

Benthic Observation System Concept Design Review (draft)

March 27, 2017

Functional Requirements

- The lander must provide the ability to identify, count, and size marine organisms by capturing video and/or still images.
- The lander must have the ability to interface and log various contextual sensors, such as O₂, pH, ADCP, acoustic, and other novel sensors such as 3G-ESP.
- The lander must be a modular platform that can be reconfigured for various sensors and deployment scenarios.

Operational Requirements (TNC)

- Must operate tethered
- Must operate in a benthic environment
- Must capture stereo video
- Must have 360 degrees of stereo video coverage
- Must be rated to 300 meters
- Must be able to land on or hover above rocky outcroppings
- Must be able to collect data from up to 30 sites within a normal operational ship day
- Must be able to be deployed from various vessels of opportunity
- Must have real time video
- Must have real time telemetry data (heading & depth)

Operational Requirements (Barry)

- Must operate autonomously
- Must operate in a benthic environment
- Must capture stereo still images
- Must be rated to 1500 meters
- Must be able to land on or near coral ridges
- Must be able to operate from days to one year
- Must be able to be deployed from MBARI ships
- Must have O₂, pH, ADCP, and CTD sensors

Operational Requirements (Chavez)

- Must operate autonomously
- Must operate in a benthic environment
- Must capture stereo video
- Must be rated to 300 meters
- Must be able to land on seafloor
- Must be able to operate for 3-6 months
- Must be able to be deployed from MBARI ships
- Must have O₂, and CTD sensors
- Must be able to interface the 3G-ESP

Operational Requirements (Benoit-Bird)

- Must operate tethered
- Must operate in a mid-water environment
- Must capture stereo video
- Must be rated to 300 meters
- Must be able to be mounted to a mooring or be suspended from a ship
- Must be able to operate 1-2 hours each at up to 5 sites per day from ships
- Must be able to be deployed from MBARI ships or various smaller vessels
- Must be able to interface the EK80 echosounder or similar
- Must provide real time data when operating from a ship

Operational Requirements Matrix

Requirement		TNC	Barry	Chavez	Benoit-Bird
Tethered		Yes	No	Yes	Yes
Autonomous		No	Yes	Yes	No
Depth 300 Meters		Yes	No	Yes	Yes
Depth 1500 Meters		No	Yes	No	No
Benthic		Yes	Yes	Yes	No
Mid-water		No	No	No	Yes
Stereo video		Yes	No	Yes	Yes
Stereo imaging		No	Yes	No	No
360 degrees coverage		Yes	No	No	No
O2 sensor		No	Yes	Yes	No (Nice)
pH probe		No	Yes	No (Nice)	No
CTD		No	Yes	Yes	No (Nice)
ADCP		No	Yes	No (Nice)	No
EK80 echosounder (or similar)		No	No	Yes	Yes
3G-ESP		No	No	Yes	No