STUDIES

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Illegal Fishing
US Coast Guard & the OSS
"The Fourth Man"
Intelligence in Public Media

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Cover image: US Coast Guard Ens. Peyton Bowler, a commissioned officer aboard USCGC *Bear* (WMEC 901) near an iceberg, North Atlantic Ocean, August 17, 2022. The Bear was on the second half of its North Atlantic patrol and was working in tandem with the Northern Atlantic Fisheries Organization. (USCG photo by Petty Officer 3rd Class Matthew Abban)

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The mission of *Studies in Intelligence* is to stimulate within the Intelligence Community the constructive discussion of important issues of the day, to expand knowledge of lessons learned from past experiences, to increase understanding of the history of the profession, and to provide readers with considered reviews of public media concerning intelligence.

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Contributors

Article Contributors

Michael Bennett was. at time his article was published a LCDR in the US Coast Guard.

Peter Oleson is a former assistant director for plans and policy at the Defense Intelligence Agency.

Dr. Richard Rita is a retired CIA counterintelligence officer.

Reviewers

Graham Alexander* is the pen name of a CIA operations officer and regular contributor.

Christopher Bort is a CIA senior analyst and former National Intelligence Officer for Russia and Eurasia.

Ian B. Ericson is the pen name of a CIA officer.

Joseph Gartin is the managing editor of *Studies.* One of his two reviews appears in Bookshelf.

J. E. Leonardson* is the pen name of a CIA analyst.

Charles Long is the pen name of a retired CIA operations officer who served in Africa.

Alissa M. is a CIA analyst specializing in Middle East governance.

Hayden Peake* served in CIA's Directorates of Operations and Science and Technology. He has contributed to the Intelligence Officer's Bookshelf since 2002.

Mike R.* is a member of CSI's History Staff.

W. Lee Radcliffe is a member of the Senior Digital Service in the CIA's Directorate of Digital Innovation and has covered Asia and Eurasia for more than 20 years.

J.R. Seeger is a retired CIA operations officer.

Anthony T. Sutton is a CIA analyst focusing on governance.

Dr. Ursula Wilder is a DDCIA Fellow at the Center for the Study of Intelligence.

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*The work of these reviewers will be found in the "Intelligence Officer's Bookshelf."

IN MEMORIAM

Vaughn F. Bishop (1946–2023)

For Immediate Release: March 27, 2023

Statement by CIA Director William J. Burns on the Passing of Vaughn Bishop

CIA mourns the passing of former Deputy Director Vaughn Bishop. Vaughn personified what it means to be a CIA officer during his long and storied career. He cared deeply about the CIA and even more so about the women and men who serve in it. He inspired countless officers and was known for his always approachable demeanor, good humor, and willingness to listen to and learn from others—from the most junior officer to the most senior. Our Agency and our country have lost a true patriot. He will be deeply missed and always remembered.

—William J. Burns, D/CIA and David S. Cohen, DD/CIA—

Using Intelligence to Counter Illegal, Unreported, and Unregulated Fishing

Peter C. Oleson

Identifying IUU is a needle-in-a-haystack problem. Which boats are engaged in IUU fishing? How can one determine that a vessel is so engaged? What is the flag nation of the vessel of interest? Who owns the vessel? Answering these and other questions requires surveillance, deep understanding of fishing operations and behavior, and analysis.

Author's note: This article is the result of two years of examination of illegal, unreported, and unregulated fishing in the Pacific by the International Maritime Security Exchange (IMSE) working group. It draws from the proceedings of the IMSE conferences in Hawaii in 2021 and 2022, as well as work by journalists such Ian Urbina (New York Times)*. A list of resources on IUU fishing, including IMSE presentations, is provided at the end of this article.*

IMSE is supported by the Navy League, the Daniel K. Inouye Center for Asia-Pacific Security Studies, the East-West Center at the University of Hawaii at Manoa, and Pacific Forum, a non-profit, foreign policy research institute based in Honolulu.

Countering IUU Fishing is an Intelligence Problem

Illegal, unreported, and unregulated (IUU) fishing is a worldwide problem. According to a US Coast Guard (USCG) report on the subject in 2020, "IUU fishing has replaced piracy as the leading global maritime security threat. If IUU fishing continues unchecked, we can expect deterioration of fragile coastal States and increased tension among foreign-fishing Nations, threatening geo-political stability around the world."

