

UNIVERSITY OF MIAMI
ROSENSTIEL
SCHOOL of MARINE &
ATMOSPHERIC SCIENCE



Tritium Laboratory

24 March 2020

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SWAB REPORT # 980

SWAB DATE: 4 March 2020

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 # 980

LOCATION: Mauritius
VESSEL: *R/V Thomas Thompson*

DATE: 4 March 2020
TECHNICIAN: Stephen Jalickee

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	36	± 80	-37	± 42
	<u>Hydro lab (Figure 1)</u>				
3	Forward starboard benchtop	2	± 17	-31	± 36
4	Starboard benchtop center section	21	± 58	-10	± 39
5	Aft section of starboard benchtop	30	± 77	-26	± 30
6	Aft benchtop	21	± 83	-21	± 24
7	Aft port benchtop	8	± 181	-13	± 47
8	Port sink area	25	± 40	9	± 34
9	Center benchtop	31	± 54	-10	± 37
10	Deck between center & starboard benchtop	28	± 44	8	± 32
11	Deck between center & port benchtop	8	± 61	-3	± 14
12	Deck inside starboard entrance	10	± 19	34	± 39
	<u>Wet Lab (Figure 2)</u>				
13	Forward benchtop	12	± 57	-4	± 21
14	Aft starboard benchtop	-5	± 38	-7	± 35
15	Sink area	15	± 77	-14	± 73
16	Deck in center of lab	47	± 48	5	± 26
	<u>BioAnalytical Lab (Figure 3)</u>				
17	Forward sink area	29	± 67	-20	± 23
18	Forward benchtop next to sink	40	± 53	-9	± 45
19	Center benchtop forward section	20	± 50	-4	± 19
20	Center benchtop aft section	12	± 55	-5	± 23
21	Inside fume hood	-7	± 55	-10	± 37
22	Aft sink area	40	± 70	-31	± 35
23	Inside aft refrigerator	1	± 4	-17	± 63
24	Inside aft freezer	32	± 73	-26	± 30
25	Deck between sink and fume hood	12	± 22	-34	± 38
26	Starboard benchtop aft section	20	± 72	-16	± 61
27	Deck in front of forward sink	27	± 91	-31	± 35
28	Deck inside starboard entrance	-3	± 21	-19	± 22

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	21	± 41	8	± 34
30	Deck in forward freezer	7	± 97	-8	± 35
31	Deck outside chambers	59	± 67	-58	± 66
	<u>Computer Lab (Figure 4)</u>				
32	Deck at forward entrance	18	± 80	-16	± 61
33	Deck inside starboard entrance	9	± 312	-17	± 64
	<u>Main Lab (Figure 5)</u>				
34	Main Lab Deck inside aft entrance	24	± 83	-24	± 27
35	Inside fume hood	-5	± 40	-20	± 23
36	Starboard benchtop under monitor	-17	± 133	-15	± 55
37	Final bucket blank CO #1	10	± 19	-25	± 29
38	Initial bucket blank CO #2	37	± 64	-23	± 26
39	Inside Cospolich refrigerator	44	± 64	-28	± 31
40	Starboard sink area	25	± 51	-5	± 21
41	Port sink area	11	± 126	-16	± 60
42	Deck inside forward port entrance	32	± 54	-9	± 38
43	Deck inside middle port entrance	16	± 133	-23	± 26
44	Deck inside aft port entrance	0	± 6	4	± 38
45	Deck below port sink	7	± 51	-14	± 54
46	Final bucket blank CO #2	33	± 96	-38	± 44

