

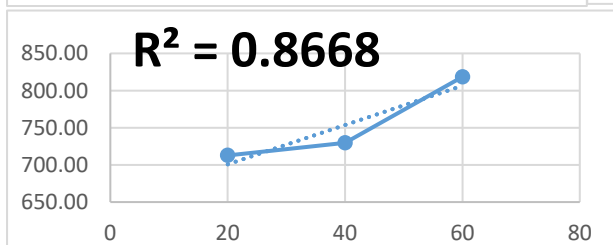
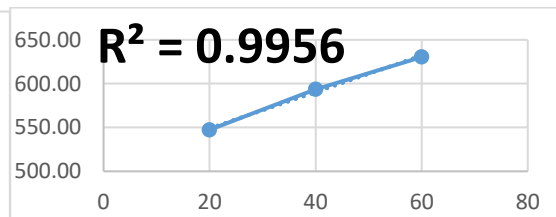
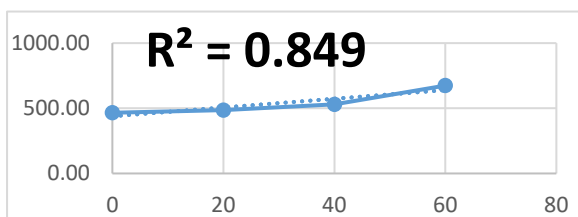
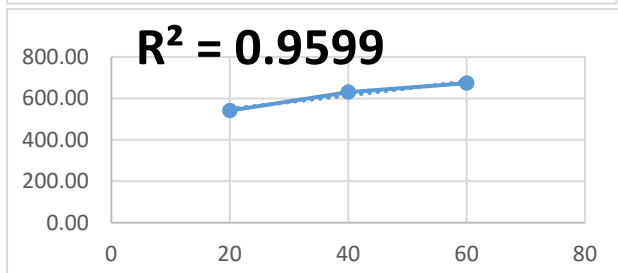
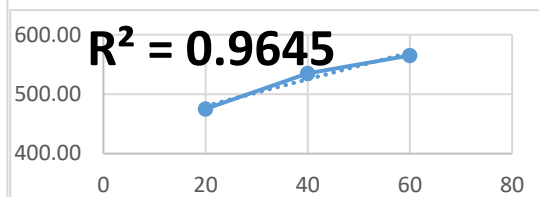
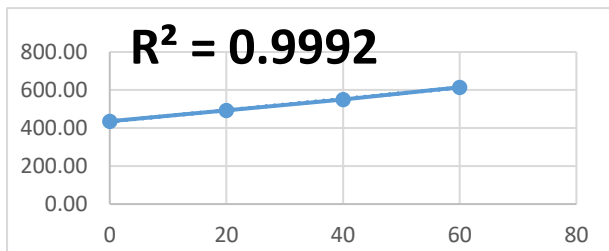
# Greenhouse gas emissions from tropical coastal wetlands and their alternative agricultural lands: Where significant mitigation gains lie

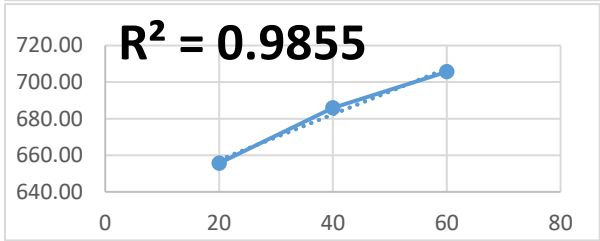
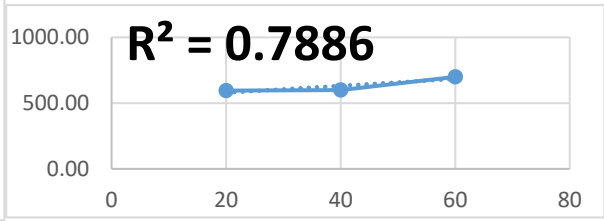
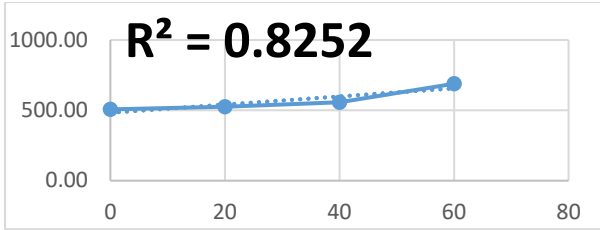
Supplementary data file 2 Linearity test results for Dry-hot season

Iram et al. 2021

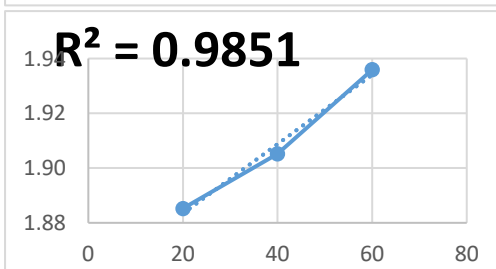
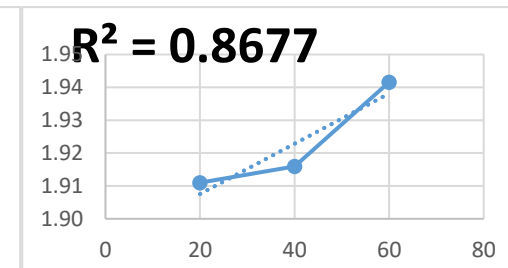
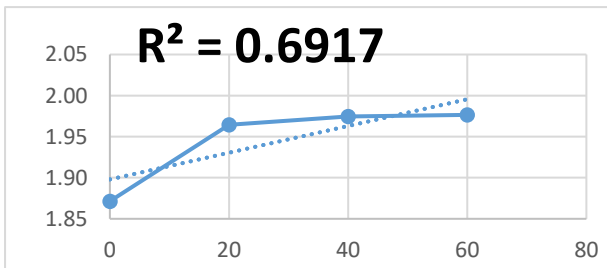
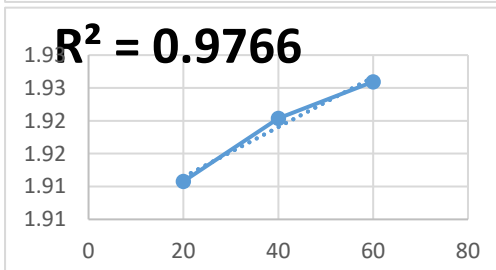
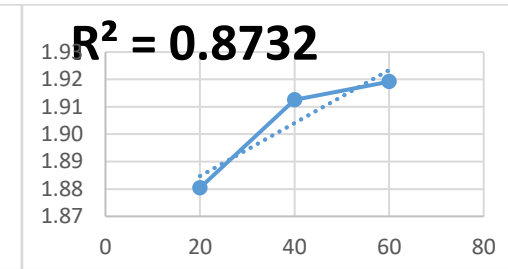
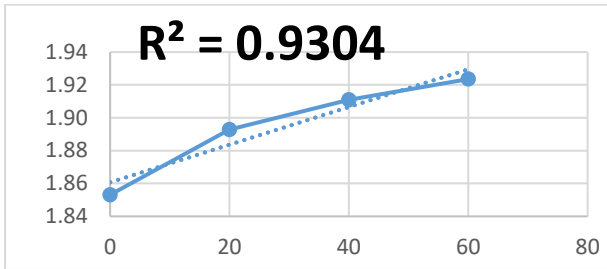
Correspondence: naima.iram@griffithuni.edu.au

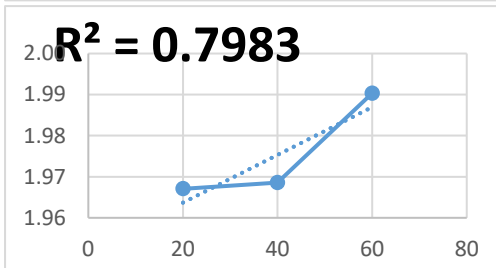
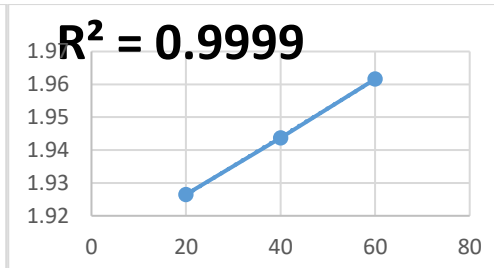
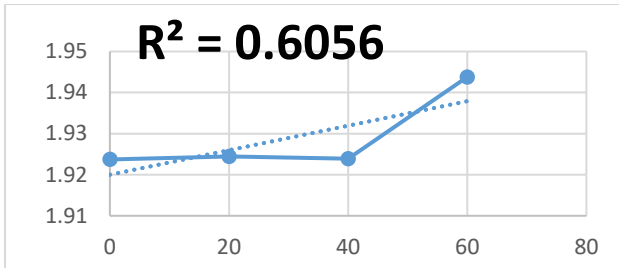
## Mangroves- CO2



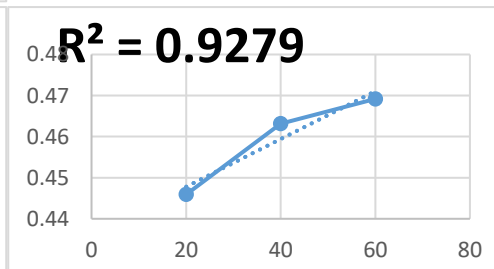
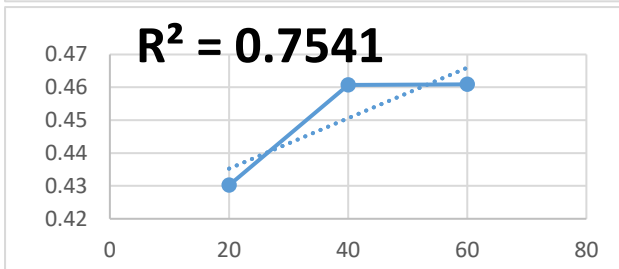
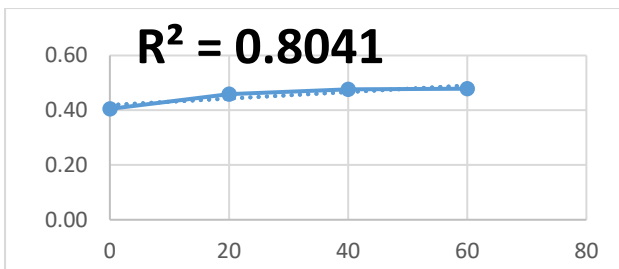
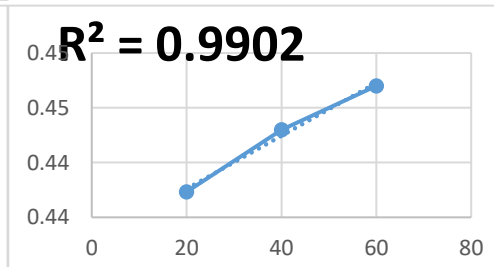
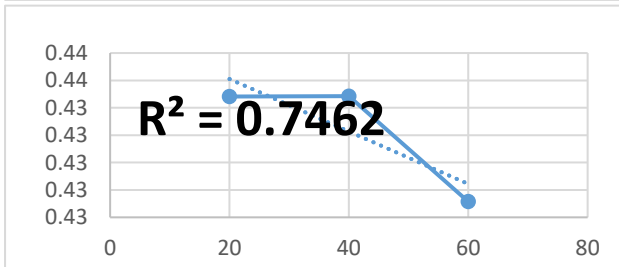
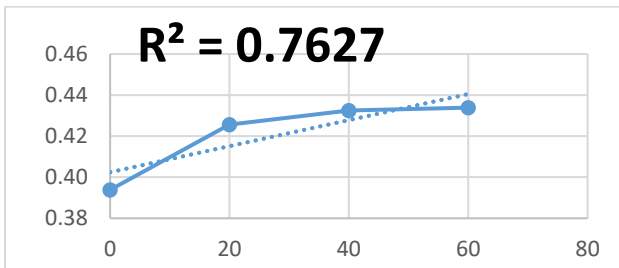


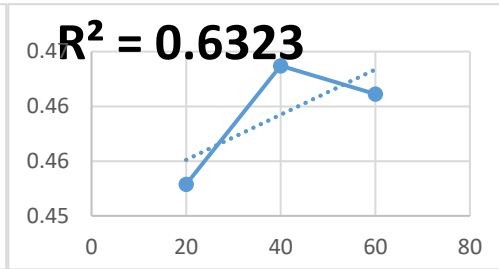
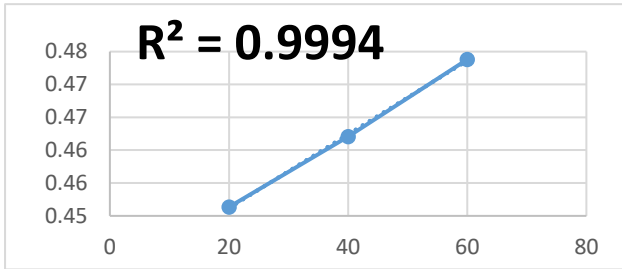
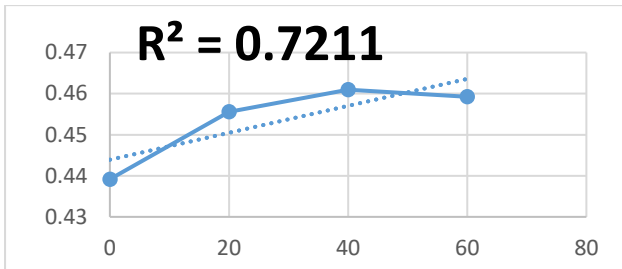
**Mangroves- CH4**



