

Albany Zavarce

Undergraduate student at the Institute for Environmental & Spatial Analysis

University of North Georgia, 3820 Mundy Mill Rd. Oakwood, GA 30566, USA.

E-mail: Zavarcealbany@gmail.com

Overflowing Barrels, Failing Foundations: The Collapse of Venezuela's Oil State

1) BLUF: Primary Observations

- Venezuela possesses the world's largest proven crude oil reserves; however, aging infrastructure, deteriorating pipelines, and years of mismanagement have reduced its ability to extract, refine, and transport petroleum. Oil fields, development zones, and pipeline networks also create environmental and security risks for nearby communities (U.S. Energy Information Administration 2023).
- Oil-related problems in Venezuela range from spills and pipeline leaks to refinery fires and pollution events. These incidents affect local populations, especially fishing communities that rely on coastal waters for food and income. Additionally, Venezuela's heavy and high-sulfur crude oil requires specialized infrastructure for processing, which the country often struggles to maintain (Observatorio de Ecología Política de Venezuela 2026).
 - Strategic locations such as the José Industrial Complex and José Port serve as critical hubs for Venezuela's oil exports, connecting production areas, storage facilities, and international shipping routes. Maritime and open-source vessel tracking data show continued tanker movements between Barcelona, Venezuela, and U.S. Gulf Coast ports following January 3, 2026, highlighting Venezuela's ongoing role in global energy markets (MarineTraffic 2026; CNN 2026). Figure 1 illustrates these tanker movements.

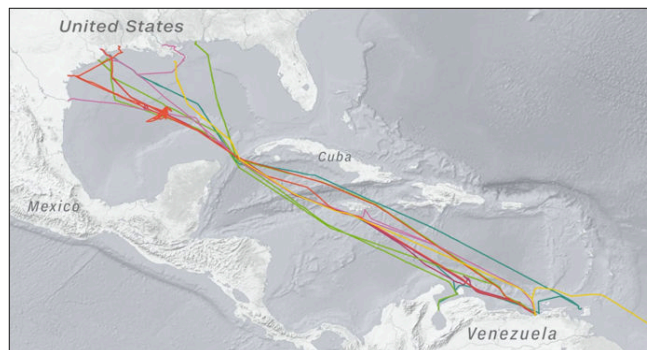


Figure 1. Venezuelan oil tanker routes between Barcelona, Venezuela, and U.S. Gulf Coast ports following January 3, 2026. Source: CNN (2026).).

- Recent geopolitical conflicts affecting global energy markets have increased fuel prices and oil demand, encouraging continued oil exports between Venezuela and the United

States. Despite ongoing political and economic instability, Venezuela remains an important player in the global energy sector, holding approximately 300 billion barrels of proved crude oil reserves in 2023 according to the U.S. Energy Information Administration (U.S. Energy Information Administration 2023).

- Drug trafficking, cartel activity, and maritime security concerns continue to impact waters surrounding Venezuela. Monitoring vessel traffic near major ports and along coastal routes is important for identifying suspicious activity, understanding regional security challenges, and assessing the relationship between maritime operations and broader geopolitical developments.

2) Top-Level Analysis

Analysis of geospatial, maritime, environmental, and open-source intelligence indicates that Venezuela's oil industry remains both a strategic national asset and a source of vulnerability. Although Venezuela maintains approximately 300 billion barrels of proven crude oil reserves, much of the country's oil infrastructure has deteriorated due to insufficient maintenance and limited investment. Critical oil-producing regions such as the Orinoco Oil Belt, Maracaibo Basin, and Monagas Basin continue to support production, but operational challenges limit efficiency and increase environmental risks (U.S. Energy Information Administration 2023).

Maritime tracking data collected from José Port reveals ongoing tanker traffic between Venezuela and destinations in the United States, Europe, and Asia. These shipping patterns demonstrate that Venezuelan oil remains important to global energy markets. Figure 2 highlights key infrastructure at the José Industrial Complex, including storage tanks, loading berths, and pipeline connections that support Venezuela's oil exports (MarineTraffic 2026).



Figure 2. High-resolution PlanetScope imagery of the José Industrial Complex showing pipeline connections, crude oil storage tanks, loading berths, and export infrastructure. Source: Planet Labs PBC, PlanetScope imagery, March 1, 2026.

Environmental reporting and satellite imagery reveal recurring spills, fires, and pollution events associated with aging infrastructure, highlighting vulnerabilities within the petroleum sector (Observatorio de Ecología Política de Venezuela 2026). Recent geopolitical developments and changes in U.S. policy toward Venezuelan oil have increased the strategic importance of monitoring production, exports, and transportation networks (CNN 2026).

