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# Applying Artificial Intelligence in Disaster Recovery and Community Development Work

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*Leading with Science®*

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## What If Your Team Could Handle More?

***The demands of disaster recovery and community development are ever increasing***

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### THE SITUATION

After a disaster, the needs are immense:

- **Thousands of images and records to review**
- **Hundreds of residents asking for a status update**
- **Limited staff and immense time pressure**

### THE QUESTION

How can our teams create more capacity without losing judgment, trust, or accountability?

### THE POSSIBILITIES

Use AI where it helps people **take in more, respond faster, and serve better.**




**SEE MORE**
Review imagery, records, and requests at a scale people previously could not.

**RESPOND FASTER**
Spend less time searching, triaging, and documenting.

**SERVE BETTER**
Give staff clearer information while people stay in charge of the outcomes.

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# Why We're Talking About This Now

*AI Has Moved From Novelty Into Everyday Work*

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**ADOPTION TODAY**

**88%**

**of organizations report using AI in at least one business function**

*Source: Stanford Institute for Human Centered AI (HAI), 2026 AI Index Report*

**MORE CAPACITY**

- Less time on repetitive review
- Faster documentation and triage
- Less time searching for information

**MORE RESPONSIBILITY**

- Clear ownership of each tool
- Protection of sensitive data
- Validation and measures of success

**WHY IT MATTERS:** In community development work especially - **trust, accessibility, privacy, and accountability** matter as much **or more** than speed.

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# AI Has Changed Quickly

*From Chat Tool to Workflow Support in <12 Months*

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| BEFORE: EARLIER AI TOOLS | | NOW: CURRENT AI TOOLS |
|---|---|---|
| **SMALL CONTEXT WINDOWS** Could only work with a few pages at a time | → | **LARGER CONTEXT** Works across documents, images, maps, audio, and structured data |
| **LIMITED REASONING** Struggled with multi-step problems | → | **STRONGER REASONING** Completes steps, routes work, and surfaces exceptions |
| **POOR HARNESSES** Little connection to files, tools, or business systems | → | **BETTER HARNESSES** Connects to organizational knowledge and business processes |
| **SIMPLE UNDERSTANDING** Seen as a chatbot for quick answers, a fancy autocomplete system, or a "Google alternative" | → | **WORKFLOW SUPPORT** Supports daily work - but still needs human judgment, direction, and review |

**KEY MESSAGE: AI tools now handle longer inputs, harder problems, and connections to work systems.**

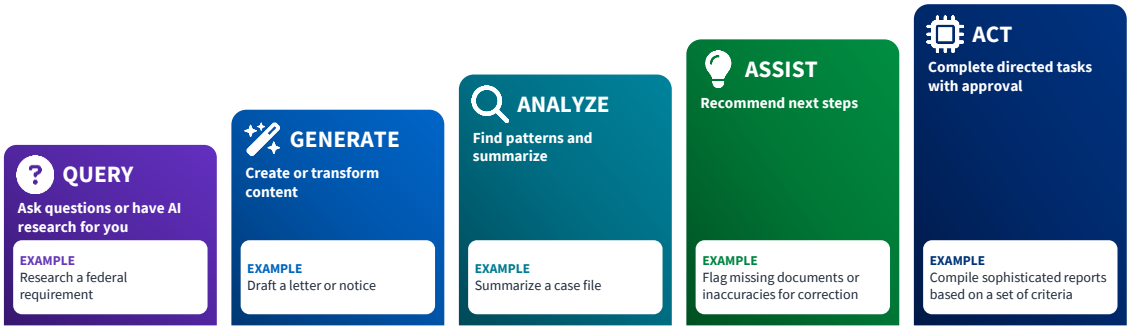
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# The New Progression

*From Generating Content to Complex Automation*

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**GENERATIVE AI:** Software that creates or transforms content using AI.

**AI AGENT:** Software that can carry out a series of directed tasks with an AI model.

**IMPORTANT:** AI can feel helpful while still being confidently wrong.

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# Working With AI Tools

*How Subject Matter Experts and Managers Get the Most From AI*

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**BEFORE:** Doing every step yourself → **NOW:** Directing, checking, and approving

**EFFECTIVE AI USERS MANAGE WELL**

- **COMMUNICATE CLEARLY** — Give careful, specific instructions and context
- **SET EXPECTATIONS** — Define the task, audience, and format up front
- **HOLD A STANDARD** — Set the bar the output must meet
- **ESTABLISH GOALS** — Work from a clear strategy and goal

**ADVANCED TECHNIQUES**

- **BRAINSTORM TO DRAW OUT EXPERTISE** — Have AI interview an expert, then organize the answers into a checklist or guide
- **CHECK AGAINST WHAT YOU KNOW** — Have AI work on documents and processes you know well, then make it a repeatable task once you fine tune
- **BUILD REUSABLE INSTRUCTIONS (SKILLS)** — Save the instructions, criteria, and examples that worked
- **ASK AI TO CHALLENGE A DRAFT** — Have the model find gaps, inconsistencies, or unclear language

