

UNIVERSITY OF MIAMI
ROSENSTIEL
SCHOOL of MARINE &
ATMOSPHERIC SCIENCE



Tritium Laboratory
30 December 2021

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SWAB REPORT # 1021

SWAB DATE: 16 December 2021

R/V Thomas Thompson & Van #625.1.05

Dr. James D. Happell
Associate Research Professor

Distribution:
SWAB Committee
Loren Tuttle

COMMENTS TO SWAB REPORTS

15 December 2021

The LSC is now a Quantulus GCT 6220, with the SWAB counting assay having background cpm of 0.3 & 1.2 for ^3H & ^{14}C . This replaces an LSC with background cpm of 1.6 & 5.5 for ^3H & ^{14}C .

All samples are counted for 60 minutes, the instrument background is subtracted, and activities are reported in dpm/m^2 . Bucket blank activities are not subtracted. Counting errors (2 standard deviations) are also reported in dpm/m^2 . An error larger than the activity indicates that the activity is not significantly different from zero. All activities significantly above background will be in **bold**.

Criteria for SWAB Results

Category	^3H (dpm/m^2)	^{14}C (dpm m^2)	Recommendations
A	<500	<50	No action
B*	500-10,000	50-10,000	Needs cleaning before any natural tracer work. Decks in radiation vans with activities above 1000 dpm/m^2 should be cleaned.
C**	10,000-100,000	10,000-50,000	Must be cleaned before any use.
D***	>100,000	>50,000	May be a health hazard. Notify local radiation safety official.

Note: ^{14}C and ^{35}S have peak energies of 156 and 167 KeV, respectively; thus ^{35}S will be registered as ^{14}C by our counting techniques. Categories A, B and C are not a health hazard.

Recommended Cleaning Procedure

Wearing ordinary household rubber gloves:

^3H : Wash and scrub with radioactive cleanup detergent such as COUNT-OFF (50 ml COUNT-OFF to 4 liters of water), using sponges to distribute solution and reabsorb it.

^{14}C : Wash with 1% sulfuric or 2% hydrochloric (muriatic) acid with good ventilation (will dissolve carbonates, releasing $^{14}\text{CO}_2$). Follow up with wash as if for ^3H .

Disposal of Cleaning Materials (gloves, sponges, etc)

Categories A & B dispose as ordinary garbage, C & D contact your institution's radiation safety office.

Note: If category C or D is encountered, we try to notify the insitution promptly by phone or email.

REPORT FOR SWAB #1021

LOCATION: Honolulu, HI
VESSEL: *R/V Thomas Thompson*

DATE: 16 December 2021
TECHNICIAN: Charlene Grall

Sample #	Sample Identification	³ H dpm/m ²		¹⁴ C dpm/m ²	
		activity	error	activity	error
1	1st Vial Bkgnd	0	± 0	0	± 0
2	Initial bucket blank	0	± 11	1	± 13
<u>Main Lab (Figure 1)</u>					
3	Port sink area	-5	± 24	18	± 14
4	Forward center benchtop	17	± 21	3	± 10
5	Starboard sink area	13	± 52	-18	± 23
6	Inside fume hood	9	± 19	3	± 11
7	Inside aft entrance	8	± 26	-3	± 14
8	Deck at port entrance	29	± 28	-11	± 14
9	Deck inside mid-port entrance	19	± 26	-1	± 47
10	Deck inside forward port entrance	30	± 25	-2	± 7
<u>BioAnalytical Lab (Figure 2)</u>					
11	Benchtop adjacent to aft sink	3	± 11	10	± 14
12	Aft sink area	16	± 23	-2	± 8
13	Inside fume hood	22	± 27	-8	± 11
14	Center section of starboard benchtop	11	± 41	-12	± 16
15	Inside aft refrigerator	27	± 29	-12	± 16
16	Inside aft freezer	5	± 15	-11	± 15
17	Forward sink area	0	± 2	-14	± 18
18	Forward benchtop adjacent to sink	26	± 27	-8	± 11
19	Forward section of center benchtop	11	± 25	-4	± 15
20	Aft section of center benchtop	-12	± 27	-11	± 14
21	Deck inside starboard entrance	23	± 20	12	± 12
22	Deck inside aft entrance	12	± 45	-14	± 18
23	Deck between sink and fume hood	41	± 30	-15	± 19
<u>Computer Lab (Figure 3)</u>					
24	Deck between starboard bench and table	12	± 21	1	± 7
25	Center table top	-29	± 34	-3	± 13
<u>Hydro Lab (Figure 4)</u>					
26	Center benchtop	-3	± 8	3	± 14
27	Center section starboard benchtop	3	± 6	16	± 14
28	Deck in front of port sink	37	± 24	11	± 12
29	Deck inside starboard entrance	20	± 24	0	± 10
30	Port sink area	-39	± 47	2	± 8

