ECOS

GREEN REPORT

Leveraging Artificial Intelligence for Environmental Protection

By Julia Henderson, under the direction of Beth Graves, ECOS*

EXECUTIVE SUMMARY

Artificial intelligence, also known as "AI," is an umbrella term for technologies that utilize data to perform tasks that are commonly thought to require human intelligence including making predictions, translating languages, and making decisions without explicit programming. The use of AI in the workplace is gaining momentum and state[1] environmental agency leadership has identified AI as a priority area to explore further. State environmental agencies are beginning to test how they can responsibly integrate AI tools to modernize environmental protection, and are identifying best practices, use cases, and applications that could improve efficiency and effectiveness in both internal and external operations. Recently, at least sixteen state governors have issued executive orders to strengthen AI governance and the National Governor's Association (NGA) has launched a **Working Group on AI & the Future of Work**.

Topics covered in this ECOS Green Report include an overview of AI and important terms, areas for AI application in environmental protection, and a list of recent and projected state environmental agency AI uses, followed by state project case studies and an appendix of sample federal and international environmental AI projects. As denoted in Figure 2, at least 36 states and the District of Columbia have begun preparing for AI or are already incorporating AI into their environmental agency operations. States have reported 34 possible internal and 14 possible external AI uses, applying AI to permitting, administration, public engagement, and other areas of environmental protection. This report provides brief profiles of AI preparations and uses in Colorado, Mississippi, New Mexico, Pennsylvania, South Carolina,

* With support from Kurt Rakouskas, ECOS, Adam Elkins, former ECOS Project Associate, and Lucy Mellen, former ECOS Intern

[1] In this report, ECOS uses the term "state" to refer to environmental agencies in states, territories, and the District of Columbia.

Tennessee, and Virginia. Some states have also provided example AI project Request for Proposals (RFPs) that are linked in this report.

AI is an emerging field with use cases yet to be thoroughly explored among environmental regulators. This report focuses on early AI applications in environmental protection. ECOS anticipates a more detailed review of the use of AI within environmental protection agencies through its Digital Business Workgroup (DBWG) and the **Interstate Technology and Regulatory Council (ITRC) AI and Machine-Learning Team** set to begin in June 2026 with registration already underway.

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I. Types of AI

There are many types of AI, with generative AI being a small and evolving subset. Examples of AI in everyday life include digital assistants such as *Siri* and *Alexa*, social media algorithms, music and video streaming recommendations, and customer service chatbots. AI algorithms present an opportunity for transforming environmental protection through analyzing and interpreting environmental data and other capabilities.

Machine learning (ML) is a type of AI that uses algorithms to identify patterns in large datasets and make educated predictions. Machine learning systems can also detect changes to imagery over time, such as by comparing geospatial satellite images to identify changes to tree cover in a given location.

Predictive analytics is the use of data, statistical algorithms, and machine learning techniques to identify the likelihood of future outcomes based on historical data. In simpler terms, it's a form of data analysis that aims to predict what is likely to happen in the future based on patterns found in past data.

By analyzing historical data, predictive analytics can help inform decisions and suggest proactive measures to optimize operations, reduce risks, and improve outcomes. This technique is widely used in industries such as finance, healthcare, marketing, and manufacturing to forecast trends, identify potential problems, and make better data-driven decisions.

Generative AI is a subset of machine learning in which a system is trained to generate language, images, music, computer code, art, or other content based on large amounts of data such as through **Large Language Models** (LLMs). An LLM uses large datasets of language to generate text. Small Language Models (SLMs) are more efficient models than LLMs that can be used for simpler tasks while using less energy. Chatbots use natural language processing models to replicate human language in responses, and can interpret patterns to improve future responses.

A **Chatbot** is software that emulates human conversation by responding to a prompt via voice or text. Chatbots range in complexity from systems programmed to answer particular questions to those that use machine learning to generate more advanced and personalized responses. A more advanced autonomous system may sometimes be referred to as an **Agent**. OpenAI's ChatGPT (Generative Pre-trained Transformer), Claude by Anthropic, and Google Gemini are examples of advanced chatbots that to respond to prompts with human-like text.

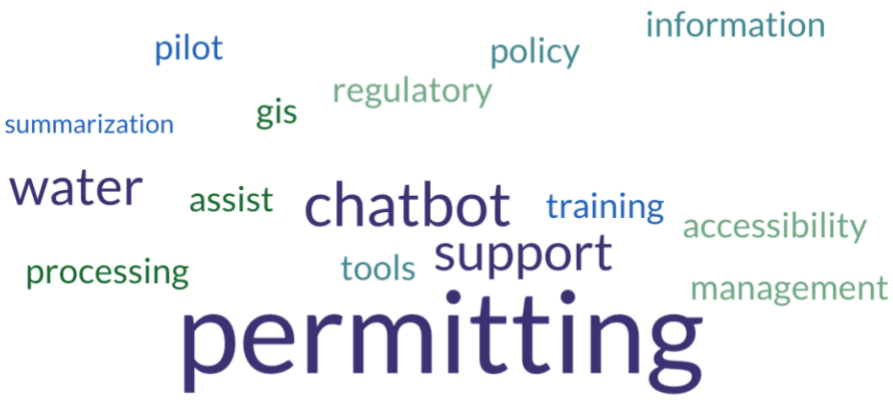
See this **Congressional Research Service AI Taxonomy** diagram for a helpful visualization of key AI terms.

II. Opportunities for AI and Environmental Protection

The following section draws from a paper ECOS published in February 2026 on **Artificial Intelligence & State Environmental Protection Agencies: Opportunities, Risks, Actions**. State environmental agencies can apply AI to environmental protection work in a variety of ways to help meet their missions. A major opportunity for AI technologies is the potential to enhance efficiency, streamlining tedious tasks and allowing environmental agency professionals to refocus their efforts on more high-level work. For state environmental agencies, AI technologies may be of particular interest for interpreting extensive historical data and offer value in both internal and external applications. Agencies may choose to use the AI product platform associated with the suite of tools they are already using, such as those using Gemini together with Google Workspace applications.

The word cloud shown in Figure 2 demonstrates the most frequently referenced terms from state AI applications and preparedness mentioned in this report.

Figure 1. Word Cloud of Potential AI Applications and Preparedness for State Environmental Agencies



Improving Internal Operations and Productivity. Many agencies are beginning their AI journeys with internally-facing use cases such as drafting emails, summarizing technical documentation, reviewing administrative paperwork, conducting initial application completeness reviews, or preparing translations of text for website content. With a human carefully reviewing any AI-generated material, these uses offer agencies an opportunity to try the technology, test its capabilities, and help staff learn how to appropriately use it. In times of stretched resources, AI tools can help agencies increase productivity and ease administrative burdens on their staff.

Improving External Operations and Productivity. States using AI in externally-facing applications may set a higher standard for review, testing, and demonstration of accuracy prior to publication to maintain a high level of public confidence and trust in agency operations. Four areas of potential external AI use are outlined below:

1. **Permit Streamlining and Efficiency.** Agencies are investigating AI as a tool to improve permitting processes and support higher-quality permit applications that are less burdensome to review and more protective of the environment. Chatbots and other AI tools can help applicants better understand permit requirements and generate more complete applications.

   If properly trained on pertinent rules, exposed to historical data from regulatory applicants, and provided examples of highly effective permits, AI may also help agency staff efficiently generate high-quality draft permits and allow them to spend more time on complex permit applications that require additional scrutiny. Generative AI is able to pull together relevant information, organize information, and create draft documents for review. Generative AI can also simulate possible scenarios and predict probable outcomes and risks, helping to identify optimal permit conditions for environmental protection. While the up-front costs of AI can sometimes be prohibitive, certain states have reported major time and cost savings in permit processing.[2]

2. **Enhancing Public Engagement.** AI has the potential to improve public comment processes and enhance community engagement. AI tools trained to recognize and process written text can efficiently categorize high volumes of comments or analyze them for key themes. This administrative assistance frees up staff time to perform more thoughtful analysis and consideration of public input on rules and other agency actions. Agencies may also be able to deploy AI-powered chatbots to help the public navigate web content, understand regulatory requirements, or access environmental data, such as those related to public engagement and comment opportunities.

3. **Environmental Monitoring, Compliance, and Data Analysis Assistance.** Some states are using AI-driven machine learning, predictive analytics, and data analysis to improve their environmental monitoring, compliance assurance, and enforcement capabilities. Data models can analyze compliance history and other information to identify facilities that may be at greater risk of experiencing a future violation. This insight helps agencies prioritize deployment of their inspection resources and potentially prevent environmental harm before it happens or a compliance violation occurs. Similarly, states can use AI to analyze satellite imagery for changes over time, help delineate sensitive environments such as wetlands, or identify where a water system may be losing water. Program staff could deploy the technology to detect data anomalies that may indicate unpermitted emissions or other types of non-compliance, leading to swifter and smarter enforcement actions. Automated data analysis can also help agencies understand if they are making progress on a given goal, identify areas for improvement, and decide on next steps.

