**Competitor Landscape for Tourism‑oriented Climate‑Risk Scoring Models**

This report analyses the tools and indexes mentioned in the user-provided document and additional sources. It focuses on what databases, variables, and methodologies each competitor uses and highlights the gaps that CRISI (Climate Resilience Investment Scoring Intelligence) could fill. Competitors can be categorized into three broad groups: public sector tools, private/commercial platforms, and academic prototypes.

**Public-sector tools and indices**

| **Tool/provider** | **Methodology & databases (key variables)** | **Strengths** | **Key limitations/gaps** |
| --- | --- | --- | --- |
| **EIB Climate Risk Country Scores (EU)** | Index combining multi-hazard exposure data (e.g., flood, heat, sea‑level rise) with socio-economic “adaptive capacity” variables. Separate *physical* and *transition* risk scores are produced for 180+ countries. The model aggregates hazard exposures and resilience factors to rate each country’s vulnerability[eib.org](https://www.eib.org/en/publications/economics-working-paper-2021-03#:~:text=comprehensively%20assess%20the%20climate%20change,faced%20by%20firms%20in%20each). | Comprehensive national coverage and integration of adaptation capacity. Helps banks and policymakers prioritise adaptation finance. | Very coarse (national) scale; no sub-national or sector-specific detail; not tailored to tourism or infrastructure. |
| **World Bank Climate & Disaster Risk Screening Tools** | Interactive modules where project teams input sector/location information. GIS layers showing flood zones, drought trends, and other hazards are overlaid with socio-economic context to produce qualitative “High/Medium/Low” ratings and guidance[ndcpartnership.org](https://ndcpartnership.org/knowledge-portal/climate-toolbox/climate-disaster-risk-screening-tools#:~:text=The%20Climate%20%26%20Disaster%20Risk,potential%20risks%20to%20climate%20change). | Encourages systematic consideration of climate risks early in project design; widely applicable across sectors and countries. | Qualitative and process-driven; outcomes depend on user inputs; no automated scoring engine or economic loss estimates; not tourism-specific. |
| **ADAPTUR Rapid Climate Risk Self‑Assessment (Mexico)** | Checklist-based self-assessment for tourism project design. It asks guided questions about site hazards, regulatory context, community vulnerability, infrastructure, operations, environment, finance, and market. Outputs a risk profile and adaptation measures. | Sector-specific for tourism; integrates climate concerns into early planning; simple and low‑cost. | Depends on subjective inputs; no AI or predictive modelling; limited to current risks; results are location-specific and not easily scalable to other countries. |
| **National / Regional indices (e.g., FEMA National Risk Index – USA)** | Aggregates expected annual losses from 18 natural hazards, social vulnerability, and community resilience at the county or census‑tract level[fema.gov](https://www.fema.gov/flood-maps/products-tools/national-risk-index#:~:text=The%20National%20Risk%20Index%20is,county%20and%20Census%20tract%20levels). | Granular spatial coverage and multi-hazard scope; includes social factors. | Domestic and high‑level: not tailored to specific industries such as tourism; uses historic data and current vulnerabilities; lacks forward-looking scenarios. Similar limitations apply to the INFORM Risk Index and EU Climate‑ADAPT. |

**Implications for CRISI**

These public tools provide broad hazard indices but do **not** link climate hazards to tourism-specific economic outcomes. Their coarse resolution and general-purpose nature leave room for a model that:

* operates at destination/meso scale (e.g., province, island, or tourism circuit) instead of just national or asset level,
* integrates tourism revenue, visitor arrivals, hotel capacity, and seasonal demand, and
* quantifies how climate hazards translate into losses of tourism income, employment, and cultural asset value.