Sample #	Sample Identification	³ H dpm/m ²		¹⁴ C dpm/m ²	
		activity	error	activity	error
<u>Wet Lab (Figure 5)</u>					
31	Aft starboard benchtop	-7	± 54	6	± 14
32	Sink area	13	± 92	-21	± 27
33	Deck in center of Lab	8	± 59	-11	± 14
34	Forward benchtop	2	± 6	-10	± 13
<u>Main Deck</u>					
35	Deck starboard of rosette in Staging Area	-18	± 67	18	± 15
36	Starboard aft deck where incubators stood	-15	± 57	40	± 16
37	Deck outside Science Reefers	49	± 30	-9	± 12
38	Inside refrigerator in Science storage	11	± 18	11	± 13
39	Intermediate bucket blank	27	± 19	16	± 13
<u>Rad Van #625.1.05 (Figure 6)</u>					
40	Sink area	-6	± 7	*84	± 18
41	Benchtop adjacent to sink	84	± 28	*96	± 18
42	Benchtop adjacent to fume hood	10	± 6	*75	± 17
43	Inside fume hood	40	± 17	*108	± 19
44	Inside freezer	22	± 4	*526	± 32
45	Inside refrigerator	*812	± 73	*200	± 20
46	Benchtop adjacent to LSC	36	± 15	*124	± 20
47	Benchtop across from sink	-15	± 19	*67	± 17
48	Deck between fume hood and LSC	73	± 29	*53	± 15
49	Deck between entrance and sink	45	± 21	44	± 15
50	Final bucket blank	-2	± 5	-9	± 12

Comments

Please note that the error reported for each isotope is the two-standard deviation counting error. Reports may now contain values less than zero. Decay counting background samples will be distributed about the background vial, which means that negative values are possible. In the past we rounded the negative values to zero. Values are only significantly above background when they are positive and larger than the error. Please note that we are now using a Quantulus 6220 LSC which counts very near natural background. While the cleanup standards have not changed all values above background will now be in bold. All areas on the ship were free from isotope contamination requiring cleaning. The Rad Van had minor ³H and ¹⁴C contamination but no action is necessary.