4. **Emergency Planning and Response.** AI tools also hold significant promise for supporting emergency planning and response—needs that may grow even more critical with increased extreme weather events. By integrating historic and real-time information into predictive models, agencies may be able to improve their ability to assess flood risks, identify wildfires by reviewing images for smoke, and plan for and conduct realistic AI-aided training for spills or other contamination events. Improved situational awareness and

[2] E-Enterprise for the Environment Leadership Council (EELC) May 2026 Meeting, Presentation on AI-Assisted NPDES Permitting in South Carolina, Brett Butz, South Carolina Department of Environmental Services

access to information about local recycling or disposal facilities helps emergency managers more effectively deploy resources and direct responders to protect the environment and human health.

III. Responsible AI Use and Governance for State Environmental Agencies

States are taking measures to promote responsible use of these technologies, keeping in mind possible risks and challenges.

In 2023, the National Institute of Standards and Technology (NIST) published an **AI Risk Management Framework** (AI RMF 1.0) outlining recommendations to ensure trustworthy, safe, and secure AI systems.[3] More recently, organizations such as the National Association of State Chief Information Officers (NASCIO) and the American Association for the Advancement of Sciences (AAAS) have published resources highlighting guidelines and key questions to consider for scaling AI responsibly in the public sector.[4][6]

A. Policy and Oversight

Before using AI, states should consider whether a task of interest is appropriate for machine augmentation. Decision-makers might first ask if there exist non-automated solutions to the problem that would be more effective and of lower risk.[5]

To ensure accountability and public trust as they integrate AI into their workflows, states may consider strengthening policies and oversight of the technology.[6] According to the National Conference of State Legislatures (NCSL), during the 2025 legislative session, all 50 states, Puerto Rico, the U.S. Virgin Islands, and the District of Columbia introduced new legislation on AI. Last year, 38 states adopted or enacted legislation regulating AI in some fashion. Many states have also developed general frameworks for AI use within state governments though executive orders or other policies. For additional information on state legislation, see the NCSL webpage on **2025 Artificial Intelligence Legislation**.[7]

Some Governors have issued executive orders addressing AI, with provisions focused on promoting responsible use and further studying potential benefits and risks of implementing the technology. For instance, in January 2025, Mississippi Governor Tate Reeves issued an **Executive Order (EO) to Foster Stakeholder Collaboration and Harness AI**, directing the Mississippi Department of Information Technology Services to identify AI uses within each state agency, evaluate guidelines in place, and develop recommendations for responsible use. The EO recognizes the balance between fully harnessing AI and providing oversight, protecting security, and ensuring it does not replace humans. In another example, in February 2026, Pennsylvania Governor Josh Shapiro announced **new actions on AI**, building on his September 2023 **Executive Order on Expanding and Governing the Use of Generative Artificial Intelligence Technologies**. These actions included the launch of an AI Literacy Toolkit and the creation of an AI Enforcement Task Force. Additional examples are provided in "Resources."

[3] NIST, **Artificial Intelligence Risk Management Framework**, January 2023
[4] AAAS, **EPICenter AI Resources**, Accessed March 2026
[5] AAAS, **Key Questions for Government Leaders to Ask When Considering the Use of AI Systems**, November 2024
[6] NASCIO and Accenture, **Harnessing GenAI to Elevate the Citizen Experience**, September 2025
[7] Microsoft, **Data, Privacy, and Security for Microsoft 365 Copilot**, February 2026

In January 2026, the National Governor's Association (NGA) launched a **Working Group on AI & the Future of Work**, composed of Governors' advisors from a bipartisan set of NGA members. The workgroup plans to meet regularly to develop *A Roadmap for Governors on AI & the Future of Work* with publication planned for November.

B. Accuracy and Bias

A major concern when using AI is the accuracy of the information it provides—particularly with generative AI when the original source is not identified. Subsequently, while AI algorithms may appear to be objective and autonomous, they are informed by the humans that have created them and the particular datasets used for their training, and biases may be reflected in their outputs. AI models may be designed to prioritize any response over accuracy, leading to AI "hallucinations" that list non-existent sources.[8]

Some states are considering scaling AI adoption strategically, starting with low-risk applications, such as closed AI environments, and consistently evaluating data quality, bias, and error in AI performance.[6] Even seemingly low error rates in AI implementations may produce a significant amount of flawed outputs. For example, while a 2% error rate for a tool may sound low, if it processes 500,000 records, then 10,000 records could be processed incorrectly. Using AI as an assistive technology while maintaining human involvement and establishing checkpoints may mitigate potential risks and unintended consequences. In publishing AI-generated products, state governments may consider disclosing the use of AI in their publications for transparency. State agencies will also have to navigate receiving AI-generated content which might include resumes, comments on regulations, and other types of information sent to agencies.

C. Data Security

To maintain trust and safety as new AI tools are integrated, states should plan to focus on AI readiness through data security measures. Data security is of particular importance for state government agencies that handle sensitive information. States should also consider security features of a given AI technology before integrating it into their procedures. Some AI tools store data by default, such as Microsoft Copilot, which auto-captures meeting conversations in a discoverable Microsoft folder.[7] As one example, the state of Utah has banned AI notetaking in meetings within the Google Suite in order to protect data privacy for internal, deliberative, and informal discussions.[9]

D. Environmental Impact

As demand for AI continues to grow, there is increasing focus and concern on the environmental impacts of new and existing data centers, including intensive energy consumption and water usage for cooling. This particular report does not investigate these impacts, and instead focuses on how states are integrating AI into agency work. State environmental agency staff will continue to maintain protection of human and environmental health as a priority in all agency operations, including decision-making around AI integration.

IV. State Environmental Agency AI Preparedness

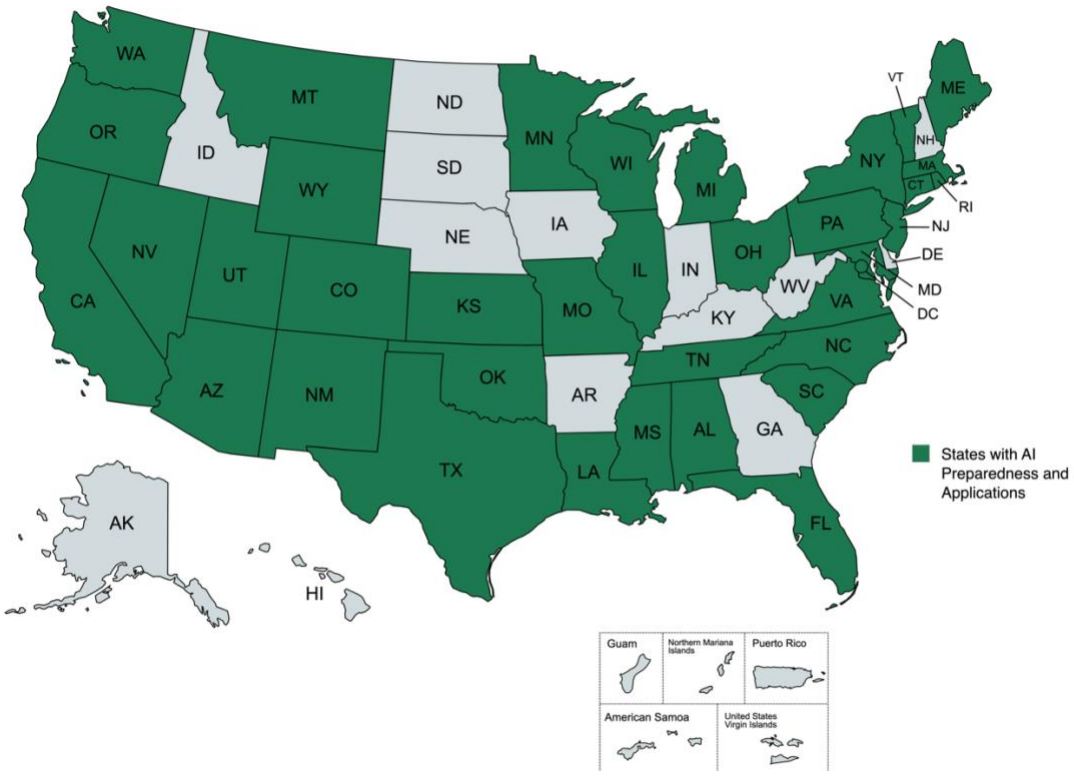
State environmental agencies are preparing for AI through staff training and pilot programs, as well as through other initiatives to make data more accessible for AI. In an effort to prepare staff for responsible AI integration, Colorado and Pennsylvania have reported successful outcomes of pilot programs introducing generative AI across state agencies. Additional information on this work can be found in the State AI Case Studies section starting on page 12.

Figure 3 shows all state environmental agencies with AI uses or preparedness initiatives mentioned in this report. This is a non-exhaustive collection of AI use examples, as ECOS did not put out a formal survey of states. States not

[8] NewsGuard, **AI False Information Rate Nearly Doubles in One Year**, September 2025
[9] As noted on ECOS All Member Call on AI, December 2025

represented may also have AI projects not captured here. States are encouraged to reach out to ECOS with updates or new information about AI plans or use within their environmental agencies.

