Survey Methods
Survey Software: Ask, Analyze, Improve
Survey Creation, Deployment, & Analysis Tools for Businesses

Survey: Survey of NOAA Mission Requirements that may be met with UAS.

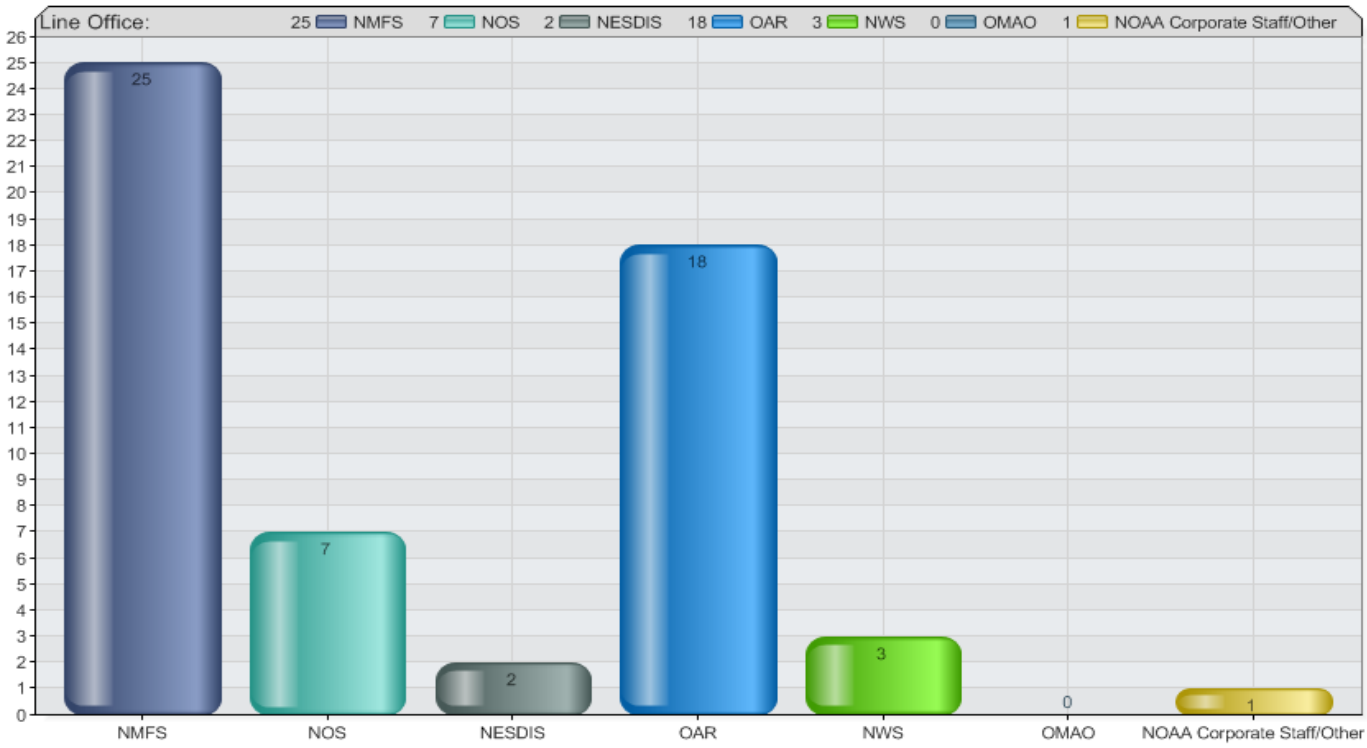
Report: Survey Summary for Participants

Survey Status		Respondent Statistics		Points Summary
Status:	Closed	**Total Responses:**	56	No Points Questions used in this survey.
Deploy Date:	10/06/2016	**Completes:**	50	
Closed Date:	10/24/2016	**Partials:**	6	

1.

Line Office:

	Responses	Percent
NMFS:	25	44.64%
NOS:	7	12.5%
NESDIS:	2	3.57%
OAR:	18	32.14%
NWS:	3	5.36%
OMAO:	0	0%
NOAA Corporate Staff/Other:	1	1.79%
Total Responded to this question:	56	100%
Total who skipped this question:	0	0%
Total:	56	100%



2.

Your employee status:

	Responses	Percent
Federal civilian employee:	49	87.5%
NOAA Corps Officer:	1	1.79%
Full time NOAA contractor:	5	8.93%
Other:	1	1.79%
Total Responded to this question:	56	100%
Total who skipped this question:	0	0%
Total:	56	100%

4.

Name of specific mission requirement that may be met with UAS within the next 5 years.

Fill out a new survey form for each unique mission or mission requirement.

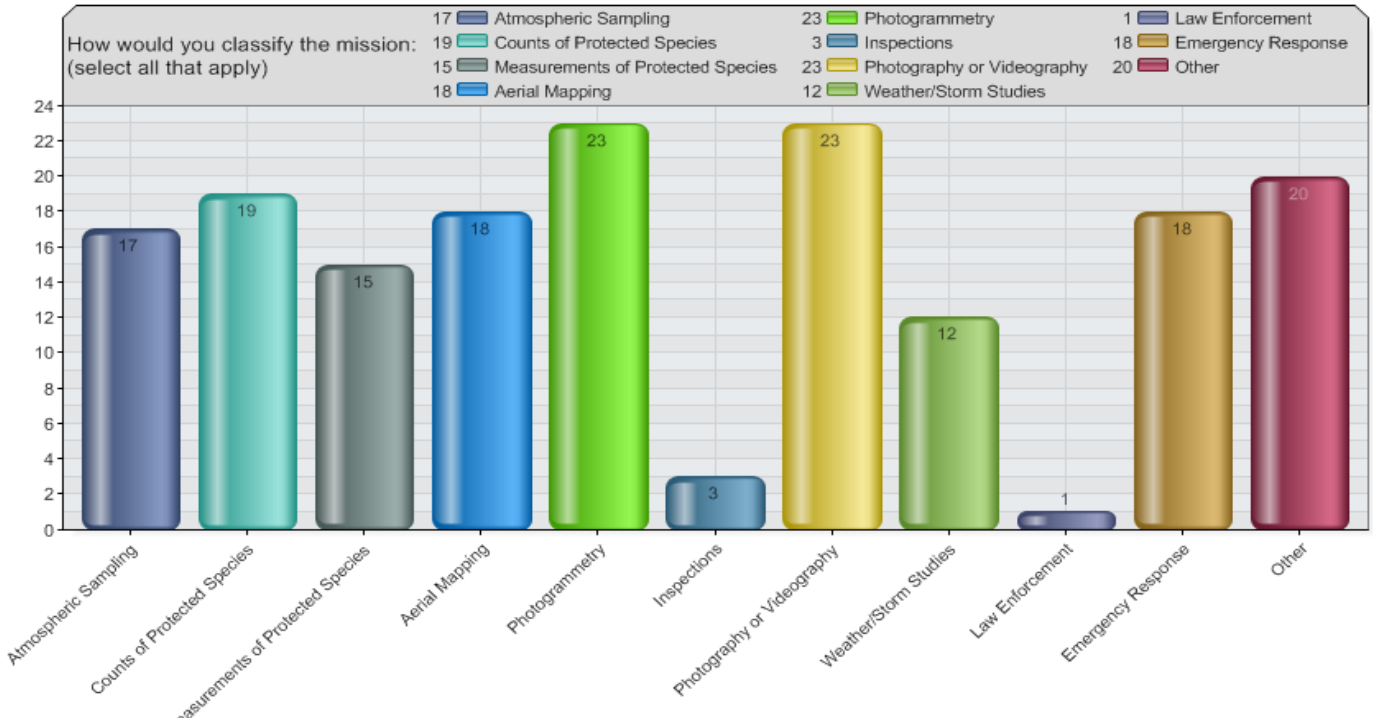
	Responses	Percent
Responses:	54	100%
Total Responded to this question:	54	96.43%
Total who skipped this question:	2	3.57%
Total:	56	100%

LO	Mission Requirement	#
OAR	Harmful Algal Bloom Detection	
OAR	GOA2HEAD	
OAR	Boundary Layer Measurements	
OAR	Atmospheric Aerosol Climate and Air Quality Studies	
OAR	Harmful Algal Bloom Detection and Mapping	
OAR	THis is unknown, but some of researchers in the 33 sections may use drones.	
OAR	Mission to “evaluate options for UAS profiling of the lower atmosphere with applications for severe weather	
OAR	COYOTE UAS	
OAR	Climate Studies	
OAR	Hurricane surveillance and PBL studies to improve HWRF	
OAR	Climate Monitoring	
OAR	Hurricane Reconnaissance (Atlantic and EPAC)	
OAR	Atmospheric Boundary Layer and Surface Applications of Small UAS Technologies	
OAR	Hurricane Reconnaissance (Atlantic and EPAC)	
OAR	Quantitative value of mass and wind information from instruments on the Global Hawk to improve forecast skill of high impact weather events, through OSEs and OSSEs	
OAR	Studying atmospheric composition through the boundary layer, especially in the Arctic	
OAR	Aircore descent from stratosphere	
NWS	Assessment of Impacts After Hazardous Weather Events	
NWS	Atmospheric Sampling	
NOS	Coastal Mapping Program	
NOS	Natural Resource Damage Assessment	
NOS	Oil mapping/surveillance overflights	
NOS	Marine monitoring	
NOS	Sensitive or remote small area marine debris surveys. Assessing and quantifying the presence of marine debris in sensitive or remote shoreline or nearshore areas.	
NOS	Emergency Response	
NOS	NOAA Hydrographic Operations	
NMFS	terrestrial, stream channel, floodplain, estuary, lagoon mapping for anadromous fish research and monitoring	
NMFS	Pinniped surveys with small UAS	
NMFS	Marine Mammal Stranding and Disaster Response	
NMFS	Shallow water benthic habitat mapping	
NMFS	Sustainable Fisheries	
NMFS	for large whales: photogrammetry, blow sampling, real time documenting of entanglement, photo ID of individuals, behavioral studies	
NMFS	Pinniped Ecology and Assessment	
NMFS	Sea turtle detection - detect sea turtles at distance from boat so boat can navigate to turtle	
NMFS	Hawaiian Monk Seal Applications	
NMFS	Pinniped photogrammetry	
NMFS	Cetacean Health Assessment (Photogrammetry and Blow Collection)	
NMFS	CPS surveys off west coast	
NMFS	Small and large scale pinniped census	
NMFS	Endurance exceeding 30 minutes for VTOL UAS	
NMFS	Pinniped health and abundance assessment	
NMFS	Cetacean Abundance and Group Size	
NMFS	Distribution, abundance and habitat studies of ringed seals in shorefast ice	
NMFS	Survey for ice-associated seals	
NMFS	Long-range, beyond LOS Steller sea lion abundance surveys	
NMFS	Cetacean Surveys	
NMFS	Habitat Mapping and Debris Detection	
NMFS	Marine Mammal Entanglement and Stranding Response	
NMFS	Marine Mammal Oil Spill Response	
NMFS	Marine Mammal Stranding and Disaster Response	
NMFS	Turtle detection to aid in tagging	
NESDIS	NOAA Satellite Data Validation	
NESDIS	Numerical Weather Prediction Model Validation	

5.

How would you classify the mission: (select all that apply)

	Responses	Percent
Atmospheric Sampling:	17	30.91%
Counts of Protected Species:	19	34.55%
Measurements of Protected Species:	15	27.27%
Aerial Mapping:	18	32.73%
Photogrammetry:	23	41.82%
Inspections:	3	5.45%
Photography or Videography:	23	41.82%
Weather/Storm Studies:	12	21.82%
Law Enforcement:	1	1.82%
Emergency Response:	18	32.73%
Other:	20	36%
Total Responded to this question:	55	98.21%
Total who skipped this question:	1	1.79%
Total:	56	100%



5.

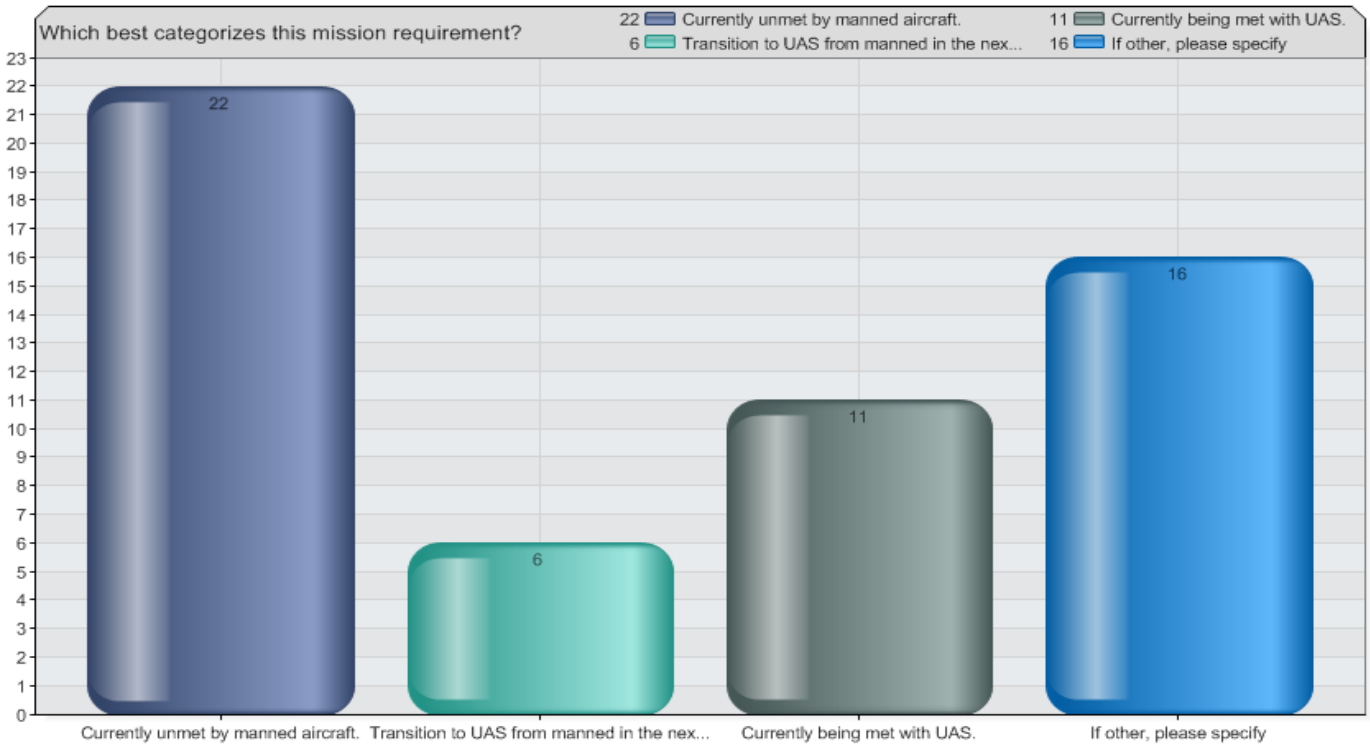
How would you classify the mission: (select all that apply)

Response	Comments
1	image derived bathymetry
2	Harmful Algal Bloom Detection and Mapping
3	Public alerts via audible speakers
4	oil/ chemical detection
5	Climate
6	1.blow sampling 2. photo ID individuals 3.behavior 4. real time entanglement documentation to aid disentanglement.
7	Animal behavior from animal borne data loggers
8	Satellite Data Validation -- Surface Refence Data Collection
9	Emergency response to Unusual Mortality Event
10	counts of CPS
11	Ocean monitoring
12	Hyperspectral Detection and Mapping
13	Air sampling of "Black Carbon" from vessels
14	Emergency response to Unusual Mortality Event
15	Industrial impact assessment
16	Surface Refence Data Collection
17	Atmospheric boundary layer and surface sampling in terrestrial, marine and Arctic environments
18	Habitat Surveys
19	Search and Rescue platform in remote areas; communications relay
20	Animal behavior from animal borne data loggers

6.

Which best categorizes this mission requirement?

	Responses	Percent
Currently unmet by manned aircraft.:	22	40%
Transition to UAS from manned in the next 5 years.:	6	10.91%
Currently being met with UAS.:	11	20%
If other, please specify:	16	29.09%
Total Responded to this question:	55	98.21%
Total who skipped this question:	1	1.79%
Total:	56	100%



6.

Which best categorizes this mission requirement?

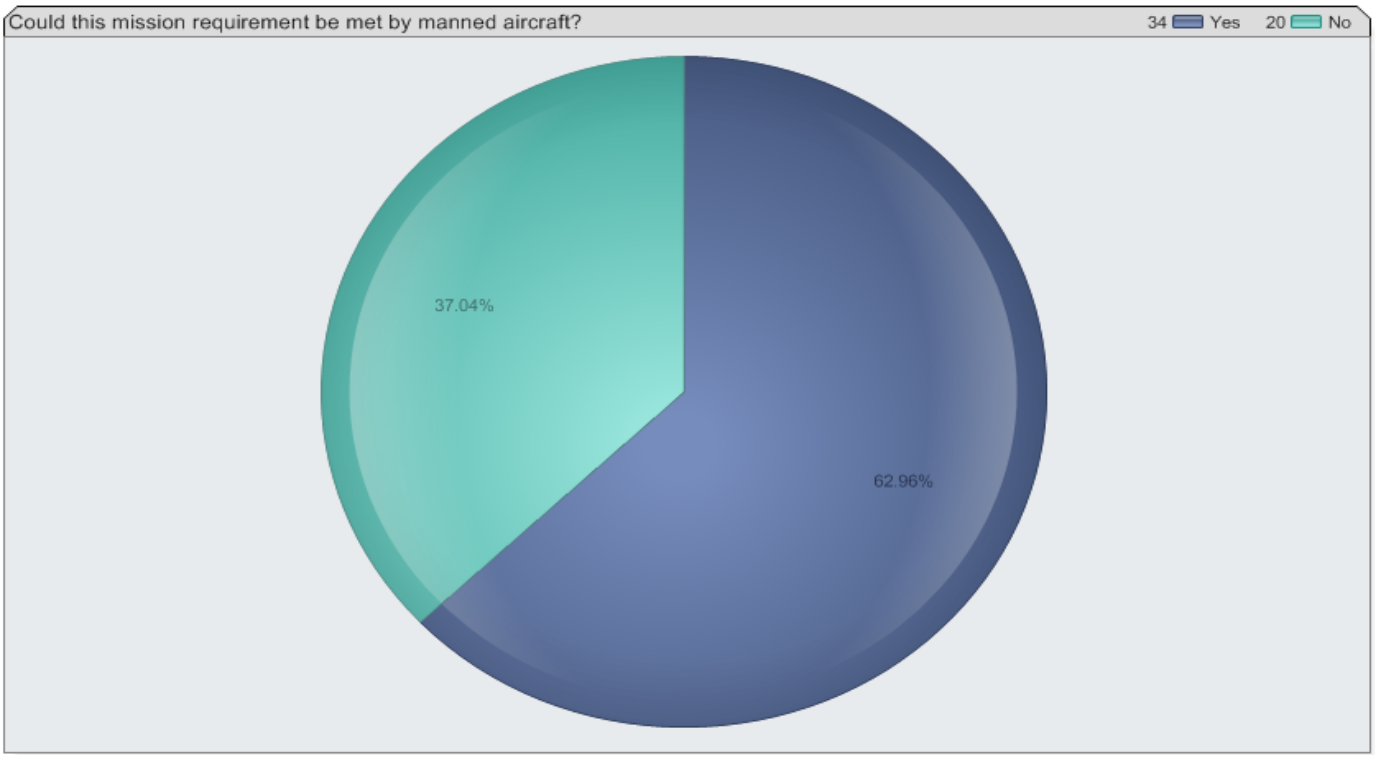
Response	Comments
1	Mission requirements that may not have been possible w/o use of UAS (logistics, cost, etc.)
2	Shared mission requirements with Aircraft, Satellite and UAS.
3	Mission requirements that are currently achieved using existing methods but could be made much more

4	Currently we do manned and boat operations, but are investigating use of UAS.
5	Currently no aerial surveys exist for the species we are looking at
6	some currently manned aircraft missions could be done with UAS
7	Mission requirements that will be either be enhanced by UAS or that may replace manned aircraft in some locations
8	The mission requirements are largely unmet, with two exceptions. 1) We very occationally have a non-NOAA party pay for manned flights, 2) NOAA Puma flew support on one cruise.
9	Our researchers may use drones.
10	Unmet mission requirements; challenging sampling
11	met with manned aircraft; plan to supplement with UAS to cover areas that are not reached by manned aircraft
12	Currently met by manned aircraft and sUAS and hope to augment with long-range surveys in the future.
13	– Emerging mission requirement that is partially met by manned aircraft, but are currently unmet in some situations. Goal would be to integrate UAS to address these needs where practical (cost, logis
14	Corroborate and compliment aircraft and satellite imagery
15	compliment manned aircraft and satellite support; offer mission efficiency if UAS located on NOAA vessels
16	The mission requirements are largely unmet though very occationally have a non-NOAA party pay for manned flights.

7.

Could this mission requirement be met by manned aircraft?

	Responses	Percent
Yes:	34	62.96%
No:	20	37.04%
Total Responded to this question:	54	96.43%
Total who skipped this question:	2	3.57%
Total:	56	100%

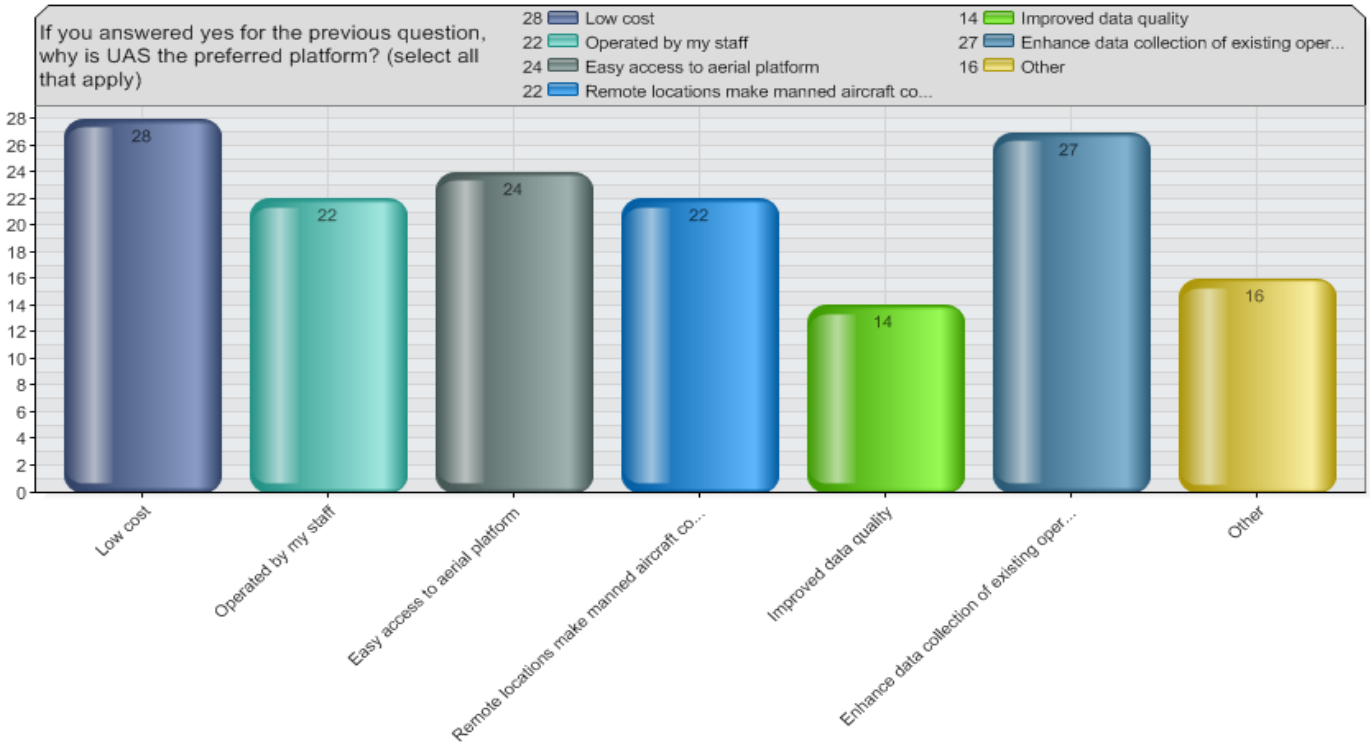


8.

