APPENDIX C

TRANSPORT STATISTICS

This appendix provides transport statistics calculated from the radar profiler winds measured at Simi Valley (Ventura), Franklin Field (Sacramento), and Visalia (San Joaquin Valley) for the 1997 and 1998 episode days analyzed in this report. Transport statistics are metrics used to help us understand transport, ventilation, and re-circulation throughout the day and at all profiler sampling heights.

The quantities computed using the procedure developed by Allwine and Whiteman (1994) represent the scalar wind run S (km), the resultant (vector) transport distance L (km), the resultant (vector-averaged) wind direction Θ (degrees from true north adjusted to the proper quadrant), and the recirculation factor, R. Note that the vector transport distance is not a trajectory, but a wind run. It quantifies the transport assuming that the wind observed by the profiler is spatially consistent through the maximum transport distance. The recirculation factor is the ratio of the resultant transport distance to the scalar transport distance (wind run). When R is equal to 1, straight-line, steady transport has occurred during the integration period. When R is equal to zero, no net transport has occurred during the integration period. Values of R close to 1, combined with transport distances of a few hundred kilometers, would typically characterize good ventilation conditions. Conversely, low values of R represent periods of stagnation or recirculation. Stagnation would be indicated by short scalar wind runs (i.e., low wind speeds); recirculation would be characterized by low values of the vector transport distance (e.g., L less than 50 km) compared to the scalar wind run. For example, if R were 0.25 and the vector-averaged wind run were 50 km, the scalar wind run would be 200 km. This would be characteristic of recirculation conditions; air must have recirculated in the area of interest.

The integration time, T, was specified as 12 hours and the transport statistics were computed from day 1 at 0400 PST to day 1 at 1600 PST, and from day 1 at 1600 PST to day 2 at 0400 PST. These time periods were selected to capture daytime and nighttime flow patterns, respectively.

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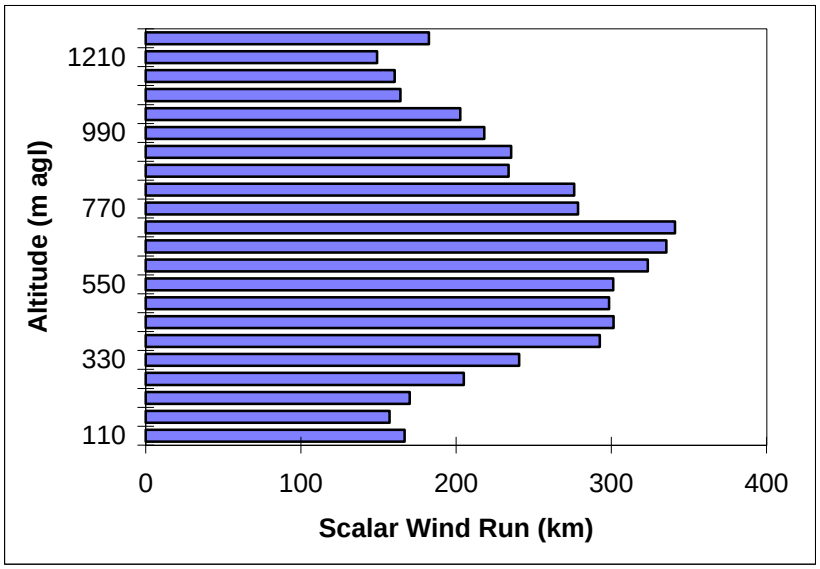