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

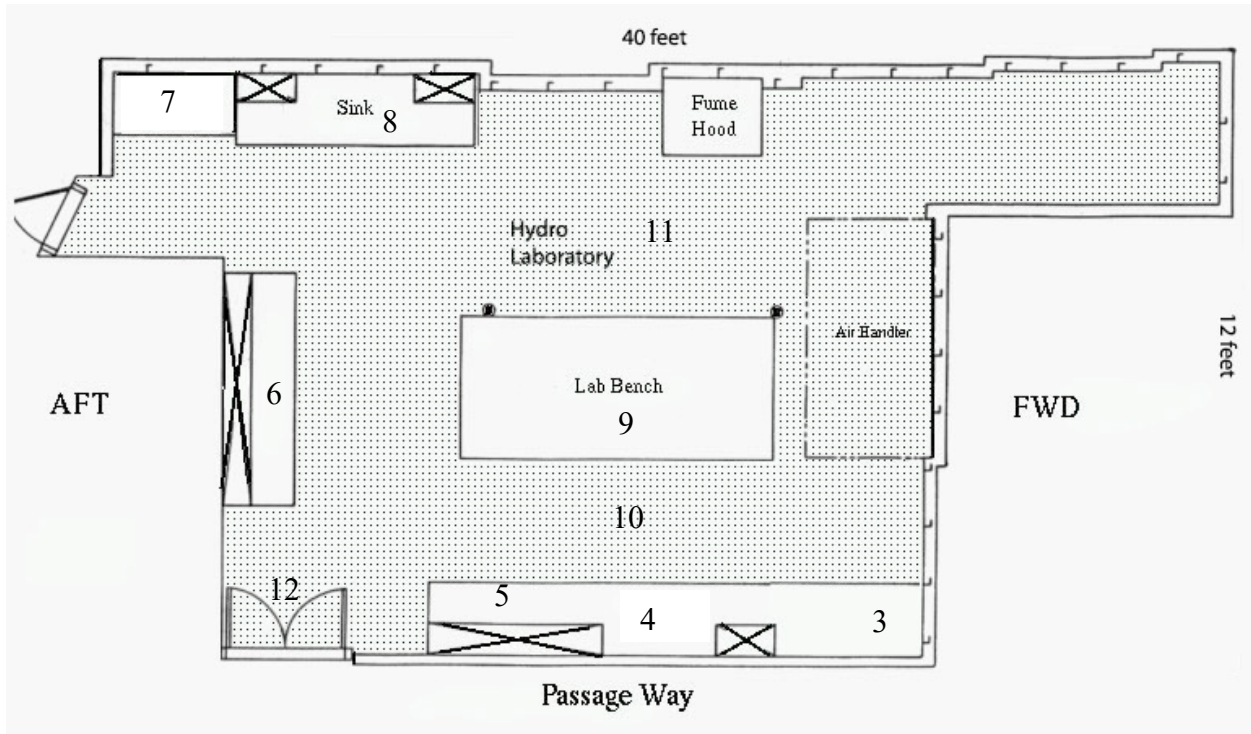


Figure 2
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Wet Lab Layout