If you answered yes for the previous question, why is UAS the preferred platform? (select all that apply)

	Responses	Percent
Low cost:	28	71.79%
Operated by my staff:	22	56.41%
Easy access to aerial platform:	24	61.54%
Remote locations make manned aircraft cost prohibitive:	22	56.41%
Improved data		

Enhance data collection of existing operations:	27	69.23%
Other:	16	41%
Total Responded to this question:	39	69.64%
Total who skipped this question:	17	30.36%
Total:	56	100%



8.

If you answered yes for the previous question, why is UAS the preferred platform? (select all that apply)

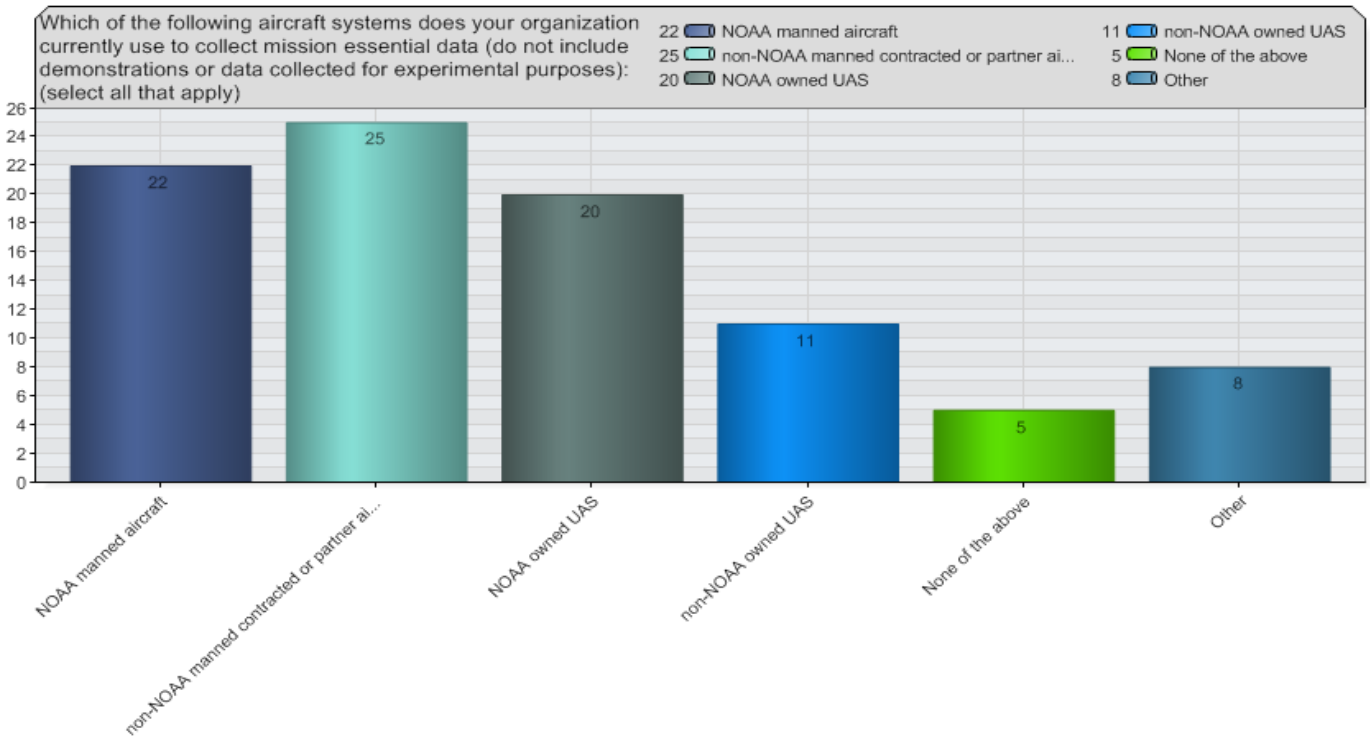
Response	Comments
1	increased human safety; reduced effects to marine mammals compared to manned aircraft; improved response time compared to manned aircraft
2	can corroborate and calibrate other remote sensing systems
3	Opens up new opportunities (like inspections of radar, or other observation equipment) that are either too costly for manned aircraft, or too dangerous for humans due to height.
4	Temporal and Spatial fine scale measurements
5	Remote locations, difficult to access shorelines and/or tight maneuverability may make UAS suitable alternative
6	some current manned aircraft missions could not be replace by UAS

8	UAS provide ability to sample at a more appropriate scale
9	safety
10	UAS provide more flexibility in timing of data collection
11	This depends on seasonal sea ice range. We also don't survey areas closer to shore around Native Alaskan communities and cannot access much of the fast ice with manned aircraft.
12	Vessel surveys to the west. Aleutian Islands may not be possible during SSL breading season (where sUAS currently used) and use of Otter in this area is expensive and a potential safety issue.
13	increased human safety; reduced effects to marine mammals compared to manned aircraft; improved response time compared to manned aircraft
14	The UAS would provide a controlled landing of the Aircore, which currently lands wherever a parachute carries it.
15	Remote locations may also prohibit entry (i.e. Papahanaumokuakea Marine National Monument) for protection of cultural and ecological resources. The use of UAS could mitigate the impacts of human prese
16	support search and rescue in remote areas

9.

Which of the following aircraft systems does your organization currently use to collect mission essential data (do not include demonstrations or data collected for experimental purposes): (select all that apply)

	Responses	Percent
NOAA manned aircraft:	22	41.51%
non-NOAA manned contracted or partner aircraft:	25	47.17%
NOAA owned UAS:	20	37.74%
non-NOAA owned UAS:	11	20.75%
None of the above:	5	9.43%
Other:	8	15%
Total Responded to this question:	53	94.64%
Total who skipped this question:	3	5.36%
Total:	56	100%



9.

Which of the following aircraft systems does your organization currently use to collect mission essential data (do not include demonstrations or data collected for experimental purposes): (select all that apply)

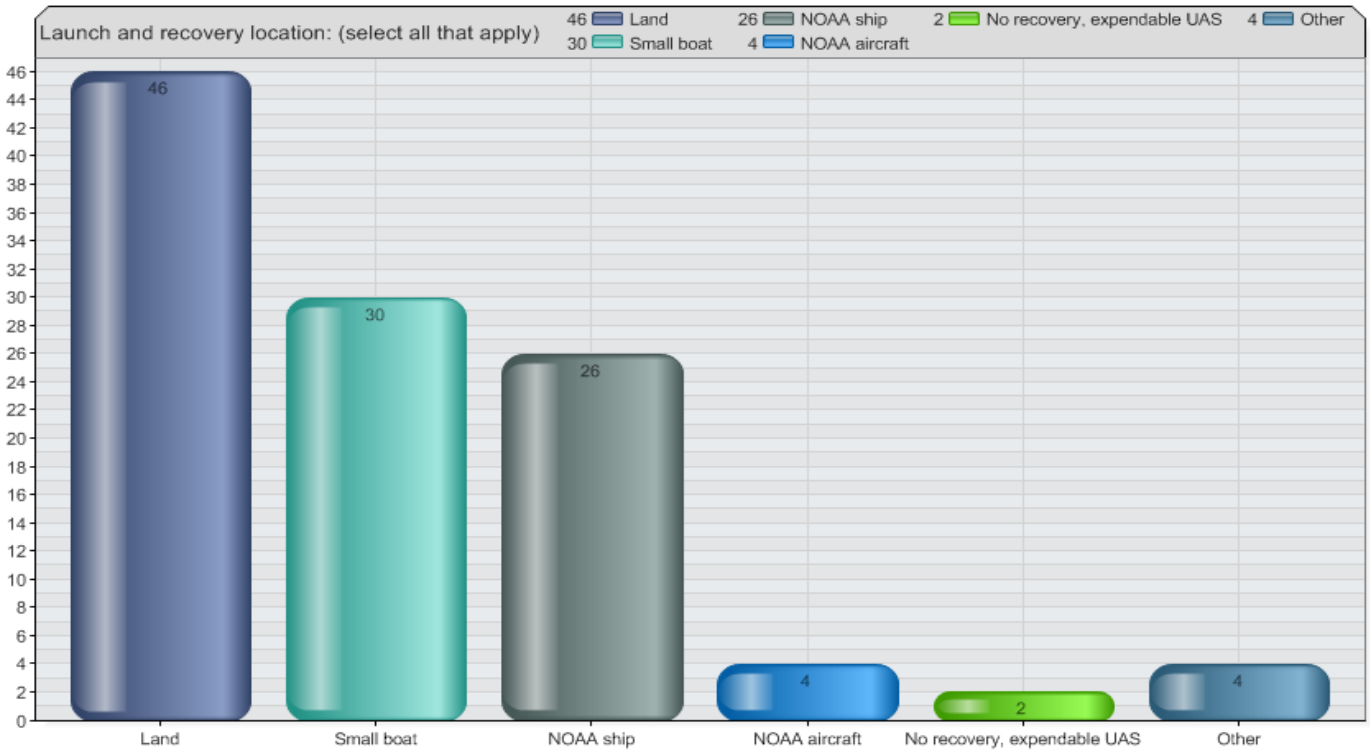
Response Comments

1	contracted by univeristy - lidar flights
2	national and commercial satellite systems
3	NWS is currently not authorized to use UAS equipment in an official capacity. We do gather UAS footage from private citizens or other government entities (fire/police) during or after events.
4	Usually USCG or industry-contracted aircraft with a NOAA observer, often helos
5	All our work is currently experimental and no aerial data are used in our assessments
6	not sure
7	Weather balloons and attached radio sondes.
8	Balloon soundings

10.

Launch and recovery location: (select all that apply)

	Responses	Percent
Land:	46	85.19%
Small boat:	30	55.56%
NOAA ship:	26	48.15%
NOAA aircraft:	4	7.41%
No recovery, expendable UAS:	2	3.7%
Other:	4	7%
Total Responded to this question:	54	96.43%
Total who skipped this question:	2	3.57%
Total:	56	100%



10.

Launch and recovery location: (select all that apply)

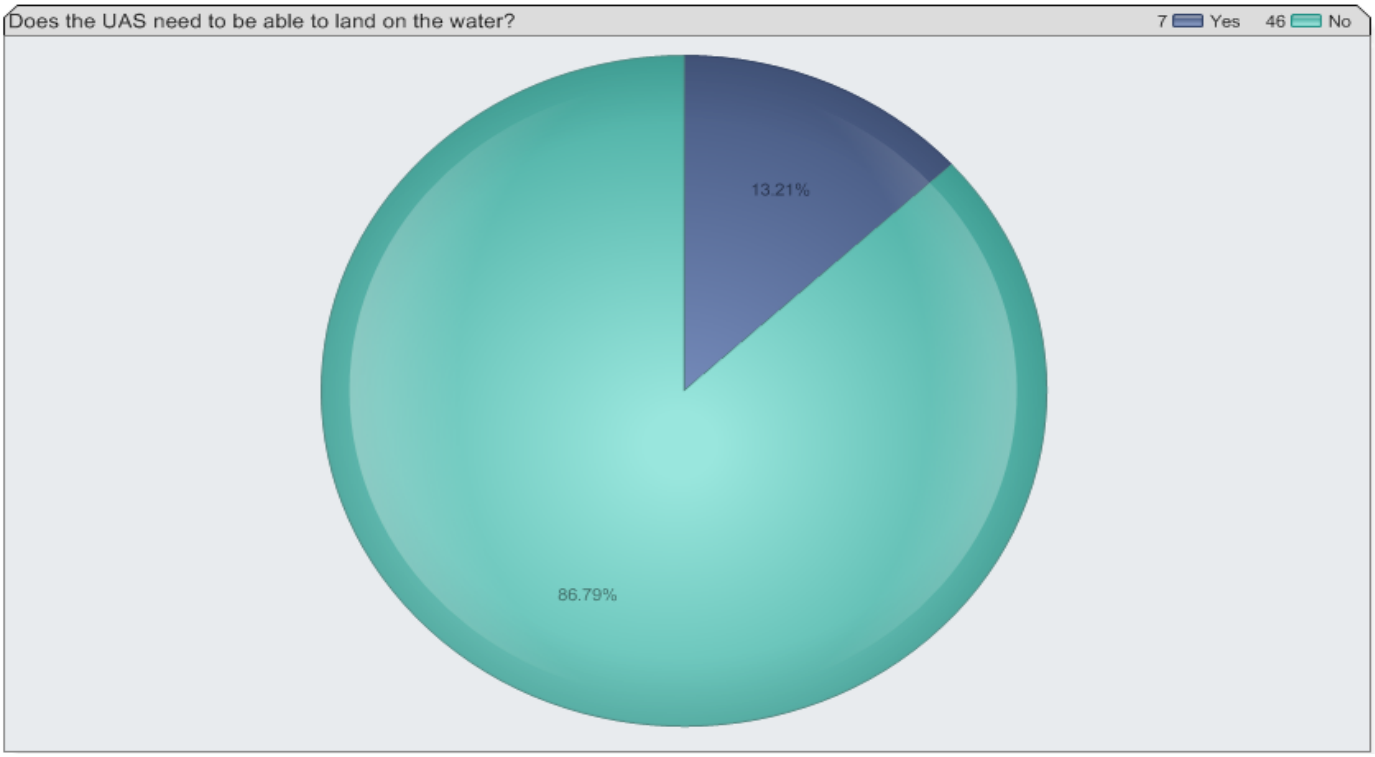
Response	Comments
1	Non-NOAA Ship (smaller vessels)

3	the AERD usually used contract research vessels in the Antarctic
4	ice/Arctic

11.

Does the UAS need to be able to land on the water?

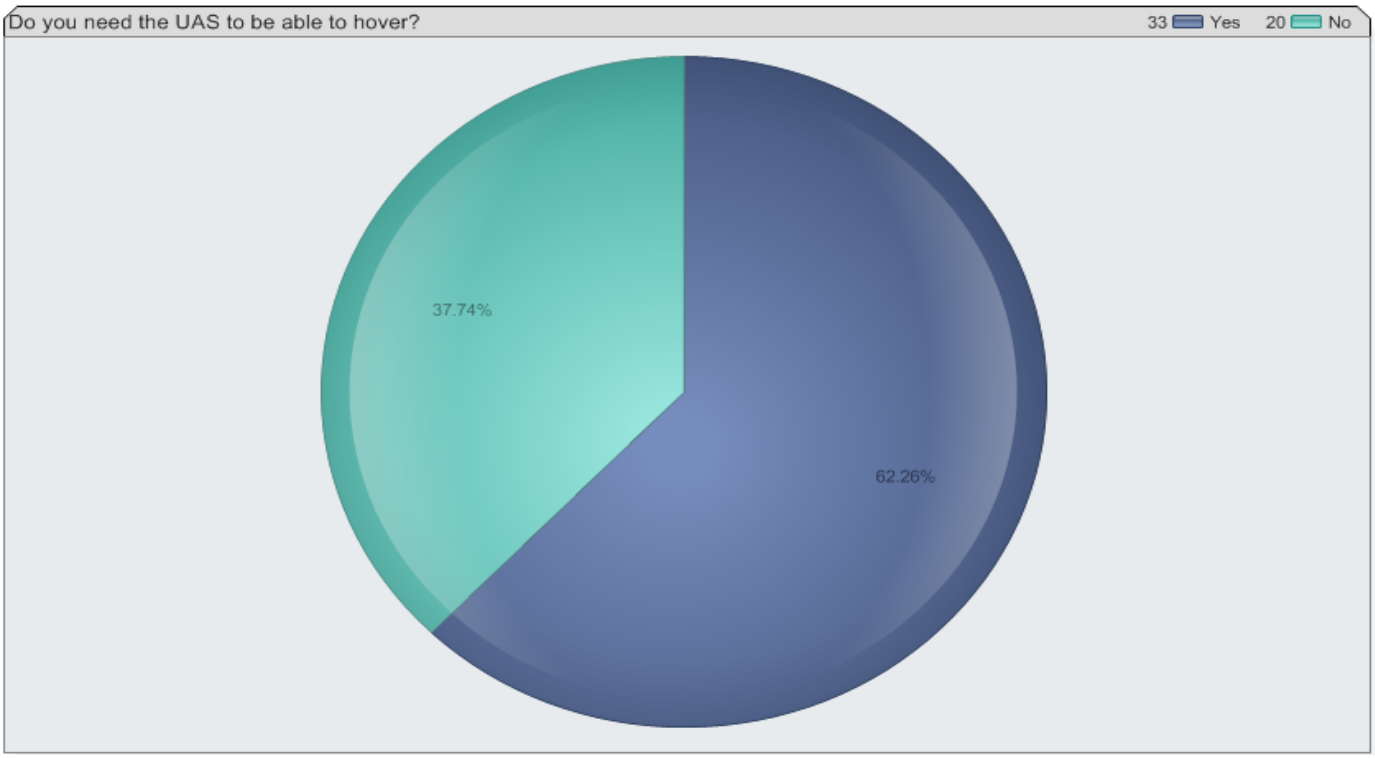
	Responses	Percent
Yes:	7	13.21%
No:	46	86.79%
Total Responded to this question:	53	94.64%
Total who skipped this question:	3	5.36%
Total:	56	100%



12.

Do you need the UAS to be able to hover?

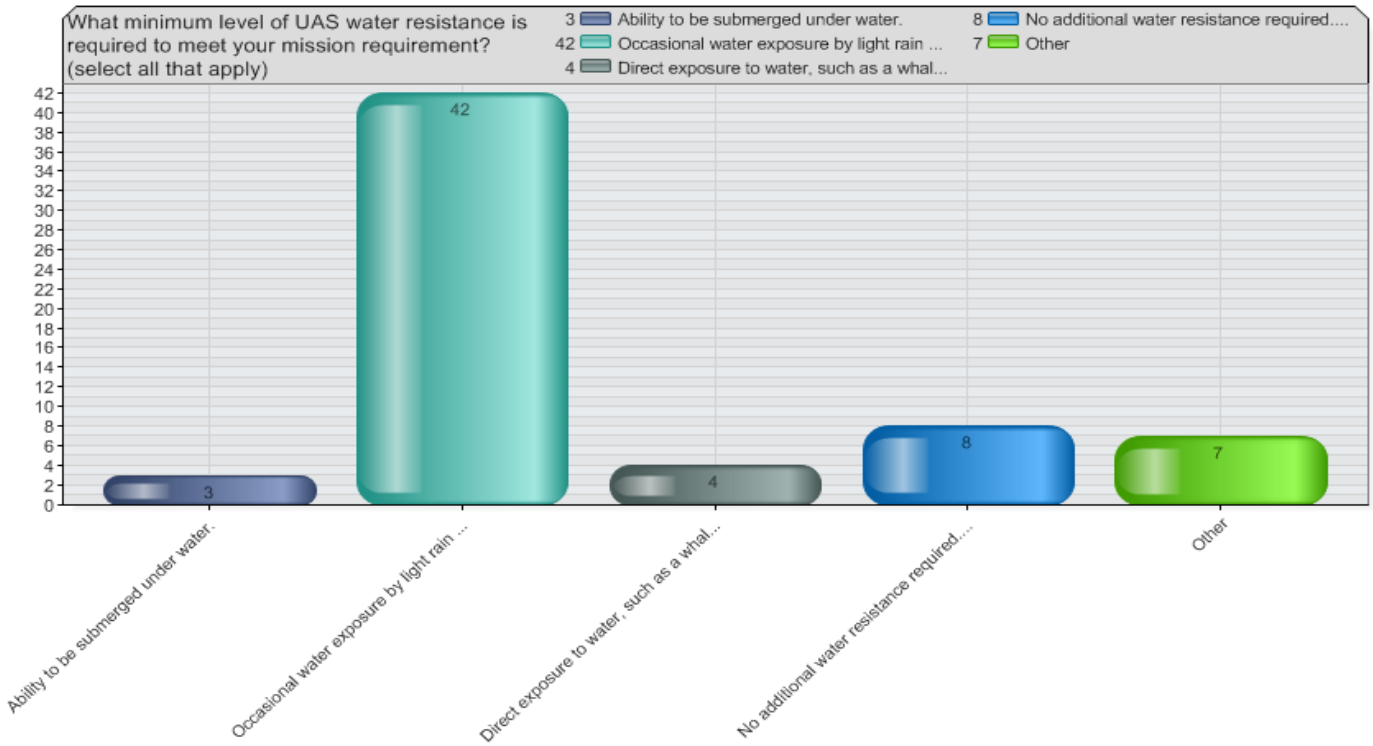
	Responses	Percent
Yes:	33	62.26%
No:	20	37.74%
Total Responded to this question:	53	94.64%
Total who skipped this question:	3	5.36%
Total:	56	100%



13.

What minimum level of UAS water resistance is required to meet your mission requirement? (select all that apply)

	Responses	Percent
Ability to be submerged under water.:	3	5.77%
Occasional water exposure by light rain or operational environment.:	42	80.77%
Direct exposure to water, such as a whale blow.:	4	7.69%
No additional water resistance required.:	8	15.38%
Other:	7	13%
Total Responded to this question:	52	92.86%
Total who skipped this question:	4	7.14%
Total:	56	100%



13.