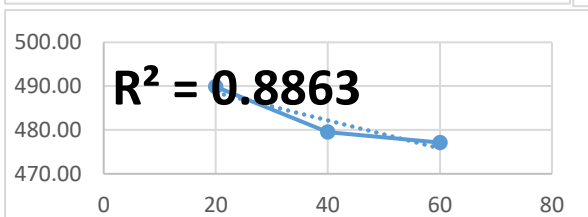
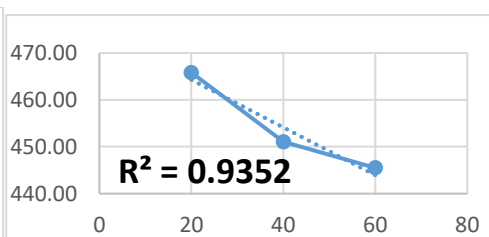
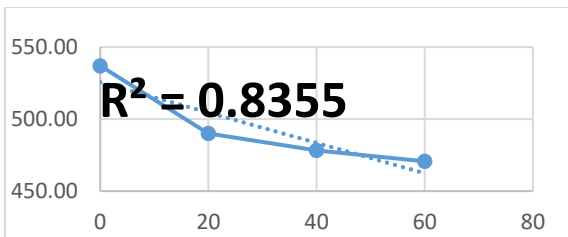
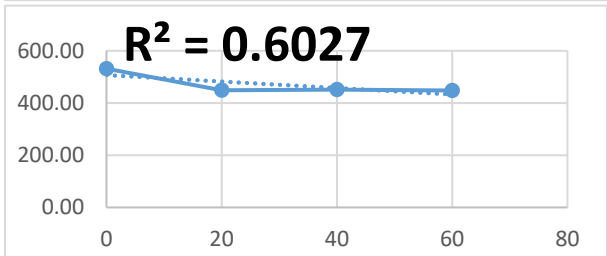
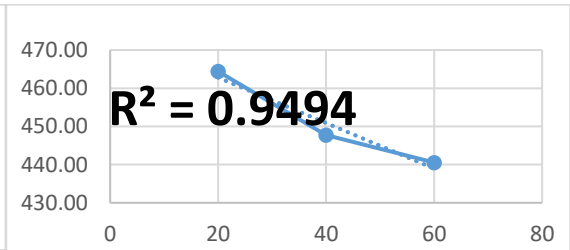
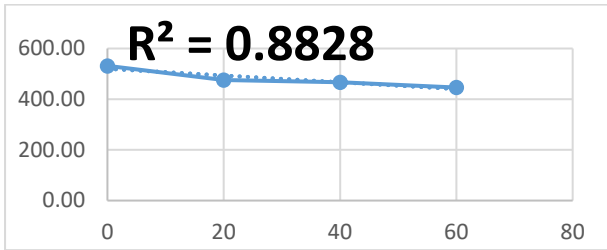


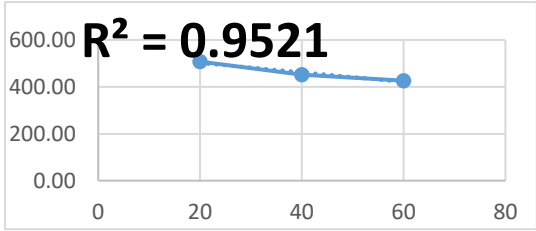
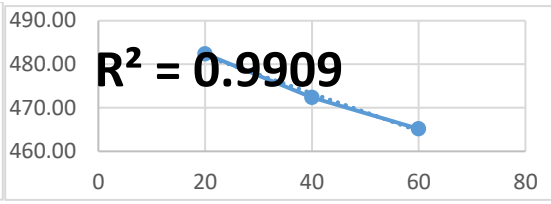
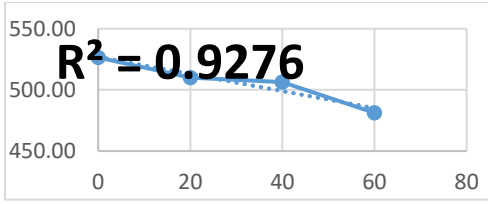
**Mangroves- N2O**



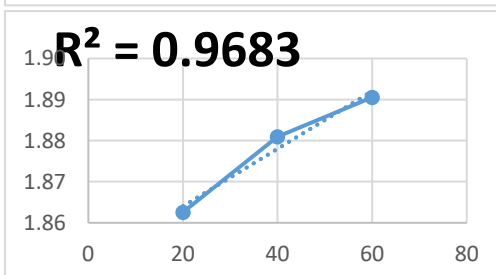
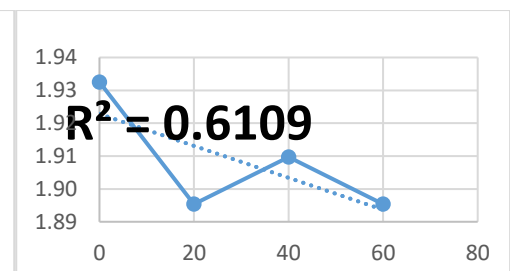
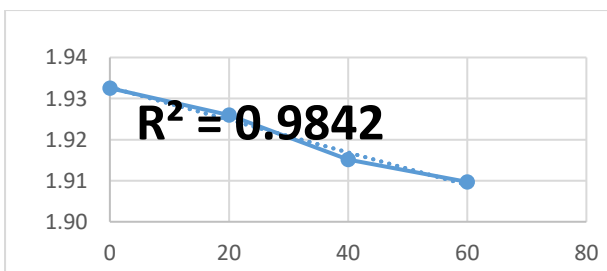
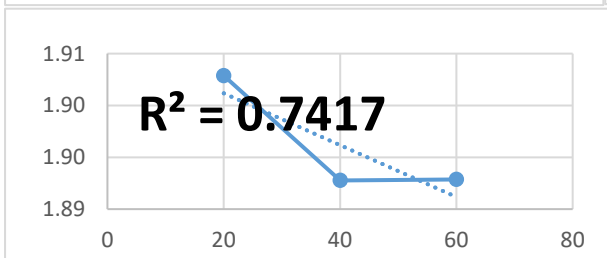
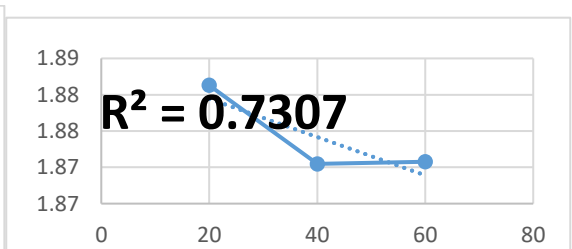
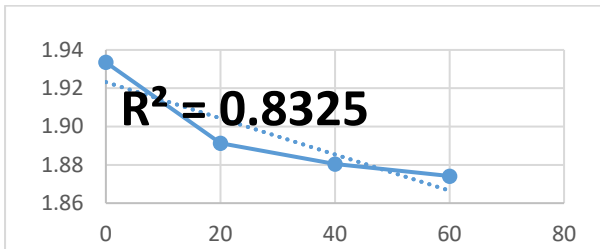


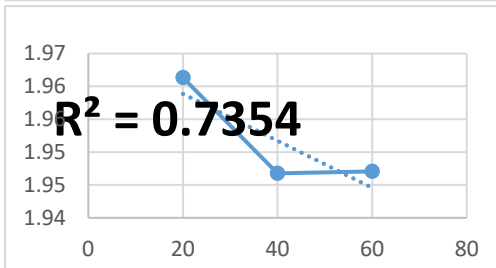
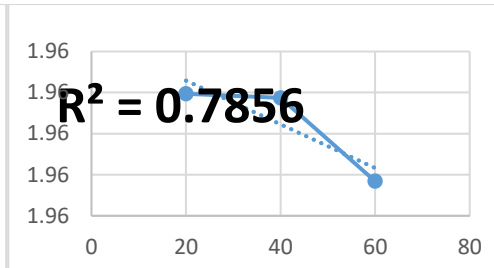
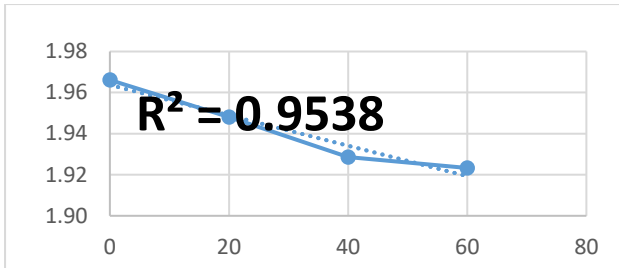
**Saltmarsh- CO2**



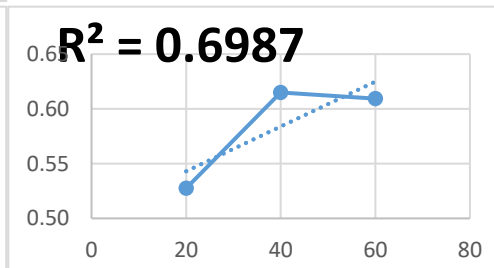
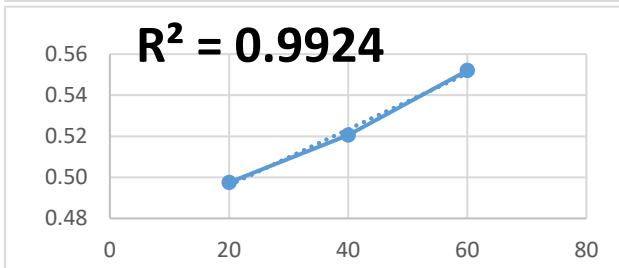
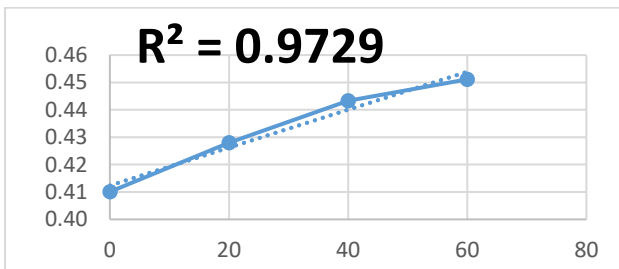


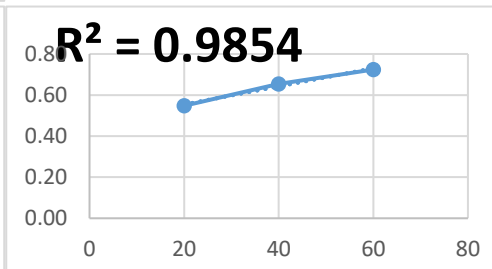
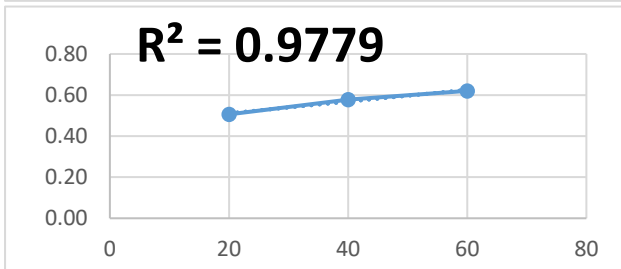
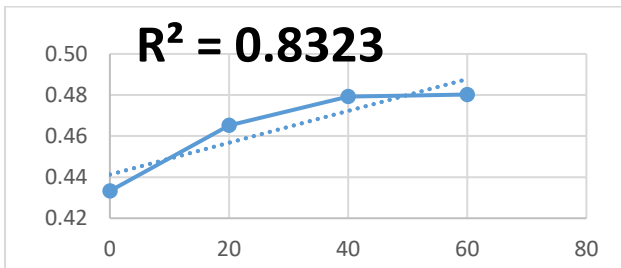
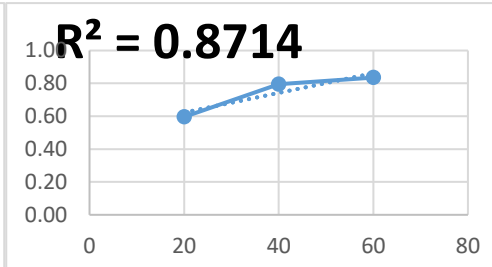
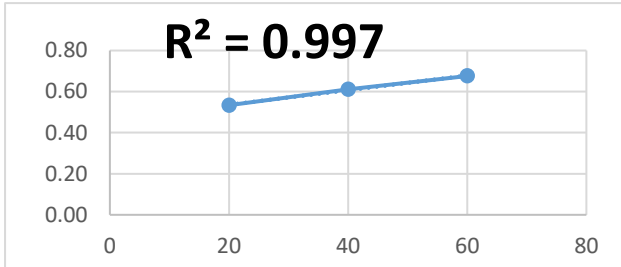
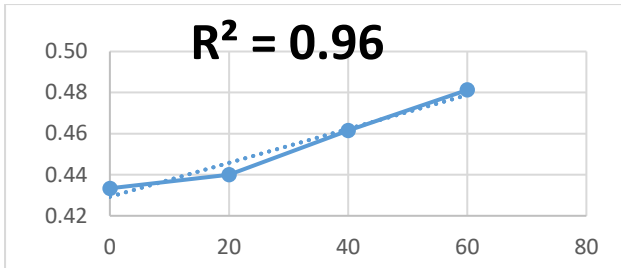
**Saltmarsh- CH4**



