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LAMPIRAN

Lampiran 1. Data Observasi Kejadian *Coral Bleaching*

Kejadian	Lokasi	Latitude	Longitude	Day	Month	Year	Severity Code
1	Titik 1	-17.575	-149.7833	15	3	1991	2
2	Titik 1	-17.575	-149.7833	15	2	1996	3
3	Titik 2	-17.625	-149.263	15	4	2002	3
4	Titik 2	-17.625	-149.263	15	4	2002	3
5	Titik 3	-16.54	-151.73	15	3	2007	3
6	Titik 3	-16.54	-151.73	15	4	2007	3
7	Titik 4	-16.55	-151.78	15	3	2007	3
8	Titik 4	-16.55	-151.78	15	3	2009	3
9	Titik 5	-16.54	-151.79	15	3	2007	3
10	Titik 5	-16.54	-151.79	15	6	2009	3
11	Titik 6	-16.53	-151.73	15	3	2007	3
12	Titik 6	-16.53	-151.73	15	5	2009	3
13	Titik 6	-16.53	-151.73	15	5	2009	3
14	Titik 7	-16.5	-151.78	15	3	2007	3
15	Titik 7	-16.5	-151.78	15	3	2007	3
16	Titik 7	-16.5	-151.78	15	10	2008	1
17	Titik 7	-16.5	-151.78	15	10	2008	1
18	Titik 7	-16.5	-151.78	15	3	2009	2
19	Titik 7	-16.5	-151.78	15	3	2009	2
20	Titik 8	-16.54	-151.75	15	5	2007	3
21	Titik 8	-16.54	-151.75	15	6	2009	3
22	Titik 9	-16.51	-151.76	15	5	2007	3
23	Titik 9	-16.51	-151.76	15	5	2009	3
24	Titik 10	-16.49	-151.71	15	5	2007	3
25	Titik 10	-16.49	-151.71	15	5	2009	3
26	Titik 11	-16.48	-151.72	15	6	2007	3
27	Titik 11	-16.48	-151.72	15	5	2009	3
28	Titik 12	-16.46	-151.78	15	6	2007	3
29	Titik 12	-16.46	-151.78	15	5	2009	3
30	Titik 13	-16.45	-151.77	15	6	2007	3
31	Titik 13	-16.45	-151.77	15	5	2009	3
32	Titik 14	-16.44	-151.76	15	6	2007	3
33	Titik 14	-16.44	-151.76	15	5	2009	3

Lampiran 2. Data Faktor Lingkungan

Kejadian	Lokasi	Distance to Shore	Exposure	Turbidity	Cyclone Frequency	Depth (m)
1	Titik 1	1431.62	2	0.0262	51.196764	9
2		1431.62	2	0.0262	51.196764	14
3	Titik 2	2651.34	2	0.0273	47.678865	0.7
4		2651.34	2	0.0273	47.678865	1
5	Titik 3	2466.29	0	0.0258	47.678865	1.3
6		2466.29	0	0.0258	47.678865	1.3
7	Titik 4	208.8	0	0.0261	52.326225	1.7
8		208.8	0	0.0261	52.326225	1.2
9	Titik 5	180.97	0	0.0261	52.326225	2.8
10		180.97	0	0.0261	52.326225	1.8
11	Titik 6	180.97	0	0.0261	52.326225	2.2
12		577.73	0	0.0264	47.678865	7
13		577.73	0	0.0264	47.678865	15
14	Titik 7	577.73	0	0.0264	47.678865	15
15		577.73	0	0.0264	47.678865	7
16		577.73	0	0.0264	47.678865	15
17		577.73	0	0.0264	47.678865	7
18		4186.99	2	0.027	46.45616	3
19		4186.99	2	0.027	46.45616	1
20	Titik 8	470.12	0	0.0262	52.326225	2
21		470.12	0	0.0262	52.326225	2
22	Titik 9	529.01	0	0.0266	47.678865	1
23		529.01	0	0.0266	47.678865	1
24	Titik 10	397.88	0	0.0262	52.55096	2.8
25		397.88	0	0.0262	52.55096	2.8
26	Titik 11	121.09	0	0.026	52.55096	1
27		121.09	0	0.026	52.55096	1
28	Titik 12	281.71	0	0.0259	48.844436	1
29		281.71	0	0.0259	48.844436	1
30	Titik 13	155.92	2	0.0272	48.844436	1.3
31		155.92	2	0.0272	48.844436	1.3
32	Titik 14	221.97	2	0.0272	48.844436	1
33		221.97	2	0.0272	48.844436	1