**Private/commercial climate‑risk platforms**

| **Platform** | **Methodology & datasets** | **Strengths** | **Limitations / gaps** |
| --- | --- | --- | --- |
| **ICE Climate Risk** | AI‑geospatial platform mapping physical hazards for ~1.6 billion building footprints worldwide. Scenario-aligned risk scores are generated for each asset, and the system aggregates them into portfolio metrics[esgtoday.com](https://www.esgtoday.com/ice-launches-geospatial-data-solution-to-assess-climate-risks-for-corporate-sovereign-asset-classes/#:~:text=Financial%20technology%20and%20data%20services,portfolios%2C%20based%20on%20geospatial%20data). | Ultra‑granular (building‑level) coverage; forward-looking risk metrics; integrates both physical risk and transition/emissions data[esgtoday.com](https://www.esgtoday.com/ice-launches-geospatial-data-solution-to-assess-climate-risks-for-corporate-sovereign-asset-classes/#:~:text=Financial%20technology%20and%20data%20services,portfolios%2C%20based%20on%20geospatial%20data). | Finance-centric and complex; focuses on asset exposure, not tourism-specific economic impacts; proprietary dataset; high cost. |
| **Moody’s Climate Solutions / Four Twenty Seven** | Uses downscaled climate‑model outputs and catastrophe models (via Four Twenty Seven and RMS) to score physical hazards (heat, flood, storm surge, cyclone, etc.) and transition risks for corporate facilities, municipalities and sovereigns[businesswire.com](https://www.businesswire.com/news/home/20210310005678/en/Moodys-Launches-Comprehensive-Suite-of-Climate-Solutions#:~:text=%2A%20Forward,support%20stress%20testing%20and%20risk). Provides country climate‑risk scores and climate‑adjusted default risk. | Deep integration with credit‑risk metrics; covers both physical and transition risks; trusted by financial markets. | Finance-centric; proprietary “black box” models; no module for tourism; results aimed at credit analysts rather than policy planners. |
| **XDI (Cross Dependency Initiative)** | Engineering-based catastrophe models for 200+ perils estimate damage probability and expected loss for individual assets (buildings, roads, utilities)[preventionweb.net](https://www.preventionweb.net/news/xdi-releases-world-first-comparison-every-states-physical-climate-risk#:~:text=XDI%E2%80%99s%20Gross%20Domestic%20Climate%20Risk,climate%20change%20including%20from%20flooding). Outputs asset risk ratings and rankings across regions[preventionweb.net](https://www.preventionweb.net/news/xdi-releases-world-first-comparison-every-states-physical-climate-risk#:~:text=The%20XDI%20Gross%20Domestic%20Climate,extreme%20wind%20and%20freeze%20thaw). | Infrastructure-oriented rigor; quantifies risk in monetary terms; can identify vulnerabilities in critical networks. | Data‑heavy and asset specific; not designed for macro‑economic or sector‑wide analysis; focuses on physical hazards only. |
| **Riskthinking.AI** | “ClimateEarth Digital Twin” integrates physical assets, climate hazards, socio‑economic data and machine‑learning models to produce stochastic risk forecasts and multi‑factor scores[riskthinking.ai](https://riskthinking.ai/#:~:text=Our%20ClimateEarthDigitalTwin). Covers 99 % of publicly listed companies and provides climate value‑at‑risk and materiality scores[riskthinking.ai](https://riskthinking.ai/#:~:text=GLOBAL%20COVERAGE). | Advanced AI captures uncertainty and tail risks; global coverage; multi‑hazard composite scores. | Finance‑focused; new platform with limited track record; results may be hard for non‑specialists to interpret; no tourism‑specific module. |
| **dClimate Aegis** | AI‑enabled physical climate‑risk evaluation platform. In a 2023 case study, Aegis assessed risks (heat waves, wildfires, floods, etc.) across **1,556 hotel locations**. It calculates the probabilistic risk of a climate peril occurring for each asset, the associated **financial loss** and provides a risk scale to help decision‑makers identify which assets are most exposed[blog.dclimate.net](https://blog.dclimate.net/case-study-physical-climate-risk-assessment-for-a-major-hotel-chain/#:~:text=Aegis%20calculates%20the%20probabilistic%20risk,climate%20risks%20for%20their%20business). | User‑centric dashboards and maps targeting corporate end‑users; sector‑specific case studies (tourism and retail) highlight practical insights; SaaS delivery makes updates easy. | Emerging tool still in early access; primarily covers physical hazards and average annual loss; may not capture macro‑economic ripple effects (e.g., how a disaster at one destination affects national tourism revenue). |
| **Jupiter Intelligence (ClimateScore Global)** | Provides high‑resolution climate‑risk modelling. In 2025 it launched new tools enabling banks and asset managers to quantify physical climate risk and calculate the return‑on‑investment of resilience measures. New features include an **Adaptation Hub** that quantifies avoided losses and ROI of adaptation strategies and **Entity Modelling** that offers climate‑risk insights across securities, funds and corporates. It also introduced a **MetricEngine** that outputs scenario‑specific return periods, exceedance probabilities and loss distributions[esgtoday.com](https://www.esgtoday.com/jupiter-intelligence-launches-new-solutions-enabling-banks-investors-to-quantify-climate-risk/#:~:text=Climate%20data%20solutions%20provider%20Jupiter,the%20ROI%20on%20resilience%20investments). | Science‑based analytics with flexible scenario exploration; ability to estimate ROI for adaptation measures; supports financial institutions’ risk‑management and disclosure requirements. | Focuses on asset portfolios for financial institutions; no explicit tourism module; proprietary. |
| **The Climate Service (Climanomics, now part of S&P Global)** | SaaS platform offering climate‑risk analytics for **seven physical hazards** (drought, wildfire, temperature extremes, water stress, coastal flooding, river flooding and tropical cyclones) across more than 250 asset types. Users upload asset details (location, value) and the platform models **expected losses** under four Representative Concentration Pathway (RCP) scenarios[ukgbc.org](https://ukgbc.org/resources/climate-risk-analytics-platform/#:~:text=The%20Climanomics%C2%AE%20platform%20provides%20climate,data%20scientists%2C%20and%20finance%20professionals). It uses a hazard‑vulnerability‑risk framework and draws on datasets from the **IPCC, NOAA, WWF** and other scientific sources[ukgbc.org](https://ukgbc.org/resources/climate-risk-analytics-platform/#:~:text=The%20Climanomics%C2%AE%20platform%20is%20built,for%20audit%20and%20explainability%20purposes). Outputs include average annual loss estimates, scenario analysis, interactive visualisations and financial metrics aligned with TCFD reporting[ukgbc.org](https://ukgbc.org/resources/climate-risk-analytics-platform/#:~:text=The%20expected%20loss%20outputs%20can,for%20analysing%20climate%20risk%20in). | Transparent methodology and science‑based datasets; one‑click scenario analysis to 2100; financial impact‑based outputs for risk management, strategic planning and credit modelling. | General‑purpose (all asset classes); not sector‑specific; subscription‑based; may not integrate tourism demand factors or socio‑economic resilience. |
| **Willis Towers Watson’s Climate Diagnostic** | Global modelling tool that uses advanced data and analytics to show how **acute hazards** (extreme wind, floods) and **chronic stressors** (sea‑level rise, heat stress) change under multiple climate scenarios and time horizons. The tool includes a climate‑change atlas of exposure maps, flexible scenario projections up to 2100 and summaries by region/time/hazard[wtwco.com](https://www.wtwco.com/en-us/news/2021/04/willis-towers-watson-launches-climate-diagnostic-modelling-solution#:~:text=Diagnostic%2C%20a%20global%20modelling%20tool,portfolios%20and%20key%20locations%20worldwide). | Integrated into WTW’s Climate Quantified suite; interactive maps help clients locate high‑risk areas and evaluate adaptation strategies; supports disclosure under TCFD[wtwco.com](https://www.wtwco.com/en-us/news/2021/04/willis-towers-watson-launches-climate-diagnostic-modelling-solution#:~:text=Diagnostic%2C%20a%20global%20modelling%20tool,portfolios%20and%20key%20locations%20worldwide). | Intended for corporate risk and insurance clients; emphasises property‑level exposure and compliance; not tailored to tourism or macro‑economic outcomes. |

**Implications for CRISI**

These commercial platforms excel at **asset‑level physical hazard modelling**, but they largely treat tourism assets like any other property and measure success in **financial risk metrics** (asset value at risk, probability of default, etc.). They seldom account for tourism‑specific variables such as seasonal visitor demand, cultural heritage value, employment dependence, or the ripple effects of climate events on regional economies. CRISI can differentiate itself by:

* using open hazard and socio‑economic databases (e.g., IPCC, Copernicus climate projections, NASA/NOAA hazard maps, UNWTO tourism statistics, World Bank socio‑economic indicators) and linking them to tourism revenue, occupancy rates, visitor nights and heritage asset vulnerability;
* providing **meso‑scale** scores for provinces, islands or tourism circuits, which are more actionable for tourism ministries and investors than national indices or property‑level scores; and
* translating hazard exposure into **economic losses and benefits** (lost tourist arrivals, job losses, infrastructure repair costs, return‑on‑investment of adaptation measures) rather than only property damage.