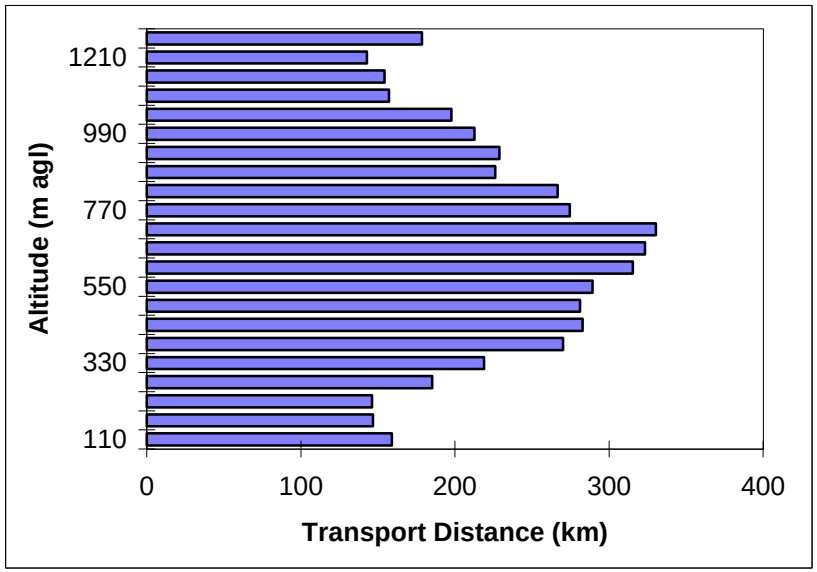

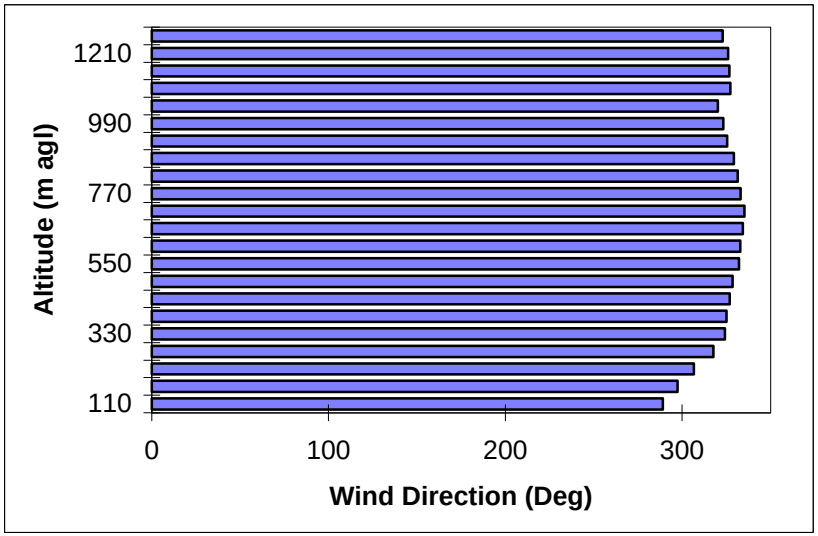

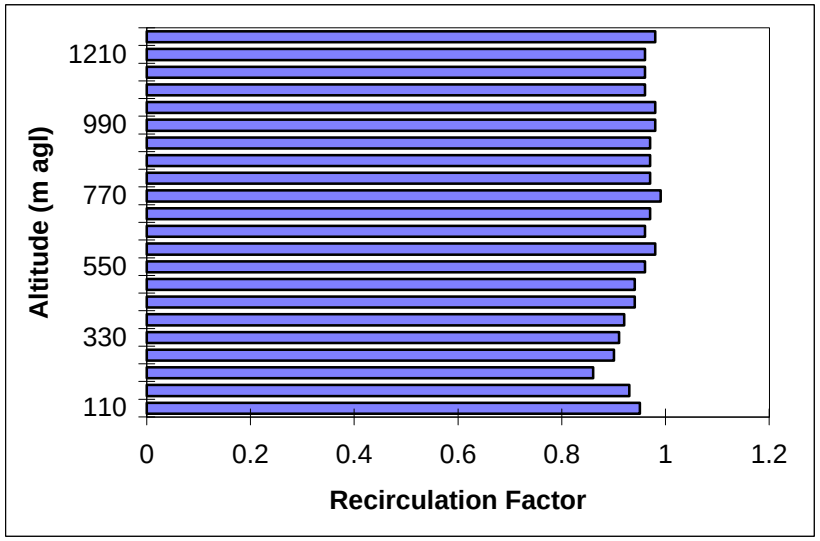

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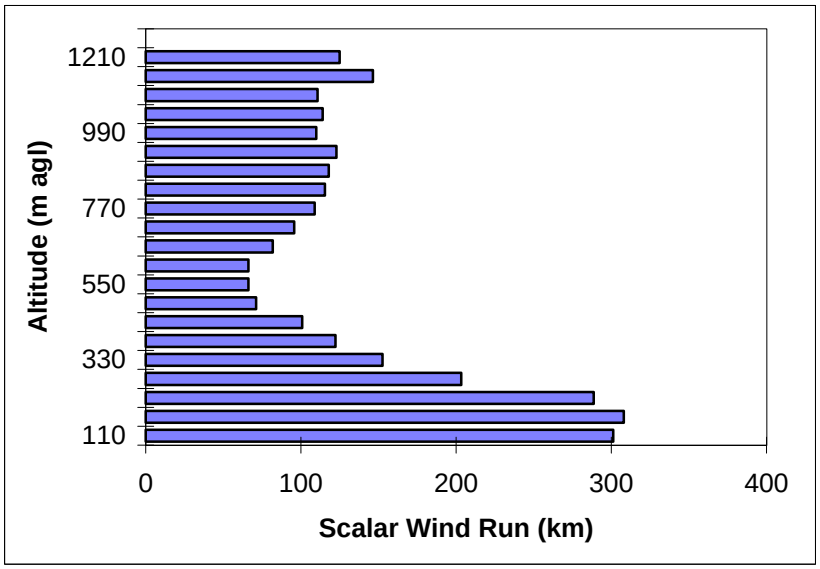

