

UNIVERSITY OF MIAMI
ROSENSTIEL
SCHOOL of MARINE &
ATMOSPHERIC SCIENCE



Tritium Laboratory

18 March 2021

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SWAB REPORT # 995

SWAB DATE: 9 March 2021

R/V Thomas Thompson

Dr. James D. Happell
Associate Research Professor

Distribution:
SWAB Committee
Loren Tuttle

COMMENTS TO SWAB REPORTS

12 May 2014

Typical LSC instrument background values for ^3H and ^{14}C are 2 and 5 cpm, respectively. The LSC is a Tricarb 2910 TR with the low level counting option.

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.

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 $1000 \text{ dpm}/\text{m}^2$ 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 institution promptly by phone or email.

REPORT FOR SWAB # 995

LOCATION: Woods Hole, MA
VESSEL: *R/V Thomas Thompson*

DATE: 9 March 2021
TECHNICIAN: Jennifer Nomura

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	7	± 48	0	± 12
	<u>Hydro lab (Figure 1)</u>				
3	Forward starboard benchtop	-16	± 48	10	± 40
4	Starboard benchtop center section	-13	± 40	-6	± 31
5	Aft section of starboard benchtop	-22	± 66	-2	± 10
6	Aft benchtop	-10	± 70	-12	± 44
7	Aft port benchtop	9	± 77	-7	± 34
8	Port sink area	-7	± 21	15	± 38
9	Center benchtop	-19	± 56	16	± 40
10	Deck between center & starboard benchtop	-11	± 34	2	± 51
11	Deck between center & port benchtop	74	± 52	4	± 17
12	Deck inside starboard entrance	-8	± 58	-13	± 48
	<u>Wet Lab (Figure 2)</u>				
13	Forward benchtop	-36	± 79	-10	± 38
14	Aft starboard benchtop	1	± 8	8	± 37
15	Sink area	-44	± 133	2	± 12
16	Deck in center of lab	-27	± 81	6	± 47
	<u>BioAnalytical Lab (Figure 3)</u>				
17	Forward sink area	-29	± 87	4	± 60
18	Forward benchtop next to sink	-3	± 171	7	± 37
19	Center benchtop forward section	6	± 46	-29	± 61
20	Center benchtop aft section	-21	± 64	-20	± 42
21	Inside fume hood	-17	± 51	11	± 40
22	Aft sink area	-4	± 31	2	± 42
23	Inside aft refrigerator	-3	± 23	-9	± 32
24	Inside aft freezer	8	± 58	-31	± 32
25	Deck between sink and fume hood	-15	± 46	-11	± 42
26	Starboard benchtop aft section	-29	± 87	-10	± 39
27	Deck in front of forward sink	-19	± 58	19	± 39
28	Deck inside starboard entrance	-17	± 53	5	± 46

Sample #	Sample Identification	^3H dpm/m ²		^{14}C dpm/m ²	
		activity	error	activity	error
<u>Science Reefer's</u>					
29	Deck in aft climate control chamber	-10	± 71	-12	± 43
30	Deck in forward freezer	6	± 46	1	± 26
31	Deck outside chambers	-18	± 54	-1	± 7
<u>Computer Lab (Figure 4)</u>					
32	Deck at forward entrance	4	± 22	10	± 36
33	Deck inside starboard entrance	-9	± 68	1	± 74
<u>Main Lab (Figure 5)</u>					
34	Main Lab Deck inside aft entrance	-22	± 68	4	± 52
35	Inside fume hood	-41	± 90	38	± 40
36	Starboard benchtop under monitor	-19	± 58	4	± 50
37	Aft center benchtop	-9	± 442	22	± 38
38	Center benchtop just forward of #37	-26	± 80	4	± 55
39	Inside Cospolich refrigerator	-14	± 42	11	± 40
40	Starboard sink area	-139	± 307	45	± 47
41	Port sink area	-43	± 94	1	± 23
42	Deck inside forward port entrance	6	± 66	-4	± 19
43	Deck inside middle port entrance	-8	± 62	-19	± 41
44	Radioactive source fridge in forward stores	-39	± 86	5	± 62
45	Deck at aft port entrance	24	± 54	-5	± 25
46	Final bucket blank	9	± 26	16	± 36

Comments

Please note that the error reported for each isotope is the two-standard deviation counting error. The reports may now contain values less than zero. When 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. All areas tested inside the ship were free from isotope contamination that requires cleaning.