Figure 2. Map of States with State Environmental Agency AI Preparedness and Applications



ECOS has documented examples of training resources and state AI preparedness as follows:

A. Examples of Data Preparation and Policy for AI

- Making internal documents accessible for AI – New Mexico Environment Department (NMED)[10], Michigan Department of Environment, Great Lakes, and Energy (MI EGLE)[9], California Environmental Protection Agency (CalEPA)[9]
- Creating an Environmental Information Management System to modernize systems and processes across platforms – Illinois Environmental Protection Agency (ILEPA)[11]
- Publishing a Study Proposing Protocols for Water and Environmental Modeling Using Machine Learning – CalEPA Department of Water Resources[12]
- Creating an Office of AI Policy, which provides a "regulatory sandbox" and liability mitigation for testing AI tools in state operations, with the state environmental agency falling under the office's jurisdiction – Utah Department of Environmental Quality (UT DEQ)[13]

[10] ECOS 2025 Fall Meeting State Innovation Video, New Mexico Project Velocity for AI, September 2025
[11] Illinois Environmental Protection Agency, RFP for Environmental Information Management System, September 2025
[12] CalEPA, Department of Water Resources, Protocols for Water and Environmental Modeling Using Machine Learning, March 2025
[13] State of Utah, Office of Artificial Intelligence Policy, Accessed March 2026

- Updating agency policy and guidance regarding AI use and creating a working committee for IT, security, and business – Virginia Department of Environmental Quality (VA DEQ)[14]
- Providing licenses to all staff to allow for the full functionality of AI tools – South Carolina Department of Environmental Services (SC DES) (pending funding availability)[15]
- Developed an agency policy, guidance, and training for responsible AI use and created an AI workgroup – Wyoming Department of Environmental Quality (WY DEQ)[16]
- Developing a Commissioner Policy for Artificial Intelligence Use that builds on the NYS Policy, Acceptable Use of Artificial Intelligence Technologies – New York Department of Environmental Conservation (NY DEC)[17]
- Participating in an AI research tool trial to support agency analysis, which includes use cases such as to develop and implement new training materials; assess rules and other documentation to assemble internal guidance; and summarize detailed documents – NY DEC[17]
- Developing Request for Information (RFI) seeking information from AI developers and other stakeholders on how AI can amplify agency effectiveness. RFI will be informed by internal facilitated discussions with agency staff – Connecticut Department of Energy and Environmental Protection (CT DEEP)[18]
- Planning to conduct an audit to identify staff using ChatGPT and ensure compliance with state security and information management policies – Maryland Department of Environment (MDE)[19]

B. Examples of Staff AI Training

- Partnership for Public Service - AI Government Leadership Program[9]
- John F. Kennedy School of Government at Harvard University, Executive Education - AI in Action Program[9]
- Innovate US free AI training for public service professionals. South Carolina used this training for agency staff, providing the non-profit with metrics each quarter – SC DES[15]
- Staff participated in an enterprise pilot on AI chatbot to explore adoption and use cases by state government employees – Pennsylvania Department of Environmental Protection (PA DEP)[20]
- Staff training on Role Instruction Context Examples Constraints Output (RICECO) framework to write good AI prompts – Washington State Department of Ecology (WA Ecology)[9]
- Pilot program guiding agencies toward responsible use of generative AI with support from facilitated training, found positive accessibility impacts – Colorado Department of Public Health and Environment (CDPHE)[9]
- Michigan central information technology (IT) group contractor provided high-level strategy on the technical implementation of AI – MI EGLE[9]
- Developing a plan with NYS Office of Information Technology Services to commence workforce training through InnovateUS and to begin using AI Pro – NY DEC[17]
- Utilized AI writing assistant to develop training videos for agency personnel on responsible AI use including case studies, and privacy and security recommendations – MDE[19]

Additional information on Governor-Issued Executive Orders and State AI Policies can be found in the Resources section.

[14] Conversation with Christoph Quasney, VA DEQ, November 2025
[15] Conversation with Sean Briggs, SC DES, December 2025
[16] Conversation with Jennifer Zygmunt, WY DEQ, March 2026. Contact Jennifer at jennifer.zygmunt@wyo.gov for more information.
[17] Conversation with Harry Hechehouche, NY DEC, April 2026
[18] Conversation with Eric Hammerling, CT DEEP, April 2026
[19] Maryland.gov AI Inventory, MDE AI Use Cases, Accessed May 2026
[20] Conversation with Daniel Egan, PA Office of Administration, January 2026

V. State Environmental Agency AI Applications

The following list provides specific uses of AI that environmental agencies are exploring, which may be in early stages or already in use. AI uses are organized by internal and external application and category of agency work. For the purposes of this report, we define “Internal” uses as applications aiming to improve efficiency within the state environmental agency workplace versus “External” uses as those that directly face the public. The majority of AI uses are currently internal, as many agencies began use of AI in a pilot or closed environment, with the possibility of making tools public-facing in the future. Figure 4 summarizes categories of AI uses by state, with letters indicating internal or external uses within the corresponding state agency.

*Figure 3. Summary of Select State Environmental Agency AI Uses**

State	Permitting	Regulatory	Public Engagement	Application Processing/ Funding	Monitoring	Administration	Technical Assistance	Compliance
Arizona						I	I	
California					I			
Colorado		I				I		
Florida							I	
Maryland	I					I, I		
Massachusetts				E			E, E	
Michigan			I			I		
Minnesota	I, I							
Mississippi		E		I		I		
New Jersey			I					
New Mexico							E	
New York	I, E				I	E		
North Carolina	I, E	I	E	I				I
Ohio	E					I		
South Carolina	I, I, I, I, I, E		I, E			I		
Tennessee	I						E	
Texas								I
Virginia	I, I, E	I	E			I		
Washington			E		I			
Total States	**8**	**4**	**6**	**3**	**3**	**9**	**5**	**2**
Total Internal/External	**13 Internal 5 External**	**3 Internal 1 External**	**3 Internal 4 External**	**2 Internal 1 External**	**3 Internal**	**9 Internal 1 External**	**2 Internal 4 External**	**2 Internal**
Overall Total Projects	**18**	**4**	**7**	**3**	**3**	**10**	**6**	**2**

**I* and *E* correspond with instances of *Internal* and *External* projects, respectively.

A. Sample of Internal AI Uses

A1. Permitting

1. Addressing permit backlogs. MPCA analyzing and grouping public comments to identify key themes and draft responses – VA DEQ[14], Minnesota Pollution Control Agency (MPCA)[9]
2. Setting up memos with effluent permit limits using GitHub – MPCA[9]
3. Septic permit processing using advanced GIS system – Tennessee Department of Environment and Conservation (TDEC)[21]
4. ePermitting chatbot trained on wikipermit platform to help with permitting – SC DES[15]
5. ePermitting deep summarization tool – SC DES[15]
6. Minor Wastewater Permit Renewal - Permit Pro, first draft of wastewater permit renewals – SC DES[15]
7. ePermitting Application Review – SC DES[15]
8. ePermitting Administrative Completeness tool – SC DES[15]
9. Partnership with contractors deploying AI to streamline environmental permitting, licensing timelines, and site assessments – MDE[22]
10. Gathering full permit history of a site for use during permit reviews, compliance evaluations, and enforcement decisions – North Carolina Department of Environmental Quality (NC DEQ)[23]
11. Assisting with permit application review through document analysis, insight extraction, and summarization – NY DEC[17]

A2. Regulatory

12. Drafting fiscal notes from proposed legislation – CDPHE[9]
13. Assisting with Public Notice response management (helping code and group like comments) and comment response document formatting and populating, formulating responses based on regulatory purview and specific applications – VA DEQ[14]
14. Provides a summary of public comments received through multiple sources, including written, oral, voicemail, and email – NC DEQ[23]

A3. Public Engagement

15. Site remediation site description for easier public accessibility, GIS convergence on a map – New Jersey Department of Environmental Protection (NJDEP)[9]
16. Recycling contamination detection for targeted educational outreach – MI EGLE[24]
17. Exploring use of AI for translating information on shellfish closures – SC DES[15]

A4. Application Processing/Funding

18. SRF loan application processing – Mississippi Department of Environmental Quality (MDEQ)[25]
19. Assistance to modernize a 40-year-old application containing 18 million records – NC DEQ[23]

A5. Monitoring

20. Reviewing data for two-year water quality standards reviews – WA Ecology[9]

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[21] ESRI Blog, **Tennessee is in a Building Boom and the State's Permitting Must Keep Pace**, April 2025
[22] Maryland Department of Environment, **Maryland Governor Wes Moore Announces Landmark AI Partnership to Transform State Service Delivery**, November 2025
[23] Conversation with Sushma Masemore, NC DEQ, April 2026
[24] *ECOSWIRE*, **Michigan Launches Landmark City-Wide, AI Powered Recycling Program**, June 2024
[25] Conversation with Chris Wells, MDEQ, January 2026

21. Air quality modeling, satellite methane monitoring, and identifying emissions in overburdened communities to support science-based policy – California Air Resources Board[26]
22. Image recognition software that analyzes all photos taken by trail cameras on State-owned lands, facilitating Law Enforcement and Forest Protection response and investigation – NY DEC[17]

