Sustainability Insights

Supply chain resilience: Identifying flood vulnerabilities in Thailand's Eastern Economic Corridor

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Key Takeaways

- Thailand's Eastern Economic Corridor (EEC) is a key region for manufacturing in the global automotive and semiconductor industries, but the road network that enables the EEC to succeed as a supply chain hub is vulnerable to river flooding.
- New high-resolution river flood projections from S&P Global Sustainable1 combined with historical data from flood-modeling firm JBA Risk Management have identified the most vulnerable segments of the EEC's roads where material flooding is likely to disrupt logistics.
- The model locates 73 kilometers of key roadway in the corridor with a 10% or greater annual chance of flooding to 0.5 meters in depth in the 2030s, a level of flooding that is unsafe for cargo transport. Furthermore, there are 29 km of road with a 50% or greater annual chance of flooding at this depth — meaning that every other year, on average, key segments of roadway could become impassable in the 2030s.
- Severe flooding in Thailand in recent years shows that even if manufacturing facilities stay dry during a flood, inundated roadways can bring supply chains to a standstill, thus preventing components from reaching production lines and finished goods from reaching seaports and airports.

Climate hazards such as drought, extreme heat and flooding pose threats to business assets across industries and around the world. The interconnected nature of modern supply chains, which may feature hundreds of discrete logistical points, means that a single extreme weather event or gradual climate-driven increases to operating costs in one link of a global supply chain can have a material financial impact on a company serving markets thousands of miles away.

One key nexus of global suppliers is the region in Thailand known as the Eastern Economic Corridor (EEC), which stretches east of Bangkok along the Gulf of Thailand and includes the three provinces of Chonburi, Rayong and Chachoengsao. As the manufacturing heart of Thailand's economy, the EEC accounted for nearly 15% of the nation's GDP in 2025,[1] and its concentration of vehicle, circuit board and semiconductor manufacturing facilities and shipping ports make it a linchpin of the global automotive and electronics supply chains.

However, the factories, industrial parks and ports that define the corridor are only as resilient as the road network that connects them. Thailand has experienced and will continue to face extreme flooding events capable of shutting down the highways that enable the EEC's function as a key supply chain link. In this analysis, Sustainable1 from S&P Global Energy Horizons applies new high-resolution climate projections of fluvial, or river, flooding to five key roads in the EEC to show how detailed modeling can identify the chokepoints where stretches of road are particularly vulnerable to failure. This climate-conditioned model provides current and future fluvial flood depths at 30-meter resolution globally. It combines baseline, present-day probabilistic flood hazard and defense data from flood-modeling firm JBA Risk Management with climate projections and interpretation from Sustainable1.

Future changes to river flood risk due to climate change vary by region, driven by changing precipitation, temperature and weather patterns. In many places, future climate scenarios indicate that what are currently 100-year floods will become more frequent over time. Considerable uncertainty remains about regional impacts, which motivates S&P Global Sustainable1's use of more than 20 state-of-the-science climate models to provide a range of projections. The high-resolution flooding model is driven by the mean climate signals over these 20+ models.

Identifying the roads most likely to fail during floods and improving them to withstand climate change-driven flooding is essential to supply chain resilience. In the case of the EEC, we find that a total of 73 kilometers across the region's five major freight roadways have a 10% or greater chance of traffic-stopping inundation (0.5 meters or more of flood depth) annually in the 2030s decade. This probability corresponds to a 10-year flood return period, which is considered frequent from a risk-management perspective.[2]

In addition to measuring the road lengths exposed to this 10% flood probability, we also identify areas facing a much higher chance of material flooding. Parts of the EEC show concentrations of road segments with 50% or greater probability of at least 0.5 meters of flooding in the 2030s. Prioritizing flood defenses in these areas would have the largest benefit for the companies and markets whose supply chains rely on the EEC.

In this report, we will describe in more detail the EEC's importance to key global supply chains and review the damage caused by extreme flooding events in 2011, before presenting the findings of our analysis of flood vulnerabilities in the region's roadways. A full description of the methodology and datasets used is provided in the appendix.

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[1] "EEC Thailand 2025 Redefines Future Supply Chains." July 31, 2025. Market Research Thailand (Eurogroup Consulting). https://marketresearchthailand.com/insights/articles/eec-thailand-2025-supply-chains-future

[2] Return period refers to the annual probability that a flood of a specific depth or greater will occur in a specific location. A 20-year flood depth has a 5% annual chance of being exceeded, and a 100-year flood depth has a 1% annual chance of being exceeded. Return periods are based on modeling that uses historical data; as the Earth's climate changes, severe flooding is expected to become more frequent in many locations. For example, a flood depth seen in the past on average once every 100 years may be seen once every 50 years in future decades.

Historical supply chain shocks from EEC flooding

The EEC's importance to global supply chains is anchored by two industries — automotive and electronics — and both suffered extensive damage during severe flooding in 2011.