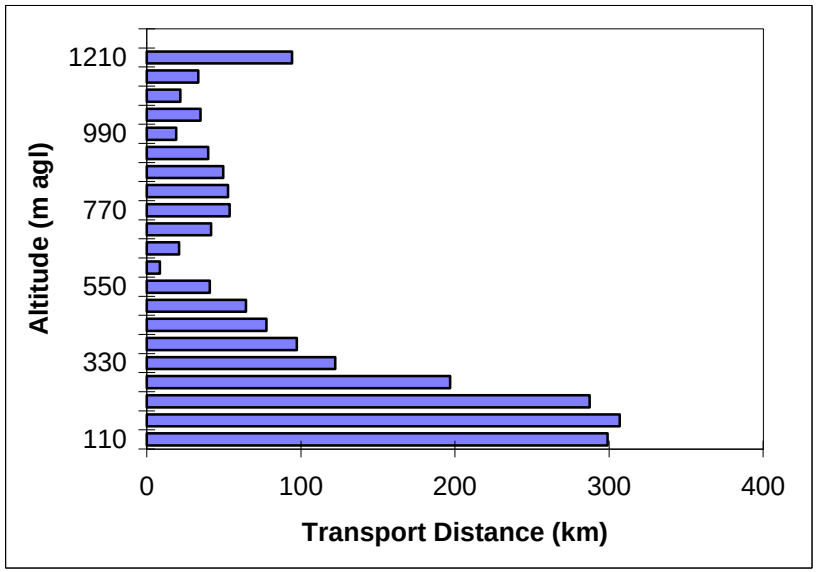

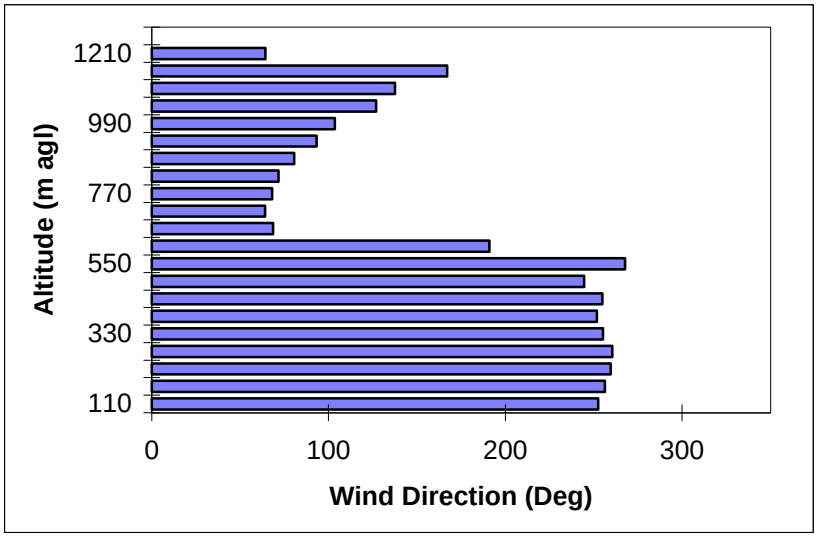

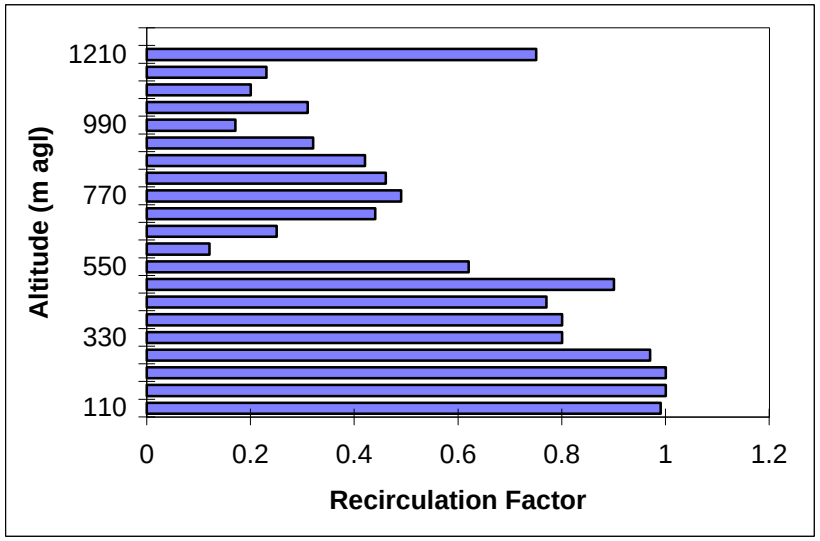

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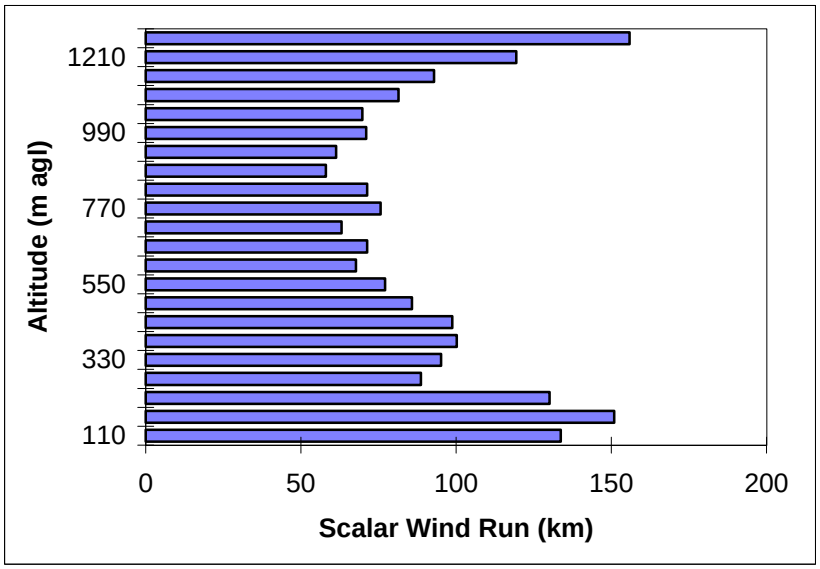

