

FINAL REPORT TO THE UNIVERSITY OF HAWAI‘I AT HILO  
MARINE OPTION PROGRAM

Organizing for The University of Hawai‘i at Hilo to Host  
The Motorboat Operator Certification Course

James Gomez DeMolina

Marine Science Department  
University of Hawai‘i at Hilo

MOP ADVISOR

Lisa Parr, UH Hilo MOP Coordinator  
Division of Natural Sciences  
University of Hawai‘i at Hilo

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**ABSTRACT**

The University of Hawai'i at Hilo (UHH) caters to the diverse interests of its students with its small size and faculty to student ratio. The Marine Science Department allows students to delve into a plethora of subjects made available by the locale. Facilitating that education, watercrafts allow for access to marine areas that would be otherwise inaccessible. Through this project, the newly established Boat Safety Program (BSP) at UHH offered the first Motorboat Operator Certification Course (MOCC) taught on Hawai'i island. This course allowed for students to facilitate their own maritime research by granting them permitted access to the BSP boat fleet. MOCC is the standard boater education course for government officials to operate vessels in the United States (e.g. National Oceanic and Atmospheric Administration, U.S. Fish and Wildlife, etc.). This project aided in the facilitation of MOCC by preparing gear, maintaining equipment, building study tools, and organizing logistics. The success of this course saw 12 certifications allowing for not only student lead boat access, but also experience for careers in marine science.

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## INTRODUCTION

### *MOCC – The Course*

Motor operated boat safety is a serious issue in the United States. In 2017, the U.S. Department of Homeland Security (USDHS) and the United States Coast Guard (USCG) published the statistics of boater fatalities in the country. In each state since 2004, the leading vessel type associated to fatalities was motor operated vessels. Drowning was the greatest cause of fatality on this vessel type, making up 80% of total fatalities. Of those, 83% were not wearing a life jacket when they drowned. Wearing a life jacket, also known as a personal floatation device (PFD), is a highly-recommended practice in boater education (Guzzwell et al. 1976). However, 77% of total fatalities were associated with boat operators who had not received boater safety education (Office of Auxiliary and Boating Safety 2017). Boating education has the potential to save lives in the recreational and commercial sectors. In the government workforce, operators are required by law to attend boat safety education courses to operate state vessels. Standardized education reduces the risk of accidents, especially those seen in recreational boating.

MOCC is a course developed by small boat operators from U.S. Fish and Wildlife. Their goal was to create an exportable, standardized course to ensure the safety and skill base required to properly operate government owned vessels. To do so, the course would be designed as a short, intensive course that thoroughly covered the fundamentals of safe boat conduct and provided an introduction to maritime operations. The result was a course that could cater to those who had no understanding of boating and reestablish guidelines for those who had already operated small vessels for years. Its objectives are to be able to make informed decisions about your/your crew's safety on a small vessel, become proficient with safety equipment and other boat related gear through actual use, and be able to demonstrate skills in boat handling and safety protocols through physical demonstration (National Conservation Training Center, 2017). The design of the course, and the wide range of students that it welcomed made it suitable for the purpose of authorizing students to operate vessels on their own. To facilitate such a class, the hosting institution must acquire a variety of teaching aids which help cover the many facets of proper small boat operation.

In many cases, the tendency to panic in dangerous boating situations makes matters worse. Panic is a very common and potentially life-threatening response to emergency situations. MOCC requires certain teaching methods that build on values of trust and confidence between the student and the teacher. Methods such as maximized till time and student lead resolutions when problems arise. In addition to the subtle psychological training, student confidence and skill demonstration is dramatically increased by integrating student lead boat preparation. Each time a vessel is taken out for a cruise, each student must take a turn using a boat-checklist and provide evidence that the boat holds all mandatory safety equipment onboard. Considerations for mandatory gear can also change based on the environment (Harding & Kotsch 1965). MOCC also delivers on adaptability to the environment and the student body for the occasion by turning bad weather into a learning opportunity. For example, a strong, consistent trade wind was turned into a teaching opportunity for wind correction for straight headings.

