



Assessing temporal variability in habitat quality for vicuñas.

Jerry Laker and Parivash Lumsdon



Vicugna vicugna mensalis



Vicugna vicugna vicugna



What's so special?

The vicuña bears the highest quality natural textile fibre on earth

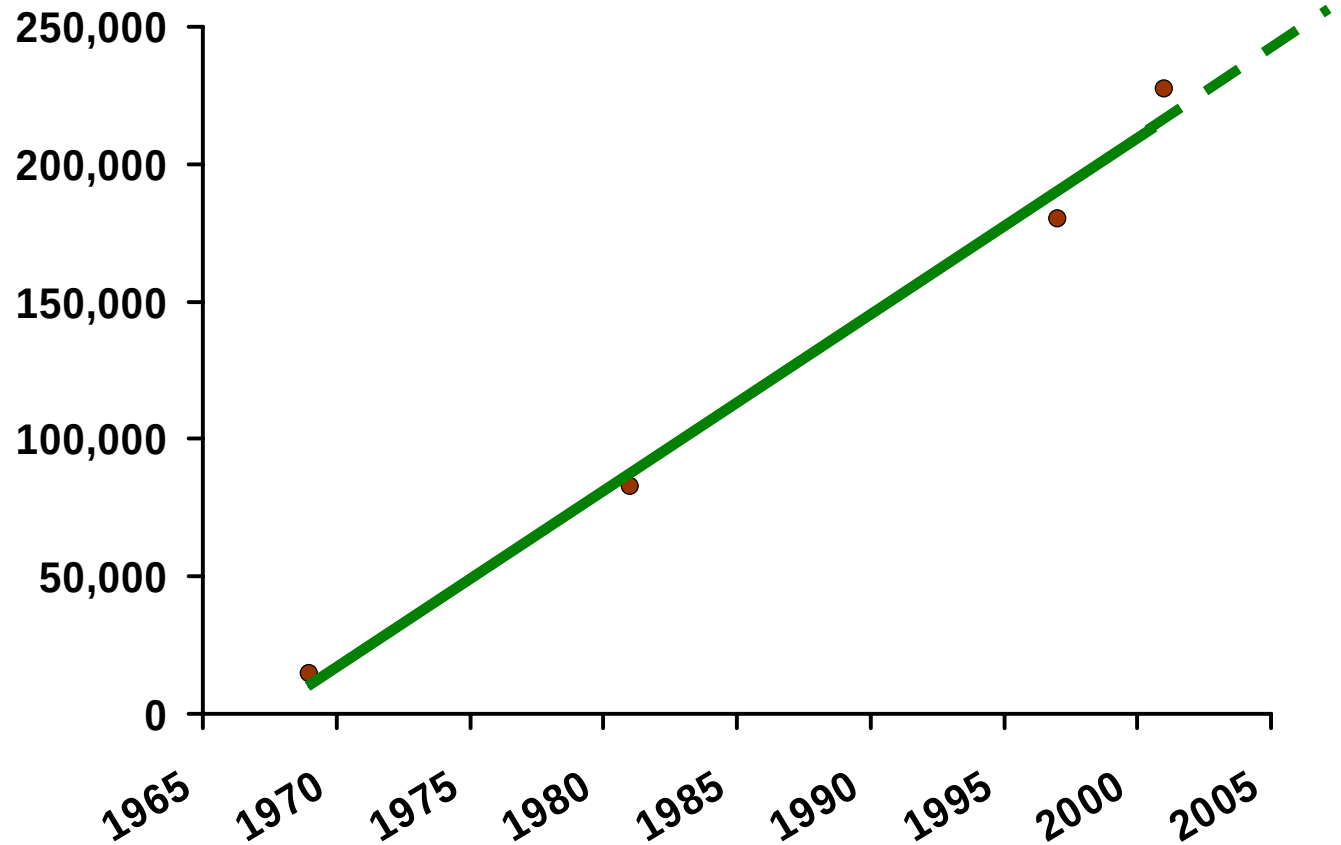


Vicuña distribution and population



	1969	1981	1997	2001
Peru	10,000	61,900	102,800	118,700
Bolivia	3,000	4,500	33,800	56,400
Argentina	1,000	8,200	22,100	33,500
Chile	500	8,000	19,800	16,900
Ecuador	0	0	1,600	2,000
Total	14,500	82,600	180,100	227,500

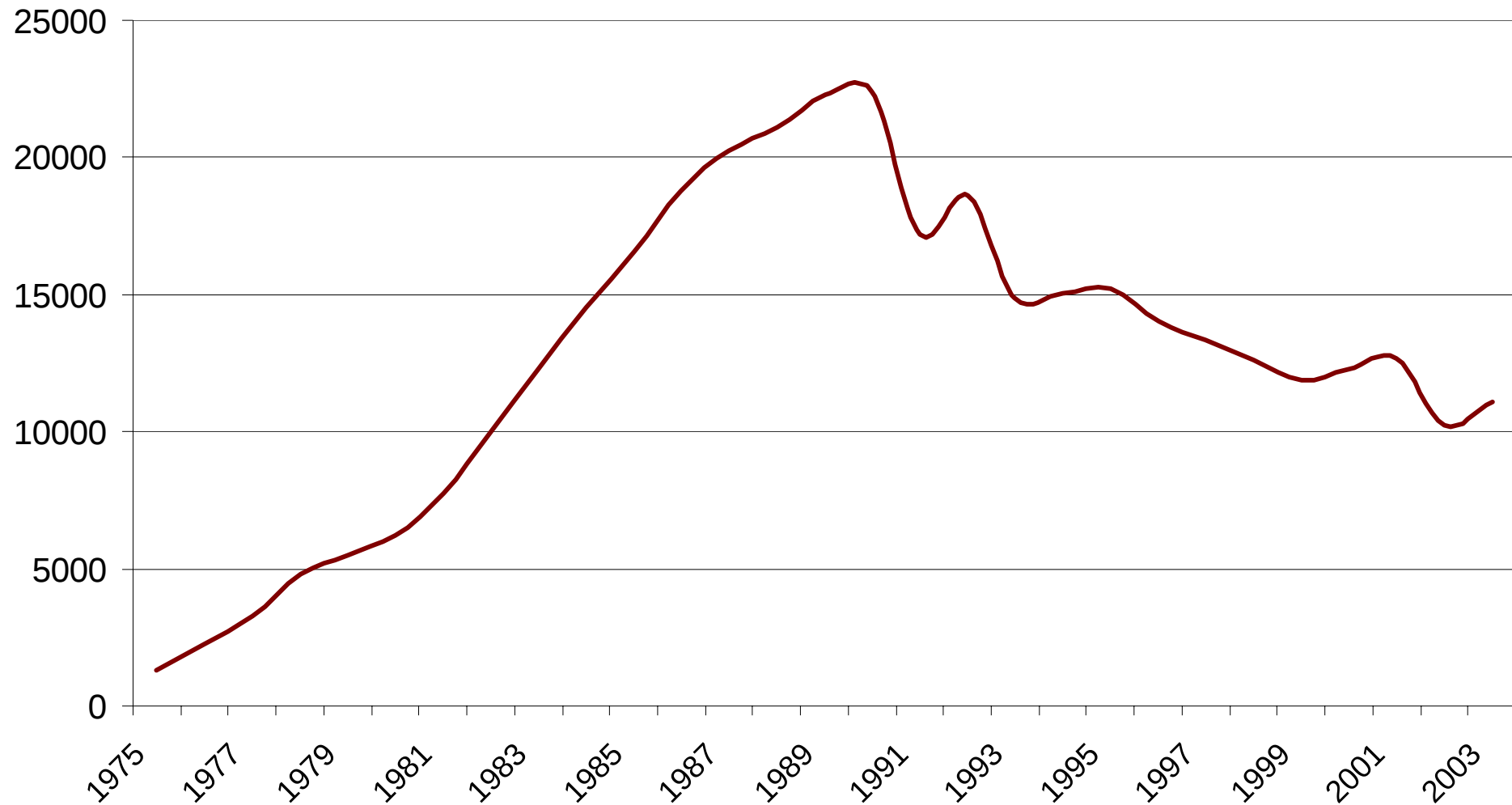
**Population growth shows
no sign of slowing....**



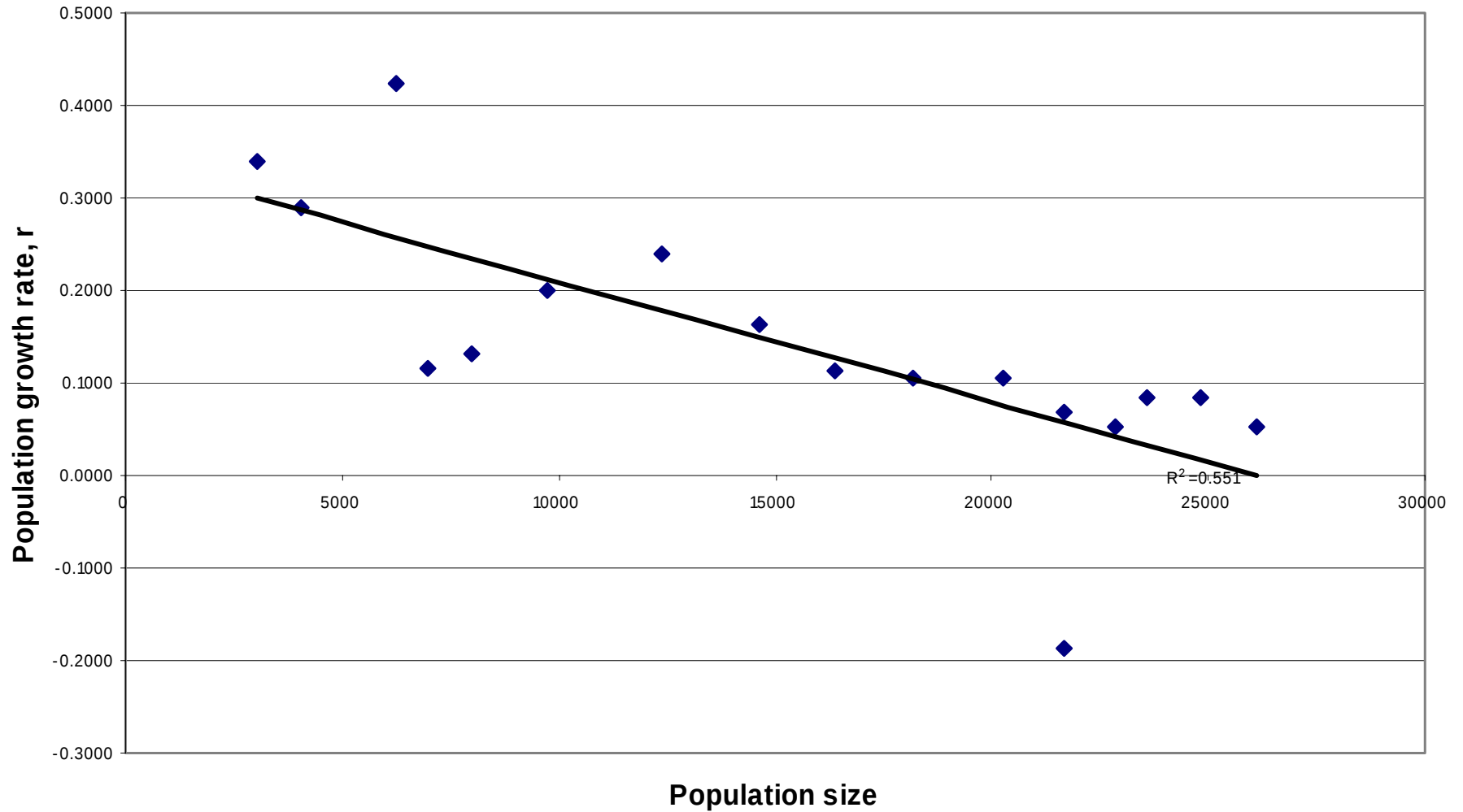
Parinacota, Northern Chile



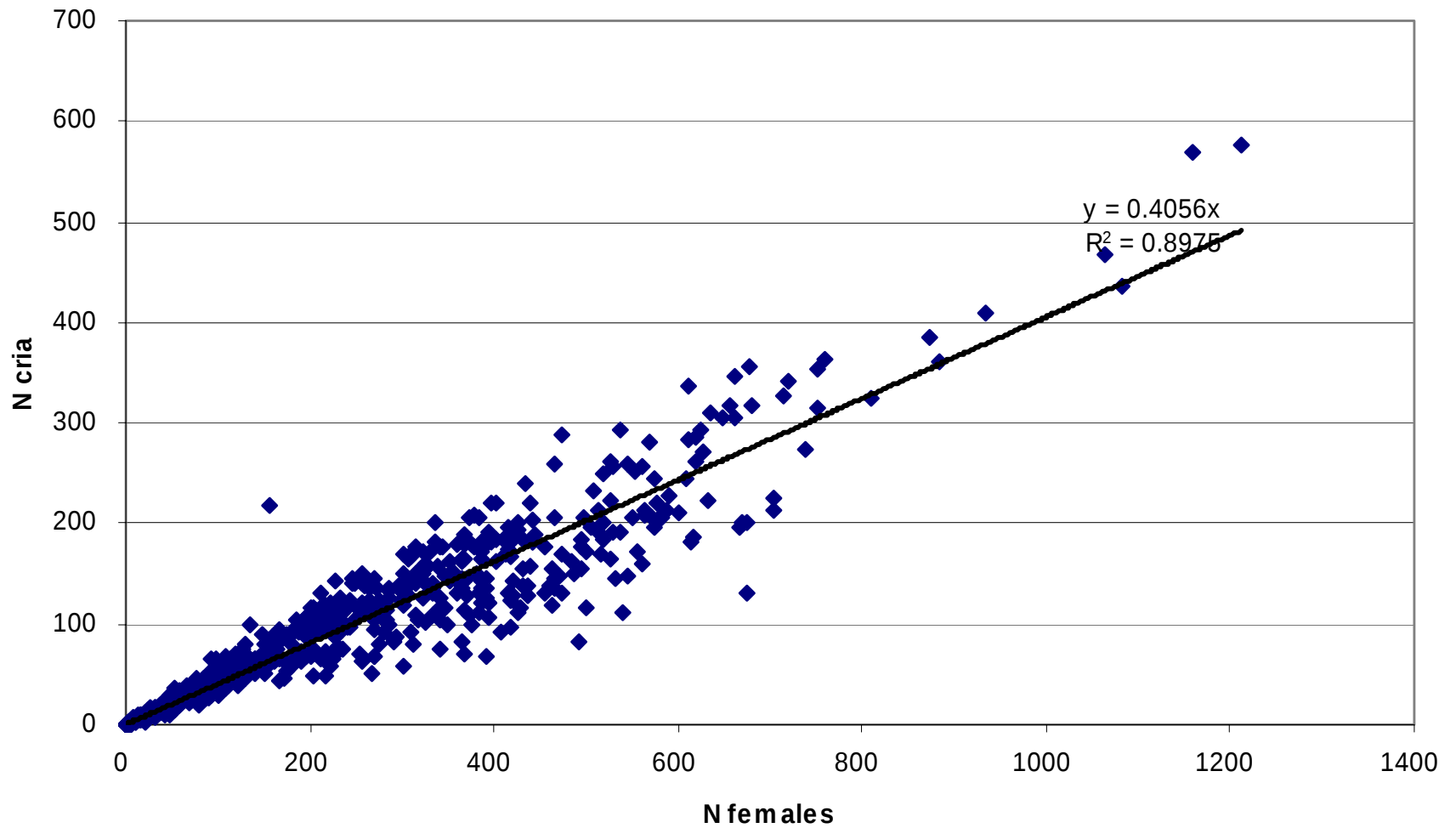
Vicuña population in Parinacota 1975-2003