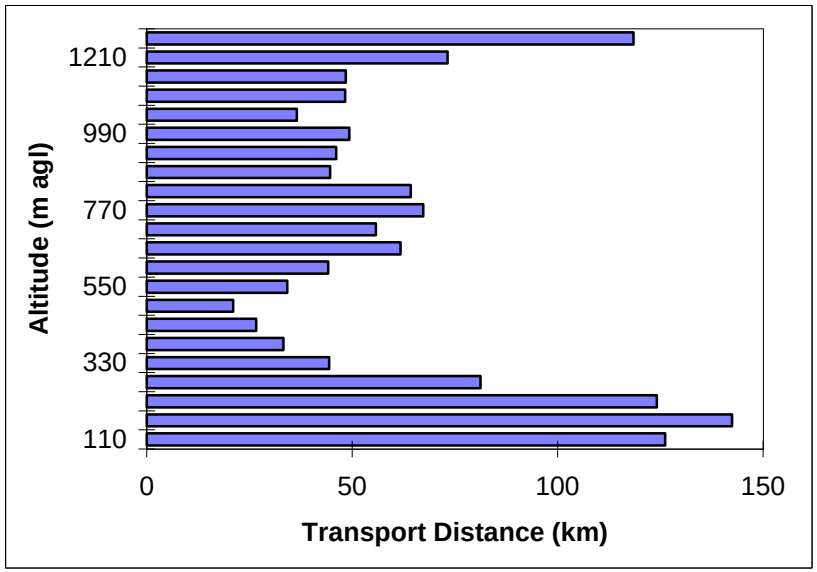

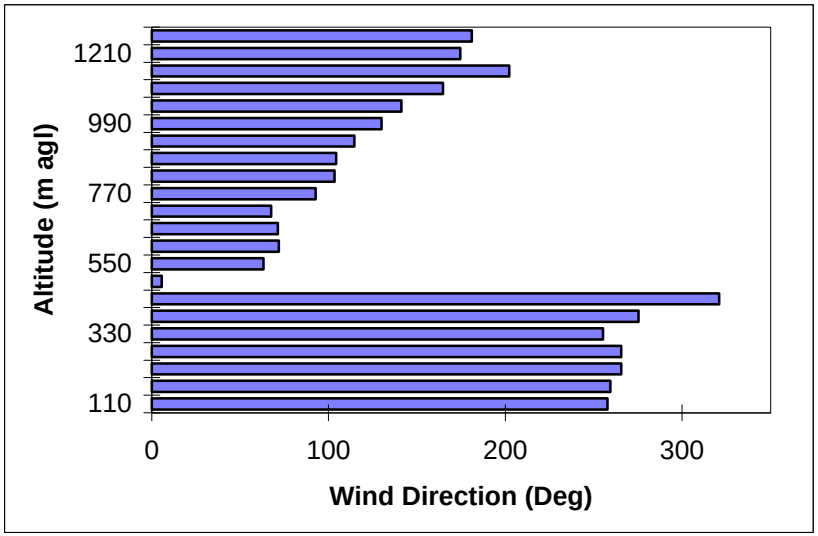

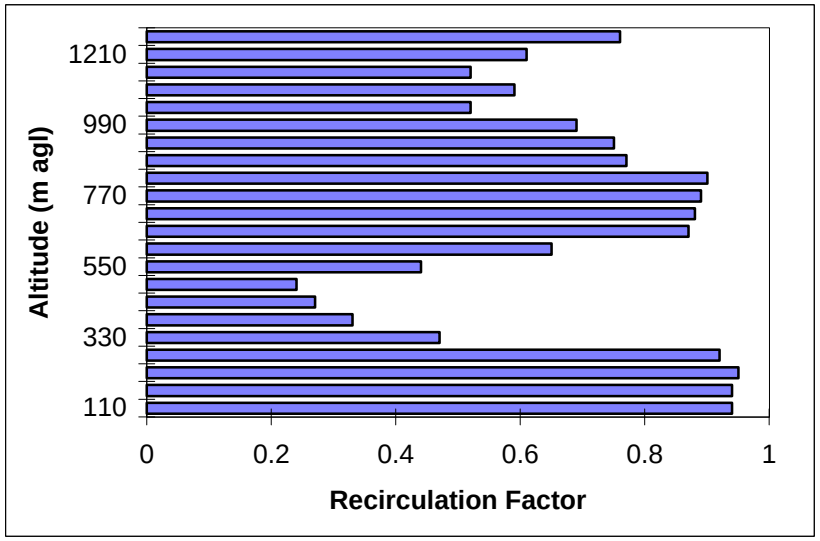

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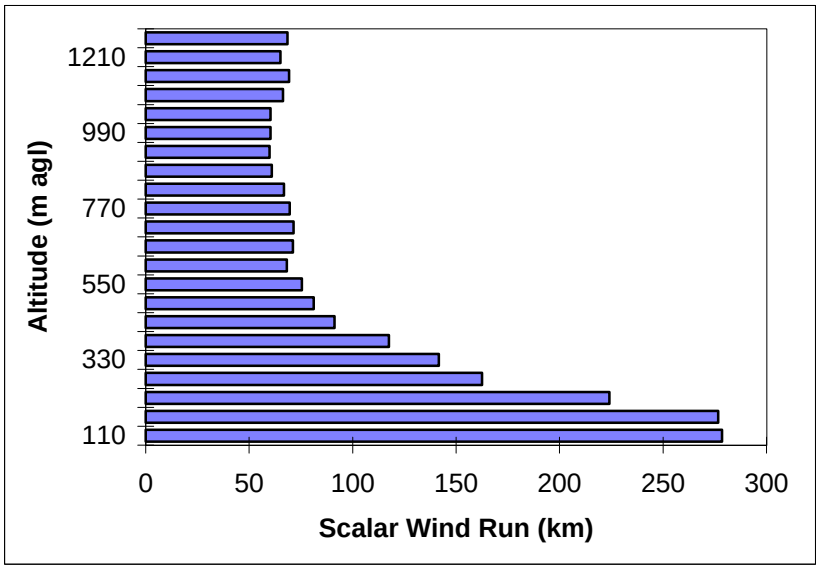