There are many aspects to the problem. Illegal fishing is conducted in waters under the jurisdiction of a state but without the permission of that state. Unreported fishing involves catch that has not been reported, as required. Unregulated fishing occurs where there are no management measures and is conducted in a manner inconsistent with treaty responsibilities.

Monitoring the Crowded Oceans

The oceans are crowded with fishing boats. The UN Food and Agricultural Organization (FAO) estimated that there are more than 4 million fishing boats worldwide. Many are small, unmotorized, and engaged in local fishing. Larger motorized fishing vessels are industrialized and are the prime actors in overfishing. China maintains by far the largest deep-water fishing fleet.

Identifying IUU fishing is a needle-in-a-haystack problem. Which boats are engaged in IUU fishing, and how do we identify them? What is the flag nation of the vessel of interest? Who owns the vessel? Answering these and other questions requires surveillance, deep understanding of fishing operations and behavior, and analysis. Those engaged in intentional IUU fishing often go to great lengths to disguise their activities.

Previously, surveillance of territorial waters and Exclusive Economic

USCG Cutter *Stone* crew observing fishing activity during Operation Southern Cross in the South Atlantic, January 2, 2021. (US Coast Guard photo by Petty Officer 3rd Class John Hightower)

Zones (EEZs) relied on a nation's patrol ships and aircraft and active fishing boat transmissions, such as from the Automatic Identification System (AIS) and Vessel Monitoring System (VMS), mandated by nations to monitor ships in their areas of responsibility. But IUU fishers often turn off these transmitters, or increasingly spoof their signals, to hide illegal activities. "[O]ver the past year, Windward, a large maritime data company that provides research to the United Nations, has uncovered more than 500 cases of ships manipulating their satellite navigation systems to hide their locations."[a]

Ship-based aerial drones are proving to be a valuable adjunct to ships and aircraft for inobtrusive surveillance, according to the USCG, which employs the ScanEagle drone from its newer cutters.[b] ScanEagle allows unobtrusive over-the-horizon persistent surveillance of fishing vessels.

Northrop Grumman's MQ-4C Triton high-altitude drone, under development for the US Navy, is a potential broad-ocean-area surveillance capability applicable to countering IUU fishing. Its future capabilities were demonstrated extensively in the international 2022 Rim of the Pacific (RIMPAC) exercise off Hawaii. Australia has committed to buying the drone. Besides carrying electro-optical and infrared imagers the MQ-4C can carry the AN/ZPY-3 multi-function radar, optimized to detect objects on the sea. However, its high cost may preclude many nations from procuring the capability.

The vast spaces of the Pacific, Atlantic, and Indian Ocean fisheries pose a challenge to active sea-based or aircraft surveillance. But the application of high-altitude, long-endurance drones and the growing constellation of commercial satellites promise improvements in maritime surveillance, including for IUU fishing.

Satellite electro-optical imagery has been available commercially for years. Maxar Technologies (a merger of several commercial space technology companies, including DigitalGlobe and Orbital Sciences) provides to its government and commercial customers high-resolution (less than 0.5 meter) optical digital satellite imagery. Planet Labs also operates a constellation of imagery

a. Anatoly Kurmanaev. "How Fake GPS Coordinates Are Leading to Lawlessness on the High Seas," *New York Times*, September 3, 2022.
b. Address by Captain Holly Harrison, USCG, commander of the USCGC *Kimball*, to the September 2021 IMSE conference.

An MQ-4C Triton Unmanned Aircraft System (UAS) assigned to Unmanned Patrol Squadron 19 (VUP-19), at on the flight line at Naval Station Mayport, Florida, December 16, 2021. (US Navy photo by Mass Communication Specialist 2nd Class Nathan T. Beard)

satellites and states it has 700 customers. Imagery is limited by field of view, resolution, and weather, but when cued by other sources it can help identify suspicious vessels. Newer forms of imagery include the Visible and Infrared Imaging Radiometer Suite (VIIRS) and synthetic aperture radar (SAR). VIIRS is carried on NOAA's Joint Polar-orbiting Satellite System (JPSS) and is used to detect the bright nighttime lights used by many purse-seiner and ring-net fishing boats to attract squid and other species.