**3 Academic and research prototypes**

| **Prototype** | **Methodology & variables** | **Strengths** | **Limitations / gaps** |
| --- | --- | --- | --- |
| **CORVI – Climate and Ocean Risk Vulnerability Index (Stimson Center)** | Multi‑criteria index using ~90 indicators across 10 risk categories (ecological health of fisheries and reefs, financial system stability, infrastructure, community resilience, etc.). Data are collected via expert surveys using a **Delphi** process and weighted to produce vulnerability scores for coastal cities[preventionweb.net](https://www.preventionweb.net/news/xdi-releases-world-first-comparison-every-states-physical-climate-risk#:~:text=XDI%E2%80%99s%20Gross%20Domestic%20Climate%20Risk,climate%20change%20including%20from%20flooding). | Holistic and context‑specific; links climate hazards to economic and social factors (e.g., decline in tourism due to coral bleaching); provides actionable insights for policymakers and donors. | Labour‑intensive and subjective; not easily scalable; results are relative vulnerability profiles rather than predictive damage estimates; currently applied mainly to coastal cities in the Caribbean. |
| **AI for Multi‑Risk Assessment (Myriad‑EU)** | Research project using machine‑learning to integrate multiple hazard susceptibility maps (heatwaves, droughts, storm surge, floods, landslides, wildfires) with socio‑economic exposure indicators (population, built‑environment value, tourism beds, agriculture). Models (e.g., XGBoost and Random Forest) are trained on historical compound events to produce **multi‑hazard risk maps** and identify sectoral hotspots under different climate scenarios  . | Demonstrates AI’s ability to detect non‑linear hazard interactions and identify hotspots of multi‑risk; includes sectoral exposure such as tourism and agriculture  . | Prototype only; requires extensive data and machine‑learning expertise; not operational for end‑users; results may be hard to interpret; no economic loss modelling. |
| **ND‑GAIN Index (Notre Dame Global Adaptation Initiative)** | Global ranking of countries’ climate **vulnerability** and **readiness** using 45 vulnerability indicators (water, food, health, infrastructure, ecosystems) and 30 readiness indicators (economic, governance and social readiness). Scores range from 0 (worst) to 100 (best) and help pinpoint how well a country can adapt  . | Free and publicly available for 180+ countries; updated annually; provides benchmarking and identifies countries needing more resilience investment; indirectly highlights tourism vulnerability (countries reliant on climate‑sensitive tourism often score poorly). | Macro‑scale and not sector‑specific; does not tell which regions or industries within a country are most at risk; based on current/historical data and capacity, not future hazards; no direct link to tourism outcomes. |
| **Tourism Climate Vulnerability indices (academic)** | Composite indicators proposed in academic literature to assess tourism climate vulnerability at national or destination levels. Variables often include destination exposure to extreme weather, tourism dependency, seasonality, visitor perceptions and adaptive capacity. | Recognise tourism’s unique sensitivities and highlight climate–tourism linkages. | Mostly theoretical; not operationalised in online tools; limited adoption; do not integrate forward‑looking climate scenarios or economics. |

**Implications for CRISI**

Academic prototypes show that **multi‑hazard modelling** and integration of socio‑economic indicators are possible and valuable. However, their limited scalability and absence of economic loss modelling underscore the need for a platform that can transform research methodologies into **practical decision tools**. CRISI could adopt machine‑learning techniques from projects like Myriad‑EU but focus on transparent, explainable models with clear links between hazards and tourism outcomes (jobs, revenue, cultural heritage) and with outputs understandable to policymakers.

**Opportunities and recommendations for CRISI**

The analysis reveals clear **gaps** in existing tools that CRISI could fill. Below are potential differentiators and recommendations:

**Data sources and variables**

1. **Hazard data** – Use open climate projections and hazard maps from credible sources:
   * **Global hazard data**: Copernicus/EU Climate Data Store, NASA/NOAA hazard databases, IPCC climate model ensembles and Representative Concentration Pathway scenarios. These provide forward‑looking information on floods, heatwaves, wildfires, droughts and sea‑level rise.
   * **Local hazard layers**: integrate FEMA or national risk indices for countries where available, along with coastal erosion, landslide susceptibility and urban heat island data from national agencies.
2. **Tourism asset data** – Build or procure a geospatial database of tourism‑related assets (hotels, resorts, airports, marinas, UNESCO heritage sites, beaches, theme parks). This can be assembled from:
   * OpenStreetMap and national cadastral datasets for physical locations.
   * UNWTO, national tourism ministries and corporate filings for tourism capacity (number of hotels, beds, room supply) and visitor arrivals.
   * Industry reports (e.g., HVS hotel construction costs and room counts) similar to those used in the dClimate case study[blog.dclimate.net](https://blog.dclimate.net/case-study-physical-climate-risk-assessment-for-a-major-hotel-chain/#:~:text=Using%20publicly%20available%20data%20on,The%20assumptions%20were%20as%20follows).
3. **Socio‑economic and adaptive capacity data** – Incorporate:
   * **Tourism revenue** and employment by region (World Travel & Tourism Council, UNWTO, Eurostat). Variables include contribution of tourism to regional GDP, share of jobs in tourism, average occupancy rates and seasonality patterns.
   * **Community vulnerability and adaptive capacity** indicators: ND‑GAIN readiness scores, income levels, education, healthcare access, emergency management capacity and insurance penetration.
   * **Infrastructure resilience**: quality of transport networks (roads, airports, ports), water and sanitation infrastructure, energy supply reliability, available shelter capacity and early‑warning systems.
4. **Cultural & natural asset importance** – Evaluate the value of **natural ecosystems** (coral reefs, beaches, forests) and **cultural heritage sites** to tourism, including UNESCO World Heritage sites. Indicators might include visitor numbers, replacement/restoration cost, and ecosystem services value.
5. **Economics and adaptation costs** – For each location, collect or model:
   * **Potential economic losses** from hazards (lost tourist nights, revenue, and jobs) and **repair/replacement costs** for hotels, infrastructure, and cultural assets.
   * **Cost of adaptation measures** such as seawalls, building retrofits, early‑warning systems or climate‑proofing and the **ROI** of these measures (drawing inspiration from Jupiter’s Adaptation Hub[esgtoday.com](https://www.esgtoday.com/jupiter-intelligence-launches-new-solutions-enabling-banks-investors-to-quantify-climate-risk/#:~:text=Among%20the%20key%20new%20features,funds%2C%20corporates%2C%20and%20investment%20vehicles)).

**Methodological recommendations**

1. **Meso‑scale scoring** – Develop composite **Climate Resilience Scores** for provinces, islands or tourist circuits by combining hazard exposure, socio‑economic vulnerability, adaptive capacity and tourism‑specific sensitivity. This fills the gap between national indices and asset‑level models.
2. **Integrate multi‑hazard AI models** – Adopt machine‑learning techniques similar to Myriad‑EU (e.g., Random Forest/XGBoost) to model compound risks (heat, drought, flood, wildfire, etc.) and their interactions.

However, ensure the models are **explainable** and provide clear reasoning behind scores to build trust among policymakers.

