

SCALABLE REGULATORY MACHINE-LEARNING FRAMEWORK FOR U.S. WATER RESOURCES

Tech ID: 33190 / UC Case 2023-146-0

PATENT STATUS

Country	Type	Number	Dated	Case
Patent Cooperation Treaty	Published Application	WO 2025/015313	01/16/2025	2023-146

Additional Patent Pending

BRIEF DESCRIPTION

Navigating the complex regulatory landscape of the 1972 Clean Water Act often requires labor-intensive site visits and inconsistent jurisdictional determinations. To streamline this process, researchers at UC Berkeley have developed a machine learning framework that assesses which water resources fall under federal protection. By training a model on 150,000 historical jurisdictional determinations made by the Army Corps of Engineers and integrating high-resolution aerial imagery with geophysical data, the system can predict regulatory status with high precision. This technology quantifies the impact of shifting legal definitions, such as illustrating how a 2020 White House rule deregulates approximately 608,000 stream miles and 32 million wetland acres compared to previous Supreme Court standards.

SUGGESTED USES

- » Regulatory Compliance: Providing developers and land managers with rapid, automated assessments of whether specific water bodies require federal permits.
- » Policy Impact Analysis: Helping government agencies and environmental groups simulate the real-world effects of proposed changes to environmental rules.
- » Conservation Planning: Identifying critical wetlands and streams that have lost federal protection to prioritize state-level or private conservation efforts.
- » Infrastructure Design: Supporting large-scale project planning by mapping jurisdictional waters across entire counties or states using remote sensing data.
- » Hydrological Mapping: Enhancing geophysical databases with high-confidence predictions of surface water connectivity and environmental significance.

ADVANTAGES

»

CONTACT

Michael Cohen
mcohen@berkeley.edu
tel: 510-643-4218.



INVENTORS

- » Shapiro, Joseph S.

OTHER INFORMATION

CATEGORIZED AS

- » **Computer**
- » Software
- » **Environment**
- » Other
- » Sensing
- » **Imaging**
- » Remote Sensing
- » **Sensors & Instrumentation**
- » Scientific/Research

RELATED CASES

2023-146-0

High-Throughput Analysis: Replaces manual, case-by-case determinations with a scalable system capable of evaluating thousands of sites simultaneously.

»

Objective Consistency: Reduces the variability inherent in human jurisdictional determinations by utilizing standardized aerial and geophysical inputs.

»

Dynamic Modeling: Allows for the immediate recalculation of federal jurisdiction across the entire country following Supreme Court rulings or executive rule changes.

»

Data-Driven Transparency: Provides a clear, quantifiable template for how machine learning can be applied to complex regulatory implementation problems.

»

Resource Optimization: Frees up personnel from the Army Corps of Engineers to focus on more complex field validations while the model handles routine screening.

RELATED MATERIALS



University of California, Berkeley Office of Technology Licensing

2150 Shattuck Avenue, Suite 510, Berkeley, CA 94704

Tel: 510.643.7201 | Fax: 510.642.4566

<https://ipira.berkeley.edu/> | otl-feedback@lists.berkeley.edu

© 2026, The Regents of the University of California

[Terms of use](#) | [Privacy Notice](#)