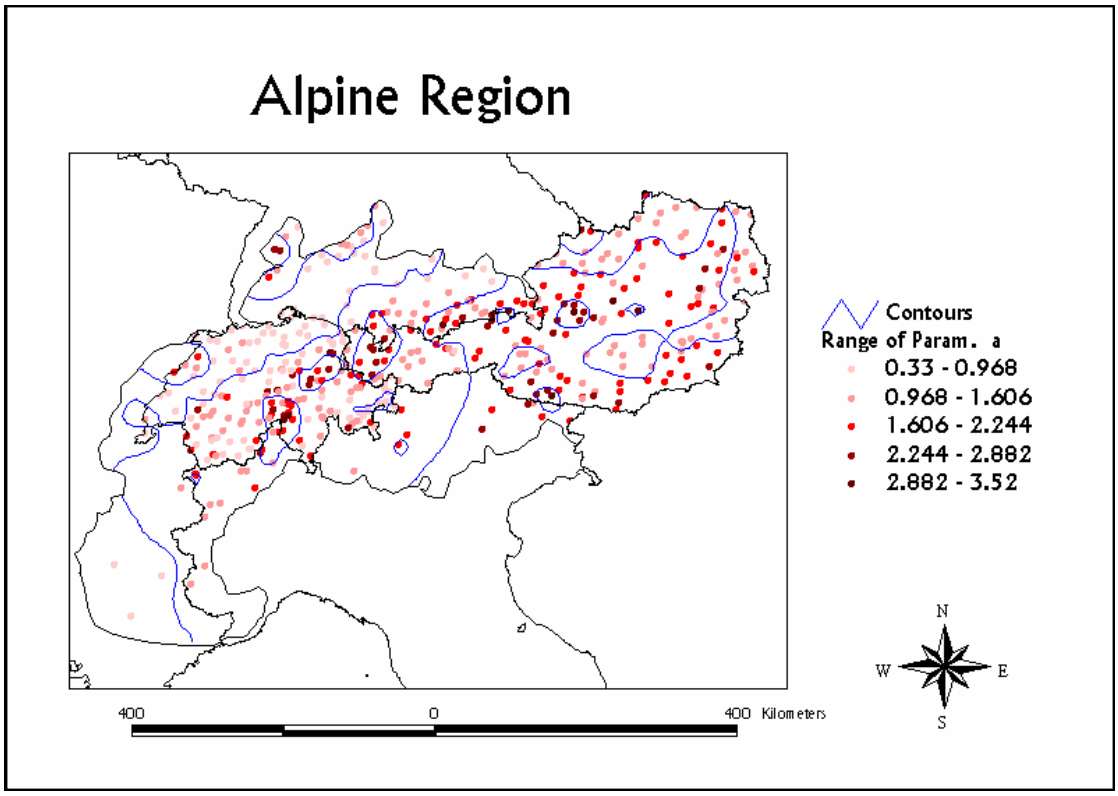
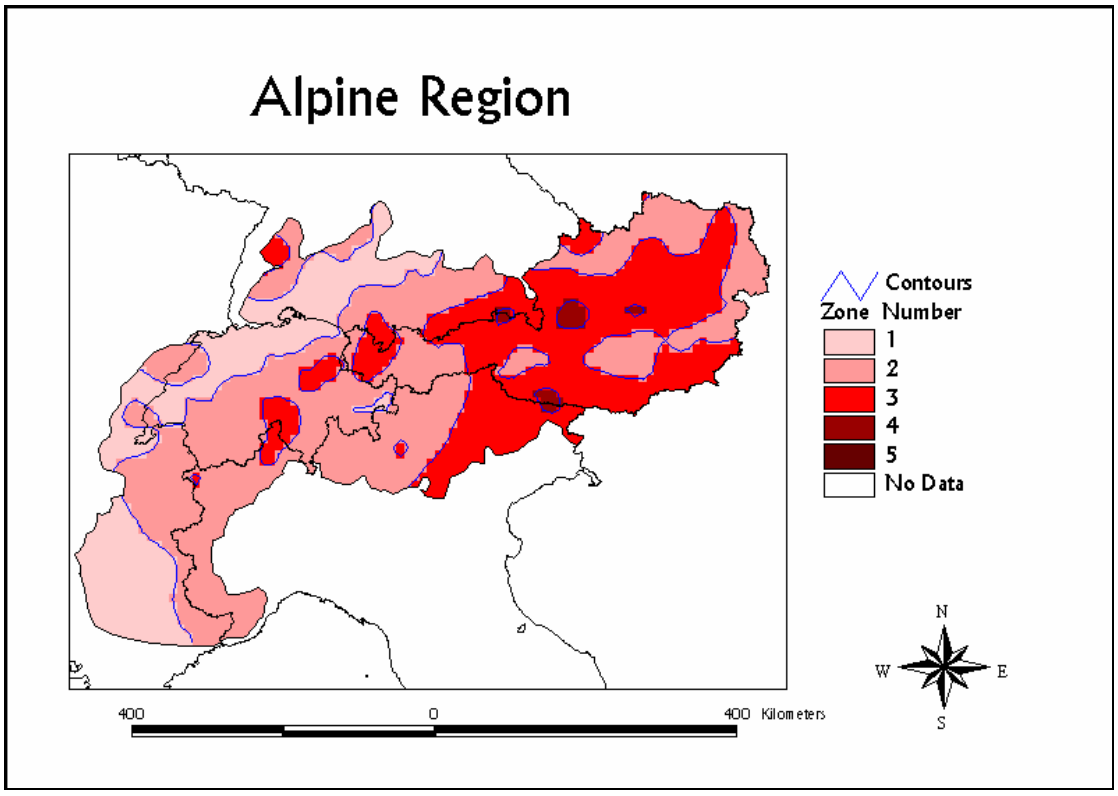
A6 European Ground Snow Load Maps

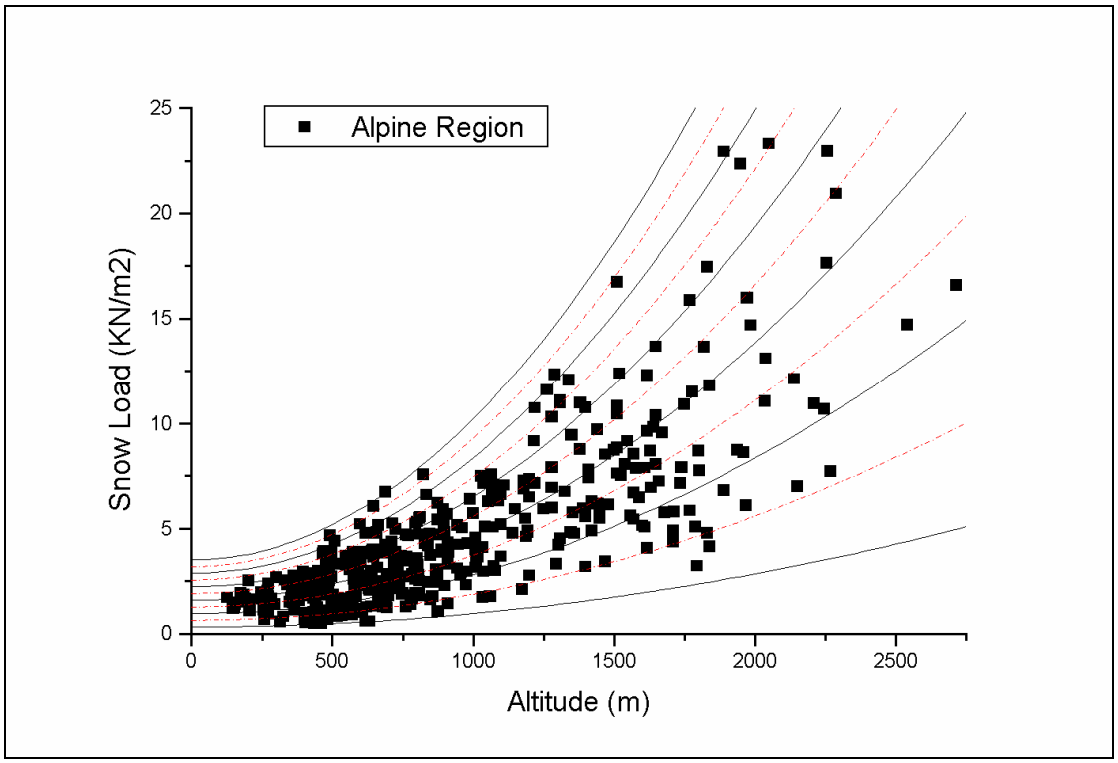
Climatic regions are grouped by type of curve (quadratic, linear, horizontal). Each group is presented in alphabetical order.

A6.1 Snow Loads Maps for each climatic region

ALPINE REGION







(black line = zone limit)
(red line = representative altitude - snow load relationship for the corresponding zone)

PARAMETERS:

Climatic Region	Function Type	a_{min}	a_{max}	b
Alpine Region	**Q**	0.33	3.52	723

Zone Number	Z=1	Z=2	Z=3	Z=4	Z=5
r	0.965239	0.969029	0.990730	0.992836	0.997646

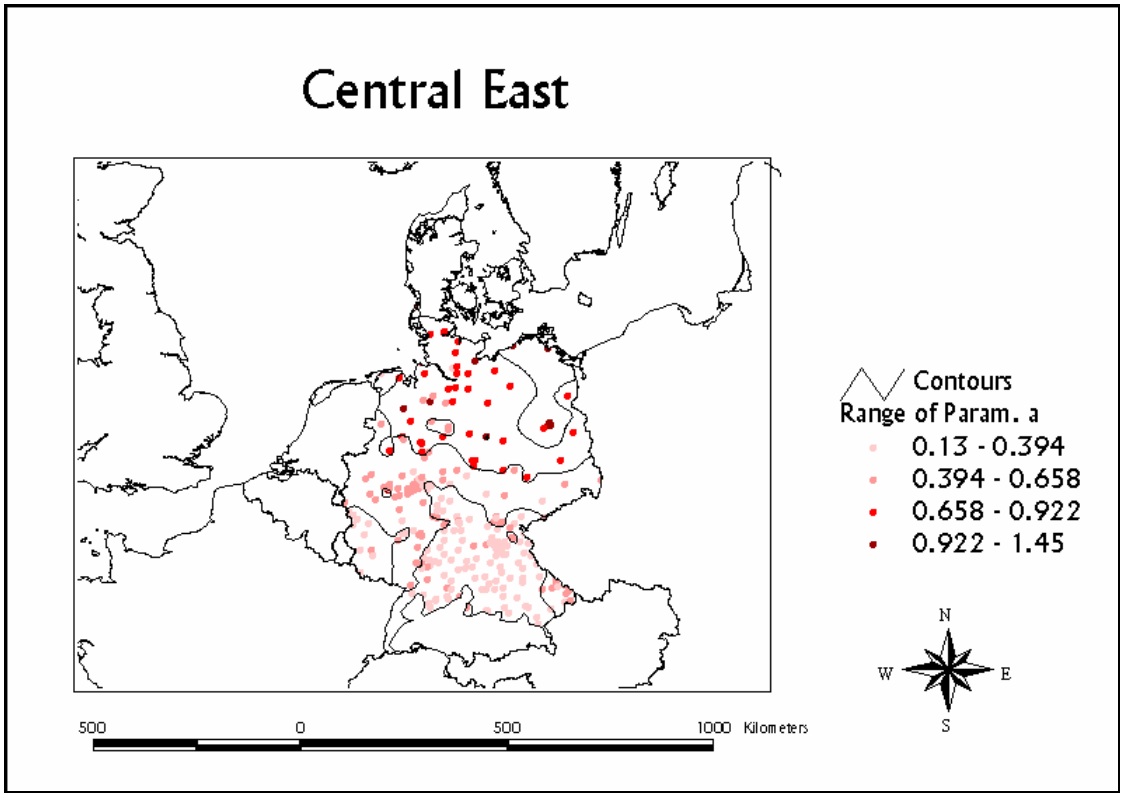
r = correlation coefficient (snow load values / representing function)
H = horizontal line, no altitude - snow load relationship
L = linear function
Q = quadratic function

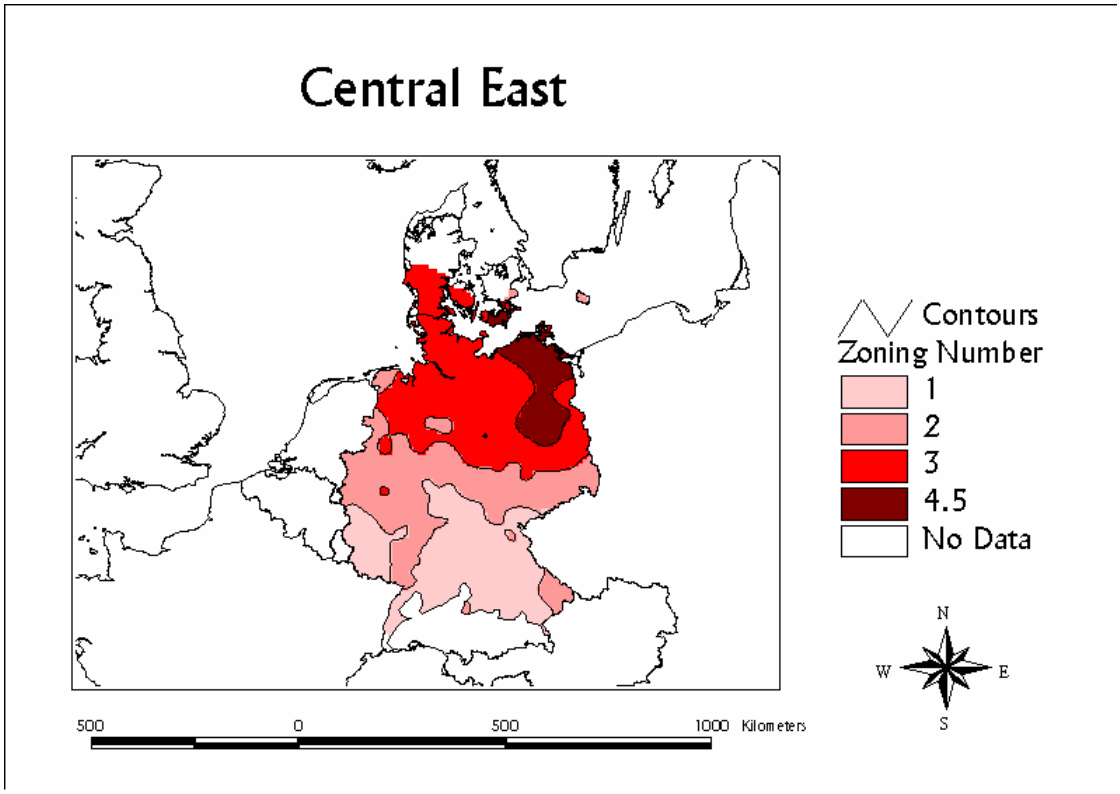
REPRESENTATIVE SNOW LOAD FOR ZONE Z AT ALTITUDE A:

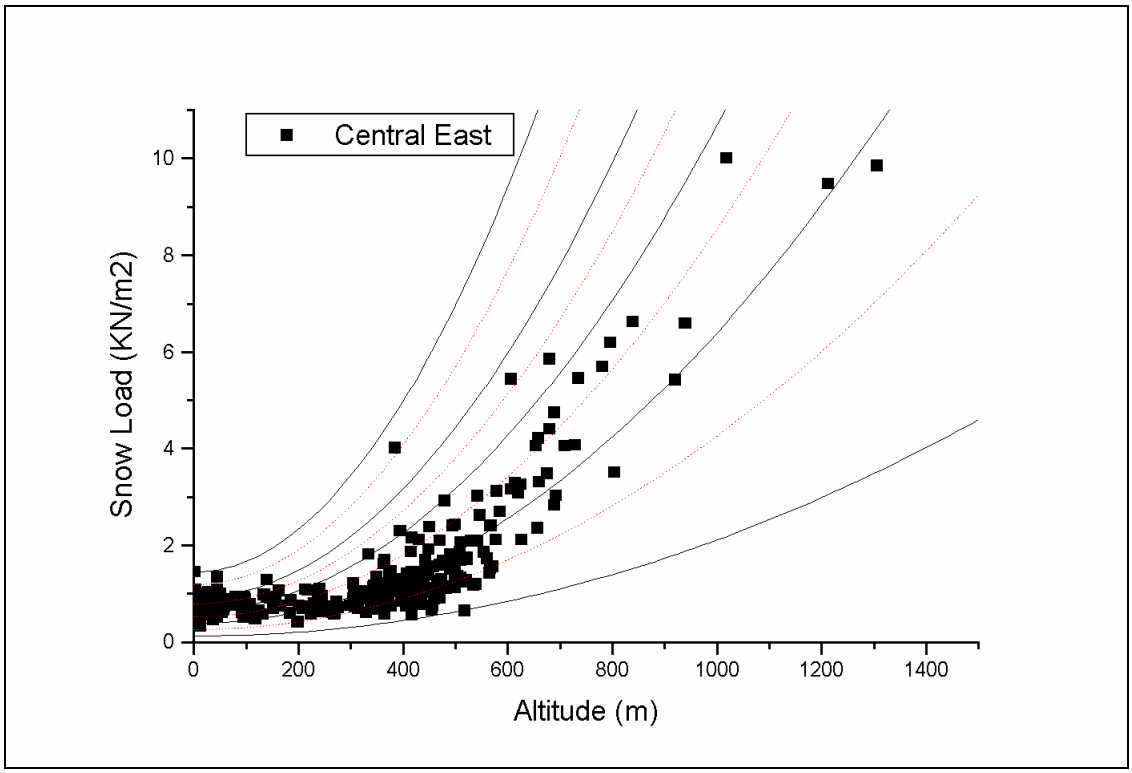
$$s = (0.33 + (Z - 0.5) * [3.52 - 0.33] / 5) \left[1 + \left(\frac{A}{723} \right)^2 \right]$$

s = Snow Load (KN/m^2)
A = Altitude above Sea Level (m)
Z = Zone Number

CLIMATIC REGION: CENTRAL EAST







(black line = zone limit)
(red line = representative altitude - snow load relationship for the corresponding zone)

PARAMETERS:

Climatic Region	Function Type	a_{min}	a_{max}	b
Central East	**Q**	0.13	1.45	256

Zone Number	Z=1	Z=2	Z=3	Z=4.5
r	0.965375	0.977156	0.993785	0.981885

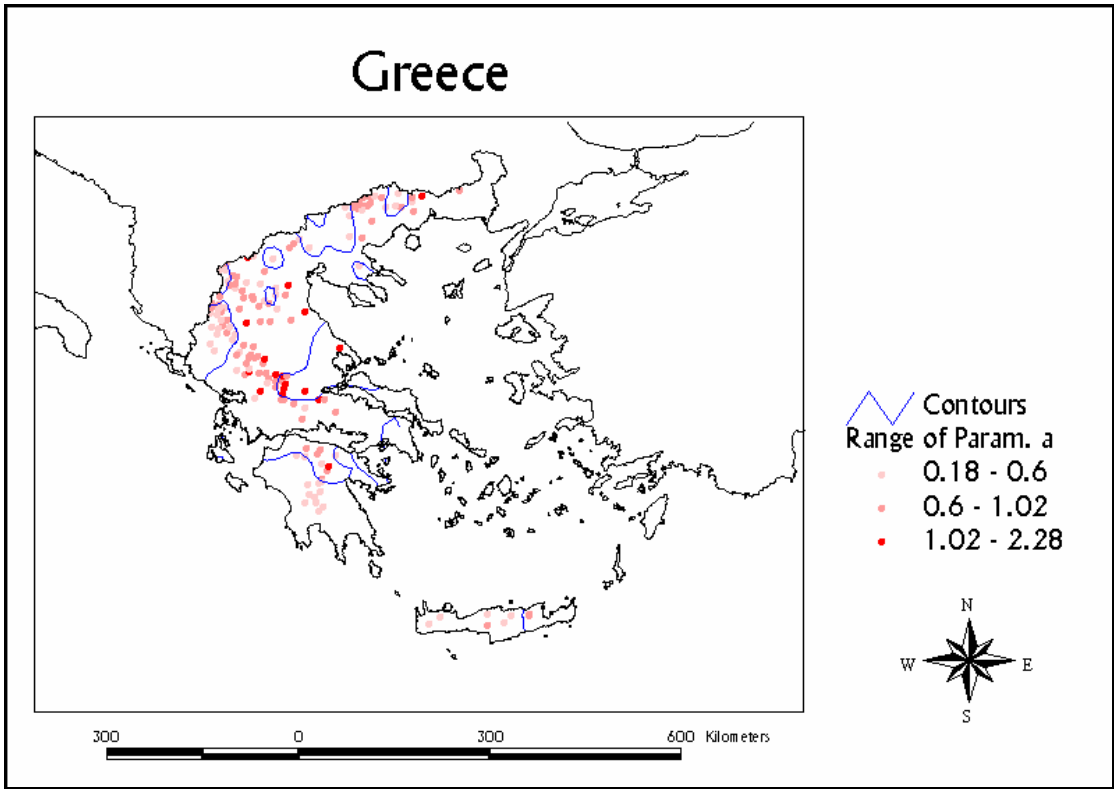
r = correlation coefficient (snow load values / representing function)
H = horizontal line, no altitude - snow load relationship
L = linear function
Q = quadratic function

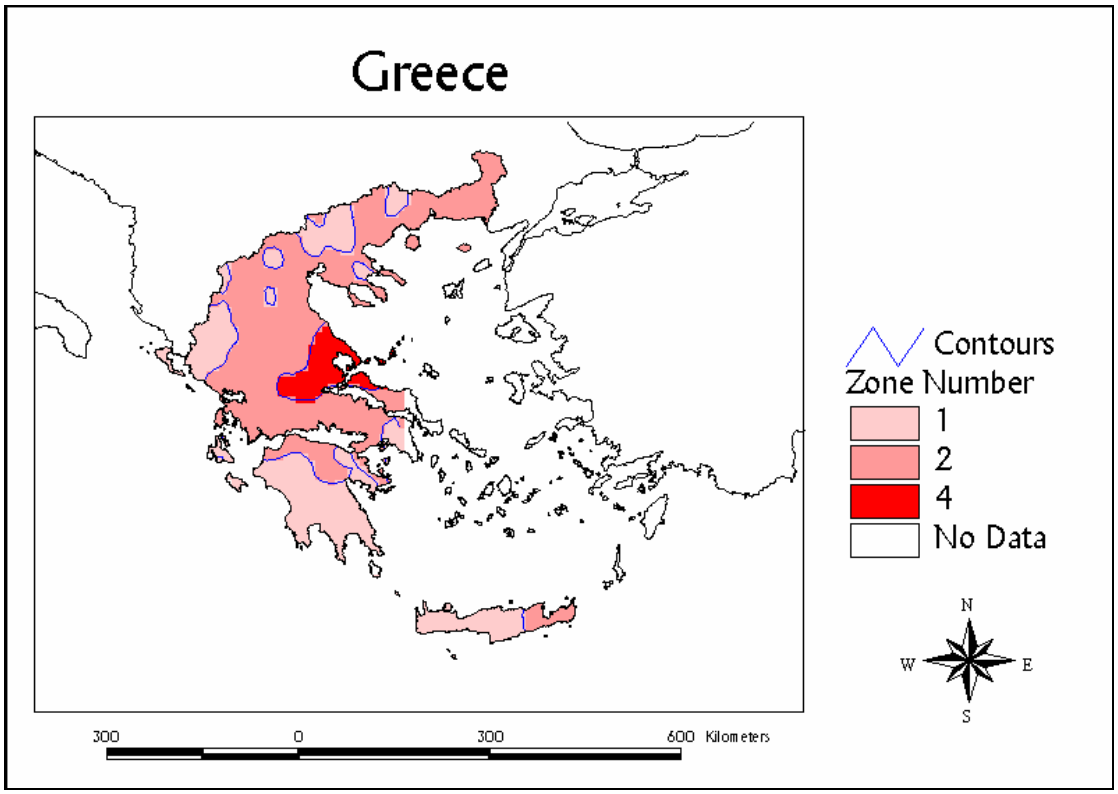
REPRESENTATIVE SNOW LOAD FOR ZONE Z AT ALTITUDE A:

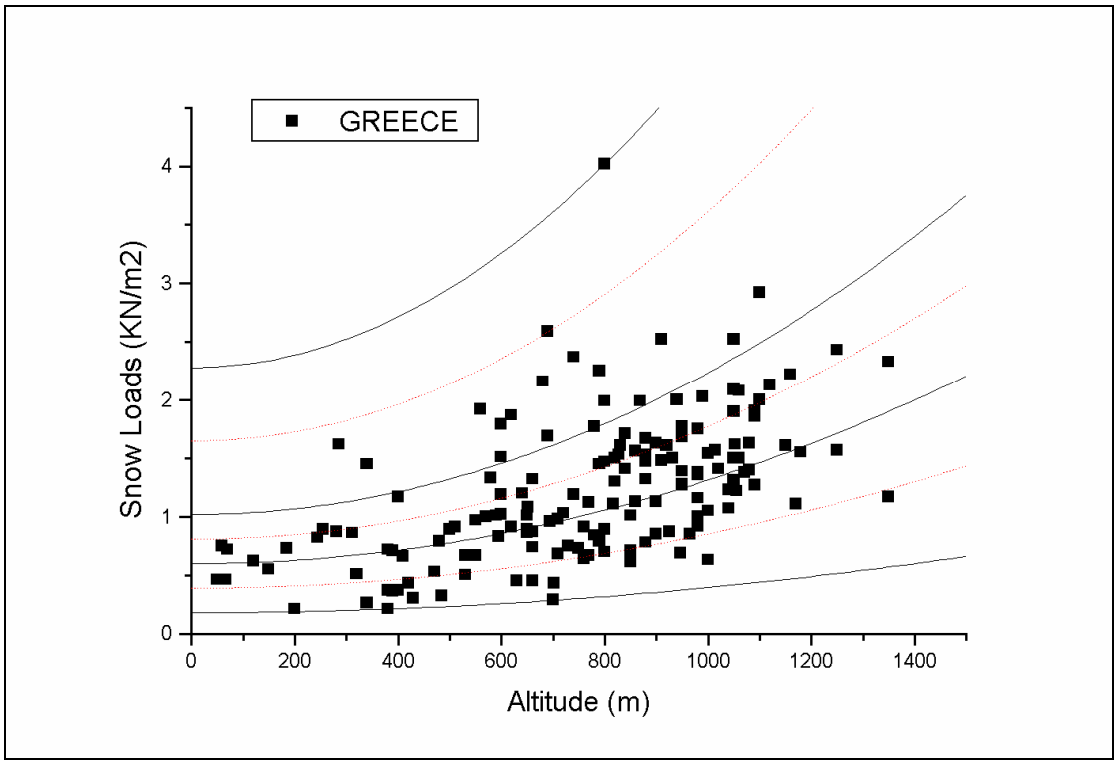
$$s = (0.13 + (Z - 0.5) * [1.45 - 0.13] / 5) \left[1 + \left(\frac{A}{256} \right)^2 \right]$$

s = Snow Load (KN/m^2)
A = Altitude above Sea Level (m)
Z = Zone Number

CLIMATIC REGION: GREECE







(black line = zone limit)
(red line = representative altitude - snow load relationship for the corresponding zone)

PARAMETERS:

Climatic Region	Function Type	a_{min}	a_{max}	b
Greece	**Q**	0.18	2.28	916

Zone Number	Z=1	Z=2	Z=4
r	0.849836	0.900579	0.574272

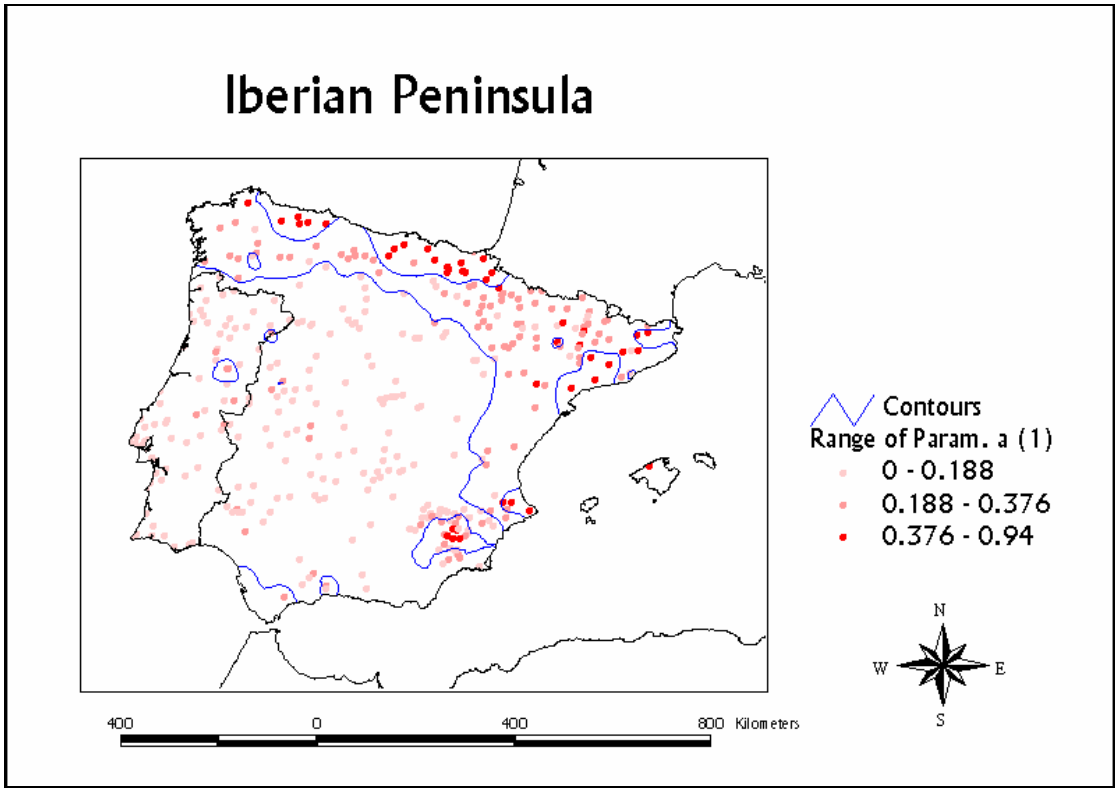
r = correlation coefficient (snow load values / representing function)
H = horizontal line, no altitude - snow load relationship
L = linear function
Q = quadratic function