Figure 1
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Hydro Lab Layout

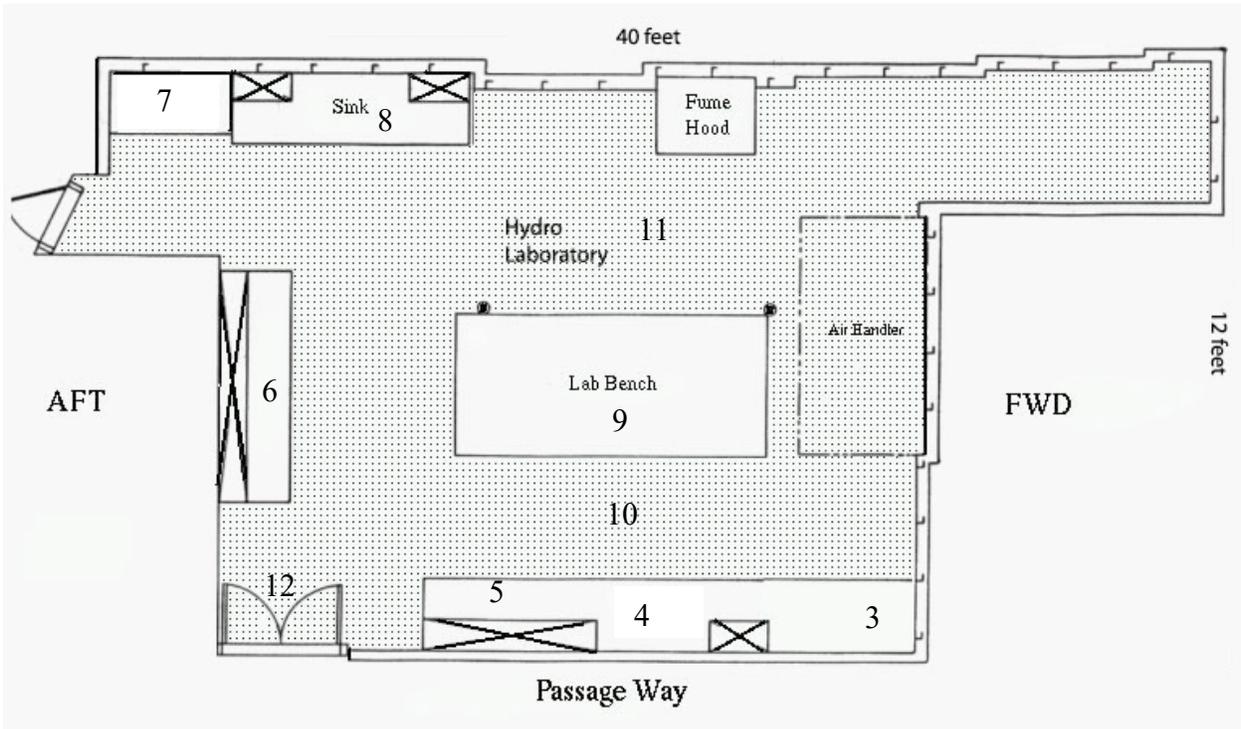


Figure 2
SWAB 995
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Wet Lab Layout