SAR allows surveillance in all-weather conditions as it penetrates clouds and darkness, and it provides multi-dimensional images. Civilian use of SAR satellite data began in 1992 with the European Space Agency's Earth Resources Satellite-1 (ERS-1). Since then, many nations have orbited SAR satellites, including Japan, Canada, Germany, India, Italy, Korea, and others. Commercial companies, such as Finland's Iceye, have recently entered the marketplace for SAR imagery.

The collection of radio frequency (RF) emissions by commercial satellites is a new capability. Several US and European firms have entered this market and can pick up navigation radar and other radio emissions from boats at sea even if the boats turn off their required AIS or VMS broadcasts. These capabilities are very useful in detecting, tracking, identifying, and understanding vessel's patterns that may be engaged in IUU fishing and spoofing active systems, such as AIS. The unclassified nature of the data permits wide sharing among nations and cueing of other sensor systems, such as electro-optical and synthetic aperture radar imagery. In development are unmanned vessels that tow underwater hydrophones that can detect, classify, and report via satellite link vessels by type and activity through analysis of sonograms.

Detecting misreporting by legally registered fishing vessels has relied in the past on government-sponsored on-board inspectors riding along with a vessel. This is labor intensive and expensive, especially for smaller nations. Also, there have been cases of on-board inspectors disappearing during a voyage with no trace. Several organizations are experimenting with on-board automated video cameras, linked to satellite communications, to monitor activities and the appropriateness of catches.

The US Office of Naval Intelligence (ONI) has long tracked foreign warships and major merchant vessels. Fishing vessels, however, have not been included due to their high numbers, comparatively small

Adverse Impacts of IUU Fishing

High prices, high demand, and shrinking stocks have sparked a "get it while you still can" mentality. In aggregate there are an estimated 3,000 long-distance fishing vessels in the Indo-Pacific, one-third of which fish in prohibited waters without permission. Fifty percent under report what they have caught. Forty percent of the vessels never visit port, off-loading their catch and replenishing at sea.

Besides over harvesting, IUU fishing takes money from legal fishers and out of local economies. Fisheries are the primary source of income for many Pacific oceanic states. The Pew Foundation estimates that IUU fishing costs nations $23.5 billion annually. The Nature Conservancy projects that many Pacific Island nations will not be able to meet their local food needs in a few years given their population growth and continued IUU fishing. The Nature Conservancy also estimates that more than 95 percent of IUU fishing activities by the Pacific tuna fleet involves unreported or misreported catch by legally licensed boats, not by so-called unregistered "dark boats." IUU fishing also destroys habitat, especially bottom trawling that damages corals and sea grasses.

Other crimes are associated with IUU fishing, including forgery of records and fraud, corruption of officials, false vessel identity and flagging, licensing avoidance and deception, human rights abuses (e.g., forced labor, human trafficking, enforced prostitution, and child labor), illegal transshipments of catch and fuel, smuggling of drugs and protected species, black marketeering and money laundering, the evasion of penalties, and murder.

For a detailed treatment, see Ian Urbina's series, "The Outlaw Ocean," *New York Times Magazine* (2015) and his book by the same name (Knopf, 2019).

displacements, and limited national technical means dedicated to higher intelligence priorities. Into the void of surveying fishing fleets has stepped commercial industry, which has developed capabilities for visual, radar, and radio-frequency surveillance that previously were the exclusive domain of national intelligence agencies.

Data Integration, Analysis, and Sharing Are Critical

To support at-sea enforcement of laws and rules applicable to territorial waters and EEZs, the integration of all-source data is a necessity. Undoubtedly, tracking fishing fleets and specifically illegal fishers will require additional resources. One approach would incorporate public-private cooperation with those commercial firms that already integrate relevant data for their shipping industry and insurance customers. Given the increasing number of collection platforms it should not be difficult to sanitize the sources for classified data to meet the IUU information requirements. These requirements include, *inter alia*, the time/location of specific ships; their historical movements and patterns (which can reveal at-sea rendezvous often indicative of illegal fishing and illegal transfers of catch to reefer vessels and out-of-port refueling); their suspected use of deceptive methods, such as spoofing tracking signals; their national identity (despite using flags of convenience); and their ownership. Timeliness of data is also important to allow both cross-cueing of collection methods and initiation of law enforcement operations.