A6. Administration

23. Travel paperwork processing tools – MDEQ[25]
24. Developers using prompts for coding assistance - Ohio Environmental Protection Agency (Ohio EPA)[9]
25. Writing aid providing spelling, grammatical, and stylistic edits for employees with disabilities affecting writing and comprehension – CDPHE[27]
26. Generative AI Sandbox Pilot testing for automating routine tasks, helping employees summarize information, create charts and graphics, take notes, format, write code and more – Arizona Department of Environmental Quality (AZ DEQ)[28]
27. Facilitating basic administrative support functions such as email management, deliverable creation, and technical support – VA DEQ[14], SC DES[15]
28. Document summarization and automated redaction and extraction of key analytical data – MI EGLE[9]
29. Meeting transcription tool automatically taking notes and providing transcripts, allowing staff to focus on the discussion – MDE[19]
30. Document summarization and creative content generator tools to streamline and automate manual tasks – MDE[19]

A7. Technical Assistance

31. Drinking water arsenic predictive analytic program to address drinking water exceedances – AZ DEQ[29]
32. Using AI and robotics to reduce chemical/pesticide usage in partnership with University of Florida Center for Applied Artificial Intelligence in Agriculture – Florida Department of Environmental Protection (FL DEP)[30]

A8. Compliance

33. Advanced mapping for on-site investigations to identify hazardous sources for follow-up – Texas Commission on Environmental Quality (TCEQ)[31]
34. Gathering large volumes of data in biosolids reports to identify high risk locations, improving pro-active risk management – NC DEQ[23]

B. Sample of External AI Uses

B1. Permitting

1. Help desk chatbot to answer questions about permitting – Ohio EPA, VA DEQ[14], SC DES[15]
2. Checking for completeness as permit applications are submitted, reducing delays and frustrations, and improving permit processing – NC DEQ[23]
3. "Smart Access" consolidated AI platform to provide a single-entry point for applicants to submit permit applications, track status, and communicate with DEC – NY DEC[17]

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[26] California Air Resources Board, **CARB Adopts Research Plan to Guide Science-Based Climate and Air Quality Policy**, September 2025
[27] 2024 E-Enterprise Leadership Council Fall Meeting, AI Strategy at the State of Colorado Presentation, October 2024
[28] Arizona Department of Environmental Quality, **Arizona Pioneers Practical Uses for Generative AI**, November 2024
[29] ECOS 2021 Fall Meeting State Innovation Video, **Arizona Predicts Arsenic Exceedances**, September 2021
[30] FL DEP, **Scientists at New AI Center Aim to Help Florida Farmers and Protect the Environment**, October 2025
[31] ECOS Fall Meeting 2025, **Texas Technological Enhancements to Onsite Investigations**, September 2025

B2. Regulatory

4. Public-facing wetlands delineation tool – MDEQ[25]

B3. Public Engagement

5. External Complaint Chatbot responding to environmental health issue FAQs – SC DES[15]
6. Website AI chatbot assist service, leveraging Agentic AI capabilities to facilitate robust customer support and provide meaningful regulatory feedback – VA DEQ[14]
7. Planning to add AI into its public library so the public can find information faster amongst the thousands of documents and records housed by the agency – WA Ecology[9]
8. Assess and remediate public-facing PDFs and provide a summary of remediation actions performed, ensuring compliance with accessibility requirements – NC DEQ[23]

B4. Funding

9. Chatbot for grants navigator – Massachusetts Department of Environmental Protection (MassDEP)[9]

B5. Administration

10. Facial recognition for proctoring online pesticide certification exam, flagging potential cheating based on eye and face movement, with to determine whether the score should be invalidated – NY DEC[17]

B6. Technical Assistance

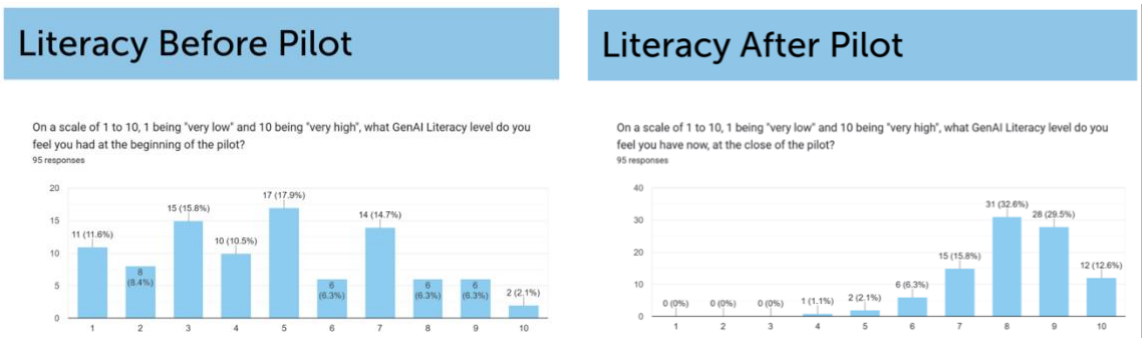
11. Identifying water system leaks using satellite imagery – NMED[32]
12. Wetland Screening GIS Tool to assist users with identifying potential wetlands – TDEC[33]
13. AI Model using AI for coastal resilience and flood planning, delivering real-time risk assessments to coastal communities (in partnership with Northeastern Univ.) – MassDEP[34]
14. Multiple AI models for footwear waste reduction, facilitating circular reuse, resale, and recycling (in partnership with EarthDNA) – MassDEP[34]

VI. State AI Case Studies

The following case studies delve further into AI projects that environmental agencies are exploring and where applicable, lessons learned.

[32] New Mexico Environment Department, **Press Release on LeakTracer**, January 2025
[33] *ECOSWIRE*, **Tennessee Launches AI-Powered Wetland Screening Tool**, January 2025
[34] Massachusetts Department of Environmental Protection, **Healey-Driscoll Administration Announces $2.9 Million in Awards through Massachusetts AI Hub**, October 2025

A. Colorado



Generative AI Pilot

The Colorado Department of Information Technology held a [90-day pilot program] integrating generative AI into state agency work beginning in August 2024. The pilot sought to guide agencies toward responsible use of generative AI with support from facilitated training. Colorado selected its generative AI tool based on its advanced features, such as users' ability to access AI capabilities within Google Workspace applications. The pilot program included all agencies within the state, with the Colorado Department of Public Health and Environment (CDPHE) among them.

Outcomes of the pilot demonstrated positive accessibility impacts for employees through features such as image description, focus assistance, document summary, and real-time captioning. Post-pilot, Colorado is exploring the expansion of AI training to add Colorado-specific content, branding, and policies through InnovateUS, which is offered at no cost to state and other public sector entities.[27]

Contact: Andy Putnam, Colorado Department of Public Health and Environment, andrew.putnam@state.co.us

B. Mississippi

The Mississippi Department of Environmental Quality (MDEQ) is in the early stages of developing both internal and external AI tools for permitting, application, and paperwork processing. Efforts include the following:

Wetlands Self-Delineation Tool (External)

This tool would use existing data, such as soil type information, to assist with aquatic resource delineation and is part of the wetlands permitting program MDEQ is developing as published in its January 2026 Advanced Notice of Proposed Rulemaking (ANPR) for its State Water Alternation Program (SWAP). MDEQ is working with a contractor to make this resource available as a public-facing desktop screening tool. MDEQ is continuing to finalize the draft regulation with feedback from public comments due in October 2026.

According to the ANPR, MDEQ previously received comments indicating concerns about the potential increase in workload associated with SWAP implementation. MDEQ points to its effort to streamline implementation through "investigating the use of artificial intelligence and machine learning tools to assist MDEQ with reviewing key components of SWAP permit applications" (p.27). The tool is expected to increase efficiency by enabling permittees to control delineation using a trusted licensing program without having to wait on MDEQ to conduct full delineation in the field.

Mississippi Gulf Coast Community College Grant-Funded Projects:

SRF Loan Application Processing Tool (Internal)
Students will develop a proof of concept for using AI to more efficiently process SRF loan applications.

Invoice Tracking (Internal)
Students will work to automate electronic submission and review of invoices for streamlined data entry and invoice processing.

Travel Paperwork Processing Tool (Internal)
Students will work to streamline the travel reimbursement process for agency staff. Currently, MDEQ staff must complete a travel voucher listing all actual travel expenses, which is compared to per diem rates before reimbursement, factoring in any advance. The AI tool would simplify this process, enabling easy scanning of receipts for information on expenses.

Contact: Chris Wells, Mississippi Department of Environmental Quality, **cwells@mdeq.ms.gov**

C. New Mexico

The New Mexico Environment Department (NMED) is improving staff access to information by making its data searchable through an AI platform and using a generative AI tool to create document summaries and first-draft materials based on existing content.

Project Velocity: "Getting your data ready for AI"

NMED's Project Velocity focuses on using AI to make regulatory documents, whether paper or digital, accessible to staff for decision-making and inquiry. NMED partnered with a contractor to pilot a unified AI platform, collecting data from scanned and digital files and making them searchable and intelligent through natural language processing. For example, staff can ask an agent questions to find information that will expedite a permitting process.