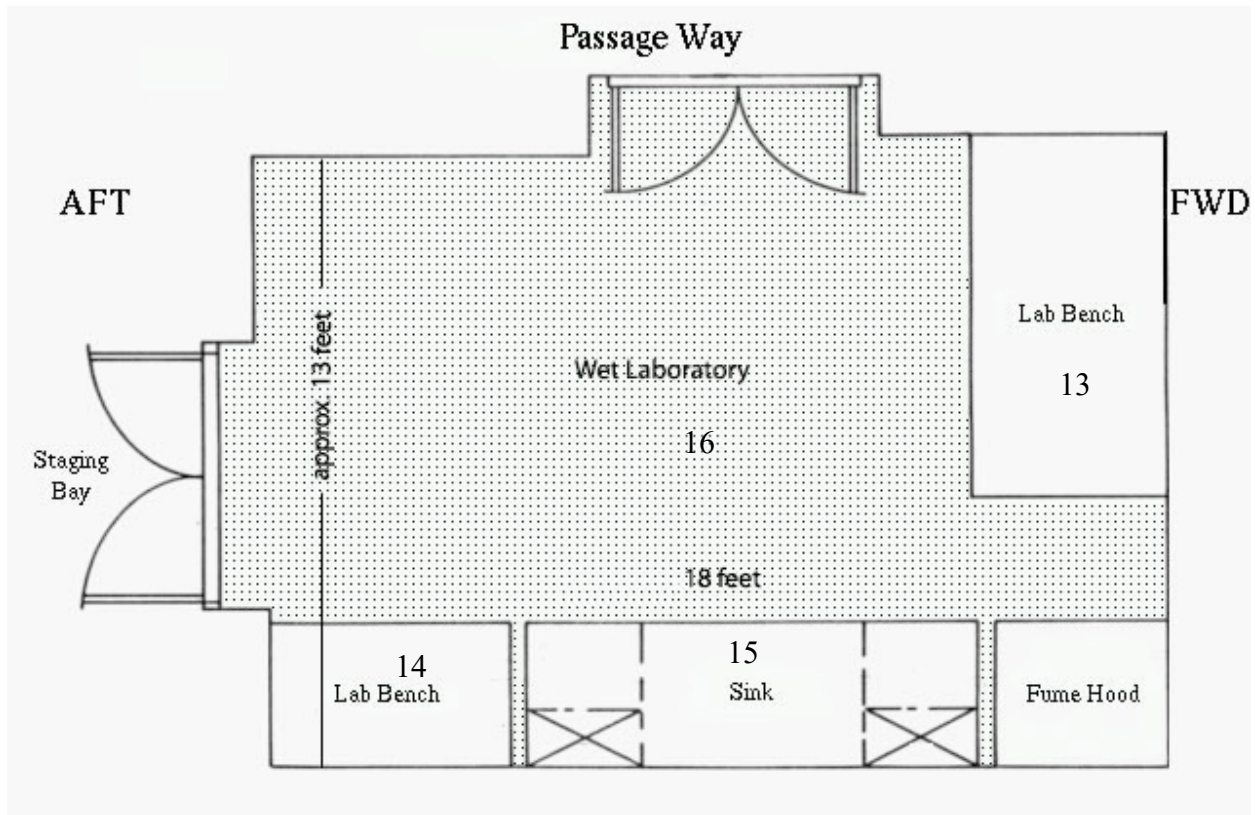


Figure 3
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BioAnalytical Lab Layout

