Washington State

Real-Time Intelligence: Advancing Disaster Response with AI

CATEGORY: Artificial Intelligence

PROJECT TIMELINE: December 2025 – April 2026

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EXECUTIVE SUMMARY

During a major statewide flood event in 2025, Washington state transformed disaster response operations using artificial intelligence and geospatial intelligence. Led by Washington Technology Solutions (WaTech), the initiative delivered near real-time situational awareness that improved coordination, accelerated emergency decision-making, and helped impacted residents and businesses receive assistance faster.

The project integrated satellite imagery, flood extent mapping, water depth estimates, infrastructure information, and operational data from federal, state, and local partners into a unified operational environment. AI rapidly analyzed these datasets to identify impacted communities, estimate structural damage risk, and prioritize emergency response activities.

Tasks that historically required weeks of manual analysis were completed in hours or days. Emergency operations centers gained faster access to actionable intelligence, enabling agencies to deploy personnel, equipment, and recovery resources more effectively.

The initiative demonstrated how responsible AI adoption can improve public safety, operational efficiency, and government service delivery during emergencies. Rather than creating standalone experimental tools, Washington embedded AI directly into existing emergency management workflows, allowing responders to use AI-generated insights during active operations.

The project established a scalable framework that can support future hazards including wildfires, landslides, severe weather events, and infrastructure emergencies.

PROJECT DESCRIPTION

What problem or opportunity does the project address?

Flooding events create immediate operational challenges for emergency responders, infrastructure operators, and local governments. Agencies must rapidly determine flood extent, identify impacted communities, assess infrastructure damage, and prioritize response activities.

Historically, these efforts relied heavily on manual analysis of satellite imagery, reports, and geospatial datasets gathered from multiple organizations. These fragmented processes often required weeks to complete, limiting the speed and effectiveness of emergency response operations during critical phases of a disaster.

Washington recognized an opportunity to modernize disaster response operations using AI and geospatial intelligence. The project focused on transforming large volumes of complex disaster data into actionable intelligence that emergency operations centers could use in near real time.

Traditional Disaster Analysis	AI-Enabled Disaster Analysis
Weeks of manual assessment	Hours to actionable intelligence
Fragmented agency data	Unified operational picture
Manual flood interpretation	Automated AI-assisted analysis
Delayed resource prioritization	Faster deployment decisions
Reactive coordination	Near real-time situational awareness

Why does it matter?

Disaster response depends on speed, accuracy, and coordination. Delays in identifying impacted areas or prioritizing response activities increase risks to residents, infrastructure, and public safety.

Washington's 2025 flood event required rapid coordination among multiple state, local, and federal agencies. Traditional analysis methods could not keep pace with the volume and complexity of incoming data during an active emergency.

The project delivered measurable operational improvements by:

- Reducing analysis timelines from weeks or months to days
- Improving situational awareness during active flooding
- Increasing coordination across agencies
- Improving prioritization of emergency personnel and equipment
- Accelerating recovery assistance for residents and businesses

The initiative also maximized existing state investments in geospatial infrastructure, enterprise data governance, and shared technology services.

What makes it different?

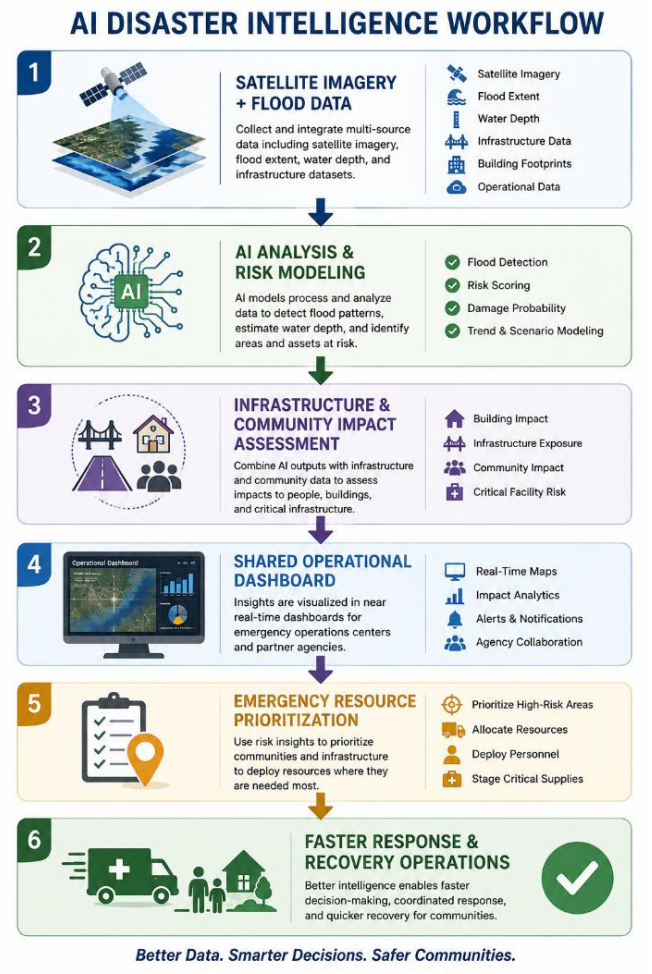
Washington developed a practical operational model for applying AI in emergency management.