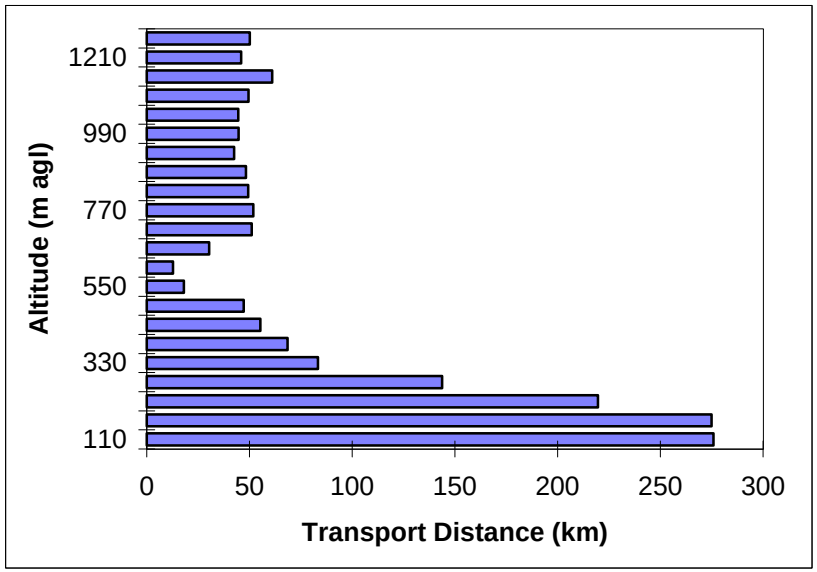

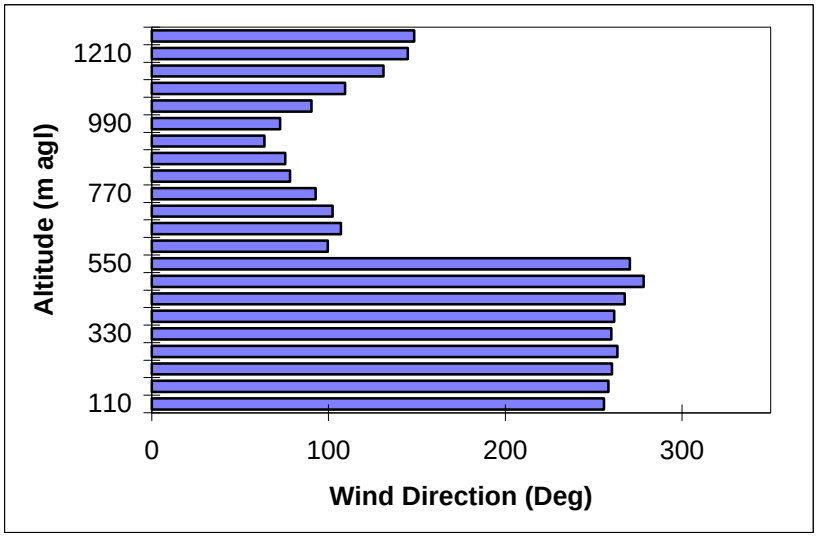

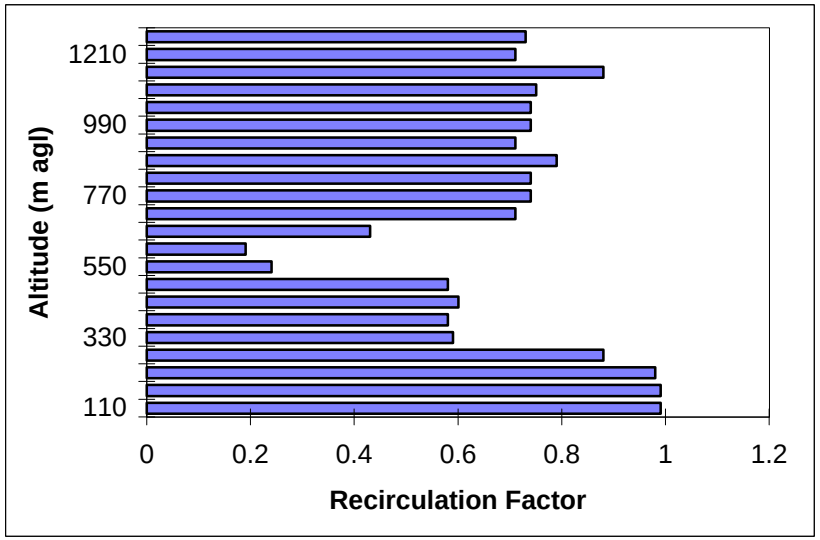

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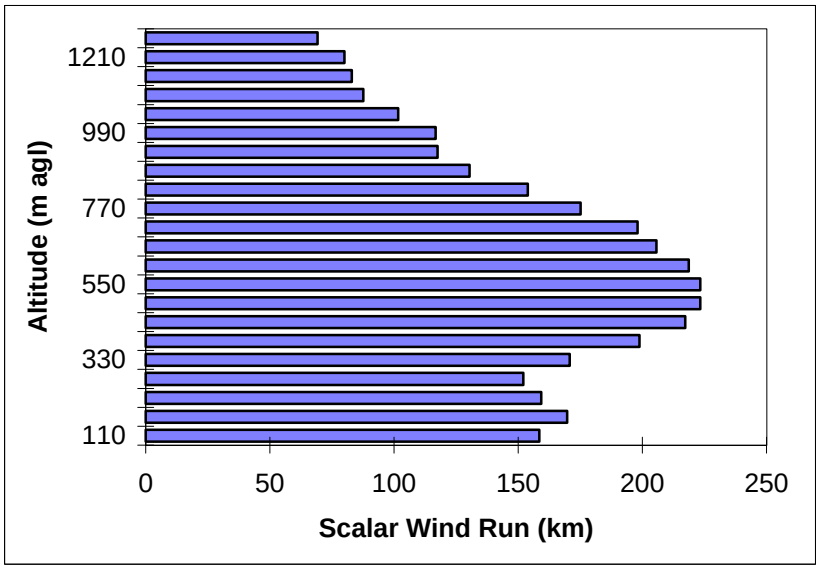