These floods lasted from July 2011 through December 2011. The waters swept across 66 of Thailand's 76 provinces, affecting more than 13 million people and causing total economic damage of an estimated $46.5 billion).[3] The disruption to Thailand's manufacturing base reduced global industrial production by an estimated 2.5%.[4]

Before the floods, Thailand was the most important node in the global hard disk drive supply chain, accounting for 41% of worldwide production and housing assembly facilities for four of the five major manufacturers.[5] Four months into the flooding, up to 50% of the world's hard-drive manufacturing capacity had been lost or damaged.[6]

The flooding also caused the nine major automakers operating in Thailand at the time, including Honda, Toyota and Nissan, to suspend production for several weeks. Nissan alone reported the inundation of 120 different suppliers in the country and recorded the loss of about 40,000 vehicles.[7] The disruption became global: Production cuts of between 30% and 50% were recorded at many car assembly plants around the world in November 2011.[8]

While the 2011 floods caused extensive damage to production facilities, they had even wider repercussions for logistics in the region, flooding roadways and making key transport arteries inaccessible.

Modern manufacturing supply chains are built on the logic of just-in-time delivery, in which components arrive at the factory floor when needed, reducing the need for large inventory buffers. Behind that efficiency is a key assumption that transport and logistics operate smoothly and reliably. This makes the road network linking facilities and points of egress — primarily shipping ports — into a load-bearing element of the production system itself. During a flood, even factories that are physically dry can grind to a halt if the transport network is compromised. This played out in 2011 for global manufacturers such as Toyota, which suspended operations at its Thai factories because supply routes had become inaccessible and components could not reach the line.[9]

Transportation remains a structural vulnerability for the EEC, where flooding of a much higher frequency and lower water depth can create chokepoints at key road segments that stop traffic flow.

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[3] “Thai Flood 2011: Rapid Assessment for Resilient Recovery and Reconstruction Planning.” 2012. World Bank. https://documents1.worldbank.org/curated/en/677841468335414861/pdf/698220WP0v10P106011020120Box370022B.pdf

[4] Haraguchi, Masahiko. “Flood Risks and Impacts: A Case Study of Thailand’s Floods in 2011 and Research Questions for Supply Chain Decision Making,” n.d. doi:10.1016/J.IJDRR.2014.09.005. https://www.academia.edu/9715754/Flood_risks_and_impacts_A_case_study_of_Thailand_s_floods_in_2011_and_research_questions_for_supply_chain_decision_making

[5] “The impact of the flood in Thailand on the global supply chain and the future of HDD and automotive production hubs in Thailand.” Bank of Thailand Monetary Policy Report Q2 2012. https://www.bot.or.th/content/dam/bot/documents/en/our-roles/monetary-policy/mpc-publication/monetary-policy-report/mpr-box/IR_2012_Q2_BOX1.pdf

[6] “Flood waters in Thailand deepen crisis at HDD companies.” Oct. 17, 2011. Forbes. https://www.forbes.com/sites/tomcoughlin/2011/10/17/flood-waters-in-thailand-deepen-crisis-at-hdd-companies/

[7] “Thailand Flood 2011: One Year Retrospective.” October 2012. Guy Carpenter. https://www.guycarp.com/content/dam/guycarp/en/documents/dynamic-content/Thailand%20Flood%202011_One%20Year%20Retrospective.pdf

[8] “The impact of the flood in Thailand on the global supply chain and the future of HDD and automotive production hubs in Thailand.” Bank of Thailand Monetary Policy Report Q2 2012. https://www.bot.or.th/content/dam/bot/documents/en/our-roles/monetary-policy/mpc-publication/monetary-policy-report/mpr-box/IR_2012_Q2_BOX1.pdf

[9] “Thailand Flood 2011: One Year Retrospective.” October 2012. Guy Carpenter. https://www.guycarp.com/content/dam/guycarp/en/documents/dynamic-content/Thailand%20Flood%202011_One%20Year%20Retrospective.pdf

Identifying climate risk chokepoints

In our analysis of the EEC's flood exposure, we sought to identify the roadway segments that are more likely to become inaccessible during relatively frequent flood events rather than the low-probability, high-flood depth events that could inundate the region's production facilities. If a handful of vulnerable chokepoints — stretches of road with low elevation that follow a nearby stream or that cross a floodplain — are inundated to a depth that makes freight passage dangerous, the entire corridor may cease to function as traffic reroutes, backs up or halts entirely.

The practical implication for supply chain managers is significant, as facility-level flood risk assessment may not capture this exposure. A company may know that its factory is resilient to floods of a 100-year return period depth — that is, floods with a 1% annual probability of occurring. But it may not know whether the road connecting that factory to its suppliers, or to the container port bringing its products to the global market, crosses a segment with a much higher annual probability of material flood depth.

Our methodology applies the same high-resolution fluvial flood model to road infrastructure that we applied to single-family homes and datacenters in two previous analyses. In our assessment of the EEC, we use a flood-depth threshold of 0.5 meters, which is consistent with the threshold used in our earlier analysis and is roughly the water depth that studies have shown a passenger four-wheel-drive or offroad vehicle can safely ford.[10] This is a conservative threshold for cargo-bearing trucks designed for highway use and normal driving conditions.