Main Lab Layout

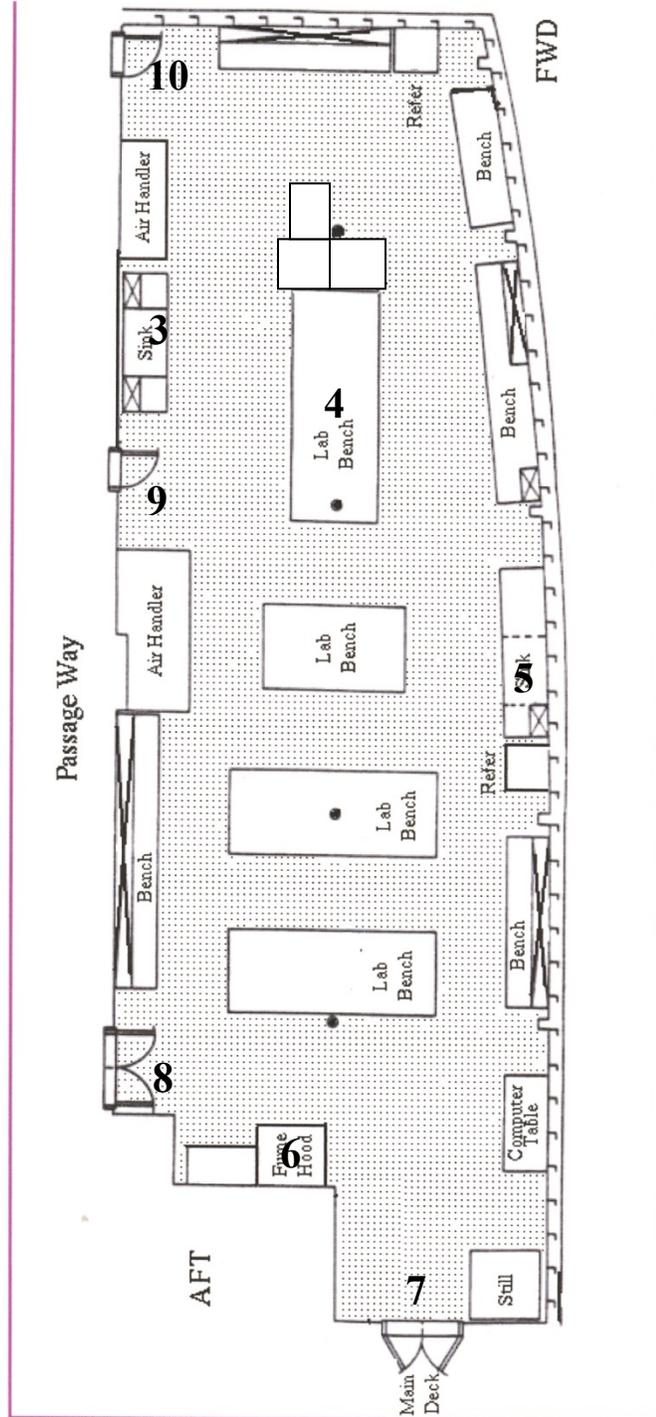


Figure 1
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Figure 2
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BioAnalytical Lab Layout