3) Secondary Analysis: Data Sources and Analysis Performed

This assessment was conducted using the TCPED intelligence methodology (Tasking, Collection, Processing, Exploitation, and Dissemination). The tasking phase focused on identifying vulnerabilities and opportunities within Venezuela's oil sector. Collections involved gathering satellite imagery, vessel tracking information, GIS datasets, pipeline databases, environmental reports, and open-source information.

Processing included organizing satellite imagery, vessel tracking information, GIS datasets, and news reports. During exploitation, spatial analysis, maritime monitoring, infrastructure assessments, and environmental evaluations were conducted. Findings were disseminated through maps, tables, visualizations, and written analysis.

Data sources included ArcGIS Living Atlas datasets such as *Oil Extraction Zones*, *Oil_Gas*, and *Exploitation Zones*. Additional analysis used PlanetScope satellite imagery from March 1, 2026 (Figure 3), MarineTraffic vessel tracking information, Global Fishing Watch vessel data, U.S. Energy Information Administration data, Global Energy Monitor pipeline databases, environmental reports from the Observatorio de Ecología Política de Venezuela, and open-source reporting (MarineTraffic 2026; Global Fishing Watch 2026; U.S. Energy Information Administration 2023).



Figure 3. Maritime Counter-Drug Operations Near Venezuela: Regional trafficking corridors and interdiction zones. Source: U.S. Coast Guard.

Python scripts were also used to automate the collection and organization of online information related to Venezuelan oil production and PDVSA operations.

Maps and visual products were used to identify oil extraction zones, heavy oil reserves, pipeline ownership, tanker routes, environmental incidents, and maritime activity. These visualizations provided insight into infrastructure conditions, export capabilities, and areas vulnerable to environmental degradation.

4) Impact

The findings of this assessment are highly relevant to U.S. government agencies, policymakers, and energy companies. Venezuela's extensive oil reserves represent a significant economic resource that may contribute to global energy stability if production and exports continue to increase. Recent policy changes allowing greater oil trade between the United States and Venezuela have the potential to strengthen economic relations and help stabilize fuel prices during periods of global market disruption.

Additionally, geospatial monitoring of oil infrastructure, tanker traffic, and environmental incidents provides valuable intelligence regarding infrastructure vulnerabilities, production capacity, and regional stability. Understanding the location of extraction zones, pipelines, refineries, and export terminals helps organizations assess risks and identify opportunities for cooperation, investment, and policy decisions.

5) Confidence

High Confidence. The assessment is supported by multiple independent and reliable sources, including satellite imagery, vessel tracking data, GIS databases, environmental reports, government statistics, and open-source intelligence. Findings were validated through comparisons between multiple datasets and analytical methods, increasing the reliability of the conclusions.

6) Bias

The analyst was born in Venezuela and has personal knowledge of the country's social, economic, and political conditions. This background may influence perspectives regarding public sentiment, government accountability, and the potential benefits of increased U.S. and Venezuela cooperation.

To minimize bias, the assessment relied primarily on objective geospatial data, satellite imagery, maritime tracking information, official statistics, and independently verified reporting. Conclusions were based on observable evidence and analytical findings rather than personal opinions. While personal experience provides context, every effort was made to maintain analytical objectivity throughout the assessment.

7) References

CNN. 2026. “US Energy Secretary Chris Wright Tours Oil Facility in Venezuela with Acting President Delcy Rodríguez.” February 17, 2026.

<https://www.cnn.com/2026/02/17/americas/venezuela-delcy-wright-energy-intl-latam>.

Global Fishing Watch. 2026. *Vessel Tracking Data and Maritime Activity Monitoring Platform*. Accessed July 14, 2026. <https://globalfishingwatch.org/>.

MarineTraffic. 2026. *José Terminal Port (VEJOT)*. Accessed July 14, 2026.

<https://www.marinetraffic.com/>.

Observatorio de Ecología Política de Venezuela. 2026. *Environmental Monitoring and Reports on Oil Impacts in Venezuela*. Accessed July 14, 2026. <https://ecopoliticavenezuela.org/>.

Planet Labs PBC. 2026. *PlanetScope Satellite Imagery of José Industrial Complex, Venezuela*. March 1, 2026.

U.S. Energy Information Administration. 2023. *Venezuela Country Analysis Brief*. U.S. Energy Information Administration. <https://www.eia.gov/international/analysis/country/VEN>.