1. **Link hazards to tourism economics** – Use econometric or system‑dynamics models to quantify how climatic hazards translate into declines in visitor arrivals, reductions in tourism spending or increases in operating costs. This could involve elasticity estimates (percentage decline in arrivals per 1 °C increase in temperature) and input–output models for regional economies.
2. **Scenario analysis and stress testing** – Provide tools to explore different climate futures (e.g., RCP 2.6, 4.5 and 8.5) and adaptation scenarios (investing in seawalls vs. relocation). Show how resilience scores and economic outcomes change under each scenario, akin to Jupiter’s Adaptation Hub and MetricEngine[esgtoday.com](https://www.esgtoday.com/jupiter-intelligence-launches-new-solutions-enabling-banks-investors-to-quantify-climate-risk/#:~:text=Among%20the%20key%20new%20features,funds%2C%20corporates%2C%20and%20investment%20vehicles). Include “what if” calculators for policymakers (e.g., what happens if warming is limited to 1.5 °C vs. 3 °C, or if specific adaptation investments are made).
3. **Dynamic updates and early warning** – Incorporate real‑time or near‑real‑time data (satellite imagery, weather forecasts, social media sentiment, booking data) to update risk scores dynamically and provide early warnings of climate‑economic disruptions. This would mirror riskthinking.AI’s stochastic methodology but tailored to tourism. Transparency in model design and documentation is crucial to maintain user trust.
4. **User‑centered design** – Provide intuitive dashboards and maps that translate complex climate data into policy‑friendly metrics: e.g., “climate‑risk‑adjusted ROI”, rankings of destinations by resilience score, and recommended adaptation measures. Offer narrative explanations and open data downloads for analysts.

**Potential collaborations and data partnerships**

* **Public agencies**: collaborate with the World Bank, FEMA, EIB and ND‑GAIN to use their hazard and adaptive capacity datasets. These sources are often open and can serve as baseline hazard layers or benchmarks.
* **Tourism ministries and industry associations**: obtain data on visitor arrivals, hotel inventories, seasonal patterns and revenues. Partnerships with UNWTO, WTTC and national statistical offices can provide timely data.
* **Academic institutions and research projects**: leverage knowledge from Myriad‑EU and other multi‑hazard AI projects to refine modelling approaches. Collaborate with universities on estimating economic impacts of climate change on tourism.

**Conclusion**

The climate‑risk analytics landscape is dominated by generic asset-focused models (ICE, Moody’s, XDI) and national indices (EIB, ND‑GAIN). While these tools provide valuable hazard and resilience metrics, they do not translate climate threats into tourism-specific economic impacts or guide strategic investment decisions for tourism development. Emerging AI-driven platforms like RiskThinking. AI and research prototypes like Myriad‑EU highlight the promise of multi-hazard, data-rich modelling but remain finance-centric or experimental.

CRISI has the opportunity to occupy a novel niche: a sector-specific, meso‑scale, AI-powered system that integrates geospatial hazard data with tourism economics and adaptive capacity. By harnessing open databases, sophisticated yet explainable machine‑learning and scenario analysis, and user-friendly dashboards, CRISI can provide governments and investors with actionable intelligence to build climate-resilient tourism economies. In doing so, it will complement – rather than duplicate – existing public, private, and academic tools, turning the complexity of climate risk into intelligible, policy-relevant insights.

**Benchmarking Climate‑Risk Assessment Tools**

**Purpose**

To design a **comprehensive and differentiated** Climate Resilience Investment Scoring Intelligence (CRISI) model, it is essential to understand how existing tools assess climate risk. This benchmarking exercise surveys public‑sector tools, commercial platforms and research prototypes, focusing on the **variables they use, methodologies, decision rules** and **user‑interface features**. Understanding these elements helps identify gaps that CRISI can fill, particularly in the tourism sector where asset‑level, socio‑economic and ecosystem variables are often under‑represented.

**Methodology**

I analysed competitors in three broad categories—public‑sector indices and screening tools, commercial products, and academic prototypes. For each tool I evaluated:

* **Variables/Indicators** – hazards considered, spatial scale, socio‑economic factors and any asset‑level variables.
* **Methodology/Decision Framework** – how indicators are combined (weighted indices, hazard‑vulnerability‑risk models, machine‑learning models, scenario analysis, adaptation ROI modelling) and whether the outputs are probabilistic or deterministic.
* **Decision Trees/Scoring** – whether the tool provides deterministic ratings, probabilistic loss distributions, return‑period modelling or other decision logic.
* **User Interface (UI)** – the level of interactivity, availability of dashboards, maps and scenario selectors, and degree of transparency of assumptions.

**Public‑Sector Screening & Risk‑Index Tools**

| **Tool** | **Variables & Sectors** | **Methodology / Decision Framework** | **UI & Outputs** | **Gaps for CRISI** |
| --- | --- | --- | --- | --- |
| **European Investment Bank (EIB) Climate Risk Country Scores** | Produces separate **physical** and **transition‑risk scores** for over 180 countries. Scores aggregate exposure to hazards (e.g., heatwaves, floods) and transition factors (e.g., carbon intensity) and integrate **adaptation and mitigation capacity**; low‑income economies are more vulnerable to physical risk, while high‑income economies face higher transition risk[eib.org](https://www.eib.org/en/publications/economics-working-paper-2021-03#:~:text=comprehensively%20assess%20the%20climate%20change,faced%20by%20firms%20in%20each). | Weighted aggregation of national‑level indicators; distinguishes between physical and transition components; emphasises cross‑country comparability rather than asset‑level detail. | Country-level dashboard and downloadable data, suited for sovereign risk and macroeconomic analysis. | No asset‑ or sector-specific variables; limited ability to drill down to tourism destinations or to evaluate local adaptation investments. |
| **World Bank Climate & Disaster Risk Screening Tools** | Sector‑specific modules (agriculture, energy, water, coastal, etc.) use country‑specific hazard data to screen project portfolios. They provide qualitative risk ratings (low/moderate/high) and link to adaptation options[ndcpartnership.org](https://ndcpartnership.org/knowledge-portal/climate-toolbox/climate-disaster-risk-screening-tools#:~:text=The%20Climate%20%26%20Disaster%20Risk,potential%20risks%20to%20climate%20change). | Decision matrices combine exposure to climate hazards with sensitivity of the sector and adaptive capacity; outputs are qualitative risk ratings with suggested resilience measures. | Web‑based questionnaires and guidance notes; users download reports summarising hazards and adaptation options. | Lacks quantitative scoring; not intended for asset‑level or tourism‑specific investments. |
| **FEMA National Risk Index (USA)** | Integrates **expected annual losses**, **social vulnerability** and **community resilience** at county and census‑tract scales[fema.gov](https://www.fema.gov/flood-maps/products-tools/national-risk-index#:~:text=The%20National%20Risk%20Index%20is,county%20and%20Census%20tract%20levels). Hazards include tornadoes, hurricanes, floods and more. | Combines hazard frequency and severity with exposure (population, buildings), vulnerability (social indices) and resilience capacity. Generates a composite relative risk score. | Interactive map with downloadable datasets; allows scenario filtering by hazard and geography. | U.S.‑centric; limited to physical hazards and socio‑economic vulnerability—no adaptation or transition metrics. |
| **EU Climate‑ADAPT platforms / National risk indices** | Provide high‑level indices and adaptation options for European regions; often rely on aggregated socio‑economic data and hazard projections. | Vary by country; generally use IPCC‑aligned scenarios and composite indices. | Web‑based maps and adaptation case‑study repositories. | Lack standardised asset‑level scoring or tourism‑sector modules. |