Population growth rate by population



Cria per female

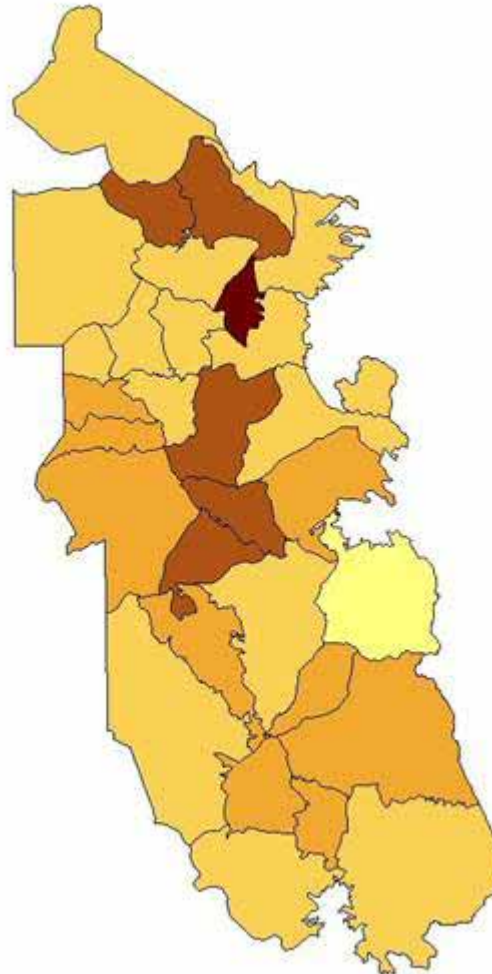
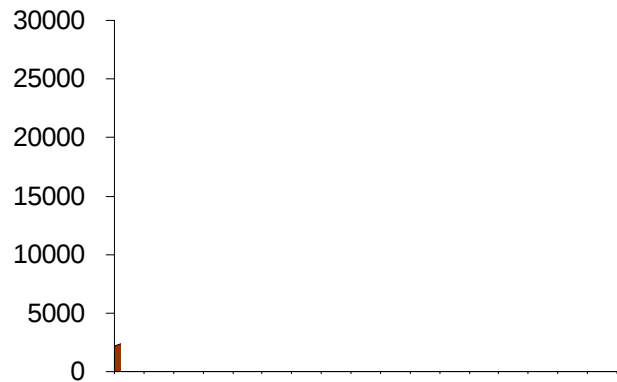


Resurgence of vicuña populations following introduction of conservation measures

I region, Chile



Total population



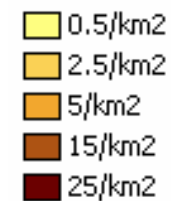
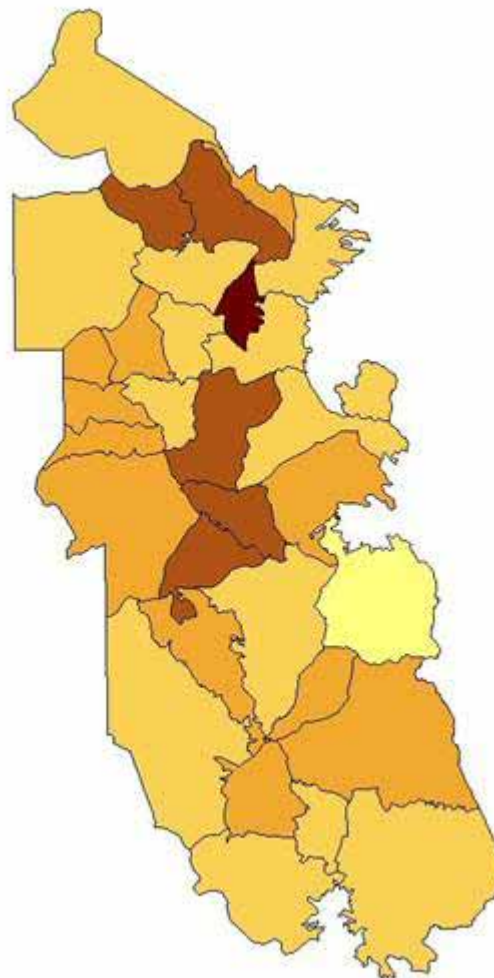
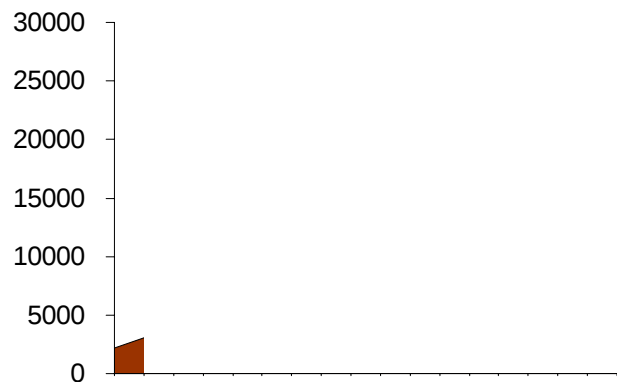
1975

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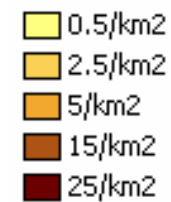
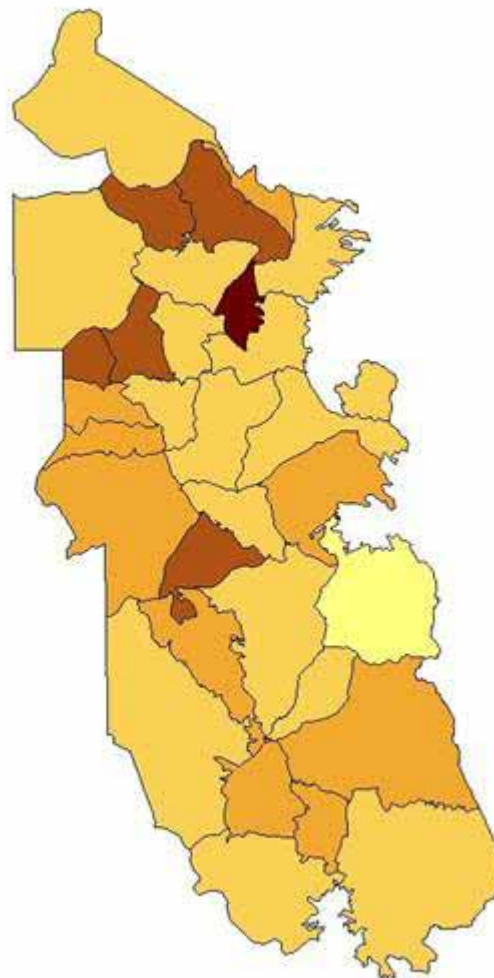
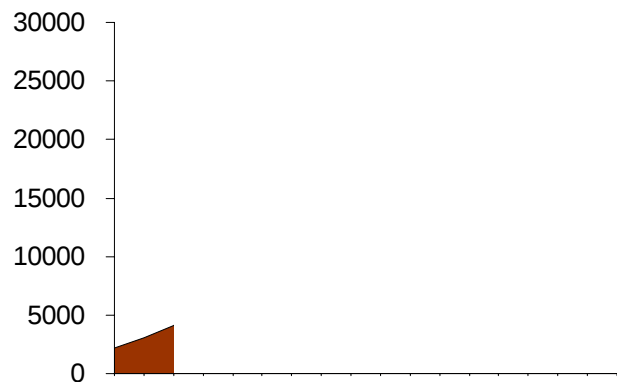
1976

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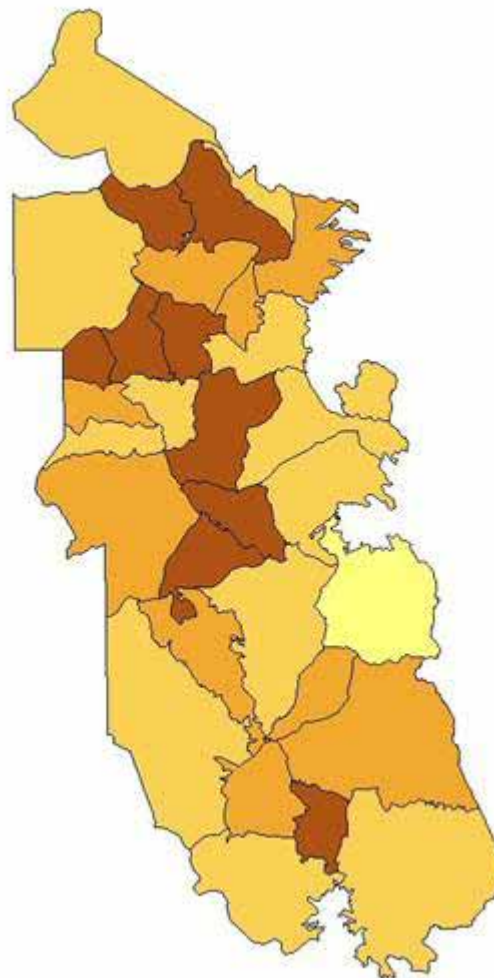
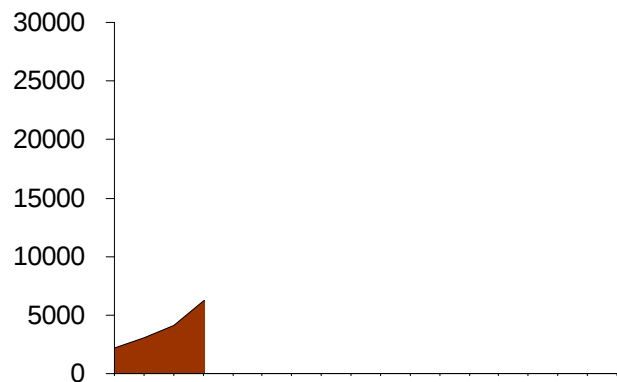
1977

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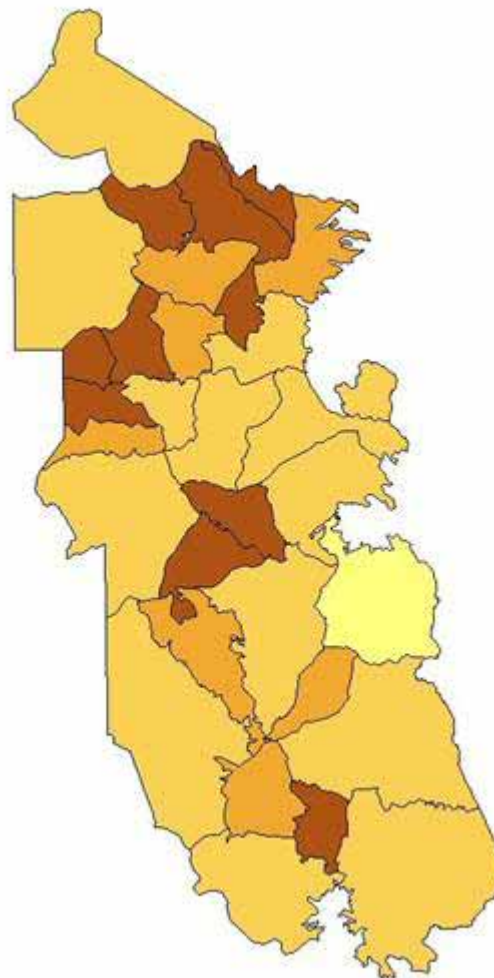
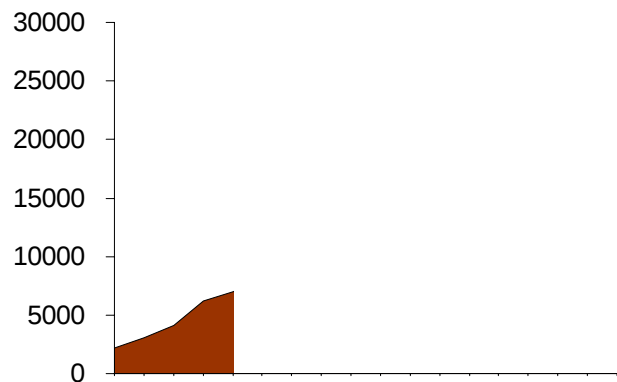
1978

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Total population



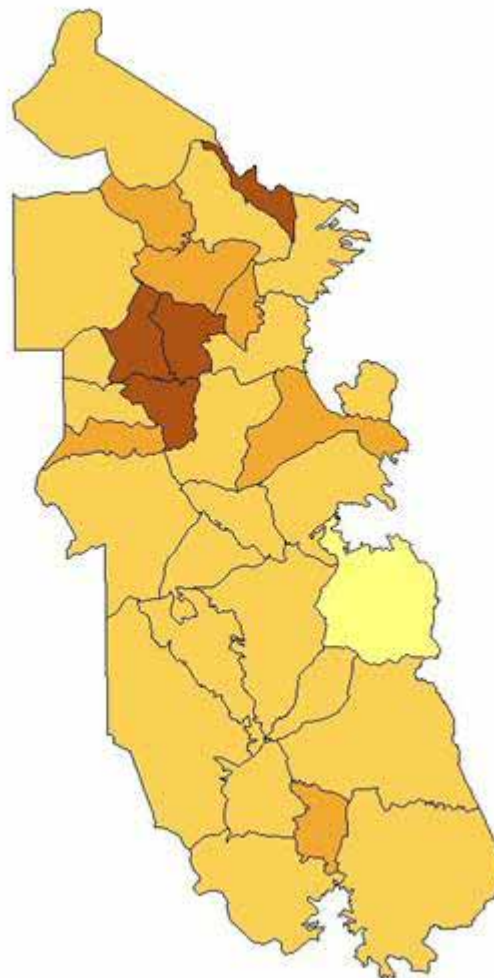
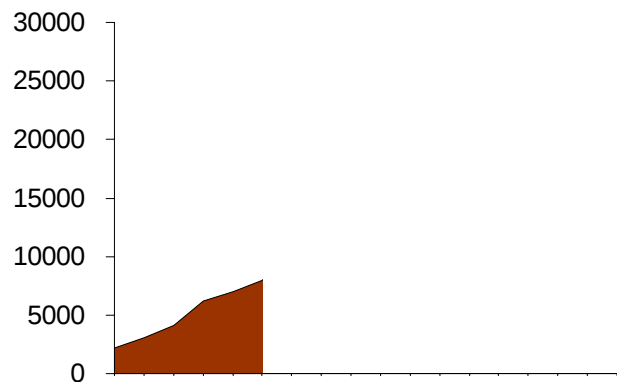
1979