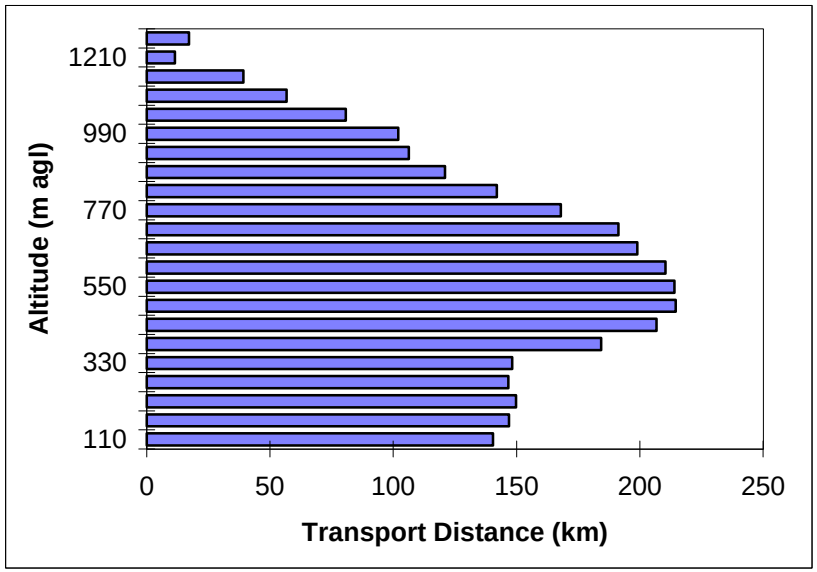

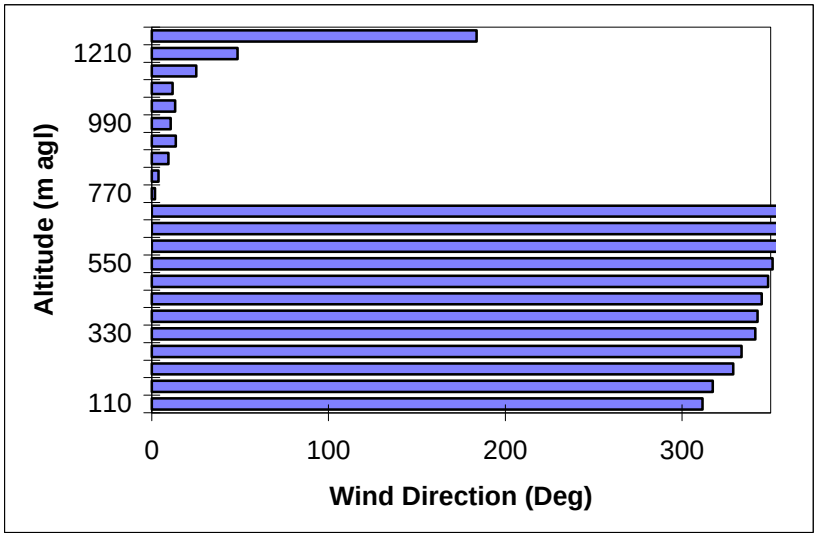

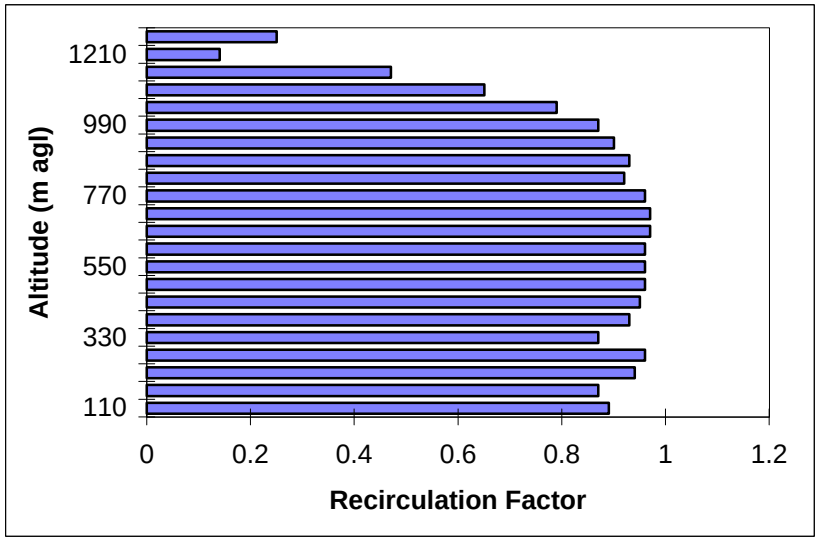

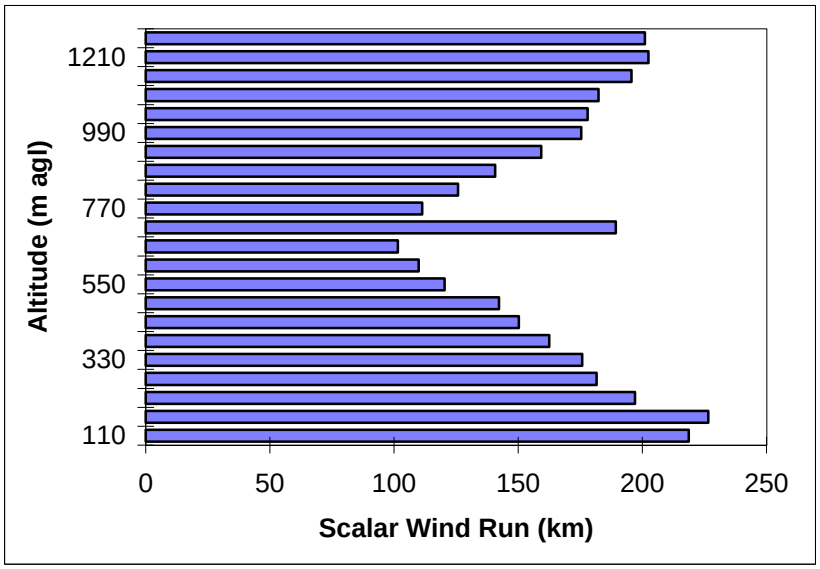
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770
550
330
110
0
50
100
150
200
250
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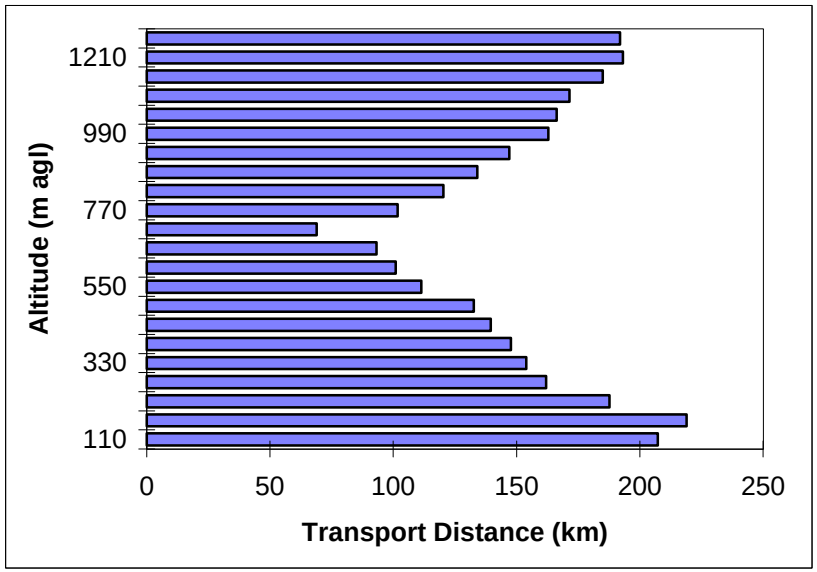