The project integrated:

- Satellite imagery
- Flood extent mapping
- Water depth estimates
- Building footprints
- Transportation infrastructure
- Agency operational data

AI rapidly analyzed these datasets to identify high-risk areas, estimate structural damage risk, and support operational decision-making during active flooding.

Unlike many AI initiatives that operate separately from business operations, Washington embedded AI directly into existing emergency response workflows. Emergency managers retained operational authority while using AI-generated insights to make faster and more informed decisions.



What makes it universal?

Every state faces increasing risks from natural disasters and extreme weather events. Emergency managers nationwide must rapidly assess impacts, coordinate across jurisdictions, and deploy limited resources efficiently.

Washington's framework addresses universal government challenges including:

- Emergency preparedness and resilience
- Real-time situational awareness

- Cross-agency data sharing
- Operational efficiency
- Public safety
- Responsible AI adoption

The framework is scalable and repeatable using existing geospatial infrastructure, emergency management partnerships, and enterprise technology governance.

The same operational model can support:

- Wildfires
- Landslides
- Severe weather events
- Infrastructure emergencies
- Environmental incidents

The initiative aligns closely with NASCIO priorities related to resilience, data management and analytics, operational efficiency, and cross-boundary collaboration.

IMPLEMENTATION

What was the roadmap?

Washington Technology Solutions (WaTech) led the project through a coordinated enterprise implementation strategy that aligned statewide technology capabilities with emergency management operations.

The roadmap focused on four priorities:

1. Integrate multi-source disaster data into a unified environment.
2. Apply AI models to accelerate flood analysis and infrastructure assessment.
3. Deliver near real-time situational awareness to emergency operations centers.
4. Create a scalable framework for future disaster response operations.

The project leveraged existing statewide GIS infrastructure, enterprise services, and interagency partnerships to rapidly operationalize AI during a live emergency event.

Who was involved?

The project succeeded because of strong collaboration among federal, state, and local partners.

Leadership came from WaTech's Architecture & Innovation Division and the State Geospatial Program Office. The implementation team included:

- Geospatial analysts
- Data scientists
- Emergency management personnel
- Enterprise IT professionals
- State agency leaders
- Local government partners
- Federal remote sensing and geospatial partners

Participating agencies included:

- Washington State Department of Transportation
- Department of Natural Resources

- Department of Agriculture
- Department of Social and Health Services
- Local emergency management organizations

Federal partners contributed satellite imagery and remote sensing data, while state and local agencies provided infrastructure information and operational updates.

Because the project enhanced existing emergency management workflows rather than replacing them, agencies rapidly adopted the capability during live operations.

Buy-in and adoption were achieved through direct collaboration with emergency managers throughout implementation. Because the project enhanced existing workflows instead of replacing them, agencies adopted the capability quickly during a live emergency event.

How did you do it?

Washington leveraged existing enterprise technology investments, statewide GIS infrastructure, and interagency partnerships to rapidly operationalize AI during the 2025 flood response.

Resources included:

- Existing statewide geospatial platforms
- Satellite imagery and remote sensing data
- Shared enterprise infrastructure
- Cross-functional emergency response teams
- Existing emergency management operational resources

The technical architecture integrated multiple datasets into a shared operational environment where AI models analyzed:

- Flood extent
- Water depth
- Infrastructure exposure
- Building impacts
- Transportation disruptions

The architecture transformed fragmented disaster data into a shared operational picture that agencies could use immediately during emergency response activities.

Washington prioritized interoperability, scalability, and usability to accelerate deployment and maximize existing state investments.

IMPACT

What did the project make better?

The project significantly improved the speed, accuracy, and coordination of Washington state's disaster response operations.

Before implementation, emergency managers relied heavily on manual analysis processes that delayed situational awareness and slowed coordination across agencies.

After implementation:

Critical Success Factors:

- Existing statewide GIS infrastructure
- Strong interagency governance
- Trusted data-sharing partnerships
- Human-centered operational design
- Responsible AI oversight
- Embedded emergency management workflows

- Analysis timelines were reduced from weeks or months to days.
- Agencies gained near real-time situational awareness.
- High-risk areas were identified faster.
- Resource deployment became more targeted and efficient.
- Coordination improved across federal, state, and local partners.
- Recovery activities began sooner.