Kejadian	Lokasi	Clim SST	Temperature Mean	Temperature Minimum	Temperature Maximum	Windspeed
1	Titik 1	262.15	300.73	297.585	305.0075	4
2		262.15	300.73	297.585	305.0075	2
3	Titik 2	301.82	300.91	297.5	305.16	3
4		301.82	300.91	297.5	305.16	4
5	Titik 3	301.82	300.91	297.5	305.16	3
6		299.92	300.91	297.5	305.16	4
7	Titik 4	301.79	300.9	297.75	304.39	3
8		301.29	300.9	297.75	304.39	5
9	Titik 5	301.74	300.84	297.58	304.14	3
10		300.43	300.84	297.58	304.14	3
11	Titik 6	300.43	300.84	297.58	304.14	3
12		301.68	300.89	297.86	304.29	3
13		301.68	300.89	297.86	304.29	3
14	Titik 7	301.68	300.89	297.86	304.29	4
15		301.68	300.89	297.86	304.29	4
16		300.74	300.89	297.86	304.29	5
17		300.74	300.89	297.86	304.29	5
18		301.11	300.56	296.69	304.16	4
19		301.11	300.56	296.69	304.16	4
20	Titik 8	300.61	300.89	297.92	304.77	4
21		300.01	300.89	297.92	304.77	4
22	Titik 9	300.62	300.87	297.89	304.33	4
23		300.46	300.87	297.89	304.33	3
24	Titik 10	300.63	300.85	297.51	304.45	4
25		300.46	300.85	297.51	304.45	3
26	Titik 11	300.46	300.85	297.51	304.45	3
27		299.89	300.85	297.51	304.45	6
28	Titik 12	300.44	300.86	297.58	304.29	3
29		299.89	300.86	297.58	304.29	6
30	Titik 13	300.41	300.84	297.67	304.13	3
31		299.86	300.84	297.67	304.13	6
32	Titik 14	300.41	300.84	297.67	304.13	3
33		299.86	300.84	297.67	304.13	6

Kejadian	Lokasi	SSTA	SSTA Standard Deviation	SSTA Mean	SSTA Minimum	SSTA Maximum
1	Titik 1	-0.4975	1	0	-2.73	3.1
2		1.29	1	0	-2.73	3.1
3	Titik 2	0.25	1	0	-2.76	3.22
4		0.23	1	0	-2.76	3.22
5	Titik 3	0.25	1	0	-2.76	3.22
6		0.44	1	0	-2.76	3.22
7	Titik 4	-0.97	1	0	-3.15777778	2.47
8		0.19	1	0	-3.15777778	2.47
9	Titik 5	-1.46	1	0	-3.28333333	2.38
10		0.06	1	0	-3.28333333	2.38
11	Titik 6	0.06	1	0	-3.28333333	2.38
12		0.36	1	0	-2.92666667	2.33
13		0.36	1	0	-2.92666667	2.33
14	Titik 7	-0.64	1	0	-2.92666667	2.33
15		-0.64	1	0	-2.92666667	2.33
16		0.41	1	0	-2.92666667	2.33
17		0.41	1	0	-2.92666667	2.33
18		0.88	1	0	-2.73166667	2.64
19		0.88	1	0	-2.73166667	2.64
20	Titik 8	1.22	1	0	-3.04333333	2.72
21		0.52	1	0	-3.04333333	2.72
22	Titik 9	1.18	1	0	-3.20777778	2.77
23		1.17	1	0	-3.20777778	2.77
24	Titik 10	0.63	1	0	-3.16333333	2.99
25		1.23	1	0	-3.16333333	2.99
26	Titik 11	1.23	1	0	-3.16333333	2.99
27		1.19	1	0	-3.16333333	2.99
28	Titik 12	1.27	1	0	-3.02555556	2.45
29		1.46	1	0	-3.02555556	2.45
30	Titik 13	0.54	1	0	-3.16444444	2.59
31		1.72	1	0	-3.16444444	2.59
32	Titik 14	0.54	1	0	-3.16444444	2.59
33		1.72	1	0	-3.16444444	2.59