For every 1 km segment of a roadway, the annual probability of exceeding 0.5 meters in flood depth was calculated across return periods from two years (50% annual probability) to 1,000 years (0.1% annual probability). Each segment was then assigned the probability corresponding to the lowest return period at which the 0.5-meter threshold was exceeded. For example, a segment where 0.5 meters is first reached at the 20-year return period is assigned a 5% annual exceedance probability. This means it faces a material freight disruption risk roughly once every twenty years on average.

We focused our analysis on one future decade, the 2030s, to emphasize the near-term risk of flooding. We provide results for the Intergovernmental Panel on Climate Change SSP2-4.5 scenario, which assumes strong mitigation of greenhouse gas emissions resulting in global average temperatures rising by 2.7 degrees C (2.1 degrees C-3.5 degrees C) by 2100. S&P Global has estimated there is a 50% likelihood of the global average temperature increase will exceed 2.3 degrees C by 2040, indicating that SSP2-4.5 is a useful approximation of the likely outcome of current climate policies. Warmer scenarios, in which less action is taken to curtail emissions, in turn display more severe climate hazards such as flooding, particularly in projections after 2050.

[10] Pregnolato et al., "The impact of flooding on road transport: A depth-disruption function. Transportation Research Part D: Transport and Environment, Volume 55, 2017, Pages 67-81, ISSN 1361-9209.
sciencedirect.com/science/article/pii/S1361920916308367

Overall road network vulnerability

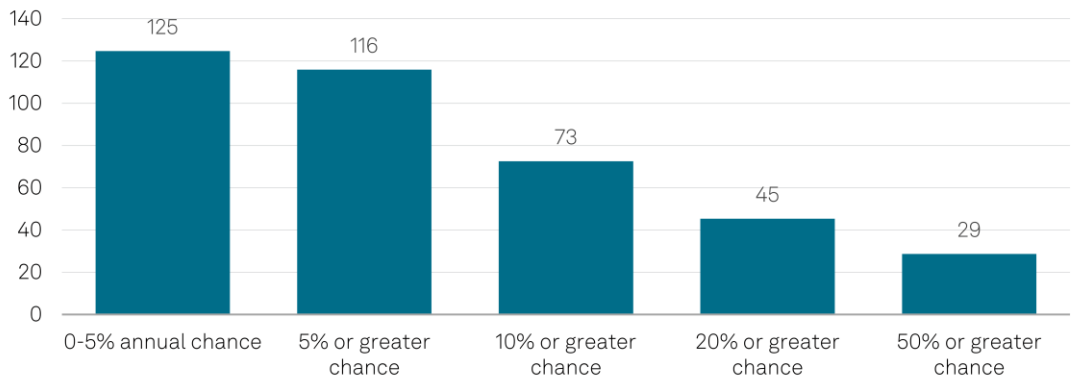
Across the five roadways in our analysis, 358 km has at least some level of fluvial flood exposure. This is the total length of road with a non-zero annual probability of flood depth of 0.5 meters or more in the 2030s. Of this total, about 73 km have an annual probability of 10% or more.

If we accumulate the annual probabilities over a longer term, the chance of material disruption is larger. For example, over a 10-year period, a segment of road with a 10% annual exceedance probability has approximately a 65% cumulative chance of flooding at least once.

Our analysis also found that 29 km of road has a 50% or higher annual chance of reaching 0.5 meters of flood depth — meaning that every two years, on average, these stretches of road are expected to become impassable to freight transport.

73 km of key roadways in the EEC face a 10% annual probability of 0.5m or more of flooding in the 2030s

Total road length across five key roadways in the EEC by annual probability of experiencing 0.5 meters or more of flood depth



As of June 4, 2026.

EEC = Eastern Economic Corridor.

Chart reflects modeled outputs for the 2030s decade under SSP2-4.5, a medium climate change scenario that contemplates strong mitigation, in which total greenhouse gas emissions stabilize at current levels until 2050 and then decline to 2100. This scenario is expected to result in global average temperatures rising by 2.7 degrees C (2.1 degrees C-3.5 degrees C) by the end of the century.

Annual probability is interpolated from the log-return period depth curve. For example, a 5% chance includes return periods of RP20 and lower.

0.5 meters of flood depth is used as a potential threshold for causing material traffic stoppage. Fluvial (river) flooding is considered as the cause of flooding at this depth.

Source: Sustainable1 from S&P Global Energy Horizons.