Live demonstration and gear display is what sets MOCC apart from other training courses. To provide a fundamental understanding of boating, MOCC requires a plethora of gear that might not be used during the course but might be needed later for the student. The actual

course takes much less time than the preparation of gear for those demonstrations. Preparation for MOCC can be categorized into three subjects gear, equipment, and logistics. Gear, with respect to objects boaters must be familiar with such as line, the different types of personal floatation devices (PFDs), and distress signals to name a few. Equipment and Machinery with which boaters would demonstrate their skills would have to be brought to and kept in an operational state. With the gear accounted for, and the equipment in good condition, the course leader spends much of their time in planning how MOCC can be carried out in the most efficient manner.

The course itself requires student proficiency in boat-handling demonstration, trailering, common boating knots, and a passing grade on a written test to indicate a proper understanding of gear application and maritime operations. By the end of the course students are able to comfortably and safely operate small vessels, understand actions that must be taken in emergencies, identify measures taken to avoid emergencies, and properly maintain vessels. It is a three-day course which can be accompanied by modules following the initial course (e.g. Open Water, River Environments, etc.). MOCC is valued for its nearly equal instructor to student ratio, and hands-on/skill-based teaching techniques (Schetrompf G, 2016).

### *Need for MOCC at UHH*

The Marine Science Department at UHH in association with the UHH Marine Option Program (MOP) utilize vessels for classes, faculty projects, student lead research, and scientific diving. The BSP fleet is composed of eight vessels. This includes: a 12-foot APEX inflatable till, a two 16-foot APEX inflatable till, an 18-foot Larson fishing vessel, a 24-foot Force fishing vessel, a 26-foot Glacier Bay diving vessel, and a 39' Force Kat research vessel. The vessels allow for safe, prolonged access to waters coastal and pelagic. Access to maritime research from these vessels was limited due to a lack of authorized personnel. To operate the vessels independent of the BPC, operators must be cleared by demonstrating safe and knowledgeable conduct with the vessels. In an effort to expand the pool of operators and establish boater education at UHH, the BPC began preparations to hold MOCC for the first time on the island. Boat education was needed for marine science students, but only existed informally or infrequently. The goal of this project was to legitimize the university's boating education to the standards of government agencies. In the process, students would be able to utilize university owned boats and become strong candidates for jobs that required boat-skill-based experience.

## **METHODS**

### *Establishing The BSP*

The equipment necessary to host the MOCC is substantial (see MOCC-MOICC Checklist). In each of the small vessels, safety and distress equipment is required to teach proper safety protocol and risk assessment. Part of the MOP project was to accumulate, organize, and catalog every piece of gear already owned between the container at the port of Hilo and the equipment in the campus storage facility, the armory. This was done to standardize the emergency preparedness of each vessel. New gear was purchased to either replace or provide entirely new sets of required items. This was carried out in the months leading up to the small boat operations course in the summer of 2016. The small boat operations course was directly

through the university and was to be used as a trial run for the upcoming MOCC taking place the following year. The initial proposal for this project was to aid in gear and equipment preparation which included: cleaning, purging expired gear, creating work spaces, and determining gear to be purchased. Those responsibilities later extended to: constructing a syllabus for the small boat operations course, promoting efficient logistical plans, coordinating the movement of eight vessels simultaneously, and catering to the needs of the instructors leading up to, during, and following the course.

Using the MOCC-MOICC Checklist (see materials section) the BPC included any additions that he deemed worthy. It was important to catalog usable gear that was owned to reduce costs of the course. I used this opportunity while sorting through years of Marine Science Department equipment to take note of the gear that we have in storage. During this time, equipment relevant to the boating program but not the course was organized as well.