What minimum level of UAS water resistance is required to meet your mission requirement? (select all that apply)

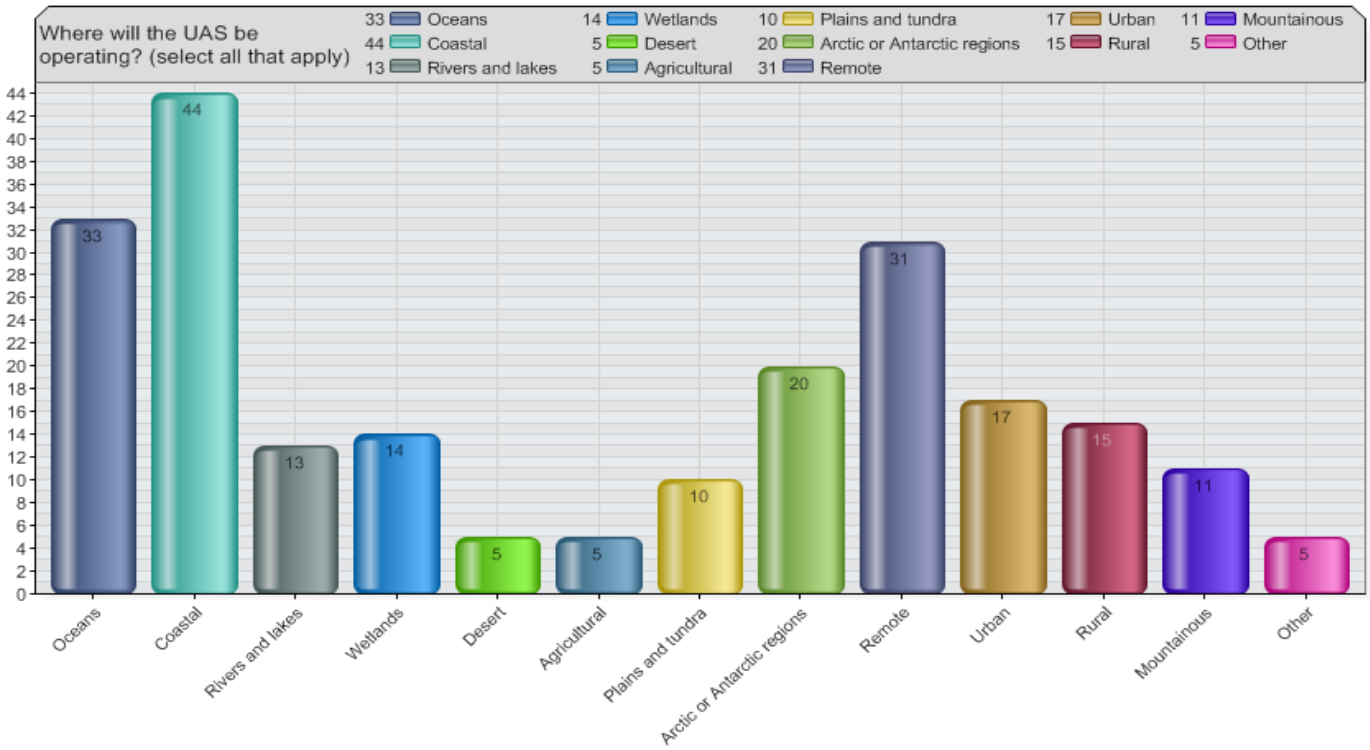
Response **Comments**

2	water proofing would be improvement, but big trade off for flight time.
3	Ability to be submerged under water would be nice but not always absolutely neccessary.
4	HEAVY RAIN, SEA SPRAY
5	Survive routine take off and/or landing from or to the water
6	Other – Ability to land in water and be retrieved within short period of time. Significant water resistance is required, waterproof preferable.
7	Ability to be submerged under water would be nice but not always absolutely neccessary.

14.

Where will the UAS be operating? (select all that apply)

	Responses	Percent
Oceans:	33	61.11%
Coastal:	44	81.48%
Rivers and lakes:	13	24.07%
Wetlands:	14	25.93%
Desert:	5	9.26%
Agricultural:	5	9.26%
Plains and tundra:	10	18.52%
Arctic or Antarctic regions:	20	37.04%
Remote:	31	57.41%
Urban:	17	31.48%
Rural:	15	27.78%
Mountainous:	11	20.37%
Other:	5	9%
Total Responded to this question:	54	96.43%
Total who skipped this question:	2	3.57%
Total:	56	100%



14.

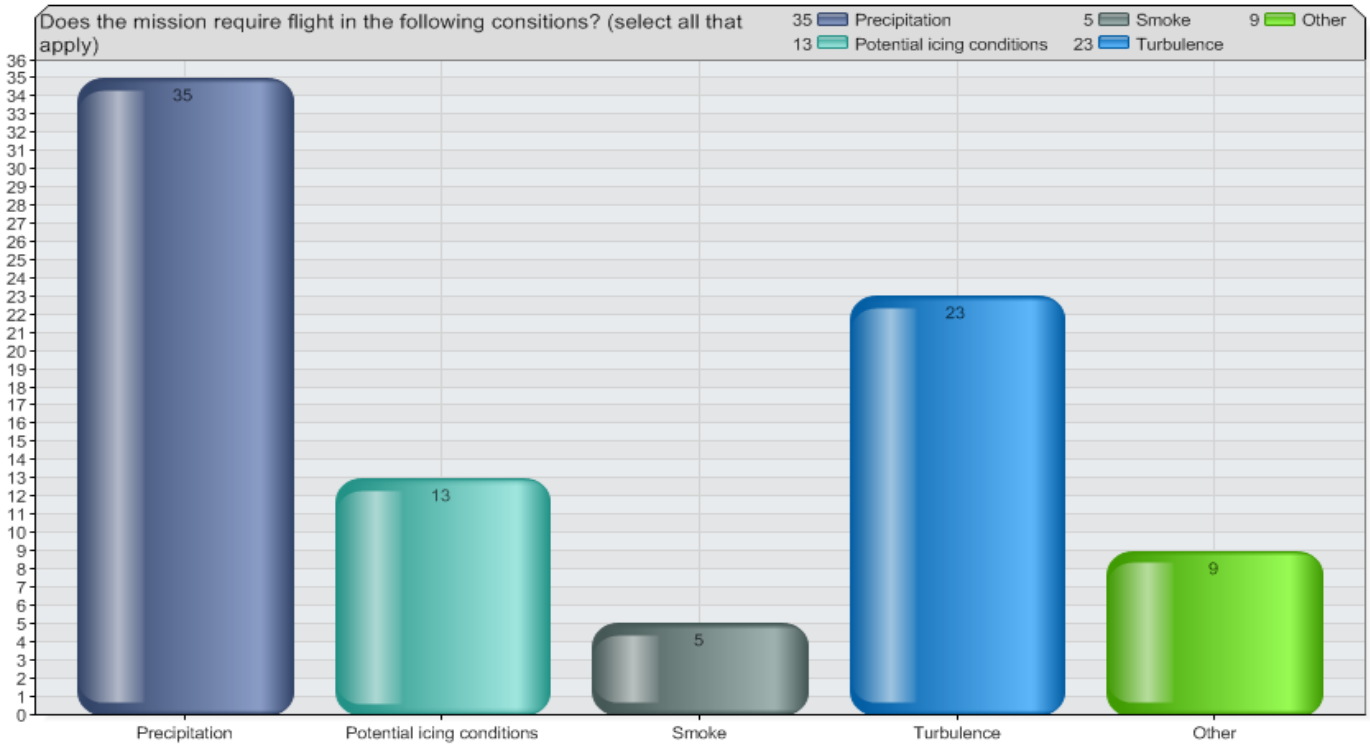
Where will the UAS be operating? (select all that apply)

Response	Comments
1	Anywhere weather has an impact on people or their assets (with exception to locations in ocean away from coast).
2	Estuaries
3	OVER OCEAN STORM ENVIRONMENTS
4	multiple locations - terrestrial, marine and Arctic boundary layers (lowest 1- 2 km of atmosphere) including in complex/mixed terrain (e.g. in mountainous regions and over vegetation)
5	Variety of locations depending where atmospheric measurements are made.

15.

Does the mission require flight in the following conditions? (select all that apply)

	Responses	Percent
Precipitation:	35	83.33%
Potential icing conditions:	13	30.95%
Smoke:	5	11.9%
Turbulence:	23	54.76%
Other:	9	21%
Total Responded to this question:	42	75%
Total who skipped this question:	14	25%
Total:	56	100%



15.

Does the mission require flight in the following consitions? (select all that apply)

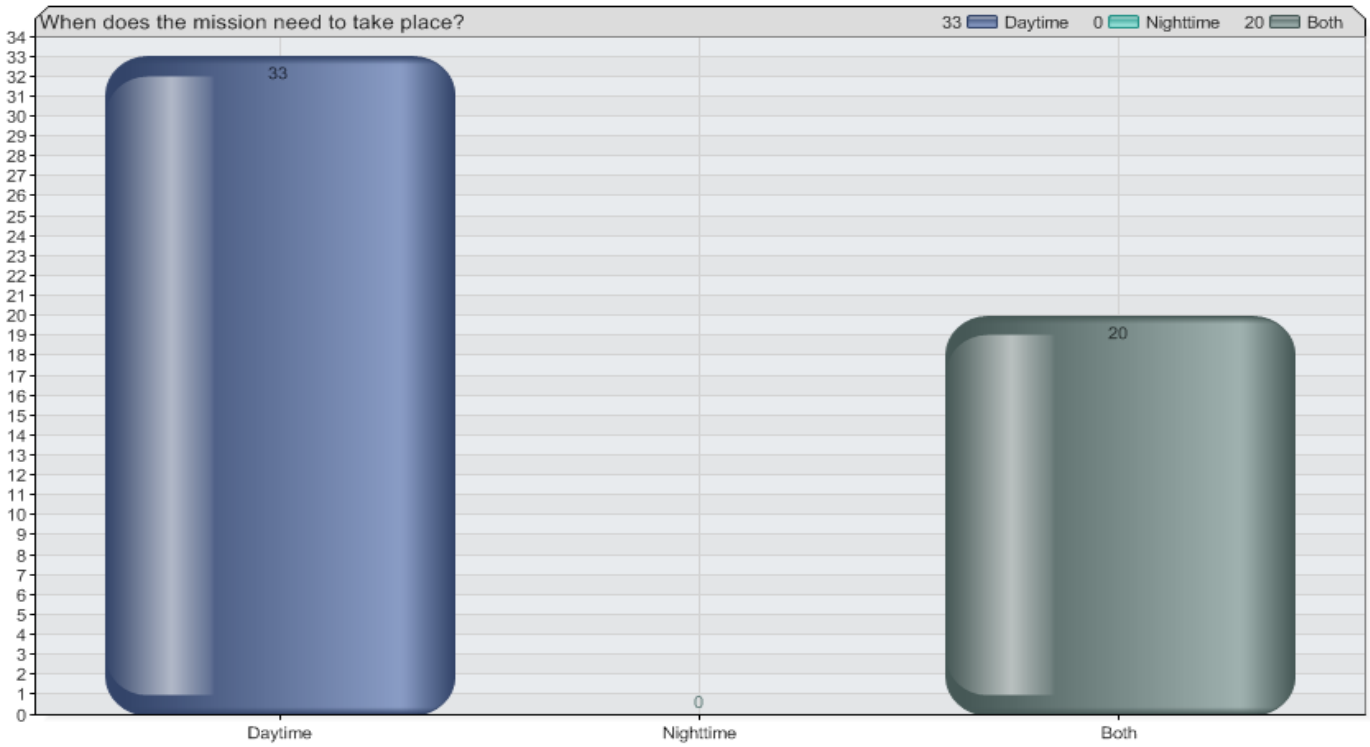
Response	Comments
1	Many of the NWS flights would be low altitude for this mission requirement.
2	High Winds

4	**Moderate wind speed (> 15 mph)**
5	**Severe storm environments outside precipitation regions**
6	**STRONG WINDS**
7	**Below low cloud ceilings**
8	**winds up to 15 kts**
9	**Potentially all conditions**

16.

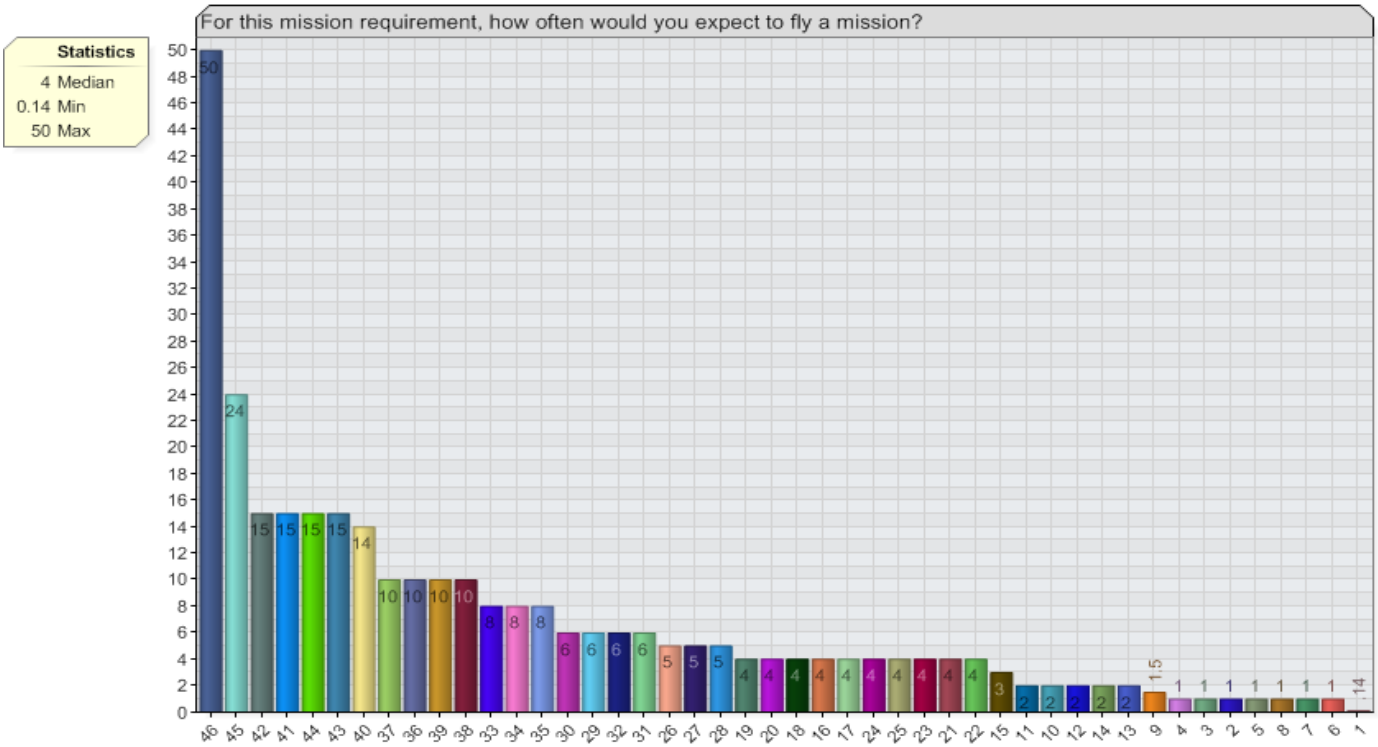
When does the mission need to take place?

	Responses	Percent
Daytime:	33	62.26%
Nighttime:	0	0%
Both:	20	37.74%
Total Responded to this question:	53	94.64%
Total who skipped this question:	3	5.36%
Total:	56	100%



For this mission requirement, how often would you expect to fly a mission?

	Responses	Percent
Average number of flights per day (number):: Highest: 50.00 Lowest: 0.14 Average: 6.80 Median: 4.00	46	93.88%
Average duration of field campaign (number of days):: Highest: 365.00 Lowest: 1.00 Average: 49.27 Median: 15.00	45	91.84%
Number of field campaigns per year (number):: Highest: 1000.00 Lowest: 1.00 Average: 37.16 Median: 2.00	44	89.8%
Other mission frequency requirement (text)::	23	46.94%
Total Responded to this question:	49	87.5%
Total who skipped this question:	7	12.5%
Total:	56	100%



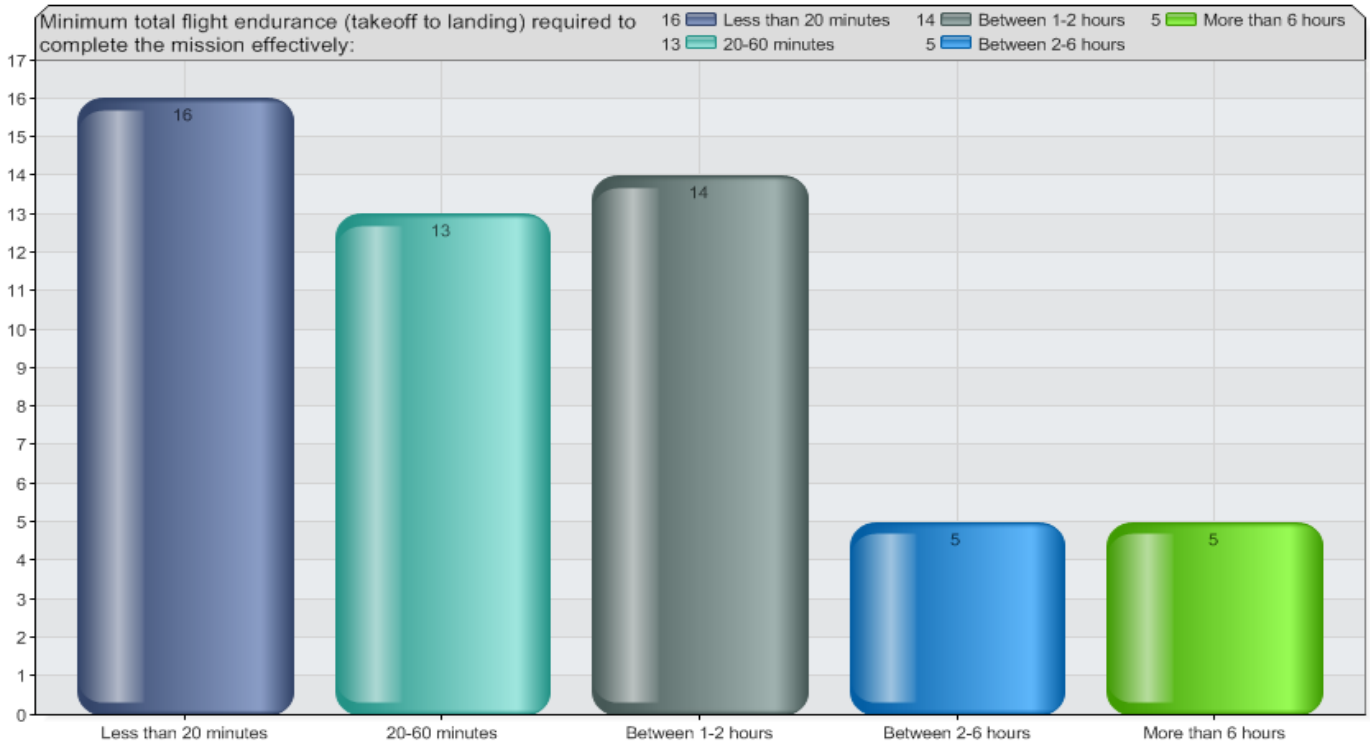
Response	Other mission frequency requirement (text):
1	Flight near airfield (used few days/wk)
2	5 is high estimate-actual # of stranding/disaster responses w/UAS use is unpredictable.
3	flights depends on UAS range

4	There are 126 Forecast offices, and 13 River Forecast Centers that could use UAS several times year
5	Daily vertical profiles from different locations
6	variable for emergency response flights
7	Above is northwestern Hawaiian islands...opportunistic use in main islands
8	Support satellite anomaly resolution efforts
9	10-20 days within a 5 month period
10	Potentially opportunistic/emergency response
11	10-20 days within a 5 month period
12	AS OPPORTUNITIES ARISE DURING HURRICANE SEASON
13	Emergency response to unusual mortality event
14	If extended to ship-based ops could be several months/year
15	The missions could be flown up to a few times each day at every NWS field office.
16	Annually
17	Every 5 years field effort will quadruple
18	Due to emergency response nature of work, the number of annual campaigns is unknown
19	Long term monitoring of climate gases
20	Due to the emergency response type mission the number of campaigns annually is unknown
21	5 is high estimate-actual # of stranding or disaster responses are unpredictable
22	Frequency dependent on an operational mission where UAS can provide the best data and is logisticall
23	Duration of hydrographic fleet field season

18.

Minimum total flight endurance (takeoff to landing) required to complete the mission effectively:

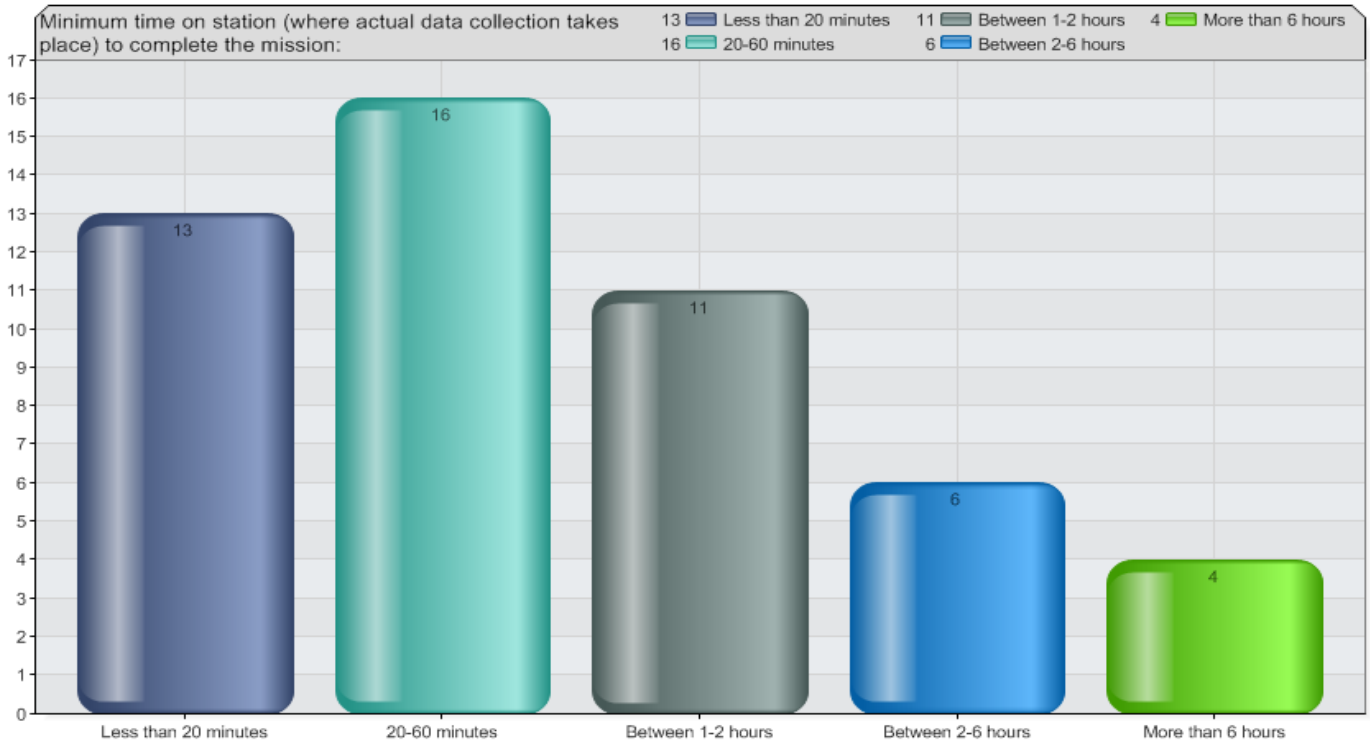
	Responses	Percent
Less than 20 minutes:	16	30.19%
20-60 minutes:	13	24.53%
Between 1-2 hours:	14	26.42%
Between 2-6 hours:	5	9.43%
More than 6 hours:	5	9.43%
Total Responded to this question:	53	94.64%
Total who skipped this question:	3	5.36%
Total:	56	100%



19.