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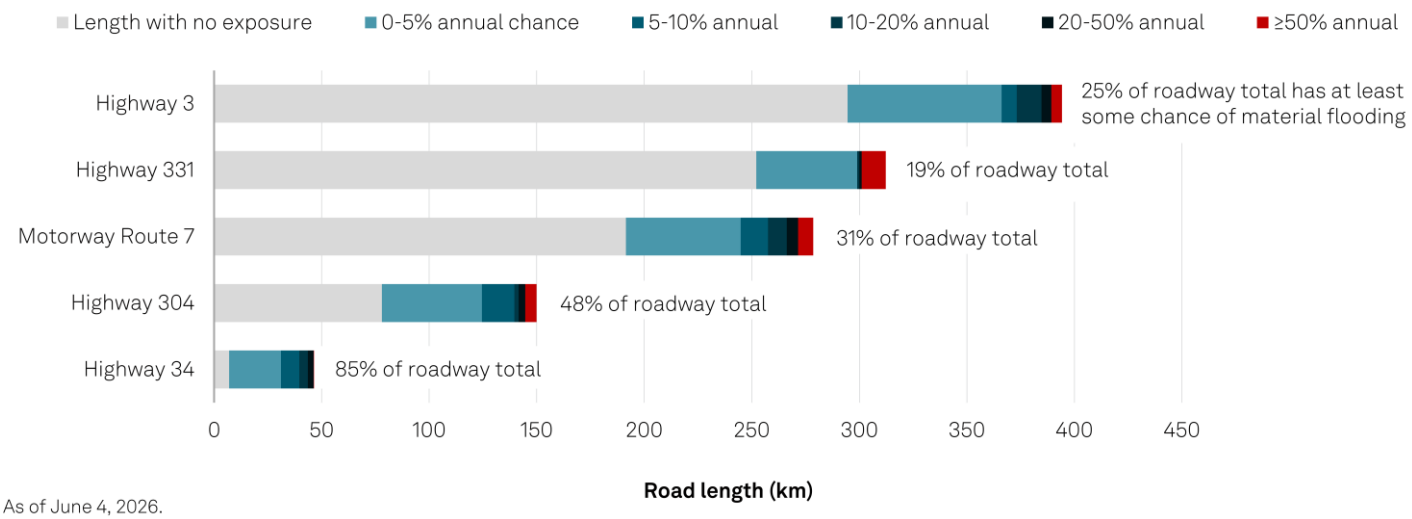
Exposure by roadway

This flood risk is not evenly distributed across the five roadways, each of which are of different lengths and cross elevations and terrain that dictate flood exposure.

- Highway 34 from Bangkok in the northwest continues into the EEC for 47 km, crossing the Bang Pakong River and a number of tributary streams. It is the shortest major roadway in the corridor and by far the most exposed to flooding: 85% of its length in the EEC has at least some chance of material flooding annually in the 2030s.
- Highway 304 stretches into the EEC for 150 km from Bangkok in the west, and it likewise traverses many streams and low-lying areas in the Bang Pakong watershed. About 48% of its length is exposed to material annual flooding.
- Motorway Route 7, which covers 279 km in the EEC, also crosses the Bang Pakong and its network of waterways before traveling the length of the corridor. It is one of the major routes connecting Bangkok and the many industrial zones near the Bang Pakong River to the seaport of Laem Chabang and U-Tapao Rayong-Pattaya International Airport, two primary departure points for goods produced in the EEC. About 31% of Motorway Route 7 has exposure to material flood depth.
- Highway 331 connects large industrial parks farther inland with the coast. Of the five major highways assessed, Highway 331 has the smallest percentage of length exposed to flooding at 19%.
- Highway 3 hugs the coastline along the length of the EEC and passes both Laem Chabang and U-Tapao Rayong-Pattaya International Airport before continuing to Bangkok. As the longest of the five highways in this analysis, it also has the greatest total length of road exposed to flooding annually: 100 km, or 25% of its length in the EEC.

Much of the EEC's major road network faces high risk of 0.5m or more of flooding annually in the 2030s

Road length segments of five key roadways in the EEC by annual probability of experiencing 0.5 meters or more of flood depth