- **New Mexico Environment Department Project Velocity for AI**
- **NMED Project Velocity: AI at Work in Environmental Programs**, Meta Hirschl, New Mexico Environment Department
- *Roundtable & Open Discussion: AI at Work in Environmental Programs*, **Lessons in Illuminating Data for Actionable Intelligence**, Alicia Keyes, Apaluma

Identifying Water System Leaks using Satellite Imagery
New Mexico's 50-year **water plan**, issued in 2024, indicates that there are significant losses of clean drinking water due to leaks in outdated water infrastructure. To address these water leaks, in January 2026, NMED **launched** "LeakTracer," a satellite-based leak detection program to help rural communities quickly find and repair leaks in drinking water systems. Using L-band radar data and AI through contractor partners, LeakTracer identifies leaks so crews can act fast—saving water and reducing costs. Eligible rural systems that serve fewer than 20,000 people and are in good standing with the Rural Infrastructure Loan Program can participate at no cost for detection; systems only need to cover repair costs. A pilot project in five communities found 78 leaks, saving 345,000 gallons per day in early 2025. Interested systems can apply via the LeakTracer Hotline: (505) 841-LEAK (5325).

Contact: Meta Hirschl, New Mexico Environment Department, **meta.hirschl@env.nm.gov**

D. Pennsylvania

Training Employees for AI Integration

Beginning in January 2024, the Commonwealth of Pennsylvania's Office of Administration began working with a contractor for a pilot program of a generative AI tool, taking an employee-centered approach to adopting generative AI. The generative AI tool offered enhanced cybersecurity, privacy, and management features. The pilot program was meant to help employees understand how to integrate AI into their daily operations, while also enabling the contractor to gather feedback to help integrate their AI tools into other state government operations for future uses. Employees were able to explore generative AI uses to help increase productivity.

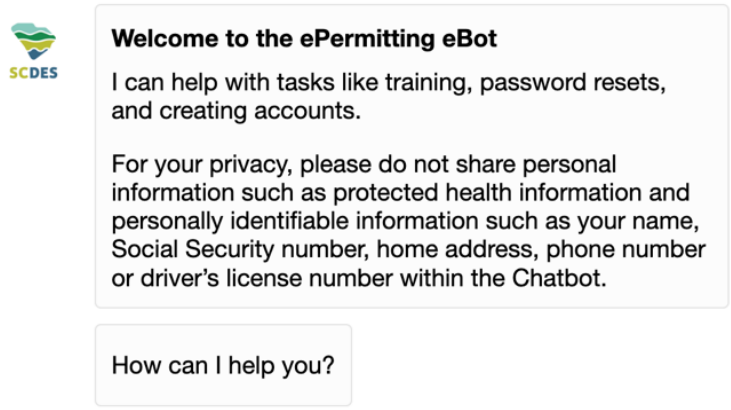
In March 2025, the Commonwealth announced the results of a yearlong pilot spanning 175 employees from 14 agencies. Over 85 percent of participants reported positive experiences using generative AI. Overall, participants saved an average of 95 minutes per day while using the AI tool for tasks such as drafting, summarization, and research support. The pilot also reinforced the importance of human oversight and robust training and support to help employees successfully integrate generative AI into their daily work. Building on these findings, the Commonwealth is scaling up adoption of AI tools. To support effective and ethical use, employees must complete mandatory training on responsible AI use, data protection, and appropriate application in government work. This phased strategy balances innovation with accountability while preparing the workforce to use AI safely and effectively.

Contact: Harrison MacRae, Office of Administration, Commonwealth of Pennsylvania, hmacrae@pa.gov

E. South Carolina

The South Carolina Department of Environmental Services (SC DES) (formerly part of the Department of Health and Environmental Control - SC DHEC) has developed multiple internally- and externally-facing AI technologies to increase efficiency, improve services, and streamline permitting, complaint response, and other processes.

In Production



ePermitting FAQ Chatbot (External)
This chatbot answers frequently asked questions about ePermitting. The chatbot was built on a now obsolete solution; however, SC will soon migrate to a more up-to-date low-code chatbot solution.

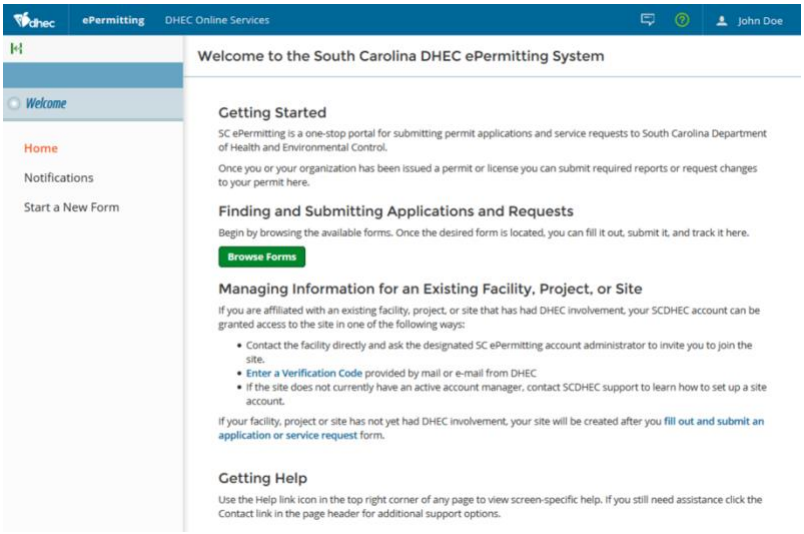
Environmental Complaints Chatbot (External)
This public-facing chatbot triages incoming environmental health complaints. The chatbot (featured in ECOS Green Report: State Strides on Environmental Justice & Title VI of the Civil Rights Act) allows any individual to log on over the Internet and type in a question. Through the chatbot, individuals will receive an immediate answer to frequently asked questions without having to make multiple phone calls. Environmental issues of concern may relate to air quality (burning, facility stack emissions, odors), boats and abandoned vehicles, mining, chemical or oil spills, fishkills, solid or hazardous waste (garbage, tires, drums), and water (sewage, stormwater, pools, coastal issues). The chatbot will similarly soon migrate to a more up-to-date Microsoft low-code chatbot solution.

AI Assistant Chatbot (Internal)
This AI assistant is designed to help agency staff work more efficiently by answering questions, solving problems, and assisting with tasks like brainstorming and email drafting. The AI assistant utilizes generative AI and is available to all

SCDES staff as of November 2025, after completion of required training. SCDES is tracking metrics and adoption among staff. This AI assistant does not have direct access to emails, Teams messages, or SharePoint data.

ePermitting Application Chatbot (Internal)
This chatbot is an in-app resource for use of the ePermitting application, which is especially useful to internal SC customer service staff responding to questions. The chatbot was trained on the application wiki along with information from SC permit applications. Training data included applications but not permits, which will be a focus of the next phase.

ePermitting Deep Summarization Tool (Internal)
This in-app tool summarizes large amounts of information about a specific item such as an application, permit, or complaint. The tool provides users with surface-level insights for all permits without having to navigate through multiple sources.



In Development

Minor Wastewater Permit Renewal Permit Pro (Internal)
This tool streamlines wastewater permit renewals by automatically generating draft permits using data extracted from applications, historical limits, and supporting documents. The system dramatically reduces drafting time—from approximately 100 hours to 15 minutes—while preserving full human oversight, allowing staff to review, refine, and finalize every draft. Permit Pro flags inconsistencies, maintains complete audit trails, and enhances consistency across permits, helping agencies accelerate renewals without compromising regulatory standards.

ePermitting Administrative Completeness - (Internal)
This tool defines checklist rules for permitting forms, evaluating submissions and delivering pass, partial, or fail results with detailed observations and recommendations for improvement. SC has completed a proof of concept of this tool with its Stormwater Pollution Prevention Plan and is now working to further develop the tool to work for any form or application.

ePermitting Application Review - (Internal)
Building on the Administrative Completeness solution above, this tool will assess permit applications for administrative completeness by analyzing form fields and content of attached documents, providing immediate feedback to customers. The tool will leverage data from past correction requests to improve accuracy. Users will still be able to submit their applications even when the AI indicates partial or fail. The AI also identifies challenges with the application itself, presenting these to staff for possible form modification. The tool will be public-facing in the future.