Minimum time on station (where actual data collection takes place) to complete the mission:

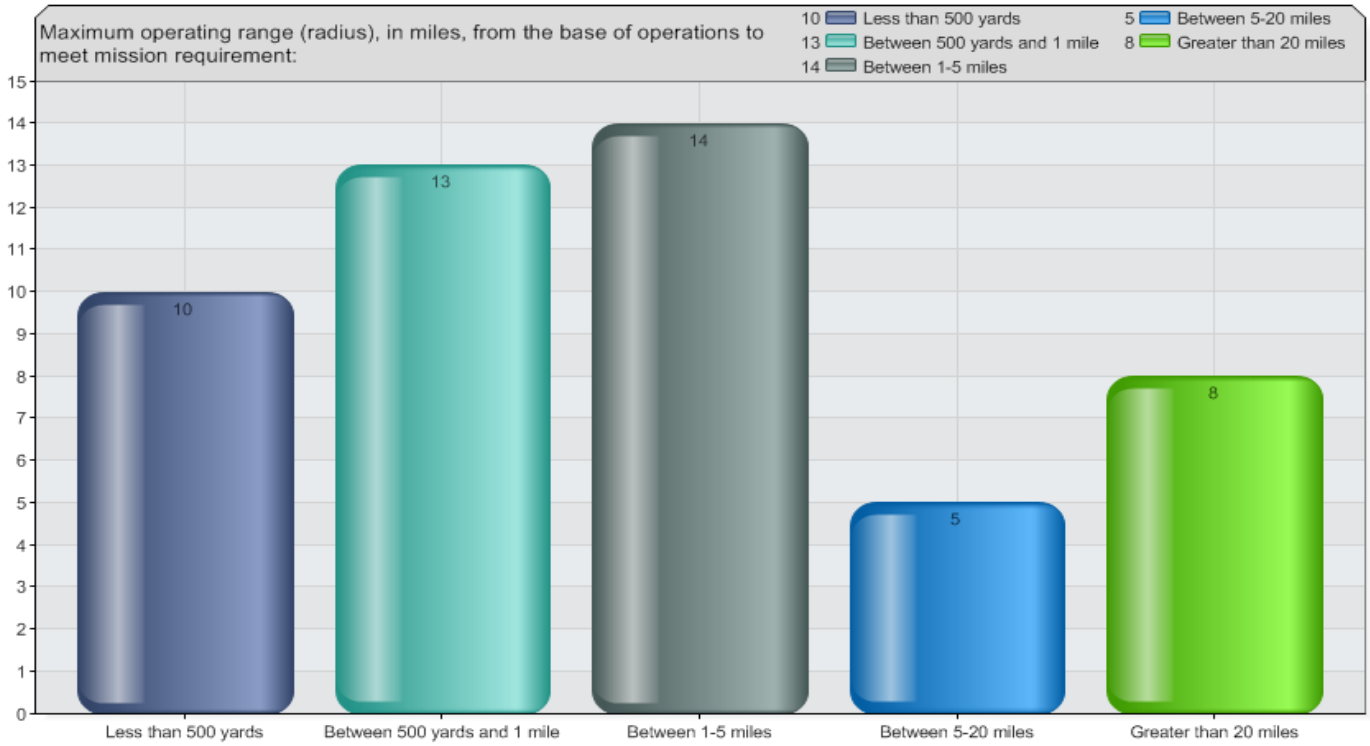
	Responses	Percent
Less than 20 minutes:	13	26%
20-60 minutes:	16	32%
Between 1-2 hours:	11	22%
Between 2-6 hours:	6	12%
More than 6 hours:	4	8%
Total Responded to this question:	50	89.29%
Total who skipped this question:	6	10.71%
Total:	56	100%



20.

Maximum operating range (radius), in miles, from the base of operations to meet mission requirement:

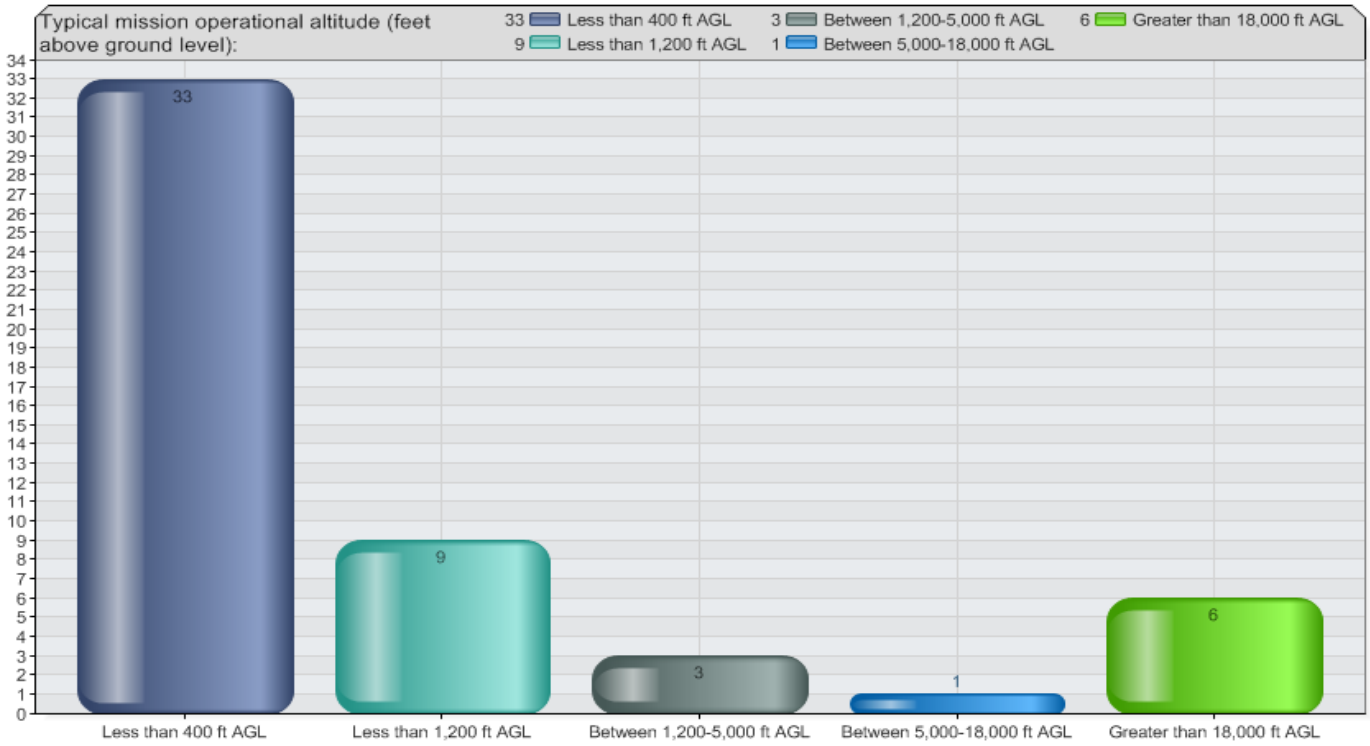
	Responses	Percent
Less than 500 yards:	10	20%
Between 500 yards and 1 mile:	13	26%
Between 1-5 miles:	14	28%
Between 5-20 miles:	5	10%
Greater than 20 miles:	8	16%
Total Responded to this question:	50	89.29%
Total who skipped this question:	6	10.71%
Total:	56	100%



21.

Typical mission operational altitude (feet above ground level):

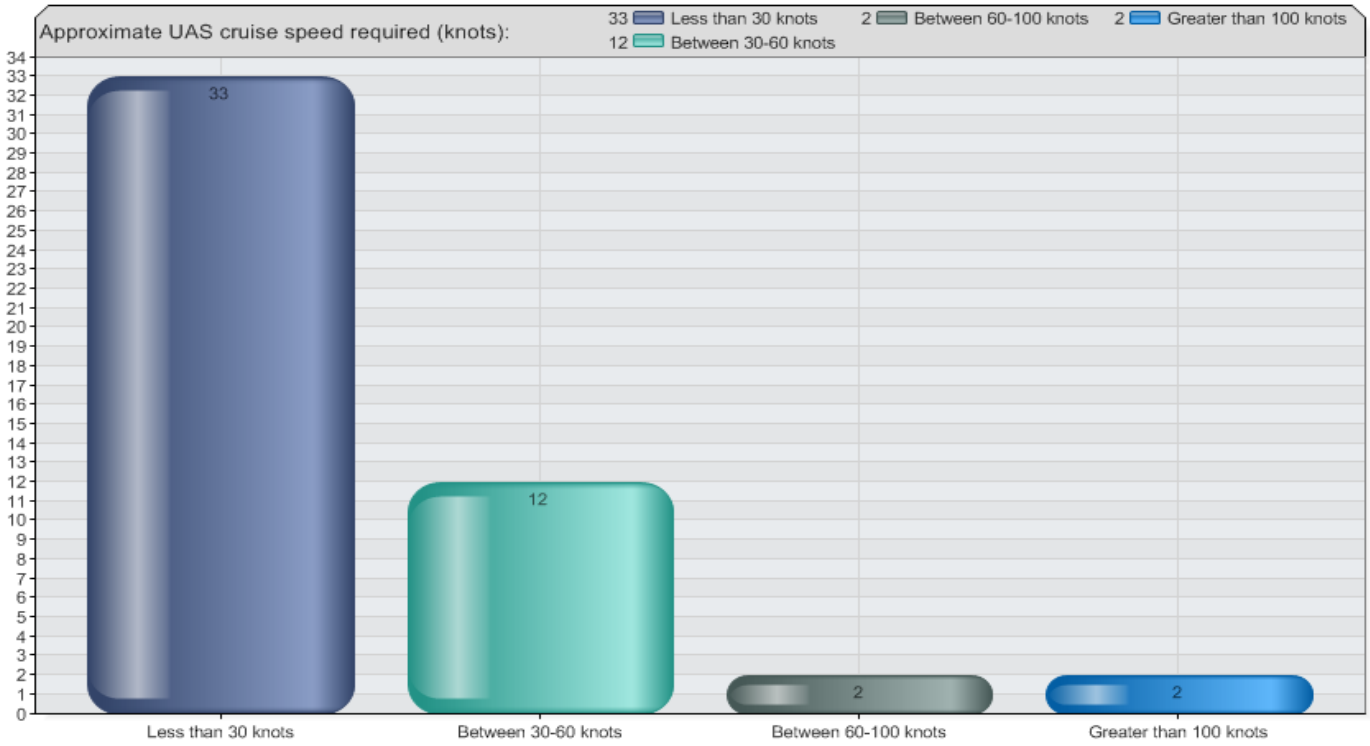
	Responses	Percent
Less than 400 ft AGL:	33	63.46%
Less than 1,200 ft AGL:	9	17.31%
Between 1,200-5,000 ft AGL:	3	5.77%
Between 5,000-18,000 ft AGL:	1	1.92%
Greater than 18,000 ft AGL:	6	11.54%
Total Responded to this question:	52	92.86%
Total who skipped this question:	4	7.14%
Total:	56	100%



22.

Approximate UAS cruise speed required (knots):

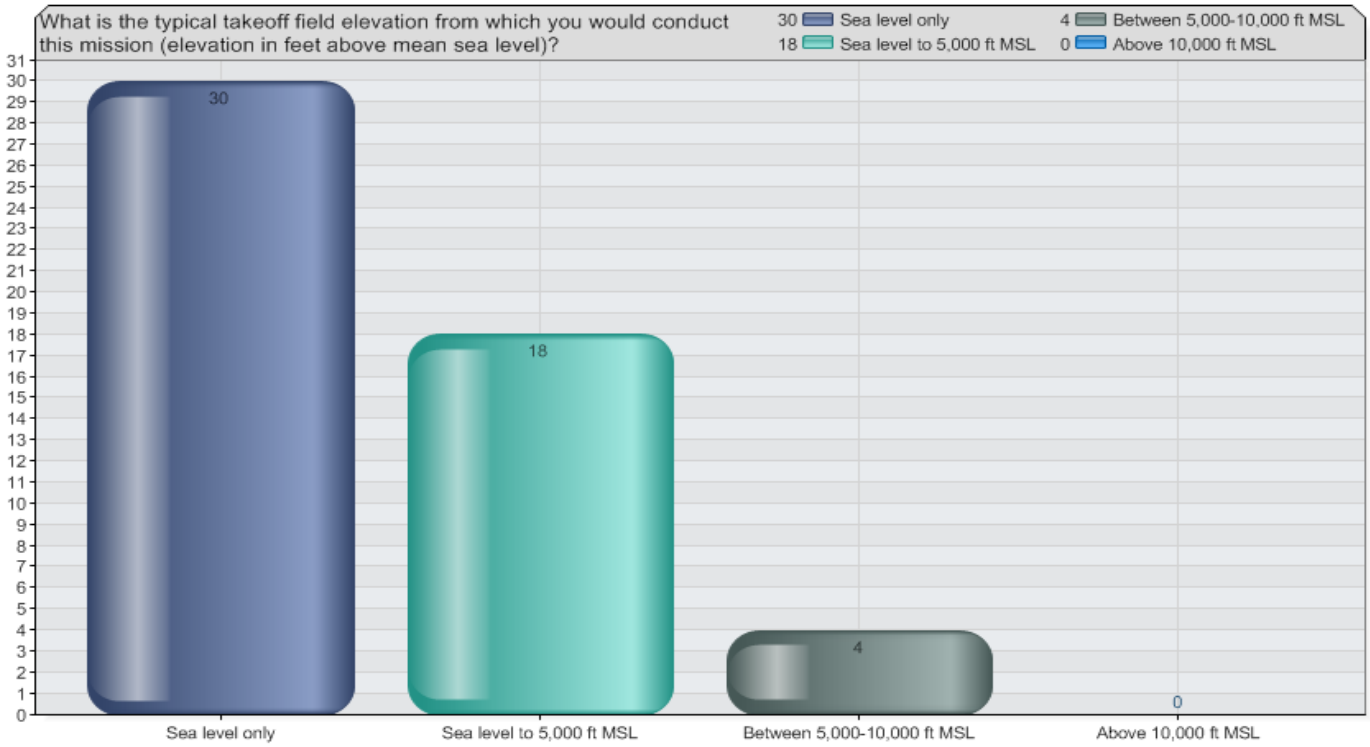
	Responses	Percent
Less than 30 knots:	33	67.35%
Between 30-60 knots:	12	24.49%
Between 60-100 knots:	2	4.08%
Greater than 100 knots:	2	4.08%
Total Responded to this question:	49	87.5%
Total who skipped this question:	7	12.5%
Total:	56	100%



23.

What is the typical takeoff field elevation from which you would conduct this mission (elevation in feet above mean sea level)?

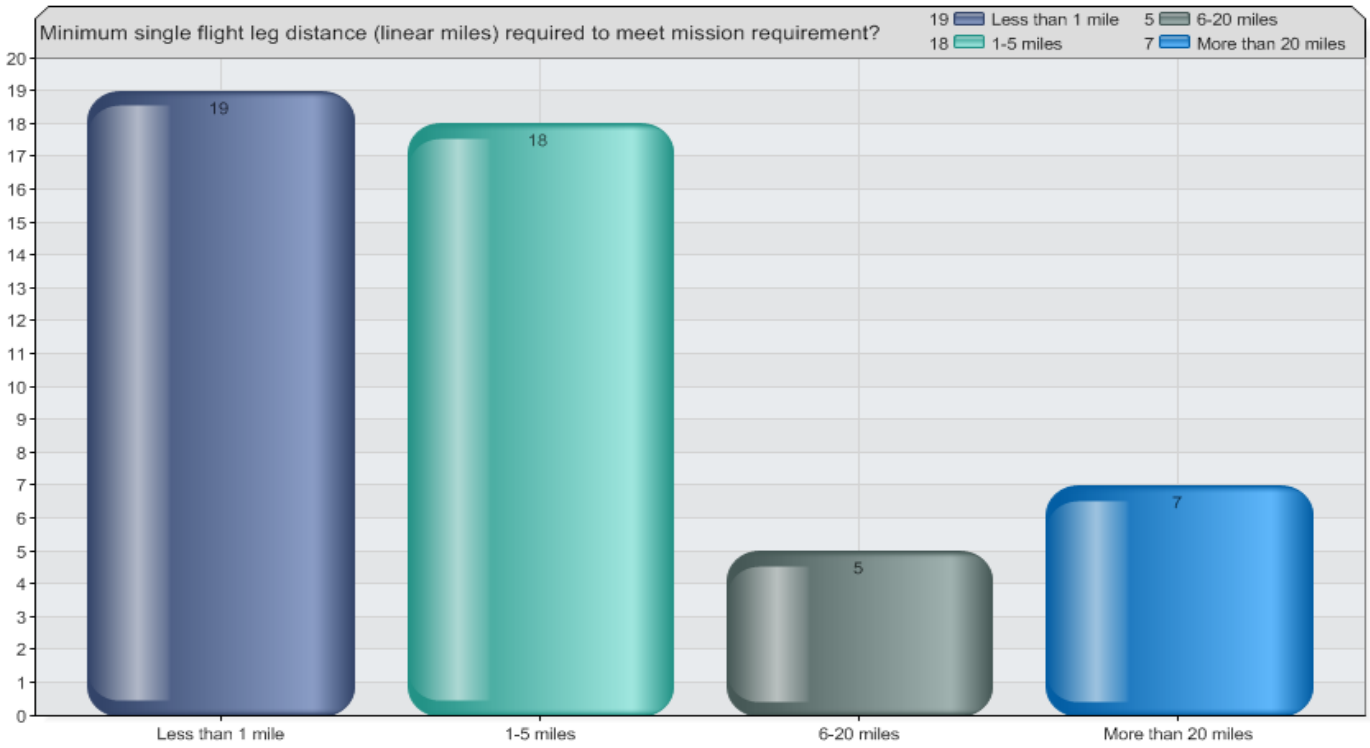
	Responses	Percent
Sea level only:	30	57.69%
Sea level to 5,000 ft MSL:	18	34.62%
Between 5,000-10,000 ft MSL:	4	7.69%
Above 10,000 ft MSL:	0	0%
Total Responded to this question:	52	92.86%
Total who skipped this question:	4	7.14%
Total:	56	100%



24.

Minimum single flight leg distance (linear miles) required to meet mission requirement?

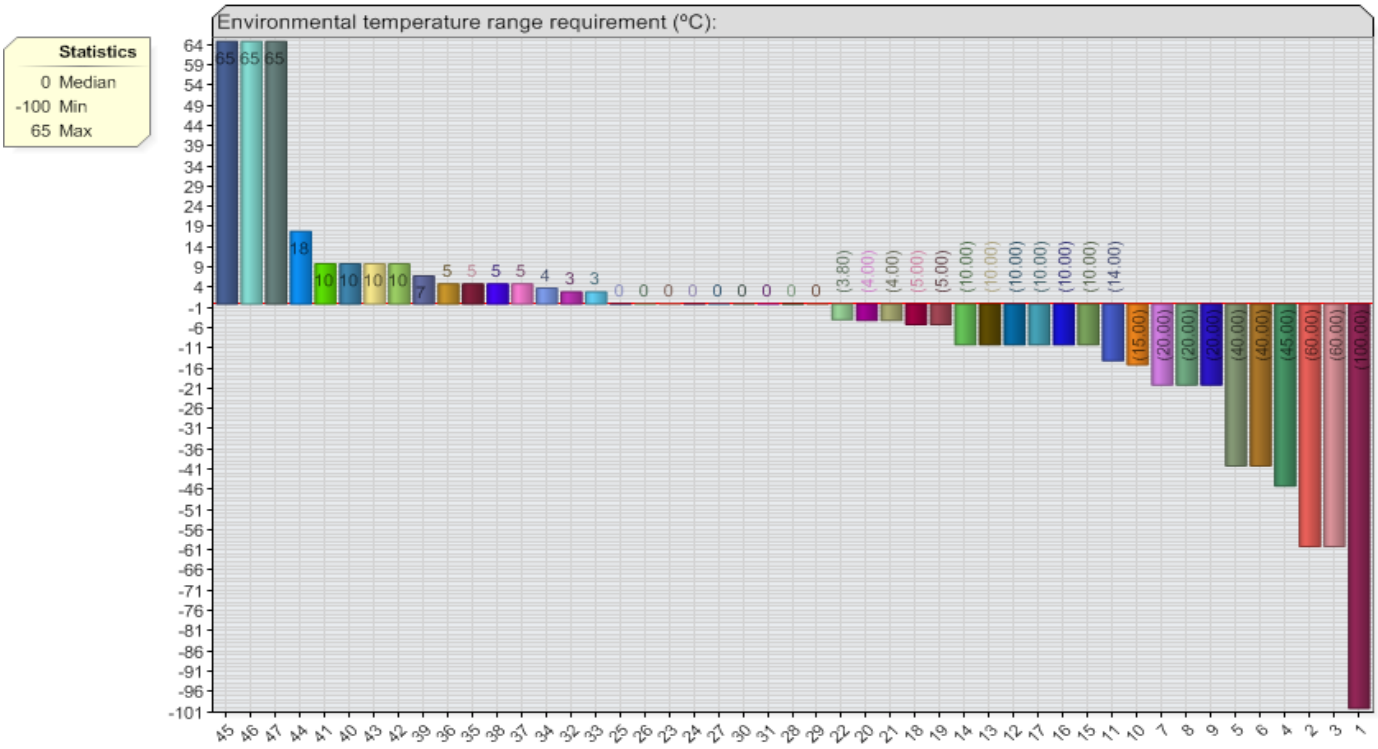
	Responses	Percent
Less than 1 mile:	19	38.78%
1-5 miles:	18	36.73%
6-20 miles:	5	10.2%
More than 20 miles:	7	14.29%
Total Responded to this question:	49	87.5%
Total who skipped this question:	7	12.5%
Total:	56	100%



25.