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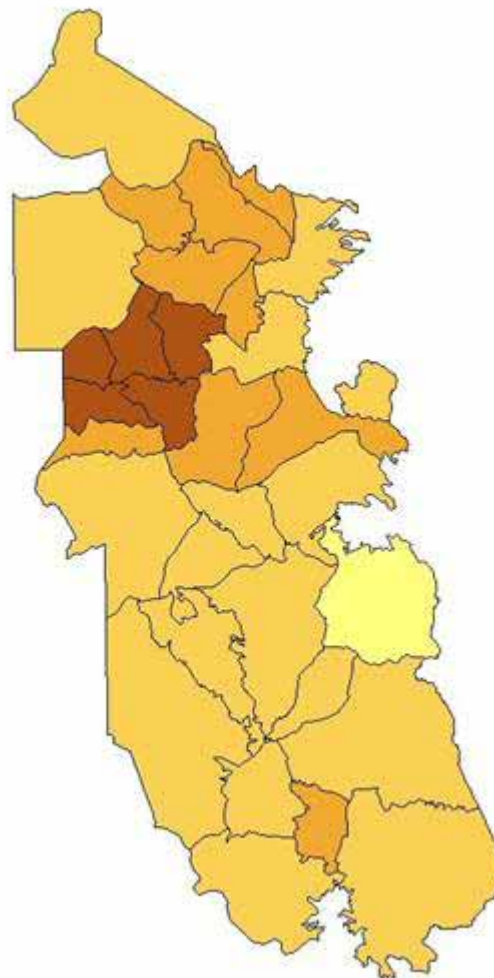
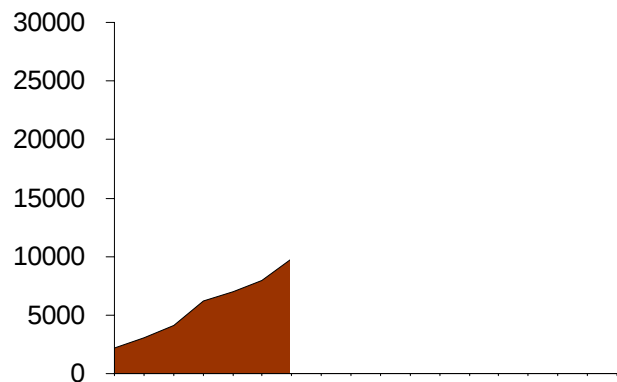
1980

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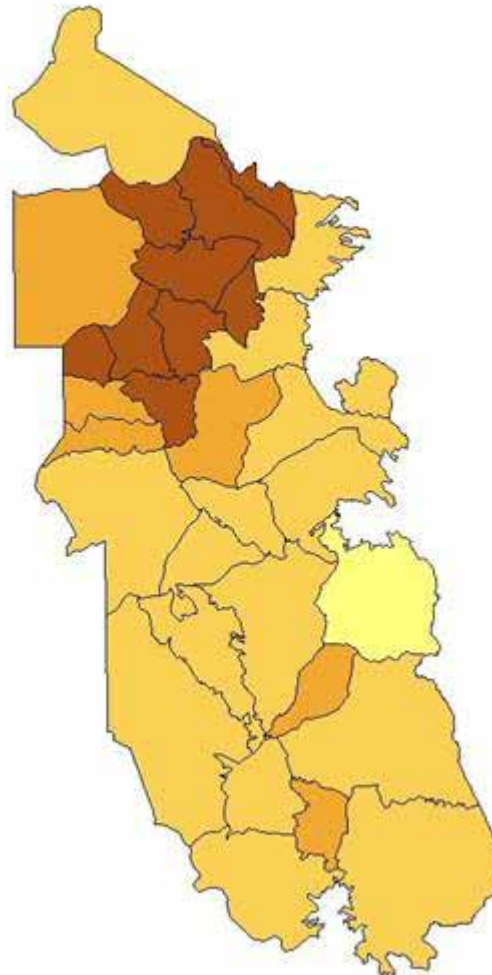
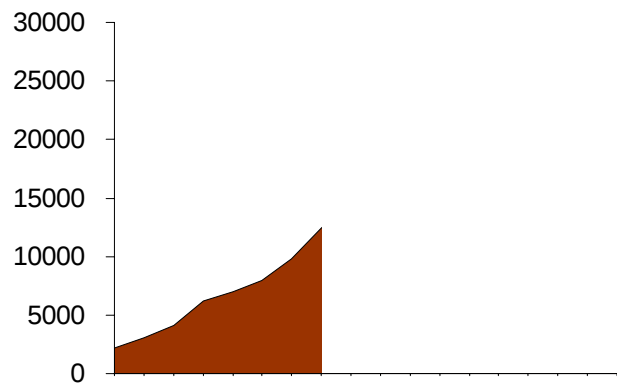
1981

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Total population



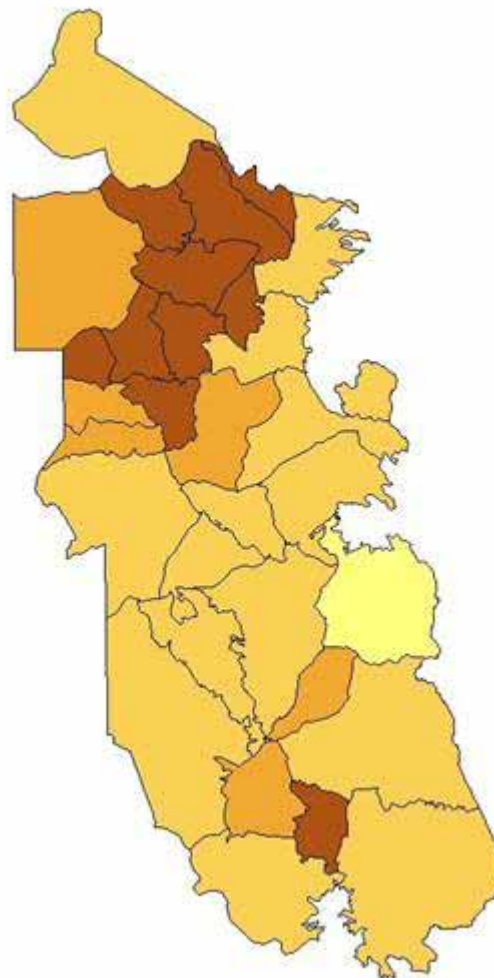
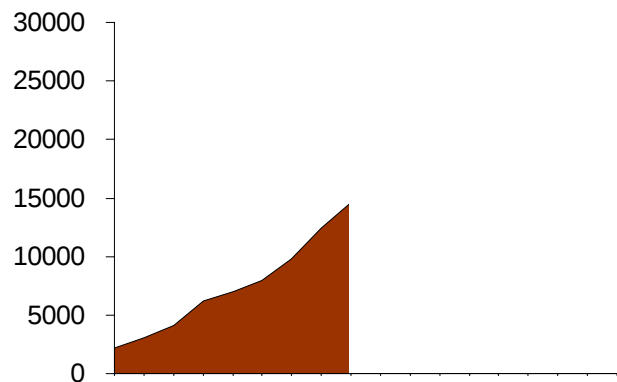
1982

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Total population



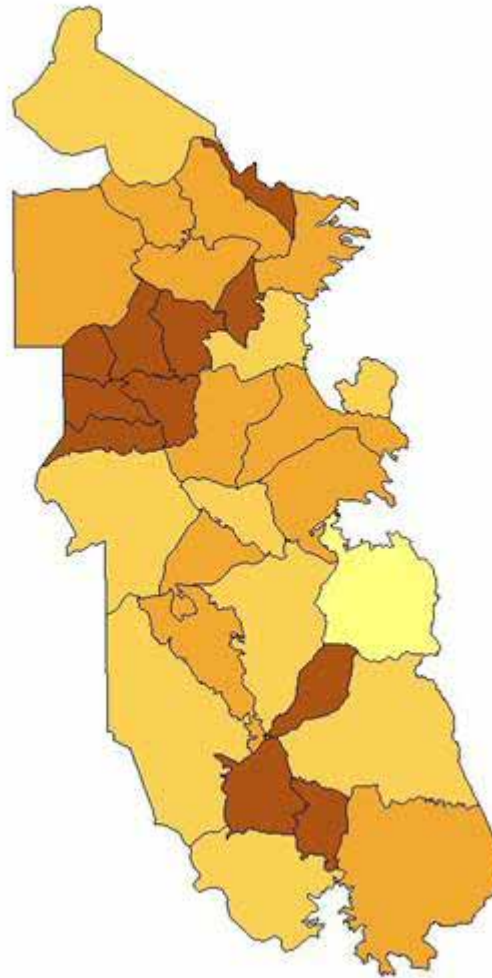
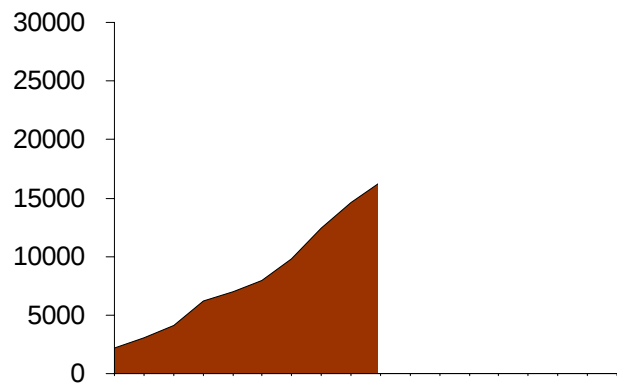
1983

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Total population



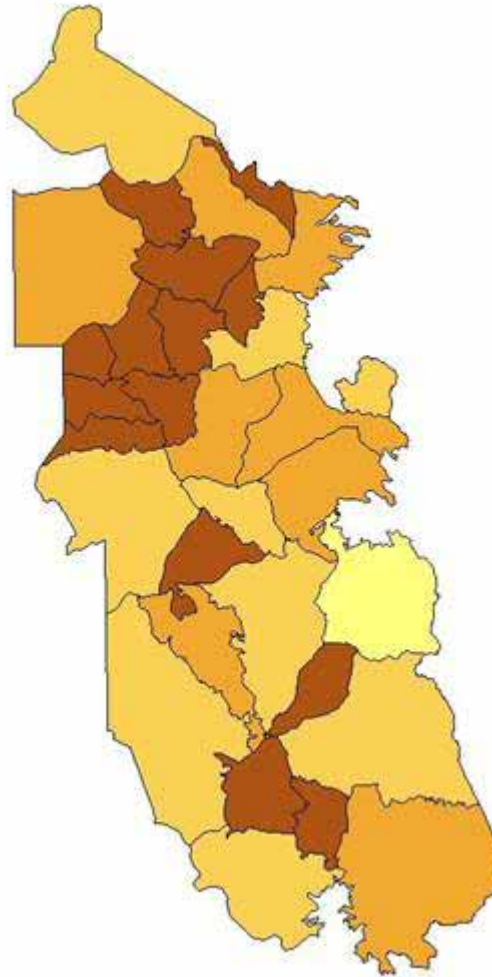
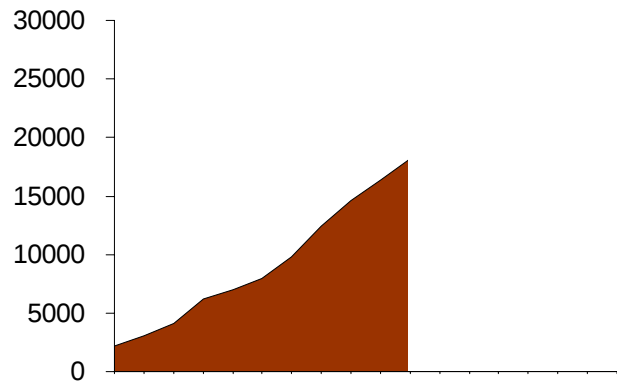
1984

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Total population



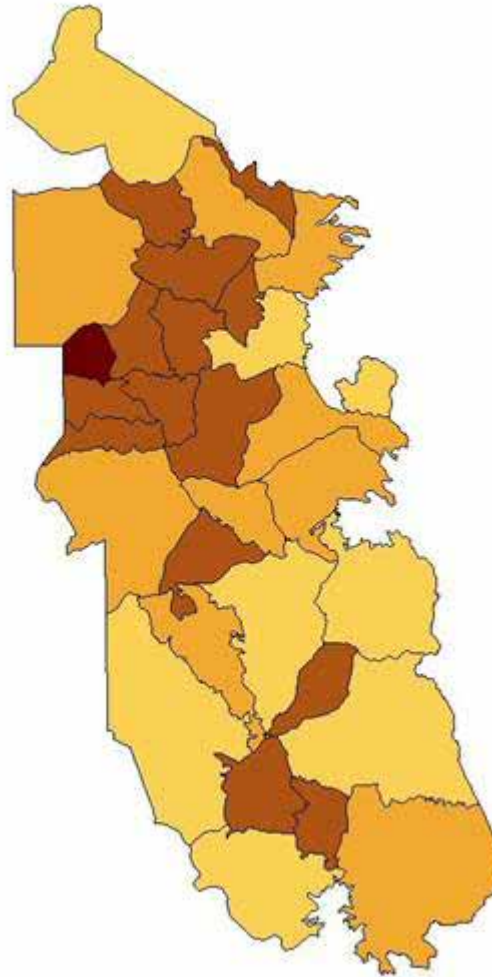
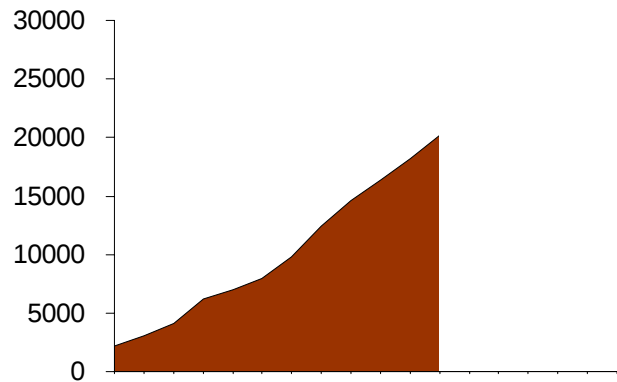
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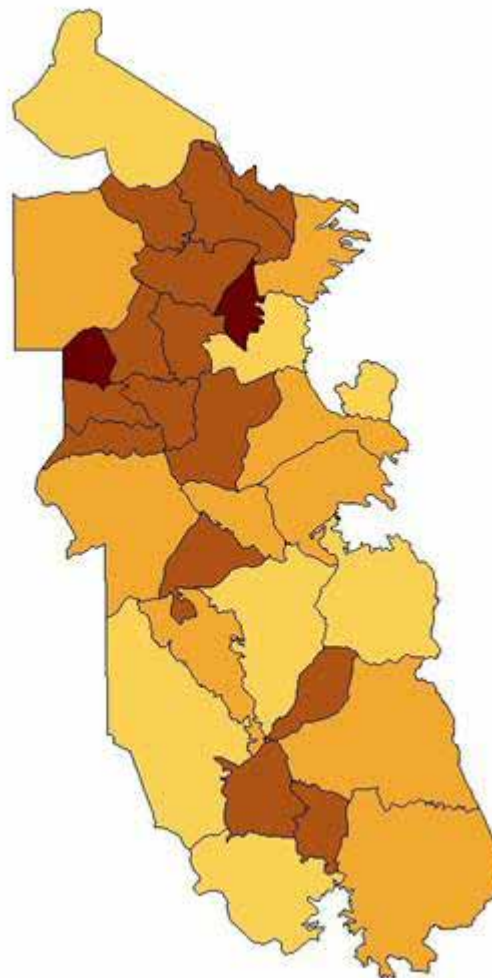
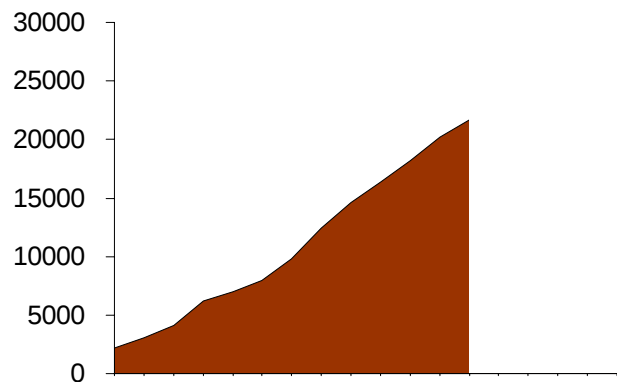
1986