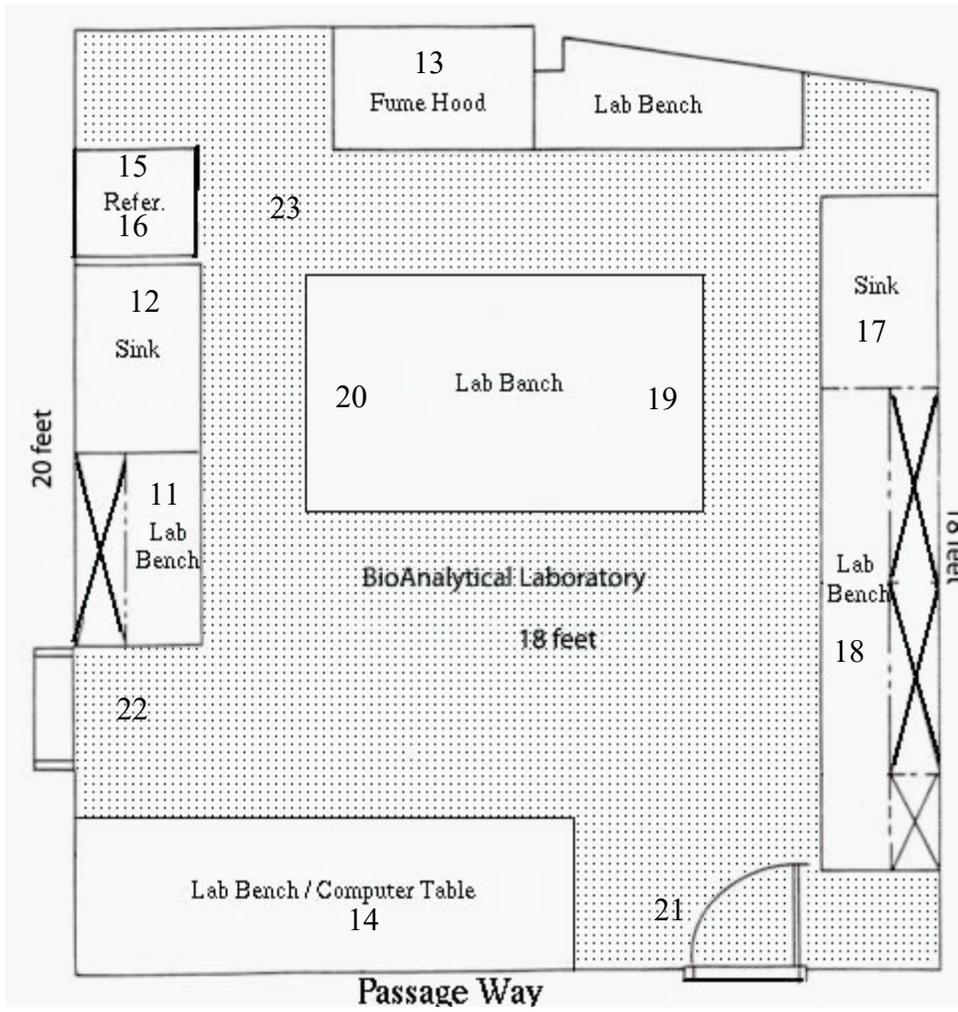