The many sensor sources available can produce an overwhelming amount of data. And any one source is rarely sufficient to determine many kinds of IUU fishing. It is the integration of data from disparate sources and the analysis of those data that are critical. The data glut is a challenge requiring various advanced analytical techniques, including artificial intelligence and machine learning. Determining suspicious vessel activities requires detailed knowledge of fish-rich ocean areas, the movement patterns of vessels engaged in various types of fishing, at-sea rendezvous for illegal transshipments or refueling, and other behaviors.

For the United States responsibility for data integration would logically fall to naval intelligence components, in conjunction with the US Coast Guard which has unique law-enforcement authorities. Several non-governmental organizations analyze data related to IUU fishing. Best known is Global Fishing Watch (GFW), an NGO that tracks in near real time fishing around the globe. The Australian Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) is the responsible overseer of fishing in the broad Southern Ocean surrounding Antarctica. The Pacific Islands Fishing Forum Agency, the International Maritime Control and Surveillance (IMCS) network, C4ADS, and several universities and

commercial firms, such as Windward AI, are also involved in aspects of analyzing IUU fishing to provide scientific insight, risk management judgments to companies, or assist in investigations of organizations and individuals behind such illegal activities.

Given the documented decrements in fish stocks and the reliance of many countries' populations on sea-based protein, preserving fish stocks is a priority national security concern for many nations, especially in the Pacific and Africa. The United States is in a unique position to share relevant data with many of these nations, and should do so in a manner that is both timely and integrative of all relevant collected and historical data. Commercial data providers and integrators, of course, have a profit motive. This limits the dissemination of their data to many smaller nations which cannot afford the contractual costs.

Employing a public-private partnership approach, the US government could provide the time-sensitive location data to international partners and compensate commercial companies adequately for the data they provide, leaving less time-sensitive data analysis to commercial companies and NGOs, which they can market, as appropriate (including to the US government).

Pacific nations have organized specialized intelligence centers focused on detecting IUU fishing. The Indonesian Maritime Information Center, for example, was established in 2020; Jakarta has long been the most aggressive in countering illegal fishers. It has seized, burned, and sunk foreign vessels caught conducting IUU fishing within Indonesia's resource-rich EEZ.

For the first time, USCG members conduct a boarding a fishing vessel in the Eastern Pacific under the South Pacific Regional Fisheries Management Organization (SPRFMO), August 4, 2022. (USCG photo by Petty Officer 3rd Class John Hightower)

Thailand has also focused government resources on improving its monitoring of maritime activities in its Thai Maritime Enforcement Coordination Center (Thai-MECC). The longest running intergovernmental center for tracking IUU fishing is the Fisheries Forum Agency, which was founded in 1979 and focused on highly migratory fish stocks such as tuna.

The newly formed Quad of India, Australia, Japan, and the US is aimed at regional prosperity with many initiatives in the realms of economics, science, technology, human

UN Agreement on Protecting Marine Resources

After almost two decades of negotiations, in March 2023 the UN Intergovernmental Conference on Marine Biodiversity of Areas Beyond National Jurisdiction adopted language for a treaty to protect marine diversity. The treaty language addresses the vast ocean areas beyond nations' exclusive economic zones, with the goal of preserving habitats and sharing marine resources in areas beyond national jurisdictions. The preamble states, "Recognizing the need to address, in a coherent and cooperative manner, biodiversity loss and degradation of ecosystems of the ocean, due to, in particular, climate change impacts on marine ecosystems, such as warming and ocean deoxygenation, as well as ocean acidification, pollution, including plastic pollution, and unsustainable use."

resources, and maritime-domain awareness. Countering IUU fishing is a major focus for the Quad nations.

Vice Admiral Andy Tiongson, US Coast Guard commander of the Pacific region, told the 2022 IMSE conference how the USCG through forensic analyses has helped Pacific countries prosecute illegal fishers and how Coast Guard personnel sail on foreign naval and coast guard ships under its ship-rider program.

Challenges remain, especially in the sharing of data and analyses. In the 2022 IMSE conference the heads of the US Pacific Fleet and Australian Navy and senior officers of the Japanese Maritime Self-Defense Forces emphasized that a free and open Indo-Pacific is critical to economic prosperity as well as maintenance of sovereignty and individual nations' national security. In their view, information sharing is fundamental to effective maritime operations between navies and other maritime forces.