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Total population



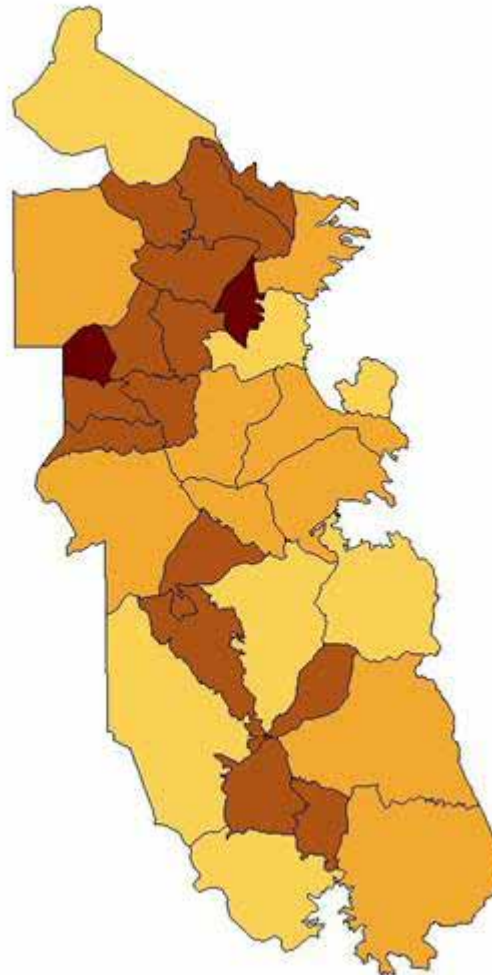
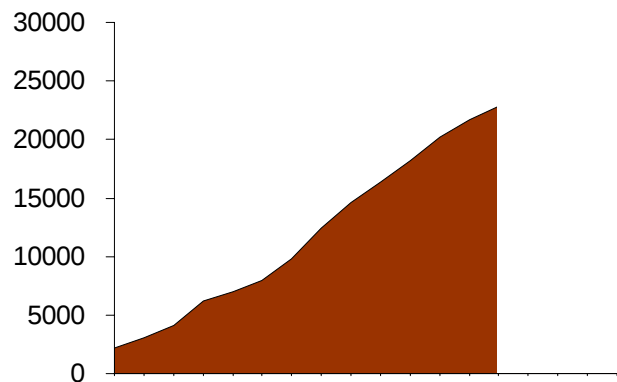
1987

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Total population



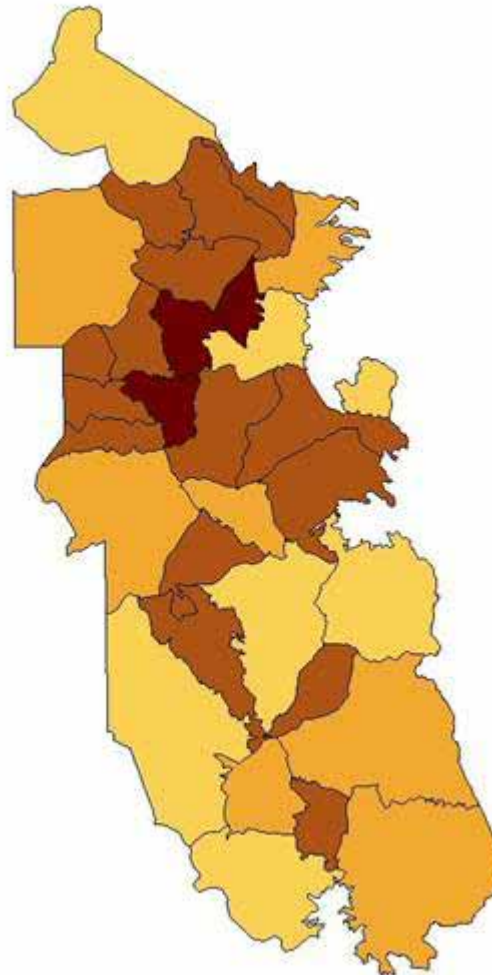
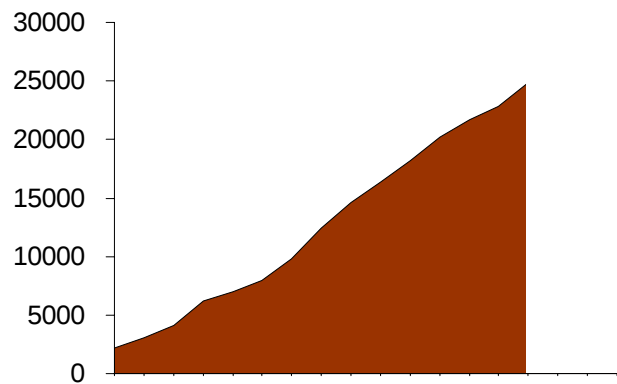
1988

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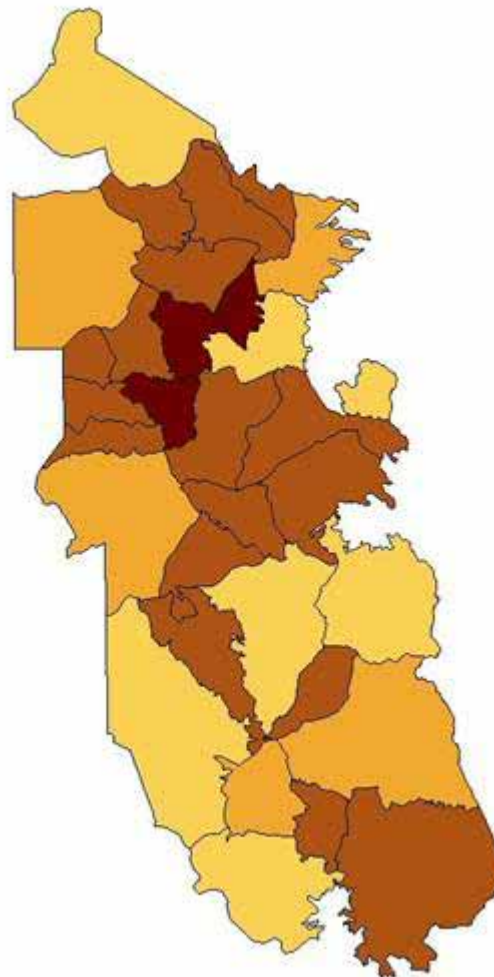
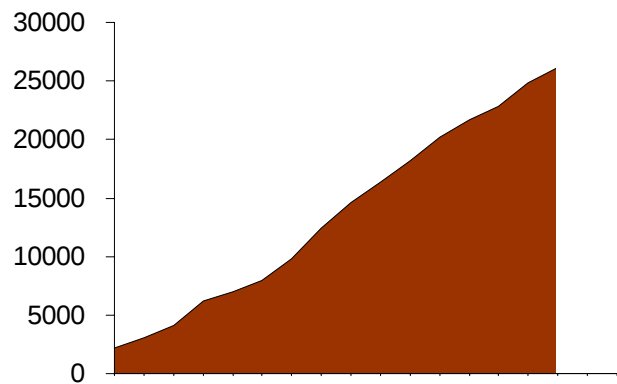
1989

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Total population



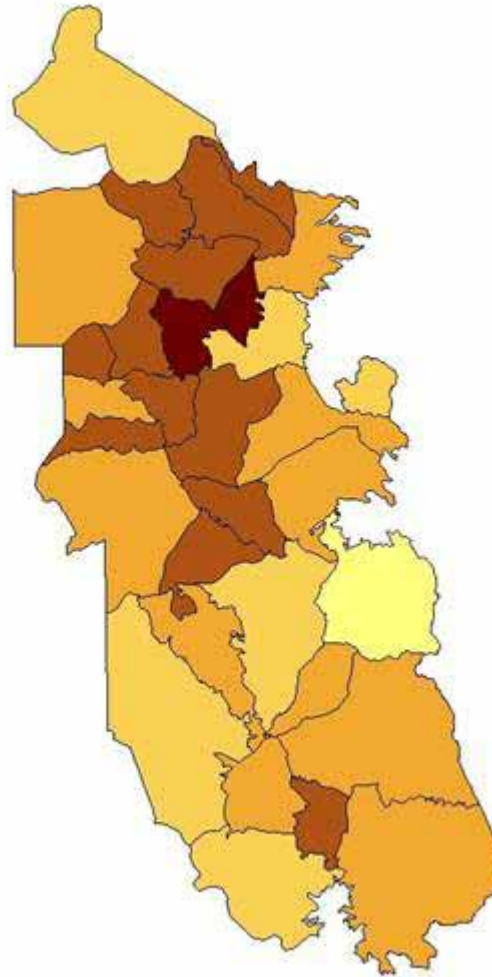
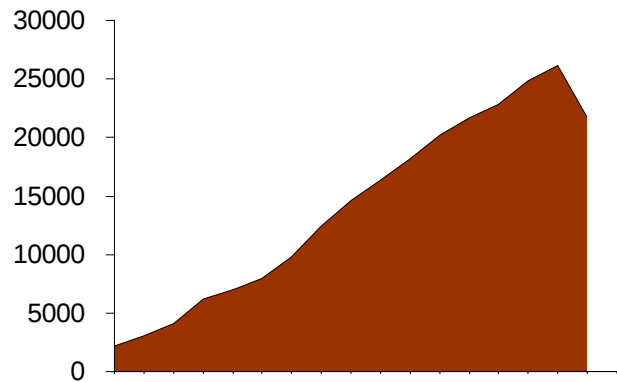
1990

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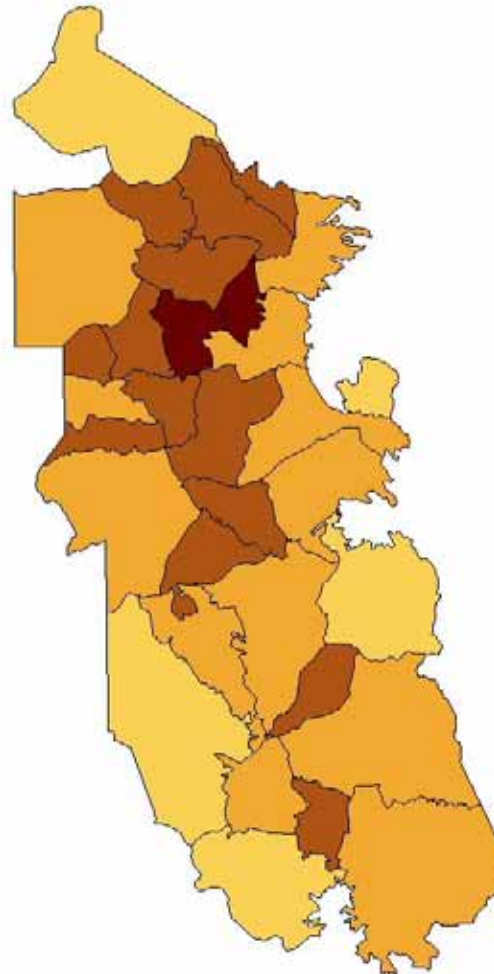
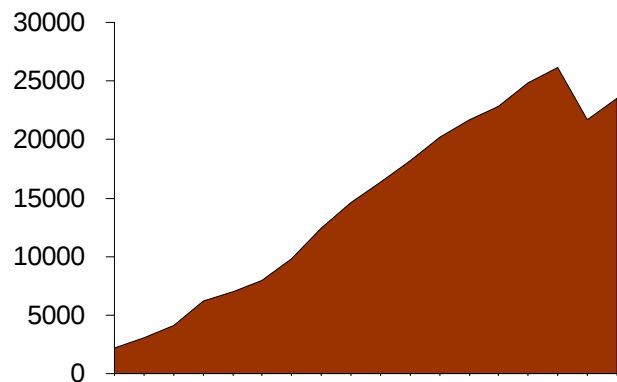
1991

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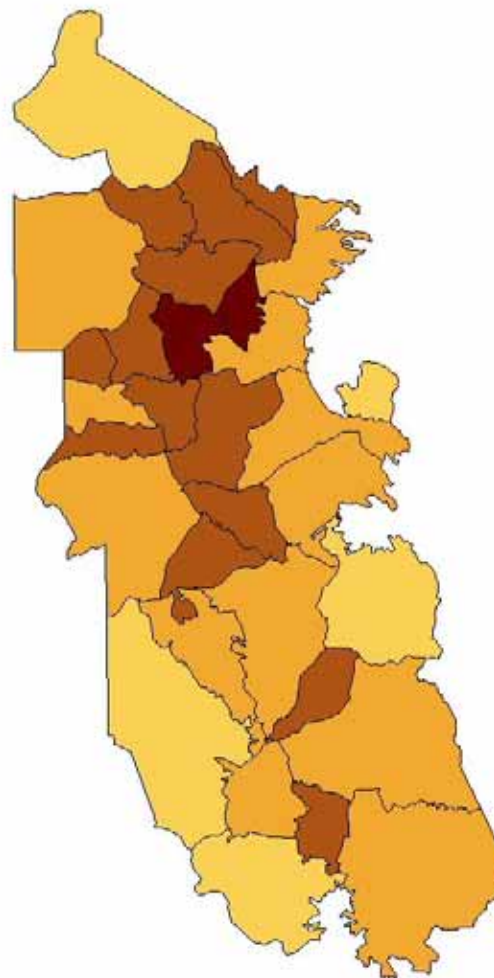
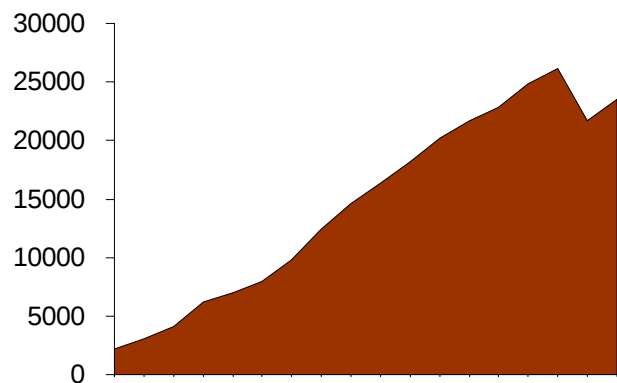
1992