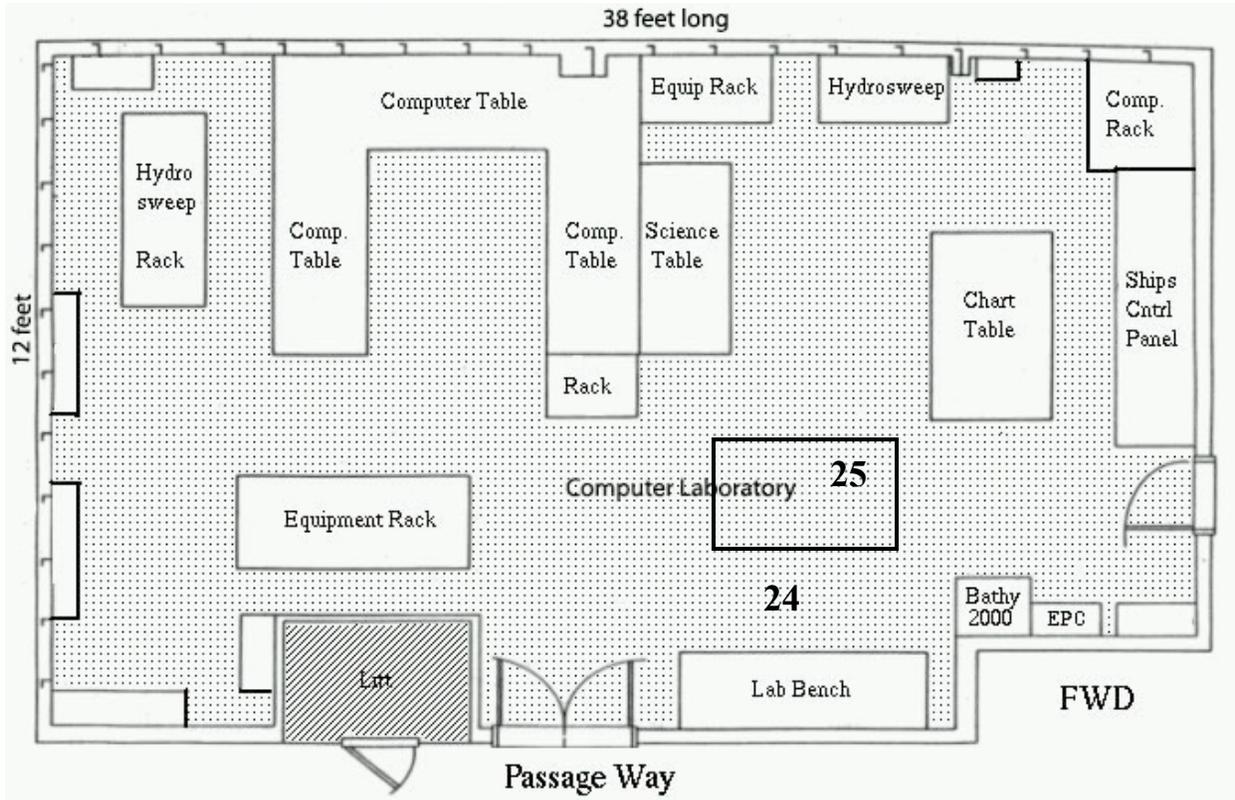


