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 Engr 351

Arcata Community Forest						
Date:	DO (mg/L)	DO % SAT	Temperature °C	pH	Turbidity (NTU)	Conductivity (Us)
3/6/19	11	96.5	9.6	*	*	*
3/13/19	11.7	98.2	7.8	*	*	*
3/27/19	11.2	98.7	9.9	*	*	*
4/7/19	7.37	67.7	11.6	8.1	19	153.6
4/10/19	10.67	96.7	10.6	8.4	15.3	155.2
4/17/19	10.77	97.1	10.8	8.34	12.7	131.2
Hidden Acres Apartment						
3/6/19	10.7	96.3	10.7	*	*	*
3/13/19	10.8	90.2	7.7	*	*	*
3/27/19	10.4	96.3	12	*	*	*
4/7/19	6.56	63.1	13.2	8.45	21.6	131.5
4/10/19	9.71	90.4	12	8.23	16.9	156.5
4/17/19	9.44	91	13.6	8.14	13.5	143.1
Note: * means no data of pH, turbidity and conductivity was taken for these dates						

Counted Coliforms

Location	Date	Volume (mL)	Total Coliforms Counted	Total Coliforms per 100 mL	Fecal Coliforms		
					Blue	Yellow	
Arcata Commu	3/13/19	15	129	860	7	1	
		25	159	636	12	0	
	3/27/19	15	324	2160	23	7	
		25	424	1696	51	18	
			35	628	1794.285714	*	*
	4/7/19	5	189	3780	2	0	
		10	213	2130	2	0	
		15	356	2373.333333	4	0	
	4/10/19	3	105	3500	1	0	
		5	102	2040	2	0	
		7	239	3414.285714	3	0	
	4/17/19	5	120	2400	1	0	
		7	186	2657.142857	2	0	
		9	263	2922.222222	*	*	
	Hidden Acre A	3/13/19	15	181	1206.666667	9	18
25			*	*	11	13	
3/27/19		15	264	1760	75	9	
		25	420	1680	114	15	
		35	924	2640	133	6	
4/7/19		5	396	7920	5	0	
		10	402	4020	11	2	
		15	528	3520	23	0	
4/10/19		3	138	4600	5	0	
		5	209	4180	7	0	
		7	226	3228.571429	4	0	
4/17/19		5	209	4180	*	*	
		7	355	5071.428571	3	0	
		9	378	4200	4	0	

Final Results with Average Coliform Colonies per 100

Date	Location	Total Coliform Colonies per 100r	Standard Devia	iform Colonies pe
13-Mar	Upstream	748.0	158	50.7
27-Mar	Upstream	1883	245	238
7-Apr	Upstream	2761	891	28.9
10-Apr	Upstream	2985	819	38.7
17-Apr	Upstream	2660	261	24.3

Date	Location	Total Coliform Colonies per 100r	Standard Devia	iform Colonies pe
13-Mar	Downstream	1207	N/A	138
27-Mar	Downstream	4636	533	491
7-Apr	Downstream	5153	2409	128
10-Apr	Downstream	4003	703	121
17-Apr	Downstream	4484	509	43.7

Note: N/A , nc

Graphing Table

date	recipitation (in	Date	EPA Standard
			200
			200
3/7/19	0		200
3/8/19	0.06		200
3/9/19	0.17		200
3/10/19	0		
3/11/19	0		
3/12/19	0.2		
3/13/19	0	3/13/19	
3/14/19	0		
3/15/19	0		
3/16/19	0		
3/17/19	0		
3/18/19	0		
3/19/19	0		
3/20/19	0.13		
3/21/19	0		

3/22/19	0.26	
3/23/19	0	
3/24/19	0	
3/25/19	1.15	
3/26/19	0	
3/27/19	0.32	3/17/19
3/28/19	0.45	
3/29/19	0.05	
3/30/19	0	
3/31/19	0	
4/1/19	0.05	
4/2/19	0.14	
4/3/19	0.08	
4/4/19	0	
4/5/19	0.63	
4/6/19	0.05	
4/7/19	0.12	4/7/19
4/8/19	0.85	
4/9/19	0.02	
4/10/19	0	4/10/19
4/11/19	0.07	
4/12/19	0	
4/13/19	0	
4/14/19	0.04	
4/15/19	0.15	
4/16/19	0.06	
4/17/19	0	4/17/19
4/18/19	0	
4/19/19	0	
4/20/19	0.1	
4/21/19	0	

s Counted	Fecal Coliform per 100mL
total	

8	53.33333333
12	48
30	200
69	276
*	*
2	40
2	20
4	26.66666667
1	33.33333333
2	40
3	42.85714286
1	20
2	28.57142857
*	*