It should be noted that historical concepts of protecting sources and methods have become increasingly obsolescent with the growth of the commercial space-based remote sensing industry and the commercial development of technologies that were once classified. While some detailed collection will always remain secret, the time-sensitive location data on vessels at sea need not be classified.

The Future

IUU fishing has already led to tensions in the South China Sea. Since 2012, China has used its coast guard and expansive fishing fleet, often manned by its maritime militia, to intimidate and force Philippine fishers from the waters around Scarborough Shoal and others that sit within the Philippines EEZ and within Beijing's unilaterally claimed dashed-line in the South China Sea. This led to a United Nations Permanent Court of Arbitration case that ruled against China, stating that there was no legal basis for China's claim of historic rights over the area within the dashed line.[a] China has ignored the court's ruling.

The conflict over IUU fishing in the South China Sea, of course, is linked to China's claim that the entire sea is exclusively Chinese. The construction of artificial islands and their militarization has affected others, especially Vietnam, Malaysia, and the Philippines. Some observers opine that it is only a matter of when Beijing's coercive actions, unless curtailed, will result in an armed clash.

IUU fishing knows no national boundaries. No one nation is capable of enforcing fishing laws and regulations. Countering IUU fishing will require investments, multi-state collaboration, intelligence sharing, and multilateral agreements between the numerous regional fishing management organizations (RFMOs). Some RFMOs are more promoters of fishing than regulators. Conservation officials and naval leaders have noted also that, to date, information-sharing has not always gone well.

There are approaches to IUU fishing beyond law enforcement. These include eliminating national subsidies for fishing. The PRC's subsidies, the most generous of any nation by far, estimated at approximately $7.2 billion in 2017, make otherwise unprofitable fishing profitable. Certification of catches assures buyers of fish that they were caught legally. Publicity about IUU fishing and the deceptive practices associated with it is an important step in depressing market attractiveness of illegally caught fish. Finally, the promotion of aquaculture—China leads world production, accounting for 60 percent of global aquaculture—is a potential solution for future food needs. Aquaculture has grown steadily since the 1970s and now supplies more than half of all seafood consumed by humans.

Like climate change, seafood sustainability within the foreseeable future will increasingly become a crisis. Understanding and countering

a. *Press Release: The South China Sea Arbitration (The Republic of the Philippines v. The People's Republic of China)*, Permanent Court of Arbitration, July 12, 2016

The crew of the USCG Cutter *Frederick Hatch* approach the *Ocean Galaxy* to conduct a fisheries boarding 195 nautical miles south of Pohnpei, Federated States of Micronesia, on November 20, 2022. (US Coast Guard photo by Seaman Paula Betancourt)

IUU fishing is critical for many poorer nations and the worldwide seafood market. Focusing intelligence on the collection of relevant data, its integration, analysis and sharing should be a high priority.

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The author: Peter C. Oleson is a former assistant director for plans and policy at the Defense Intelligence Agency. He was one of the organizers of the IMSE conferences in 2021 and 2022 in Hawaii, where he resides. He previously co-authored an article for *Studies in Intelligence* in 1997 on the Intelligence Community's contributions to the development of digital mammography.

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Resources on IUU Fishing

Food and Agricultural Organization of the United Nations, https://fao.org/home/en

Global Fishing Watch, https:globalfishingwatch.org

IMSE, *Proceedings of the IMSE 2022 Conference* (August 4–5, 2022), https://imsehawaii.org/imse-2022/2022-written-summary.html

IMSE, *Proceedings of the IMSE 2022 Conference* (September 8–9, 2021), https://imsehawaii.org/imse-2021/2021-written-summary.html

International Maritime Organization, https://imo.org

National Oceanic and Atmospheric Administration, https://fisheries.noaa.gov

The Nature Conservancy, https://www.nature.org/en-us

OCEANA, https://usa.oceana.org

Pacific Forum, https://pacforum.org

US Coast Guard, *Illegal, Unreported, and Unregulated Fishing,* https://uscg.mil/iuufishing

Woods Hole Oceanographic Institution, https://whoi.org/edu