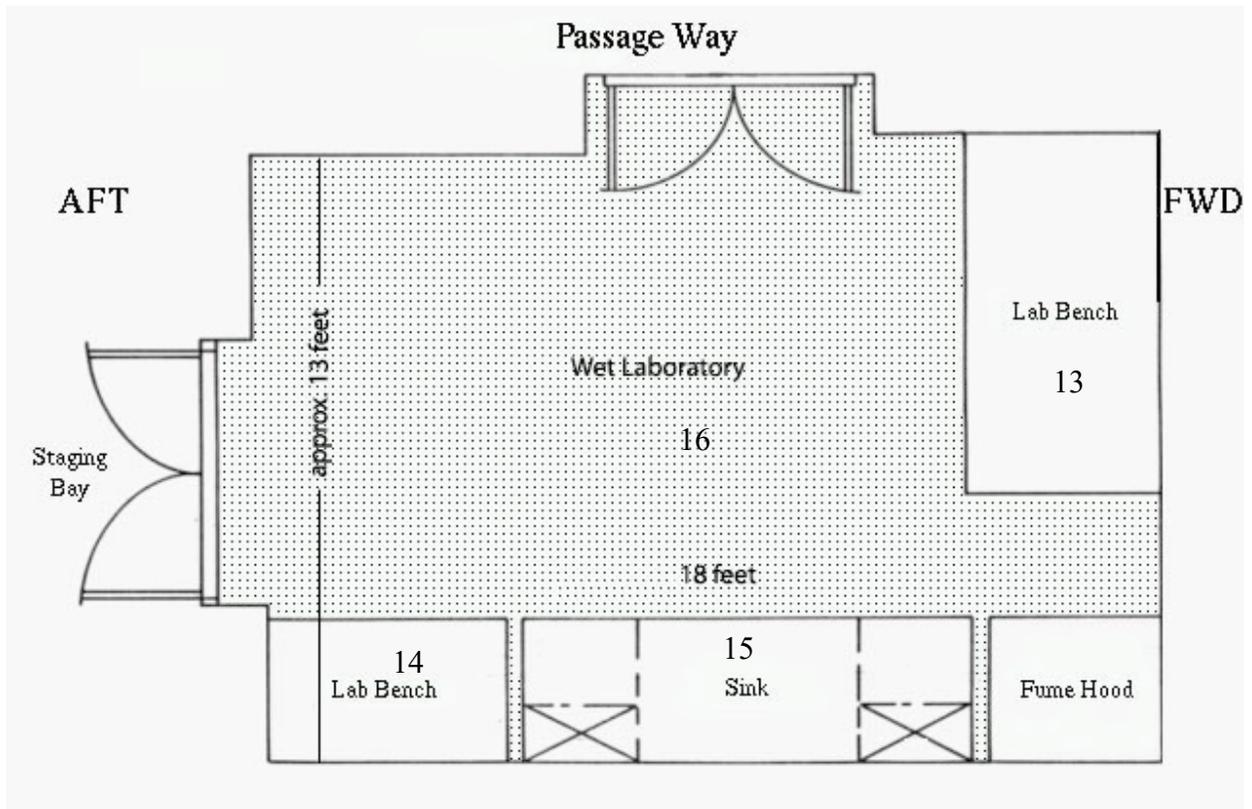


Figure 3
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BioAnalytical Lab Layout