27	180
24	96
84	560
129	516
139	397.1428571
5	100
13	130
23	153.3333333
5	166.6666667
7	140
4	57.14285714
*	*
3	42.85714286
4	44.44444444

Note: * means not applicable

3/13/19	860	1206.66667
3/27/19	2160	1760
4/7/19	3780	7920
4/10/19	3500	4600
4/17/19	2400	4180

Standard Deviation

3.77
53.7
10.2
4.89
6.06

Standard Deviation

59.4
84.2
26.7
57.1
1.12
not applicable

Sample Testing for: Total Suspended

Location	Date	ID #	Volume (ml)	weight of crucible (g)	Date	weight of crucible + residue @105°C (g)	Date	weight of crucible + residue @550°C (g)
Commur	3/6/19	1	422	24	3/7/19	23.6163	3/8/19	23.6150
		2	450	23		22.6800		22.678
		3	200	19		18.9473		18.945
Hidden A	3/6/19	4	234	24	3/7/19	24.3371	3/8/19	24.336
		5	481	22		21.6487		21.645
		6	263	22		22.4595		22.456

Sample Testing for: Total Solids

Location	Date	ID #	Volume (ml)	weight of evaporating dish (g)	Date	weight of dish + residue @105°C (g)
Commur	3/6/19	17	100	77	3/7/19	77.4244
		28	100	72		71.9510
		16	100	####		72.7037
Hidden A	3/6/19	34	100	72	3/7/19	72.2136
		14	100	####		70.6089
		24	100	72		72.4661

Location	Trials	TS	TSS	TDS	VSS	FSS
Upstream	17	96	13	83	3.1	10.0
	28	138	14	124	3.6	10.9
	16	137	32	105	9.5	23
Downstream	34	103	32	71	6.8	25
	14	109	12	97	6.9	4.8
	24	118	49	69	12	37

Upstream	TS	TSS	TDS	VSS	FSS
Average	124	20	104	5.4	15
Standard	24	11	20	3.6	7.3

Downstream	TS	TSS	TDS	VSS	FSS
Average	110	31	79	8.6	22
Standard	7.5	19	16	3.1	16

Conversion (g → mg) & (mL →
1000

Location:	Nutrient	dilution vol (mL)	mV or absorbance
Community forest	phosphate	5	0.056
		5	0.075
	nitrate	100	169
		100	173
	ammonia	100	11.4
		100	-3.2
Hidden Acres	phosphate	5	0.064
		5	0.068
	nitrate	100	157
		100	159
	ammonia	100	35
		100	18.2

Phosphorous Curve Data

Concentration	Absorbance (abs)
0.01	0.012
0.1	0.064
1	0.637
4	1.615

Calibration Curve: $y = 0.394x + 0.078$

Sample
Upstream
Downstream

Sample
Upstream
Downstream

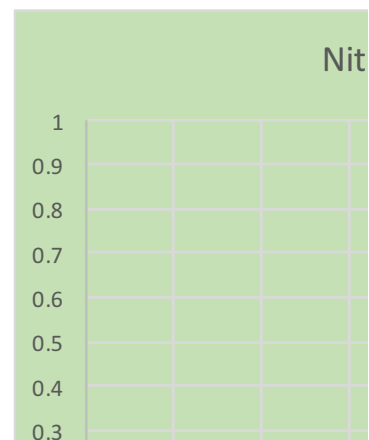
Nitrate Curve Data

Concentration	Log of Concentr	Voltage (mV)
0.1	-1	176
0.5	-0.301029996	173
1	0	160
10	1	115