Environmental temperature range requirement (ºC):

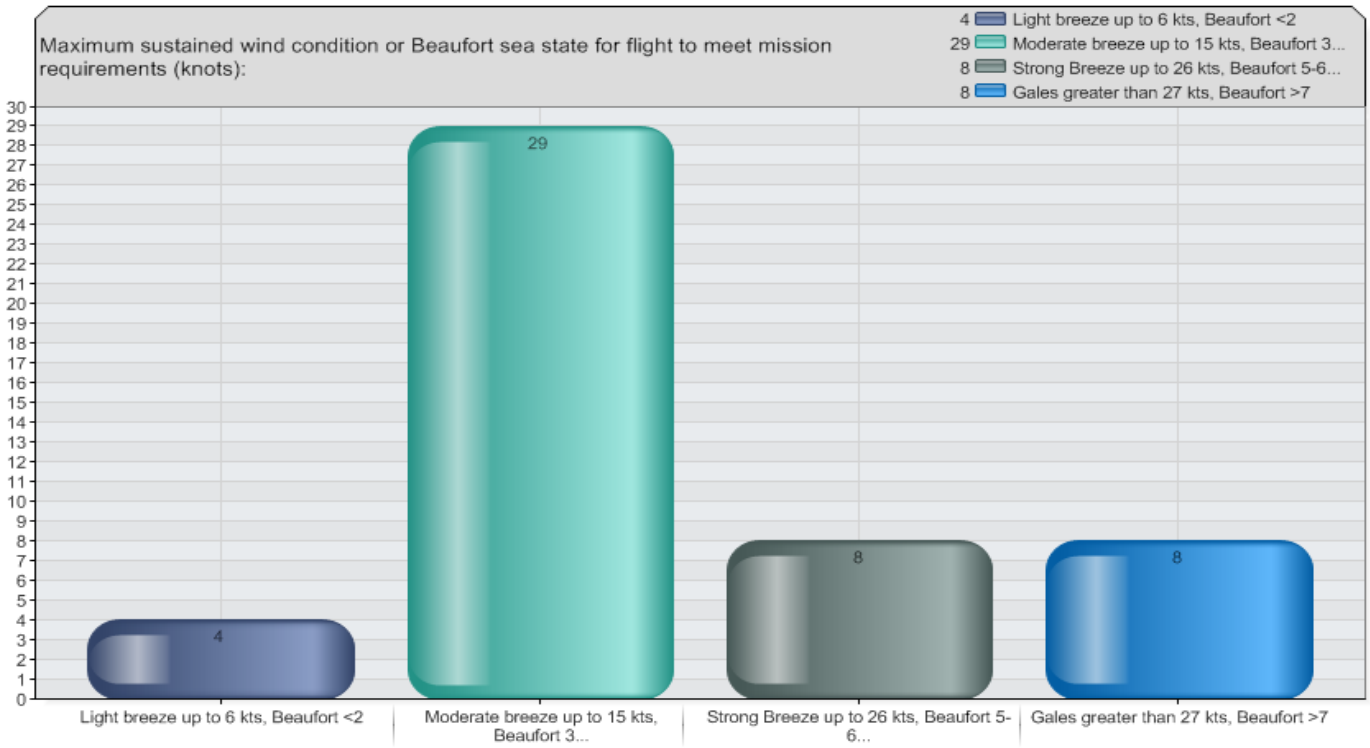
	Responses	Percent
Minimum:	47	100%
Highest: 65.00 Lowest: -100.00 Average: -4.80 Median: 0.00		
Maximum:	47	100%
Highest: 120.00 Lowest: 8.00 Average: 40.23 Median: 37.00		
Average Environmental Temp.:	43	91.49%
Highest: 80.00 Lowest: -80.00 Average: 20.60 Median: 20.00		
Total Responded to this question:	47	83.93%
Total who skipped this question:	9	16.07%
Total:	56	100%



26.

Maximum sustained wind condition or Beaufort sea state for flight to meet mission requirements (knots):

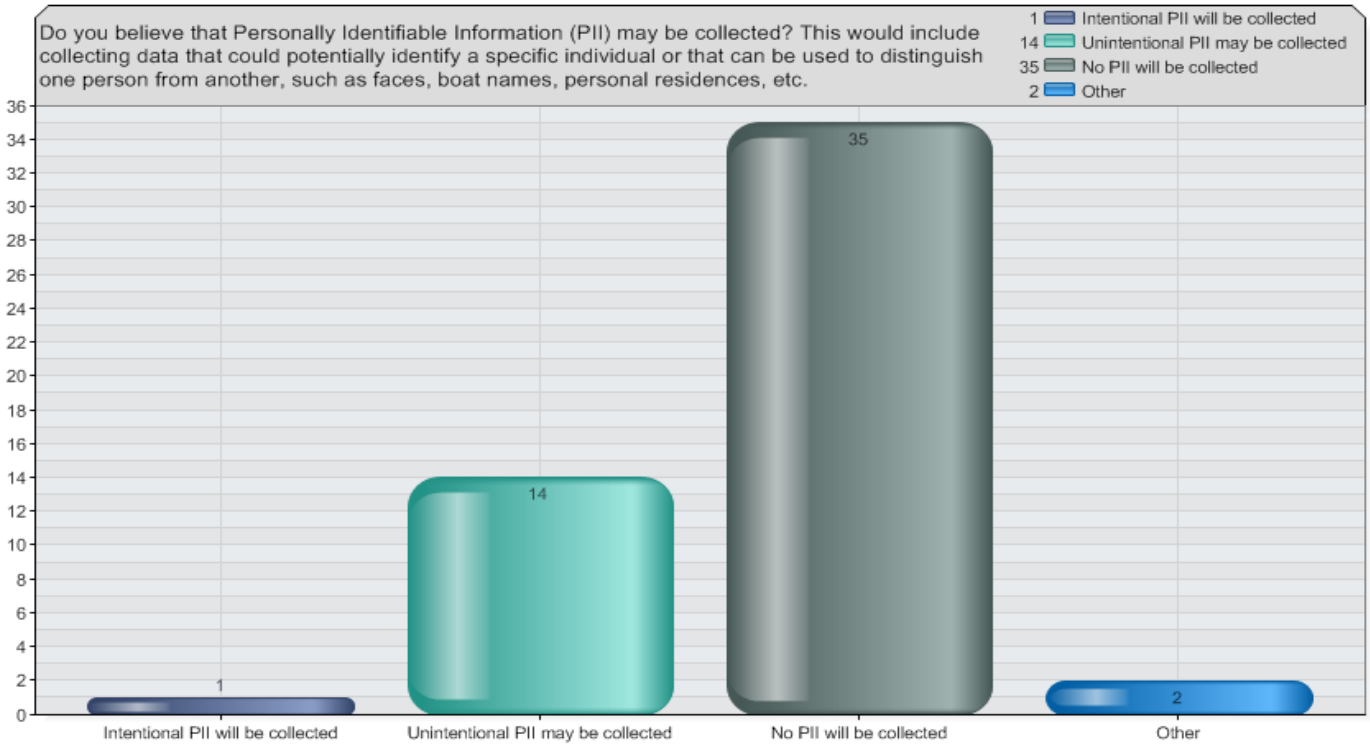
	Responses	Percent
Light breeze up to 6 kts, Beaufort <2:	4	8.16%
Moderate breeze up to 15 kts, Beaufort 3-4:	29	59.18%
Strong Breeze up to 26 kts, Beaufort 5-6:	8	16.33%
Gales greater than 27 kts, Beaufort >7:	8	16.33%
Total Responded to this question:	49	87.5%
Total who skipped this question:	7	12.5%
Total:	56	100%



27.

Do you believe that Personally Identifiable Information (PII) may be collected? This would include collecting data that could potentially identify a specific individual or that can be used to distinguish one person from another, such as faces, boat names, personal residences, etc.

	Responses	Percent
Intentional PII will be collected:	1	1.92%
Unintentional PII may be collected:	14	26.92%
No PII will be collected:	35	67.31%
Other:	2	3.85%
Total Responded to this question:	52	92.86%
Total who skipped this question:	4	7.14%
Total:	56	100%



27.

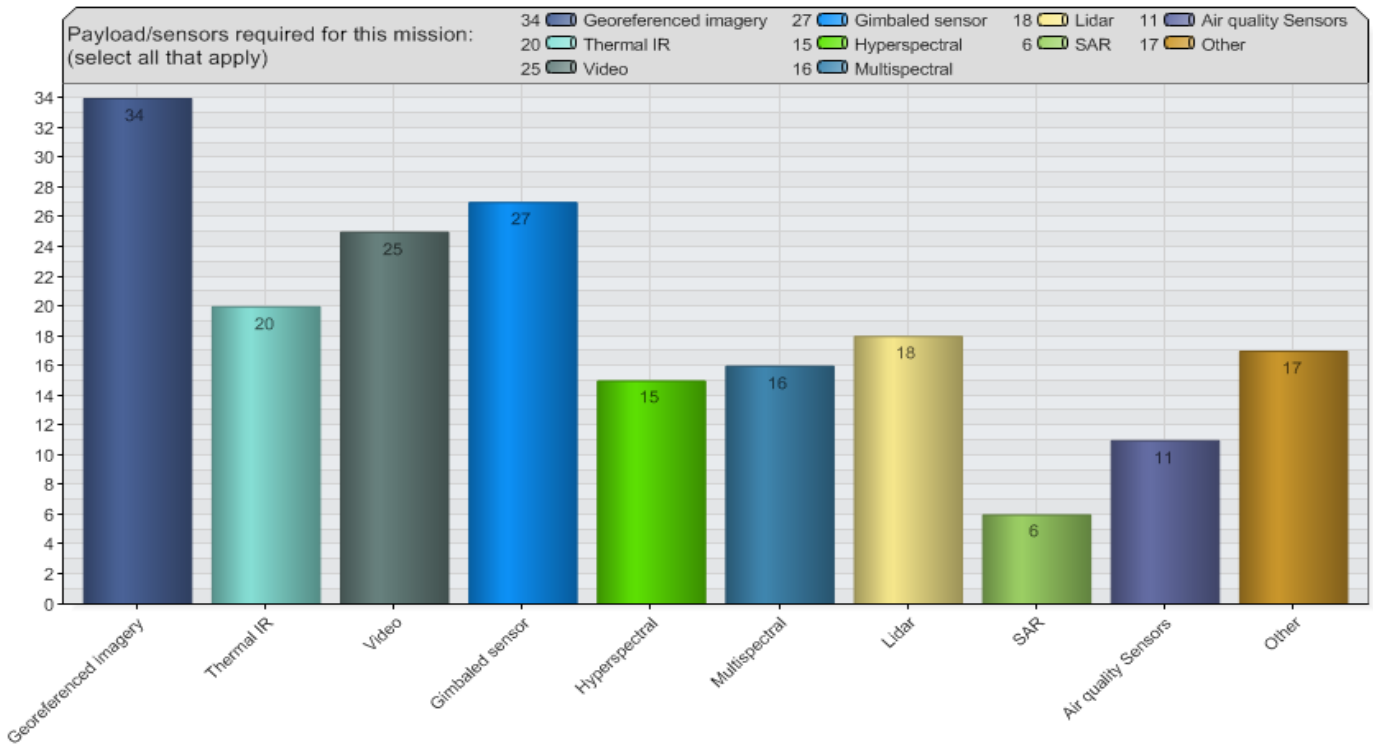
Do you believe that Personally Identifiable Information (PII) may be collected? This would include collecting data that could potentially identify a specific individual or that can be used to distinguish one person from another, such as faces, boat names, personal residences, etc.

Response	Comments
1	PII colelction would be very rare when offshore
2	PII colelction would be rare

28.

Payload/sensors required for this mission: (select all that apply)

	Responses	Percent
Georeferenced imagery:	34	66.67%
Thermal IR:	20	39.22%
Video:	25	49.02%
Gimbaled sensor:	27	52.94%
Hyperspectral:	15	29.41%
Multispectral:	16	31.37%
Lidar:	18	35.29%
SAR:	6	11.76%
Air quality Sensors:	11	21.57%
Other:	17	33%
Total Responded to this question:	51	91.07%
Total who skipped this question:	5	8.93%
Total:	56	100%



28.

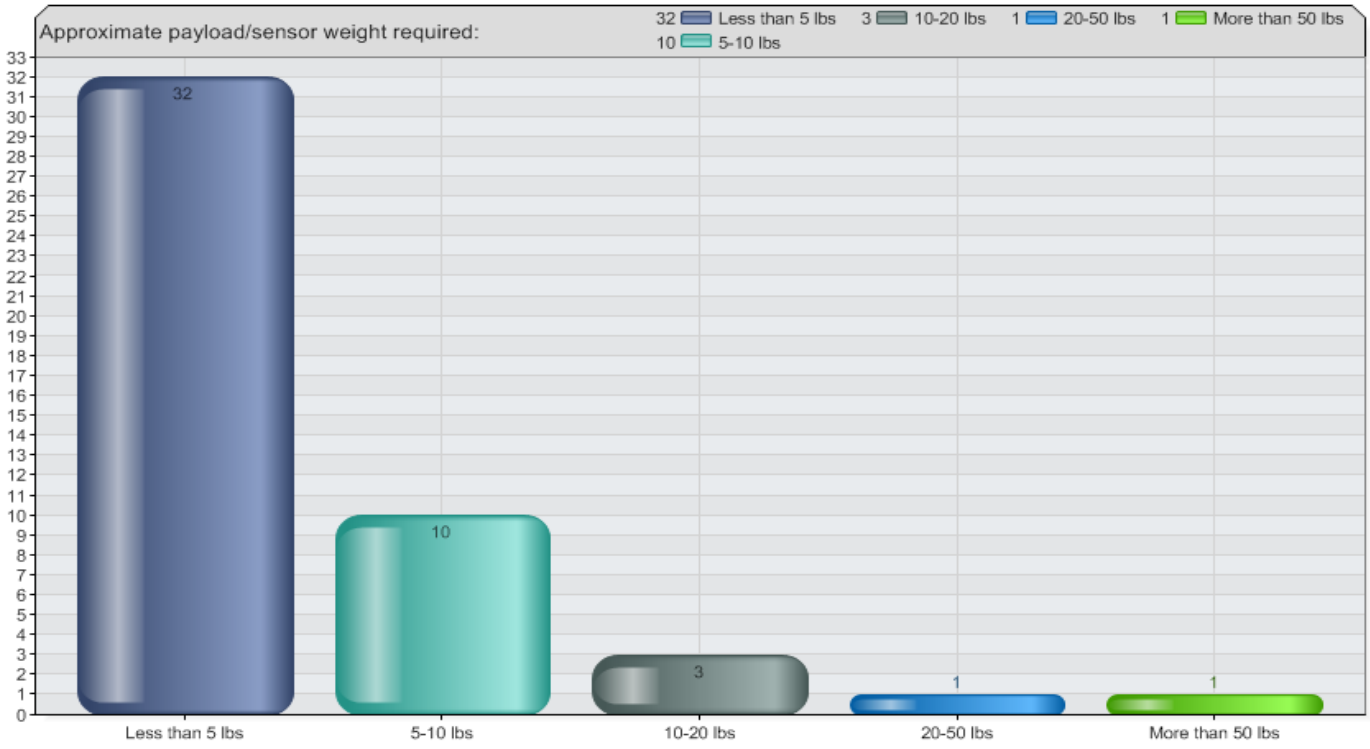
Payload/sensors required for this mission: (select all that apply)

Response	Comments
1	High-resolution imagery
2	For the purpose of post storm damage assessment, or equipment assessment (ex. evaluating integrity of radar dome), we would only require georeferenced image and video. The other sensors would be excellent for other mission needs though.
3	Current work is focused on image mapping, but SAR, Hyperspectral, Multispectral, Lidar, are all of interest in mapping oil footprint. We have just not operationally seen an UAS with this capacity in our time constraints and instead have relied on remote sensing and manned aircraft for those sensors.
4	3d winds, temperature, pressure, relative humidity
5	The main objective would be high quality video displayed in real time, with lat/lon instantly available; if size from photogrametry is available, that would be great, but not a minimum requirement
6	non-georeferenced imagery, laser altimeter
7	Sine wave transmitter
8	iMet or similar onboard meteorological in situ sensors
9	still photographs, laser altimeter
10	STD METOC...ATMOSPHERIC PRESSURE TEMPERATURE MOISTURE AS WELL AS ENVIRONMENTAL WIND SPEED AND DIRECTION
11	Temperature, pressure, humidity and wind sensors for typical weather observations. The other sensors (spectral or LIDAR) would be used to assess ground conditions (ex. fuel dryness for potential wildfires or dust storms, or changes in drainage basins after flood events). Either way, the sensors should be "plug in play" so we could use the right sensor for the job instead of having a specific UAS that meets only one need.
12	Cooled LWIR, machine vision EO, custom computer and storage
13	atmospheric variables, PTH and wind speed and direction
14	Aircore, ozone and met sensors.
15	temperature, pressure, humidity (average and fast response (.1 hz) for turbulence measurements)
16	For debris identification, there could be value in IR, hyperspectral and multispectral sensors. However, those sensors are not proven to be effective, as yet, and would in current development status require a much larger UAS platform than is practical for most debris applications.
17	The goal is for the UAS to be deployed once a turtle is sighted (either by naked eye, or with aid of other UAS or manned aircraft). Once a turtle is sighted, this UAS would scan the nearby area looking for where the turtle resurfaced. Typically they will resurface within 1/2 mile, very often within a 1/4 mile. We know manned aircraft can see turtles underwater far better than from a boat. Manned aircraft can help the boat navigate to the correct area to be prepared to tag or capture the turtle when it surfaces. We have not yet tested to see if UAS could be deployed to do this, but we plan to test it.

29.

Approximate payload/sensor weight required:

	Responses	Percent
Less than 5 lbs:	32	68.09%
5-10 lbs:	10	21.28%
10-20 lbs:	3	6.38%
20-50 lbs:	1	2.13%
More than 50 lbs:	1	2.13%
Total Responded to this question:	47	83.93%
Total who skipped this question:	9	16.07%
Total:	56	100%



30.

Other payload/sensor requirements:

	Responses	Percent
Responses:	15	100%

Total Responded to this question:	15	26.79%
Total who skipped this question:	41	73.21%
Total:	56	100%

Graph/Chart function not relevant for this question type.

30.

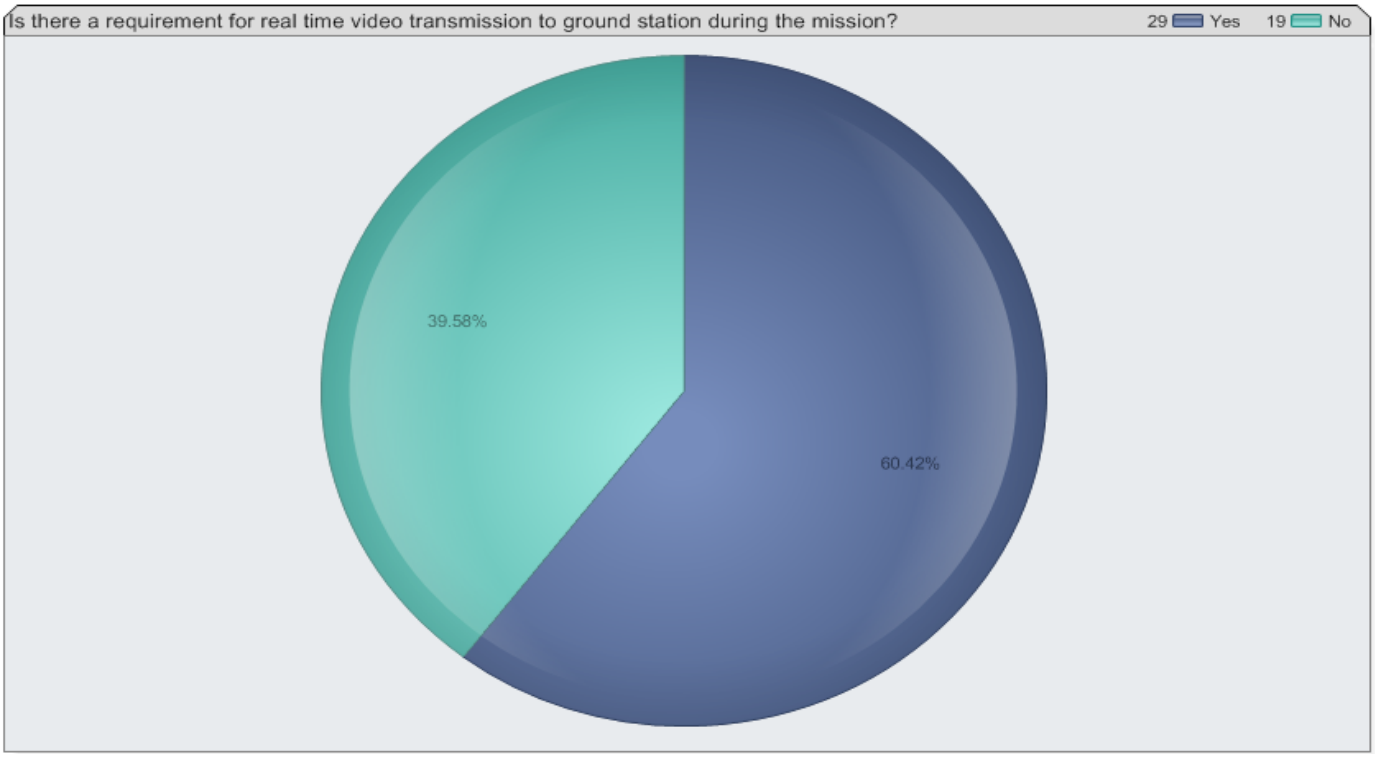
Other payload/sensor requirements:

Response	Response Text
1	Not sure, we have not used UAS in our research
2	high-resolution camera for still images, waypoint capabilities, gimbal for vertical image capture, geo-referenced images
3	INS (IMU/GPS)
4	It would be nice to have a way to use a UAS to communicate with an individual on the ground. For example, a speaker could be used to alert an individual that emergency services are "on the way" if they are trapped in a damaged structure after a tornado/hurricane. Or to alert individuals that a flooded roadway is too dangerous to cross.
5	Current demonstration use has been high resolution geo-rectified images and commented video. However, we are currently coordinating with BSEE and universities regarding a mini SAR as we are not aware of internal NOAA UAS options for SAR.
6	Precision altimetry; high resolution still camera; blow sampling apparatus
7	None at this stage of development
8	METOC ALSO INCLUDES IR SENSOR FOR LAND/SEA TEMPERTURE IN THE FUTURE WE WOULD LIKE TO ADD A LASER ALTIMETER AND A TURBULENCE PROBE CAPABLE OF MEASURING 3D WINDS
9	Precision altimetry; high resolution still camera
10	High resolution still camera
11	Ability to detect and monitor icing conditions; 1TB data storage.
12	Need high resolution imagery of coastlines to find Steller sea lions, thermal or multispectral sensors could help pinpoint SSL locations.
13	-High enough resolution to readily distinguish and identify debris objects on shorelines and in water. -High enough geo-reference resolution to map objects and photos clearly/cleanly.
14	Communication relay
15	I'm not sure if there are filters or sensors that would help the UAS pilot see better or deeper into the water column. If so, those would be of interest. Photogrametry would be very useful for those turtles that are tagged rather than captured, but this is not an absolute requirement.