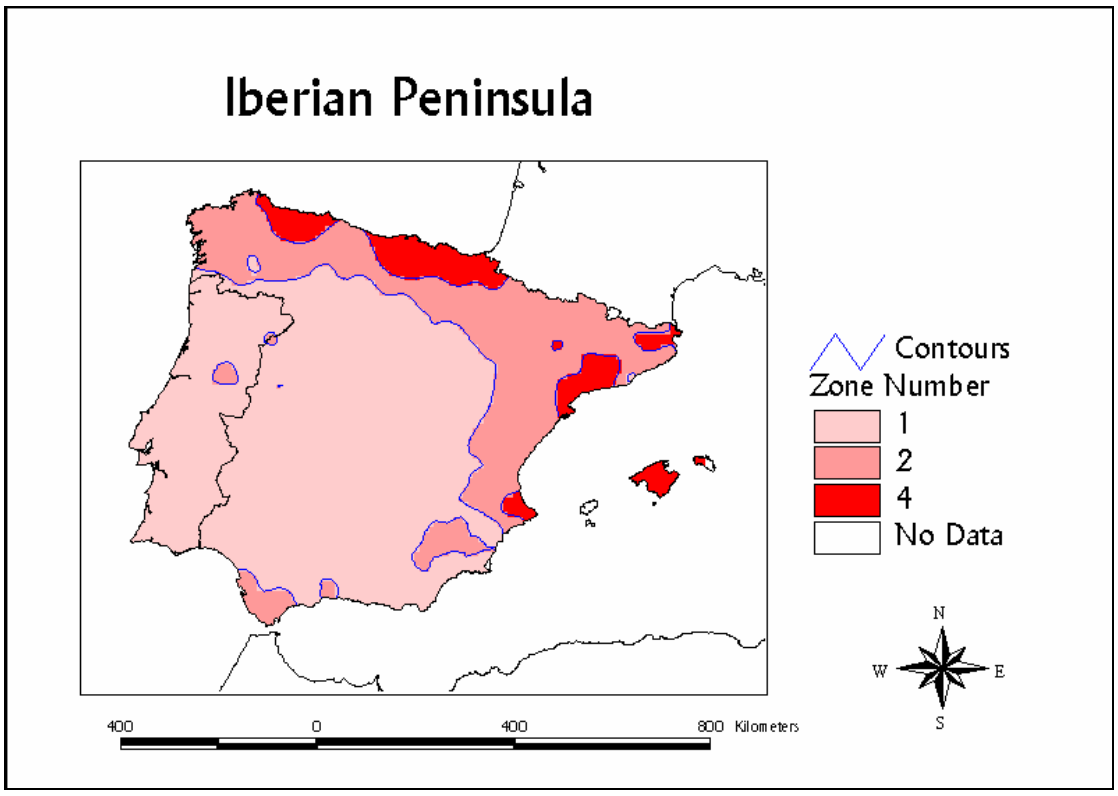
REPRESENTATIVE SNOW LOAD FOR ZONE Z AT ALTITUDE A:

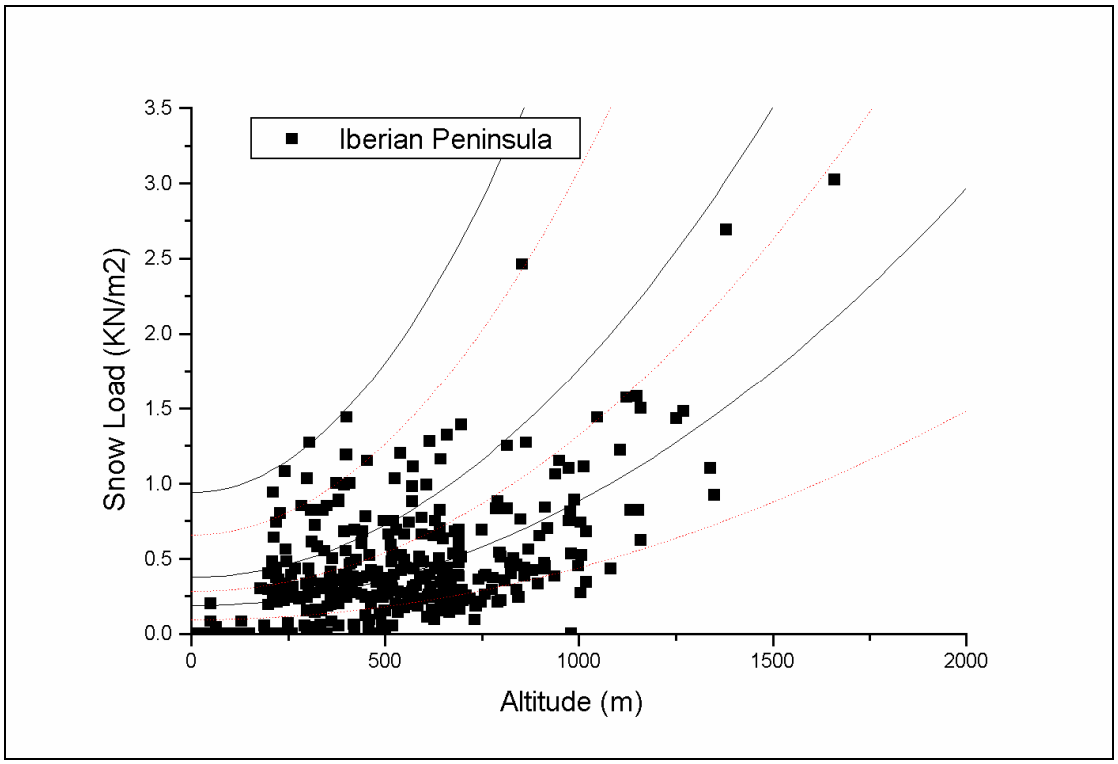
$$s = (0.18 + (Z - 0.5) * [2.28 - 0.18] / 5) \left[1 + \left(\frac{A}{916} \right)^2 \right]$$

s = Snow Load (KN/m^2)
A = Altitude above Sea Level (m)
Z = Zone Number

CLIMATIC REGION: IBERIAN PENINSULA







(black line = zone limit)
(red line = representative altitude - snow load relationship for the corresponding zone)

PARAMETERS:

Climatic Region	Function Type	a_{min}	a_{max}	b
Iberian Peninsula	**Q**	0	0.94	521

Zone Number	Z=1	Z=2	Z=4
r	0.855967	0.959583	0.743993

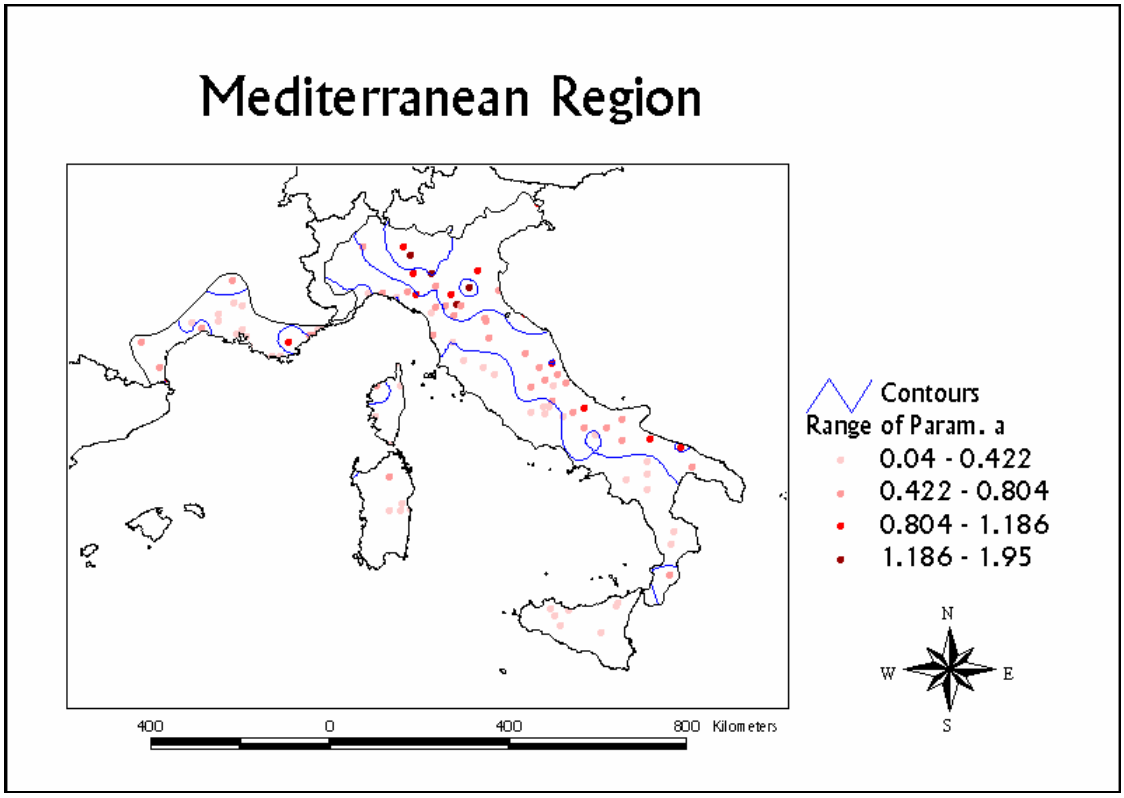
r = correlation coefficient (snow load values / representing function)
H = horizontal line, no altitude - snow load relationship
L = linear function
Q = quadratic function

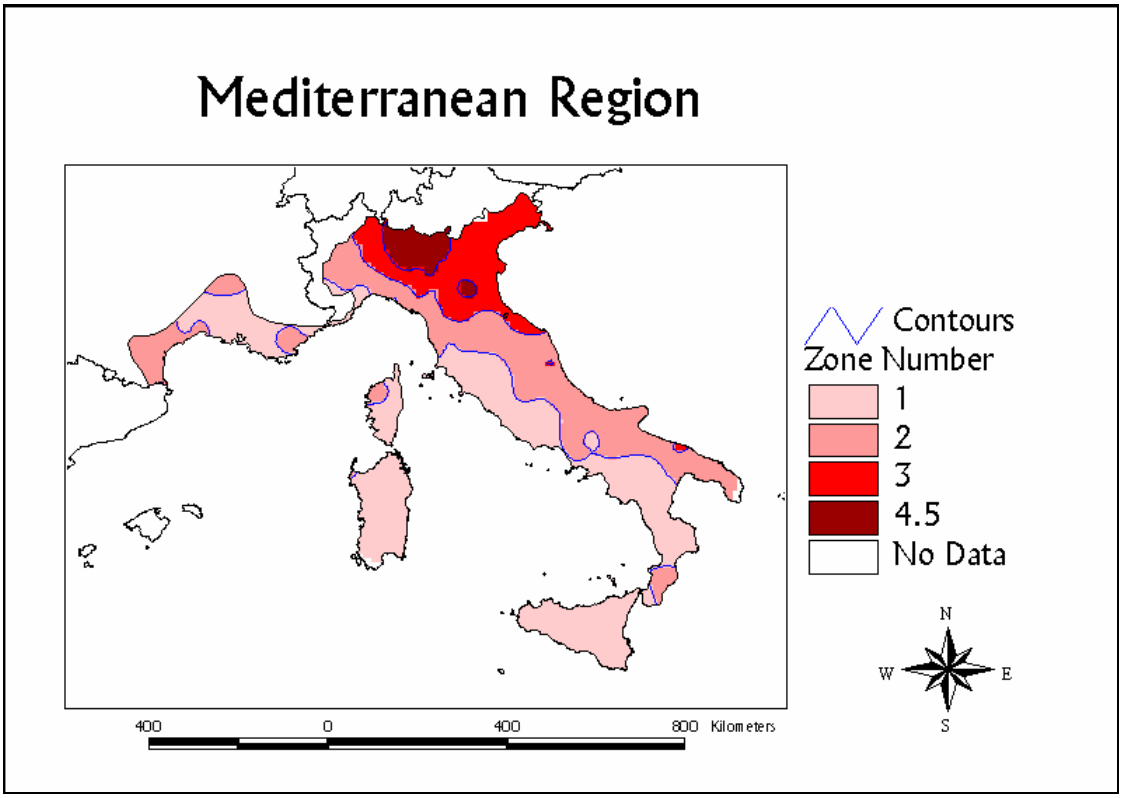
REPRESENTATIVE SNOW LOAD FOR ZONE Z AT ALTITUDE A:

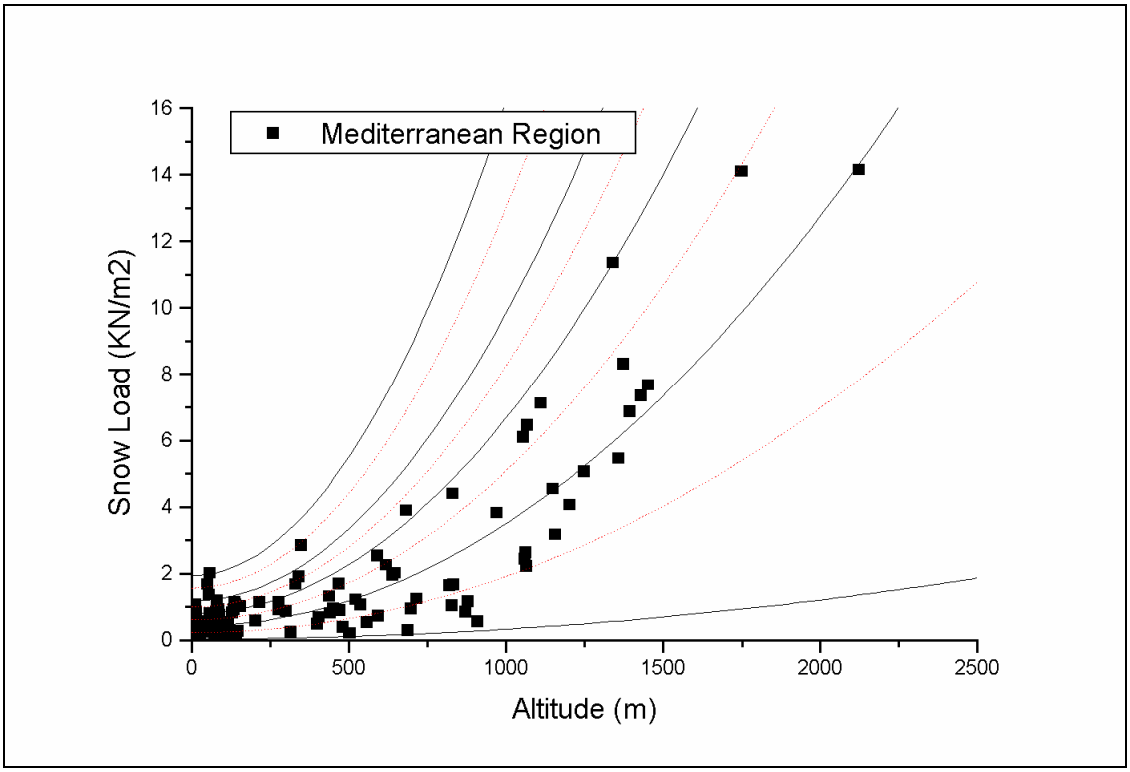
$$s = (0+(Z-0.5)*[0.94-0]/5)\left[1+\left(\frac{A}{521}\right)^2\right]$$

s = Snow Load (KN/m^2)
A = Altitude above Sea Level (m)
Z = Zone Number

CLIMATIC REGION: MEDITERRANEAN REGION







(black line = zone limit)
(red line = representative altitude - snow load relationship for the corresponding zone)

PARAMETERS:

Climatic Region	**Function Type**	**a_{min}**	**a_{max}**	**b**
Mediterranean Region	**Q**	0.04	1.95	370

Zone Number	**Z=1**	**Z=2**	**Z=3**	**Z=4.5**
r	0.967808	0.964791	0.989108	0.910892