Calibration Curve: $y = -31.9172x + 152.59$

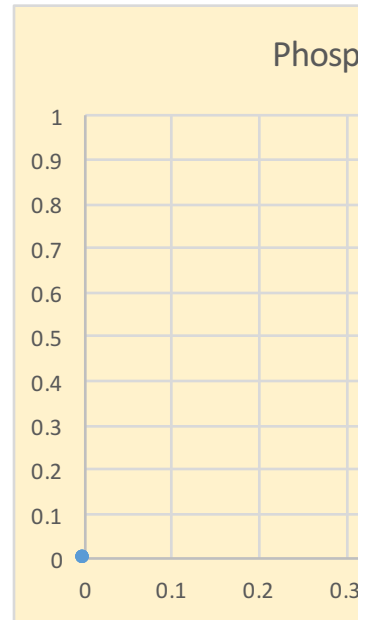
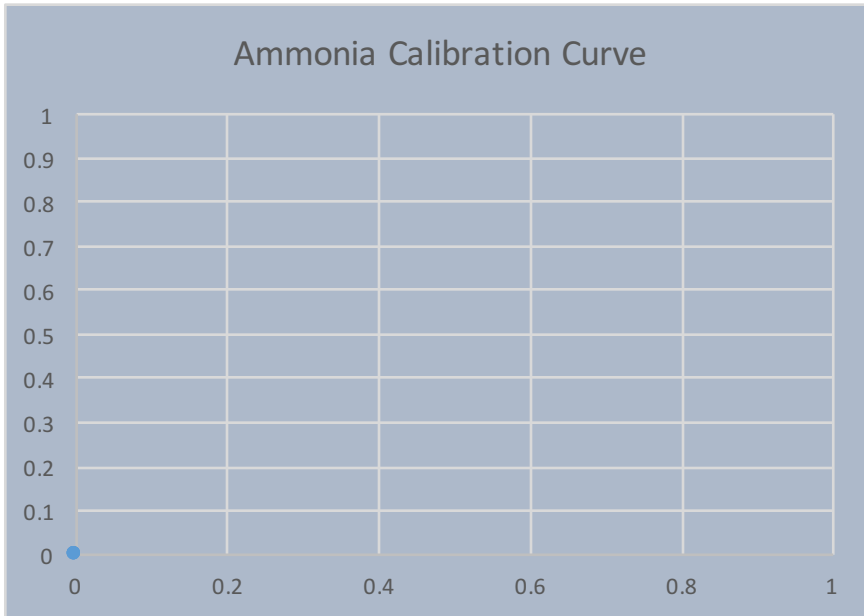
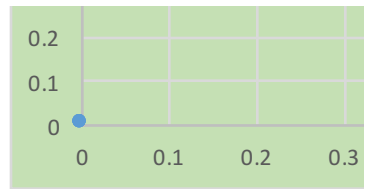
Ammonia Curve Data

Concentration	Log of Concentr	Voltage (mV)
0.1	-1	97.7
1	0	53.1



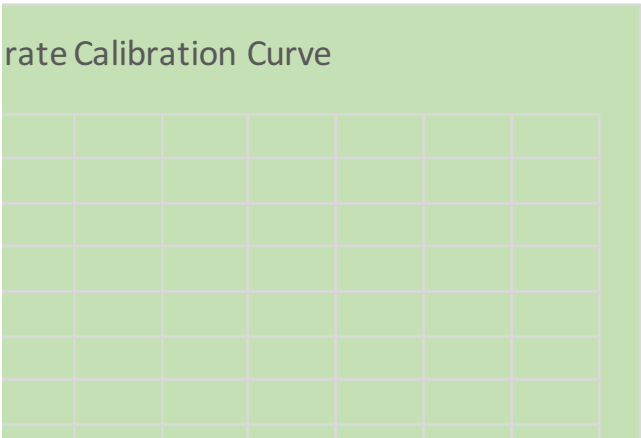
10	1	-3.3
100	2	-63

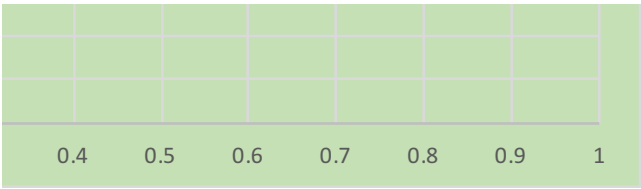
Calibration Curve: $y = -53.85x + 48.05$