A new list of what we did not already have was constructed. This was the list of everything we need to purchase using the Boating Program funds. Some pieces of equipment were ordered, some purchased in Hilo, and some were constructed. It was during this time that I built a star-like apparatus, appropriately named “the star” for boating maneuvers. Captain ordered several types of PFDs, parbuckling equipment, new lines, and more to prepare for the course. I prepared spaces for the new equipment so that it could be stored properly. This part of the project was highly supervised by the BPC. Once all gear arrived it was my responsibility to assemble a storage system so that MOCC equipment was functionally accessible for future MOCC courses. Kennedy proposed that we purchase a trailer that acts as a mobile MOCC unit. Although the idea is functional, there were not enough funds to purchase such a trailer. In lieu of a trailer, the container at port was organized to fit all MOCC equipment in an orderly fashion.

I processed the gear in the Containers located at port and in the armory and determined the gear that we had, and the gear we needed. It was during this time that I built a star-like apparatus, appropriately named “the star” for boating maneuvers. Captain ordered several types of PFDs, parbuckling equipment, new lines, and more to prepare for the course. I prepared organized spaces for the new equipment so that it could be stored properly. I also generated a syllabus and a course schedule for the class that was congruent with MOCC standards. Captain used the small boats course as a trial for the upcoming MOCC the following year.

### *Primary Applications of MOCC*

The small boat operations course curriculum was overlaid with MOCC material. This required an adaptive schedule that spread a three-day intensive course out to 2 days a week for 4 hours. Although the course was not a legitimate MOCC, the BPC relied on me to prep field material before the class arrived. This included: boat preparation, launching boats from the Wailoa Boat Ramp, retrieving them from the water, operating state vehicles to transport boats, preparing fire extinguisher stations, teaching trailering, teaching boat maneuvers from MOCC curriculum, adaptively changing schedules to fit the needs of students, and cleaning the boats afterwards. The small boat operations course had allowed us to clearly determine missing equipment and consider major logistical issues which became important the following year.