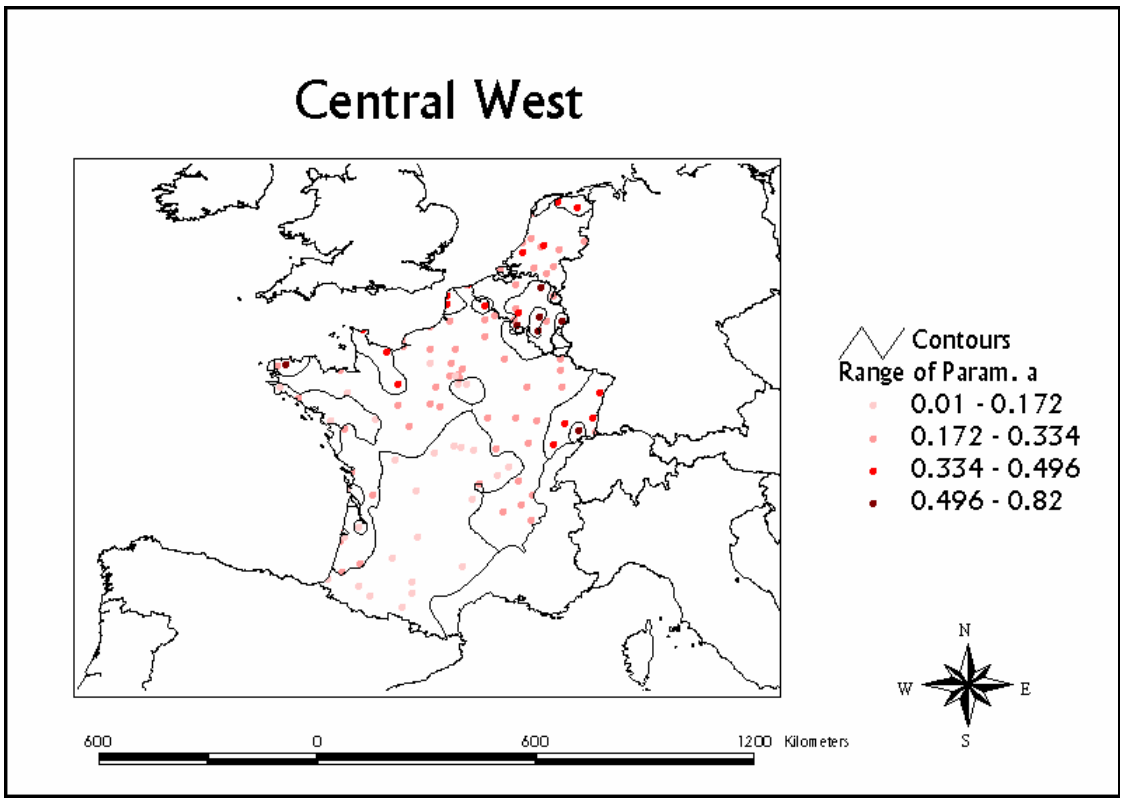
r = correlation coefficient (snow load values / representing function)
H = horizontal line, no altitude - snow load relationship
L = linear function
Q = quadratic function

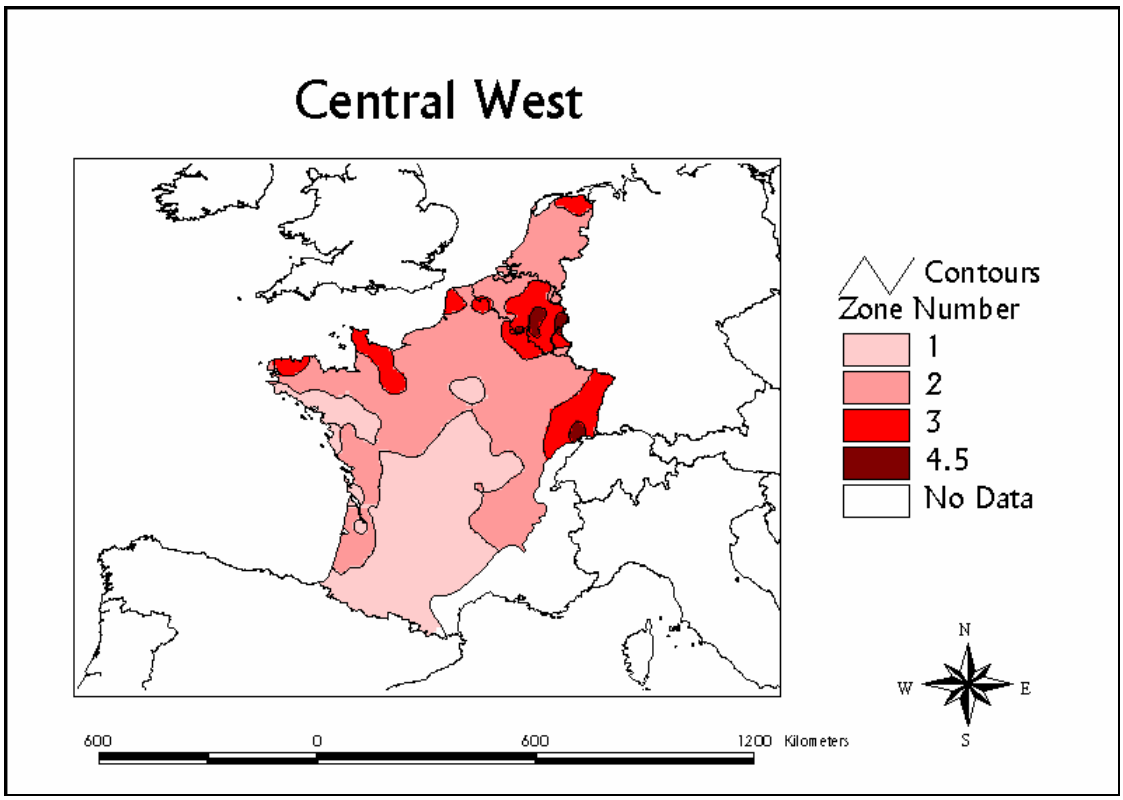
REPRESENTATIVE SNOW LOAD FOR ZONE Z AT ALTITUDE A:

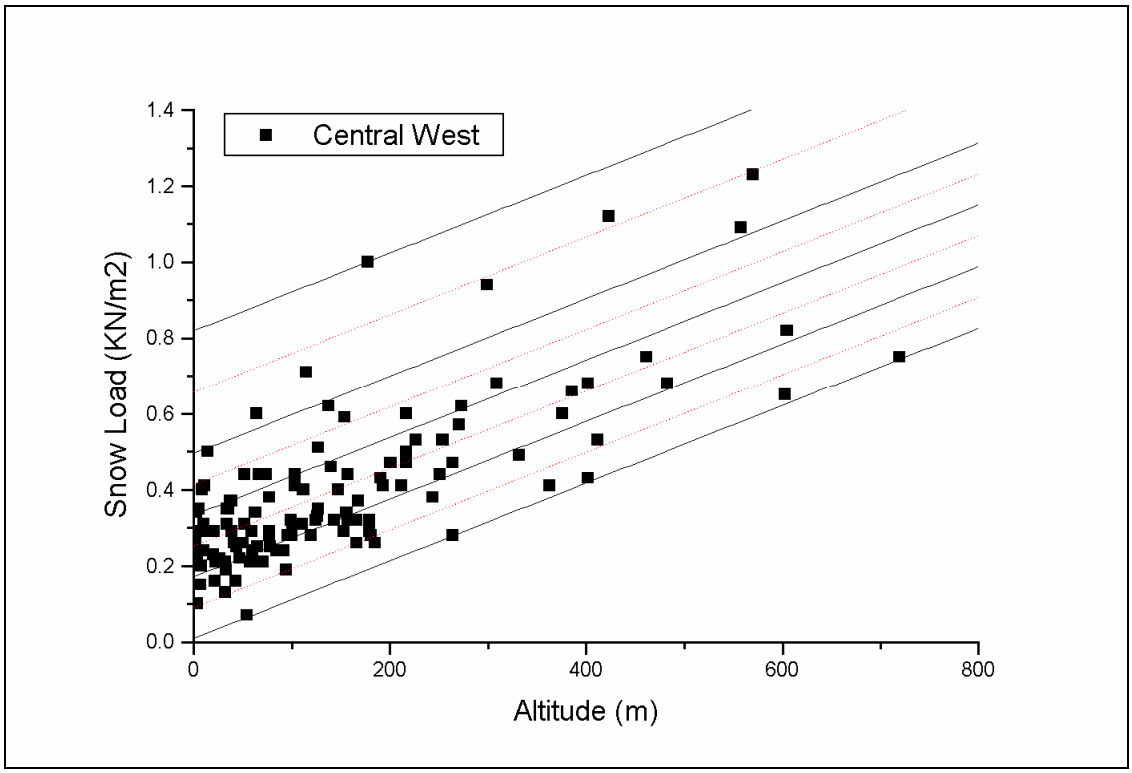
$$s = (0.04 + (Z - 0.5) * [1.95 - 0.04] / 5) + \frac{A}{370}$$

s = Snow Load (KN/m^2)
A = Altitude above Sea Level (m)
Z = Zone Number

Linear Function:
CLIMATIC REGION: CENTRAL WEST







(black line = zone limit)
(red line = representative altitude - snow load relationship for the corresponding zone)

PARAMETERS:

Climatic Region	**Function Type**	**a_{min}**	**a_{max}**	**b**
Central West	**L**	0.01	0.82	979

Zone Number	**Z=1**	**Z=2**	**Z=3**	**Z=4.5**
r	0.963995	0.941009	0.915297	0.895668

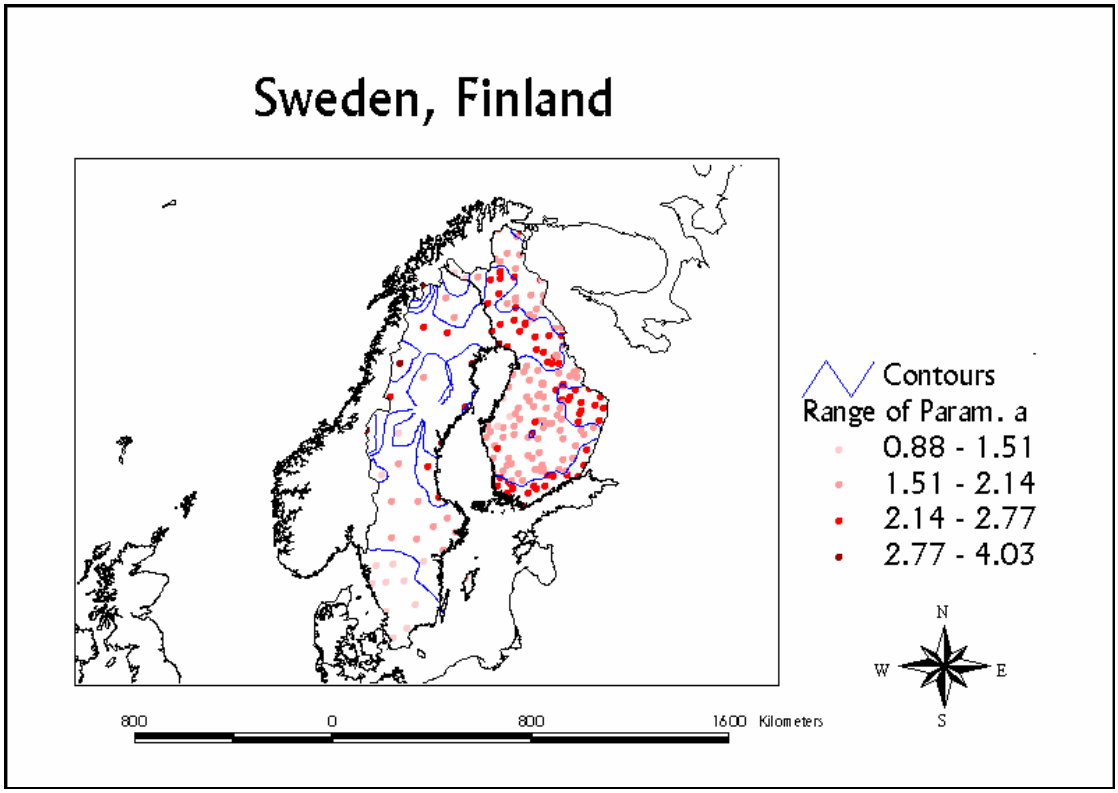
r = correlation coefficient (snow load values / representing function)
H = horizontal line, no altitude - snow load relationship
L = linear function
Q = quadratic function

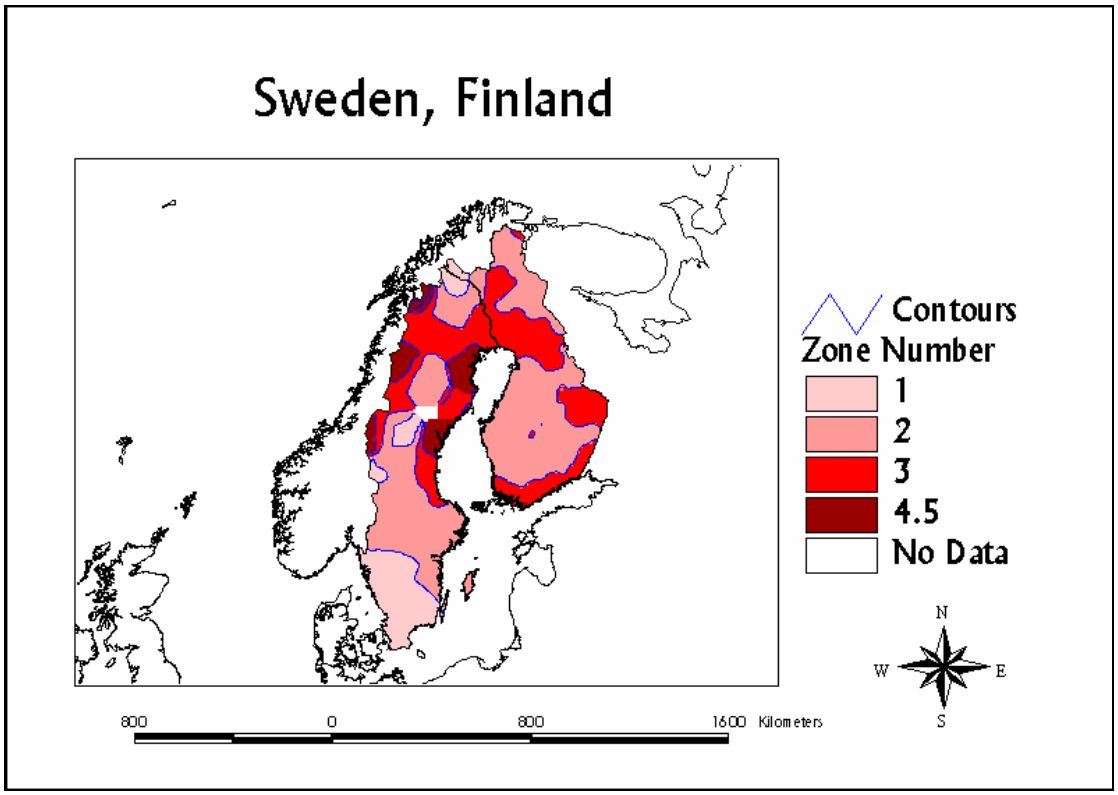
REPRESENTATIVE SNOW LOAD FOR ZONE Z AT ALTITUDE A:

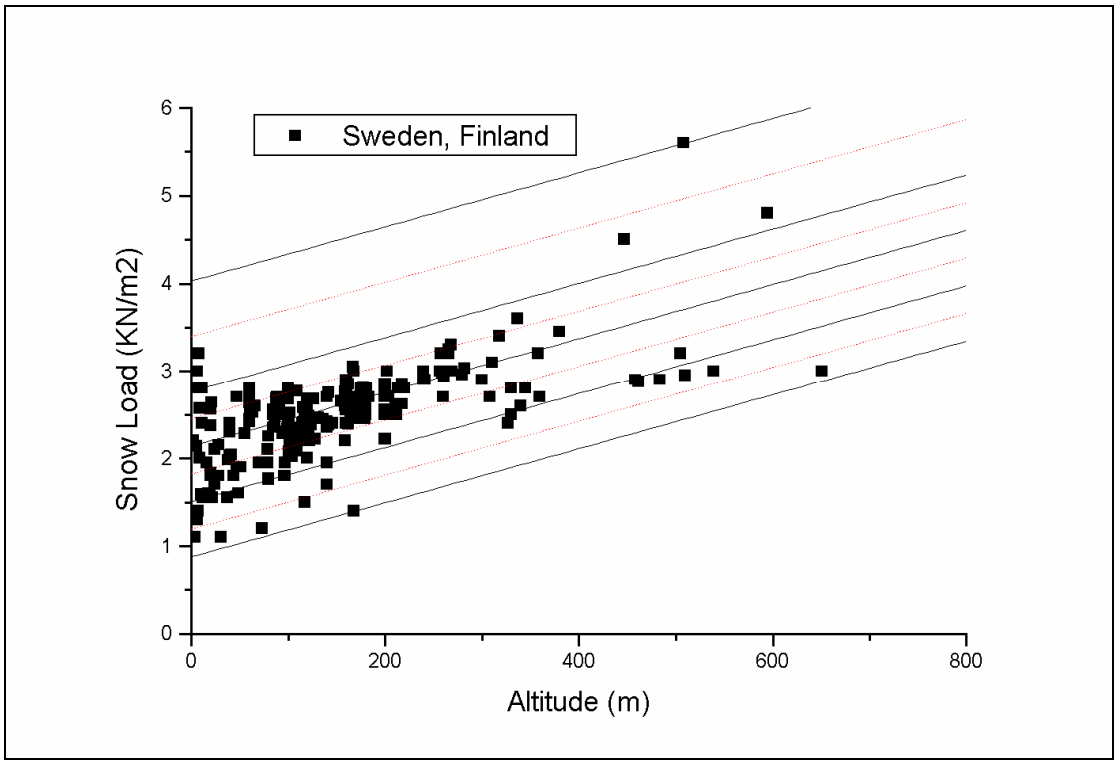
$$s = (0.01 + (Z - 0.5) * [0.82 - 0.01] / 5) + \frac{A}{979}$$

s = Snow Load (KN/m^2)
A = Altitude above Sea Level (m)
Z = Zone Number

CLIMATIC REGION: SWEDEN, FINLAND







(black line = zone limit)
(red line = representative altitude - snow load relationship for the corresponding zone)

PARAMETERS:

Climatic Region	Function Type	a_{min}	a_{max}	b
Sweden, Finland	**L**	0.88	4.03	324

Zone Number	Z=1	Z=2	Z=3	Z=4.5
r	0.959375	0.847081	0.880184	0.938354

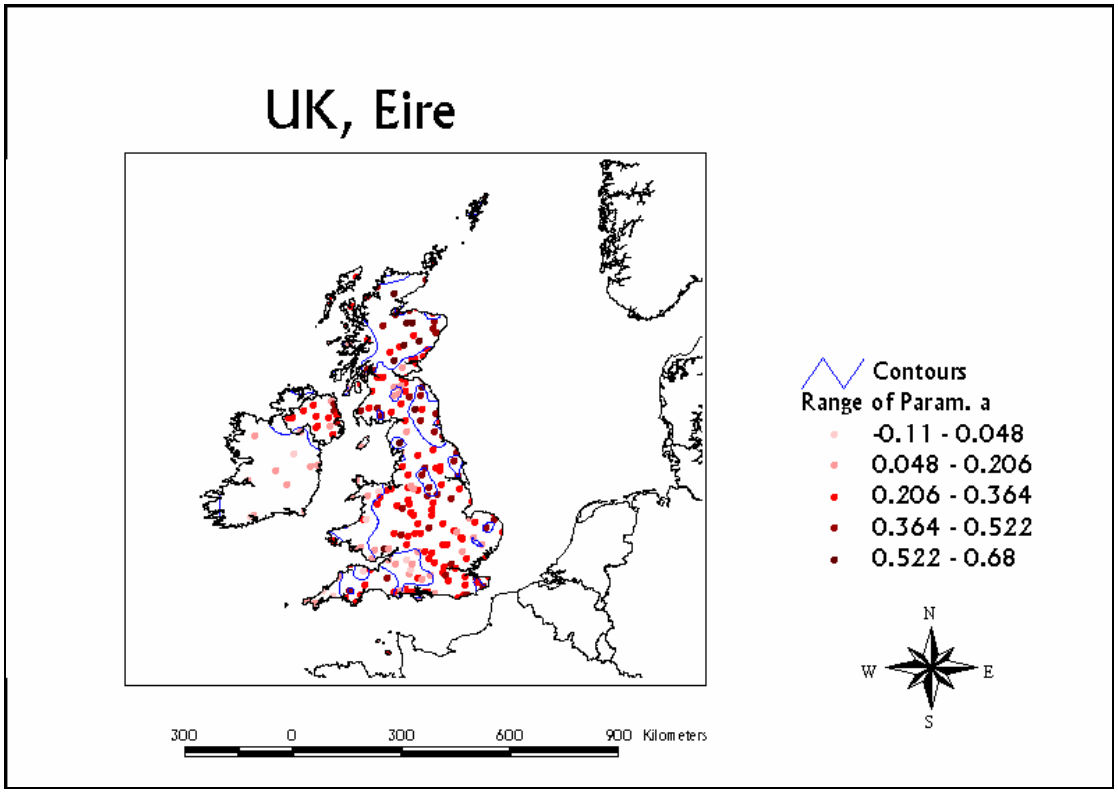
r = correlation coefficient (snow load values / representing function)
H = horizontal line, no altitude - snow load relationship
L = linear function
Q = quadratic function

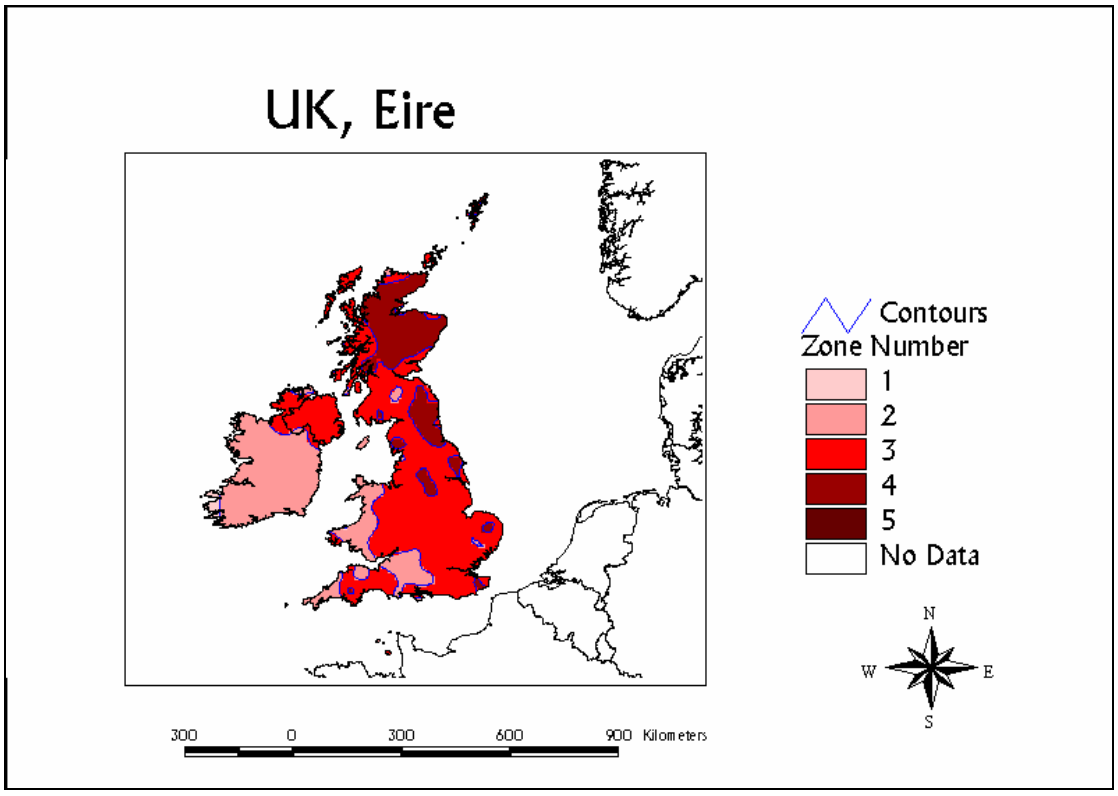
REPRESENTATIVE SNOW LOAD FOR ZONE Z AT ALTITUDE A:

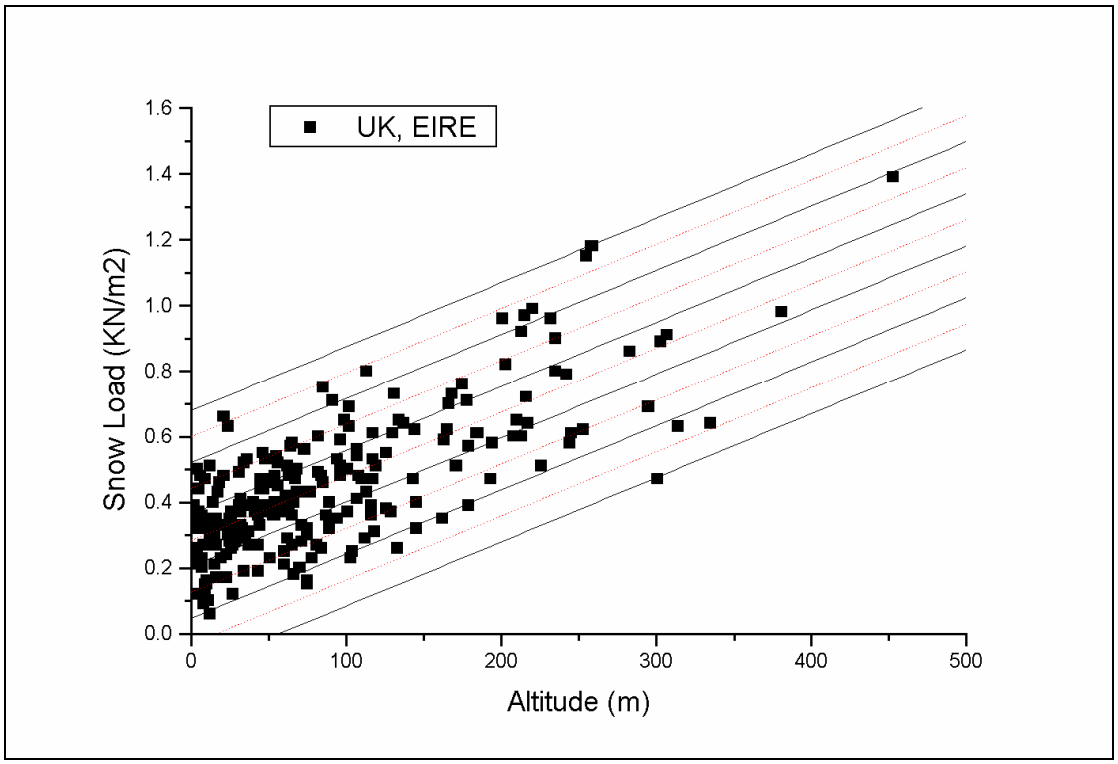
$$s = (0.88 + (Z - 0.5) * [4.03 - 0.88] / 5) + \frac{A}{324}$$

s = Snow Load (KN/m^2)
A = Altitude above Sea Level (m)
Z = Zone Number

CLIMATIC REGION: UK, EIRE







(black line = zone limit)
(red line = representative altitude - snow load relationship for the corresponding zone)

PARAMETERS:

Climatic Region	Function Type	a_{min}	a_{max}	b
UK, Eire	**L**	-0.11	0.68	512

Zone Number	Z=1	Z=2	Z=3	Z=4	Z=5
r	0.978893	0.956928	0.959077	0.974603	0.976574

r = correlation coefficient (snow load values / representing function)
H = horizontal line, no altitude - snow load relationship
L = linear function
Q = quadratic function

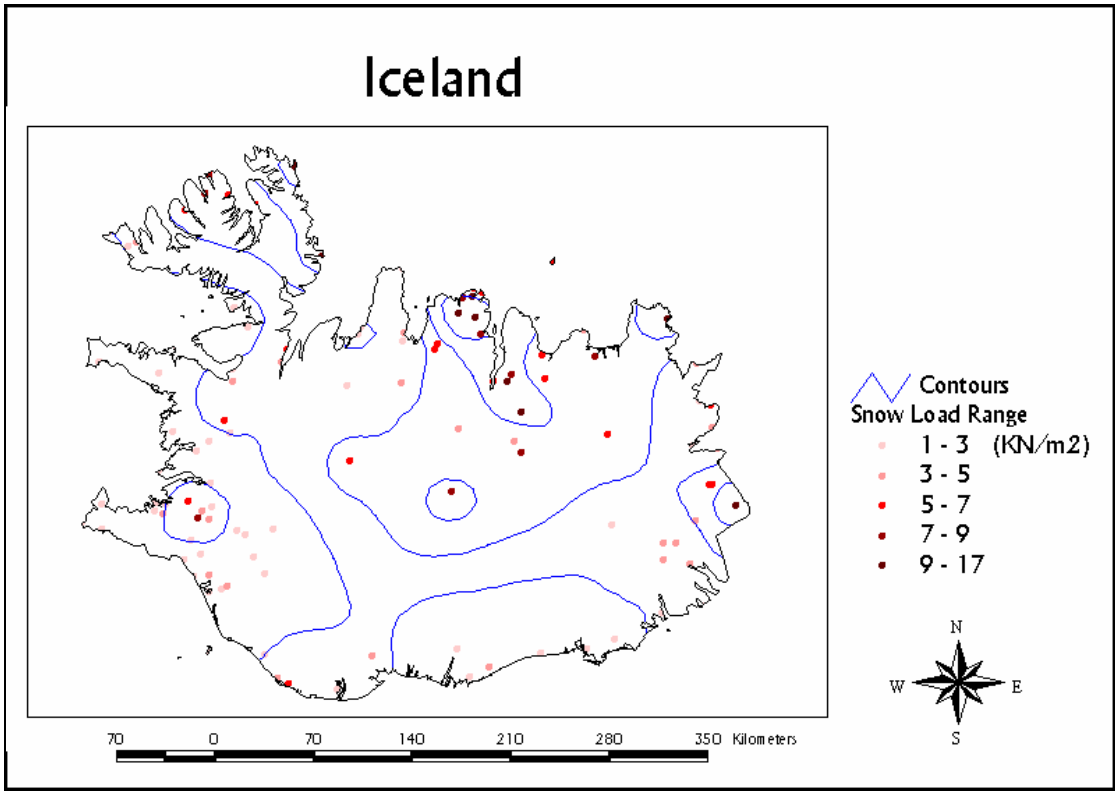
REPRESENTATIVE SNOW LOAD FOR ZONE Z AT ALTITUDE A:

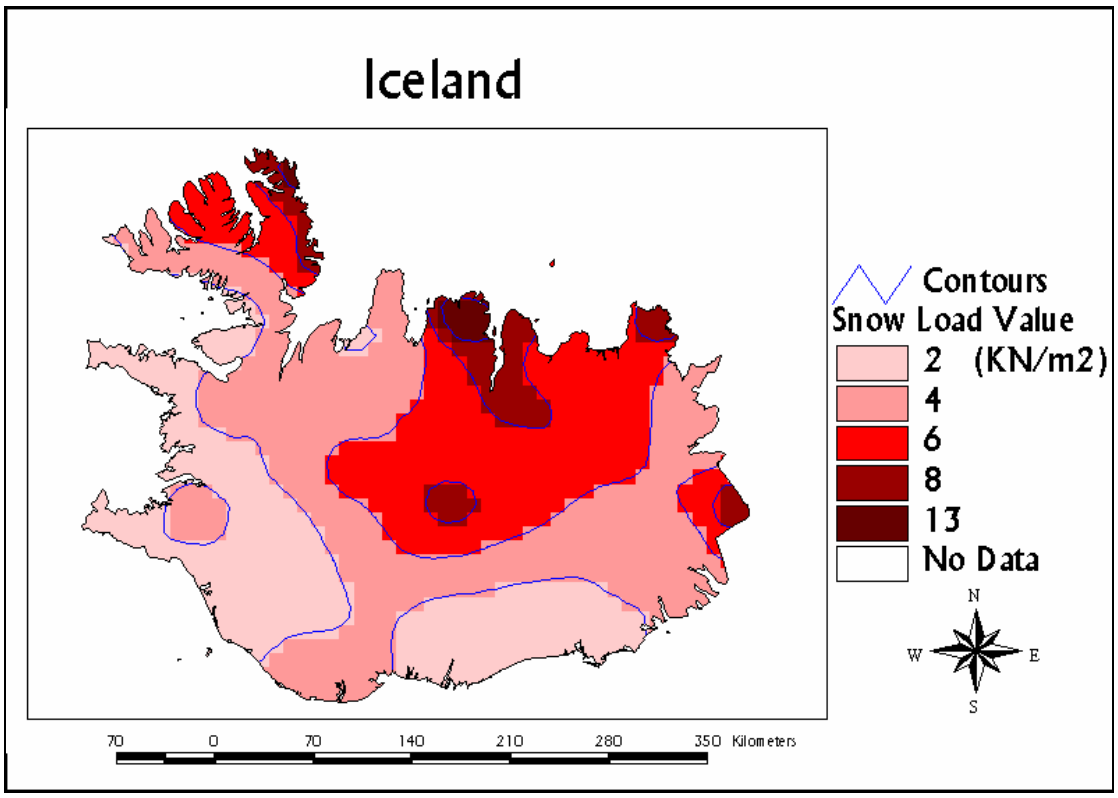
$$s = (-0.11 + (Z - 0.5) * [0.68 + 0.11] / 5) + \frac{A}{512}$$

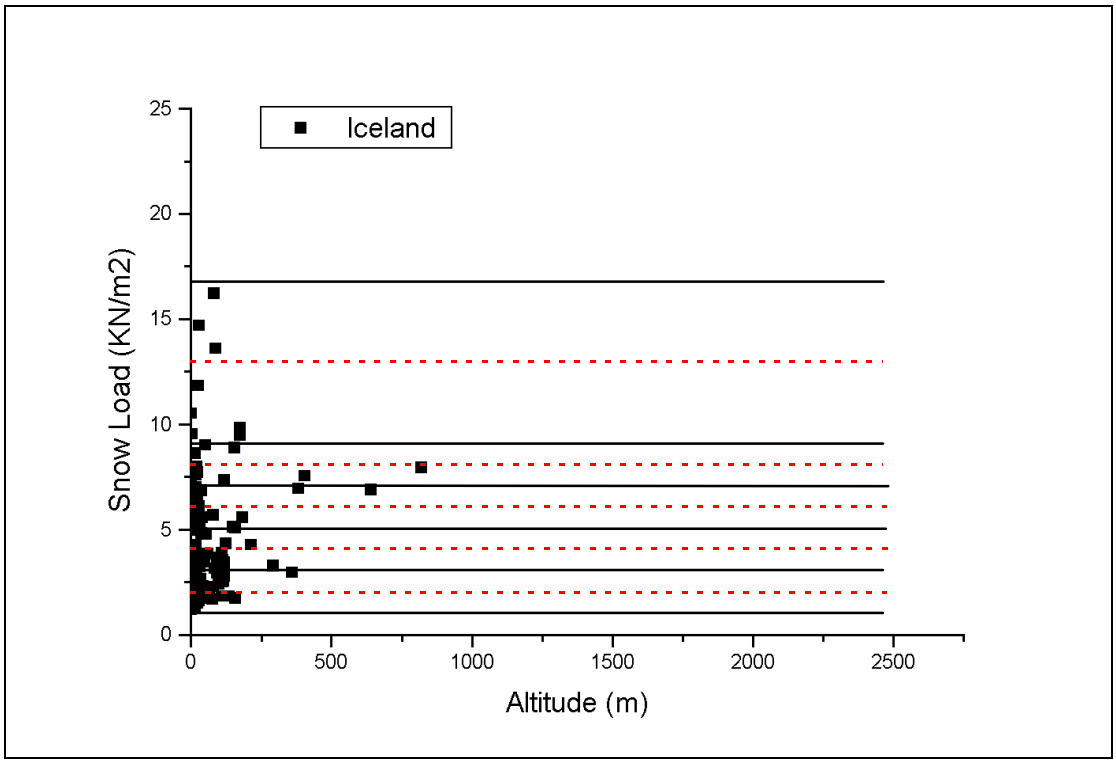
s = Snow Load (KN/m^2)
A = Altitude above Sea Level (m)
Z = Zone Number

No Altitude-Snow Load Relationship:

CLIMATIC REGION: ICELAND







(black line = zone limit)
(red line = characteristic snow load for the corresponding zone)

PARAMETERS:

Climatic Region	**Function Type**	**a_{min}**	**a_{max}**	**b**
Iceland	**H**	-	-	-

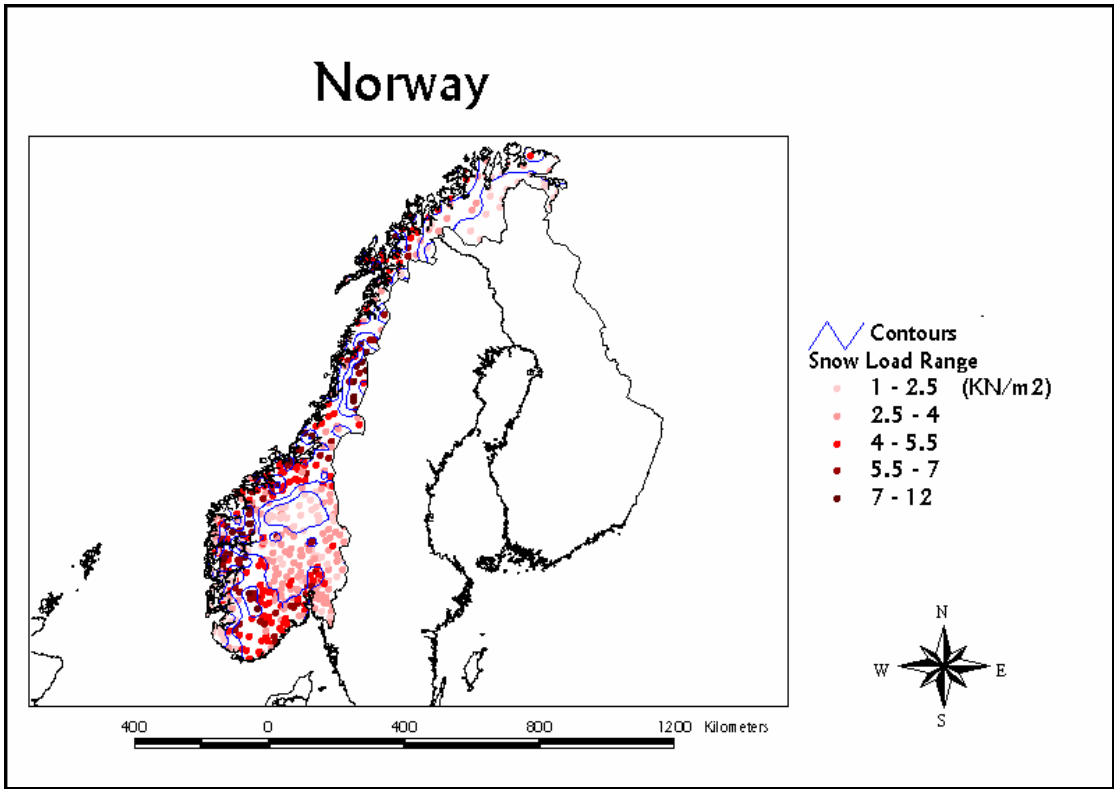
H = horizontal line, no altitude - snow load relationship
L = linear function
Q = quadratic function

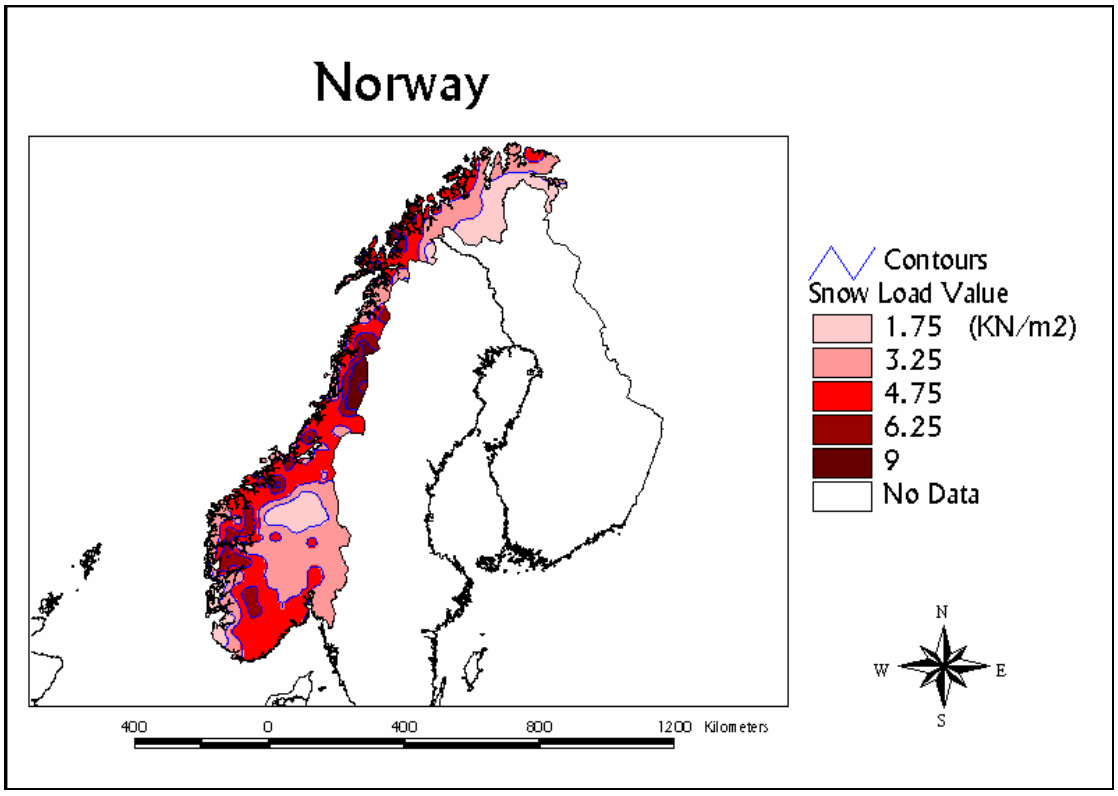
CHARACTERISTIC SNOW LOAD FOR ZONE Z:
No altitude - snow load relationship.
The characteristic snow load value for a zone is the middle value:

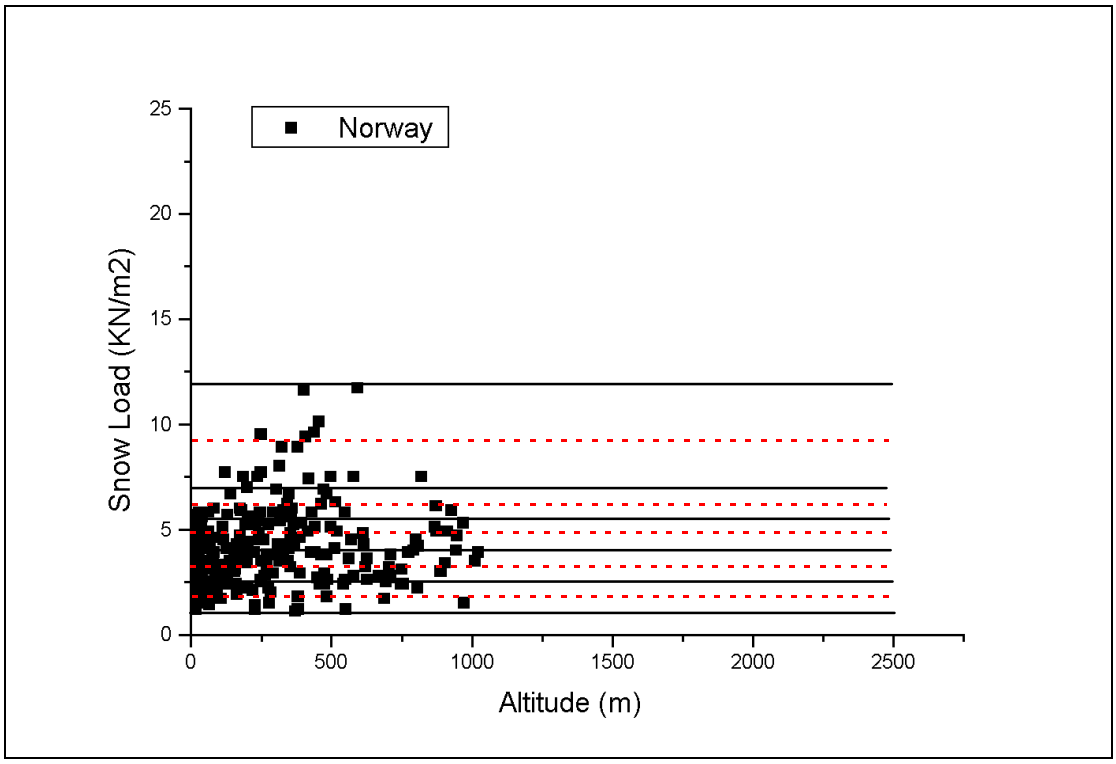
Z=1	Z=2	Z=3	Z=4	Z=5
2 KN/m^2	4 KN/m^2	6 KN/m^2	8 KN/m^2	13 KN/m^2

Z = Zone Number

CLIMATIC REGION: NORWAY







(black line = zone limit)
(red line = characteristic snow load for the corresponding zone)

PARAMETERS:

Climatic Region	Function Type	a_{min}	a_{max}	b
Norway	**H**	-	-	-

H = horizontal line, no altitude - snow load relationship
L = linear function
Q = quadratic function

CHARACTERISTIC SNOW LOAD FOR ZONE Z:
No altitude - snow load relationship.
The characteristic snow load value for a zone is the middle value:

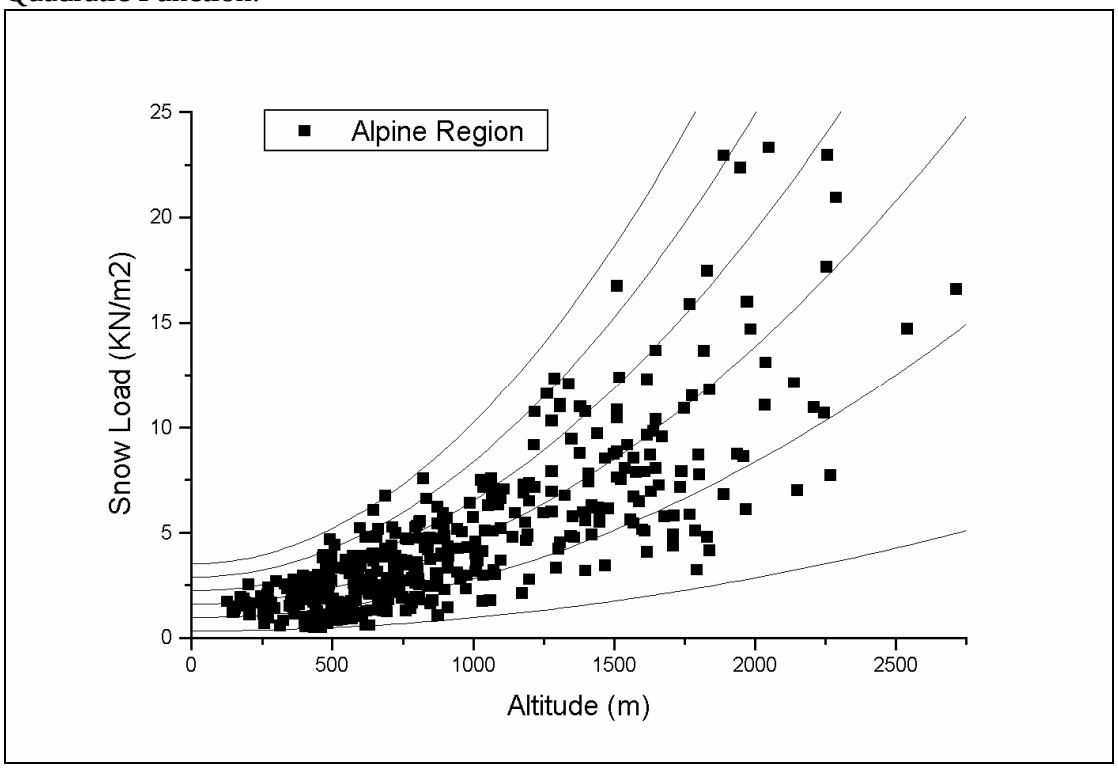
Z=1	Z=2	Z=3	Z=4	Z=5
1.75 KN/m^2	3.25 KN/m^2	4.75 KN/m^2	6.25 KN/m^2	9 KN/m^2

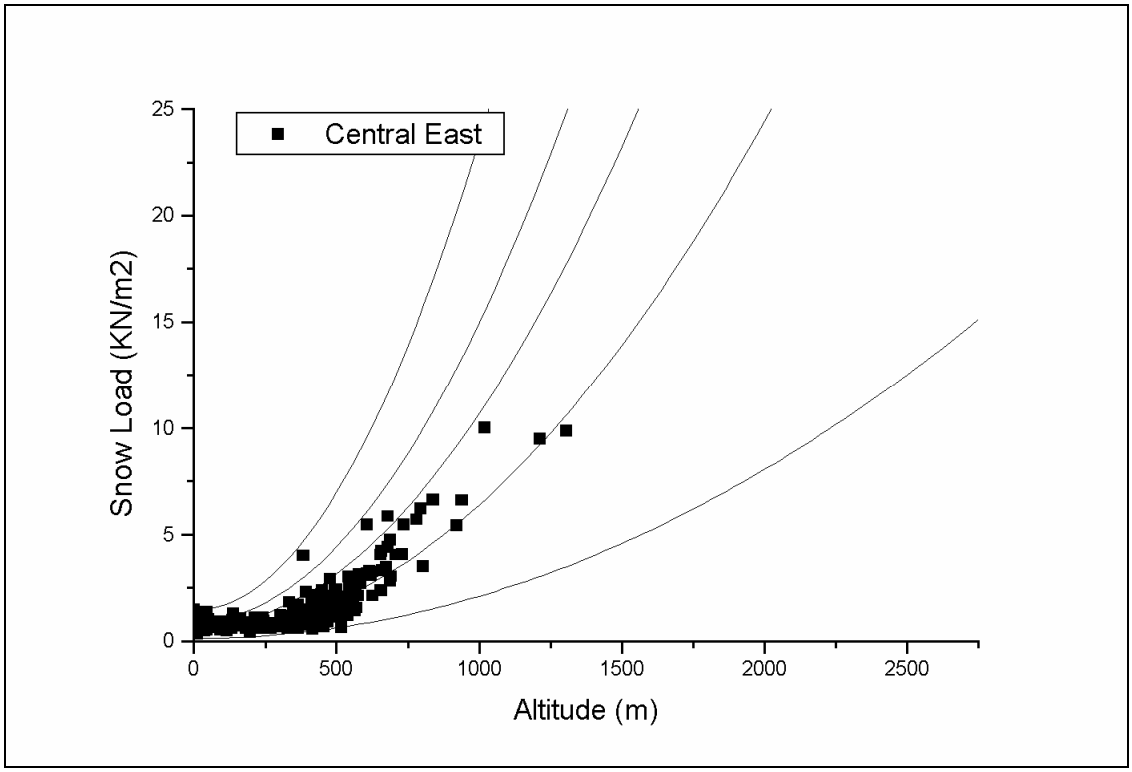
Z = Zone Number

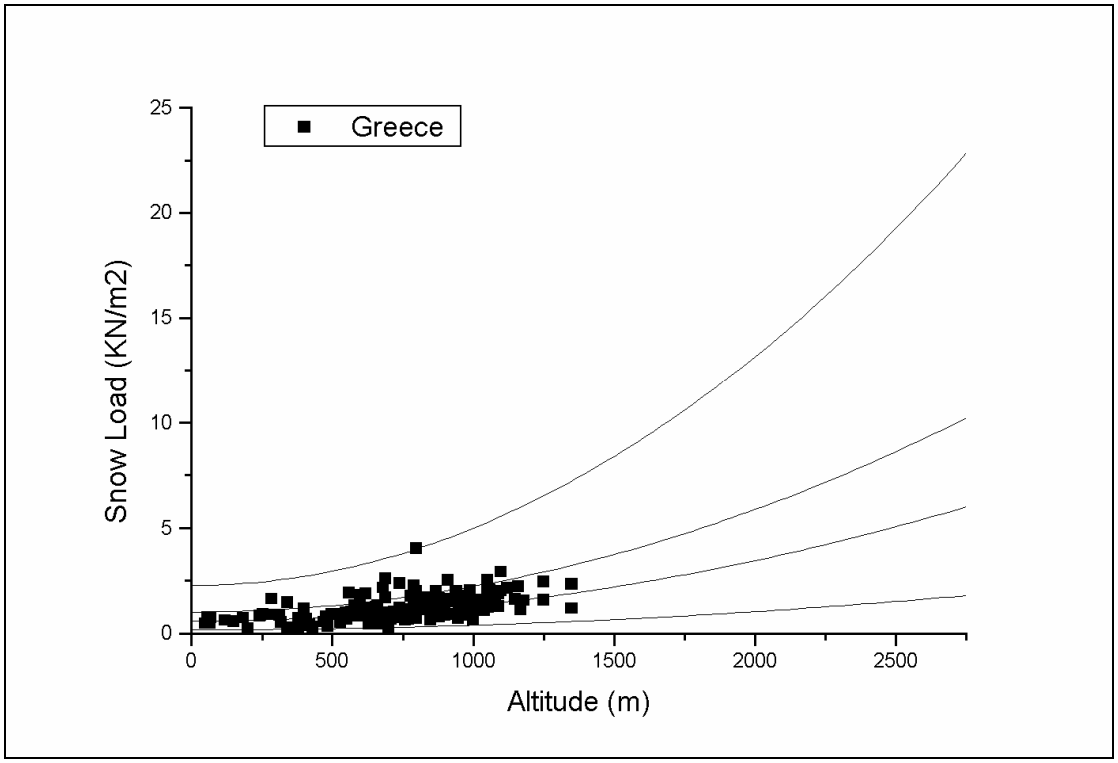
A6.2 Standardised Scatterplots for each climatic region

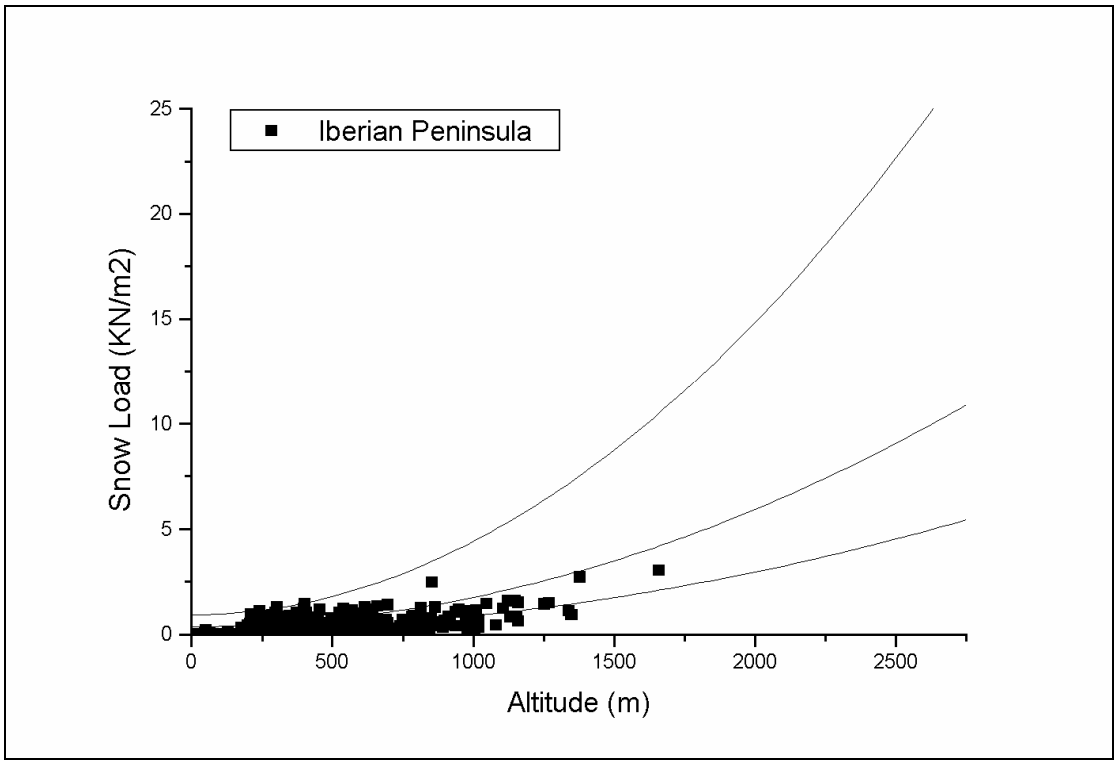
Climatic regions are grouped by type of curve (quadratic, linear, horizontal). Each group is presented in alphabetical order.

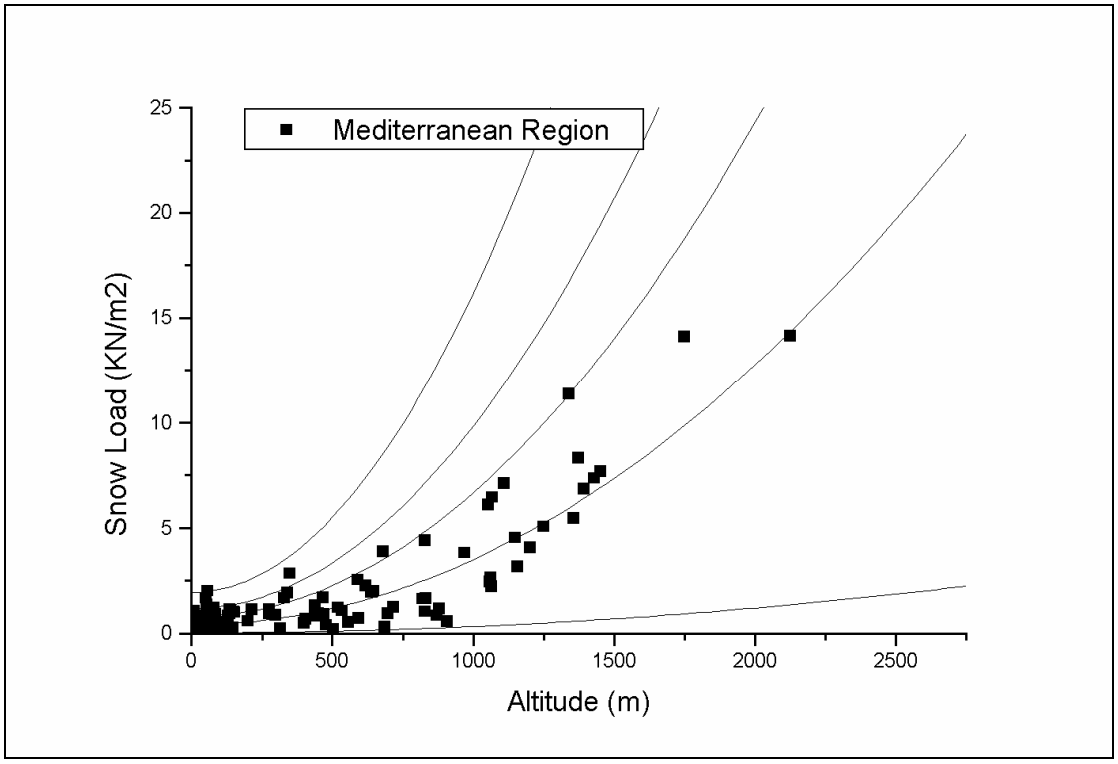
Quadratic Function:



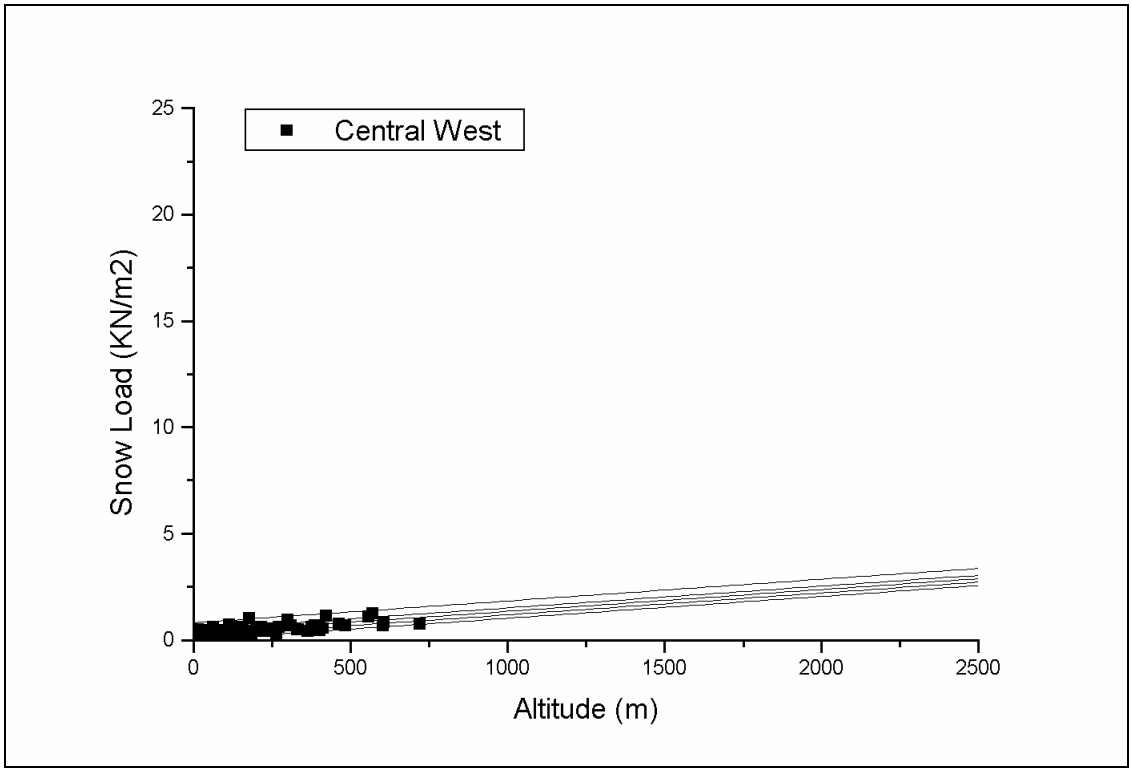


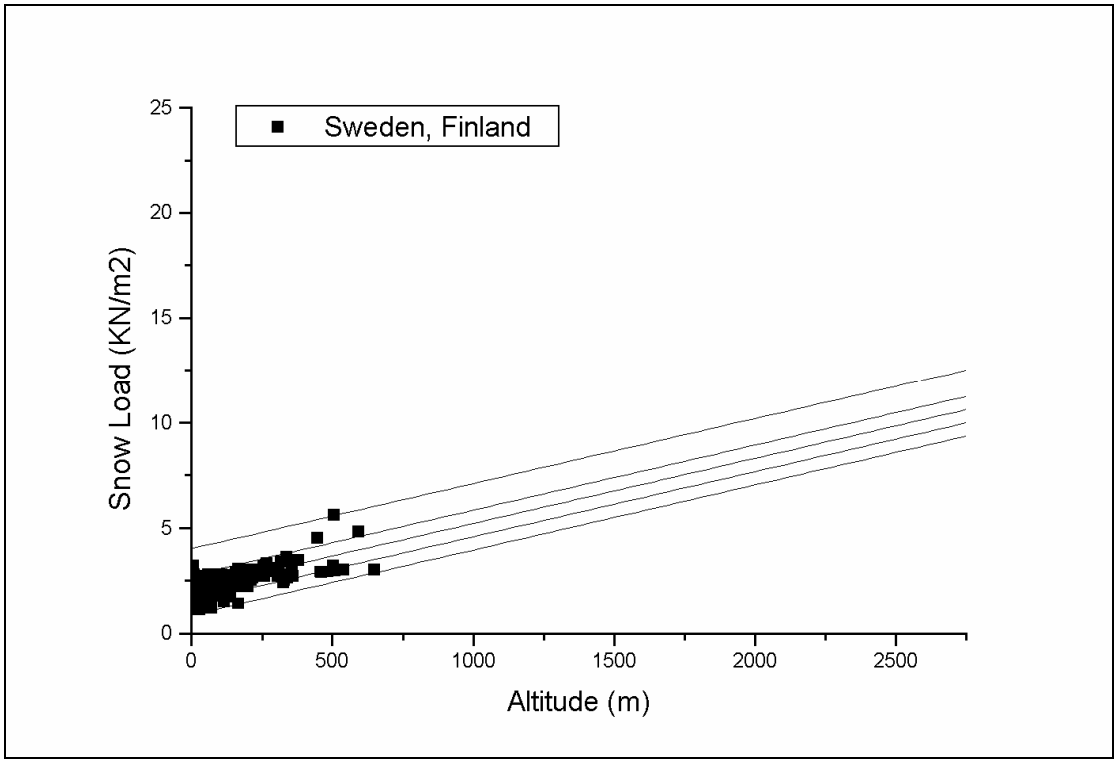

Greece
Snow Load (KN/m2)
Altitude (m)
0
5
10
15
20
25
0
500
1000
1500
2000
2500

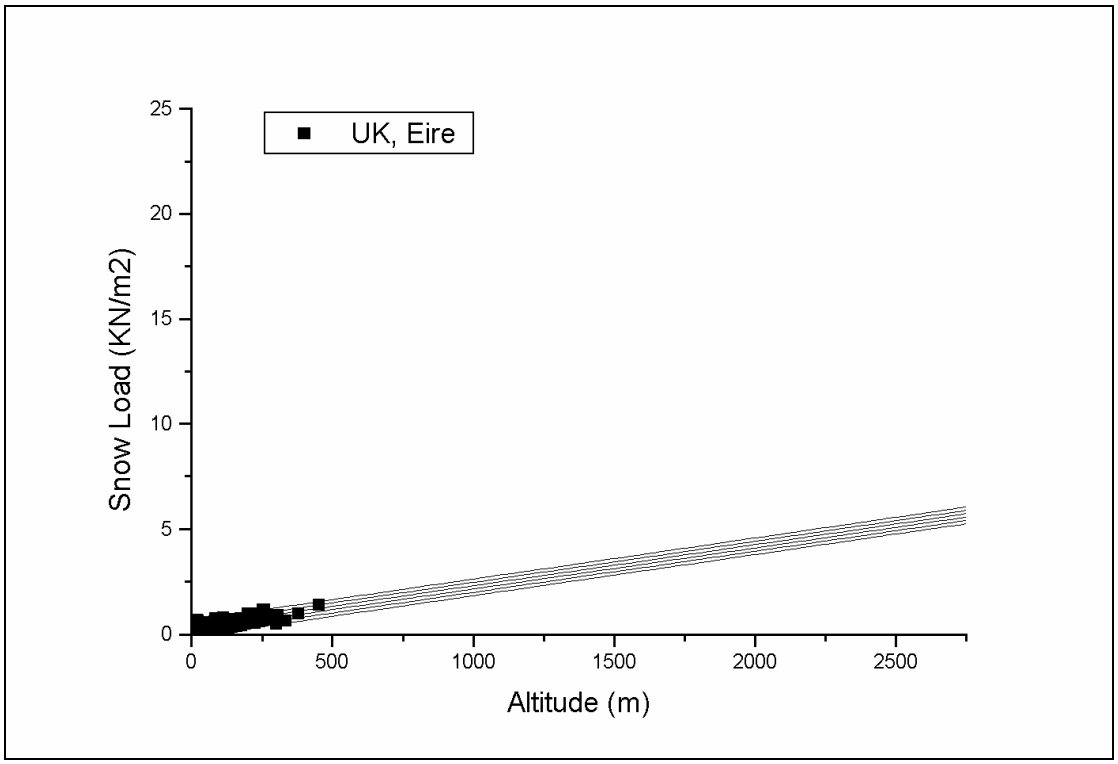

Iberian Peninsula
Snow Load (KN/m2)
Altitude (m)
0
5
10
15
20
25
0
500
1000
1500
2000
2500



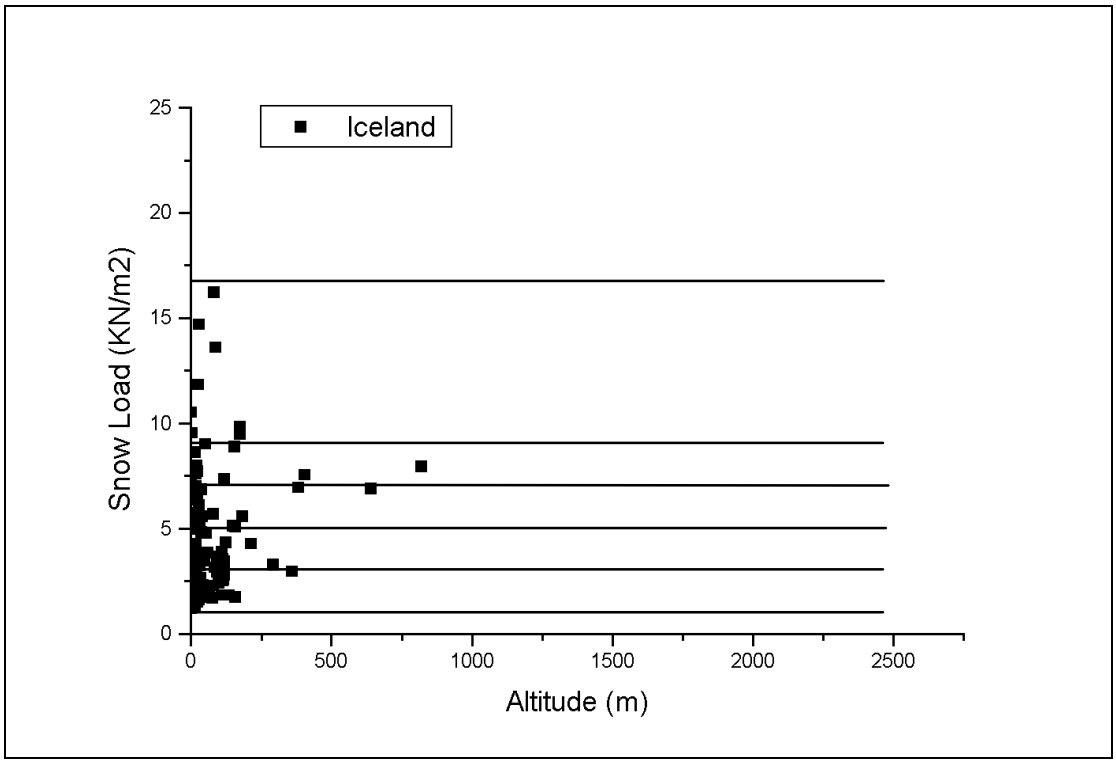
Linear Function:

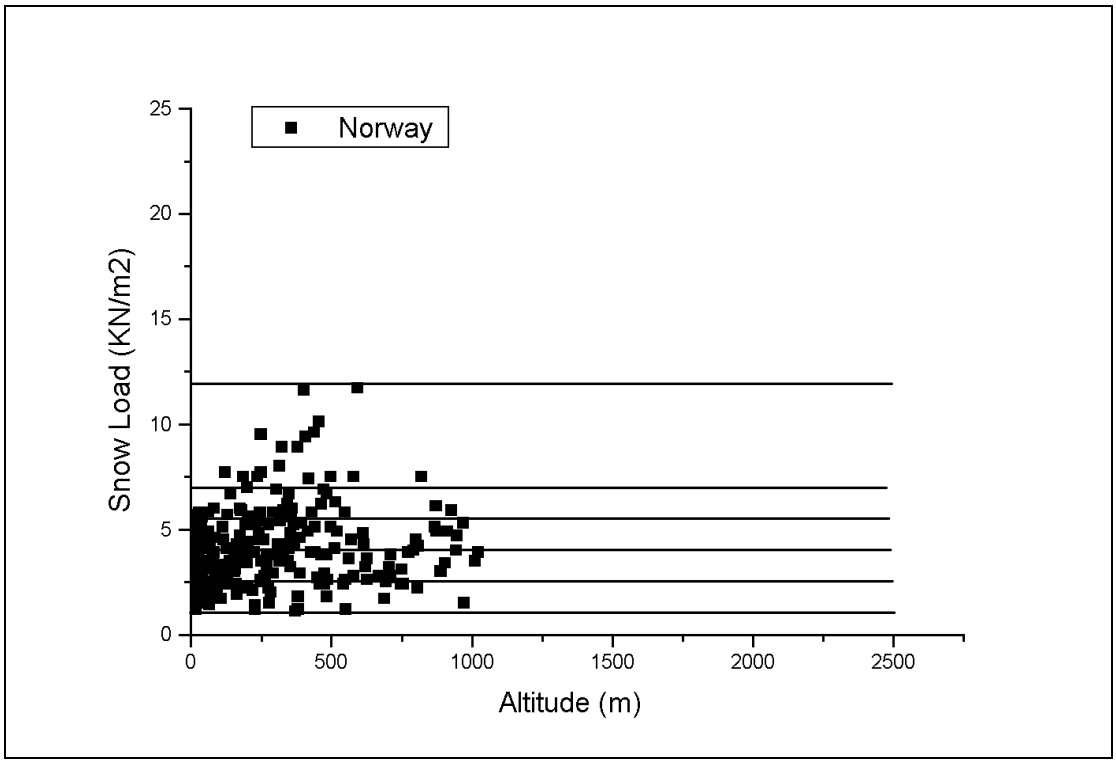



Sweden, Finland
Snow Load (KN/m2)
Altitude (m)
0
5
10
15
20
25
0
500
1000
1500
2000
2500


UK, Eire
Snow Load (KN/m2)
Altitude (m)
0
5
10
15
20
25
0
500
1000
1500
2000
2500

No Altitude - Snow Load Relationship:





A6.3 Summary Table: Basic Parameters

Climatic Region	**Function Type**	**a_{min}**	**a_{max}**	**b**	**r1**	**r2**	**r3**	**r4**	**r5**
Alpine Region	**Q**	0.33	3.52	723	0.965239	0.969029	0.990730	00.992836	0.997646
Central East	**Q**	0.13	1.45	256	0.965375	0.977156	0.993785	0.981885	-
Greece	**Q**	0.18	2.28	916	0.849836	0.900579	0.574272	-	-
Iberian Peninsula	**Q**	0	0.94	521	0.855967	0.959583	0.743993	-	-
Mediterranean Region	**Q**	0.04	1.95	370	0.967808	0.964791	0.989108	0.910892	-
Central West	**L**	0.01	0.82	979	0.963995	0.941009	0.915297	0.895668	-
Sweden, Finland	**L**	0.88	4.03	324	0.959375	0.847081	0.880184	0.938354	-
UK, Eire	**L**	-0.11	0.68	512	0.978893	0.956928	0.959077	0.974603	0.976574
Iceland	**H**	-	-	-					
Norway	**H**	-	-	-					

H = horizontal line, no altitude - snow load relationship
L = linear function
Q = quadratic function
a_{max}, a_{min} = max and min of parameter a
b = parameter b
r =correlation coefficients (snow load/representative function) for every zone from the lowest zone number (r1) to the highest

A6.4 Summary Table: Altitude - Snow Load Relationship

Climatic Region	***FORMULA***
Alpine Region	$s = (0.33+(Z-0.5)*[3.52-0.33]/5)\left[1+\left(\frac{A}{723}\right)^2\right]$
Central East	$s = (0.13+(Z-0.5)*[1.45-0.13]/5)\left[1+\left(\frac{A}{256}\right)^2\right]$
Greece	$s = (0.18+(Z-0.5)*[2.28-0.18]/5)\left[1+\left(\frac{A}{916}\right)^2\right]$
Iberian Peninsula	$s = (0+(Z-0.5)*[0.94-0]/5)\left[1+\left(\frac{A}{521}\right)^2\right]$
Mediterranean Region	$s = (0.04+(Z-0.5)*[1.95-0.04]/5)\left[1+\left(\frac{A}{370}\right)^2\right]$
Central West	$s = (-0.01+(Z-0.5)*[0.82+0.01]/5)+\frac{A}{979}$
Sweden, Finland	$s = (0.88+(Z-0.5)*[4.03-0.88]/5)+\frac{A}{324}$
UK, Eire	$s = (-0.11+(Z-0.5)*[0.68+0.11]/5)+\frac{A}{512}$
Iceland	-
Norway	-

s = Snow Load (KN/m^2)
A = Altitude above Sea Level (m)
Z = Zone Number