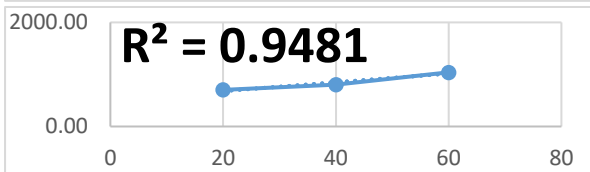
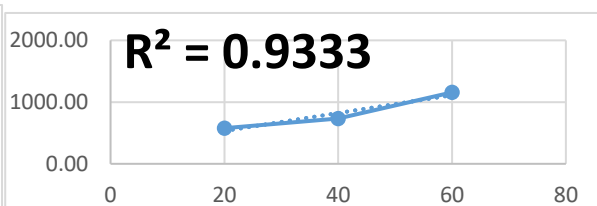
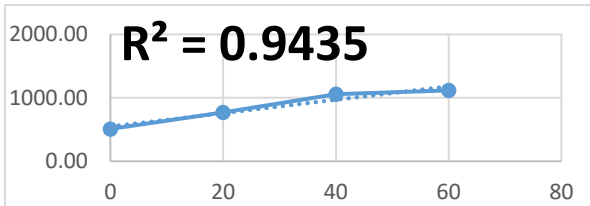


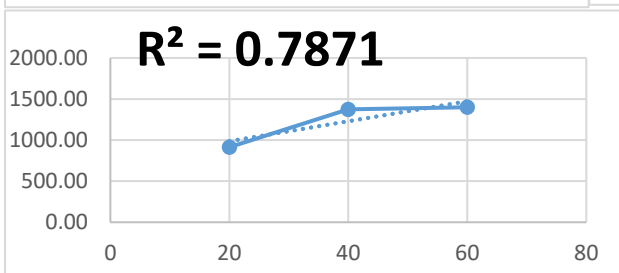
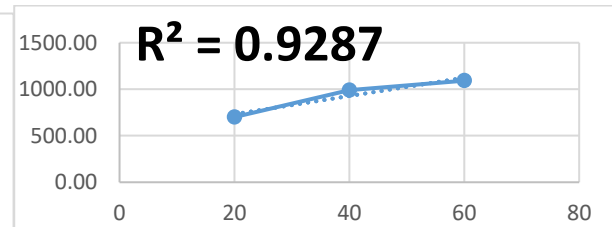
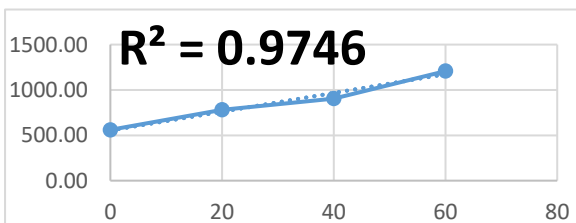
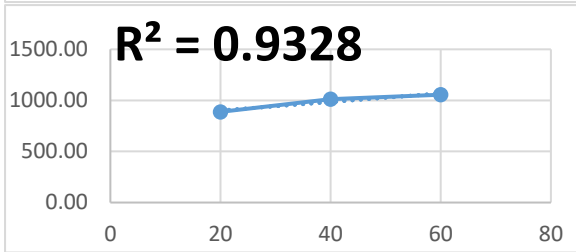
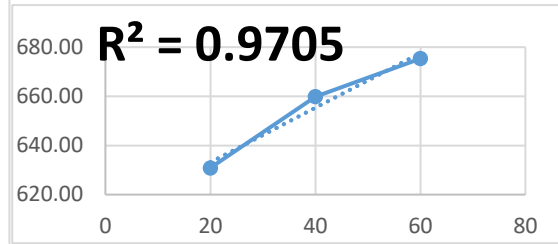
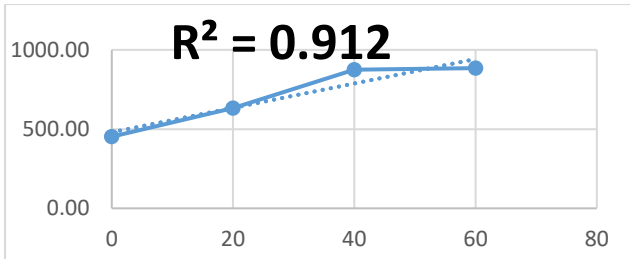
Saltmarsh- N2O





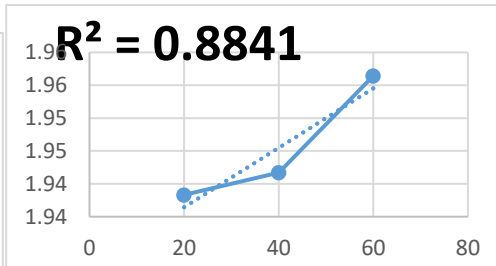
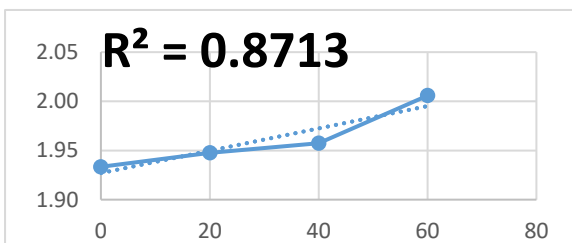
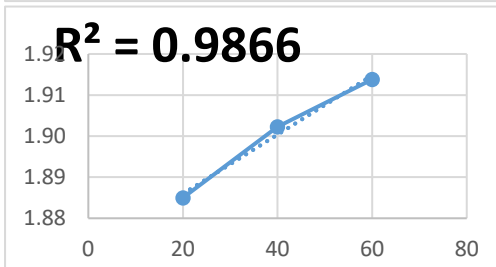
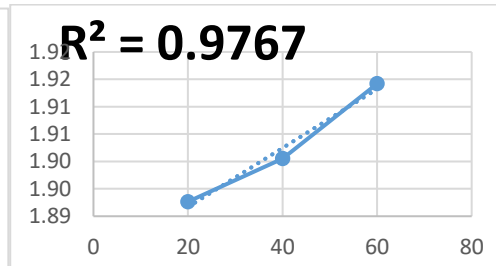
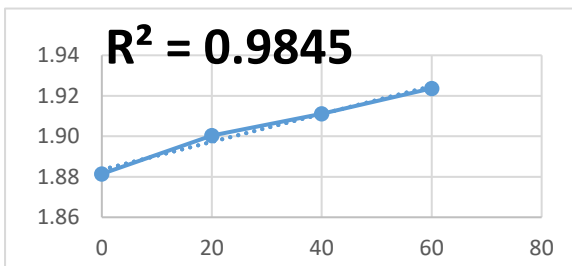
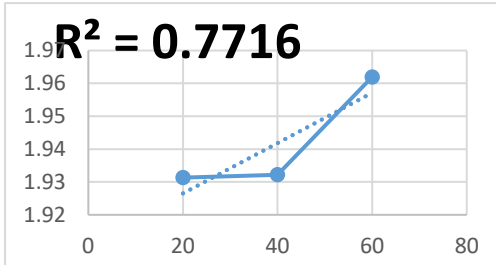
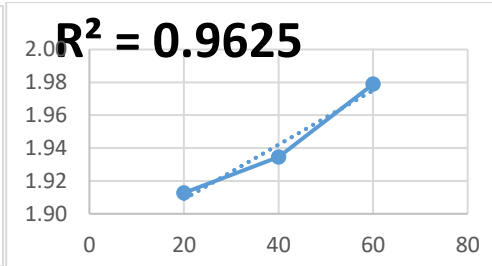
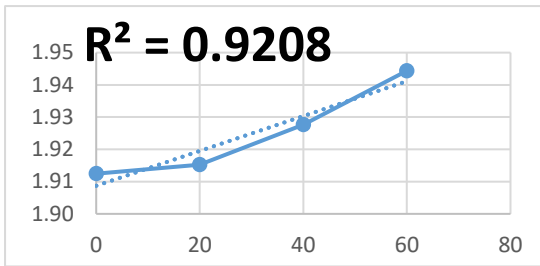
**Freshwater tidal forest-CO2**



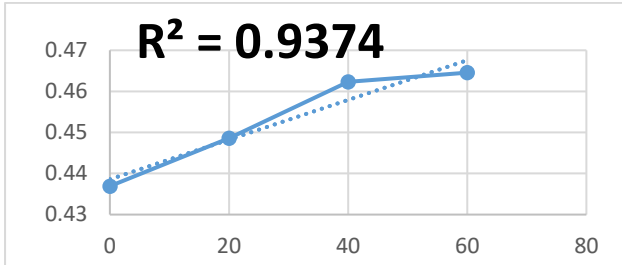
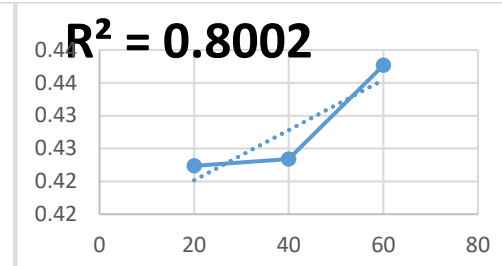
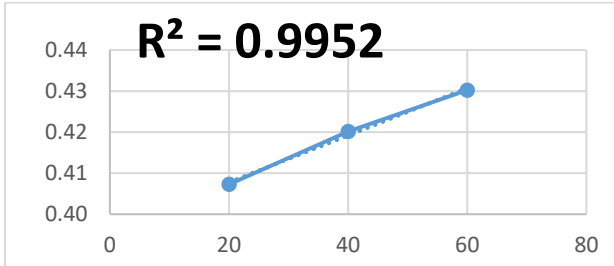
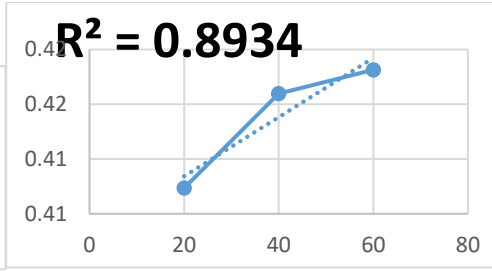
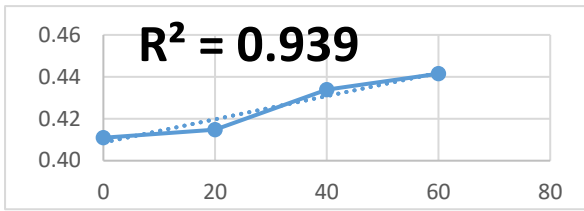


**Freshwater tidal forest-CH4**

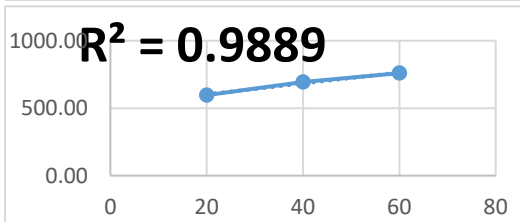
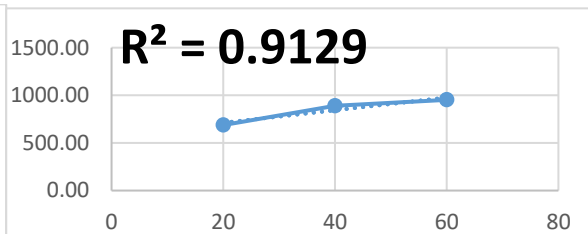
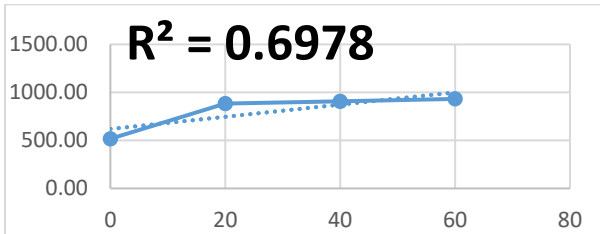


