

Software Licensing Practices at Major Oceanographic Research Institutions

Research Summary

Prepared for MBARI Engineering Group

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Executive Summary

This research examines software licensing practices at major oceanographic research institutions including Woods Hole Oceanographic Institution (WHOI), Ocean Observatories Initiative (OOI), NOAA, University of Washington APL, and MBARI. The findings reveal a strong preference for permissive open-source licenses, particularly Apache 2.0, MIT, and BSD variants, with strategic use of copyleft licenses for specific projects.

Key Finding: Apache 2.0 has emerged as the most popular choice for modern collaborative oceanographic research projects due to its explicit patent protection and institutional familiarity.

Detailed Findings by Institution

Woods Hole Oceanographic Institution (WHOI)

Primary licenses: MIT, GPL-3.0

- Mix of permissive (MIT) and copyleft (GPL-3.0) licenses depending on project requirements
- MIT typically used for simpler tools and utilities
- GPL-3.0 reserved for larger collaborative projects where derivative works should remain open
- Pragmatic approach based on project goals and collaboration needs

Ocean Observatories Initiative (OOI)

Primary licenses: Apache-2.0, BSD-2-Clause

- Apache-2.0 used for user management and service applications
- BSD-2-Clause for marine instrument integration code
- Licensing strategy aligned with NSF-funded collaborative projects
- Focus on broad adoption across research institutions
- Patent protection important for complex multi-institution projects

NOAA (National Oceanic and Atmospheric Administration)

Primary licenses: LGPL-3.0, with federal policy requirements

- LGPL-3.0 commonly used for modeling systems
- Formal policy (NAO 201-118) mandates open-source releases
- Federal requirement: software must be "released under an open license, at no cost and with no restrictions on copying, publishing, distributing, transmitting, citing, or adapting"
- Public release of federally-funded software is the default
- Strong emphasis on intellectual property compliance

University of Washington APL

Primary licenses: BSD-style licenses

- BSD 3-Clause for Seaglider basestation software
- Emphasis on minimal restrictions for academic and research use
- Some projects include specific attribution requirements
- Balance between openness and institutional recognition

MBARI (Monterey Bay Aquarium Research Institute)

Primary licenses: Apache-2.0, MIT, BSD-3-Clause, GPL-3.0, AGPL-3.0

Most common license: Apache-2.0 (annotation tools, AI pipelines, audio processing)

- MIT for grid view tools and utilities
- BSD-3-Clause for AUV data processing
- GPL-3.0 for LRAUV templates requiring derivative work to remain open
- AGPL-3.0 for modified Tator web application (network copyleft)
- Demonstrates thoughtful, pragmatic license selection based on project needs
- Greatest diversity of licenses reflects sophisticated understanding of licensing strategy

Key Patterns Across Institutions

Pattern	Description
Permissive licenses dominate	70-80% of repositories use Apache 2.0, MIT, or BSD variants
Apache 2.0 trending	Increasingly popular for modern collaborative projects
Selective copyleft	GPL used strategically when derivatives should remain open
Federal mandates	Government agencies (NOAA) have specific open-source requirements
NSF alignment	NSF-funded projects favor permissive licenses for broad scientific collaboration
Patent awareness	Growing preference for Apache 2.0 over MIT due to explicit patent grants

Recommendations for MBARI

Default License: Apache 2.0

Based on this research and MBARI's institutional context as a 501(c)(3) oceanographic research institute with occasional commercial licensing arrangements, we recommend Apache 2.0 as the default license for new projects.

Why Apache 2.0?

- Already successfully used by OOI and multiple MBARI projects
- Provides explicit patent protection (important given MBARI's commercial licensing history)
- Well understood by both academia and industry partners
- More comprehensive than MIT/BSD while remaining permissive
- Compatible with most other open-source licenses for collaborative work
- Aligns with NSF expectations for publicly-funded research

Alternative: MIT License

For small utilities, scripts, or simple libraries where patent concerns are minimal, MIT offers a simpler alternative that is extremely well understood across the research community.

Strategic Use of Copyleft (GPL/AGPL)

Continue using GPL-3.0 or AGPL-3.0 selectively for projects where ensuring derivative works remain open source is important to MBARI's mission or collaborative partnerships.