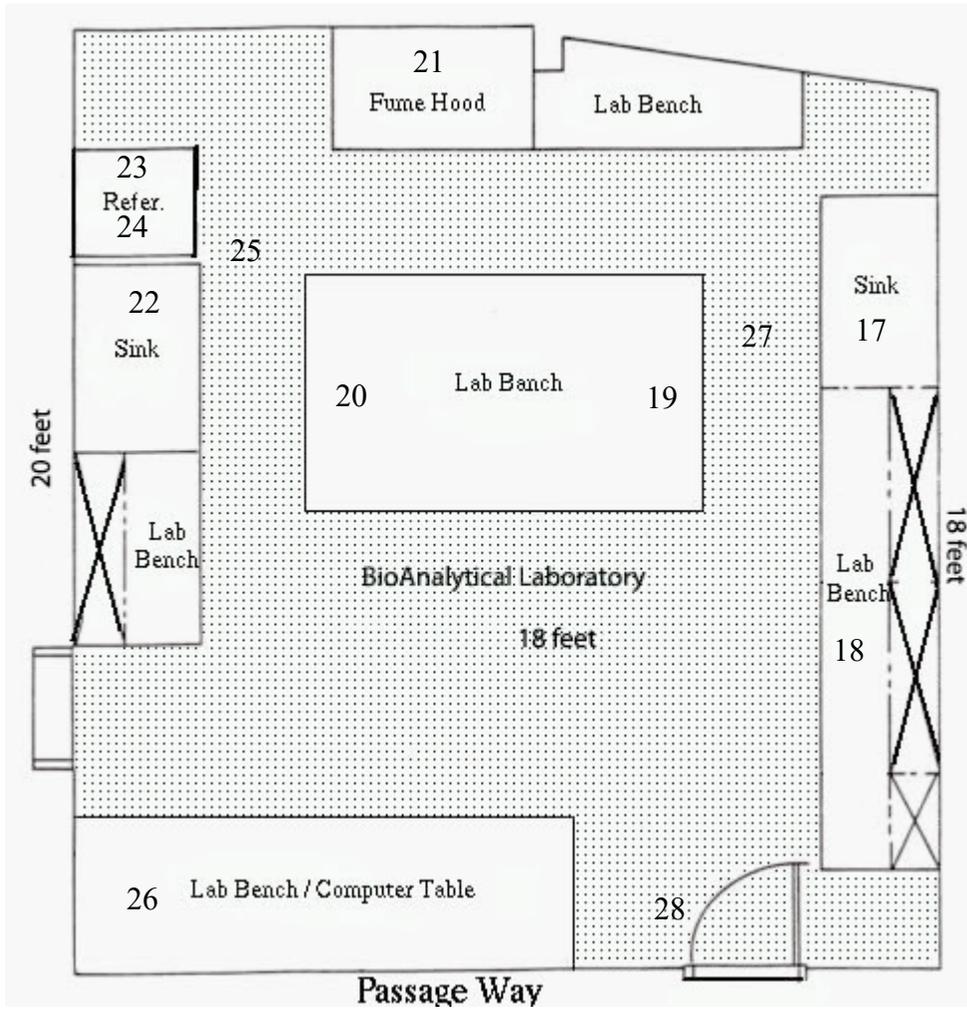


Figure 4
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Computer Lab Layout

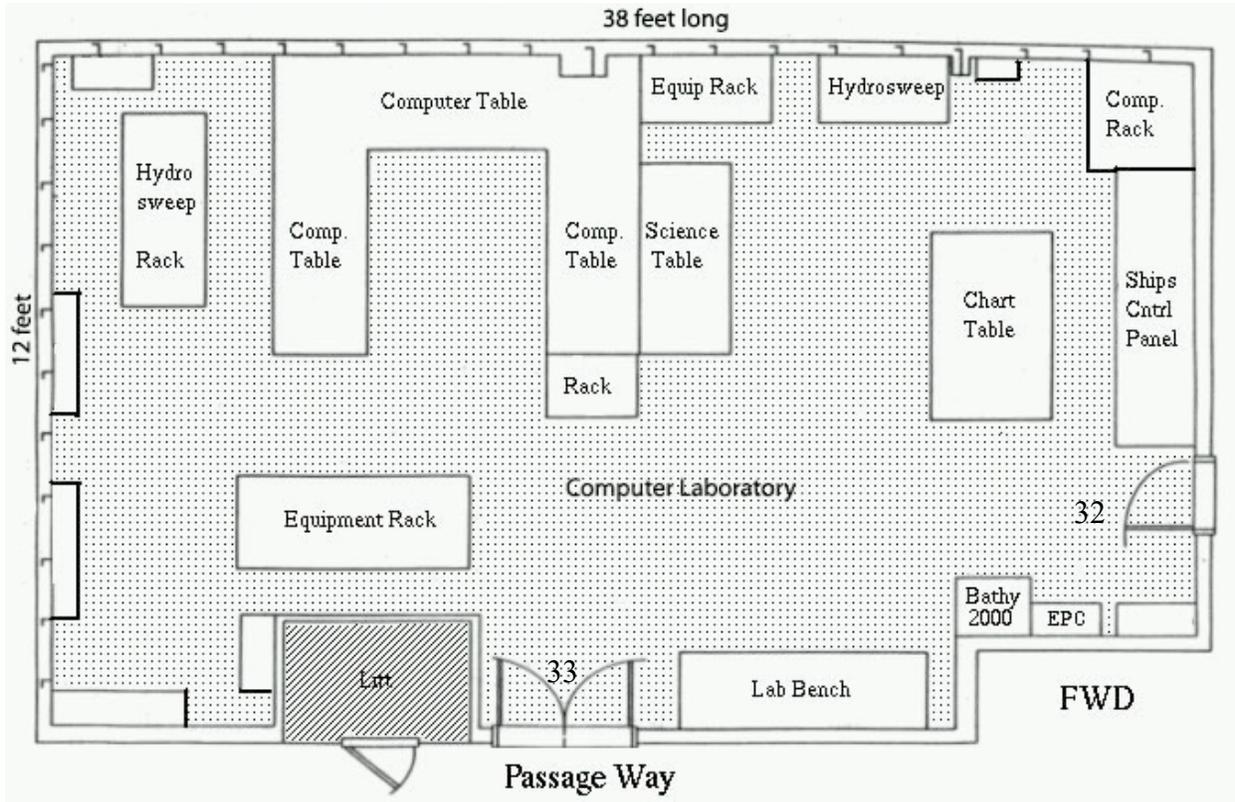


Figure 5
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Main Lab Layout

