



Wide Field of View Maritime Infrared Camera

Toyon's state-of-the-art, **maritime infrared camera technology and proprietary software** was developed to support whale conservation efforts and oil and gas operations in partnership with NOAA.

This custom-built camera houses six stabilized long-wave infrared (LWIR) paired with the supporting detection software for superior maritime detection.

Features Include:

- Automatically detect marine mammals, vessels or other targets in the day and night
 - Can be operated by a single analyst
 - Provides 24/7 surveillance option for extended operation
- Record video data and retrieve recently-collected video for verification
 - Instant replay allows for rapid verification without unnecessary delays in operations
 - Store/back-up video files and detection logs
- Effectively detect targets when they are present
 - Mitigate anthropogenic effects to nearby cetaceans
 - Reduce ship-strike risk through improved detection
- Camera performance evaluated by trained marine mammal observers
- Land or vessel mounted options available
- Wide field of view for larger area data collection



Six LWIR camera sensors provide a wide field of view.

Camera Specifications:

- 6 uncooled long-wave infrared (LWIR) FLIR Tau 2 camera cores
- Custom weatherproof camera enclosure
- Camera resolution of 640x512 pixels at 30 frames per second. Combined resolution of 3840x512 pixels
- 90° field-of-view. Multiple modules can be installed together to extend the field-of-view coverage up to 360°
- Internal navigation system and electronic stabilization that both stabilizes the infrared imagery and tracks the geographic location of the camera
- Connects directly to a laptop running the detection software

Camera	Date	Time	X Pixel	Y Pixel	Lat	Lon
WhaleCam	2019-08-18	12:11:54	2763	269	34.1376231	-119.855665
WhaleCam	2019-08-18	12:12:02	2740	266	34.1376081	-119.856835
WhaleCam	2019-08-18	12:22:56	3234	289	34.1394046	-119.849419
WhaleCam	2019-08-18	12:23:32	3194	326	34.1425946	-119.842332
WhaleCam	2019-08-18	12:23:52	656	305	34.1380514	-119.841172
WhaleCam	2019-08-18	12:24:13	1242	304	34.140328	-119.840043
WhaleCam	2019-08-18	12:24:57	3059	278	34.1420993	-119.842156
WhaleCam	2019-08-18	12:25:15	3156	280	34.1433289	-119.843156
WhaleCam	2019-08-18	12:25:29	3210	280	34.1437005	-119.845408
WhaleCam	2019-08-18	12:25:49	3085	295	34.1427343	-119.843052
WhaleCam	2019-08-18	12:25:53	2930	295	34.1425296	-119.842117
WhaleCam	2019-08-18	12:25:56	2845	285	34.1423733	-119.842398
WhaleCam	2019-08-18	12:26:02	2825	295	34.1430084	-119.843094
WhaleCam	2019-08-18	12:26:03	2650	294	34.1433029	-119.843098
WhaleCam	2019-08-18	12:26:31	3374	295	34.1430487	-119.844308

Quickly confirm or deny putative blows

90° field of view from six stabilized LWIR camera sensors

Automatically detected whale blow