As of June 4, 2026.
EEC = Eastern Economic Corridor.
Chart reflects modeled outputs for the 2030s decade under SSP2-4.5, a medium climate change scenario that contemplates strong mitigation, in which total greenhouse gas emissions stabilize at current levels until 2050 and then decline to 2100. This scenario is expected to result in global average temperatures rising by 2.7 degrees C (2.1 degrees C-3.5 degrees C) by the end of the century.
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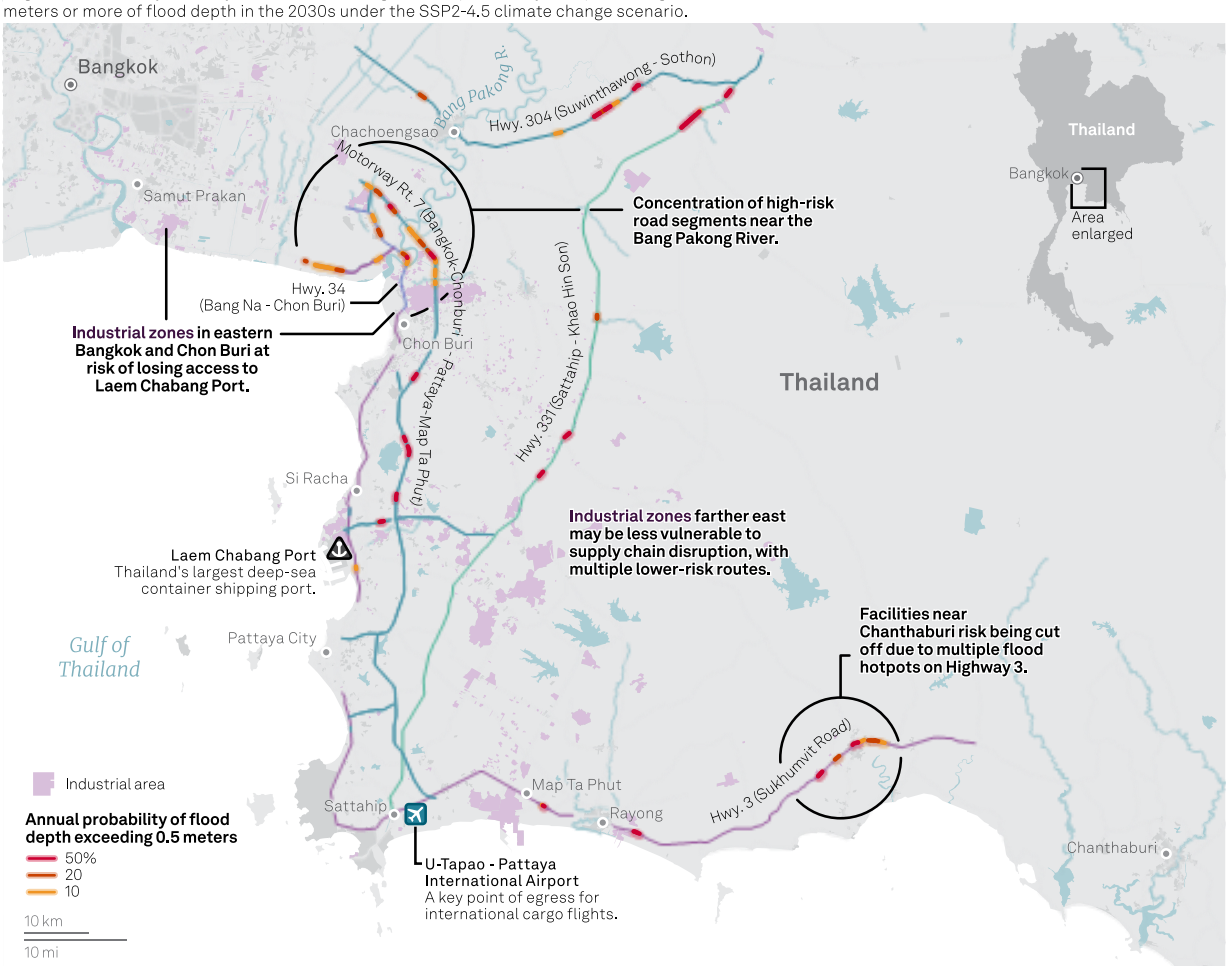
Flooding chokepoints

Beyond overall exposure, our analysis identifies the road segments where flood depth of 0.5 meters or more has an annual probability of 50% or more. In some parts of the EEC, these road segments at risk of frequent failure are concentrated around rivers, streams or low-lying terrain. There is a particularly high concentration of these high-probability segments on Motorway Route 7 and Highway 34 as they traverse the Bang Pakong River. Motorway Route 7 also features a cluster of high-risk segments near Laem Chabang port.

The flood model used in our analysis accounts for any existing manmade flood defenses, such as levees. Any stretch of road that can be identified as elevated, such as a bridge, is assigned a zero chance of flooding. With this in mind, the high incidence of at-risk road segments near the Bang Pakong River and its tributaries signals a need for greater flood defense infrastructure. Any 1-km road segment identified as having a 50% or greater annual probability of material flooding is where targeted infrastructure investment would yield the highest protective return for the corridor as a whole.

Material flood exposure chokepoints exist across Thailand's Eastern Economic Corridor

Segments of five key roadways in the EEC with high annual probability of experiencing 0.5 meters or more of flood depth in the 2030s under the SSP2-4.5 climate change scenario.



Annual probabilities reflect modeled outputs for the 2030s decade under SSP2-4.5, a medium climate change scenario that contemplates strong mitigation, in which total greenhouse gas emissions stabilize at current levels until 2050 and then decline to 2100. This scenario is expected to result in global average temperatures rising by 2.7 degrees C (2.1 degrees C-3.5 degrees C) by the end of the century.
Annual probability is interpolated from the log-return period depth curve. For example, a 5% chance includes return periods of RP20 and lower.
0.5 meters of flood depth is used as a potential threshold for causing material traffic stoppage. Fluvial (river) flooding is considered as the cause of flooding at this depth.
Data from Horizons Sustainable1. Compiled June 4, 2026
Source: S&P Global Energy, OpenStreetMap Contributors, MapTiler

Implications for companies, policymakers and investors

For companies, data identifying transport weaknesses and potential chokepoints can allow supply-chain managers to stress test their logistics plans against specific failure scenarios. In practice, this means identifying the roads that a given facility depends upon for inbound components and outbound finished goods, and then overlaying that dependency map against chokepoints. Where a single high-probability segment sits on a critical route, the logical responses could include setting alternative routing options, creating protocols to keep more inventory on hand based on flood forecasts, and prioritizing supplier diversification away from facilities that all rely on a single primary road.