**KEY MESSAGE:** The skills that make someone a good manager also make them effective with AI tools.

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# AI in Practice: Tetra Tech Fusion Maps

*AI-Supported Damage Assessment After Disaster*

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**EXAMPLE:**

**EF3 tornado near Appleton, WI**

| AUG 16 | AUG 17 | AUG 18 |
|---|---|---|
| Pre-event imagery | EF3 tornado strikes | Post-event imagery |

| 1. IMAGERY | 2. AI DETECTION | 3. HUMAN REVIEW | 4. FEMA DOCUMENTATION |
|---|---|---|---|
| High-resolution satellite imagery from before and after the event | Model identifies fallen trees, damaged structures, and impacted parcels | Staff confirm and interpret what the model found | Supports the City's formal damage assessment and Public Assistance process |

**KEY POINT:** AI turned large volumes of imagery into a decision supporting model nearly immediately.





# Fusion Maps: Results and Broader Uses

*More Applications for Fusion Maps*

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WISCONSIN RESULT

**~92%**

**Agreement with final FEMA data**

VERIFIED ACCURACY FOR

**~12,000**

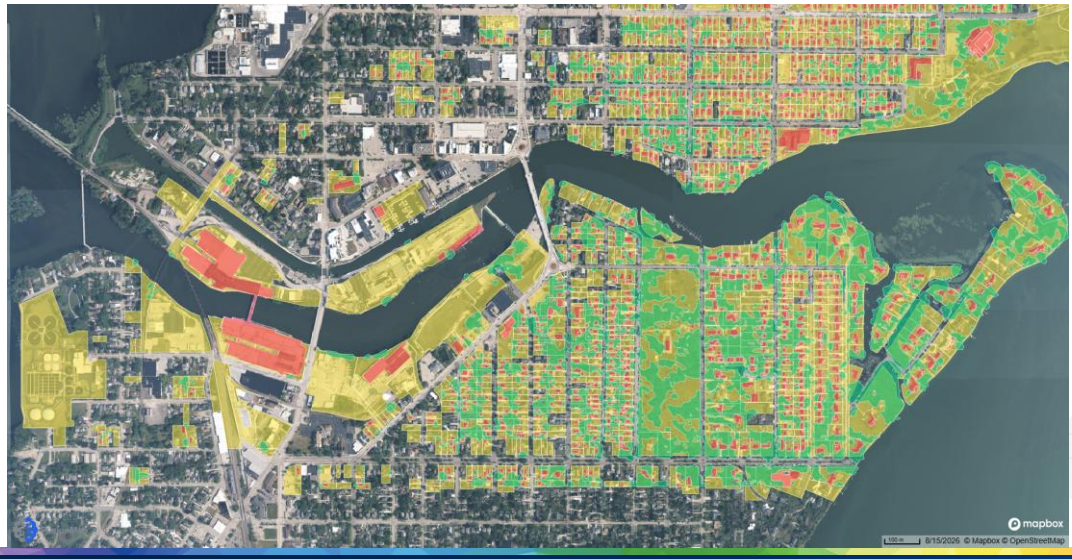
**units of a 13,000-unit dataset**

| DISASTER RECOVERY | ENVIRONMENTAL MONITORING | COMMUNITY DEVELOPMENT |
|---|---|---|
| IN USE | POTENTIAL | POTENTIAL |
| **Tornado damage** Four Wisconsin cities | **Water levels** Stream channels over time | **Blight** Deterioration over time |
| **Flood inundation** King County, WA | **Drought conditions** Changes visible in imagery | **Vegetation** Greenspace and tree cover |
| **Burned EVs** Los Angeles County wildfire | | |