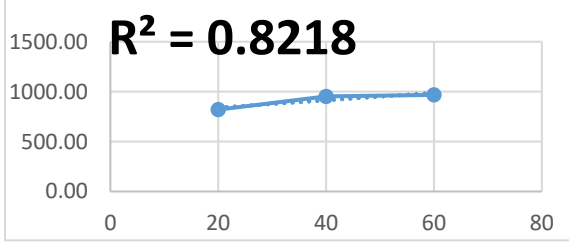
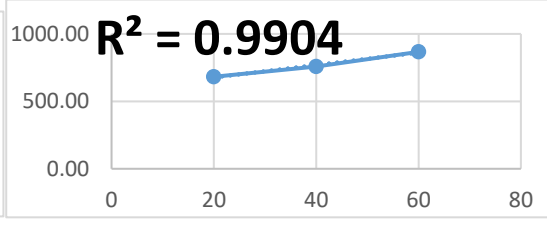
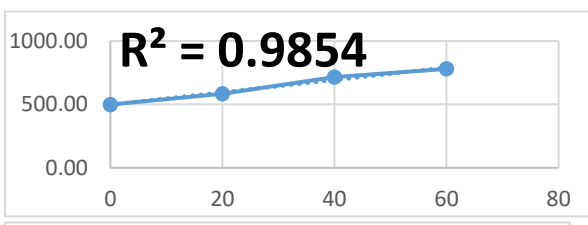
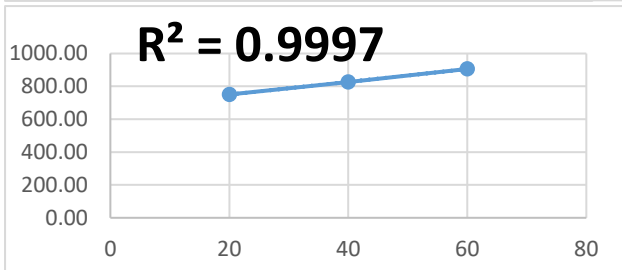
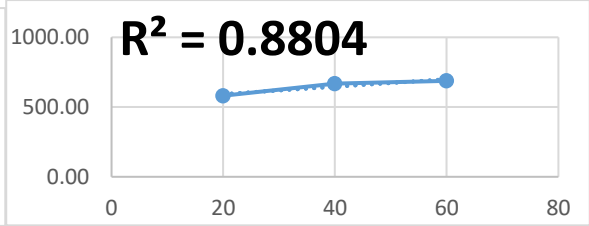
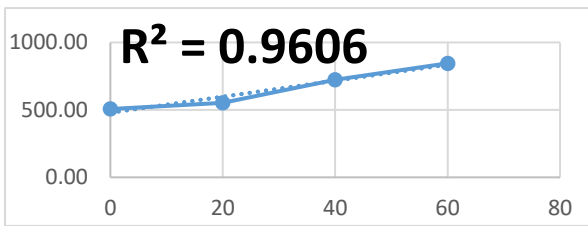


**Freshwater tidal forest-N2O**

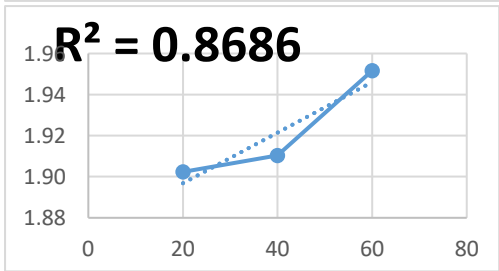
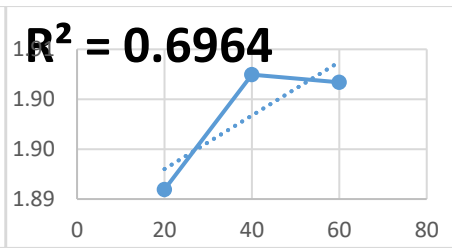
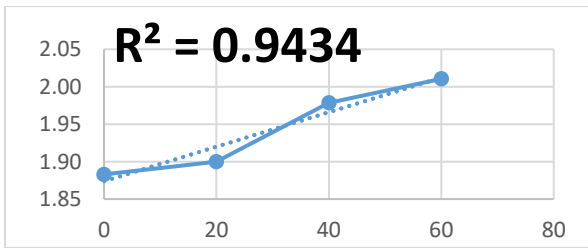


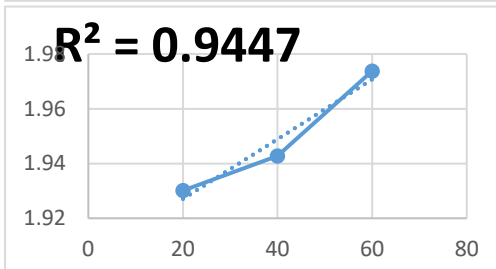
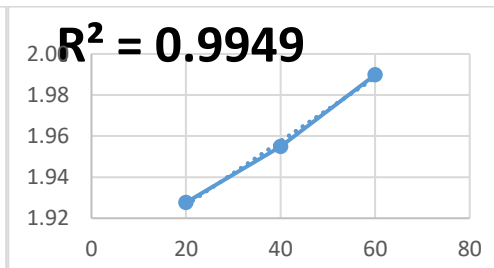
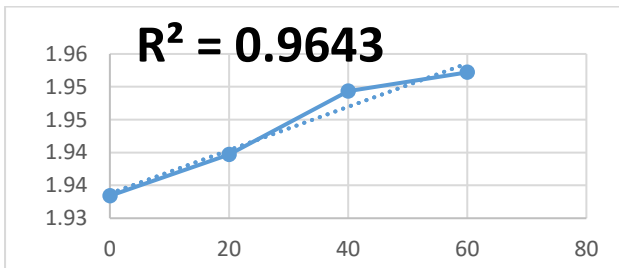
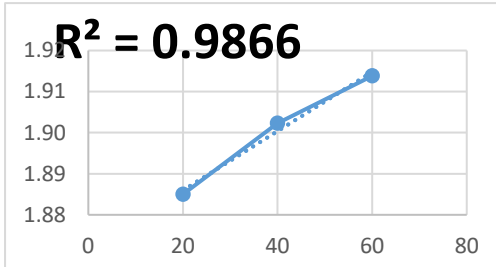
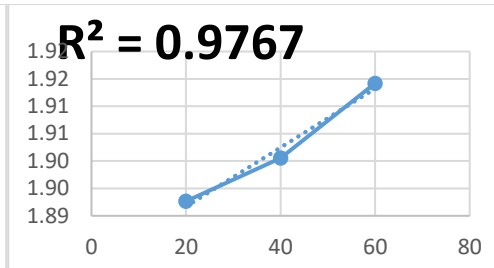
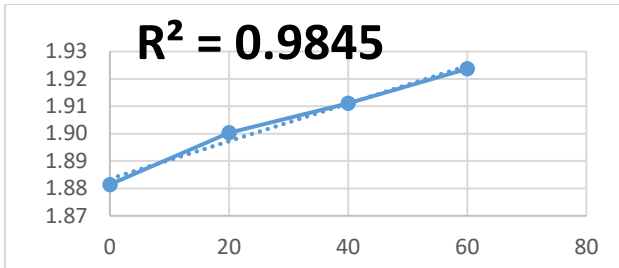
**Sugarcane- CO2**



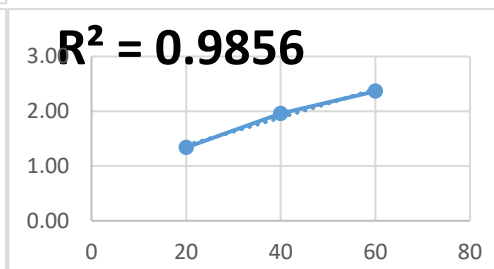
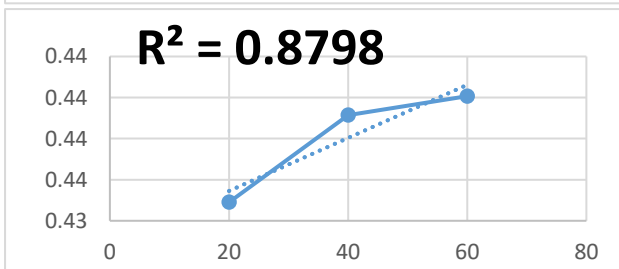
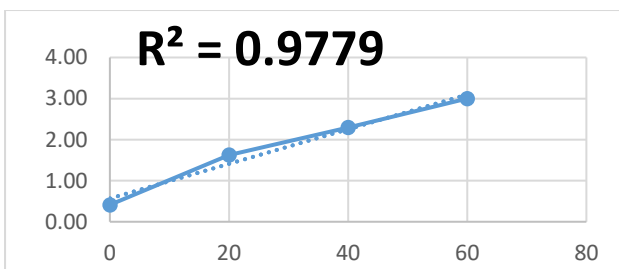


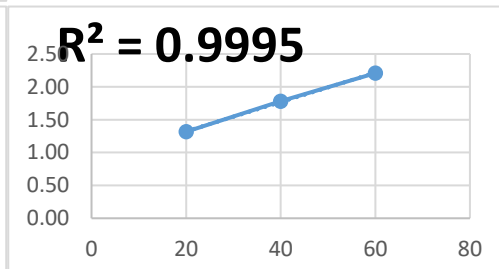
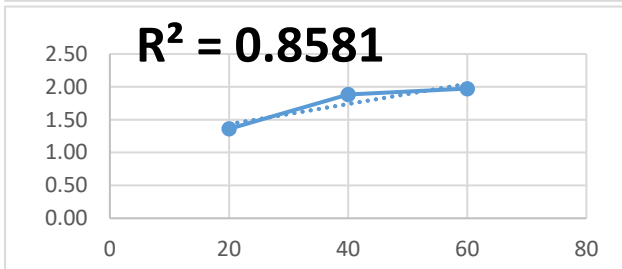
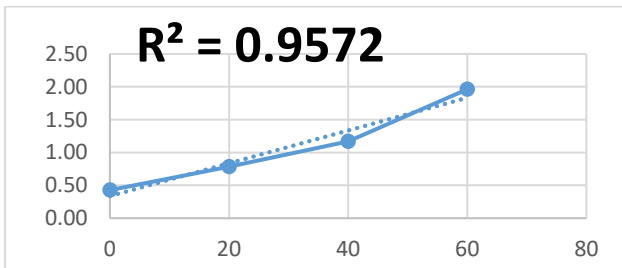
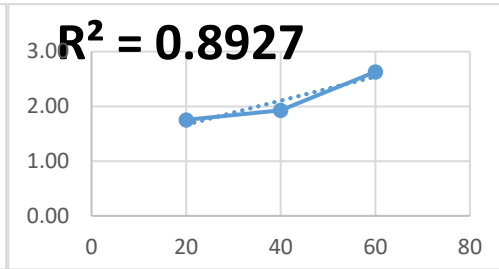
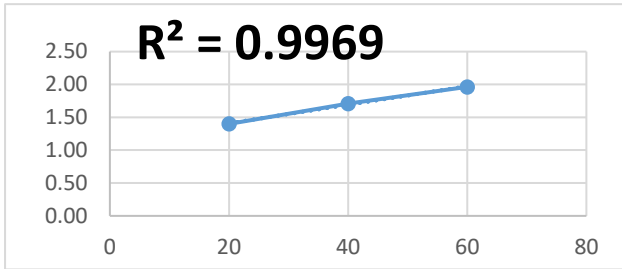
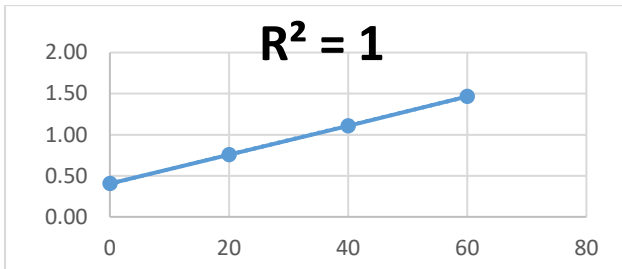
**Sugarcane- CH4**



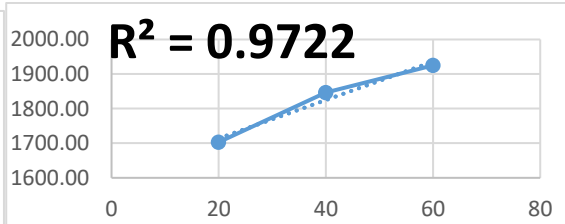
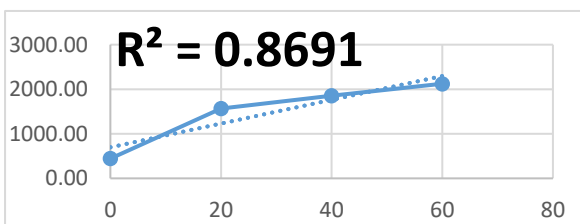