31.

Is there a requirement for real time video transmission to ground station during the mission?

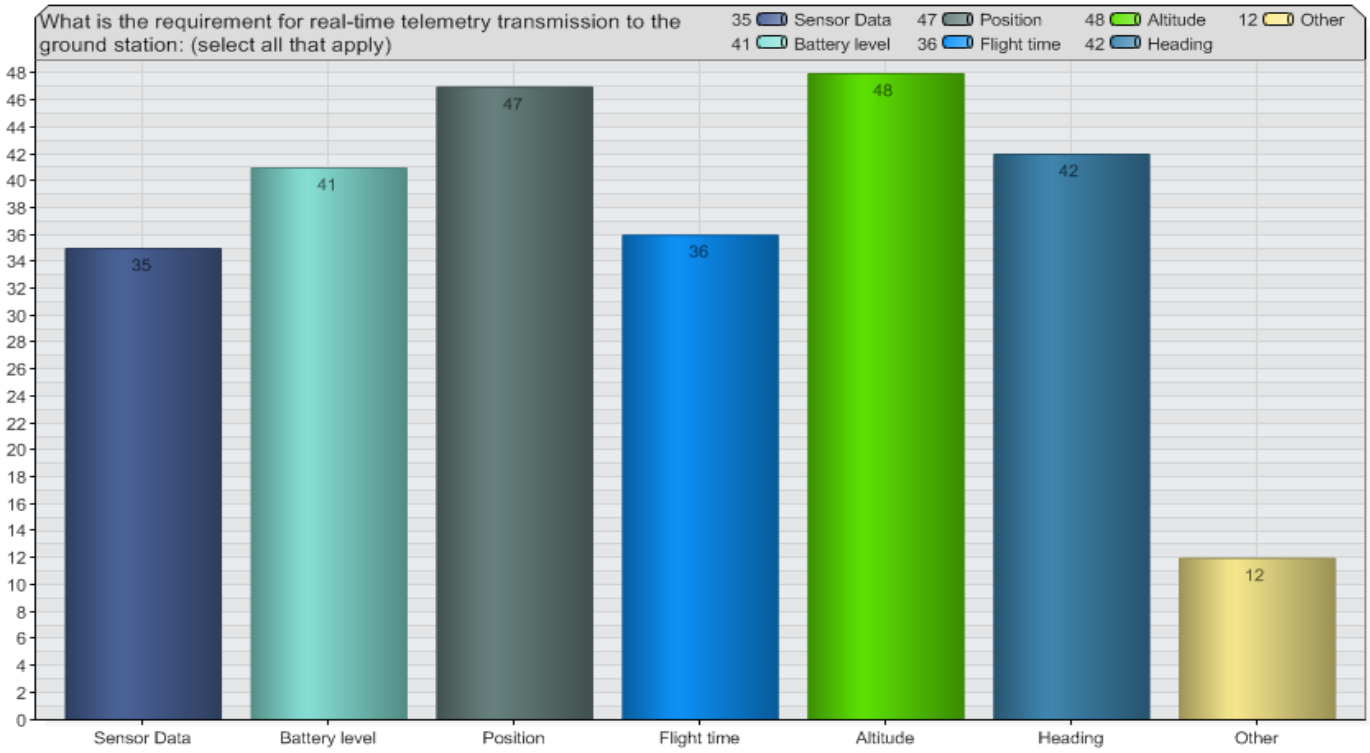
	Responses	Percent
Yes:	29	60.42%
No:	19	39.58%
Total Responded to this question:	48	85.71%
Total who skipped this question:	8	14.29%
Total:	56	100%



32.

What is the requirement for real-time telemetry transmission to the ground station: (select all that apply)

	Responses	Percent
Sensor Data:	35	71.43%
Battery level:	41	83.67%
Position:	47	95.92%
Flight time:	36	73.47%
Altitude:	48	97.96%
Heading:	42	85.71%
Other:	12	24%
Total Responded to this question:	49	87.5%
Total who skipped this question:	7	12.5%
Total:	56	100%



32.

What is the requirement for real-time telemetry transmission to the ground station: (select all that apply)

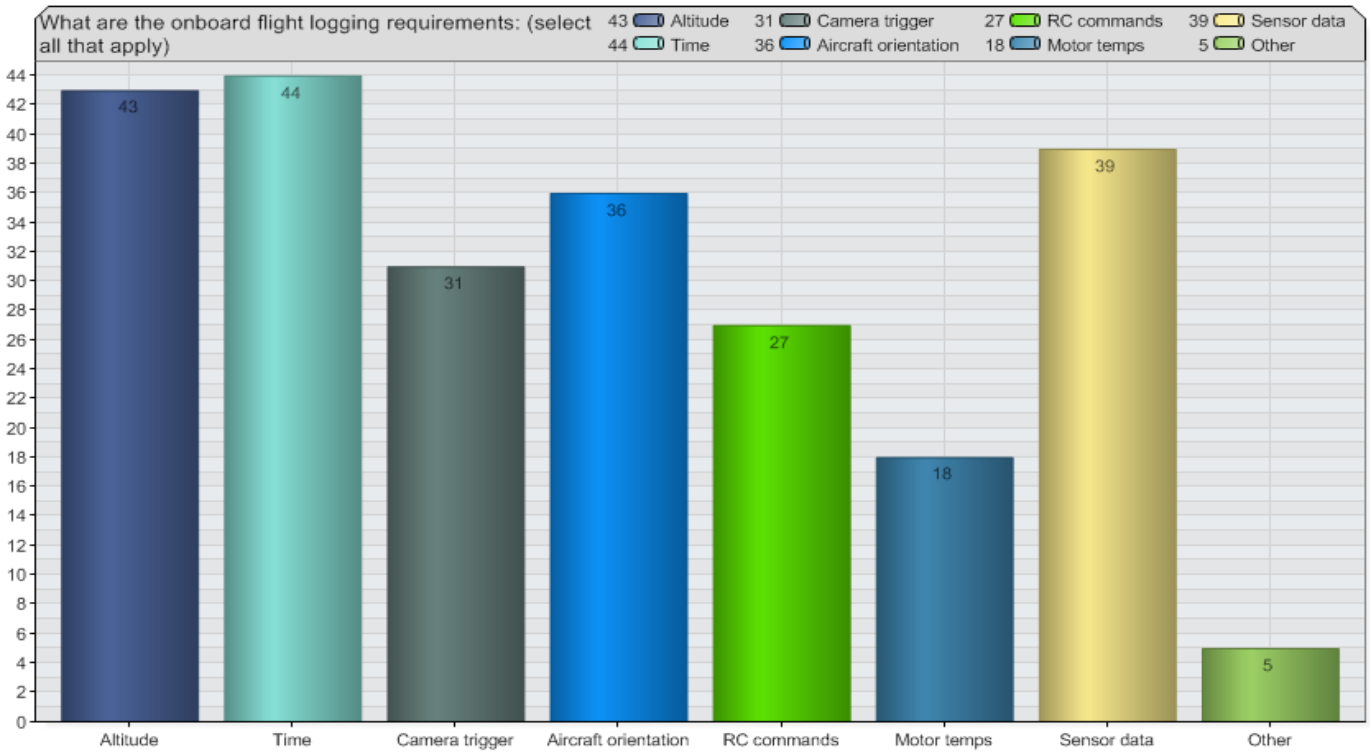
Response **Comments**

1	live view of camera coverage
2	video imagery
3	pitch, roll, speed
4	camera status
5	RC channel status (position hold, come home, etc.)
6	IMU data, Differential GPS
7	camera status
8	status of flight control parameters
9	Active RC channels
10	RC channel status (position hold, come home, etc.)
11	Icing conditions
12	video imagery

33.

What are the onboard flight logging requirements: (select all that apply)

	Responses	Percent
Altitude:	43	93.48%
Time:	44	95.65%
Camera trigger:	31	67.39%
Aircraft orientation:	36	78.26%
RC commands:	27	58.7%
Motor temps:	18	39.13%
Sensor data:	39	84.78%
Other:	5	10%
Total Responded to this question:	46	82.14%
Total who skipped this question:	10	17.86%
Total:	56	100%



33.

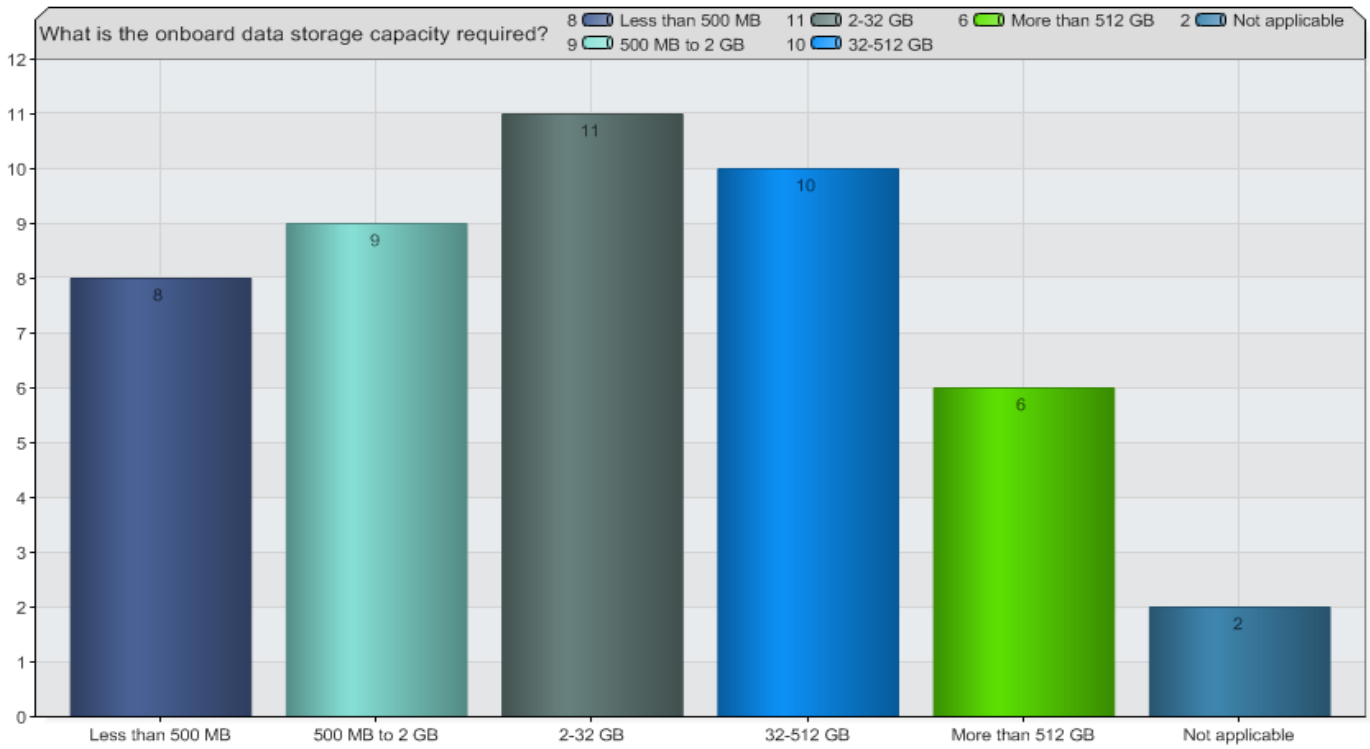
What are the onboard flight logging requirements: (select all that apply)

Response	Comments
1	speed, waypoints
2	location
3	gimbal orientation
4	secondary altitude (laser altimeter)
5	location

34.

What is the onboard data storage capacity required?

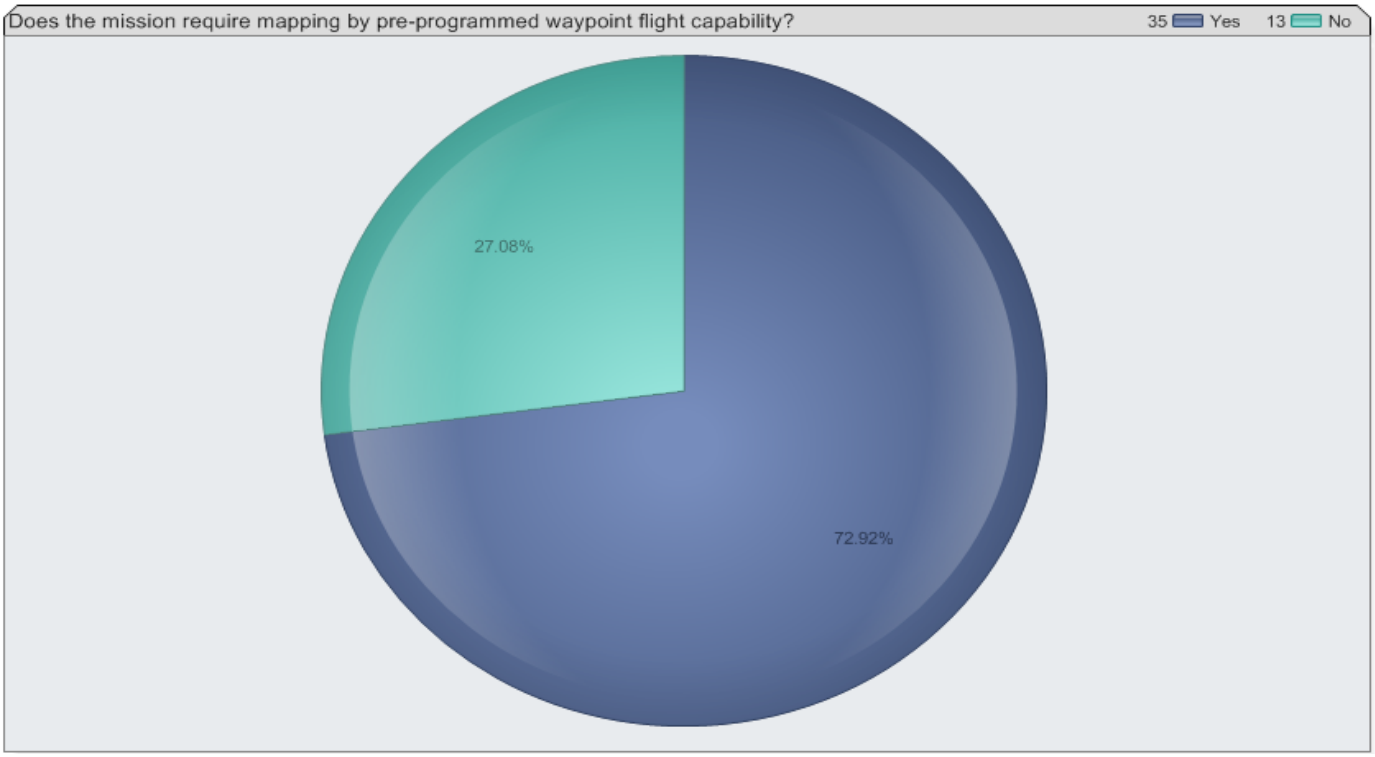
	Responses	Percent
Less than 500 MB:	8	17.39%
500 MB to 2 GB:	9	19.57%
2-32 GB:	11	23.91%
32-512 GB:	10	21.74%
More than 512 GB:	6	13.04%
Not applicable:	2	4.35%
Total Responded to this question:	46	82.14%
Total who skipped this question:	10	17.86%
Total:	56	100%



35.

Does the mission require mapping by pre-programmed waypoint flight capability?

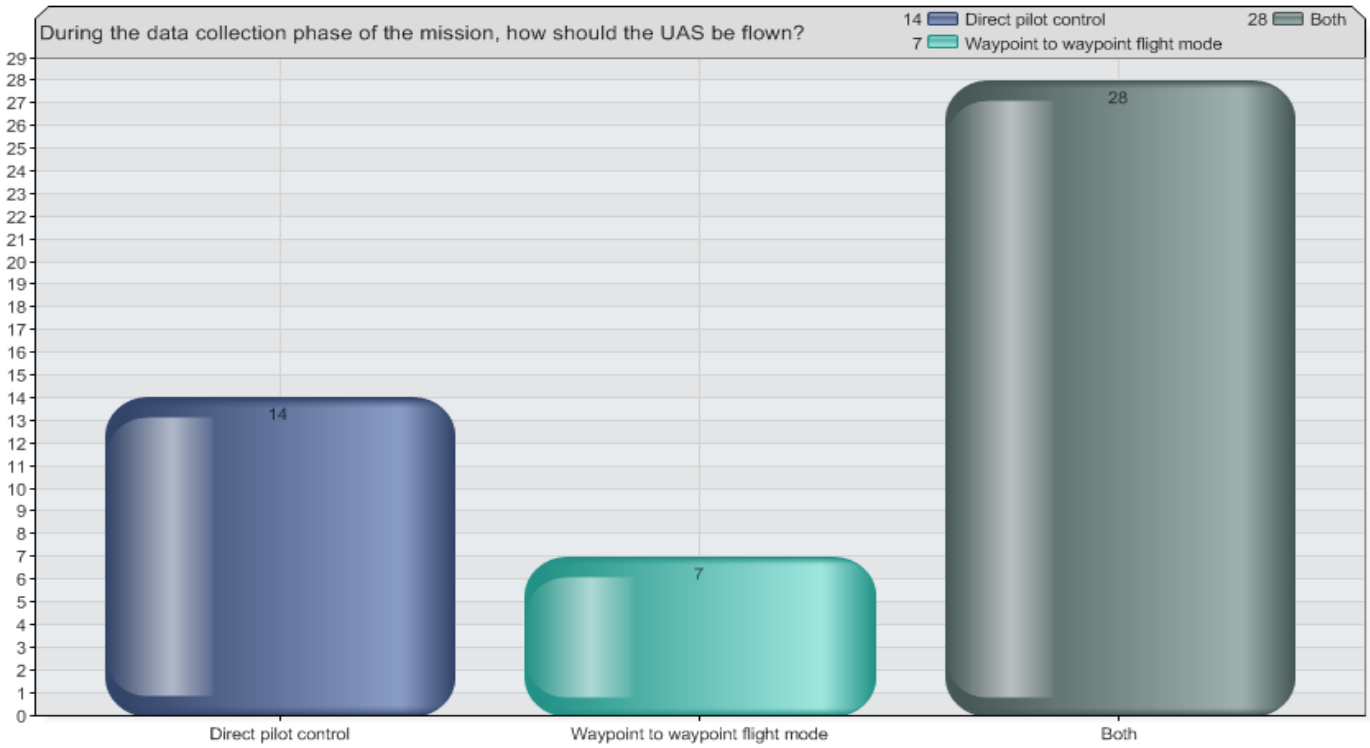
	Responses	Percent
Yes:	35	72.92%
No:	13	27.08%
Total Responded to this question:	48	85.71%
Total who skipped this question:	8	14.29%
Total:	56	100%



36.

During the data collection phase of the mission, how should the UAS be flown?

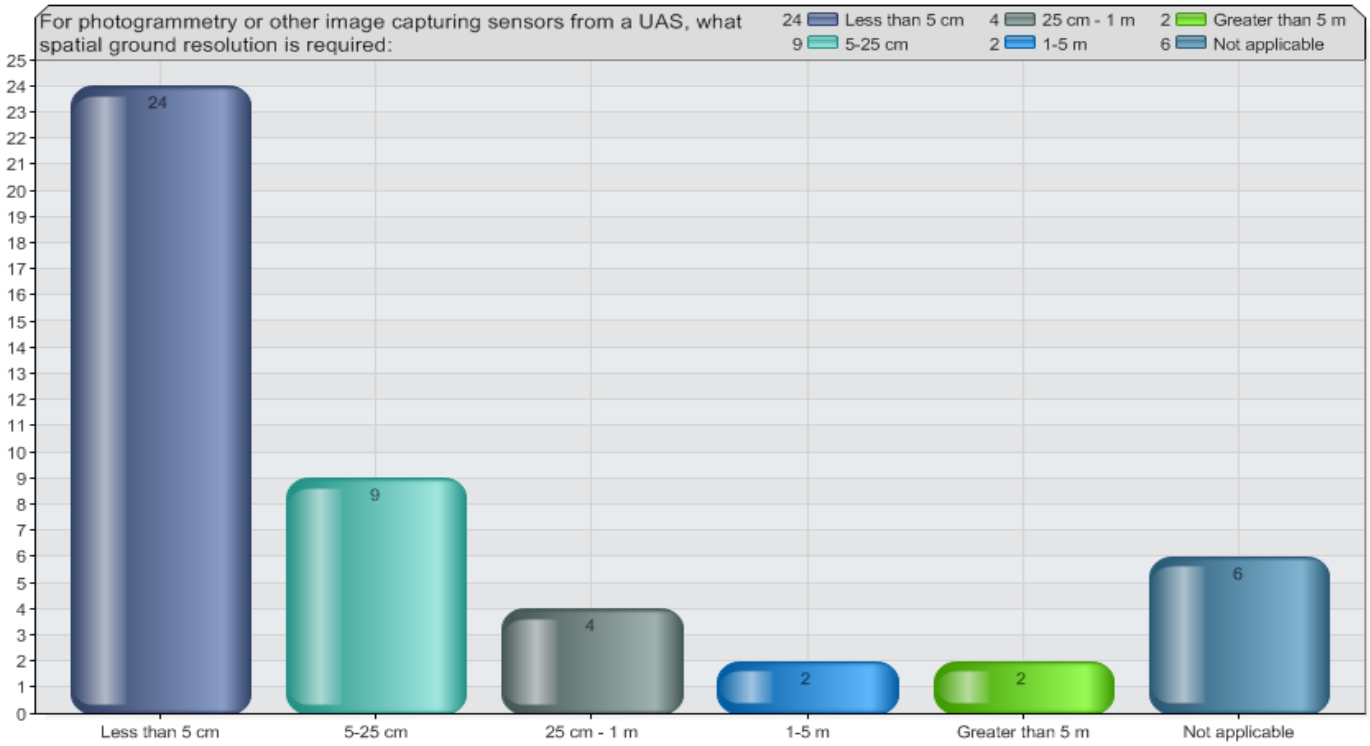
	Responses	Percent
Direct pilot control:	14	28.57%
Waypoint to waypoint flight mode:	7	14.29%
Both:	28	57.14%
Total Responded to this question:	49	87.5%
Total who skipped this question:	7	12.5%
Total:	56	100%



37.