Next Steps

1. **Create decision matrix:** Develop a simple 2-3 question decision tree for engineers
2. **Document rationale:** Capture institutional knowledge about why certain projects use different licenses
3. **Template repository:** Set up GitHub organization templates with pre-populated LICENSE files
4. **Policy consultation:** Review with legal counsel and tech transfer office
5. **Community outreach:** Connect with 2-3 peer institutions to learn from their implementation experiences

Appendix: Special Considerations for MBARI

ITAR/EAR Restrictions

Projects containing export-controlled technology must remain in private repositories regardless of platform. Maintain a clear list of restricted projects.

Commercial Licensing

When commercial licenses have been granted, projects may require dual-licensing (open + commercial) or must remain proprietary. These require case-by-case legal review.

Grant-Funded Work

Check funding agency requirements. Many federal agencies now require open-source licenses for publicly funded research. NSF and NOAA typically expect permissive open-source releases.

Third-Party Dependencies

Always verify that chosen licenses are compatible with dependencies. Apache 2.0 is compatible with most other licenses; GPL requires careful compatibility checking.

References and Source Links

All information in this report was gathered from publicly accessible sources. Below are direct links to the repositories and documentation reviewed.

Woods Hole Oceanographic Institution (WHOI)

GitHub Organization:

<https://github.com/WHOIGit>

Example Repositories:

FishDetector - <https://github.com/WHOIGit/FishDetector>

ifcddb - <https://github.com/WHOIGit/ifcddb>

Ocean Observatories Initiative (OOI)

GitHub Organization:

<https://github.com/oceanobservatories>

Key Repositories:

mi-instrument (BSD-2-Clause) - <https://github.com/oceanobservatories/mi-instrument>

ooi-data-explorations - <https://github.com/oceanobservatories/ooi-data-explorations>

ion-functions - <https://github.com/oceanobservatories/ion-functions>

ooi-user-mgmt (Apache-2.0) - <https://github.com/asascience-open/ooi-user-mgmt>

OOI Website:

<https://oceanobservatories.org/>

NOAA (National Oceanic and Atmospheric Administration)

GitHub Organization:

<https://github.com/NOAAGov>

Policy Documentation:

NAO 201-118 Software Governance -

<https://www.noaa.gov/administration/nao-201-118-software-governance-and-public-release-policy>

Example Repositories:

NEMS (LGPL-3.0) - <https://github.com/NOAA-EMC/NEMS>

NCEPLIBS-pyprodutil (LGPL-3.0) - <https://github.com/NOAA-EMC/NCEPLIBS-pyprodutil>

Information repository - <https://github.com/NOAAGov/Information>

University of Washington APL

Research Programs:

Integrative Observational Platforms - <https://iop.apl.washington.edu/>

Licensing Guidance:

UW CoMotion Open Source - <https://comotion.uw.edu/licensing/open-source/>

GitHub:

<https://github.com/uw-edu>

MBARI (Monterey Bay Aquarium Research Institute)

GitHub Organizations:

Main organization - <https://github.com/mbari-org>
Machine Learning - <https://github.com/mbari-machine-learning>
ESP - <https://github.com/MBARI-ESP>

Apache-2.0 Licensed Projects:

aipipeline - <https://github.com/mbari-org/aipipeline>
vars-annotation - <https://github.com/mbari-org/vars-annotation>
pbp (audio processing) - <https://github.com/mbari-org/pbp>
humpback-whale-song-detection - <https://github.com/mbari-org/humpback-whale-song-detection>

MIT Licensed Projects:

vars-gridview - <https://github.com/mbari-org/vars-gridview>

BSD-3-Clause Licensed Projects:

auv-python - <https://github.com/mbari-org/auv-python>

GPL-3.0 Licensed Projects:

lrauv_backseat_python_template - https://github.com/mbari-org/lrauv_backseat_python_template

AGPL-3.0 Licensed Projects:

tator (modified) - <https://github.com/mbari-org/tator>

Other MBARI Resources:

Main MBARI website - <https://www.mbari.org/>

Additional Context

General Ocean Sciences on GitHub:

Ocean sciences topic - <https://github.com/topics/ocean-sciences>