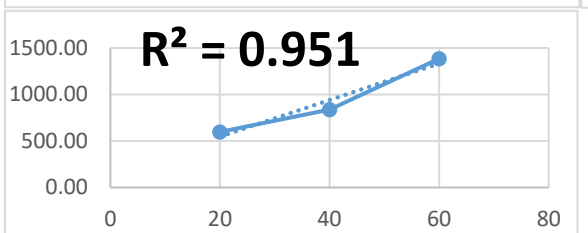
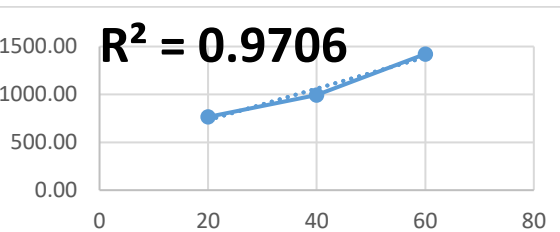
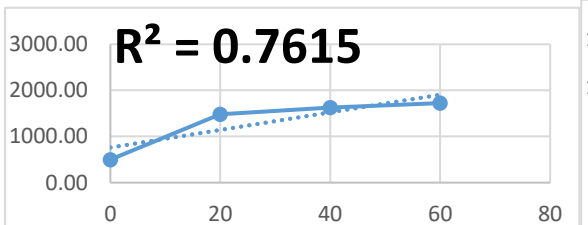
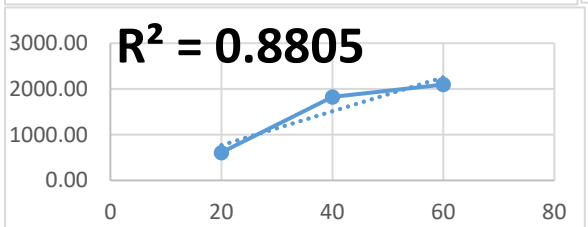
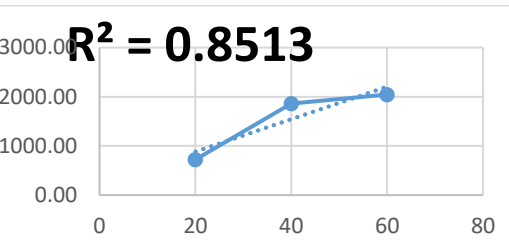
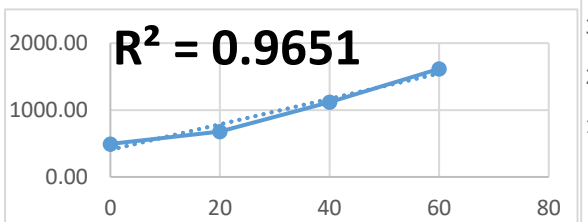
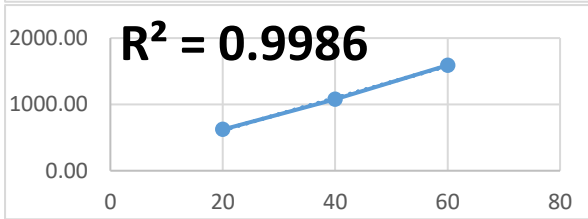
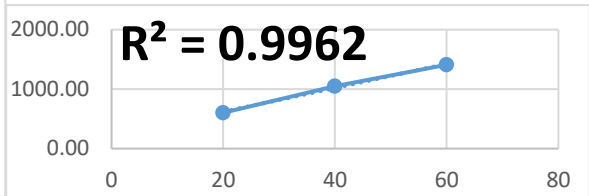
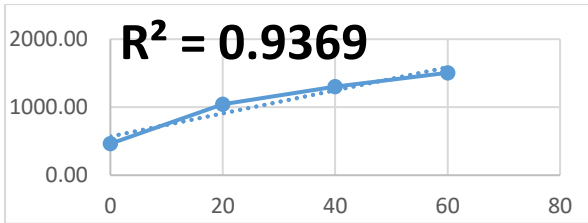
**Sugarcane- N2O**