For photogrammetry or other image capturing sensors from a UAS, what spatial ground resolution is required:

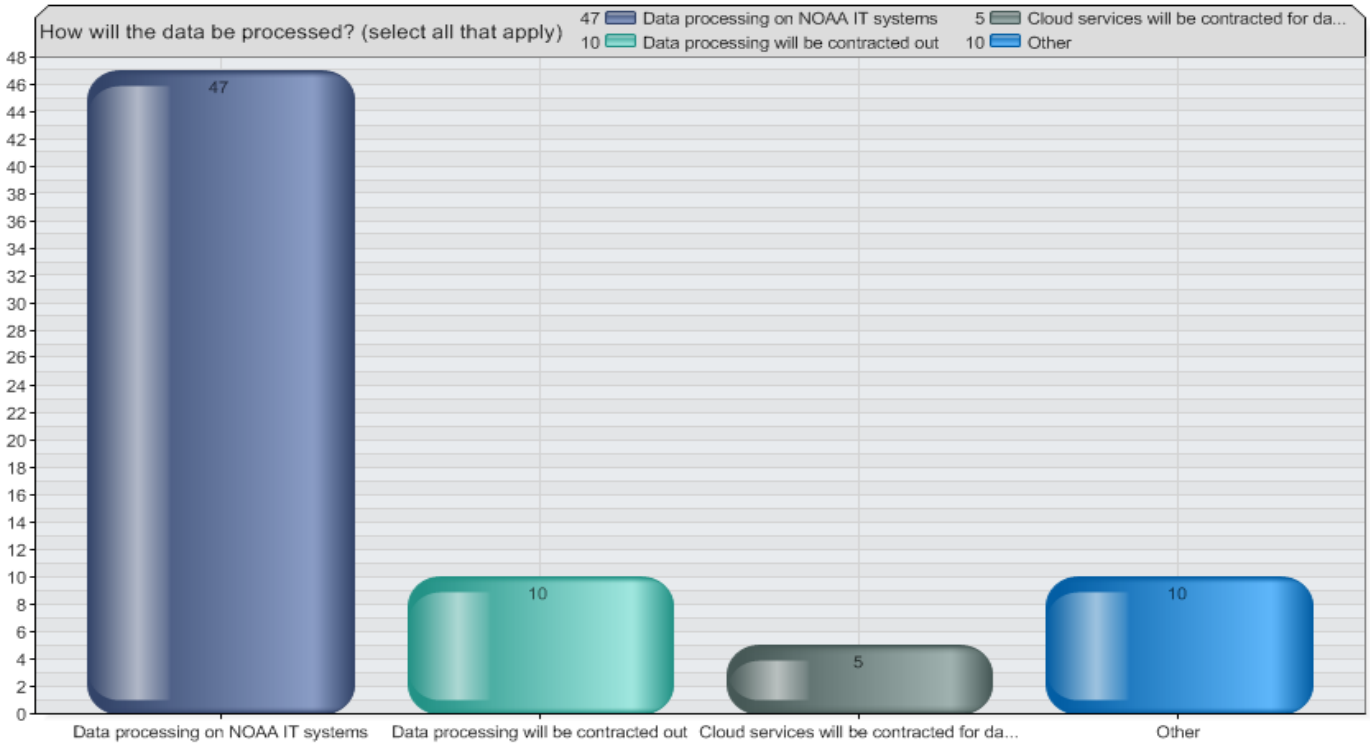
	Responses	Percent
Less than 5 cm:	24	51.06%
5-25 cm:	9	19.15%
25 cm - 1 m:	4	8.51%
1-5 m:	2	4.26%
Greater than 5 m:	2	4.26%
Not applicable:	6	12.77%
Total Responded to this question:	47	83.93%
Total who skipped this question:	9	16.07%
Total:	56	100%



38.

How will the data be processed? (select all that apply)

	Responses	Percent
Data processing on NOAA IT systems:	47	94%
Data processing will be contracted out:	10	20%
Cloud services will be contracted for data processing:	5	10%
Other:	10	20%
Total Responded to this question:	50	89.29%
Total who skipped this question:	6	10.71%
Total:	56	100%



38.

How will the data be processed? (select all that apply)

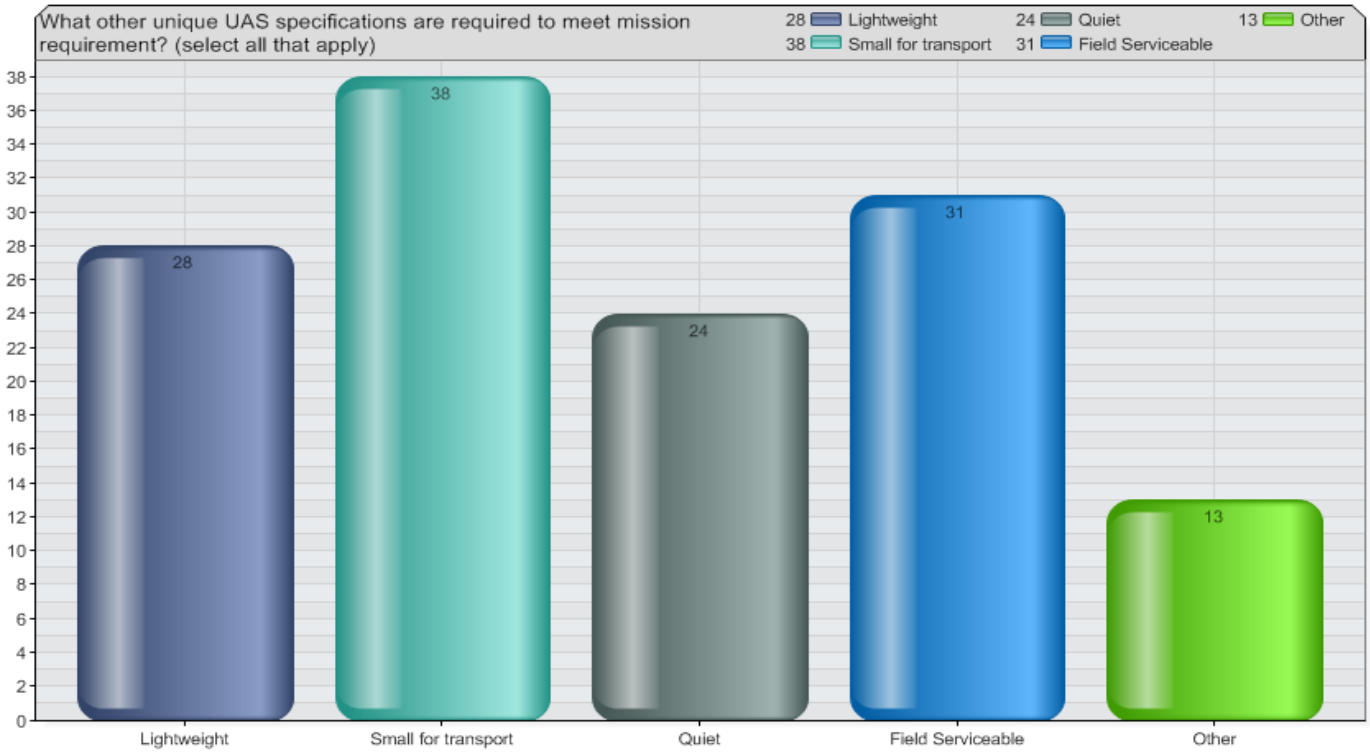
Response	Comments
1	university research (collaborators)
2	Most data processing would be contracted by private industry, but products and maybe data provided to NOAA & others

4	If used for location only services, processing will be minimal becuase the utility lies with real time detection
5	NOAA Cooperative Institute for Climate & Satellites - University of Maryland
6	Pilot in Command
7	INIT QC DATA PROCESSING BY CONTRACTOR
8	Depends on whether contract for products, data, services or operations
9	NOAA Cooperative Institute for Climate & Satellites - University of Maryland
10	Primary use is real time detection of turtles, not sure how we'd handle photogrametry if it were available

39.

What other unique UAS specifications are required to meet mission requirement? (select all that apply)

	Responses	Percent
Lightweight:	28	59.57%
Small for transport:	38	80.85%
Quiet:	24	51.06%
Field Serviceable:	31	65.96%
Other:	13	27%
Total Responded to this question:	47	83.93%
Total who skipped this question:	9	16.07%
Total:	56	100%



39.

What other unique UAS specifications are required to meet mission requirement? (select all that apply)

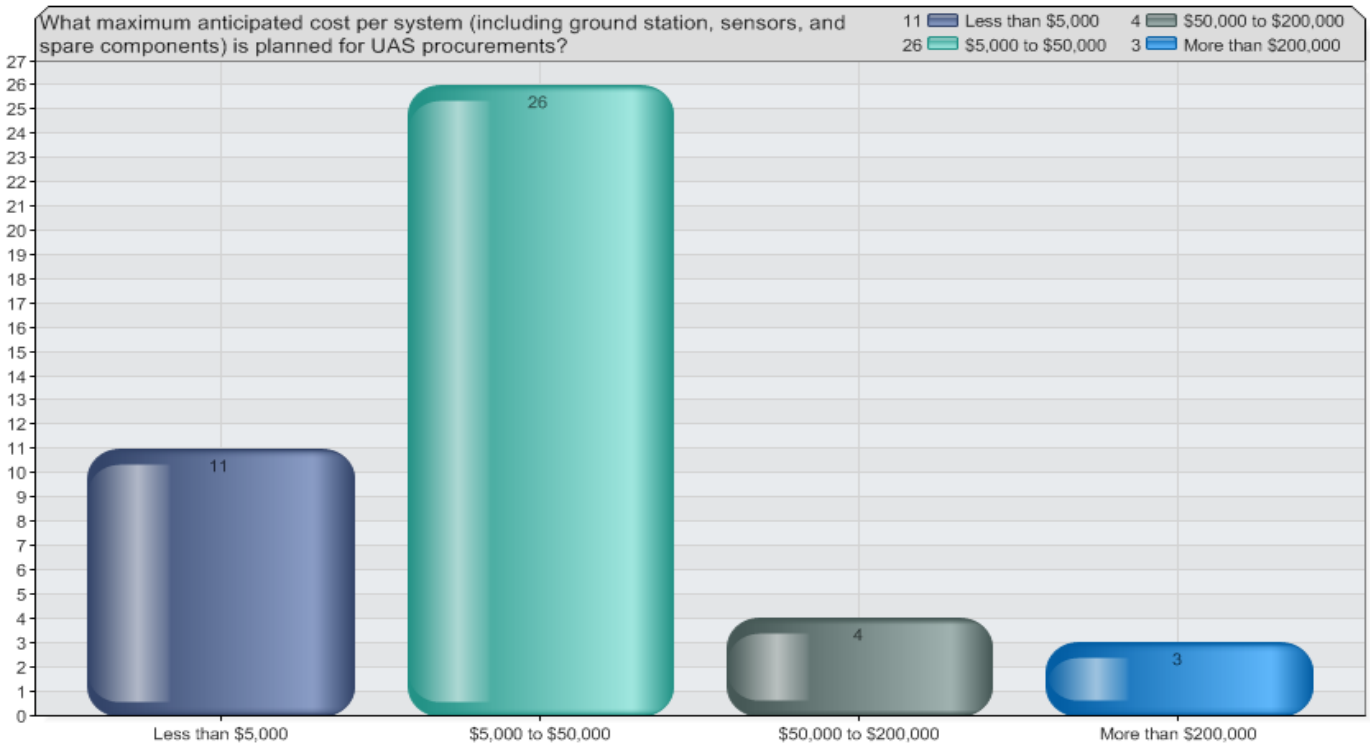
Response	Comments
1	Sensor adaptable, easy to fly, position and altitude hold controls, return to base station
2	Vertical take-off and landing

4	Vertical takeoff and landing
5	able to return home autonomously to a mobile platform (ship)
6	EXTENDED RANGE. 20NMI P3-UAS RANGE WOULD BE A MINIMUM REQUIREMENT. 70-100NMI IS PREFERRED/GOAL
7	Redundant systems for remote ops
8	Satellite control, able to mount our own sensors and computers, detect and respond to icing conditions.
9	Stationed on land at central location (ie Adak Island) to survey coastlines remotely.
10	Quick deployment and relative ease of use.
11	high altitude (>50,000 ft flight-level)
12	Quickly deployable.
13	This UAS in particular would need to be deployed in a small (23-25') boat, and it would need to be able to be deployed quickly.

40.

What maximum anticipated cost per system (including ground station, sensors, and spare components) is planned for UAS procurements?

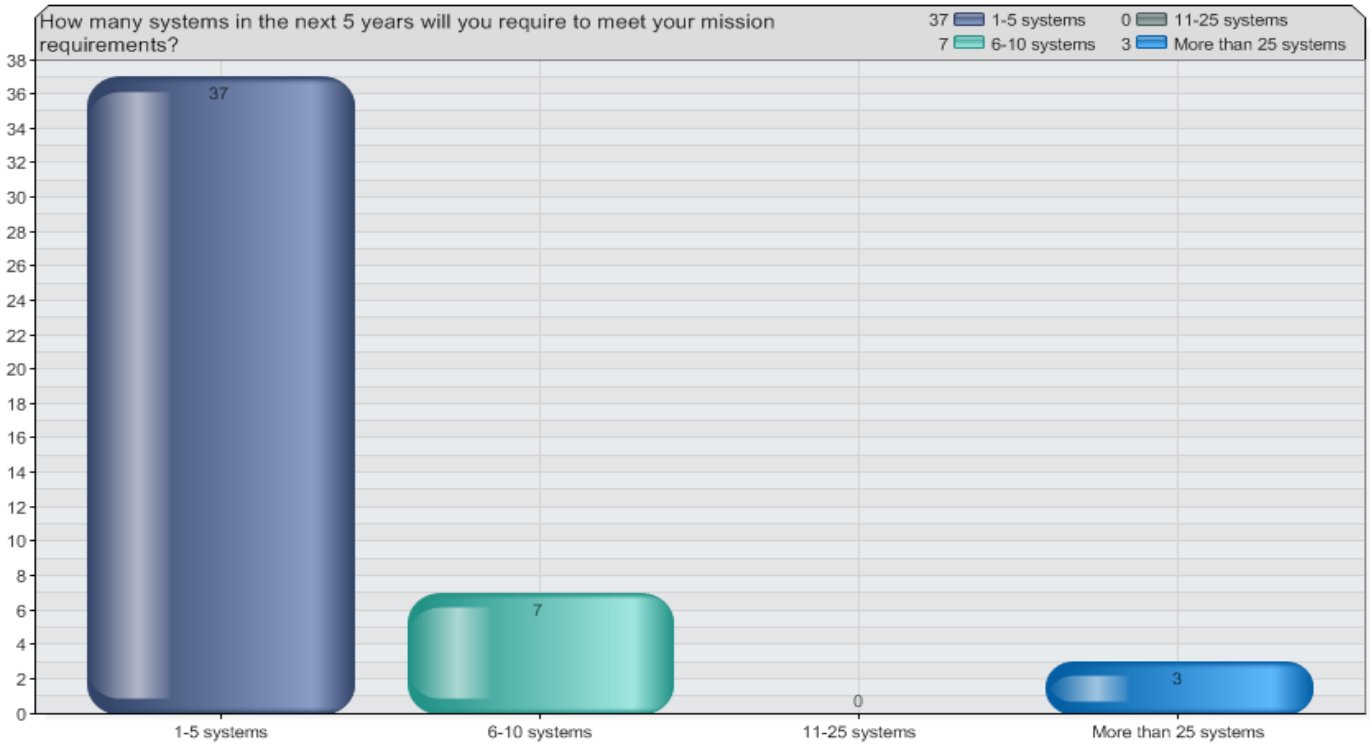
	Responses	Percent
Less than $5,000:	11	25%
$5,000 to $50,000:	26	59.09%
$50,000 to $200,000:	4	9.09%
More than $200,000:	3	6.82%
Total Responded to this question:	44	78.57%
Total who skipped this question:	12	21.43%
Total:	56	100%



41.

How many systems in the next 5 years will you require to meet your mission requirements?

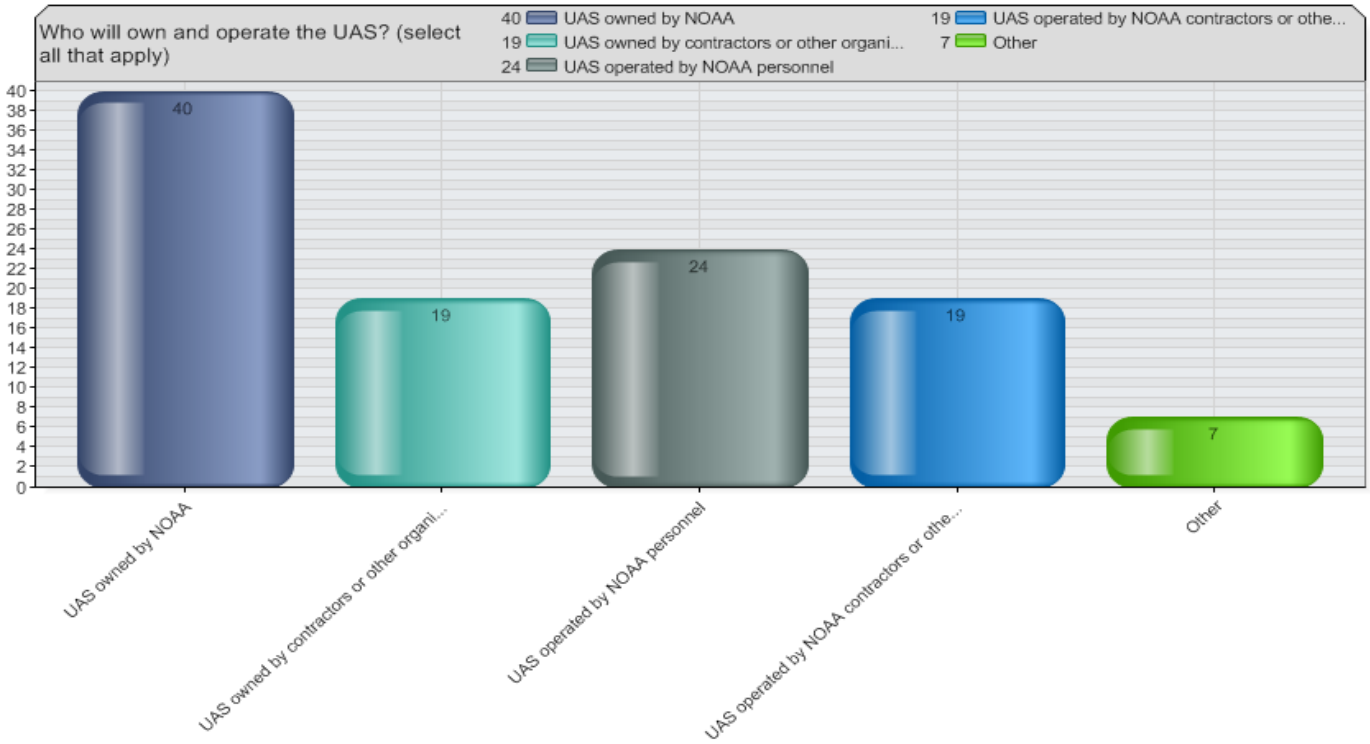
	Responses	Percent
1-5 systems:	37	78.72%
6-10 systems:	7	14.89%
11-25 systems:	0	0%
More than 25 systems:	3	6.38%
Total Responded to this question:	47	83.93%
Total who skipped this question:	9	16.07%
Total:	56	100%



42.

Who will own and operate the UAS? (select all that apply)

	Responses	Percent
UAS owned by NOAA:	40	83.33%
UAS owned by contractors or other organizations:	19	39.58%
UAS operated by NOAA personnel:	24	50%
UAS operated by NOAA contractors or other organizations:	19	39.58%
Other:	7	14%
Total Responded to this question:	48	85.71%
Total who skipped this question:	8	14.29%
Total:	56	100%



42.

Who will own and operate the UAS? (select all that apply)

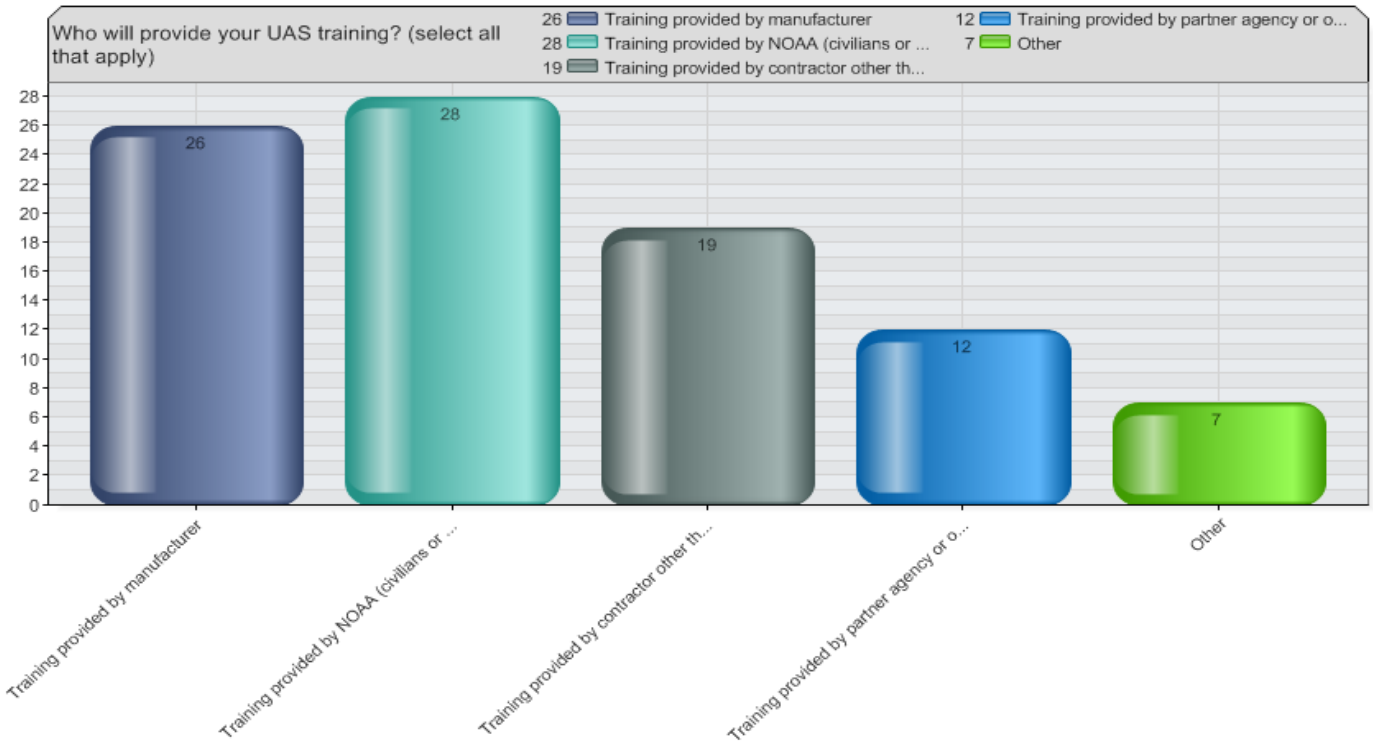
Response	Comments
1	ORR is not planning on internal pilots but could leverage other offices or sub to contractors with our funds.