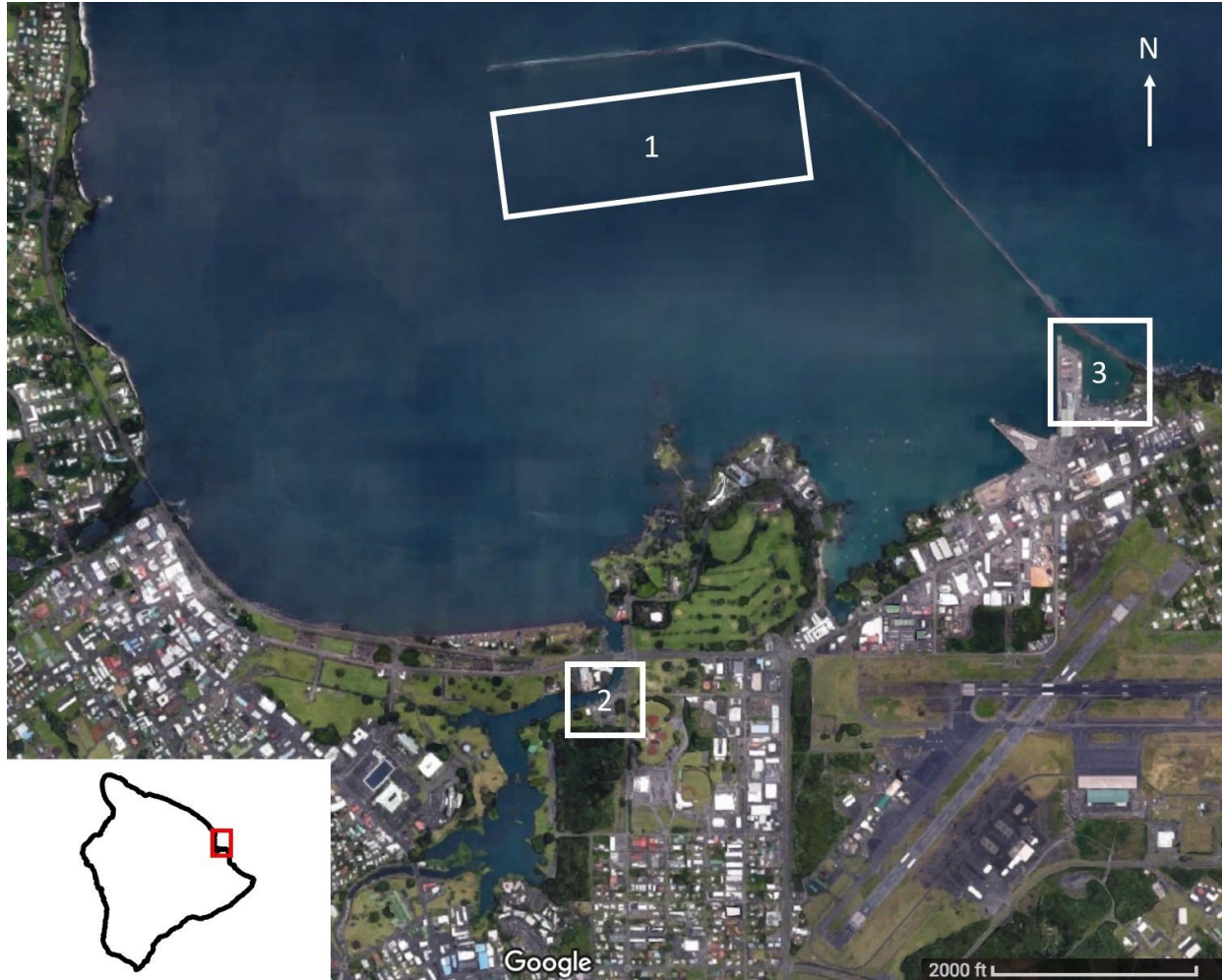
Another purge to both the armory and the port container occurred. Not only would equipment be organized, but the environment had to be a professional environment for the visiting instructors. In preparation, boats were again deep-cleaned, multiple days were spent

discussing logistical considerations, and providing space for more equipment that the other instructors were providing (i.e. fire extinguishers, OSCAR dummy, immersion suites, etc).