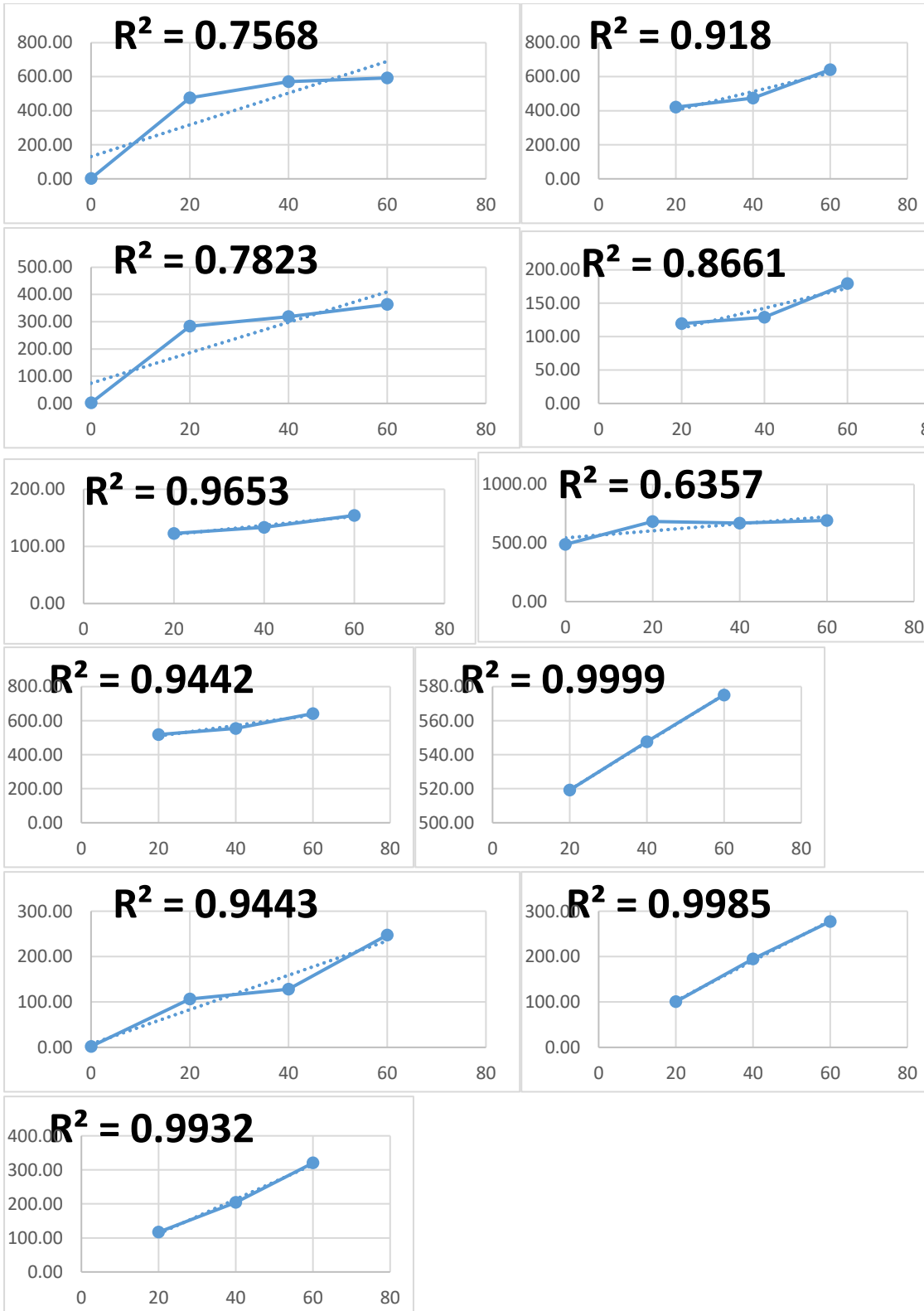


**Wet ponded pasture-CO2**

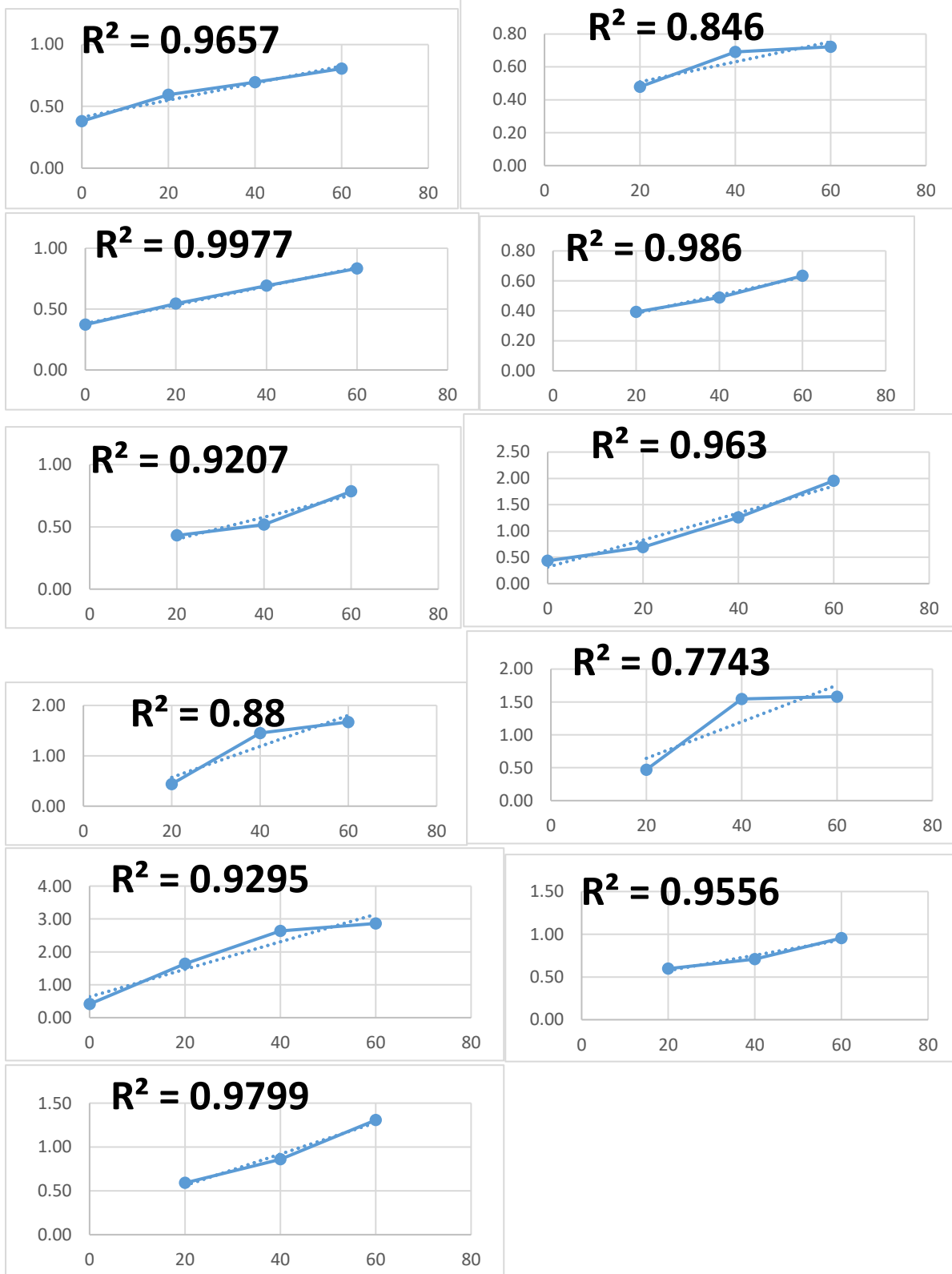




**Wet ponded pasture-CH4**

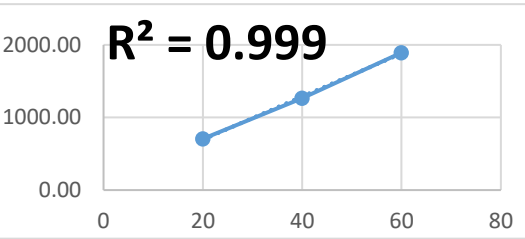
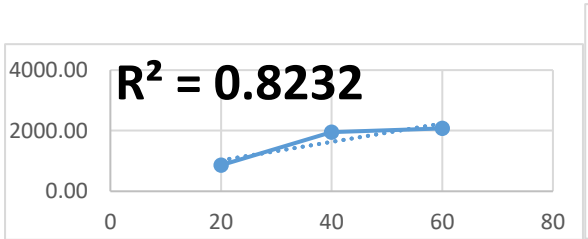
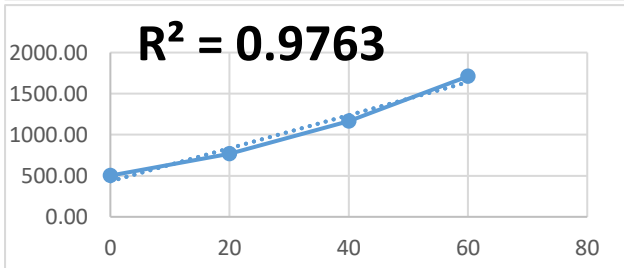
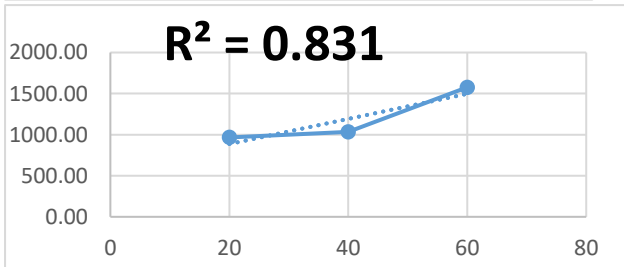
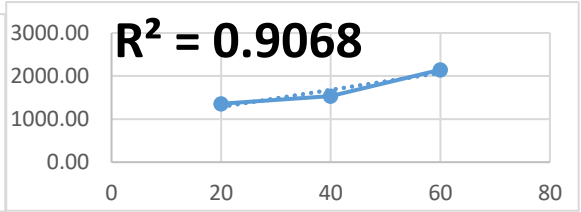
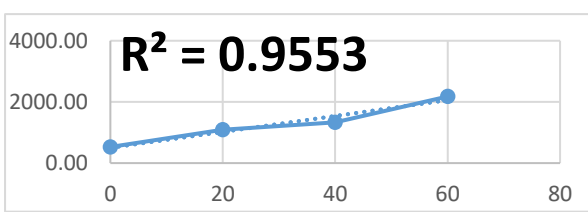
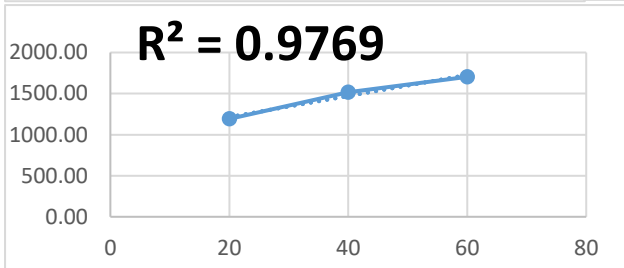
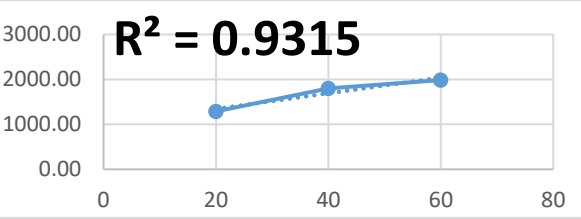
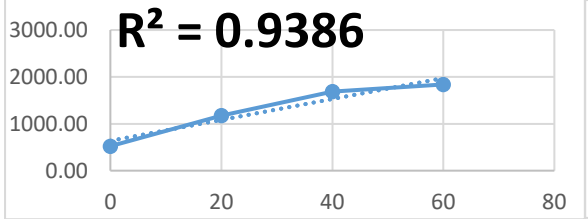
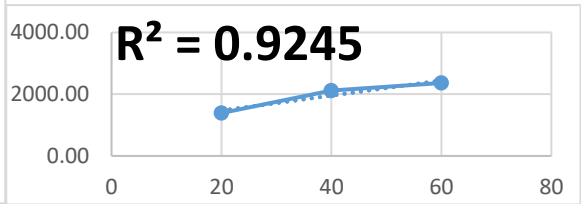
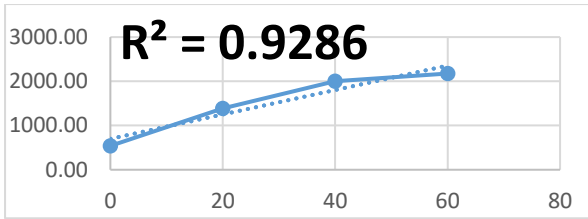


Wet ponded pasture-N2O

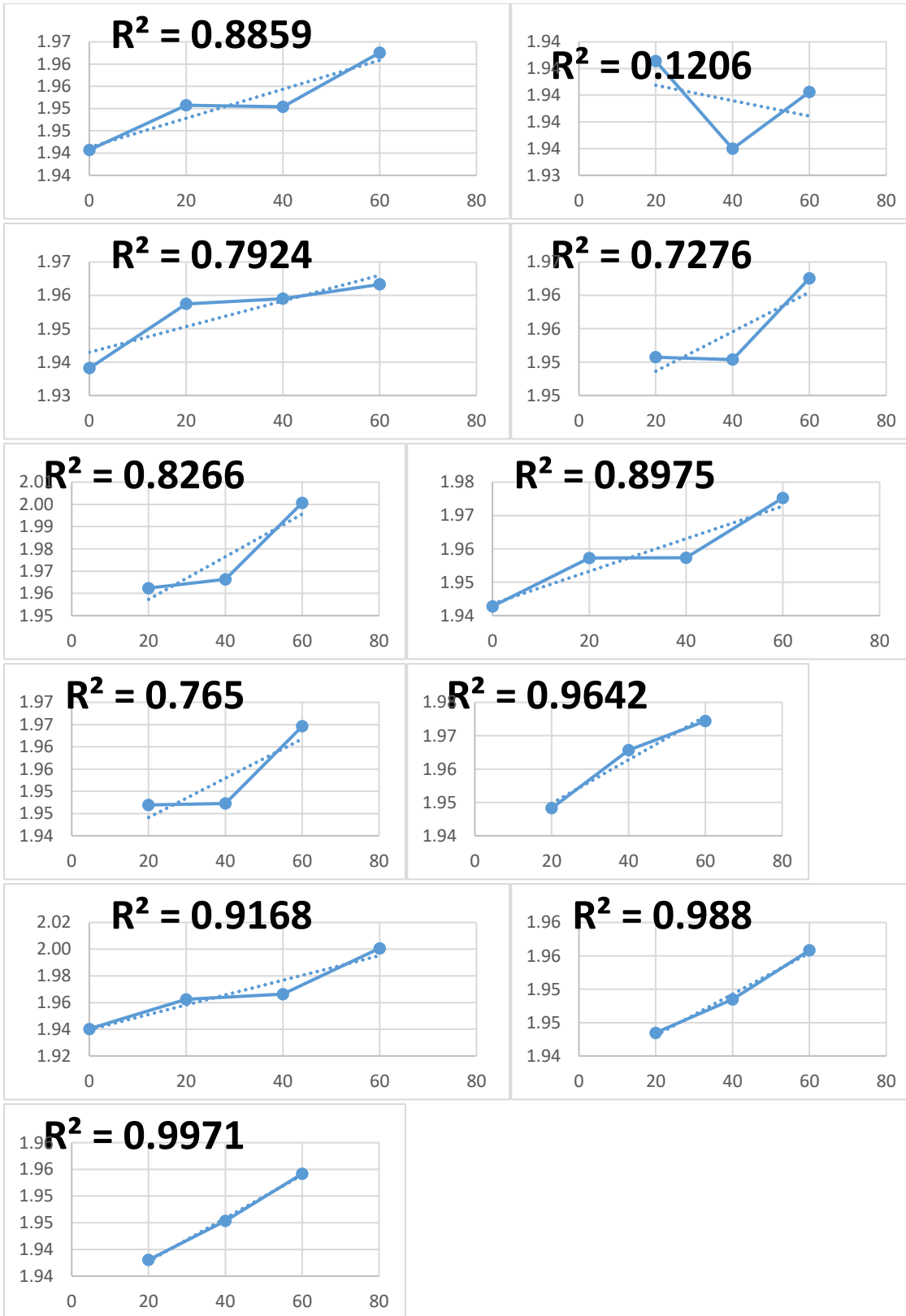


**Dry ponded pasture-CO2**

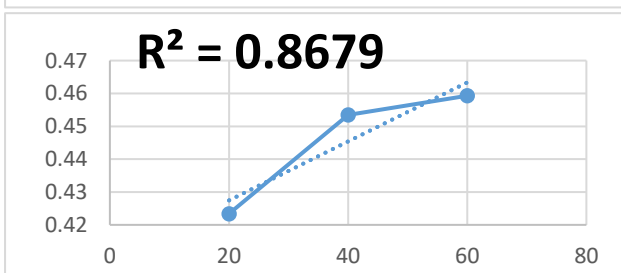
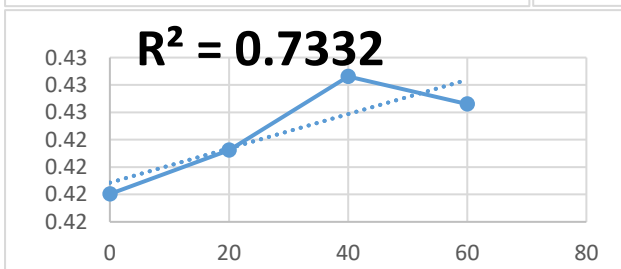
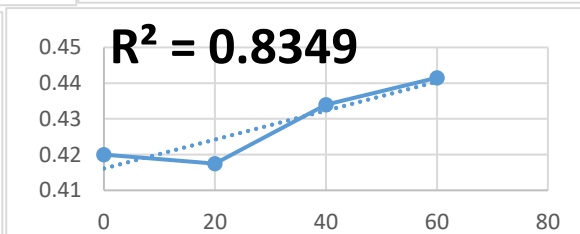
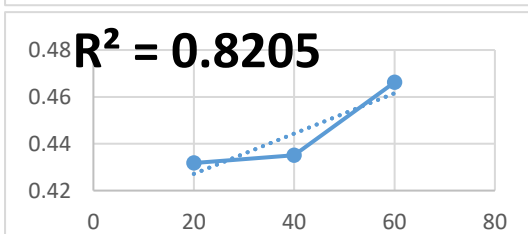
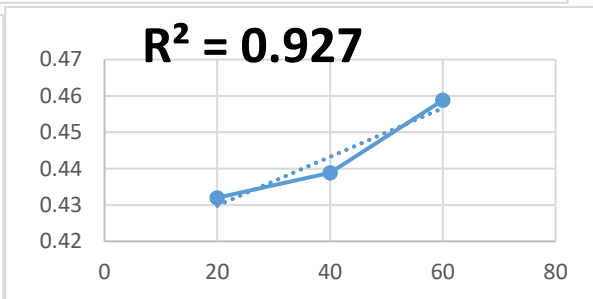
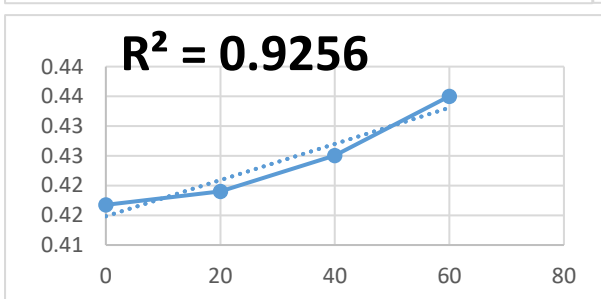
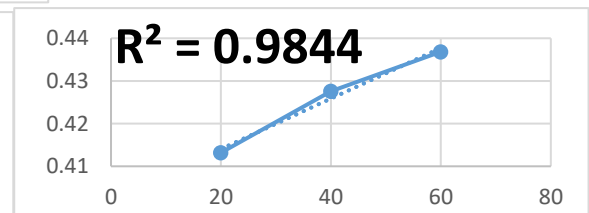
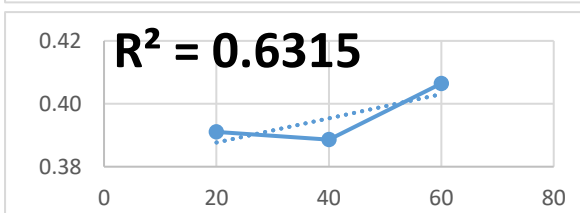
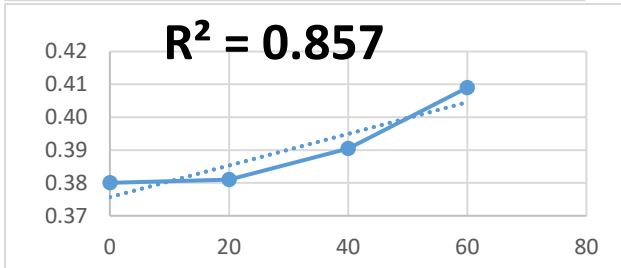
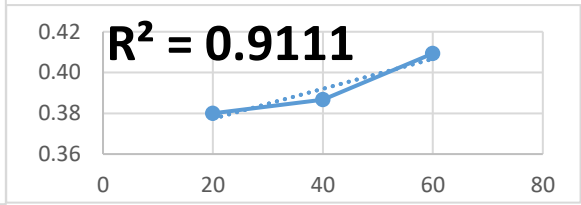
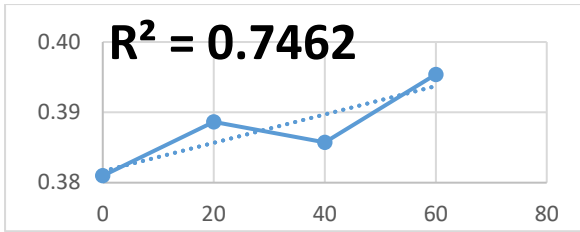




**Dry ponded pasture-CH4**



Dry ponded pasture-N2O





### Greenhouse gas emissions from tropical coastal wetlands and their alternative agricultural lands: Where significant mitigation gains lie

Iram et al. 2021  
 Correspondence to: [Naima.Iram@unimelb.edu.au](mailto:Naima.Iram@unimelb.edu.au)

40 years climate data on mean maximum temperature and rainfall from Bureau of Meteorology Australia.

