Week #13: Assignment

Due: 05/05/2021

4/25/2021

Contents

We have assessed the association between the harbor seal count observed in Maine's coastal regions and time (different survey years between 1981 and 2001) using both Poisson and quasi-Poisson regression. In this assignment, you assess the association between the counts of harbor seal pubs and the time. The data table is given below (the frequency counts are in the red box of the following table)

Table 6. Number of ledge and island sites occupied by harbor seals in Maine from 1981 to 2001.

Region	1981	1986	1993	1997	2001
Sites with harbor seals					
South of Cape Elizabeth	13	11	16	18	18
Casco Bay	26	22	41	33	43
Boothbay region	15	15	23	32	26
Muscongus Bay	28	21	44	44	47
Penobscot Bay	80	72	148	138	125
Blue Hill Bay	75	54	123	113	107
Frenchman's Bay	23	10	26	25	28
Narraguagus region	24	24	38	33	36
Western Bay	19	18	30	28	36
Eastern Bay	9	13	29	27	35
Machias region	14	15	37	34	41
Cobscook Bay	10	10	19	16	25
Total	336	285	574	541	566
Sites with harbor seal pups					
South of Cape Elizabeth	6	6	10	8	17
Casco Bay	13	18	32	26	37
Boothbay region	13	9	17	21	22
Muscongus Bay	17	12	32	27	40
Penobscot Bay	49	45	112	92	113
Blue Hill Bay	45	39	97	91	101
Frenchman's Bay	13	8	23	19	27
Narranguagus region	12	22	28	26	34
Western Bay	10	15	25	26	33
Eastern Bay	5	11	23	26	34
Machias region	5	7	23	26	36
Cobscook Bay	4	7	12	9	19
Total	186	193	424	389	496

To save your time, defined a vector for each survey year in the following code chunk.

```
y.1981=c(6, 13, 13, 17, 49, 45, 13, 12, 10, 5, 5, 4)
y.1986=c(6, 18, 9, 12, 45, 39, 8, 22, 15, 11, 7, 7)
y.1993=c(10, 32, 17, 32, 112, 97, 23, 28, 25, 23, 23, 12)
```

```
y.1997=c(8, 26, 21, 27, 92, 91, 19, 26, 26, 26, 26, 9)
y.2001=c(17, 37, 22, 40, 113, 101, 27, 34, 33, 34, 36, 19)
```

Please refer to the case study in the class note to analyze the data and draw conclusions to address the research question. To be more specific, you are expected to answer the following question.

1. Fit both regular and quasi-Poisson regression models.
2. Pick a model as the final model and justify your choice.
3. Comment on the dispersion and interpret the output of the final model.
4. Write a separate paragraph to summarize the results and draw the conclusion.