### *Executing MOCC*

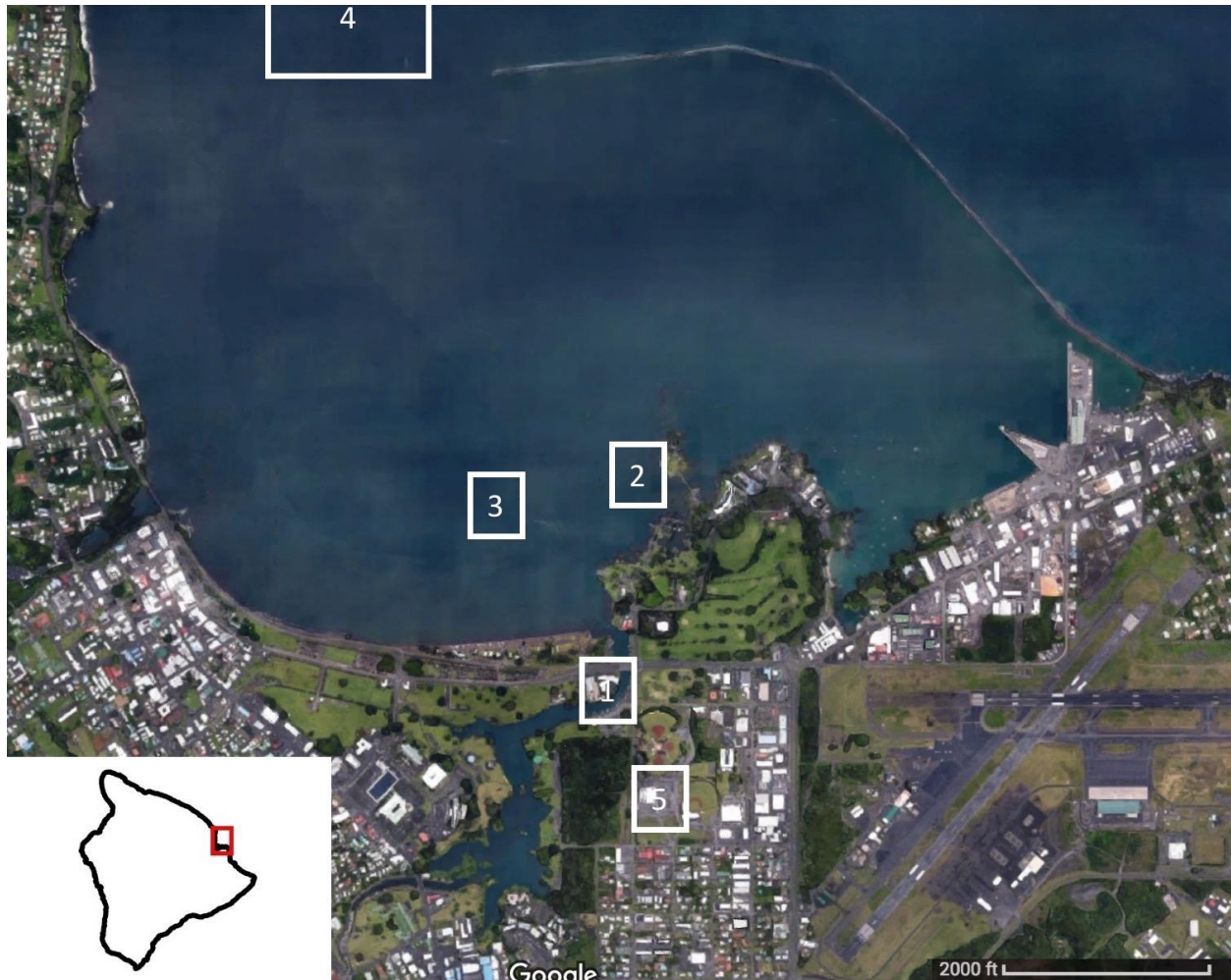
When the instructors arrived, it was my responsibility to help them with any task that they requested. Instructors present were: Jamie Barlow, Lead instructor of MOCC; Captain Stephen Kennedy, Co-lead of MOCC; John Burns, Instructor; Jeff Kuwabara, instructor; and Jason Jones, instructor. My involvement with MOCC shifted from an educator to a logistics coordinator during the entirety of the process. The instructors' objective was to build a logistical foundation around MOCC in Hilo. During the course, students would participate in MOCC and the complimentary module, the OWM. The course was structured in stations with specific time slots for small groups of three to rotate through different skills. Coordination was key and communication was strained.

If I was not preparing the next course for the students while the instructors lectured I would remain with a van on land and coordinate timely rotations. Being a logistics coordinator was an important opportunity to excel because my supervisors were potential employers. The preparation work I had been doing for the previous two years was tested in one week when I needed to know where things were located, how many of them we had, and coordinated getting them. I spent very little time with the students and instead carried out tasks with instructors to prepare for upcoming lessons. To ensure maximum efficiency in the schedule I carried out most upkeep and maintenance on my own while instructors were teaching. Upon the end of the course, the equipment that was borrowed were shipped back to O'ahu and MOCC equipment was disassembled and stored for next year. A short manual on assisting with MOCC was generated for the next deckhand in my position to ensure an efficient transition.

*Course Location*

**Figure 1.** Three areas that were used for boating procedures. The box labeled ‘1’ is deep protected water. The box labeled ‘2’ indicates the Wailoa Boat Ramp. Box ‘3’ is Radio Bay, a shallow protected zone where the University’s boat slot is located.





