT HOUSE	OH	1/24/16	23	High	Temperature
30	[Retail Store #51]	WINTERSVILLE	OH	1/24/16	23	High	Temperature
110	[Dist. Center #14]	LEWISTON	ME	1/22/16	24	High	Snow
125	[Dist. Center #70]	POTTSVILLE	PA	1/22/16	25	High	Winter Weather
231	[Dist. Center #14]	LEWISTON	ME	1/23/16	24	High	Snow
232	[Dist. Center #16]	GORDONSVILLE	VA	1/21/16	20	High	Winter Weather
233	[Dist. Center #95]	BEDFORD	PA	1/21/16	25	High	Snow
558	[Dist. Center #94]	HENDERSON	NC	1/21/16	20	High	Winter Weather
560	[Dist. Center #47]	WINTERSVILLE	OH	1/22/16	23	High	Temperature
670	[Dist. Center #62]	LONDON	KY	1/25/16	20	High	Winter Weather
725	[Retail Store #29]	WASHINGTON COURT HOUSE	OH	1/23/16	23	High	Temperature
726	[Dist. Center #94]	HENDERSON	NC	1/24/16	20	High	Winter Weather
728	[Dist. Center #47]	WINTERSVILLE	OH	1/25/16	23	High	Temperature
730	[Dist. Center #16]	GORDONSVILLE	VA	1/25/16	20	High	Winter Weather
775	[Dist. Center #95]	BEDFORD	PA	1/30/16	25	High	Snow
778	[Dist. Center #47]	WINTERSVILLE	OH	1/23/16	23	High	Temperature
779	[Dist. Center #70]	POTTSVILLE	PA	1/23/16	25	High	Snow
1536	[Dist. Center #95]	BEDFORD	PA	1/23/16	25	High	Snow
1537	[Retail Store #29]	WASHINGTON COURT HOUSE	OH	1/23/16	23	High	Temperature
1538	[Dist. Center #16]	GORDONSVILLE	VA	1/21/16	20	High	Winter Weather
1560	[Retail Store #31]	GORDONSVILLE	VA	1/21/16	20	High	Winter Weather
1566	[Retail Store #64]	HENDERSON	NC	1/25/16	20	High	Winter Weather
1613	[Dist. Center #62]	LONDON	KY	1/24/16	20	High	Winter Weather



Additionally, a wholesale grocer reported **a \$1 million spike in sales in a single day** just before Jonas hit one of their retail customers. Proactive business continuity and transportation managers avoided disruptions thanks to the coupling of early high confidence forecasts and an understanding of the high impact implications both upstream and downstream. By anticipating a “bread and milk run” before the blizzard, customer service managers and buyers facilitated communications with retailers and shipped excess inventory early to make sure shipments weren’t getting stuck on roads and shelves didn’t go empty when the crush of shoppers hit the store.

With this level of advanced forecasting, enhanced transportation network visibility, and collaboration tools available for your channel partners, today’s supply chains can become more resilient and adaptive than ever before. **It’s now possible to deliver measurable results and avoid the crippling impact of the next winter storm Jonas.**



Production Planning

Resource Scheduling (Lines & Unit Ops)

Collaborate with suppliers, carriers, and buyers to identify supply chain risks and network decision-making. Today's manufacturers cannot afford slow-moving communication and a lack of decisive action when addressing threats. The way you organize the flow of information around these events can make or break your operation. Riskpulse empowers manufacturers, carriers, and suppliers with a shared view of relevant, real-time risks to their facilities and transportation lanes in order to adapt to events and minimize plant downtime.

Streamline communication. Communicating across many different channels limits your visibility into the impact weather risk will have on your supply chain. Beyond aggregating weather risk information, our platform allows your team to update status and announce closures or delays over the web and mobile, so your supply chain can stay in sync before, during, and after decisions are made.

Know the risks threatening your logistics. Adapt to conditions and discover opportunities to improve your resource utilization while updating facility operational status. Customized risk profiles automatically configure your maps, analytics, alerts, and reports to be relevant and actionable for your organization. Transform reactive scrambles using disparate silos of information to proactive decision-making that prepares and protects your supply chain.



Transportation Planning

Transport Route Optimization - Truck Load Planning & Load Building - Transportation Forecasting

Visualize risk to your shipping lanes and optimize your freight spend. Riskpulse equips food and beverage shippers, carriers, and third-party logistics providers (3PLs) with a continuous assessment of forecasted risks to over-the-road (OTR) and intermodal transportation lanes. Our platform enables shippers, carriers, and 3PLs to gather valuable insights about client shipments and delivers unsurpassed accuracy and confidence when making go / no-go decisions, timing shipments, choosing insulation, and loading cargo.

Monitor your network with cargo-specific risk. The foundation of the Riskpulse platform is customized to the specific conditions that threaten your routes. Tailored profiles inform a risk score attached to specific commodities, from beer to wine to mayonnaise to paint, and more. This scoring is the key to transforming your organization from reactive scrambles to proactive decision-making.

Avoid losses by visualizing route-based forecasts. Assess temperature risk and forecast conditions across your OTR or intermodal lanes up to 10 days in advance. Because our platform monitors conditions for all of North America, it will automatically highlight the stretches that jeopardize the integrity of your clients' valuable cargo so you can make informed routing and insulation decisions to minimize disruptions and reduce costs.

Display conditions at origins, destinations, and waypoints. Riskpulse customers can browse forecasts and conditions for every city and intermodal facility in North America to inspect forecasts at each leg of the journey from plant to wholesaler to retailer. Our maps, alerts, reports, and sophisticated analytics make it easy to monitor conditions coast-to-coast and provide you with the situational awareness needed to justify logistics decisions.