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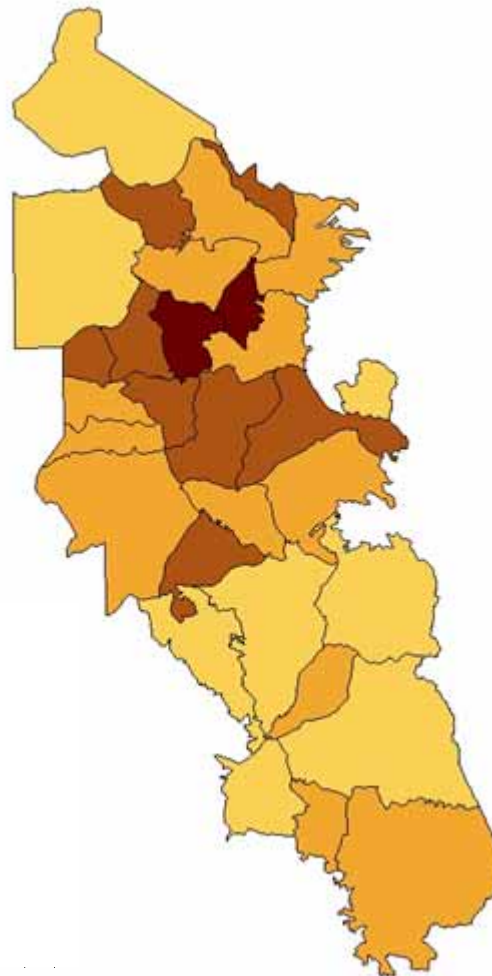
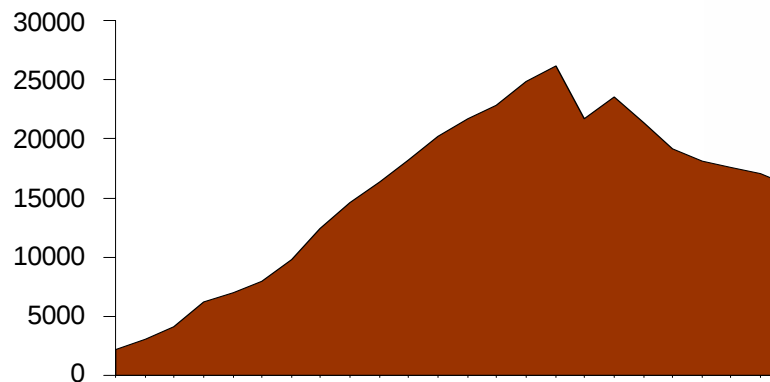
Total population



1995

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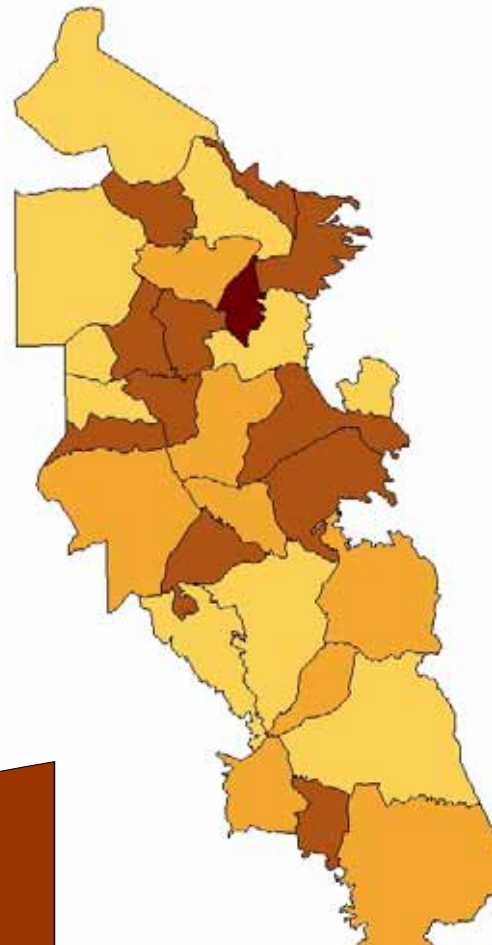
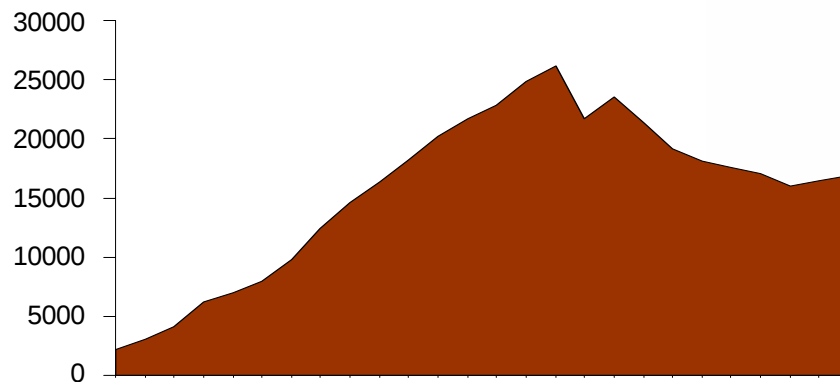
I region, Chile



1999

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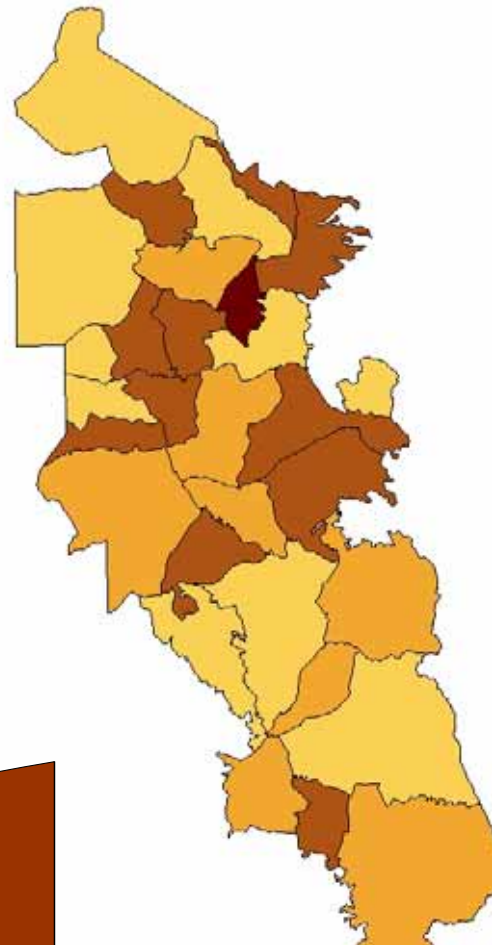
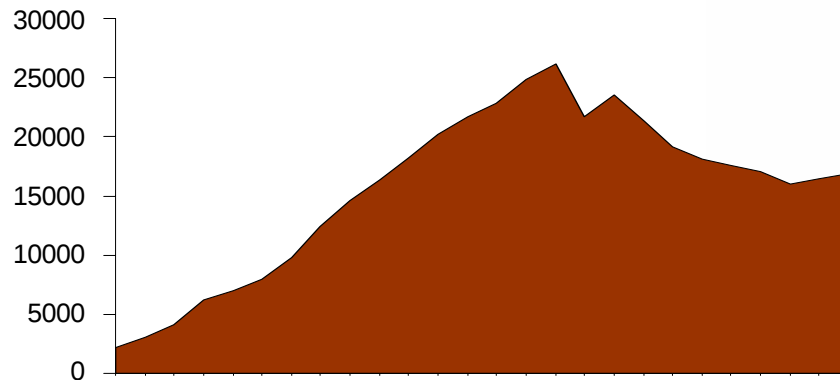
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2001

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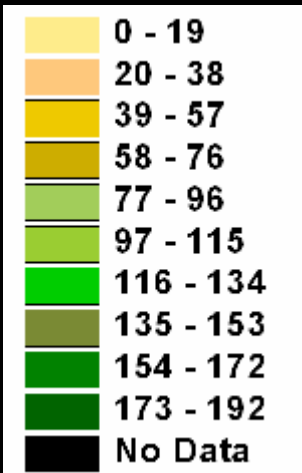
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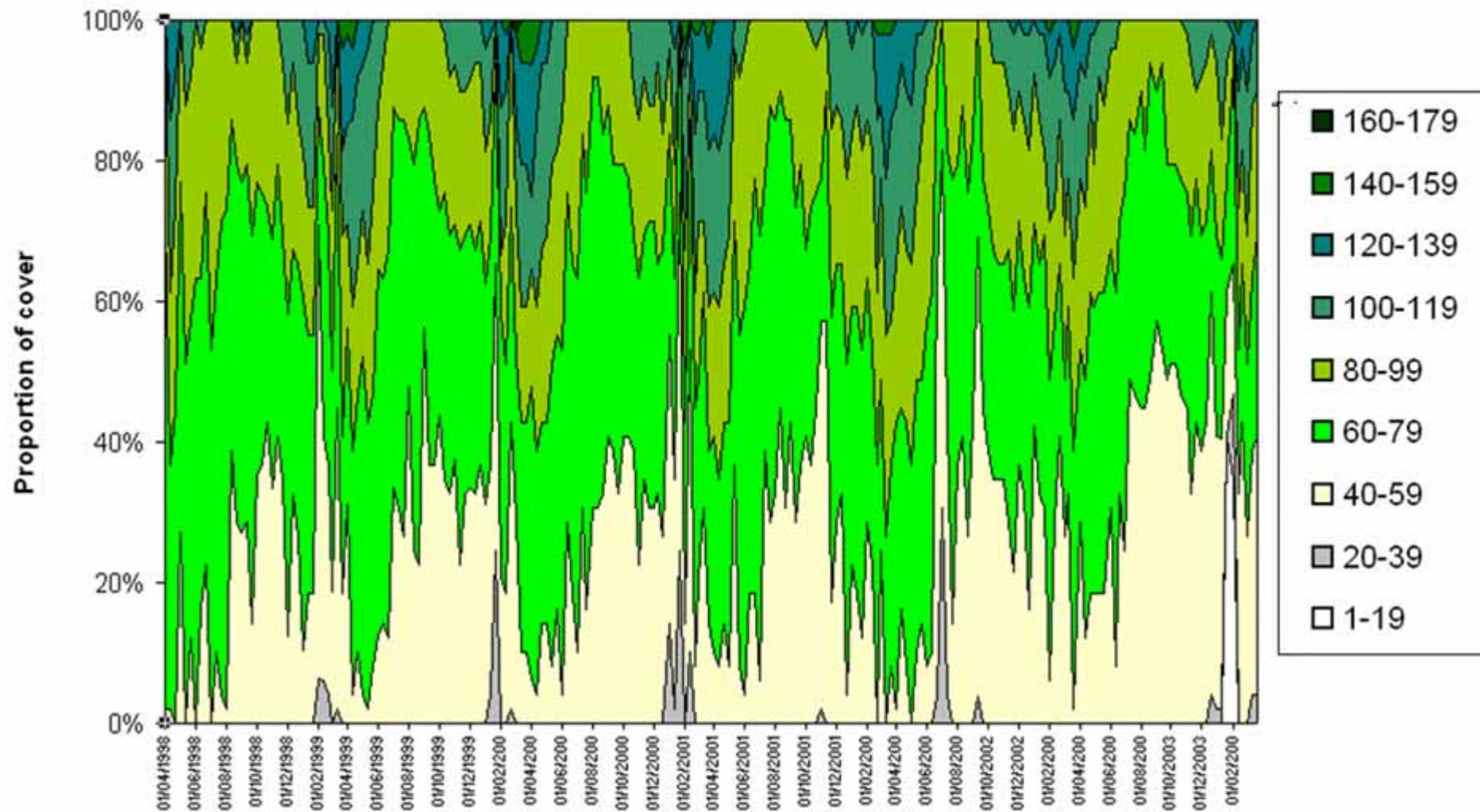
2001