For governments investing in road infrastructure, this data can help understand where money should be spent to protect the most economic value in the event of a flood. Targeted flood adaptation measures at chokepoints would yield a disproportionately high protective return relative to cost by defending the weakest link. As Thailand continues to attract large-scale electric vehicle and semiconductor foreign investment into the EEC, the economic case for targeted infrastructure hardening will only strengthen.

For investors and lenders with exposure to EEC-based manufacturers or suppliers, material road-level flooding falls into a category of tail risk that historically has been difficult to express in portfolios. Climate physical risk assessments of corporate assets such as manufacturing facilities are becoming increasingly standard. But as the events of 2011 demonstrated, an unharmed facility can still shut down if its supply chain collapses due to a road severance upstream or downstream. The gap in awareness of risk at the asset level versus risk at the logistics level will only become more material as the EEC attracts more capital from global investors.

Looking forward

Investments made by major players that in key industries, including semiconductor producers Intel and TSMC and electric vehicle manufacturers like BYD, mean that the EEC will continue to be an important link in global supply chains.[11] As the value of what moves through the EEC's road network grows, so does the cost of disrupting it. Detailed projections of where flooding is more likely to be frequent and material can help companies manage their exposure to one of the most relevant climate physical risks facing Southeast Asia.

With thanks to Kim Kresan for map design.

[11] “EEC Thailand 2025 Redefines Future Supply Chains.” July 31, 2025. Market Research Thailand (Eurogroup Consulting). https://marketresearchthailand.com/insights/articles/eec-thailand-2025-supply-chains-future

Appendix

Methodology for roadway flood exposure

The flood depth data underpinning this analysis was generated in-house by the Climate Center of Excellence within Sustainable1 from S&P Global Energy Horizons, using a high-resolution (30-meter grid) flood inundation model run across nine return periods (2, 5, 10, 20, 50, 100, 200, 500 and 1,000 years) for each decade from the 2020s through to the 2090s, and across four Shared Socioeconomic Pathway (SSP) climate scenarios.

This paper uses the SSP2-4.5 scenario, a moderate emissions trajectory consistent with current policy commitments and widely used as the central planning case in climate risk assessments.

Highway corridor geometry was sourced from OpenStreetMap. Each highway shapefile was divided into discrete 1 km segments, which were then intersected with the flood depth raster for each return period and time period. A segment is classified as flood-exposed in our analysis if the modelled flood depth at its location meets or exceeds 0.5 meters, a threshold at which road surfaces become dangerous for freight and commercial vehicles. For a given return period and time period, the flood depth assigned to each 1 km segment is the maximum of the flood depths in the set of 30-meter pixels touched by the 1 km segment.

For each exposed segment, the analysis identifies the lowest return period (i.e., the most frequent) at which the 0.5-meter depth threshold is breached, and assigns that return period as the segment's flood probability. For example, a segment first exposed to at least 0.5 meters of flood depth under a 10-year return period is assigned a 10% annual exceedance probability, meaning it faces at least a 10% chance of experiencing flood depths of 0.5 meters or greater in any given year. Corridor-level exposure statistics are then calculated as the percentage of total 1 km segments meeting each probability threshold.

In the EEC region of Thailand, projections of flood exposure for the 2030s are similar to those for the 2040s and 2050s. Therefore, this analysis presents projections for the 2030s decade as a near-term view of a material climate physical risk and to provide a time horizon in which adaptation and resilience investments could be deployed. Many climate physical risk hazards are projected to worsen more significantly after 2050.

Roadway definitions and scope

The five highway corridors examined in this paper collectively span approximately 1,181 km of road network across the EEC region. Exposure percentages are calculated as a proportion of each corridor's total length. Road lengths as used in these calculations are as follows:

Roadway	Total length (km)	Role
Highway 34 (Bang Na-Chonburi)	46	Bangkok-EEC gateway
Highway 304 (Suwinthawong-Sothon)	150	Northern inland connector
Motorway Route 7 (Bangkok-Chonburi-Pattaya-Map Ta Phut)	279	Primary motorway spine
Highway 3 (Sukhumvit Road)	394	Coastal corridor, full EEC length
Highway 331 (Sattahip-Khao Hin Son)	312	Southern EEC corridor

Flood model comparison to observed flood events

To evaluate the fluvial flood model, we compare modeled flood depth maps at return periods with flooded area extents from documented events. The flood model predicts probabilities (reciprocal of return period) of annual flood depth at individual locations, not specific flood events. Conceptually, these probabilistic location-by-location flood depths can be thought of as resulting from a statistical analysis of many potential events, rather than any single event. Nonetheless, comparison to single events offers a useful qualitative assessment. While such a comparison does not validate the model, it can invalidate the model if the flooding occurs in a region where the model assigns little or no probability.