AI-enabled analysis improved accuracy by identifying affected structures, estimating flood depth, and predicting where structural damage was most likely to occur.

Most importantly, impacted residents and businesses received assistance more quickly because agencies could prioritize response and recovery activities using reliable, data-driven insights.

How do you know?

The project produced measurable operational improvements during Washington's 2025 flood response by significantly accelerating damage assessment, improving coordination, and reducing manual analysis efforts.

Time Savings

The initiative significantly shortened disaster assessment timelines:

- Reduced field damage evaluation timelines from approximately one month to one week.
- Accelerated overall damage assessment activities by an estimated two weeks.
- Enabled faster completion of federal emergency declaration documentation and supporting analyses reduced from weeks to days.

The system also allowed agencies to process flood impacts incrementally as new data became available rather than waiting for all assessments to be completed. AI-enabled map-based analysis replaced time-consuming spreadsheet tracking and helped agencies focus response and recovery efforts on the areas most likely impacted.

These improvements helped impacted residents and businesses apply for assistance more quickly.

Geographic Scale

The system supported statewide flood response operations across:

- 13 counties
- 75 flood impact areas

Coverage extended from Yakima, Chelan, and Kittitas counties in Eastern Washington to Clallam, Grays Harbor, and the broader Puget Sound region.

Operational Usage

The shared operational environment supported:

- More than 65 direct users
- More than 12 participating agencies and emergency response organizations
- 14 iterative AI-generated assessment releases as flooding conditions evolved

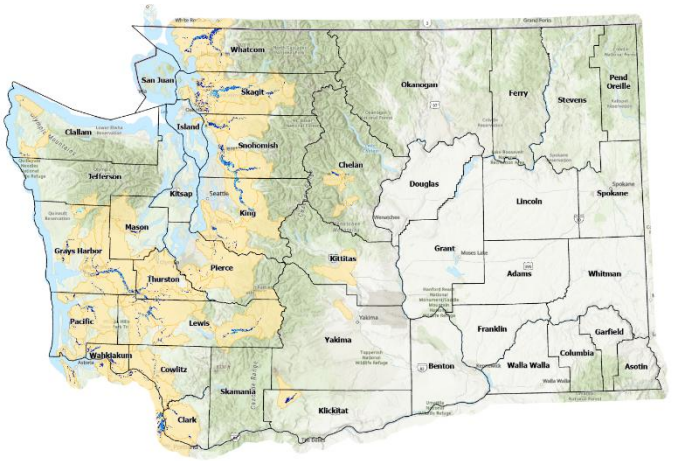


Figure 1: Impact areas highlighted in yellow. Inundation areas highlighted in blue.

The platform also allowed local agencies to integrate field reports and damage photos directly into the operational environment, improving situational awareness and statewide coordination.

Operational Efficiency

The initiative:

- Reduced manual GIS analysis and duplicate reporting efforts.
- Accelerated FEMA and emergency declaration documentation preparation.
- Reduced staff time needed to compile and validate operational data.
- Improved prioritization of emergency response and recovery resources.

Public Impact

The project improved outcomes for residents and businesses by:

- Accelerating damage verification for resident assistance requests.
- Supporting faster response and recovery coordination.
- Improving prioritization of high-impact areas.
- Helping reopen transportation corridors more quickly.

Financial and Resource Benefits

Washington also reduced operational costs and resource demands by:

- Reducing field verification trips through AI-supported impact analysis.
- Leveraging existing GIS infrastructure and partnerships instead of requiring major new technology investments.

Emergency management teams reported that AI-generated insights improved operational decision-making and strengthened coordination during rapidly changing flood conditions.

What now?

Washington state is expanding this framework to support broader emergency management and geospatial intelligence capabilities.

Future plans include:

- Applying the framework to wildfires, landslides, and severe weather events.
- Developing AI-powered natural language tools for geospatial analysis.
- Expanding enterprise data integration capabilities.
- Increasing accessibility for non-technical emergency personnel.
- Strengthening responsible AI governance and oversight.

Because the initiative relies on scalable enterprise infrastructure and established partnerships, future expansion can occur efficiently without significant new infrastructure investments.

CONCLUSION

Real-Time Intelligence: Advancing Disaster Response with AI transformed how Washington responds to disasters. During a major statewide flood event, the project reduced damage assessment timelines from weeks to days, delivered near real-time situational awareness, and enabled faster, more coordinated response and recovery efforts across 13 counties and 75 flood-impacted areas.

By combining AI, geospatial intelligence, and cross-agency collaboration, Washington created a scalable model for faster decision-making, stronger public safety outcomes, and more efficient government operations. The project demonstrates how responsible AI can deliver measurable public value when residents and communities need it most.