**Figure 2.** Four areas that were used for boating procedures during MOCC. The box labeled ‘1’ is the Wailoa Boat Ramp. Box ‘2’ indicates Coconut Island station. Box ‘3’ is open water. Box ‘4’ is open water which is exposed to offshore surf. Box ‘5’ is the parking lot of the Afook-Chinen Auditorium and the Francis Wong Stadium.

The site used for the small boat operations course was in Hilo bay which features the three necessary environments required in MOCC: open water, dock area, and base camp.

**Figure 1** indicates the 3 areas that were used during the course. Box ‘1’ was used for fast boating maneuvers that required a lot of space. The area in box ‘2’ was used for docking maneuvers and boat ramp procedure. And the area in box ‘3’ was used for anchoring, the star drill, and indicates our base of operations.

The site was similar for MOCC but the locations at this site changed. In **Figure 2** box ‘1’ was used for docking, launching, and retrieving procedures. Box ‘2’ was used for rock awareness procedure, star drills, and man-overboard exercises. Box ‘3’ was used for serpentine maneuvers and turn control exercises. Box ‘4’ was used primarily for the open water module where students learn the pivot turn technique which is used in high surf conditions.

## MATERIALS

The two following lists are the lists I received upon gaining my responsibilities as a logistics coordinator for the 2017 UHH MOCC. The ‘typical supplies needed for MOCC’ is the list of items I was directly responsible for providing, organizing, and staging either by locating it or requesting a purchase. However, I helped procure or account for almost every item on the motorboat operator instructor certification course (MOICC) list. These were the materials I was responsible for keeping track of, staging classes with, and maintaining after MOCC concluded.

The MOICC checklist requires a greater level of detail because it provides the instructor with reminders including logistical considerations as well as required elements to the course for teaching. This list is not necessarily inclusive of everything needed for the entirety of the course but is composed of many of the same components. For this reason, there are several redundancies in the Instructor’s list and the MOCC equipment list. The ‘typical supplies needed for MOCC’ is a general collection of items that were needed for the boats and the lecturing material.

### *MOCC-MOICC Checklist*

#### Arrangements

- Field-site permits
- pool
- Classroom
- Lodging
- Boats (tow trucks/drivers)
- Instructors
- Trailer

#### Lead Binder and Materials

- PowerPoint printouts
- Course worksheet
- Instructor schedule
- Instructor briefing
- Instructor registration
- Instructor contact information
- Instructor directions
- Final test instructor answer sheet
- Updated NASBLA presentation paper)<sup>1</sup>

#### ○ Updated safety/protection ending

#### Student Binder Handouts

- Class attendance sheet
- Student registration
- Student schedule
- Critique
- FWS Policy
- Refresher training policy
- Homeland Security information
- Replacement page 69 for student manual
- Pretest
- State boating regulations
- Map to field site
- Map to pool
- Boat field orientation sheets
- Practical grading sheets(write-in-rain

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\*The amount of line we will need for the buoys depends solely on where Captain Kennedy wants them placed whether inside Radio Bay or in Hilo Bay the amount of line needed to anchor the buoys will greatly vary.

- Final test
- State test answers
- Final test student answer sheets

- Checklist (handout)
- PFD's/Class & field shirts

#### Equipment

- Computer (extension cord) & spare
- Projector & spare bulb
- Student knot-tying lines
- Fire extinguishers
- VDS
- Auto-inflate PFD CO,
- Binders & student manuals
- Federal boater pamphlets
- State boater pamphlets
- Digital camera
- Propane
- Backup CD with PowerPoint & MOCC files Personal gear
- AA batteries

#### Instructor meeting

- Radios
- Set up classroom
- Site visits (Field, pool)
- Review schedule
- Safety briefing
- Time to meet in morning
- Cell phone numbers
- Tides
- Review inflatable demo
- Fuel issues