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100
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200
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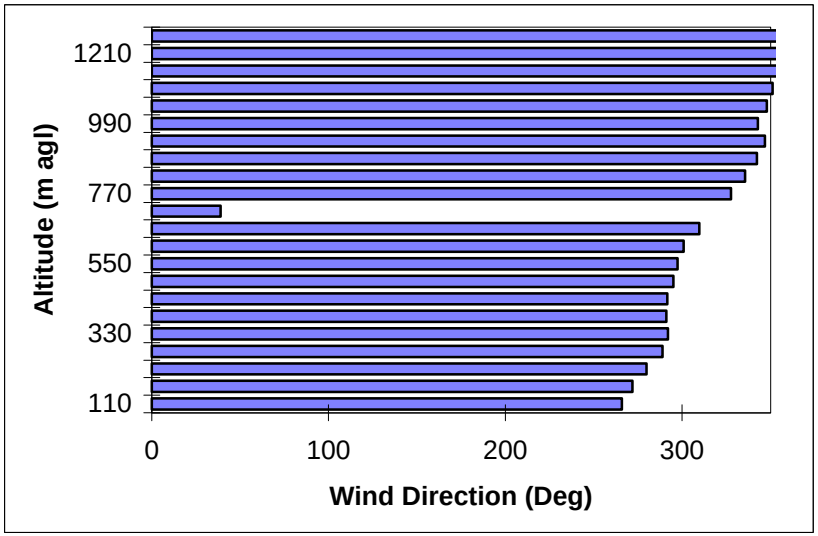
Transport Distance (km)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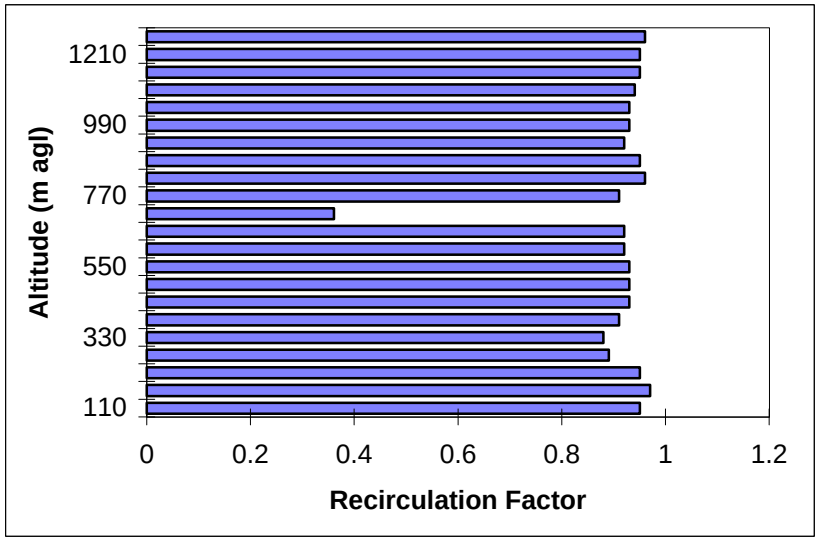