Figures 1-3 compare observed flooded-area extents from single events to model return-period flood-depth maps in San Jose, California, (Figure 1), Altenahr, Germany (Figure 2), and Bangkok, Thailand (Figure 3). In each example, return periods are selected to approximately bracket the observed flood extent. In other words, the model assigns plausible flood depth probabilities to these major flood events in most regions. For each region, we also calculate the fraction of the observed flooded area that the model indicates has non-zero flood depth at all nine return periods (Tables 1-3).

If the model displays flooding in most of the observed flooded region at long return periods, then the model is reasonably consistent with, and not invalidated by, the observations. In addition, the change in this fraction with return period provides an estimate of the return period of the majority of the event's flooded locations.

San Jose, California, experienced significant flooding in January 2017. The observed flood extent is larger than the modeled regions with non-zero 100-year flood depth, but smaller than the regions with 200-year flood (Fig. 1), indicating that most of the observed flooding had return periods between 100 and 200 years. The fraction of the observed flood area inundated in the model increases from 0.25 to 0.82 from 100 to 200 years. At the 1,000-year return period, most but not all the observed flood area is reproduced by the model (0.84). The remaining 0.16 could indicate model shortcomings. It could also indicate the presence of pluvial (direct rain on surface) or coastal flooding in the observations, which are modeled separately.

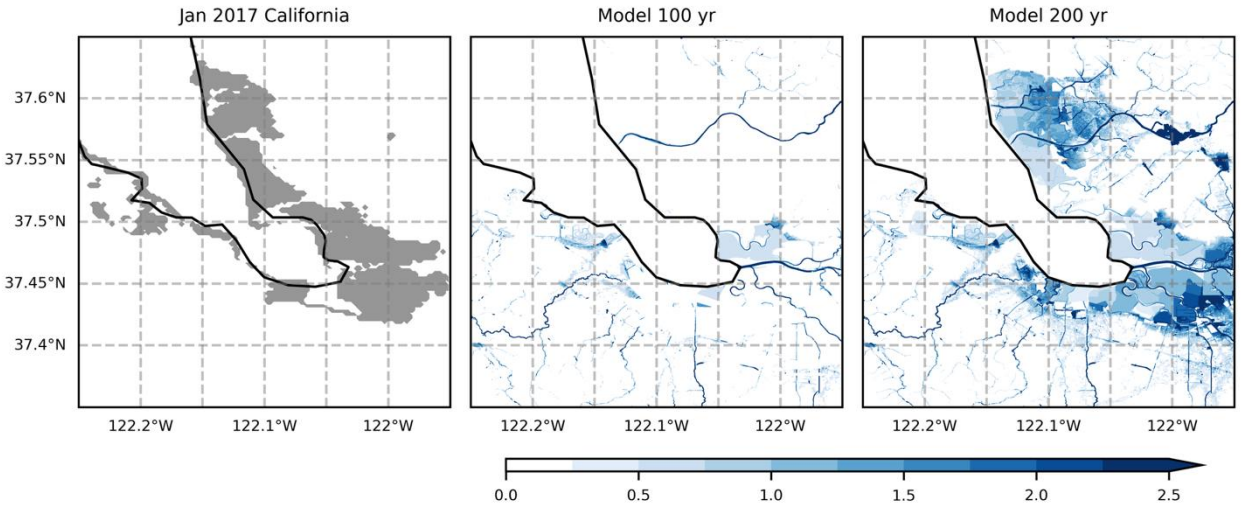


Figure 1: Observed January 2017 flood area extent in a 30 km vicinity of San Jose, California vicinity (left). Modeled flood depth maps (meters) for the 100-year (center) and 200-year (right) return periods. Observed flood extents come from MODIS satellite flood data (https://global-flood-database.cloudtostreet.ai).

RP (years)	2	5	10	20	50	100	200	500	1000
fraction	0.09	0.10	0.12	0.15	0.16	0.25	0.82	0.84	0.84

Table 1: Fraction of the San Jose flooded extent (Fig. 1) that is flooded by the model at different return periods.

The town of Altenahr in the Ahr River Valley of Germany experienced devastating flooding in July 2021. Much, though not all, of the flood extent falls between the modeled 50-year and 500-year return period flood depths (Figure 2). The fraction of the observed flood area also flooded in the model increases steadily from 0.36 at the two-year return period to 0.84 at the 1,000-year return period.