Kejadian	Lokasi	TSA	TSA Standard Deviation	TSA Minimum	TSA Maximum	TSA Mean
1	Titik 1	-0.6125	1.1225	-4.4175	2.995	-1.265
2		1.2925	1.1225	-4.4175	2.995	-1.265
3	Titik 2	0.26	1.07	-4.53	3.11	-1.12
4		0.23	1.07	-4.53	3.11	-1.12
5	Titik 3	0.26	1.07	-4.53	3.11	-1.12
6		-0.89	1.07	-4.53	3.11	-1.12
7	Titik 4	-0.98	1.06	-4.26	2.36	-1.11
8		0.04	1.06	-4.26	2.36	-1.11
9	Titik 5	-1.46	1.08	-4.36	2.2	-1.09
10		-0.57	1.08	-4.36	2.2	-1.09
11	Titik 6	-0.57	1.08	-4.36	2.2	-1.09
12		0.33	1.06	-4.21	2.22	-1.17
13		0.33	1.06	-4.21	2.22	-1.17
14	Titik 7	-0.66	1.06	-4.21	2.22	-1.17
15		-0.66	1.06	-4.21	2.22	-1.17
16		-1.5	1.06	-4.21	2.22	-1.17
17		-1.5	1.06	-4.21	2.22	-1.17
18		0.67	1.15	-5.17	2.29	-1.29
19		0.67	1.15	-5.17	2.29	-1.29
20	Titik 8	0.44	1.09	-4.15	2.69	-1.18
21		-0.91	1.09	-4.15	2.69	-1.18
22	Titik 9	0.61	1.08	-4.06	2.36	-1.08
23		0.52	1.08	-4.06	2.36	-1.08
24	Titik 10	0.07	1.07	-4.46	2.47	-1.12
25		0.59	1.07	-4.46	2.47	-1.12
26	Titik 11	0.59	1.07	-4.46	2.47	-1.12
27		-0.18	1.07	-4.46	2.47	-1.12
28	Titik 12	0.59	1.07	-4.4	2.3	-1.11
29		0.06	1.07	-4.4	2.3	-1.11
30	Titik 13	-0.17	1.09	-4.31	2.13	-1.14
31		0.28	1.09	-4.31	2.13	-1.14
32	Titik 14	-0.17	1.09	-4.31	2.13	-1.14
33		0.28	1.09	-4.31	2.13	-1.14