01-01-1999

NDVI scale

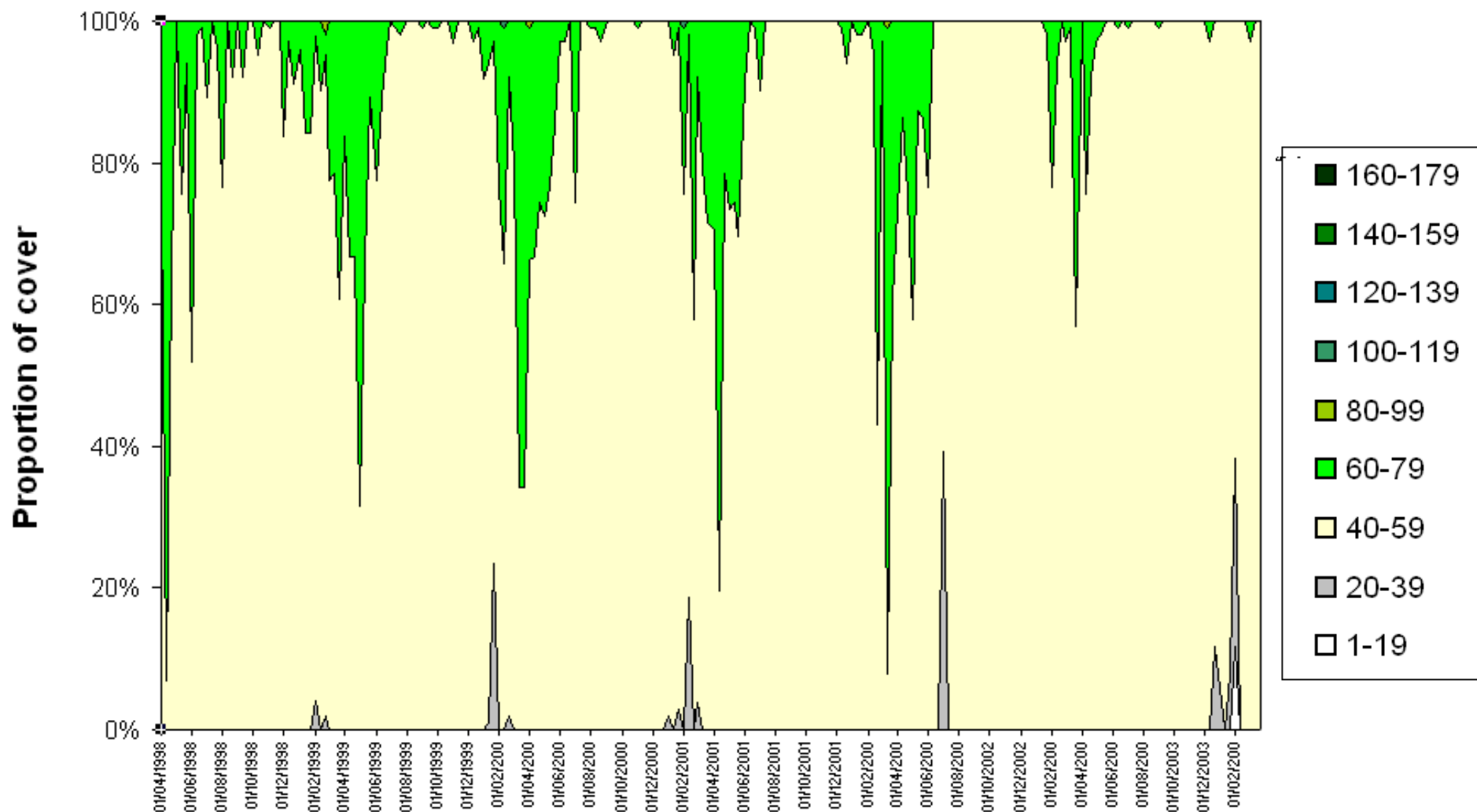


Casiri
NDVI reflectance profile April 1998-March 2004

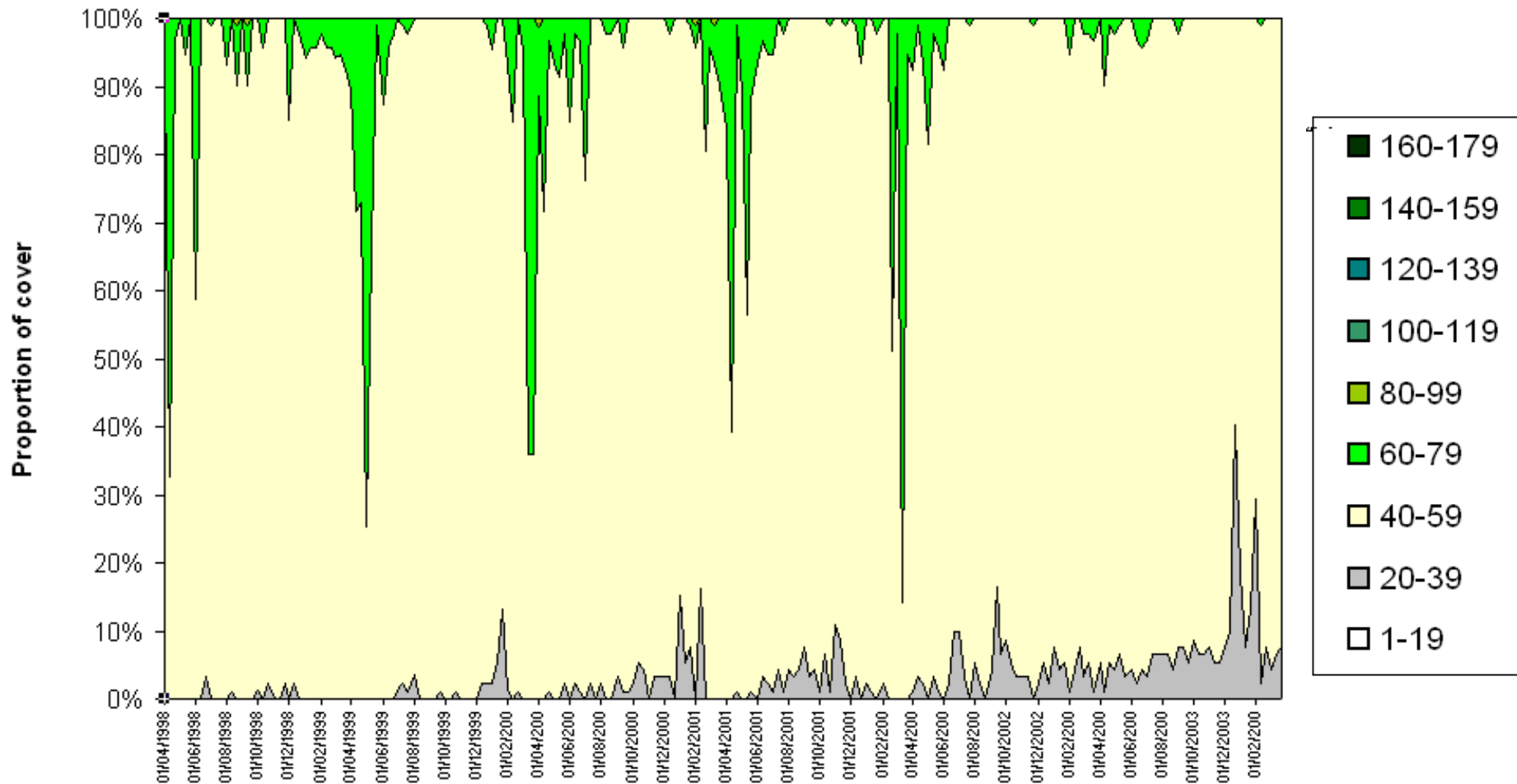


Chivatambo

NDVI reflectance profile April 1998-March 2004

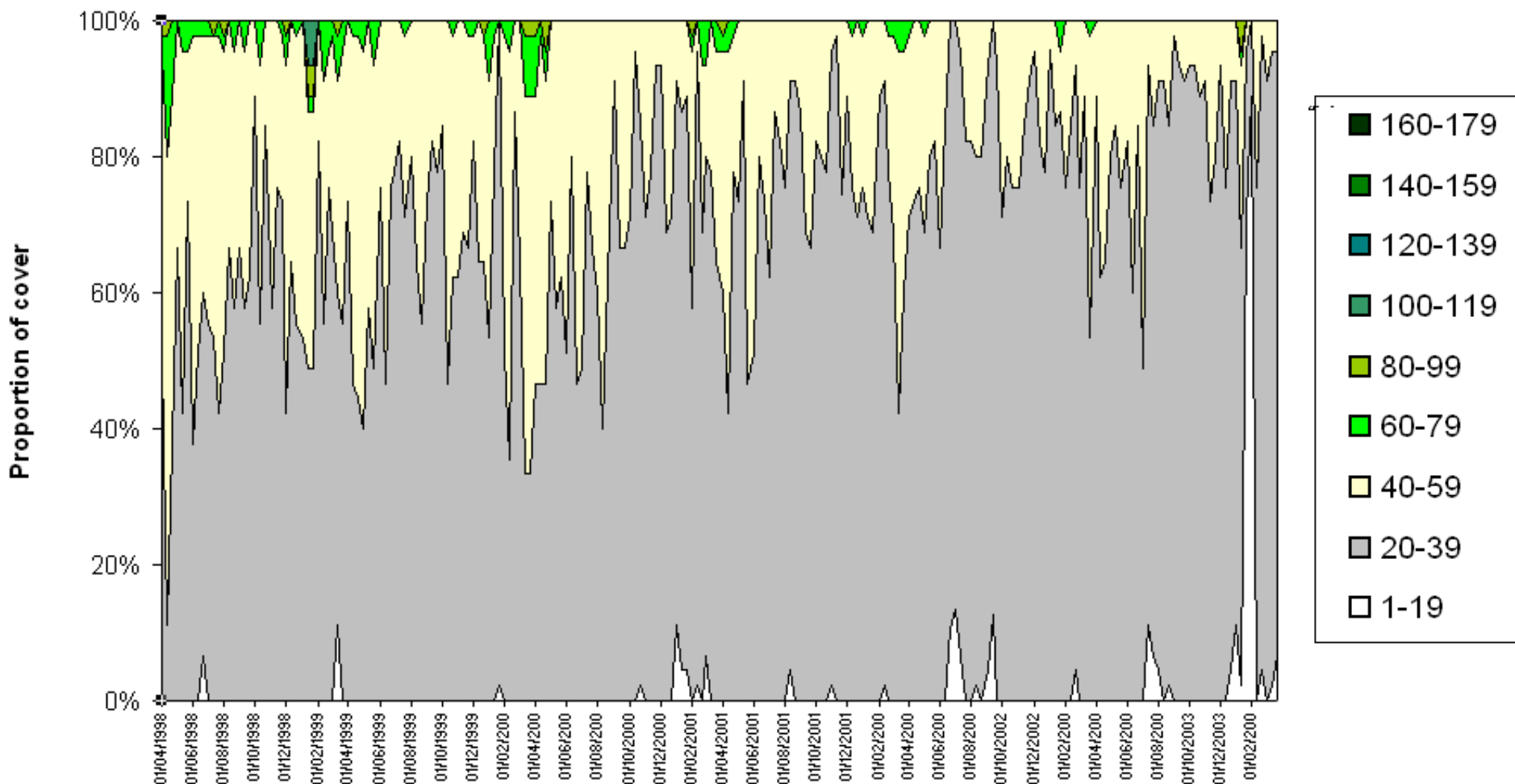


Contorine
NDVI reflectance profile April 1998-March 2004

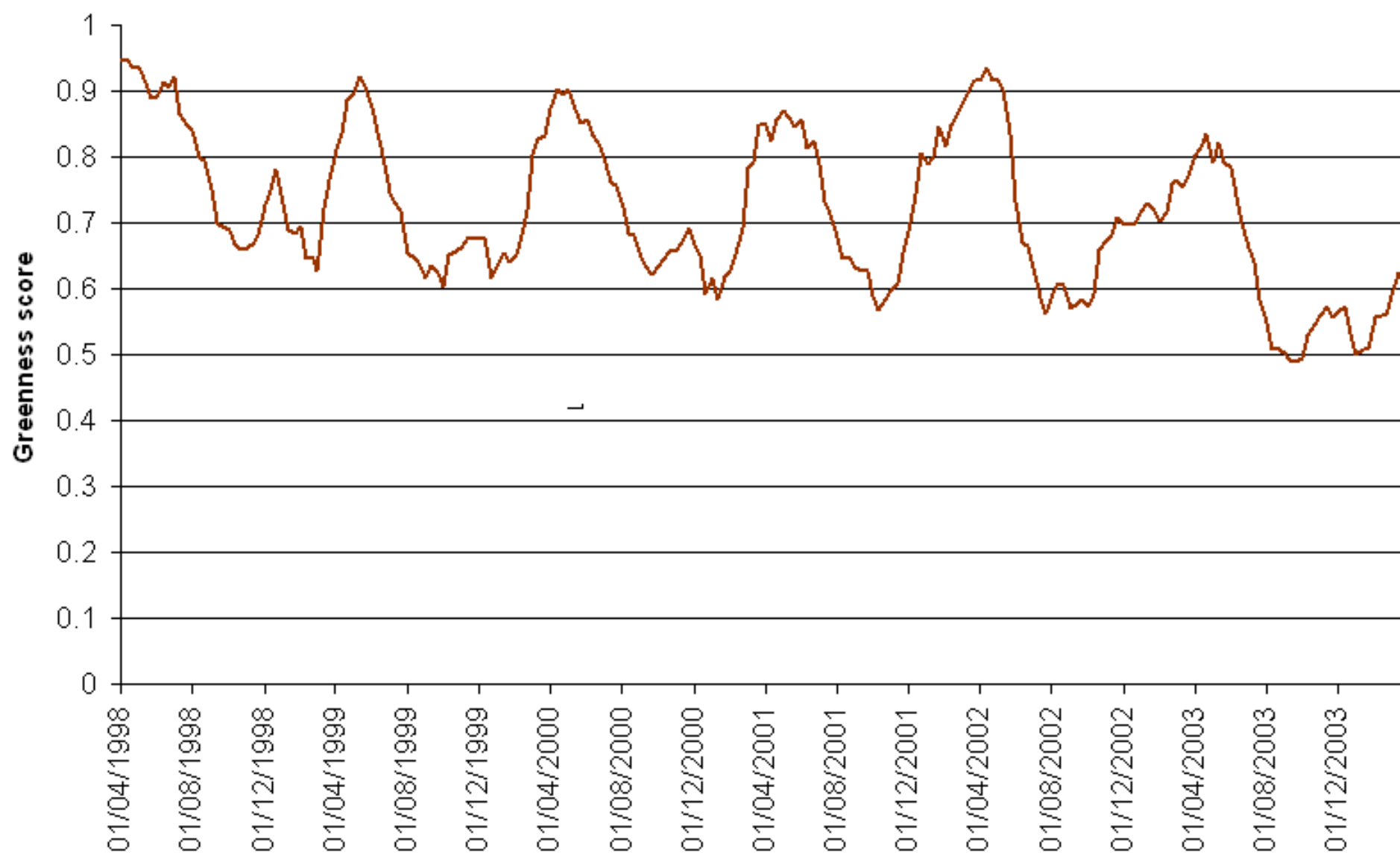


Quisiquisine

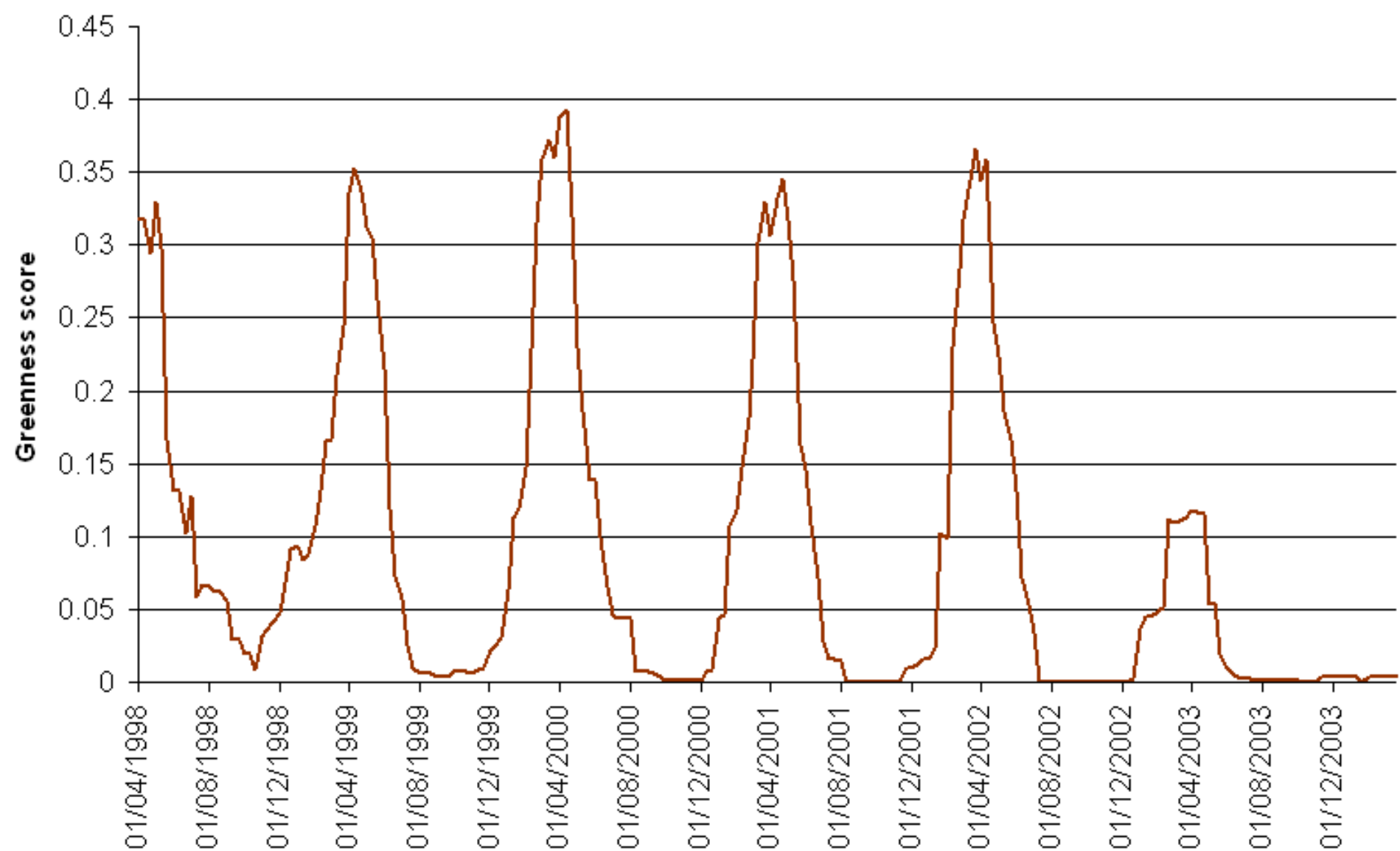
NDVI reflectance profile April 1998-March 2004