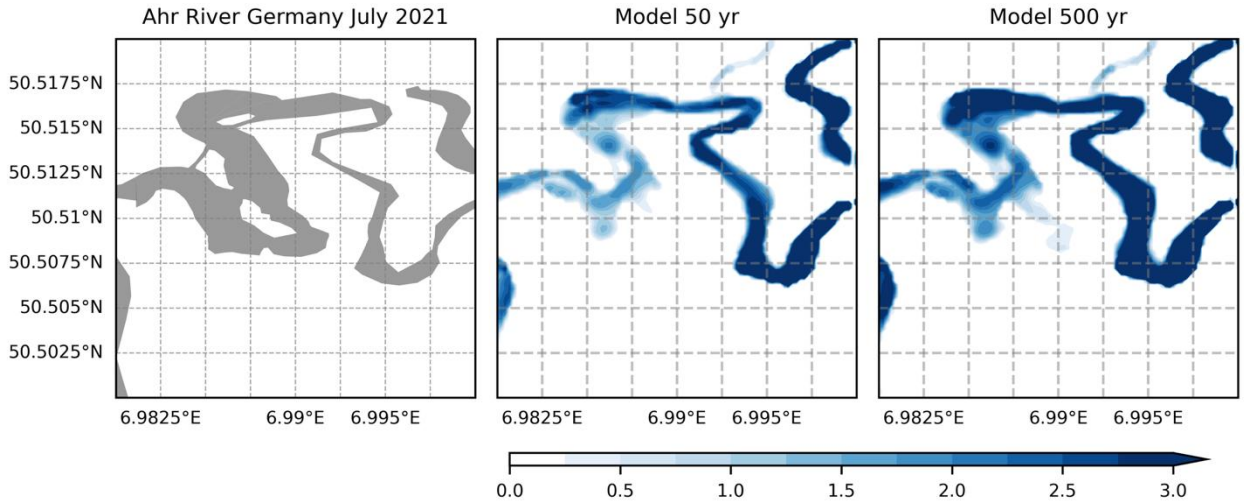


Figure 2: Observed July 2021 flood area extent in a 2km vicinity centered on the town of Altenahr in the Ahr River Valley, Germany (left). Modeled flood depth maps (meters) for the 50-year (center) and 500-year (right) return periods. Observed flood extents come from the data supplement published for the study "A multi-disciplinary analysis of the exceptional flood event of July 2021 in central Europe," Schäfer, Andreas, and Julian Francesco Daniel Quinting. https://www.radar-service.eu/radar/en/dataset/XoHpmcjErwsfADvq

RP (years)	2	5	10	20	50	100	200	500	1000
fraction	0.36	0.54	0.63	0.67	0.72	0.74	0.77	0.82	0.84

Table 2: Fraction of the Altenahr flooded extent (Figure 2) that is flooded by the model at different return periods.

Central Thailand experienced widespread flooding in September 2012, much of which (0.91) is flooded by the 50-year modeled flood depths (Figure 3). In fact, the model indicates that half (0.50) of the observed flooded area floods frequently, on average every two years (two-year return period), though the typical depth of such flooding is much less than at longer return periods.

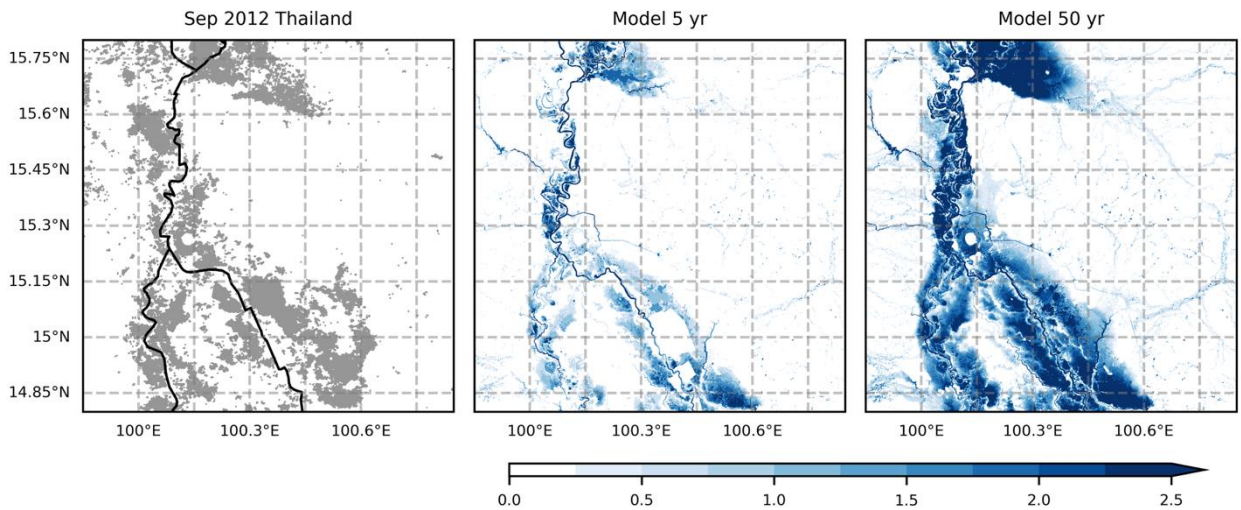


Figure 3: Observed September 2012 flood area extent in a 100 km vicinity of central Thailand (left). Modeled flood depth maps (meters) for the 10-year (center) and 100-year (right) return periods. Observed flood extents come from MODIS satellite flood data (https://global-flood-database.cloudtostreet.ai).

RP (years)	2	5	10	20	50	100	200	500	1000
fraction	0.50	0.69	0.79	0.84	0.91	0.93	0.95	0.97	0.99

Table 3: Fraction of the central Thailand flooded extent (Fig. 3) that is flooded by the model at different return periods.

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