Lampiran 3. Script Matlab

```
%calculate persentasi kebenaran model stepwise bleaching French
Polynesia
%halmar halide, hydrometeorologygeophysics dept. fmipa unhas
%data skripsi Nur Fatihah
clear
clf
load modelS.txt
factors=modelS(:,1:20); %
bleach=modelS(:,21);  %  dibuat pada kolom terakhir
mdl = stepwiselm(factors,bleach,'PEnter',0.05); %
% mdl =
%
%
% Linear regression model:
%     y ~ 1 + x11 + x16 + x20
%
% Estimated Coefficients:
%                    Estimate      SE        tStat       pValue
%                    ________    _______    _______    __________
%
%     (Intercept)      9.7124     1.3739     7.0694    8.9043e-08
%     x11            -0.30874    0.11709    -2.6368      0.013307
%     x16              0.6009    0.12856     4.6739    6.2743e-05
%     x20              5.8468     1.1866     4.9275    3.1029e-05
%
%
% Number of observations: 33, Error degrees of freedom: 29
% Root Mean Squared Error: 0.375
% R-squared: 0.571,  Adjusted R-Squared 0.527
% F-statistic vs. constant model: 12.9, p-value = 1.58e-05
tetapan=9.7124;ssta_11=-0.30874;tsa_16=0.6009;tsamean_20=5.8468;
sevcod=[2;3;3;3;3;3;3;3;3;3;3;3;3;3;3;1;1;2;2;3;3;3;3;3;3;3;3;3;3;3;
3;3;3]
ssta=factors(:,11);
tsa=factors(:,16);
tsamean=factors(:,20);
ssta11=(ssta-mean(ssta))./std(ssta);
tsa16=(tsa-mean(tsa))./std(tsa);
tsamean20=(tsamean-mean(tsamean))./std(tsamean);
sevcod21=(sevcod-mean(sevcod))./std(sevcod)
X_std = [ones(length(ssta11), 1) ssta11, tsa16, tsamean20];
bleach_obs=bleach;
bleach_mod=round(tetapan+ssta_11.*ssta+tsa_16.*tsa+tsamean_20.*tsame
an);
[m,n]=size(bleach_mod);
%utk menyesuaikan nilai prediksi bleaching yg >3 atau <1
 for i=1:m
```

```
     if bleach_mod(i)>=3
        bleach_mod(i)=3;
     else if bleach_mod(i)<=1
        bleach_mod(i)=1;
         else
             bleach_mod(i)=bleach_mod(i);
         end
     end
 end
         %exitt
%contingency tabel or confusion matrix
C = confusionmat(bleach_obs,bleach_mod,'Order',[1 2 3]); %low=2
med=3 high=28  french polynesia
%     0    2     0
%     0    3     0
%     0    2     26
confusionmat=[0,2,0;0,3,0;0,2,26]
numCategories = size(confusionmat, 1);
totalCorrect = sum(diag(confusionmat));
totalIncorrect = sum(confusionmat(:)) - totalCorrect;
expectedCorrect = sum(sum(confusionmat, 2) .* sum(confusionmat, 1))
/ sum(confusionmat(:));
HeidkeSS = (totalCorrect - expectedCorrect) / (sum(confusionmat(:))
- expectedCorrect);
disp(HeidkeSS); %Heidke SS 0.4370
%exitt
diagonal=sum(diag(C));
PC=100.*(diagonal./m); %  87.87 percent-correct utk kasus french
polynesia
hasil_regression=[bleach_obs,bleach_mod];
pearmse1(bleach_mod,bleach_obs)%[r.^2 RMSE] 0.1832   0.8165
REG_ALL
%exitt
%standardized variabels
Y=sevcod21;X=X_std;
[B,BINT] = regress(sevcod21,X_std);
%exitt
%standardized coeffs B, strength:
%A standardized beta coefficient compares the strength of the effect
of each individual independent variable to the dependent variable.
load tebardatamodelS.txt
obs=tebardatamodelS(:,1);
preb=tebardatamodelS(:,2)
satu=ones(size(obs));
[m,n]=size(obs);
time=1:m;
% exitt
t=1:m;
data=obs;
```

```
tetha=45;
R=[cosd(tetha) sind(tetha);-sind(tetha) cosd(tetha)];
p1s=preb;
dp1s=[obs(t) p1s(t)];
nip1s=(R*dp1s');
jp1s=nip1s(:,2);
jrk_p1s=norm(jp1s);
sjp1s=std(jp1s);
RMSE_preb = sqrt(mean((p1s(t)-obs(t)).^2));
korr_preb=xcorr(p1s(t),obs(t),'coeff');
k_preb=korr_preb(m);
% exitt
axis('square')
xa=min(obs):max(obs);
ya=min(obs):max(obs);
figure (1);
axis('square');
plot(obs,preb,'o','LineWidth',2.5),hold on
plot(xa,ya,'r:','LineWidth',2),hold off
xlabel('Data Observasi Coral Bleaching')
ylabel('Data Prediksi Coral Bleaching')
title('Diagram Tebar Data Observasi dan Data Prediksi')
text(1.1,2.9,'Prediksi')
text(1.1,2.8,'r =0.7613')
axis([min(obs) max(obs) min(obs) max(obs)])
yticks (1:1:3)
xticks (1:1:3)
print -dtiff korelasi1.tif
load tebardatamodelS.txt
preb=tebardatamodelS(:,2);
obs=tebardatamodelS(:,1);
satu=ones(size(preb));
[m,n]=size(preb);
%exitt
axis('square')
figure (2);
axis('square');
plot(obs,'o'),hold on
plot(preb,'*'),hold on
xlabel('Kejadian Coral Bleaching')
ylabel('Kategori Coral Bleaching')
title('Kesesuaian Data Observasi dan Data Prediksi Coral Bleaching')
text(0.5,3.8,'Prediktor ssta,tsa,tsamean')
legend ('observasi','prediksi')
text(0.5,3.5,'r = 0.7613')
axis([0,35,0,4])
yticks (1:1:3)
xticks (1:1:33)
print -dtiff klascb.tif
```