SCDES has reported significant permitting process time and cost savings from AI user testing. The agency found that when employing AI tools, application review time decreased from 2.5 hours to 30 mins, limit extraction from 50-75 hours to 4.5 hours, and permit drafting from 15-35 hours to 2.5 hours. In total, over 75 hours were freed up to be redirected to staff editing, technical review, and public communications. Additionally, PermitPro saved the agency about $4,000 in costs per permit.[2]

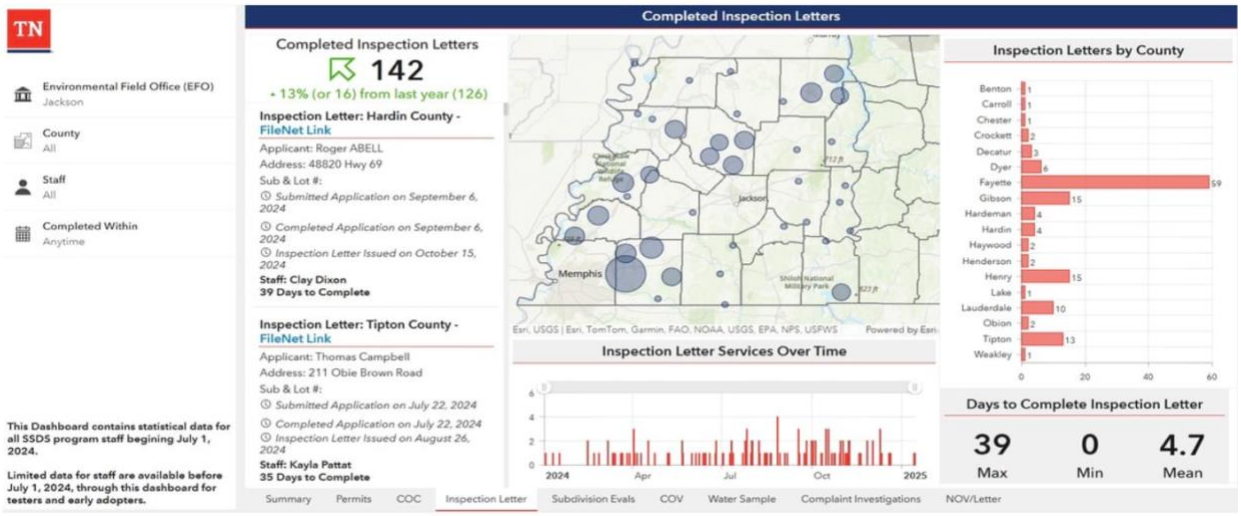
Contact: Sean Briggs, South Carolina Department of Environmental Services, Sean.Briggs@des.sc.gov

F. Tennessee

GIS for Septic System Permit Processing and Wetland Mapping

The Tennessee Department of Environment and Conservation (TDEC) is leveraging AI to streamline agency work through GIS for both septic system permitting and wetland identification.

TDEC has revolutionized septic permit processing in the state's rapidly growing rural areas by implementing an advanced GIS system, significantly reducing the average permit issuance time. The digital transformation streamlines TDEC workflows for resident requests, inspector assignments, and updates. Due to a building boom in the state, TDEC inspectors have seen a sharp rise in requests for subsurface sewage disposal system services. Modernizing its permitting and inspection system has provided TDEC with tangible efficiency gains to present to legislators and the public.
Additionally, TDEC has launched a Wetland Screening Tool to assist users with identifying potential wetlands – and the extent of



those wetlands – throughout the state. The predictive model leverages AI learning, GIS geospatial mapping, and 75,500 acres of existing wetland data to highlight areas where wetlands are likely to occur. Although the tool does not definitively confirm the presence or boundaries of wetlands and TDEC strongly recommends that qualified professionals verify results, it serves as a valuable resource. TDEC notes that the tool will help streamline and jumpstart the wetland identification process for stakeholders engaged in environmental planning, conservation efforts, and regulatory compliance.

Contact: Jeremy Hooper, Advisor for the Tennessee Bureau of Environment, jeremy.hooper@tn.gov

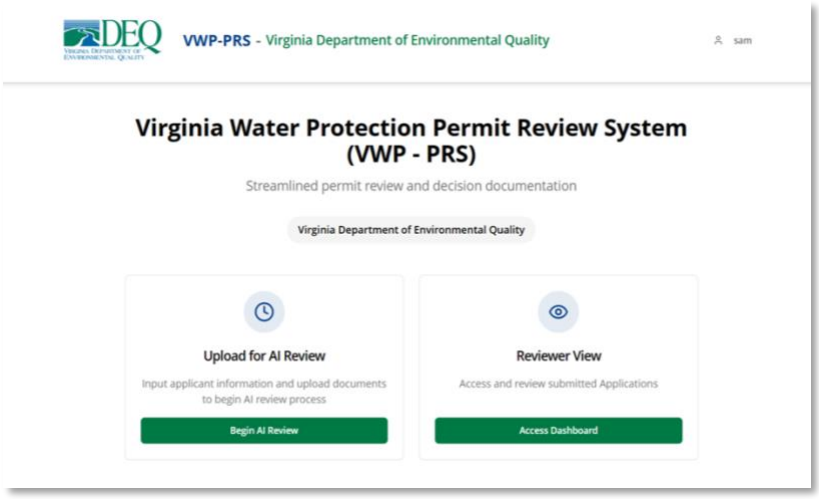
G. Virginia

Permitting AI Proof of Concept

The Virginia Department of Environmental Quality (VA DEQ) has completed its AI Proof of Concept (POC) for the Virginia Water Protection Permit (VWPP) Program. This pilot program tested AI-powered permit processing for regulatory and "proof of concept" review to increase permitting efficiency. The AI agent assesses permit applications for completeness and consistency with federal and state requirements. The goal of this program is to help with workload due to the high volume of permit applications VA DEQ receives currently, which is expected to increase as the U.S. Army Corps of Engineers implements the U.S. Supreme Court's *Sackett* decision.

According to VA DEQ, the AI agent has demonstrated an ability to conduct both a completeness review and technical review. For example, it is able to successfully analyze whether an applicant has demonstrated a sufficient purpose and need for the project for which they are seeking permit approval. The agent also flags areas for additional human review.

VA DEQ has worked with a contractor to customize an AI agent for its unique permit processing. The pilot program worked with historical VWPP applications with the intent to deploy the technology in the future for real-time review of new applications. VA DEQ owns the AI solution and will initially operate internally behind a firewall. As permitting-related regulations change, VA DEQ will account for such changes through updates to the AI solution.



VA DEQ experienced high usage costs while testing the tool in its sandbox environment, a secure space for software development. However, the. agency expects to lower usage costs as the tool is further refined and is deployed in a production environment for real-world staff use.

Results from the initial AI POC pilot found reduced complex permit review time to 2.5 hours, while exceeding the typical pilot benchmark of a 70% success rate. The estimated processing cost was $130-200 per permit. As VA DEQ moves to externalize the tool, the agency plans to give applicants direct access, charging a per-use fee to offset costs and reinvest in AI development.[35]

See project **RFP** here.

Contact: Christoph Quasney, Virginia Department of Environmental Quality, christoph.quasney@deq.virginia.gov

VII. Federal AI Activities and Uses

President Trump has released a number of Executive Orders (EO) on AI recently, as well as other EOs and policies that impact the U.S. EPA and other federal agencies' work on AI.

A. Executive Orders and Office of Management and Budget Memos

[35] E-Enterprise for the Environment Leadership Council (EELC) May 2026 Meeting, Presentation on Environmental Permitting Tech Modernization: Using AI to Accelerate Permit Reviews, Mike Rolband, Virginia Department of Environmental Quality

EO 13960: **Promoting the Use of Trustworthy Artificial Intelligence in the Federal Government**, December 3, 2020. Directs federal agencies to develop lists of AI uses, share them with other federal agencies, make public non-classified and non-sensitive use cases, and update this information annually. For additional details on U.S. EPA and U.S. Department of Energy (U.S. DOE) federal use cases, see Appendix B, Table 1.

EO 14365: **Ensuring a National Policy Framework for Artificial Intelligence**, December 11, 2025. Sets forth a national policy framework to promote U.S. global AI dominance through less cumbersome regulation. Directs establishment of AI Litigation Taskforce to challenge state laws inconsistent with this policy and restrict funding for these states.

EO 14179: **Removing Barriers to American Leadership in Artificial Intelligence**, January 23, 2025. Directs development of AI action plans within 180 days by specified agencies with a goal to sustain and enhance American global AI dominance.

The Office of Management and Budget (OMB) has issued several AI related memorandums:

- **OMB Memorandum M-25-21**, April 3, 2025, Accelerating Federal Use of AI through Innovation, Governance, and Public Trust. Provides agencies guidance on implementing EO 14179.
- **OMB Memorandum M-25-22**, April 3, 2025, Driving Efficient Acquisition of Artificial Intelligence in Government. Rescinds and replaces OMB Memorandum M-24-18 issued under the Biden Administration and provides guidance to agencies on responsible AI procurement.

B. U.S. Environmental Protection Agency AI Uses Inventory

U.S. EPA and other federal agencies are required to submit an inventory of AI uses annually, per Executive Order 13960. U.S. EPA, U.S. DOE, and the National Oceanic and Atmospheric Administration (NOAA) are leading projects which utilize some form of AI to advance environmental protection. See the appendix for more information on these projects.

In October 2025, U.S. EPA released its **AI Compliance Plan** and **AI Strategy** pursuant to EO 14179 and OMB Memo M-25-21. The EPA AI Compliance Plan describes how the agency will build governance, execute risk management, and adhere to federal requirements of maintaining an annual AI use case inventory. The AI Strategy outlines the agency's plans to further develop its use of AI through strengthening workforce readiness, AI infrastructure, and governance.