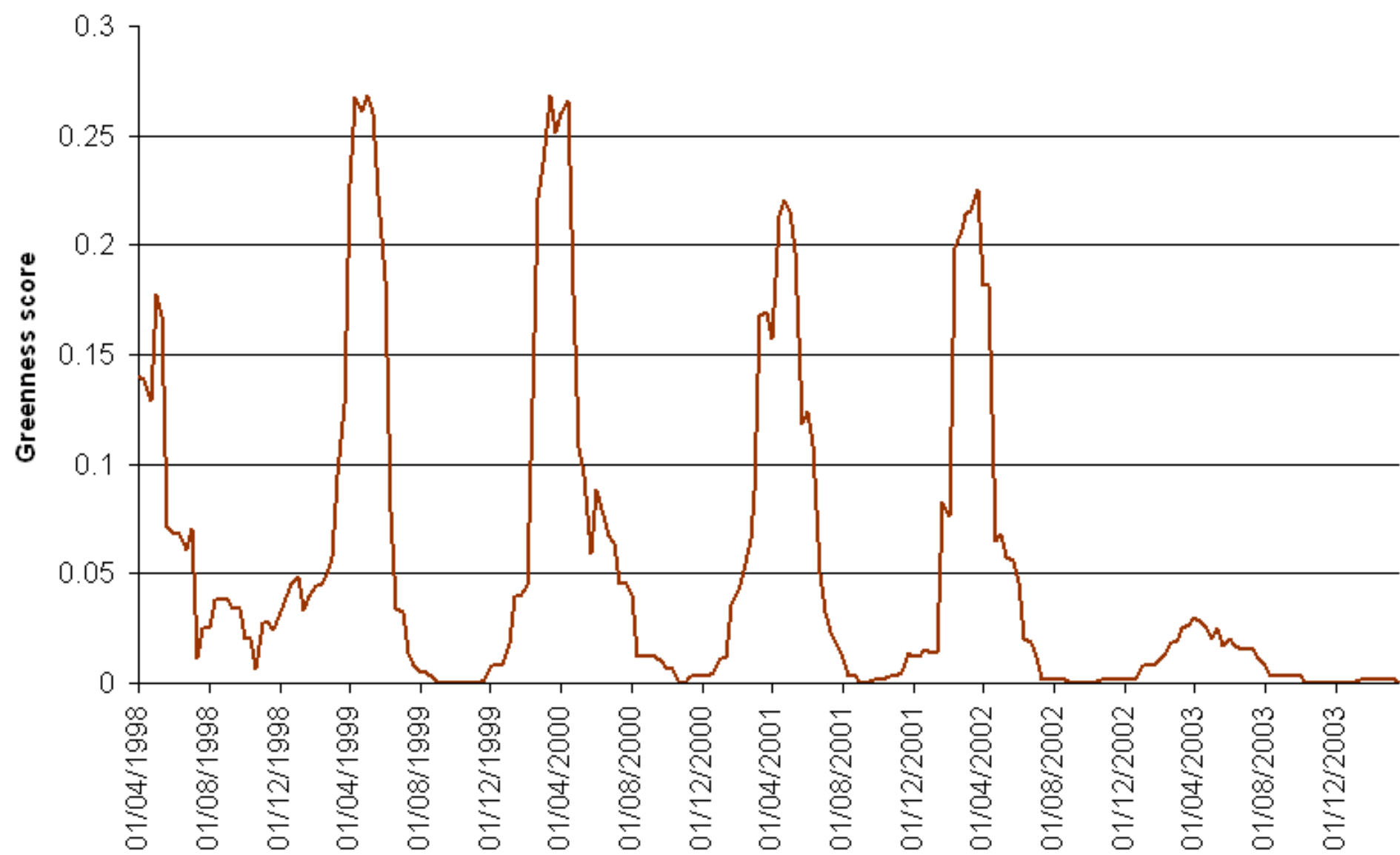
Casiri



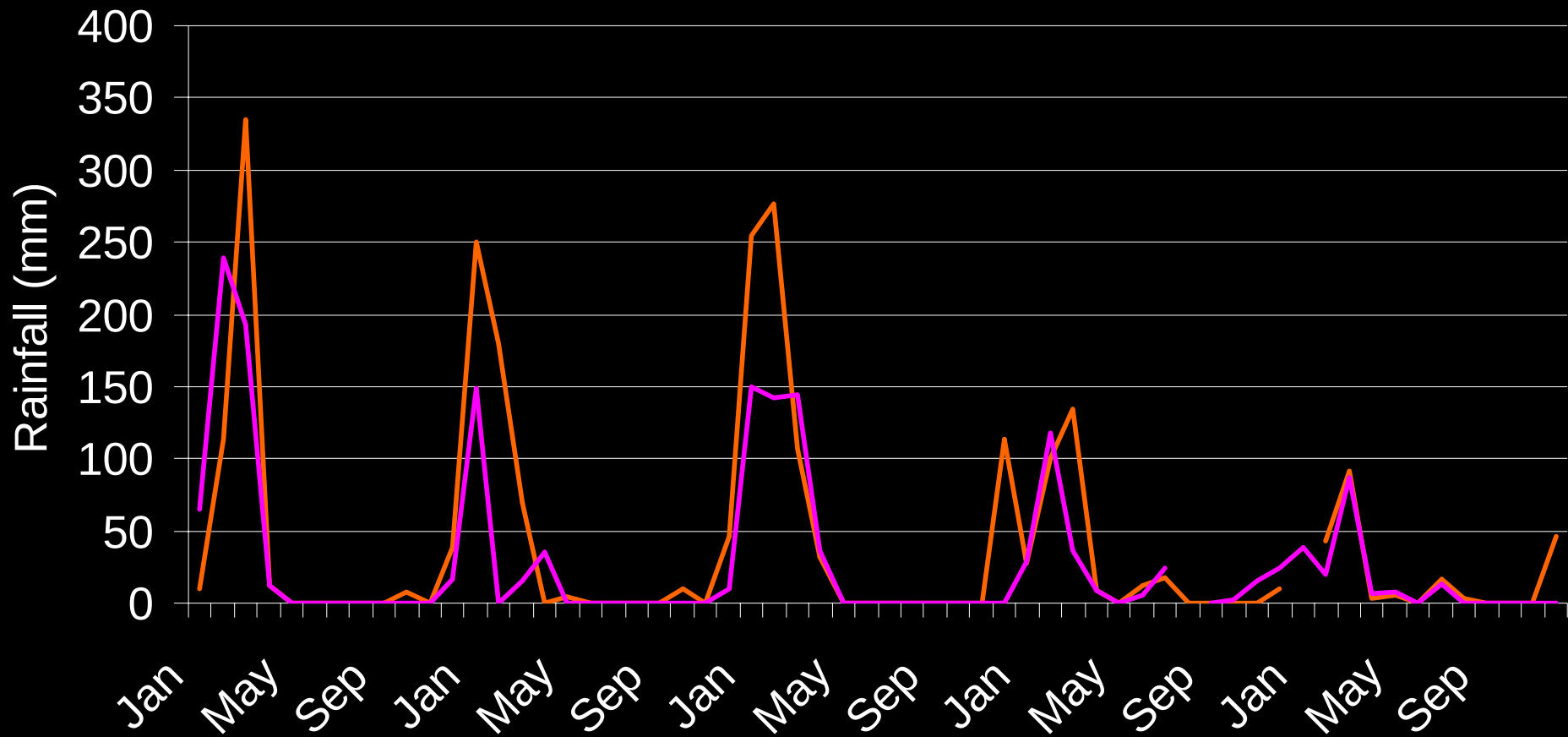
Chivatambo



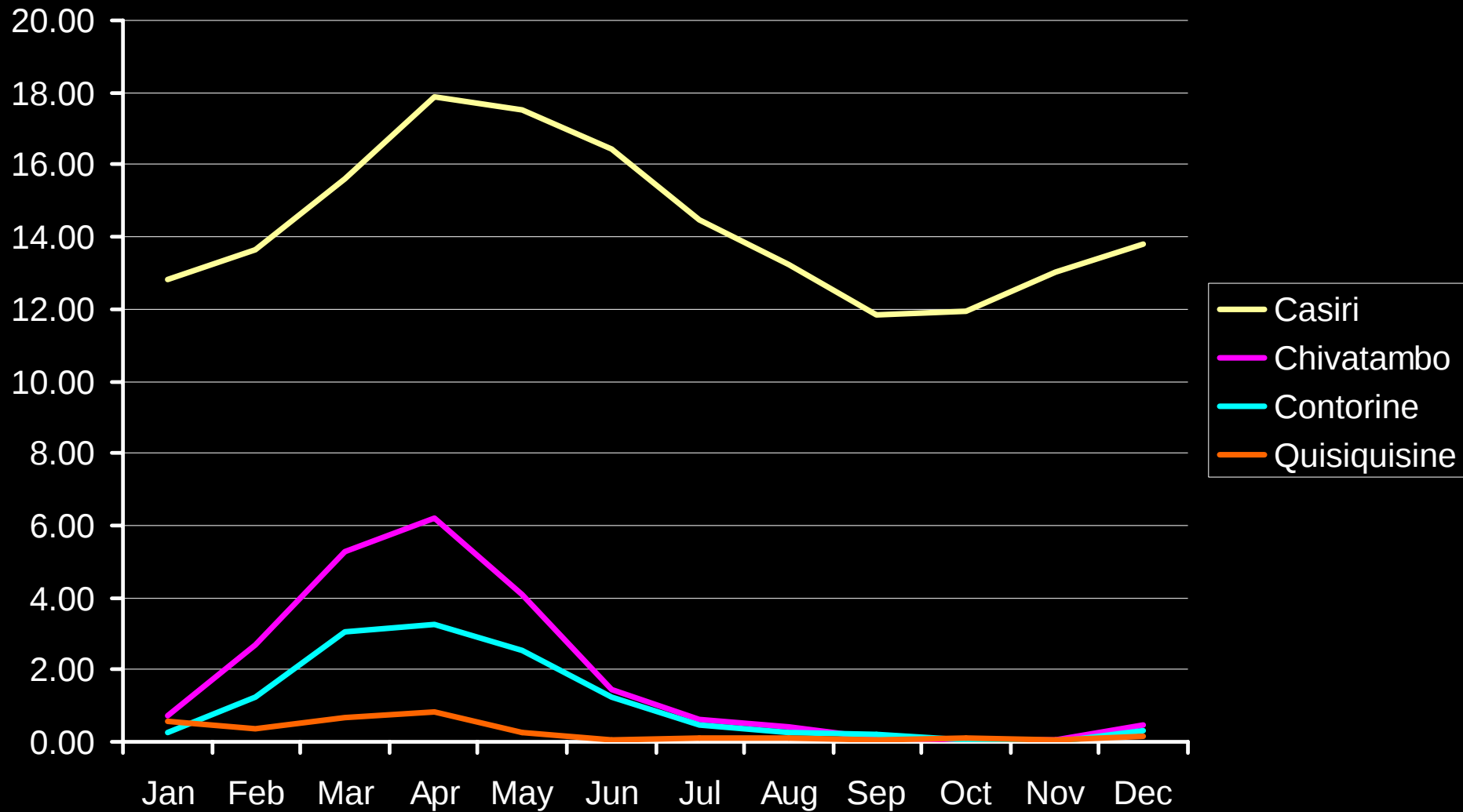
Contorine



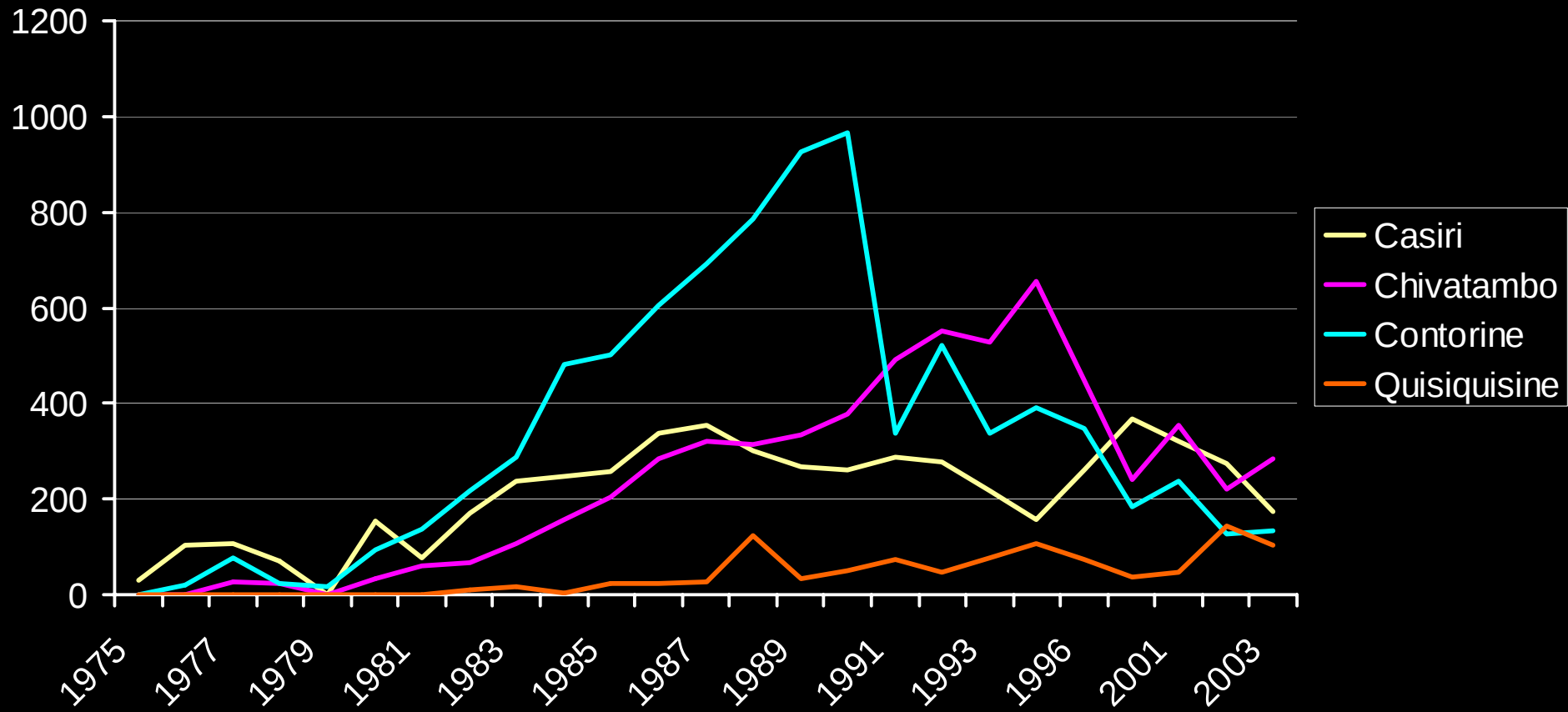
Monthly rainfall 1998-2004



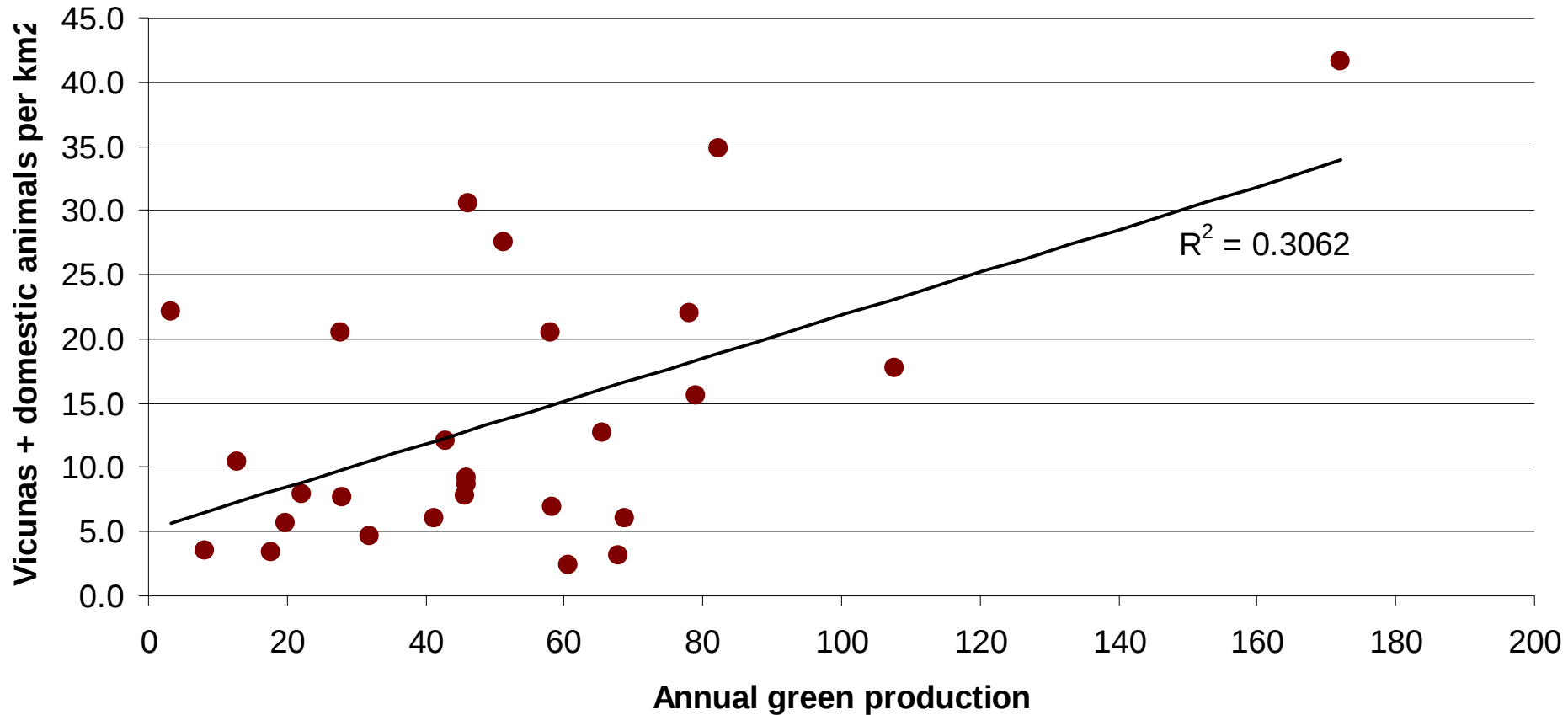
Mean greenness score per month



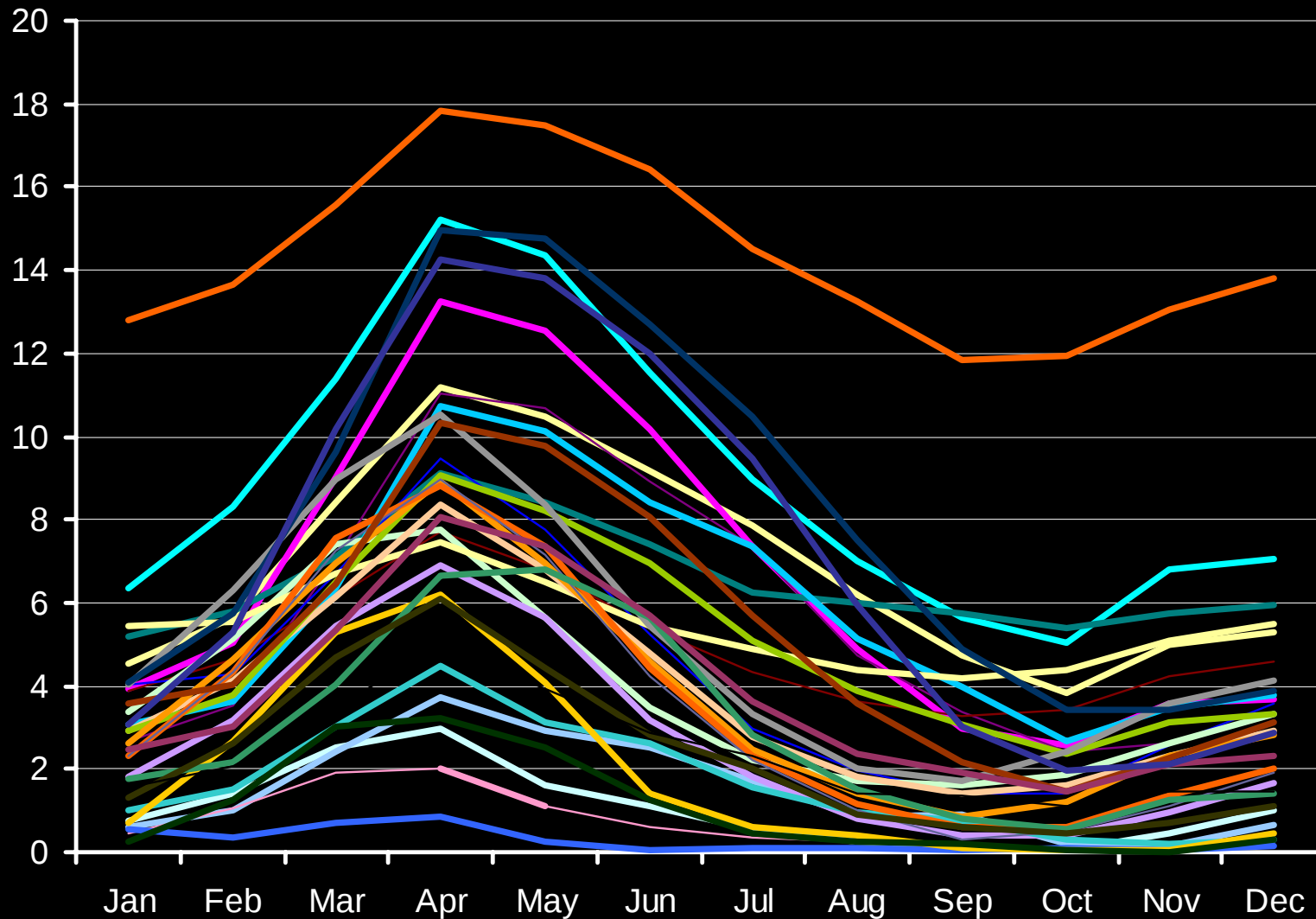
Vicuna census 1975-2003



Grazing intensity vs. greenness score

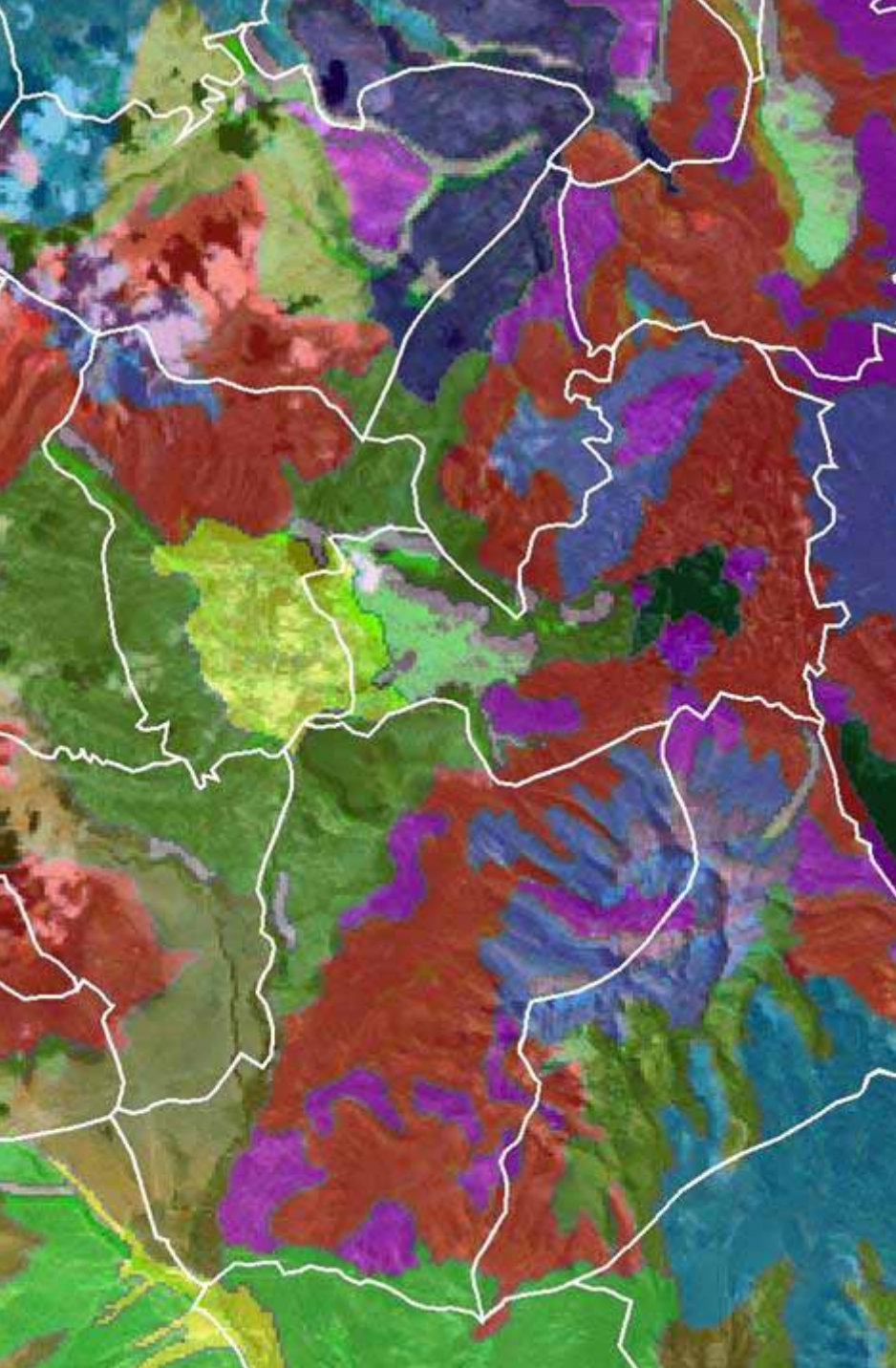


Mean greenness score per month



- Chuquiananta
- Japocota
- Angostura
- Casiri
- Taapaca
- Jaillabe
- Rinconada Caquena
- Guane Guane
- Japane
- Las Cuevas
- Pampa Chucuyo
- Parinacota
- Alto Socoroma
- Ancocholloane
- Queñuta
- Chungara
- Quisquisine
- Portezuelo Chapiquiña
- Portezuelo Belén
- Chivatambo
- Churiguaylla
- Catane
- Vichuta
- Japu
- Marquez
- Guallane
- Contorine
- Paquiza

Cross check to known vegetation types



- Atriplex imbricata-Acantholippia punensis
- Azorella compacta-Pycnophyllum molle
- Deyeuxia curvula-Festuca nardifolia
- Fabiana densa-Atriplex imbricata
- Fabiana densa-Baccharis boliviensis
- Festuca orthophylla-Deyeuxia nardifolia
- Lagos y lagunas
- Lophopappus tarapacanus-Balbisia microphylla
- Oreocereus leucotrichius-Ambrosia artemisioides
- Oxychloe andina-Werneria pygmaea
- Parastrephia lepidophylla-Parastrephia quadrangulari
- Parastrephia lepidophylla-Tetraglochin cristatum
- Parastrephia lucida-Azorella compacta
- Parastrephia lucida-Tetraglochin cristatum
- Parastrephia lucida-Werneria aretioides
- Polylepis besseri-Fabiana densa
- Polylepis tarapacana-Parastrephia lucida
- Pycnophyllum bryoides-Deyeuxia breviaristata
- Salares



This index relates to all green herbage, not necessarily that selected by vicuñas.





Conclusions

Greenness score:

Gives a convenient relative measure of green biomass.

- Can identify year to year variations in herbage availability
- can be used to characterise areas in terms of their annual herbage production profile





Acknowledgements

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Jorge Herreros
Cristian Bonacic,
Alejandra Muñoz

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