**The applications for AI enhanced imagery analysis are significant and rapidly changing.**

## Nearby Appleton, WI – August Tornado

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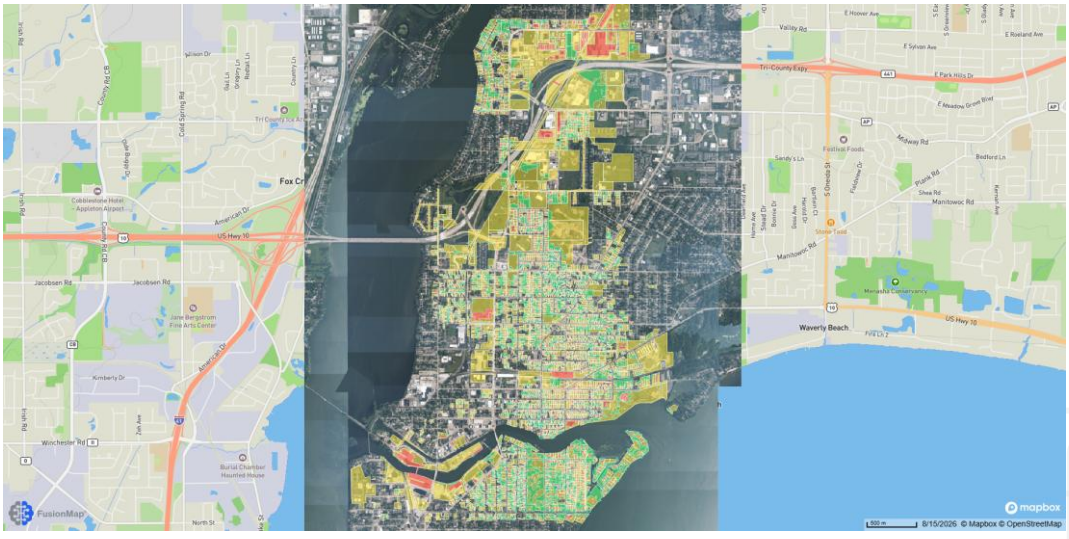



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## Nearby Appleton, WI – August Tornado

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## AI-Assisted Debris Removal Processes

*Less Manual Entry and Stronger Reimbursement Documentation*

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1. LOAD OBSERVED
2. MATERIAL IDENTIFIED
3. TICKET POPULATED
4. DESTINATION ROUTED
5. HUMAN VERIFIES EXCEPTIONS

**WHAT THE AI MODEL DOES**

- Identifies material type
- Estimates approximate weight
- Helps complete FEMA load tickets
- Supports the “tag” in “bag and tag”

**WHERE MATERIAL GOES**

- Contaminated
- Recyclable
- Multi-purpose sites

**THE VALUE**

- Less manual data entry
- Greater consistency
- Faster reimbursement records
- Better operational visibility

## Debris Cleanup and Monitoring

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## AI-Assisted Case Management

*One Central Entry Point Across Programs and Areas*

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**A RESIDENT ASKS**

- *"What is the status of my file?"*
- *"What do I need to submit next?"*
- *"Who can help with this issue?"*

INTAKE → TRIAGE → HUMAN SPECIALIST → STATUS UPDATE

**WHAT AI HANDLES**

- Answers routine status questions
- Identifies missing information
- Routes residents to the right person or resource

**ONE CASE MANAGEMENT HUB**

Planning | Permitting | Community development | Inspections | Related services

**KEY MESSAGE:** AI does not replace the case manager. It helps one person handle more requests with less effort.



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# Human in the Loop by Design

*Responsible AI Use Helps Make AI Tools Trustworthy*

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**PRIVACY**
Use approved systems and protect sensitive information.

**ACCURACY**
Validate outputs against source records.

**TRANSPARENCY**
Differentiate AI products from human created products

**EQUITY**
Check and address biases that emerge during AI-assisted work.

**ACCOUNTABILITY**
Document who owns the decision making and who monitors the output of the tool for adequacy.

**MEASURE OUTCOMES**

- Time saved
- Accuracy
- Response time
- Resident experience
- Equity
- Error rates

**HIGHER STAKES:** Validate before acting on eligibility, benefits, safety, reimbursement, or enforcement.

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# Where to Start With AI

*Start Small and Scale Responsibly*

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| CHOOSE A WORKFLOW | MAP THE PROCESS | DEFINE SUCCESS | TRAIN THE TEAM | RUN A PILOT | COMPARE AND DECIDE | CAPTURE LESSONS |
| High-volume, low-risk, with a clear pain point | Find where staff search, triage, or document | Set desired outcomes before selecting the appropriate tool | Review current training on and methods for using the tool | Choose representative cases with room for human review | Stop, refine, or scale | Policy, training, best practices |

**HUMAN REVIEW AND MEASUREMENT SUPPORT EVERY STEP**

- BOUNDED PROBLEM
- CLEAR MEASURES
- HUMAN REVIEW
- REFINE AS NEEDED

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# Takeaways

*AI Is Changing Rapidly, and the Applications Are Real*

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**AI HAS CHANGED A LOT IN UNDER 12 MONTHS**

QUERY → GENERATE → ANALYZE → ASSIST → ACT WITH APPROVAL

## AI IMAGING

**FUSION MAPS**

- Turns before-and-after imagery into a decision-support model
- Supported FEMA damage documentation in Wisconsin
- Extends to floods, wildfires, blight, and greenspace

## CUSTOMER SERVICE

**CASE MANAGEMENT**

- Answers routine resident status questions
- Identifies missing information early
- Routes residents to the right person or resource

## PROCESS STANDARDIZATION

**DEBRIS REMOVAL**

- Identifies material type and estimates weight
- Populates load tickets for FEMA reimbursement
- Applies the same criteria to every load

**IN EVERY USE CASE: AI augments, but does not replace, the human element.**

***Which parts of the work should AI assist, so people can focus on the parts that require people?***

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