3	NOAA Cooperative Institute for Climate & Satellites - University of Maryland
4	UCSB
5	ASSUMPTION: THIS IS IN FIVE YEARS
6	TBD
7	NOAA Cooperative Institute for Climate & Satellites - University of Maryland

43.

Who will provide your UAS training? (select all that apply)

	Responses	Percent
Training provided by manufacturer:	26	56.52%
Training provided by NOAA (civilians or NOAA Corps):	28	60.87%
Training provided by contractor other than manufacturer:	19	41.3%
Training provided by partner agency or other government organization:	12	26.09%
Other:	7	15%
Total Responded to this question:	46	82.14%
Total who skipped this question:	10	17.86%
Total:	56	100%



43.

Who will provide your UAS training? (select all that apply)

Response **Comments**

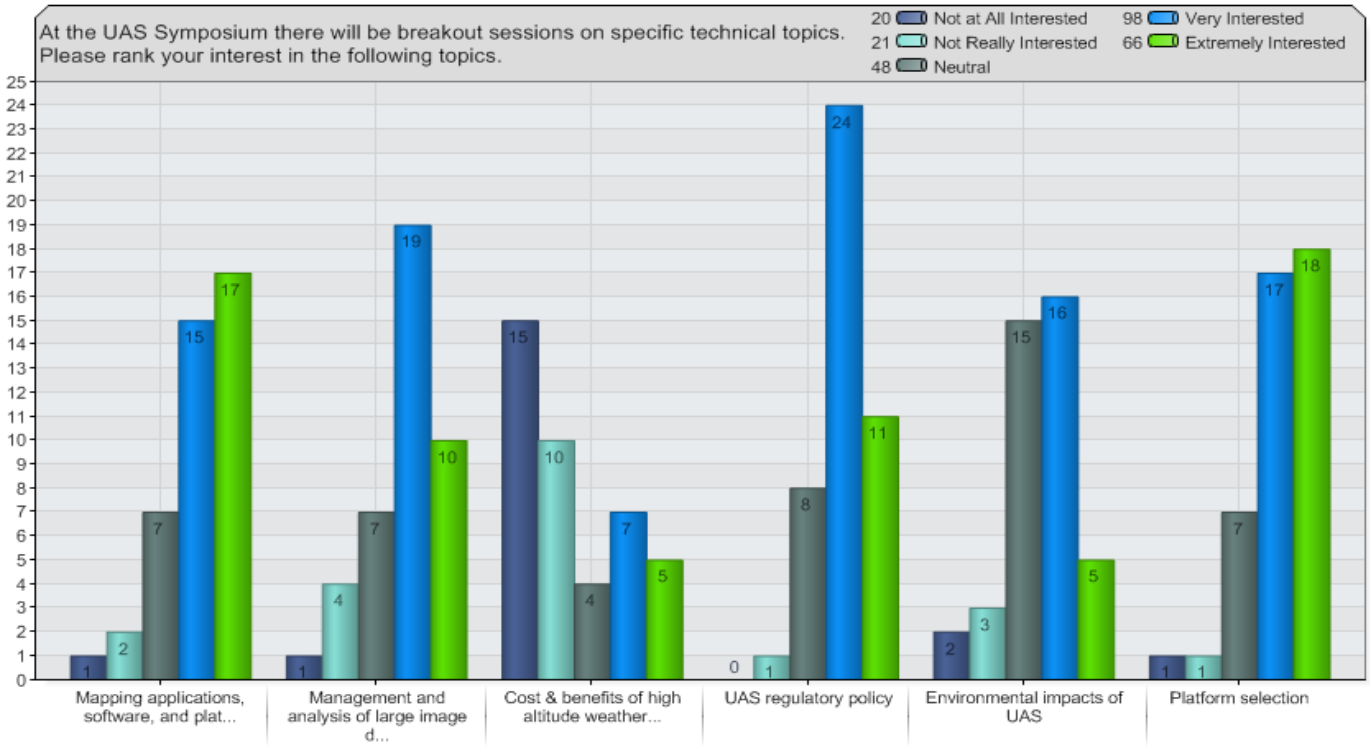
	staff received classroom and hands-on flight operation training
2	**AT TRL9 NO EXTERNAL TRAINING REQUIRED...AOC WILL OPERATE (SIMILAR TO GPS DROPSONDE OPERATIONS)**
3	**TBD**
4	**Platform operated by contractor or AOC team (hopefully, eventually)**
5	**Unsure; likely contractor or NOAA Corps**
6	**NOAA Cooperative Institute for Climate & Satellites - University of Maryland**
7	**week-long UAS training already completed which included presentations by AOC, FAA, and UAS contractor; NMFS staff received classroom and hands-on flight operations training**

44.

At the UAS Symposium there will be breakout sessions on specific technical topics. Please rank your interest in the following topics.

	Not at All Interested	Not Really Interested	Neutral	Very Interested	Extremely Interested	Total
Mapping applications, software, and platforms:	1(2.38%)	2(4.76%)	7(16.67%)	15(35.71%)	17(40.48%)	42
Management and analysis of large image datasets:	1(2.44%)	4(9.76%)	7(17.07%)	19(46.34%)	10(24.39%)	41
Cost & benefits of high altitude weather missions and platforms:	15(36.59%)	10(24.39%)	4(9.76%)	7(17.07%)	5(12.2%)	41
UAS regulatory policy:	0(0%)	1(2.27%)	8(18.18%)	24(54.55%)	11(25%)	44
Environmental impacts of UAS:	2(4.88%)	3(7.32%)	15(36.59%)	16(39.02%)	5(12.2%)	41
Platform selection:	1(2.27%)	1(2.27%)	7(15.91%)	17(38.64%)	18(40.91%)	44

Total Responded to this question:	44	78.57%
Total who skipped this question:	12	21.43%
Total:	56	100%



45.

	Responses	Percent
Responses:	10	100%
Total Responded to this question:	10	17.86%
Total who skipped this question:	46	82.14%
Total:	56	100%

Graph/Chart function not relevant for this question type.

45.

Space for additional breakout session topic suggestions (optional).

Response	Response Text
1	UAS training req for NOAA employees + contractors
2	Foster communication and collaboration among groups using UASs
3	centralized location (web site) for in-house users to keep up with regulations, experience by others, etc....
4	1) Linking applications with payloads and UAS capablities; 2) NOAA Remote Sensing collection stratedgy to harmonize (satellite, manned, and umanned system observations)
5	Practical Piloting of Small UAS (LOS; ship ops.; clearances)
6	In-House (NOAA) UAS development of a common use sUAS platform
7	NEPA and UAS!!!
8	Wildlife disturbance studies (particularly pinnipeds)
9	Development of new rotary wing platforms
10	Outside LOS missions; low altitude surveys along coastlines

46.

What are the most significant hurdles you face meeting your airborne mission requirements?

	Responses	Percent
Responses:	35	100%
Total Responded to this question:	35	62.5%
Total who skipped this question:	21	37.5%
Total:	56	100%

Graph/Chart function not relevant for this question type.

46.

What are the most significant hurdles you face meeting your airborne mission requirements?

Response	Response Text
1	Unfamiliar with how useful systems will be for specific research and monitoring objectives. Preliminary work will need to focus on determining efficacy of using UAS platforms for our mission
2	UAS training requirements (relevancy, cost, and frequency) for NOAA biologists using small UAS. Small UAS ops under 400 AGL and <0.25nm from ground station and the limitations of flights near airfields. UAS training could include training req'd to fly closer to airfield without a private pilot license.
3	NWS WFOs currently cannot own or operate UAS.
4	Internal and external authorization processes
5	Policy. The NWS is currently not authorized to use UAS for our mission needs. Technically, we can gain authorization to use a UAS, but the process to gain authorization takes time and typically requires noting set dates/locations for the use in the request. In the case of post-storm assessments, we would need to launch a UAS on very short notice because we typically do not know where the impacts from a storm will be until hours or minutes prior to the event. Thus, we would need a blanket policy that allows the NWS to use UAS to conduct post-storm assessments without gaining written approval for each flight days/weeks in advance.
6	Training to become a NOAA UAV pilot, and permission to fly in restricted airspace.
7	We oil/ chemical respond to releases with no advance notice for deploying. Access and approval to fly a UAS with the appropriate imaging capacity and post processing has been limited. Our need is generally within 48-96 hours and processing of data is needed 4-6 hours post flight. Additionally there are often manned aircraft in area and due to safety concerns drones are often banned by AirOps within the command post. We have relied on industry partners and universities for recent testing.
8	UAS regulatory policy
9	FAA flight restrictions. The technology is there it's being able to execute beyond line of sight and flying multiple platforms at different locations simultaneously.
10	1) For spill response, NOAA provides mission support and technical advice, but may not always have much operational control/authority. We often provide technical support to USCG decision-makers in the form of trained observers and technical expertise while using either USCG or industry-contracted aircraft (not likely to be NOAA-owned, contracted, or directed). 2) Best tool may be simple/efficient/flexible rather than robust - Oil spills often include a variety of different overflight missions operating in close proximity and with differing priorities. Advances in UAS technology is impressive, but specific spill response mission needs/constraints (platforms, sensors, objectives, data management, timing, etc) have seldom been articulated well enough to define what might actually be "operationally useful". 3) Post-processing times can make good tools useless for response timeframes. (better to have an 80% answer on-time, than a 100% answer too late) 3) Few established "best management practices" for emergency use to properly address operational needs while minimizing potential environmental impact (particularly to species sensitive to disturbance). For instance, for aircraft a "safe distance" from marine mammals may be 1,000', but what might a "safe distance" be for a UAS during a spill? What are the concerns and how can they be effectively mitigated?
11	Air space restrictions. We live and work in a very populated area and being able to get into areas where the fish are, but are not restricted, can be very challenging.
12	The laborious paperwork with long wait times for AOC. As missions within the science center increase, we will experience a shortage of hexacopters to comply with all needs.
13	Multiple authorizations required for flying missions are excessive and often confusing
14	Ability for UAS to detect turtles Ability for all aspects of UAS to work simultaneously Ability to host enough people to full staff UAS onboard a boat
15	1. Funding 2. Adequate UAS platform - need to move from the Manta to a UAS that can take off and land on a ship 3. Availability of trained pilots

17	Obtaining multiple levels of approval and clearance for international missions.
18	Access to air space and mission funding.
19	Flying in coastal waters off California
20	Flight Time
21	unknown
22	FAA regulations on maximum allowable flight levels, need for Visual Line Of Sight at all times with no reliance on transponders and/or laser beacons, interference with military operations areas (MOAs) even though research flights would occur below 7,000 ft AGL.
23	Obtaining the multiple levels of approvals for international surveys.
24	Sustained funding. Need for a NOAA funding program that concentrates on sUAS requirements (vs ancillary involvement in other agency high cost, large UAS programs)
25	NEPA documentation
26	Complex air space issues; overlapping responsibilities by several agencies
27	We currently have an excellent small rotary wing UAS for boat and shore missions but mission capability could be greatly enhanced by greater range and duration
28	Lack of ability to respond to events or incidents in real-time/near real-time due to time it take for internal NOAA review and approval of small UAS operations.
29	Policy and cost. While it would be extremely beneficial to have UAS to supplement upper air weather balloon releases - or replace them altogether - we (the NWS) would need to use these at many field offices and fly them to relatively high altitudes (~20 kft) - which pose a cost burden when considering the number of UAS we would need to purchase (over 100).
30	Need funding support for missions.
31	Ability to fly beyond LOS at low altitudes near shore in remote areas.
32	Access to platforms to conduct missions and maintain proficiency through out the year
33	Aircraft selection and approval of low-cost COTS aircraft systems.
34	internal clearance process by AOC
35	- Asset cost and availability - Imagery quality and resolution - Post-processing level of effort - Regulatory challenges in aerial survey, especially using UAS

47.

What do you hope to take away from the UAS Symposium?

	Responses	Percent
Responses:	35	100%
Total Responded to this question:	35	62.5%
Total who skipped this question:	21	37.5%
Total:	56	100%

Graph/Chart function not relevant for this question type.

47.

What do you hope to take away from the UAS Symposium?

Response	Response Text
1	Become familiar with steps necessary to implement UAS surveys to determine their efficacy to meet our research and monitoring objectives
2	Any new changes to UAS regulation and training with the release of FAA's new UAS rules and regulations for commercial ops.
3	I hope to learn of NOAA's vision for UAS use, and to ensure that NWS WFOs have a place in it.
4	Better understanding of of the NOAA interests, consolidation and consistency amongst platforms and sensors.
5	Unfortunately, due to budget constraints, I will no longer have the opportunity to attend the symposium.
6	The knowledge to purchase appropriate NOAA-approved UAS equipment and how to become a NOAA UAV pilot.
7	Awareness of other resources and potential partners within NOAA regarding UAS deployments. Knowledge of sensor capacities. Awareness of internal NOAA policies and restrictions for deployment and better navigation of the process should we need to deploy.
8	Unfortunately I am in a field mission that has been hit a couple of delays and therefore has been extended to the beginning of November. As a result I will not be able to attend the symposium.
9	Certainly a better understanding of where NOAA should be in the next 5 years and as an agency for environmental monitoring and we should be leading that effort.
10	A better understanding of the capabilities and challenges of using UAS for emergency response to minimize overall impact of both the spill and the cleanup. This would help us provide better advice & support to USCG for overall response decisions and be better suited to manage and visualize/display resultant data and interpreted products. Be advised that "supporting the USCG" means not only helping select the best tool for the job (technical issues, data management constraints, etc) and providing useful products, but also keeping USCG out of trouble as the lead federal agency on a response (i.e. knowledge of regulatory constraints, and other consultation/coordination issues such as land manager concerns, wildlife disturbance & ESA Section 7 topics, etc).
11	Learn what others are doing scientifically and for data processing and analysis. Learn the current bureaucracy at NOAA and AOC for flying UASs How NOAA and AOC interact with FAA How will the Part 107 impact us How NOAA, AOC, and scientists interact and their roles and responsibilities
12	Better understanding of AOC process. Learning what others are successfully doing. What are upcoming options for VTOL and fixed wing platforms. Unified request to make AOC's FAA requirements more applicable.
13	Increased knowledge of UAS scientific applications, sharing UAS experiences with other users, processing imagery, and regulatory requirements
14	Lisa (Grace) Conger is attending to represent turtle needs. I'd like for her to bring home information about whether there are NOAA resources we can use to achieve our turtle detection research needs. If not, I'd like for her to understand if there are resources available outside of NOAA that can be purchased. If there are no viable UAS systems available I'd like to know that as well.
15	A clear idea of the direction NOAA will go with UASs.

16	an understanding of the current NOAA applications and capabilities
17	New ideas for photogrammetry analysis, processing large image data sets, and hardware.
18	Agree on a small number of platforms for NOAA's unmet mission requirements and clarification for support for platform evaluations and availability
19	Better understanding of the regulations and what paperwork is required for a mission. What new platforms are available to use for my mission.
20	Current applications of UAV uses in reasearch
21	unknown
22	I will not be attending.
23	A clear vision as it relates to NOAA's future for sUAS platforms needed to meet high priority research and operational requirements.
24	networking and policy clarity
25	Better understanding of mission requirements for NOAA and platforms for met and unmet missions
26	Guidance on longer range rotary wing platforms
27	A clear understanding of how NOAA small UAS policy and management will evolve given the new FAA Part 107 rules.
28	I can not longer attend unfortunately (due to budget limitations).
29	How is NOAA planning to meet long-range UAS needs?
30	How these types of surveys (outside LOS, low altitude, nearshore) are being considered for the future.
31	Unable to attend
32	A better understanding of the UAS platforms that NOAA will authorize, as well as PIC requirements given the recent implementation of FAA FAR Part 107 regulations.
33	n/a
34	how to effectively clear our UAS use with AOC and to be in compliance with federal regulations without wasting the funds we have already obligated to UAS and training
35	A better understanding of the current efforts within NOAA to use UAS, the lessons people are learning with them, and the chance to share our observations to date. Ideally, coming away with a sense of the future arc and plan for UAS operations within NOAA would be great.

48.

Provide any additional constructive feedback about UAS use in NOAA, such as what NOAA is doing well and where NOAA could improve.

	Responses	Percent
Responses:	21	100%
Total Responded to this question:	21	37.5%
Total who skipped this question:	35	62.5%
Total:	56	100%

Graph/Chart function not relevant for this question type.

48.

Provide any additional constructive feedback about UAS use in NOAA, such as what NOAA is doing well and where NOAA could improve.

Response	Response Text
1	NOAA AOC does a great job in coordinating UAS/FAA side of policy and regulations with small UAS ops conducted by biologists. May strides have been made to simplify this process, especially for operations proven to be successful. New ops are met with reasonable assessment and the approval process has been streamlined and conducted in a timely manner. With the new FAA UAS guidelines released and considering other federal agency's (DOI/USGS) success with collaborating with the FAA for less restricted small UAS use it seems further strides could be made to make training more applicable, effective, and include information to allow greater ability in UAS survey range. For example, more specific training or UAS certification could include training to allow biologists to fly small UAS closer (than 5nm) to airfields without a private pilot's license when air traffic is not present. This is a very real limitation for one of our future research objectives, especially in light of reduced research budgets and where it is not practical to have a pilot (with a PPL) present that is not involved in the project.
2	While NOAA is using large UAS, there are numerous missions that sUAS could be conducting in support of operations: atmospheric sampling (to augment or replace weather balloons), air quality sampling, post event damage assessments, rip current identification, burn area evaluation, etc.
3	It sounds like NOAA is doing great work with UAS outside of the NWS. Unfortunately, we are putting NWS offices at risk of violating policy because some offices have purchased UAS craft without understanding the policy restrictions. Thus, some well intentioned offices have already broken the policy. The symposium must address the specif situation facing the NWS.
4	NOAA should have a single UAS training program for UAV pilots similar to how the NOAA diving center has one centralized program for all NOAA divers. The NOAA diving program has an internal certification process, an online dive log, and website to disseminate information. It would also be nice to see more of a focus on near shore benthic habitat mapping/coral reef mapping with UAVs.
5	I believe both OMAO and OAR UAS program are trying to engage the offices, however there is a general lack of awareness in the field offices regarding what is available and what can be accessed and done by the offices for deployment. The NOAA PUMAs did not meet our office needs for image resolution or post processing. With the speed at which technology is advancing access to contractors with appropriate equipment versus need for NOAA to maintain should be considered.
6	I think NOAA has been playing catch up on the use of sUAS's and this symposium is a good start at where we are, where we should go and how do we get there..Having the symposium is a good start of defining NOAA's role in the use of UAS's
7	AOC has been very good at interactions with the FAA. The interactions we've had with the FAA seem to go smoothly when they know we are NOAA. Reduce the overlap in the information required. There seems to be multiple places where the same information is required. Web-based forms would be very handy. Better and consistent communication within and with AOC. I'm often shunted among different contacts and it's hard to know who I need to communicate with.
8	Current mandates for repeated FAA testing and medical certs seem unwarranted. A more appropriate test (which I believe is in the works) seems more beneficial. The FAA ground school pilot's exam requires a significant amount of time to prepare for and much of the information is not applicable. FAA medical every year seems excessive. I would like to see a centralized location for information. Perhaps an 'in house' web site where all things NOAA UAS could be located (i.e. updates in policies and requirements, trouble shooting logistics, mechanics, bureaucracy, etc...
9	Thank you very much for hosting this forum! I appreciate the inclusive and proactive approach. Cheers!
10	Area of improvement - Building cross-agency institutional support for UAS applications and operations

11	We have had great support from AOC and feel that increased staff has had a positive influence.
12	N/A
13	inknown
14	The NOAA UAS program spends most of its resources on NASA Globalhawk activities. The platform is expensive, not owned or operated by NOAA and it does not meet the needs of most NOAA PIs or LO high priority objectives. I do not think this is a good use of resources in a limited resource environment. Instead, a refocussing of efforts towards the use of sUAS should be undertaken immediately. Each line office should identify specific areas where sUAS can help their highest priority mission requirements. Once this information is gathered, a 'Venn diagram' of sorts should be constructed to see where NOAA can effectively transform those common needs into an actual sUAS capacity. NOAA's AOC does a great job managing NOAA's air resources. UAS should be no different. UAS operations should be centered at AOC. If more resources are needed to do this they should be found/reprogrammed internally if necessary.
15	AOC support excellent; training facility availability is essential to safe and effective UAS operations
16	AOC support excellent; hope that they will continue to allow scientists to evaluate platforms specific to mission requirements
17	It seems there has been minimal improvement in long-range mission capabilities in the Arctic. There has been a huge push for platforms that don't meet these goals (Puma) and little assistance with platforms that do.
18	AOC staff has been very responsive in assisting, to their ability, program questions regarding the use of UAS for program missions. I feel that AOC is probably greatly understaffed to adequately handle the approval of this burgeoning new use of technology and would suggest additional assistance be given to them to help with drafting these new use policies and reviewing and approving new NOAA UAS requirements.
19	It would be good to see NOAA more focused with its approach re: incorporating UAS efforts into its mission. NOAA's current manned aircraft infrastructure and its manpower to support that infrastructure is well-established and closely linked...and it shows. NOAA's UAS aircaft infrastructure and its manpower to support that infrastructure seems much less unified and a bit disconnected. Arguably, this is just a reflection of how much "younger" the UAS aircraft programs are compared to the manned aircraft programs. Still, it would be good to see the NOAA UAS efforts move in a direction of "1 NOAA".
20	UAS availability has improved our ability to obtain more information about marine mammals while reducing harassment to the animals, reducing costs to the agency, and reducing human safety risks associated with flying in Alaska. UAS do not have the impact on marine mammals that manned aircraft have, and we hope to see consideration of this reduced impact reflected in the agency's UAS policy.
21	I'm sorry this survey was late. I was in the field, and just now back in the office.