Monthly Climate Statistics for "LUCINDA POINT" [032141]  
 Created on: 16 May 2021 14:44:52 GMT+0800

Source: <http://www.bom.gov.au/jsp/ncs/cdo/cvq/cv>

032141 LUCINDA POINT  
 Commenced: 1980  
 Last Record: 2021  
 Latitude: 18.52 Degrees South  
 Longitude: 146.39 Degrees East  
 Elevation: 10 m  
 State: QLD

Statistic Element	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Number of	Start Year	End Year
Mean maximum temperature (Degrees C) for years 1980 to 2021	30.1	30.3	29.7	27.9	25.9	23.8	23.1	23.9	25.8	27	28.4	29.6	27.1	32	1980	2021
Highest temperature (Degrees C) for years 1980 to 2021	37	38.5	35.9	33.1	31	29.9	28.4	29.5	32.5	31	34.4	37	38.5	32	1980	2021
Date of Highest temperature for years 1980 to 2021	7-Jan-84	20-Feb-19	1-Mar-81	14-Apr-81	12-May-92	1-Jun-81	27-Jul-98	18-Aug-81	22-Sep-86	20-Oct-86	28-Nov-18	6-Dec-91	20-Feb-19	N/A	1980	2021
Lowest maximum temperature (Degrees C) for years 1980 to 2021	25.2	24.7	25.5	23.2	17.3	17.8	17.5	19.4	22.2	22.6	23.9	25.8	17.3	32	1980	2021
Date of Lowest maximum temperature for years 1980 to 2021	13-Jan-81	20-Feb-21	4-Mar-88	30-Apr-82	23-May-20	21-Jun-07	15-Jul-16	14-Aug-05	1-Sep-86	21-Oct-10	27-Nov-09	24-Dec-99	25-May-20	N/A	1980	2021
Decile 1 maximum temperature (Degrees C) for years 1980 to 2021	28.5	28.2	27.9	26.2	24.2	23.8	23.4	22	23.9	25.4	28.9	28.1	28.1	30	1980	2021
Decile 9 maximum temperature (Degrees C) for years 1980 to 2021	32	32.3	31.8	29.9	28	25.9	25	26.1	28	28.7	29.9	31.4	31.4	30	1980	2021
Mean number of days >= 30 Degrees C for years 1980 to 2021	14.3	14	10.6	2.2	0.1	0	0	0	0.2	0.2	2.5	10	54.1	32	1980	2021
Mean number of days >= 35 Degrees C for years 1980 to 2021	0.1	0.4	0.1	0	0	0	0	0	0	0	0	0	0.1	32	1980	2021
Mean number of days >= 40 Degrees C for years 1980 to 2021	0	0	0	0	0	0	0	0	0	0	0	0	0	32	1980	2021
Mean minimum temperature (Degrees C) for years 1980 to 2021	25.3	25.2	24.8	23.4	21.3	19	18.1	18.9	20.9	22.9	24.2	25.3	22.4	32	1980	2021
Lowest temperature (Degrees C) for years 1980 to 2021	18.7	18.7	21	16.7	13.9	11.7	11.2	12.5	13	17	20.4	20.3	11.2	32	1980	2021
Date of Lowest temperature for years 1980 to 2021	25-Jan-86	4-Feb-15	12-Mar-03	24-Apr-03	24-May-20	24-Jun-82	20-Jul-85	2-Aug-03	26-Sep-96	6-Oct-93	4-Nov-09	24-Dec-85	20-Jul-85	N/A	1980	2021
Highest minimum temperature (Degrees C) for years 1980 to 2021	29	29.2	28.8	27.3	26	23.6	23.1	23.6	25.4	26.4	28.5	29.1	29.2	32	1980	2021
Date of Highest minimum temperature for years 1980 to 2021	11-Jan-83	14-Feb-17	30-Mar-17	8-Apr-83	8-May-96	15-Jun-20	21-Jul-98	22-Aug-10	29-Sep-16	27-Oct-05	28-Nov-18	20-Dec-05	14-Feb-17	N/A	1980	2021
Decile 1 minimum temperature (Degrees C) for years 1980 to 2021	23.5	23.3	23	21.4	19	15.9	14.7	16.6	18.8	20.6	22.2	23.3	23.3	30	1980	2021
Decile 9 minimum temperature (Degrees C) for years 1980 to 2021	27.2	27	26.6	25.4	23.4	21.6	20.7	21	23	24.8	26	27.1	26	30	1980	2021
Mean number of days <= 2 Degrees C for years 1980 to 2021	0	0	0	0	0	0	0	0	0	0	0	0	0	32	1980	2021
Mean number of days <= 0 Degrees C for years 1980 to 2021	0	0	0	0	0	0	0	0	0	0	0	0	0	32	1980	2021
Mean daily ground minimum temperature (Degrees C) for years null to null	N/A															
Lowest ground temperature (Degrees C) for years null to null	N/A															
Date of Lowest ground temperature for years null to null	N/A															
Mean number of days ground min. temp. < -1 Degrees C for years null to null	N/A															
Mean rainfall (mm) for years 1980 to 2020	191.7	210	176	89.7	60.1	35.2	22.1	23.8	24.9	25.9	75.2	99.7	1076.1	29	1980	2020
Highest rainfall (mm) for years 1980 to 2020	880.8	542.8	684	312	195.6	194.4	166.8	139.4	151.4	223.6	607.4	568.8	2208.8	34	1980	2020
Date of Highest rainfall for years 1980 to 2020	1981	2009	2016	1990	1981	1990	1981	1997	2010	2010	2010	2018	2010	N/A	1980	2020
Lowest rainfall (mm) for years 1980 to 2020	0	32	35.6	8.6	1.4	2.8	0	0	0	0	0	0	504.9	34	1980	2020
Date of Lowest rainfall for years 1980 to 2020	2002	2011	2008	1994	2001	2004	1995	2018	1991	2001	2019	2019	2002	N/A	1980	2020
Decile 1 monthly rainfall (mm) for years 1980 to 2020	21.5	44.2	42.3	22.5	12	8.2	4.2	0.7	0.5	1	3.6	16.2	593	34	1980	2020
Decile 5 (median) monthly rainfall (mm) for years 1980 to 2020	108.6	276.6	133.2	80.8	56.8	25.6	15.5	15.2	16.2	11.2	27.2	76.2	1047	34	1980	2020
Decile 9 monthly rainfall (mm) for years 1980 to 2020	314.1	412.9	315.6	148.6	97.2	64.2	40.5	50.7	53.8	59	216.4	151.8	1605.2	34	1980	2020
Highest daily rainfall (mm) for years 1980 to 2020	173.6	213	175	134	94.4	167	134	81	65.4	106.2	132	390.4	390.4	32	1980	2020
Date of Highest daily rainfall for years 1980 to 2020	17-Jan-81	25-Feb-18	17-Mar-00	11-Apr-06	21-May-81	6-Jun-90	25-Jul-81	31-Aug-98	20-Sep-10	21-Oct-10	2-Nov-13	16-Dec-18	16-Dec-18	N/A	1980	2020
Mean number of days of rain for years 1980 to 2020	15.1	14.4	15.1	14	12	7.4	6.7	6.4	5.2	5.6	7.9	10.5	100.3	34	1980	2020
Mean number of days of rain >= 1 mm for years 1980 to 2020	11.7	11.3	11.6	9.6	7.5	4.7	3.4	3.1	2.7	3.4	5	7	81	32	1980	2020
Mean number of days of rain >= 10 mm for years 1980 to 2020	5.3	5.2	4.4	2.5	1.7	0.8	0.4	0.6	0.8	0.6	2	2.3	26.6	32	1980	2020
Mean number of days of rain >= 25 mm for years 1980 to 2020	2.5	2.5	2.2	0.8	0.4	0.2	0.1	0.2	0.2	0.2	0.9	1	11.2	32	1980	2020
Mean daily wind run (km) for years 2003 to 2021	425	463	426	424	397	406	394	358	362	427	425	413	410	13	2003	2021
Maximum wind gust speed (km/h) for years 1980 to 2021	115	185	109	96	82	68	94	72	76	113	74	84	185	22	1980	2021
Date of Maximum wind gust speed for years 1980 to 2021	13-Jan-09	2-Feb-11	20-Mar-06	13-Apr-14		11-Jun-15	20-Jul-05			24-Oct-05			2-Feb-11	N/A	1980	2021
Mean daily sunshine (hours) for years null to null	N/A															
Mean daily solar exposure (MJ/(m^2)) for years 2007 to 2021	19.4	18.9	17.5	15.8	14.1	13.3	14.4	17.6	20	22	22.8	22.8	18.2	14	2007	2021
Mean number of clear days for years null to null	N/A															
Mean number of cloudy days for years null to null	N/A															
Mean daily evaporation (mm) for years 2007 to 2010	27.5	27.6	26.8	25	22.9	20.7	19.6	20.5	22.9	25.1	26.6	27.6	34.4	20	1980	2010
Mean 9am wet bulb temperature (Degrees C) for years 2000 to 2010	7	7	7	7	7	7	7	7	7	7	7	7	7	2000	2010	
Mean 9am dew point temperature (Degrees C) for years 2000 to 2010	7	7	7	7	7	7	7	7	7	7	7	7	7	2000	2010	
Mean 9am relative humidity (%) for years 2000 to 2010	7	7	7	7	7	7	7	7	7	7	7	7	7	2000	2010	
Mean 9am cloud cover (oktas) for years null to null	N/A															
Mean 9am wind speed (km/h) for years 1980 to 2010	16	17	19.4	21.4	21.3	21.3	20.3	18.6	16.7	16.2	15.3	14.8	18.2	18	1980	2010
Mean 3pm temperature (Degrees C) for years 1980 to 2010	28.7	28.9	28.5	26.8	24.9	22.8	22.4	22.7	24.4	25.8	27	28.2	25.9	20	1980	2010
Mean 3pm wet bulb temperature (Degrees C) for years 2000 to 2010	7	7	7	7	7	7	7	7	7	7	7	7	7	2000	2010	
Mean 3pm dew point temperature (Degrees C) for years 2000 to 2010	7	7	7	7	7	7	7	7	7	7	7	7	7	2000	2010	
Mean 3pm relative humidity (%) for years 2000 to 2010	7	7	7	7	7	7	7	7	7	7	7	7	7	2000	2010	
Mean 3pm cloud cover (oktas) for years null to null	N/A															
Mean 3pm wind speed (km/h) for years 1980 to 2010	21.6	20.7	20.7	20.3	17.9	17.7	17.2	18.9	20.9	23.6	23	22.9	20.4	18	1980	2010

# Greenhouse gas emissions from tropical coastal wetlands and their alternative agricultural lands: Where significant mitigation gains lie

Correspondence to: Naima Iram (naima.iram@griffithuni.edu.au)

## Difference in physiochemical parameters across seasonal cycle

### Nonparametric Tests

Hypothesis Test Summary				
	Null Hypothesis	Test	Sig. <sup>a,b</sup>	Decision
1	The distribution of Gravimetric water content% is the same across categories of Season .	Independent-Samples Kruskal-Wallis Test	.033	Reject the null hypothesis.
2	The distribution of BD (g cm <sup>-3</sup> ) is the same across categories of Season .	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.
3	The distribution of Soil Tem is the same across categories of Season .	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.

a. The significance level is .050.

b. Asymptotic significance is displayed.