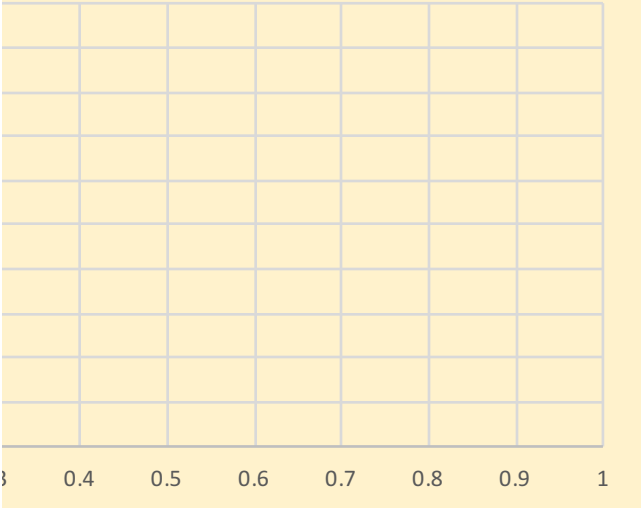
Nutrient Raw Data		
Nitrate (mV)	Phosphorous (abs)	Ammonia (mV)
105.0	1.078	0.000
106.0	0.7840	0.100

Nutrient Concentration Calculation		
Nitrate (mV)	Phosphorous (abs)	Ammonia (mV)
0.1727	2.5363	-0.04949
0.1634	1.7901	-0.05040





Phorous Calibration Curve



Initial Readings

Location: Community Forest		Date: 3/27/19		
BOD bottle	Control	4	29	31
Volume Used	78	80	120	240
DOi (mg/L)	8.71	9.22	9.59	10.45
DO %SAT	101.7	105.7	109	115.1
Temp°C	23.2	22.2	21.7	20.1
time:	3:48	3:51	3:53	3:55

Location:Hidden Acres		Date: 3/27/19		
BOD bottle	Control	33	27	21
Volume Used	78	80	120	240
Doi (mg/L)	9.1	9.13	9.34	10.12
DO %SAT	105.5	105.3	106.9	113.4
Temp°C	22.4	22.4	22	20.9
time:	3:57	3:58	4:00	4:01

Final Readings

Location: Community Forest		Date: 4/1/19		
BOD bottle	Control	4	29	31
DOf (mg/L)	8.76	9.2	9.53	10.02
DO %SAT	96.9	101.4	104.9	110.3
Temp°C	20.14	20.11	20.05	20.05
time:	2:04	2:06	2:06	2:08

Location: Hidden Acres		Date: 4/1/19		
BOD bottle	Control	33	27	21
DOf (mg/L)	8.76	8.98	9.19	9.59
DO %SAT	96.6	98.8	101.2	105.4
Temp°C	20.14	20	20.02	19.97
time:	1:59	2:01	2:01	2:03

Mid point (mg/L)		4		
tot volume (mL)		300		
expected BOD5 (mg/L)		5	10	15
Volume(mL)				
	1	240		
	2	120		
	3	80		
Dilution Factor		1	0.8	
		2	0.4	
		3	0.26666667	
Control		-0.05		

Expected BOD after 5 days

Location: Community Forest			
BOD bottle	4	29	31
BOD _e (t)	0.3	0.3	0.6
Average:	0.4		
Standard Deviation	0.2		
Location: Hidden Acres			
BOD bottle	33	27	21
BOD _e (t)	0.7	0.5	0.7
Average:	0.7		
Standard Deviation	0.1		

Alkalinity				
Location	Date	Trials	volume used (mL)	Alkalinity (mg/L as CaCO ₃)
Community Fo	4/3/19	1	3.3	33
		2	2.4	24
Hidden Acres	4/3/19	1	2.4	24
		2	3.2	32

Hardness				
Location	Date	Trials	volume used (mL)	Hardness (mg/L as CaCO ₃)
Community Fo	4/3/19	1	1.8	36
		2	1.2	24
Hidden Acres	4/3/19	1	2.45	49
		2	2.2	44

Location	Date	Average Alkalinity (mg/L as CaCO ₃)	Standard Deviation	Average Hardness(mg/L as CaCO ₃)
Upstream	4/3/19	29	6.4	30
Downstream	4/3/19	28	5.7	46.5

Average Alkalinity (µg/L as CaCO ₃)	Average Hardness(µg/L as CaCO ₃)
6363.96	29000
5656.85	28000
8485.2814	30000
3535.5339	46500

33000
24000
24000
32000

36000
24000
49000
44000

Standard Deviation
8.5
3.5