Figure 3
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Computer Lab Layout



Note: Lab configuration has changed for this report. Computer tables and equipment racks were moved.

Figure 4
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Hydro Lab Layout

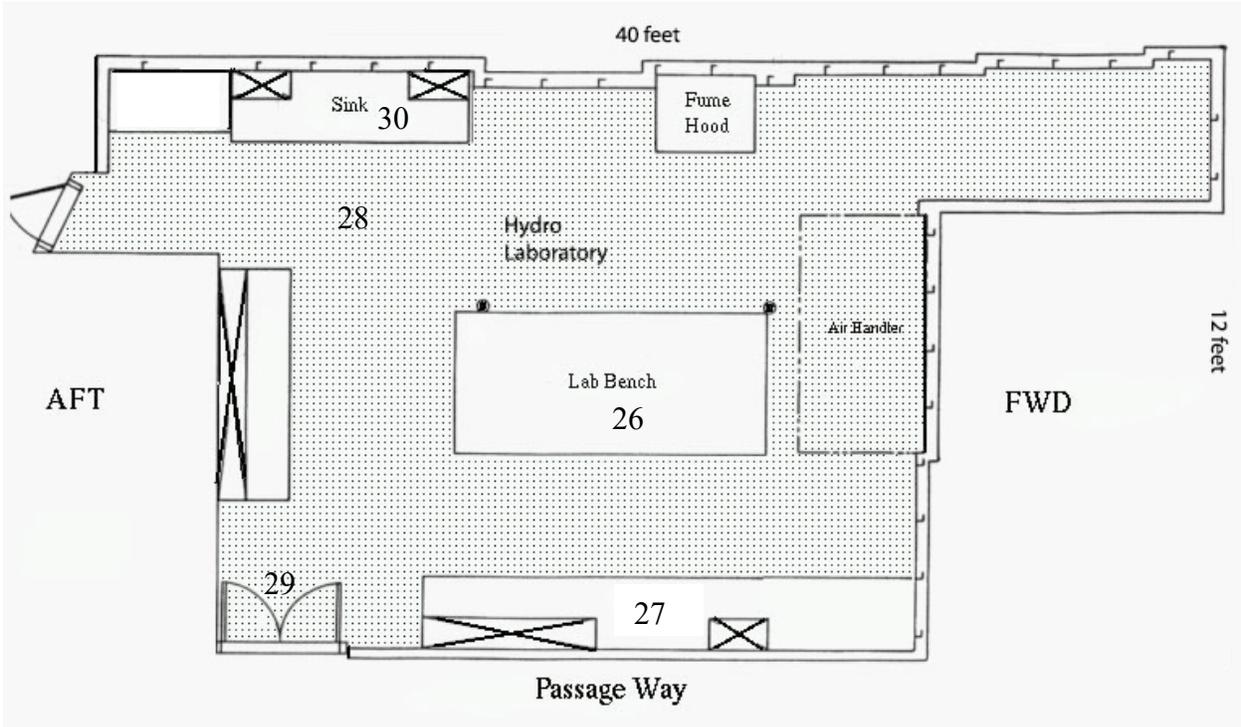
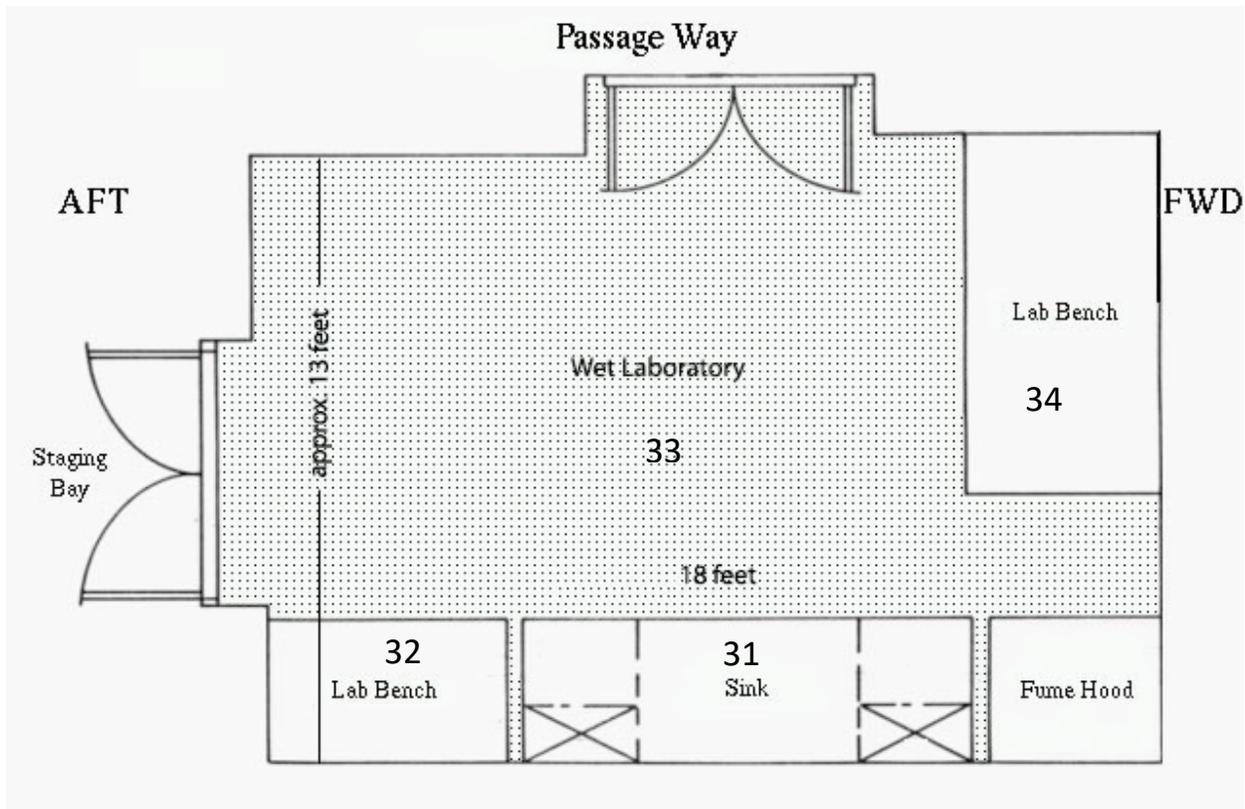


Figure 5
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Rad Van #625.1.05 "R5"

Figure 6
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