#### Follow up

- Radios
- Travel protocol
- Improvement suggestions

#### Personal Gear

- PFD
- Swim trunks
- Rain gear
- Ice chest
- Sun glasses
- Map

#### MOICC

- Cheat Sheets
- PowerPoint CD's
- Critiques
- Students take refresher
- Instructor Levels doc

*Typical Supplies Needed for MOCC*

## Boat Exercises

- 25 orange buoys
- 1 large buoy
- line for buoys\*
- 25 concrete cinder blocks/anchors to secure buoys
- air pump to blow up buoys
- hand bilge pump
- fuel for boats
- sufficient number and types of boats
- access boat ramp
- 2 docks or 4 docking locations - 5 x 20 ft.
- extra PFDs
- bailing bucket
- oar/paddle
- rescue gear - throw bag, cargo net, retrieval straps
- survival kit - food/water, blanket/sleeping bag, clothing (foul weather, float coat, floatation suit, immersion suit)
- charts
- log book
- radios
- lights
- tool kit
- spare prop and nut
- boat hook
- tide book (if appropriate)
- anchor(s) and lines (pins for beach, hammer)
- fenders
- boarding ladder
- first aid kit
- compass

- knife or axe

## Visual Distress Signals Devices

- variety of flares (SOLAS, USCG-hand-held, shotgun type)
- cyalume sticks
- dye marker
- strobe light
- day flag
- floating banner

## Fire Suppression

- 2 pair heavy gloves
- road flares
- duct tape
- dowel or broomstick
- steel tub or shallow pan to burn fuel
- gallons fuel (mixture 50% diesel 50% gasoline)
- B1 fire extinguisher (out-dated or old extinguishers will suffice)
- B11 fire extinguisher
- nomex suit or flight suit
- safety goggles

## Pool Exercises

- PFDs-
- Type I
- Type III
- Type III flotation jacket
- Type IV ring with line attached
- Type IV cushion
- Type V immersion suit
- Type V work suit
- Type V inflatable
- throw bags

## Trailing

- 24-30 traffic cones
- vehicles with trailers
- good locations to set up exercise

## DISCUSSION

The students which attended the course were from both Mānoa and Hilo campuses with the most UH students certified in one MOCC ever. The instructor had constructive feedback after the course was complete which will be used to produce a better program in a following course. The students who attended this MOCC were able to gain valuable experience in small boat operations and are more competitive candidates for boat and research-related jobs.

This project also provided me with excellent opportunities and connections in the future. I have successfully worked as a logistical coordinator for an MOCC, and if I repeated that role I would be eligible to attend an Motorboat Operator Instructor Certification Course. I achieved my objective which was to aid in the preparation for MOCC in Hilo. This project did enable many more UH students than normal to gain certified boating education. The gear is set and ready for the next generation of safe boaters at the university to unpack it and carry on with another course.

The completion of this course marks a new period where MOCC and boat time in general can be offered more frequently for the student body. A system has now been established to produce more students efficiently and widen accessibility to the BSP fleet. MOP events such as Small Boat Workshops that are held each semester invite previous MOCC graduates and new students interested in boating on the water. Events and boating opportunities through the BSP are building a boating community at UHH. The group allows for a collaborative scientific environment where students are able to help each other carry out research, execute scientific dives, and produce MOP projects.

**Acknowledgements**

I would like to thank my supervisor, Captain Stephen Kennedy, for providing me with the opportunities and connections that this project gave me. His mentorship, and consistent patience were qualities I hope to exemplify in future positions.

Thank you to Jamie Barlow, the co-lead of the 2017 UHH MOCC, as well as the other instructors John Burns, Jeff Kuwabara, and Jason Jones. All of which were paramount to my experience as a logistics coordinator. Their resolve allowed me to work as efficiently as possible during the course.

Thanks as well to the other logistics coordinator, Matt Connelly and the support of marine science department faculty who propelled me into a career with scientific boating by supporting Captain's course.