U.S. EPA published three AI use cases in its 2023 inventory, and significantly increased its AI adoption in 2024, reporting 17 use cases. In 2025, U.S. EPA continued this trend, reporting 28 use cases in its annual AI inventory. U.S. DOE reported 91 AI use cases in 2024 and 325 use cases in 2025. U.S. EPA's actual AI use cases may be higher than the number reported as U.S. EPA has separately reported having 103 AI use cases on an internal inventory, including some still in the conceptual phase.[36]

The U.S. EPA **2025 AI Use Case Inventory**, February 2026, includes a list of all agency projects using AI and a consolidated list of general types of AI applications. Of the 28 reported use cases, six referred to projects reported in the prior year's inventory that have since been discontinued. Other projects are in various stages of pilot, pre-deployment, and deployment. Most of the projects utilize machine learning, natural language processing, or generative AI, with a major focus on streamlining administrative functions.

C. U.S. EPA AI Application Examples

[36]E&E News, **EPA Use of Artificial Intelligence Skyrockets**, July 2025

U.S. EPA and University of Chicago Predicts RCRA, CAA, and CWA Noncompliance
In 2015, U.S. EPA partnered with the University of Chicago Energy and Environment Lab (UChicago E&E) to improve targeting and detection of noncompliance. Using predictive analytics, UChicago E&E flags the facilities that are most likely to violate the Resource Conservation and Recovery Act (RCRA). As of 2017, the model had achieved a 50% increase in the detection of severe violations. It was released to U.S. EPA, state, local, and tribal regulators in August 2020, and its full impact is still being considered.[37]

As of 2024, U.S. EPA and UChicago are in pre-deployment to expand predictive analytics for noncompliance to Clean Air Act (CAA) and Clean Water Act (CWA) violations.[38]

U.S. EPA Emergency Response Training Tool
In 2023, U.S. EPA created an **EmergencAI tool** generating tabletop exercises for disaster preparedness and resilience. The tool helps to conduct training for agency staff on realistic scenarios, in which they are able to practice emergency response strategy and planning. With this tool, U.S. EPA is able to instantaneously develop tabletop exercises that would have previously taken experts substantial time to prepare. Generated exercises focus on chemical, biological, radiological, and nuclear scenarios.[39]

RESOURCES

National Conference of State Legislators, **Artificial Intelligence Policy Toolkit**, March 2026
American Association for the Advancement of Science, **Center for Scientific Evidence in Public Issues AI Resources**, 2023-2025
National Association of State Chief Information Officers, **Harnessing GenAI to Elevate the Citizen Experience**, September 2025
National Academies, **Strategies for Integrating AI into State and Local Government Decision Making**, July 2025

National Association of State CIOs, **Your AI Blueprint: 12 Key Considerations as States Develop Their Artificial Intelligence Roadmaps**, December 2023
National Institute of Standards and Technology, **AI Risk Management Framework**, January 2023
Environmental Law Institute, **Artificial Intelligence - Advancing Environmental Compliance, Enforcement, and Follow-Up Programs**, June 2022

Governor-Issued Executive Orders

1. Alabama Governor Kay Ivey, **EO 738 on Providing for the responsible and productive use of Generative AI in state government**, February 2024
2. California Governor Gavin Newsom, **EO N-5-26**, March 2026
3. District of Columbia Mayor Muriel Bowser, **Mayor's Order on Articulating DC's Artificial Intelligence Values and Establishing Artificial Intelligence Strategic Benchmarks**, February 2024
4. Louisiana Governor Jeff Landry, **EO on State Government's Use of AI**, September 2025
5. Maine Governor Janet Mills, **An Order Establishing the Maine Artificial Intelligence Task Force**, December 2024

[37]Environmental Law Institute and Impact Assessment Agency of Canada, **Artificial Intelligence: Advancing Environmental Compliance, Enforcement & Follow-Up Programs**, June 2022
[38] U.S. EPA, **2025 AI Use Case Inventory**, February 2026
[39] U.S. EPA, **The Current State of Artificial Intelligence in Disaster Recovery: Challenges, Opportunities, and Future Directions**, September 2023

6. Maryland Governor Wes Moore, EO 01.01.2024.02 on Catalyzing the Responsible and Productive Use of Artificial Intelligence in Maryland State Government, January 2024
7. Massachusetts Governor Maura Healey, EO No. 629 Establishing an Artificial Intelligence Strategic Task Force, February 2024
8. Mississippi Governor Tate Reeves, EO No. 1584, January 2025
9. Missouri Governor Mike Kehoe, EO 26-02, January 2026
10. Montana Governor Greg Gianforte, EO Creating the 406 Jobs Initiative, August 2025
11. New Jersey Governor Philip Murphy, EO No. 246, October 2023
12. North Carolina Governor Josh Stein, EO No. 24: Advancing Trustworthy Artificial Intelligence That Benefits All North Carolinians, September 2025
13. Oklahoma Governor Kevin Stitt, EO 2023-24, September 2023
14. Oregon Governor Tina Kotek, EO No. 23-26 on Establishing a State Government Artificial Intelligence Advisory Council, November 2023
15. Pennsylvania Governor Josh Shapiro, EO 2023-19 on Expanding and Governing the Use of Generative Artificial Intelligence Technologies Within the Commonwealth of Pennsylvania, September 2023
16. Rhode Island Governor Daniel McKee, EO 24-06 on Artificial Intelligence and Data Centers of Excellence, February 2024
17. Vermont, Governor Phil Scott, EO No. 04-26 on Establishing the Vermont AI Economic Taskforce, May 2026
18. Virginia, Governor Glenn Youngkin, EO No. 5 on Recognizing the Risks and Seizing the opportunities of Artificial Intelligence, September 2023
19. Washington Governor Jay Inslee, EO 24-01, January 2024
20. Wisconsin Governor Tony Evers, EO #211 on Regulating the Creation of the Governor's Task Force on Workforce and Artificial Intelligence, August 2023

Policies

City of San José, Generative AI Guidelines, April 2025
Colorado, Statewide GenAI Policy, September 2025
Delaware, Generative Artificial Intelligence Policy, July 2025
Kansas, Generative Artificial Intelligence Policy, July 2023
Louisiana, Artificial Intelligence Acceptable Use Policy, September 2025
Nevada, Policy on the Responsible and Ethical Use of Artificial Intelligence, November 2024
North Carolina, AI Impact Assessment Policy, February 2026
North Carolina, Use of Publicly Available Generative AI Policy, February 2026
New York State, Acceptable Use of Artificial Intelligence Technologies, March 2025
Ohio, Use of Artificial Intelligence in State of Ohio Solutions, January 2025
Pennsylvania, Artificial Intelligence Policy, Updated January 2026
South Carolina, Artificial Intelligence Policy[15]
Virginia, Enterprise Architecture Standard, 2023-2025
Wyoming, Artificial Intelligence Policy, March 2026[16]

RFPs

Illinois, Illinois EPA AI RFP, November 2025
New Mexico, Project Velocity: Enterprise Document Management and AI-Enhanced Retrieval Platform, 2025
Virginia, DEQ AI Pilot Proof of Concept – VWPP Permit Review and Preparation, July 2025

CONCLUSION

State environmental agencies are making progress with integrating AI into routine work and specific projects involving permitting, administration, and public engagement, as well as other areas of environmental protection. States are primarily testing low-risk tools with AI components to improve internal efficiency, supported by staff training for responsible use and additional state AI governance. Some states have launched public-facing AI tools, such as chatbots to provide support for permitting and grants processes and tools to identify wetlands, water leaks, and flooding risk. U.S. EPA, other federal agencies, and international entities have also demonstrated potential areas for AI adoption in environmental work, which states may look to as they consider future opportunities for leveraging AI.

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Appendix I. U.S. EPA AI Use Examples

Table 1. U.S. EPA AI Use Examples 2023-2025[40]

Use Case	**Year** (first appears in inventory)	**Stage of Development**	**Lead EPA Office**	**Internal/ External**	**Description**
Drafting Brownfield Success Stories	2025	Pilot	Region 1	Internal	Generative AI to prepare first draft brownfields success stories using extensive data from technical site reports
Summarizing and Responding to Comments	2025	Pilot	Region 8	Internal	Generative AI to summarize large volumes of comments and draft responses
Analyzing Drivers of Water Quality	2025	Deployed	OA	Internal	Machine learning to analyze drivers of water quality and violations, such as concentrations or HABs
Streamflow Classification	2025	Deployed	OW	Internal	Machine learning to predict whether a streamflow is perennial, intermittent, or ephemeral for improved classification
Semantic Search of Qualitative Data	2025	Pre-deployment	OFA	Internal	Natural language processing to replace manual search of qualitative database with "semantic search," analyzing for semantic similarity
Unpermitted Facility Finder	2025	Pilot	OECA	Internal	AI-enhanced facility finder identifying geolocation of facilities at increased likelihood of lacking necessary industrial stormwater permits
Chemical Review Assistant	n/a	Pre-deployment		Internal	AI Chemist Assistant to help identify chemical information in Toxic Substances Control Act (TSCA) submission reviews and risk assessments[41]
Predicting Water System Service Area Boundaries	n/a			Internal	Machine learning to model public drinking water system service area boundaries using census data[42]
Predicting Clean Air Act Violators	2024	Pre-deployment	OECA	Internal	Predictive analytics to identify facilities at high risk for violations: Clean Air Act[43]
Predicting Clean Water Act Violators	2024	Pre-deployment	OECA	Internal	Predictive analytics to identify facilities at high risk for violations: Clean Water Act