**Observations**

Public‑sector tools provide broad coverage and transparency but operate at **macro scales**. They mostly use deterministic indices and qualitative decision matrices. Socio‑economic variables such as **tourism revenue** or **asset values** are rarely included, and adaptation investments are not evaluated at project level.

**Commercial Platforms**

| **Platform** | **Variables & Sectors** | **Methodology / Decision Framework** | **UI & Outputs** | **Gaps for CRISI** |
| --- | --- | --- | --- | --- |
| **ICE Global Climate Risk Solution (Intercontinental Exchange)** | Utilises a database of **~1.6 billion building footprints worldwide** to produce scenario‑aligned risk scores for hazards like wildfires, floods and hurricanes[ice.com](https://www.ice.com/insights/sustainable-finance/ice-climates-exposure-datasets-understanding-how-climate-risks-impact-infrastructure-and-communities#:~:text=To%20meet%20this%20challenge%2C%20ICE,within%20municipalities%20and%20sovereign%20nations). Covers more than three million corporate asset locations and sovereign exposures[esgtoday.com](https://www.esgtoday.com/ice-launches-geospatial-data-solution-to-assess-climate-risks-for-corporate-sovereign-asset-classes/#:~:text=Financial%20technology%20and%20data%20services,portfolios%2C%20based%20on%20geospatial%20data). | Combines geospatial hazard models with asset‑level exposure and vulnerability; forward‑looking risk scores aligned to climate scenarios. | Delivered via ICE’s data feeds and analytics platform; provides asset‑level risk metrics for investors and insurers. | Focuses on physical hazards and capital‑market exposure; does not integrate socio‑economic variables (e.g., tourism revenue) or adaptation benefits. |
| **Moody’s Climate Solutions / Four Twenty Seven** | Provides **physical and transition‑risk assessments** for more than 5,000 companies and over 10 million properties[businesswire.com](https://www.businesswire.com/news/home/20210310005678/en/Moodys-Launches-Comprehensive-Suite-of-Climate-Solutions#:~:text=%2A%20Forward,support%20stress%20testing%20and%20risk). Offers climate‑adjusted probability‑of‑default models, macroeconomic climate scenarios and hazard‑specific loss estimates. | Integrates physical and transition risk into credit‑risk analytics; uses scenario analysis and hazard‑vulnerability models to adjust default probabilities. | Interactive dashboards and API feed; outputs include exposure scores, expected loss and credit‑risk metrics. | Financial‑sector focus; limited tourism‑sector tailoring; adaptation options not explicitly modelled. |
| **WTW (Willis Towers Watson) Climate Diagnostic** | Shows exposure to **acute hazards** (hurricanes, extreme flooding) and **chronic hazards** (heat stress, sea‑level rise, precipitation, wildfire) under multiple climate scenarios[wtwco.com](https://www.wtwco.com/en-us/solutions/products/climate-diagnostic#:~:text=Climate%20Diagnostic%20offers%20wide,and%20flexible%20features). Evaluates exposures over time horizons to **2030, 2050 and 2100** and allows comparison across SSP/RCP 2.6, 4.5 and 8.5 scenarios[wtwco.com](https://www.wtwco.com/en-us/solutions/products/climate-diagnostic#:~:text=views%2C%20evaluating%20your%20global%20exposures,based%20on%20greenhouse%20gas%20concentration). | Uses catastrophe models and climate projections to compute physical risk scorecards at asset level. Users can adapt the view by time horizon and scenario[wtwco.com](https://www.wtwco.com/en-us/solutions/products/climate-diagnostic#:~:text=,dynamic%20risk%20dashboards%2C%20plus%20downloadable). | Interactive **atlas of maps** and risk dashboards; generates executive summaries and downloadable reports[wtwco.com](https://www.wtwco.com/en-us/solutions/products/climate-diagnostic#:~:text=,demand). Available via the Risk IQ platform or API. | Focuses on physical hazard exposure and value‑at‑risk; limited socio‑economic variables or decision logic for adaptation; primarily serves insurers and large corporates. |
| **Jupiter Intelligence (ClimateScore Global, Adaptation Hub and MetricEngine)** | Models hazards across multiple perils (flood, wind, wildfire, heat, subsidence) with **dynamic return periods, exceedance probabilities and Average Annual Loss (AAL)**. The **Adaptation Hub** allows users to select from a library of >10 adaptation strategies across flood, wind, wildfire and heat, customise cost assumptions and **compare unadapted vs. adapted loss** over 1‑, 5‑, 10‑ or 30‑year horizons[jupiterintel.com](https://www.jupiterintel.com/blog/adaptation-and-cem-have-arrived-weve-raised-the-bar-on-climate-informed-capital-decisions#:~:text=Here%E2%80%99s%20a%20bit%20more%20detail,in%20action%2C%20contact%20us%20here). **Entity Modeling** links climate hazards to securities, funds and corporates using financial, operational and geospatial signals[jupiterintel.com](https://www.jupiterintel.com/blog/adaptation-and-cem-have-arrived-weve-raised-the-bar-on-climate-informed-capital-decisions#:~:text=Jupiter%20Entity%20Modeling%20is%20built,compliant%2C%20they%E2%80%99ll%20be%20competitively%20positioned). | Uses high‑resolution climate models, catastrophe models and financial models. **MetricEngine** enables on‑demand modelling of return periods, exceedance probabilities and tail‑risk losses[jupiterintel.com](https://www.jupiterintel.com/blog/adaptation-and-cem-have-arrived-weve-raised-the-bar-on-climate-informed-capital-decisions#:~:text=Jupiter%20MetricEngine%20fills%20that%20gap,term%20resilience%20planning). Adaptation Hub quantifies avoided losses and ROI[jupiterintel.com](https://www.jupiterintel.com/blog/adaptation-and-cem-have-arrived-weve-raised-the-bar-on-climate-informed-capital-decisions#:~:text=Here%E2%80%99s%20a%20bit%20more%20detail,in%20action%2C%20contact%20us%20here). | Web‑based platform with scenario selectors, adaptation strategy libraries and portfolio‑level analytics; outputs are scenario‑specific, transparent and exportable. | Pricing is oriented to financial institutions; adaptation module is generic (floodwalls, shutters, etc.) and may not capture tourism‑specific ecosystem‑based adaptation. |