Mahalo University of Hawai'i at Hilo for the funds granted to Captain to establish a legitimate boating program on our island.

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**APPENDIX A: SMALL BOAT OPERATIONS COURSE (SUMMER 2016) SYLLABUS**

University of Hawaii at Hilo

## MOTORBOAT OPERATOR CERTIFICATION COURSE (MOCC)

### Course Goals

- Introduce proper boating terminology and orient students in basic boating understanding and instill a functional maintenance understanding of boating equipment.
- Receive a functional understanding of legal considerations of boating and navigational rules when boating in coastal waters or interacting with another vessel.
- Be a functional risk assessor and to feel confident in survival and rescue situations on boats.
- Gain an understanding of Fire Hazards/Suppression/Prevention.
- Habitualize proper knotting techniques and applications.
- Get a confident understanding of trailering, unloading a boat into the water, and getting underway.
- **Focus on boat maneuverability, boat handling, and operating techniques such as docking, undocking, avoiding objects in the water, coming alongside objects in the water, and total control over the vessel.**

### Instructor

Captain Stephen Kennedy    [sjkenned@hawaii.edu](mailto:sjkenned@hawaii.edu) Phone#    Room#: W-2

### Materials Needed

- Paper & Writing Utensil

This course **will have an evaluation** and it recommended that you bring materials to take notes with especially during the first week where the majority of lecturing with take place. **It is unrecommended to haul around too many supplies** as we will be moving around frequently and your items may be exposed to water.

- Appropriate yourself for the Ocean

The Ocean is a big, unpredictable place. We will be spending a lot of time outside so it is important to consider **Sunscreen, Hat, Sunglasses, Raingear, or anything else you might need for varying weather.**

- Water and Snacks

It is going to be really important while out on the water for extended periods of time to **hydrate early and often**. Bring any for a lunch or some snacks so as to avoid getting worn-out on the water.



### Grading

Grading for this course will be determined by an evaluation at the end of the course and your practical abilities on the water. In regards to practical abilities on the boats, you will not be graded on how you perform at the beginning of the course, but rather, on how well you demonstrate your ability to carry out boating techniques at the end of the course.

93-100%	A	79%	C+
90-92	A-	68-78	C
89	B+	50-67	D
81-88	B	< 50	F
80	B-		

### UH Hilo Sexual Assault Policy

UH Hilo provides confidential assistance for victims of sexual assault. Counseling Services on-campus and the YWCA Sexual Support Services off-campus offer guidance regarding medical assistance and emotional help and can discuss options for reporting sexual assaults to law enforcement. All conversations are private and confidential. The UH Hilo Sexual Assault Policy can be found at:

<http://hilo.hawaii.edu/uhh/vcsa/documents/UHHSexualAssaultPolicy.pdf>

For assistance during the day, contact UH Hilo Counseling Services at (808) 932-7465; or, after hours and on weekends, contact the YWCA Sexual Assault Support Services at (808) 935-0677.

### Evaluations

There will be two exams on the last week of this course. The first exam will be a written exam that will evaluate your knowledge on material in the lectures and in the field. And the second exam will be a practical evaluation where you will demonstrate boat maneuvers and and common nautical knots.

#### Tentative Schedule:

Week	Date	Topic
1	5/24	Boat Orientation and Lecture at MSB 104
	5/26	Continued Lecture at MSB 104 and Pool Session at SLC
2	5/31	Meet at MSB 104 before heading to the armory for lecture on dry docked boats, boat maintenance, and trailering practice
	6/2	Meet at MSB 104 before heading to the armory for trailering practice and later class will practice putting a vessel in the water
3	6/7	Meet at MSB 104 (Boating Practice All day)
	6/9	Meet at MSB 104 (Boating Practice All day)
4	6/14	Meet at MSB 104 for Written test followed by boating practice
	6/16	Meet at MSB 104 for Practical Exam (Trailerling, Boat Maneuvers) at Suisan Boat Ramp and Radio Bay