### Independent-Samples Kruskal-Wallis Test

#### Gravimetric water content% across Season

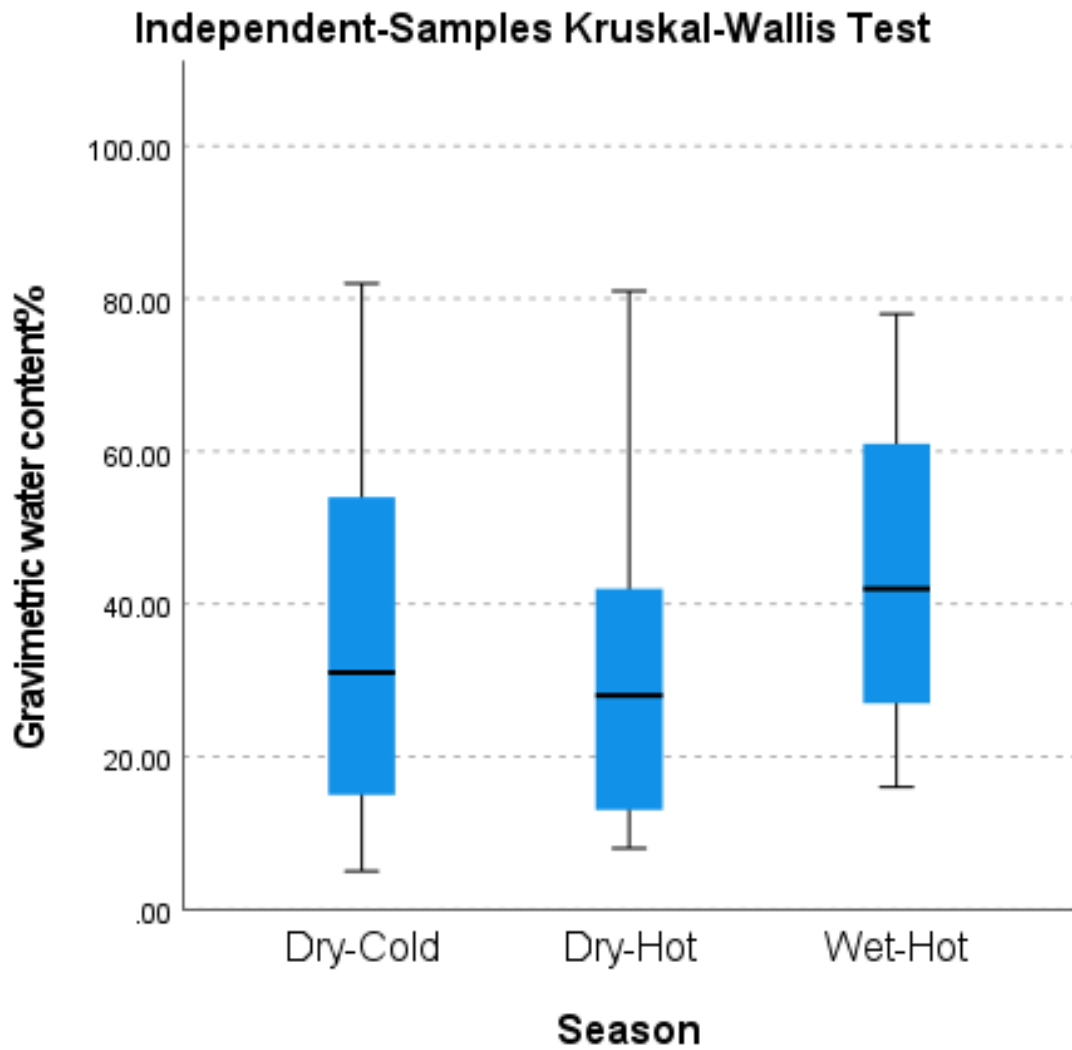
#### Independent-Samples Kruskal-Wallis Test Summary

Total N	90
Test Statistic	6.800 <sup>a</sup>
Degree Of Freedom	2

Asymptotic Sig.(2-sided test)

.033

a. The test statistic is adjusted for ties.



#### Pairwise Comparisons of Season

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. <sup>a</sup>
Dry-Hot-Dry-Cold	.317	6.743	.047	.963	1.000

Dry-Hot-Wet-Hot	-15.383	6.743	-2.281	.023	.068
Dry-Cold-Wet-Hot	-15.067	6.743	-2.234	.025	.076

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significances (2-sided tests) are displayed. The significance level is .050.

a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

## BD (g cm-3) across Season

### Independent-Samples Kruskal-Wallis Test

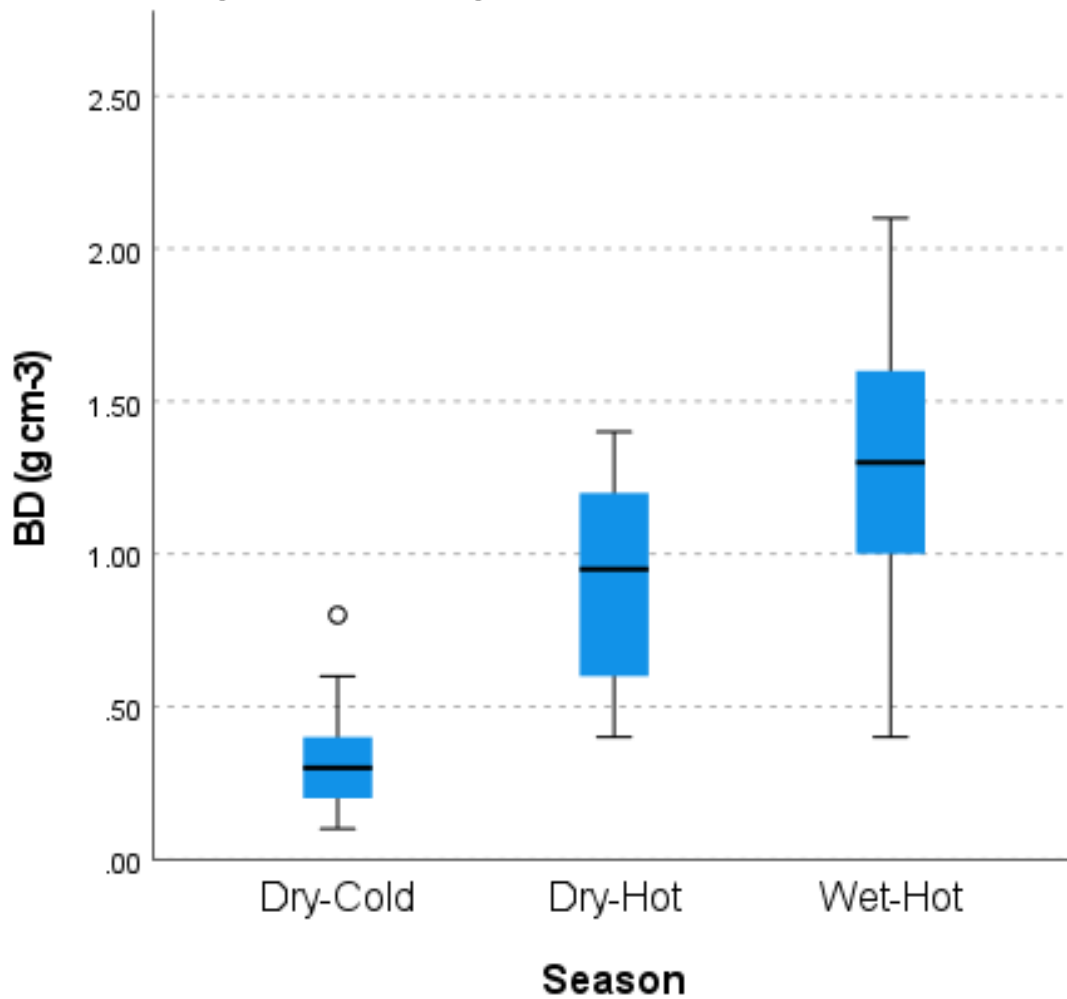
#### Summary

Total N	90
Test Statistic	54.599 <sup>a</sup>
Degree Of Freedom	2
Asymptotic Sig.(2-sided test)	.000

a. The test statistic is adjusted for ties.



## Independent-Samples Kruskal-Wallis Test



### Pairwise Comparisons of Season

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. <sup>a</sup>
Dry-Cold-Dry-Hot	-33.683	6.729	-5.006	.000	.000
Dry-Cold-Wet-Hot	-48.517	6.729	-7.210	.000	.000
Dry-Hot-Wet-Hot	-14.833	6.729	-2.204	.028	.083

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significances (2-sided tests) are displayed. The significance level is .050.

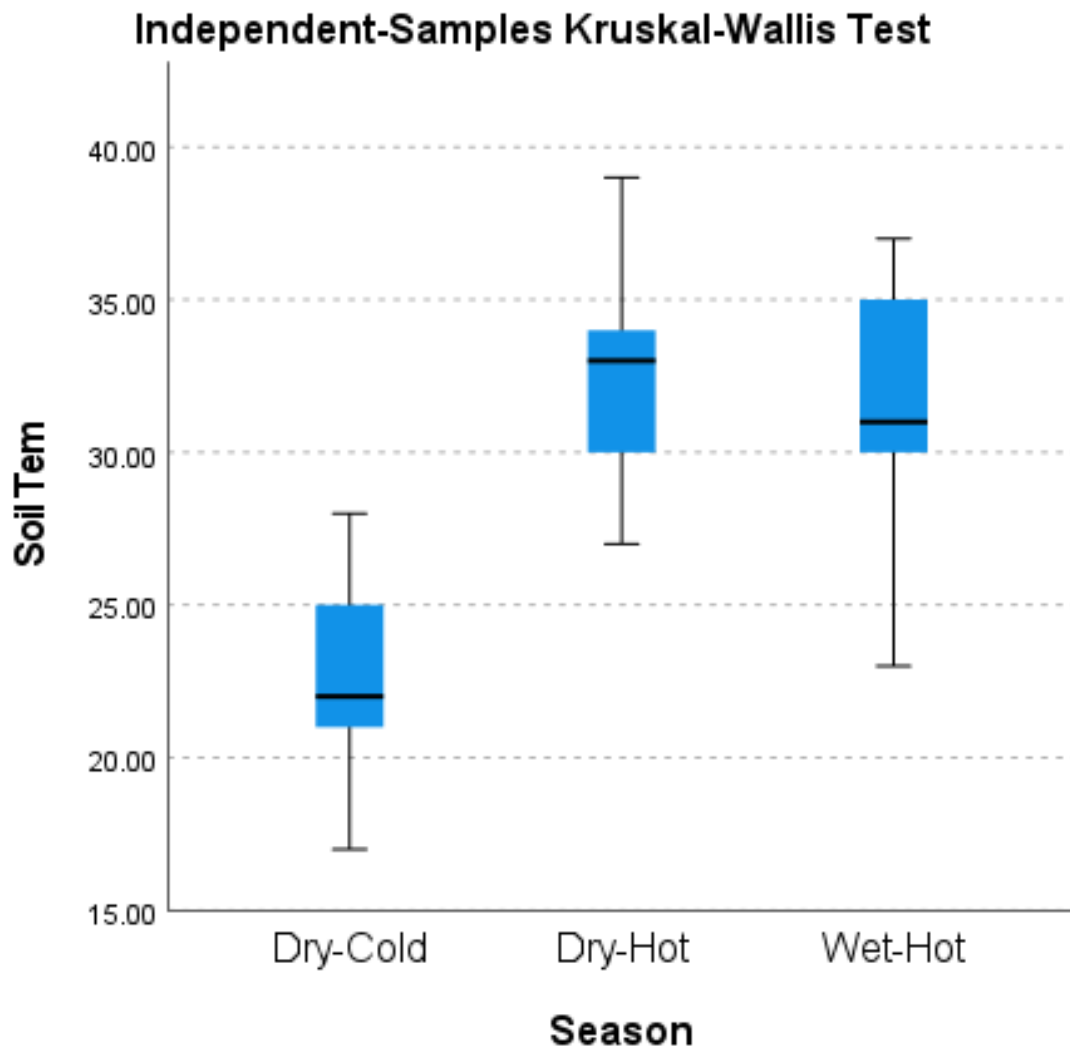
a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

## Soil Tem across Season

### Independent-Samples Kruskal-Wallis Test Summary

Total N	90
Test Statistic	57.561 <sup>a</sup>
Degree Of Freedom	2
Asymptotic Sig.(2-sided test)	.000

a. The test statistic is adjusted for ties.



### Pairwise Comparisons of Season

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. <sup>a</sup>
Dry-Cold-Wet-Hot	-42.583	6.724	-6.333	.000	.000
Dry-Cold-Dry-Hot	-45.617	6.724	-6.784	.000	.000
Wet-Hot-Dry-Hot	3.033	6.724	.451	.652	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significances (2-sided tests) are displayed. The significance level is .050.

a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

### Physiochemical properties across three depths

Parameter	<i>t</i>	<i>n</i>	<i>p</i>
Gravimetric water	0.268	90	0.875
pH	0.109	90	0.947
EC	5.134	90	0.077
BD	25.994	90	0.000
C	20.407	90	0.000
N	21.467	90	0.000

Table 1. Greenhouse gas (GHG) fluxes from soils of tropical coastal wetlands: mangroves, saltmarsh, and freshwater (Fw) tidal forest during high and low tide during a dry-hot season

GHG	Land-use type	High tide	SE	Low tide	SE
		Mean		Mean	
CO <sub>2</sub> (g m <sup>-2</sup> d <sup>-1</sup> )	Mangroves	2.55	0.37	3.25	0.57
	Saltmarsh	-1.12	0.24	0.69	0.40
	FW tidal forest	2.97	1.35	5.35	2.68
CH <sub>4</sub> (mg m <sup>-2</sup> d <sup>-1</sup> )	Mangroves	3.38	0.98	236	73
	Saltmarsh	-0.13	0.06	-25	6
	Fw tidal forest	1.10	0.52	457	108
N <sub>2</sub> O (mg m <sup>-2</sup> d <sup>-1</sup> )	Mangroves	-0.74	0.17	0.15	0.06
	Saltmarsh	0.19	0.06	-0.14	0.04
	FW tidal forest	0.06	0.01	-0.25	0.16