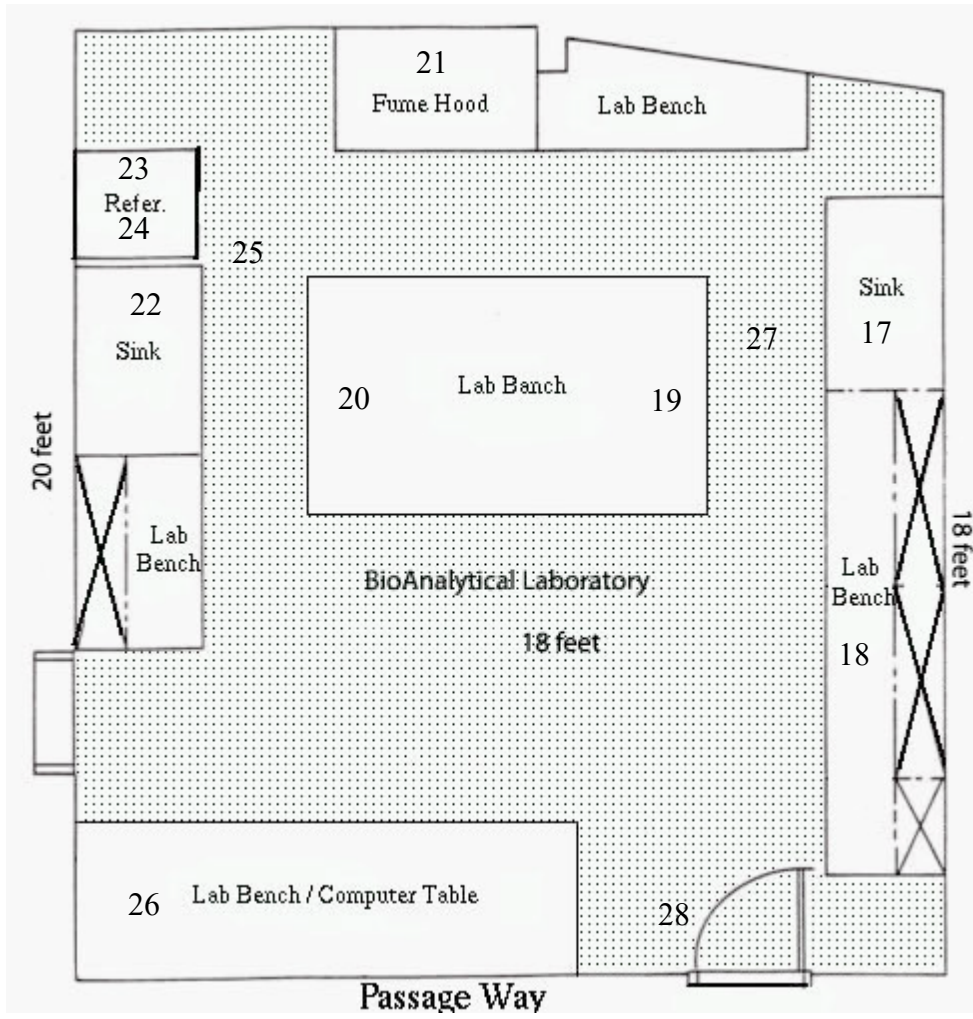
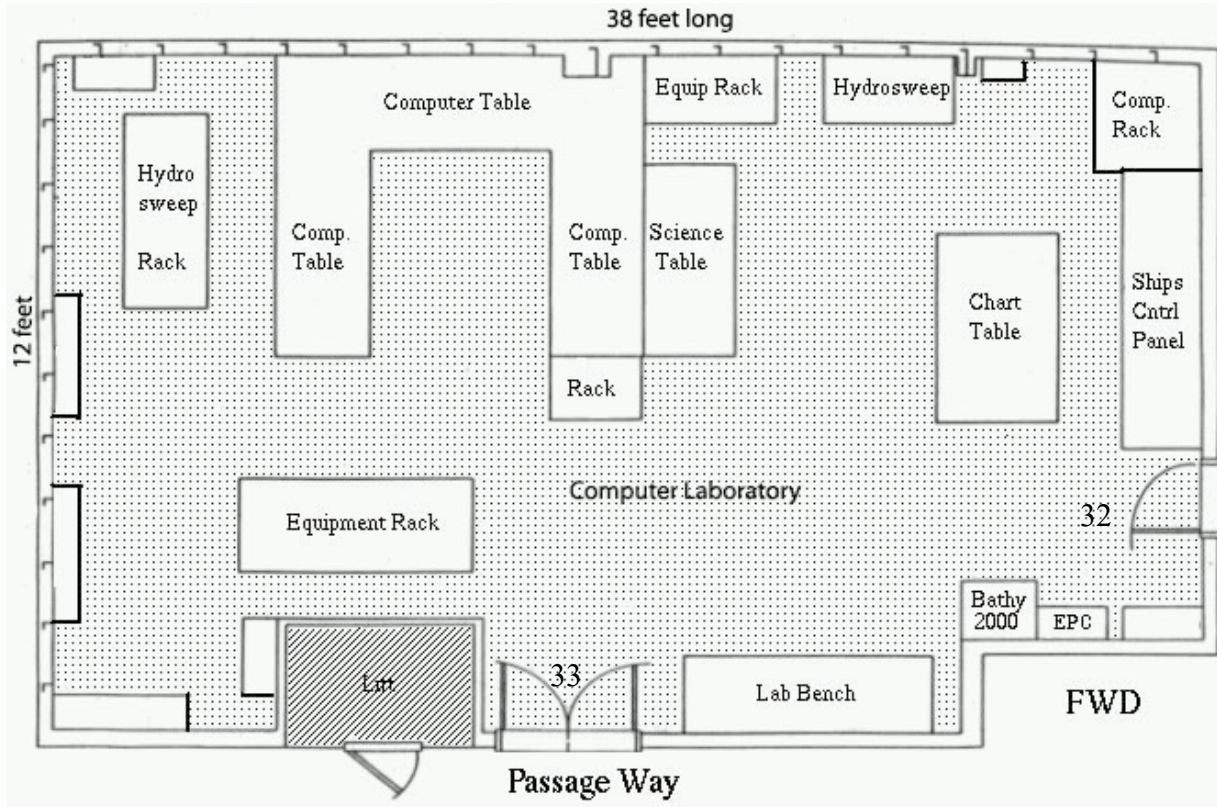


