

### Time— Space ERA20 dataset

						X	Axis: node_	number ()					
		0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0
	1979.0	78	32	37	32	13	34	41	5	24	32	14	23
	1980.0	51	22	31	34	26	26	36	22	30	39	19	29
	1981.0	59	14	35	34	14	14	37	11	25	69	27	26
	1982.0	62	35	40	24	14	26	30	12	28	43	22	29
0	1983.0	56	21	34	39	19	31	29	15	26	36	24	35
time	1984.0	82	18	30	47	7	28	39	13	15	41	20	25
=	1985.0	68	23	37	40	17	31	29	11	32	37	16	24

## Histogram of Frequency of occurrence, ECMWF

		X Axis: node_number													
		0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0		
	1979.0	21.37	8.77	10.14	8.77	3.56	9.32	11.23	1.37	6.58	8.77	3.84	6.30		
time	1980.0	13.97	6.03	8.49	9.32	7.12	7.12	9.86	6.03	8.22	10.68	5.21	7.95		
	1981.0	16.16	3.84	9.59	9.32	3.84	3.84	10.14	3.01	6.85	18.90	7.40	7.12		
	1982.0	16.99	9.59	10.96	6.58	3.84	7.12	8.22	3.29	7.67	11.78	6.03	7.95		
	1983.0	15.34	5.75	9.32	10.68	5.21	8.49	7.95	4.11	7.12	9.86	6.58	9.59		
	1984.0	22.47	4.93	8.22	12.88	1.92	7.67	10.68	3.56	4.11	11.23	5.48	6.85		
	1985.0	18 63	6.30	10.14	10.96	4.66	8 40	7.05	2.01	8 77	10.14	4 28	6.58		

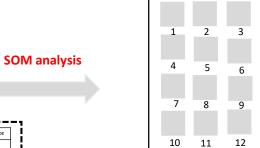
#### Histogram of Relative Frequency of occurrence, ECMWF

X Axis: node_number													
0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0		
43.0	13.0	17.0	34.0	13.0	16.0	49.0	32.0	32.0	53.0	22.0	41.6		
38.0	20.0	32.0	37.0	19.0	24.0	35.0	31.0	25.0	43.0	33.0	28.0		
49.0	22.0	12.0	65.0	24.0	14.0	40.0	22.0	22.0	40.0	16.0	39.0		
64.0	16.0	30.0	41.0	22.0	20.0	45.0	16.0	27.0	36.0	26.0	22.0		
	43.0 38.0 49.0	43.0 13.0 38.0 20.0 49.0 22.0	43.0 13.0 17.0 38.0 20.0 32.0 49.0 22.0 12.0	43.0 13.0 17.0 34.0 38.0 20.0 32.0 37.0 49.0 22.0 12.0 65.0	0.0 1.0 2.0 3.0 4.0   43.0 13.0 17.0 34.0 13.0   38.0 20.0 32.0 37.0 19.0   49.0 22.0 12.0 65.0 24.0	0.0 1.0 2.0 3.0 4.0 5.0   43.0 13.0 17.0 34.0 13.0 16.0   38.0 20.0 32.0 37.0 19.0 24.0   49.0 22.0 12.0 65.0 24.0 14.0	0.0 1.0 2.0 3.0 4.0 5.0 6.0   43.0 13.0 17.0 34.0 13.0 16.0 49.0   38.0 20.0 32.0 37.0 19.0 24.0 35.0   49.0 22.0 12.0 65.0 24.0 14.0 40.0	0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0   43.0 13.0 17.0 34.0 13.0 16.0 49.0 32.0   38.0 20.0 32.0 37.0 19.0 24.0 33.0 31.0   49.0 22.0 12.0 65.0 24.0 14.0 40.0 22.0	0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0   43.0 13.0 17.0 34.0 13.0 16.0 49.0 32.0 32.0   38.0 20.0 32.0 37.0 19.0 24.0 33.0 31.0 25.0   49.0 22.0 12.0 65.0 24.0 14.0 40.0 22.0 22.0	0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0   43.0 13.0 17.0 34.0 13.0 16.0 49.0 32.0 32.0 53.0   38.0 20.0 32.0 37.0 19.0 24.0 35.0 31.0 25.0 43.0   49.0 22.0 12.0 65.0 24.0 14.0 40.0 22.0 22.0 42.0	0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0   43.0 13.0 17.0 34.0 13.0 16.0 49.0 32.0 32.0 53.0 22.0   38.0 20.0 32.0 37.0 19.0 24.0 33.0 31.0 25.0 43.0 33.0   49.0 22.0 12.0 65.0 24.0 14.0 40.0 22.0 22.0 43.0 33.0		

# Histogram of Frequency of occurrence, ERA20C

	X Axis: node_number													
	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0		
1900.0	11.8	3.6	4.7	9.3	3.6	4.4	13.4	8.8	8.8	14.5	6.0	11.7		
1901.0	10.4	5.5	8.8	10.1	5.2	6.6	9.6	8.5	6.8	11.8	9.0	7.7		
1902.0	13.4	6.0	3.3	17.8	6.6	3.8	11.0	6.0	6.0	11.0	4.4	10.7		
1903.0	17.5	4.4	8.2	11.2	6.0	5.5	12.3	4.4	7.4	9.9	7.1	6.0		
10040			0.5		4.0	6.3	140	4.5		10.7				

Histogram of Relative Frequency of occurrence, ERA20C



Principal

components

Euclidean distance

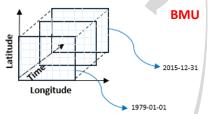
158.2

Node number

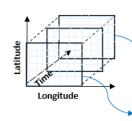
Node dataset ECMWF

**iNode dataset ERA20C** 

# **SOM** patterns nodes



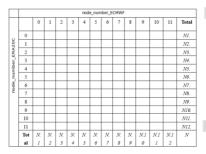
Time— Space ECMWF dataset



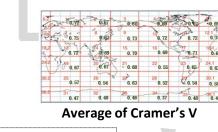
Time— Space ERA20 dataset

**Chi-square** 

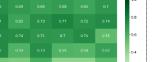
entropy



**Contingency Table** 

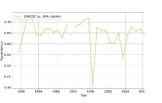


Average of dependency



Heatmap of Cramer's V

2010-12-31





=< 0.50): 31 32 33 34 35 36

Heatmap of dependency Time Series of dependency