| **S&P Global / Climanomics® Platform** | Users upload asset type, location and value; the platform models **expected losses** due to seven hazards (drought, wildfire, temperature extreme, water stress, coastal flooding, river flooding and tropical cyclones) across more than **250 asset types**[ukgbc.org](https://ukgbc.org/resources/climate-risk-analytics-platform/#:~:text=The%20platform%20makes%20it%20easy,Climanomics%C2%AE). One‑click scenario analysis to 2100 using RCP scenarios[ukgbc.org](https://ukgbc.org/resources/climate-risk-analytics-platform/#:~:text=losses%20due%20to%20climate%20change,verifiable%20global%20risk%20modelling%20methodology). Uses hazard‑vulnerability‑risk framework aligned with insurance practice[ukgbc.org](https://ukgbc.org/resources/climate-risk-analytics-platform/#:~:text=uses%20a%20robust%2C%20transparent%2C%20and,that%20used%20by%20insurance%20companies). | Combines public climate data from the IPCC, NOAA and WWF with asset vulnerability functions[ukgbc.org](https://ukgbc.org/resources/climate-risk-analytics-platform/#:~:text=The%20Climanomics%C2%AE%20platform%20is%20built,for%20audit%20and%20explainability%20purposes). Outputs expected loss (AAL) and can incorporate market‑level trends and adaptation/insurability layers[ukgbc.org](https://ukgbc.org/resources/climate-risk-analytics-platform/#:~:text=The%20Climanomics%C2%AE%20platform%20would%20provide,the%20mortgage%20team%20with). | SaaS platform with interactive dashboards and downloadable reports[ukgbc.org](https://ukgbc.org/resources/climate-risk-analytics-platform/#:~:text=and%20to%20identify%20what%20risks,to%20support%20mitigation%20and%20adaptation). Transparent methodology; literature‑based impact functions available for audit[ukgbc.org](https://ukgbc.org/resources/climate-risk-analytics-platform/#:~:text=The%20models%20on%20which%20the,for%20audit%20and%20explainability%20purposes). | Focuses on financial impact; adaptation options limited; hazard coverage does not include socio‑economic drivers like tourism demand or supply‑chain interdependencies. |
| **dClimate Aegis (case study)** | Calculates the **probabilistic risk of climate perils** (cold outbreak, heat wave, earthquake, excessive rainfall, river flooding, tropical cyclone, European windstorms, tsunami and wildfire) for each asset and estimates the associated financial loss[blog.dclimate.net](https://blog.dclimate.net/case-study-physical-climate-risk-assessment-for-a-major-hotel-chain/#:~:text=In%20this%20study%2C%20we%20assess,in%20Europe%2C%20India%2C%20and%20China). Uses asset‑specific data (e.g., number of rooms, construction costs) to approximate hotel asset value[blog.dclimate.net](https://blog.dclimate.net/case-study-physical-climate-risk-assessment-for-a-major-hotel-chain/#:~:text=Using%20publicly%20available%20data%20on,The%20assumptions%20were%20as%20follows). Provides a **risk scale** to rank assets and a **flexible peril selection**[blog.dclimate.net](https://blog.dclimate.net/case-study-physical-climate-risk-assessment-for-a-major-hotel-chain/#:~:text=Aegis%20calculates%20the%20probabilistic%20risk,climate%20risks%20for%20their%20business)[blog.dclimate.net](https://blog.dclimate.net/case-study-physical-climate-risk-assessment-for-a-major-hotel-chain/#:~:text=Using%20Aegis%2C%20we%20calculated%20the,both%20individual%20and%20portfolio%20levels). | Probabilistic models estimate exceedance probabilities and expected loss for chosen climate scenarios (e.g., SSP2‑45)[blog.dclimate.net](https://blog.dclimate.net/case-study-physical-climate-risk-assessment-for-a-major-hotel-chain/#:~:text=Analyses%20included%20probability%20calculations%20for,both%20individual%20and%20portfolio%20levels). AAL and exceedance probability curves are calculated for each asset and portfolio[blog.dclimate.net](https://blog.dclimate.net/case-study-physical-climate-risk-assessment-for-a-major-hotel-chain/#:~:text=Analyses%20included%20probability%20calculations%20for,both%20individual%20and%20portfolio%20levels). | Dashboard displays per‑asset and portfolio graphs of AAL, exceedance probability and risk scores[blog.dclimate.net](https://blog.dclimate.net/case-study-physical-climate-risk-assessment-for-a-major-hotel-chain/#:~:text=Summary%20of%20Average%20Annual%20Losses). Users can assess region‑specific risk differences and identify priority perils. | Only physical hazards are considered; does not incorporate socio‑economic vulnerability, transition risk or adaptation ROI; asset values must be estimated externally. |
| **riskthinking.AI – ClimateEarth™ Digital Twin** | Integrates multiple data layers—physical assets, climate hazards, climate analytics, biodiversity, water, commodities and sovereign risk—covering 99 % of public companies[riskthinking.ai](https://riskthinking.ai/#:~:text=Our%20ClimateEarthDigitalTwin). Computes **multi‑factor scores** combining exposures (e.g., fire, heat, drought, wind, coastal flooding) into an overall risk score; uses a **patented stochastic methodology** for scenario‑agnostic analytics from 2025‑2100[riskthinking.ai](https://riskthinking.ai/#:~:text=GLOBAL%20COVERAGE). | Stochastic engine generates distributions of potential outcomes across multiple climate scenarios rather than relying on a single path. Multi‑factor scores combine hazard exposures with socioeconomic and asset data. | Cloud‑based platform with interactive dashboards; offers dynamic risk queries across assets, sectors and time horizons. | Methodology is proprietary; limited transparency into indicator weighting; adaptation modelling appears absent; tourism‑specific variables not highlighted. |
| **XDI (Cross‑Dependency Initiative) / Gross Domestic Climate Risk** | Models **projected damage to built environments** from eight hazards (e.g., flooding, wildfire, sea‑level rise). Ranks over **2,600 jurisdictions** by calculating damage to physical infrastructure using **over 320 million data points**, global climate models and local weather/environmental data[preventionweb.net](https://www.preventionweb.net/news/xdi-releases-world-first-comparison-every-states-physical-climate-risk#:~:text=XDI%E2%80%99s%20Gross%20Domestic%20Climate%20Risk,climate%20change%20including%20from%20flooding)[preventionweb.net](https://www.preventionweb.net/news/xdi-releases-world-first-comparison-every-states-physical-climate-risk#:~:text=The%20XDI%20Gross%20Domestic%20Climate,extreme%20wind%20and%20freeze%20thaw). | Uses bottom‑up catastrophe modelling; provides jurisdiction‑level risk rankings and asset‑level risk metrics. Focuses on damage under RCP8.5 scenario. | Interactive rankings and dashboards; outputs can feed into investment or insurance models. | Emphasises physical infrastructure; does not integrate socio‑economic or adaptation factors; scenario coverage limited. |