Figure 4
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Computer Lab Layout



Main Lab Layout

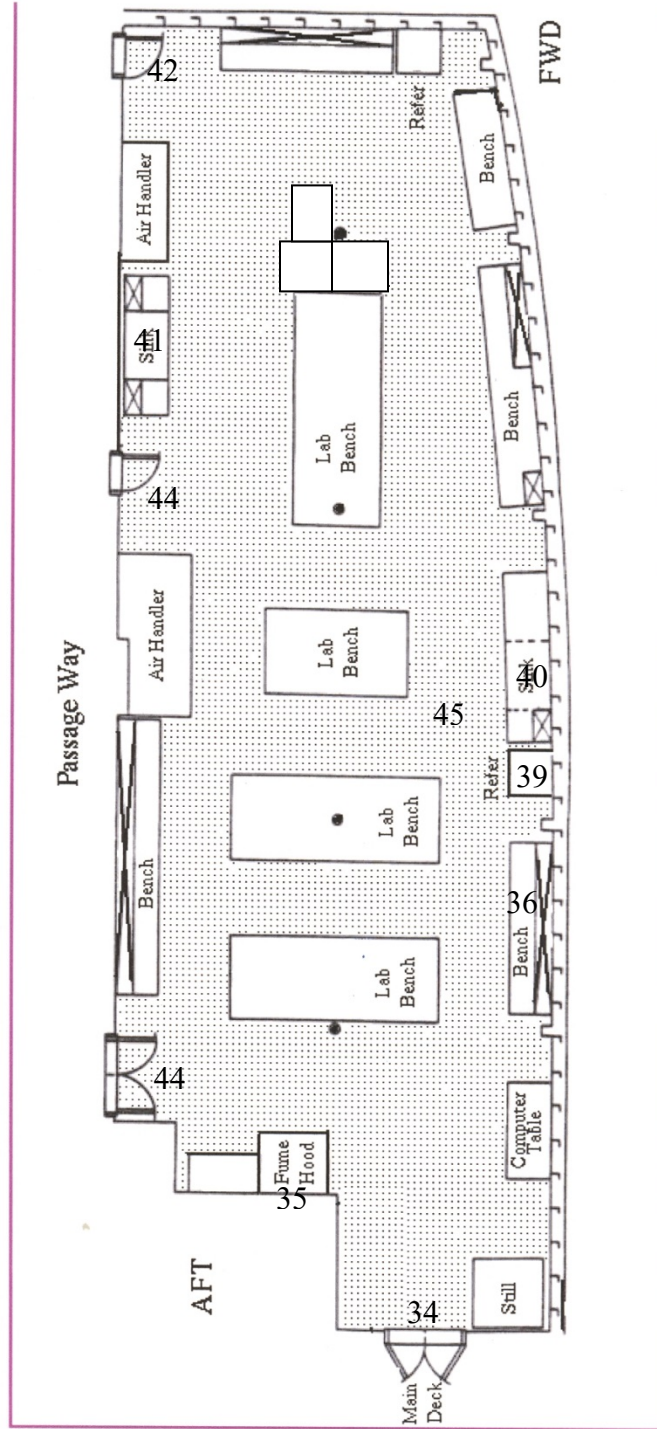


Figure 5
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