[40] U.S. EPA, **AI Use Case Inventories 2023-2025**, February 2026
[41] National Association of Manufacturers Newsroom, **EPA to Use AI to Expedite Chemical Reviews**, September 2025
[42] Environmental Information and Innovation (E2i) Meeting, **Using Machine Learning to Model Drinking Water Service Area Boundaries**, September 2024
[43] National Targeting Center CAA Call, January 8, 2026

Emissions Monitoring Chatbot	2024			Internal	Chatbot to respond to U.S. EPA monitoring system analyst questions about the emission monitoring programs, including historical regulatory changes and the reasons for those changes
Identifying Lead Service Lines	2024			Internal	Identification of lead service lines in drinking water distribution systems using predictive tools and bioindicators/biomarkers
Superfund Enterprise Management System Modernization	2024			Internal	Modernize and enhance the U.S. EPA's Superfund Enterprise Management System (SEMS) document search and processing system through intelligent automation
Audio Narration for STAR Videos	2024, retired in 2025			Internal	Using an AI tool to create realistic audio narration files for Natural Gas STAR Videos by turning text to speech
GovChat for EPA Staff	2024			Internal	GovChat website user interface application to provide a generative AI chatbot tool to EPA staff when on the EPA network
Literature Screening	2024	Deployed	OAR	Internal	Reducing the time required to screen literature for inclusion in scientific assessments by using machine-learning to rank references based on relevance
Open-Source AI Code				External	U.S. EPA has a large open-source presence with AI related source code publicly posted on GitHub
Predicting Chemical Exposure	2023			Internal	Use of random forest model to predict chemical exposure pathways and rank risk to human health
Predicting Records Retention	2023	Deployed	OFA	Internal	Machine learning to predict retention schedule for records categorization and management
Predicting RCRA Violators	2023	Deployed	OECA	Internal	Predictive analytics to identify facilities at high risk for violations: RCRA Large Quality Generators (LQGs) (2022)

Appendix II. Other Federal AI Applications

NOAA National Weather Service Translation
After 30 years of manual translation of weather forecasts to Spanish, NOAA began using AI for Spanish and Chinese translation in October 2023. NOAA conducted a series of pilot projects to train its AI software for weather, water, and climate terminology. The AI translation services are meant to make forecasts and warnings more accessible to diverse communities, increasing safety in severe weather events. In their pilot project, NOAA found that the AI model reduced time spent on Spanish translation for National Hurricane Center storm forecast products from one hour to less than ten minutes.

U.S. DOE PermitAI for NEPA Permit Streamlining
U.S. DOE is supporting the development of PermitAI (formerly known as PolicyAI) by its Pacific Northwest National Laboratory (PNNL), as well as related tools including SearchNEPA, EngageNEPA, and CommentNEPA that use AI to speed up National Environmental Policy Act (NEPA) permitting reviews.

These tools are built on a dataset of over 120,000 documents from over 60,000 projects and millions of pages of permitting documents from past environmental reviews. Building on this foundation, PermitAI's beta tools are testing AI-powered applications to accelerate individual tasks and workflows. For instance, PermitAI uses AI to extract information from environmental documents from U.S. EPA, U.S. DOE, Bureau of Land Management, and other federal agencies. Among other actions, AI is used to perform an initial review of correspondence, categorize comments, import documentation data into an EIS or EA, cite this documentation to expedite drafting, and identify apparent inconsistencies in data points across sections of a document, while keeping human subject-matter experts in the loop for verification.

U.S. DOE AI Use Examples 2024-2025

1. PermitAI to streamline energy infrastructure permitting by leveraging machine-learning to search and summarize 120,000 NEPA documents from 50 years of reviews.[44]
2. Joulix AI Application Suite of tools to enhance productivity and foster innovation, empowering employees to accelerate progress toward U.S. DOE's mission.[44]
3. AI Chatbot trained on facility recycling, composting, and trashing guidelines to inform users how to handle niche cases for sustainably disposing of unwanted items.[45]
4. Topic modeling for Energy.gov to minimize time spent through manual effort of reading and tagging 100,000 webpages.[45]
5. AskGDR Virtual Assistant to increase accessibility for the public to geothermal data.[45]
6. Position description tool to streamline the creation of job descriptions for hiring federal employees.[45]
7. PDF Analyzer to enable U.S. DOE teams to upload large PDFs and ask questions and generate content related to those PDFs.[45]
8. The Funding Finder to aggregate FOAs from different U.S. DOE sources and enable users to ask questions when identifying opportunities and developing proposals.[45]
9. Spot, a mobile robot, to navigate hazardous or hard-to-reach areas to perform inspections and gather precise data with its advanced sensors and cameras.[45]
10. Groundwater modeling to predict flow of water contaminants underground.[45]

[44] U.S. DOE, 2025 AI Use Case Inventory, September 2025
[45] U.S. DOE, 2024 AI Use Case Inventory, December 2024

NOAA AI Use Examples 2023-2025

1. National Weather Service air quality translation from English to Spanish and Simplified Chinese.[46]
2. Automated satellite fire detection to identify heat anomalies.[47]
3. Predicting the location of heat islands to help with public health response in 14 U.S. cities.[48]

NASA AI Use Examples 2025

1. Ames Research Center Pilot on Deep Learning for Flood Mapping (DELTA) using machine learning for satellite imagery to monitor and map flood event impacts, informing disaster preparedness and response.
2. Jet Propulsion Laboratory providing visualization tools and streamlining detection and tracking wildfire-induced smoke plumes.
3. Ames Research Center modifying past NASA algorithms identifying anomalies and precursors to issues in Unmanned Aerial Vehicle test flights.
4. Marshall Space Flight Center automated smoke plume detection using deep learning model from satellite reflectance.
5. Goddard Space Flight Center Urban Information System using machine learning to analyze climate risk and exposures in cities, including related to flooding and heat.
6. Goddard Space Flight Center using machine-learning for terrestrial ecosystem and carbon cycle modeling.

Appendix III. Sample International AI Use Cases

Canada Predicts Facility Noncompliance
Environment and Climate Change Canada's (ECCC) Enforcement Branch is responsible for investigating regulated facilities to ensure compliance, but the branch has the capacity to inspect only a small fraction of facilities. In order to more effectively mitigate noncompliance, the Office of the Auditor General found that the branch needed to employ a risk-based approach. The branch partnered with external data scientists to develop the Micro Enforcement Targeting Algorithm (META), which predicts noncompliance in order to help ECCC prioritize resource distribution. In testing of the first generation of META, it predicted noncompliance with three times more accuracy than previous methods.[27]

Chile Streamlines Complaint Processing
The Superintendency of the Environment (SMA) in Chile handles environmental monitoring and compliance and receives thousands of environmental complaints each year. SMA created a machine-learning model based on data from past complaints to identify serious environmental issues by labeling them according to whether action should be taken. Those labeled "relevant" are run through a second model to predict severity and prioritize inspection. This use of AI enables SMA to read through and address complaints much more efficiently without overextending its limited resources. SMA estimates that these models will increase the speed by which complaints are redirected to the proper agency by 80%, archived by 85%, and flagged for further inspection by 65%.[27]

New Zealand Uses Change Detection to Identify Landfill Noncompliance
With goals to curb the trend of sending more trash to landfills, New Zealand Ministry for the Environment plans to increase its national waste disposal levy. The Ministry commissioned Air & Space Evidence (ASE) to identify non-

[46] NOAA Uses Artificial Intelligence to Translate Forecasts, Warnings into Spanish and Chinese, October 2023
[47] NOAA Unveils Powerful Convergence of AI and Science with Revolutionary Next-Generation Fire System Technology, May 2025
[48] NOAA, Federal Agencies, Communities to Map Heat Inequities in 14 U.S. Cities, April 2024

compliant waste sites using satellite data. Using AI techniques developed by ASE, the change detection model will produce a file of potential landfill sites which will then be examined using high spatial resolution data and aerial imagery. This program has been piloted and demonstrated success in corroborating and adding new information to New Zealand's landfill registry.[27]

Appendix IV. Suggested Reading

1. Government AI Coalition hosted by San Jose, **Comprehensive List of AI Government Resources**, 2023-present
2. U.S. National Science Foundation, **National AI Research Resource 2 Year Progress Update**, 2026
3. Brookings, **How Different States are Approaching AI**, August 2025
4. Pacific Northwest Laboratory, **Benchmarking LLMs for Environmental Review and Permitting**, June 2025
5. National Association of Environmental Professionals Annual Conference, **Workshop Summary Report on Using AI Tools to Improve the Efficiency and Outcomes of the NEPA Process**, May 2025
6. State of California, **Benefits and Risks of Generative Artificial Intelligence Report**, November 2023
7. National Association of Clean Air Agencies, **The Environmental Impacts of AI**, November 2023
8. Climate Change AI and the Centre for AI and Climate, **Global Partnership on AI Report – Climate Change and AI: Recommendations for Government Action**, November 2021
9. Environmental Policy Institute (EPIC), **2025 Summary: Adopting Innovation at the U.S. Forest Service**, 2025
10. EPIC, **Reimagining the Work(force) our Environment Needs: Why We're Building a New Skills Taxonomy**, April 2026