**Observations**

Commercial tools generally offer **higher spatial resolution** and sophisticated analytics (probabilistic models, scenario analysis, adaptation ROI, entity modelling). However, they are predominantly **finance‑oriented**, focusing on asset value and expected loss. Few integrate socio‑economic variables such as tourism demand, labour force dependency or cultural heritage. Adaptation modules, where present, tend to be generic (e.g., floodwalls) and rarely quantify nature‑based or community‑led interventions.

**Research and Prototype Tools**

| **Tool** | **Variables & Sectors** | **Methodology / Decision Framework** | **UI & Outputs** | **Gaps for CRISI** |
| --- | --- | --- | --- | --- |
| **CORVI – Climate & Ocean Risk Vulnerability Index (Stimson Center)** | Collects data on **96 indicators** across **10 risk categories** covering ecological (geology/water, climate, ecosystems, fisheries), financial (industry, infrastructure, economics) and social/political (governance, demographics, stability) risks. Indicators were selected through research and aligned with SDG indicators[stimson.org](https://www.stimson.org/2020/corvi-report-climate-and-ocean-risk-vulnerability-index/#:~:text=categories%20are%20made%20up%20of,the%20potential%20for%20available%20data). Scores are standardised on a **1–10 scale** relative to other cities[stimson.org](https://www.stimson.org/2020/corvi-report-climate-and-ocean-risk-vulnerability-index/#:~:text=CORVI%20standardizes%20risk%20on%20a,issue%20will%20lead%20to%20insecurity). | Blends empirical data with **expert elicitation** (Structured Expert Judgment) to weight indicators. Produces a comparative risk profile for each coastal city. Assessment includes exposure, observed trend, expected trend and magnitude of change[stimson.org](https://www.stimson.org/2020/corvi-report-climate-and-ocean-risk-vulnerability-index/#:~:text=When%20analyzing%20how%20to%20build,32). | Provides city‑level risk dashboards and issue heatmaps; emphasises cross‑sectoral interactions. | Index is relative—scores depend on the set of cities compared. Does not provide asset‑level detail, loss estimates or adaptation ROI. |
| **ND‑GAIN Country Index (University of Notre Dame)** | Comprises two dimensions: **vulnerability** (exposure, sensitivity and adaptive capacity) and **readiness** (economic, governance and social). Vulnerability is assessed across six life‑supporting sectors: **food, water, health, ecosystem services, human habitat and infrastructure**[gain.nd.edu](https://gain.nd.edu/our-work/country-index/methodology/#:~:text=vulnerability%20and%20readiness). Readiness captures economic, governance and social factors[gain.nd.edu](https://gain.nd.edu/our-work/country-index/methodology/#:~:text=READINESS). Thirty‑six indicators contribute to vulnerability and nine indicators contribute to readiness[gain.nd.edu](https://gain.nd.edu/our-work/country-index/methodology/#:~:text=A%20country%27s%20ND,score%20and%20a%20readiness%20score). | Aggregates indicators into a vulnerability score and a readiness score. Exposure indicators are projected climate impacts; sensitivity and adaptive capacity are socio‑economic. Readiness indicators measure institutional capacity to deploy adaptation investments. | Global country‑level rankings and interactive maps; datasets downloadable for research. | Macro‑level; lacks sectoral granularity; does not quantify physical asset damage or adaptation ROI. |
| **MYRIAD‑EU Multi‑Risk Dynamics (dashboard)** | Aims to build an evidence base on **multi‑risk dynamics** and **risk drivers**. Investigates how different hazards (floods, storms, earthquakes, droughts) interact and influence vulnerability and exposure. Uses **machine‑learning techniques**, disaster forensics and diverse data sources (disaster loss databases, national statistics, social media, night‑time lights) to detect changes in exposure and vulnerability over time[dashboard.myriadproject.eu](https://dashboard.myriadproject.eu/methods/multi-risk-dynamics/#:~:text=In%20our%20increasingly%20unpredictable%20world%2C,building%20resilience%20against%20future%20disasters). Pilots examine systemic interdependencies across sectors including tourism, energy and infrastructure[myriadproject.eu](https://www.myriadproject.eu/#:~:text=MYRIAD,be%20studied%20in%205%20pilots). | Combines innovative approaches (interviews, multi‑hazard susceptibility maps, AI frameworks) with traditional risk analysis. Develops functions to represent dynamic feedbacks between risk drivers[dashboard.myriadproject.eu](https://dashboard.myriadproject.eu/methods/multi-risk-dynamics/#:~:text=The%20insights%20obtained%20from%20these,dashboard%2C%20providing%20stakeholders%20with%20valuable). Tools include **VulneraCity** (database of urban vulnerability drivers) and a **multi‑hazard events database**[dashboard.myriadproject.eu](https://dashboard.myriadproject.eu/methods/multi-risk-dynamics/#:~:text=In%20addition%2C%20we%20developed%C2%A0VulneraCity%2C%20a,risk%20assessment%20and%20mitigation%20strategies). | A web‑based dashboard hosts methods and tools; aims to provide an online database of multi‑hazard interactions for policymakers. | Still under development; outputs are not yet standardised; focus is on understanding risk interactions rather than delivering quantitative loss estimates. Not tailored to tourism asset‑level assessment. |

**Observations**

Academic tools often provide **conceptual innovations**, such as multi‑hazard dynamics and integrated socio‑economic indices. They highlight the importance of cross‑sectoral interactions and long‑term vulnerability trends, but they rarely produce **decision‑grade asset‑level scores** or user‑friendly dashboards comparable to commercial platforms.

**Cross‑Cutting Insights and Gaps to Fill**

1. **Hazard Coverage** – Commercial tools emphasise acute hazards (hurricanes, floods, wildfire, heat stress) and some chronic stressors (sea‑level rise). Few consider **compound hazards** or interactions (e.g., drought leading to wildfire then flood) that are increasingly relevant. Research projects like MYRIAD‑EU attempt to fill this gap by using machine learning to analyse multi‑risk dynamics[dashboard.myriadproject.eu](https://dashboard.myriadproject.eu/methods/multi-risk-dynamics/#:~:text=In%20our%20increasingly%20unpredictable%20world%2C,building%20resilience%20against%20future%20disasters).
2. **Spatial Resolution** – ICE, WTW, Jupiter and dClimate provide high‑resolution asset‑level scoring, whereas public indices operate at national or regional scales. CRISI should adopt a **meso‑scale approach** (between building‑level and country‑level) relevant for tourism destinations—e.g., municipal or resort scale.
3. **Socio‑Economic & Sector‑Specific Indicators** – Most tools neglect **tourism‑specific variables** such as tourist arrivals, seasonal demand, revenue per room, local workforce dependency, visitor expenditure and cultural heritage. Only ND‑GAIN and CORVI capture broader socio‑economic aspects like governance, health or fisheries[gain.nd.edu](https://gain.nd.edu/our-work/country-index/methodology/#:~:text=READINESS)[stimson.org](https://www.stimson.org/2020/corvi-report-climate-and-ocean-risk-vulnerability-index/#:~:text=Each%20coastal%20city%20risk%20profile,and%20future%20climate%20fragility%20risks), but they do not link them to tourism metrics. CRISI can differentiate itself by integrating **tourism economies**, **ecosystem services** (beaches, coral reefs) and **community vulnerability** into its scoring model.
4. **Adaptation and Resilience** – Jupiter’s Adaptation Hub stands out for modelling adaptation strategies and ROI[jupiterintel.com](https://www.jupiterintel.com/blog/adaptation-and-cem-have-arrived-weve-raised-the-bar-on-climate-informed-capital-decisions#:~:text=Here%E2%80%99s%20a%20bit%20more%20detail,in%20action%2C%20contact%20us%20here). Most other tools provide static risk scores without explicitly evaluating **avoidance benefits**, **costs** or **nature‑based solutions**. CRISI can incorporate a **decision tree** that compares risk reduction from different adaptation measures (e.g., dune restoration vs. seawalls vs. insurance) and quantifies co‑benefits for tourism and ecosystems.
5. **Decision Logic & Probabilistic Outputs** – dClimate, Jupiter and ICE provide probabilistic loss metrics (AAL, exceedance probabilities), while public indices offer deterministic scores. CRISI should adopt **probability distributions** and **scenario‑dependent decision trees** to inform investment decisions (e.g., threshold levels for investment triggers or hazard exposure). Transparent methodology is important—riskthinking.AI’s proprietary approach lacks transparency, whereas Climanomics provides literature‑based impact functions[ukgbc.org](https://ukgbc.org/resources/climate-risk-analytics-platform/#:~:text=The%20models%20on%20which%20the,for%20audit%20and%20explainability%20purposes).
6. **User Interface** – Tools such as WTW and Climanomics feature **interactive maps, dashboards and downloadable reports**[wtwco.com](https://www.wtwco.com/en-us/solutions/products/climate-diagnostic#:~:text=,demand)[ukgbc.org](https://ukgbc.org/resources/climate-risk-analytics-platform/#:~:text=and%20to%20identify%20what%20risks,to%20support%20mitigation%20and%20adaptation). Jupiter adds a library of adaptation strategies with cost sliders[jupiterintel.com](https://www.jupiterintel.com/blog/adaptation-and-cem-have-arrived-weve-raised-the-bar-on-climate-informed-capital-decisions#:~:text=,individual%20sites%20or%20full%20portfolios). Aegis offers per‑asset risk graphs[blog.dclimate.net](https://blog.dclimate.net/case-study-physical-climate-risk-assessment-for-a-major-hotel-chain/#:~:text=Summary%20of%20Average%20Annual%20Losses). CRISI should combine these strengths: provide **intuitive dashboards** with map overlays for hazards and socio‑economic indicators, allow **user‑defined scenarios**, and enable **export of underlying data** for transparency and further analysis.

**Recommendations for CRISI**

1. **Integrate Tourism‑Specific Data** – Include variables like visitor numbers, revenue per room, seasonality, cultural heritage value and ecosystem services (beach width, coral reef health). Combine them with hazard exposure to derive **tourism resilience scores**.
2. **Adopt a Multi‑Risk, Meso‑Scale Approach** – Draw on MYRIAD‑EU methods to model interactions between multiple hazards and socio‑economic drivers at the municipal or destination scale. Use machine learning to identify compound risk scenarios and dynamic feedbacks[dashboard.myriadproject.eu](https://dashboard.myriadproject.eu/methods/multi-risk-dynamics/#:~:text=In%20our%20increasingly%20unpredictable%20world%2C,building%20resilience%20against%20future%20disasters).
3. **Develop a Decision‑Tree for Adaptation** – Build a module similar to Jupiter’s Adaptation Hub but tailored to tourism. Present options such as dune restoration, mangrove rehabilitation, grey infrastructure and policy measures. Quantify avoided loss, co‑benefits (e.g., biodiversity, community well‑being) and cost‑benefit ratios.
4. **Use Probabilistic Scoring and Scenario Analysis** – Provide distributions (not just point estimates) of risk and integrate multiple climate scenarios (e.g., SSP/RCP combinations). Use exceedance probabilities and AAL to inform threshold‑based decisions, following dClimate’s and Jupiter’s example[blog.dclimate.net](https://blog.dclimate.net/case-study-physical-climate-risk-assessment-for-a-major-hotel-chain/#:~:text=Analyses%20included%20probability%20calculations%20for,both%20individual%20and%20portfolio%20levels)[jupiterintel.com](https://www.jupiterintel.com/blog/adaptation-and-cem-have-arrived-weve-raised-the-bar-on-climate-informed-capital-decisions#:~:text=Jupiter%20MetricEngine%20fills%20that%20gap,term%20resilience%20planning).
5. **Ensure Transparency and Explainability** – Publish documentation of variables, weighting and algorithms. Allow users to download underlying data and sensitivity analyses. Consider adopting CORVI’s hybrid approach combining empirical data with expert elicitation[stimson.org](https://www.stimson.org/2020/corvi-report-climate-and-ocean-risk-vulnerability-index/#:~:text=categories%20are%20made%20up%20of,the%20potential%20for%20available%20data).
6. **User‑Centric Interface** – Develop interactive dashboards that show hazard maps, socio‑economic indicators and adaptation options; allow user‑driven scenario selection; and generate shareable reports for stakeholders (government, investors, tourists). Provide training or guidance similar to World Bank screening tools but with quantitative outputs.