770
550
330
110
0
100
200
300
Wind Direction (Deg)


Altitude (m agl)
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770
550
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0.4
0.6
0.8
1
1.2
Recirculation Factor

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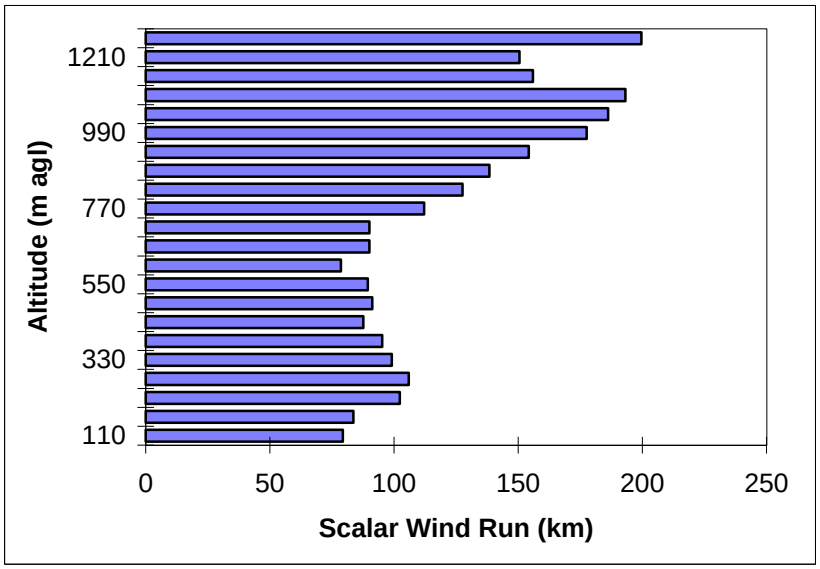

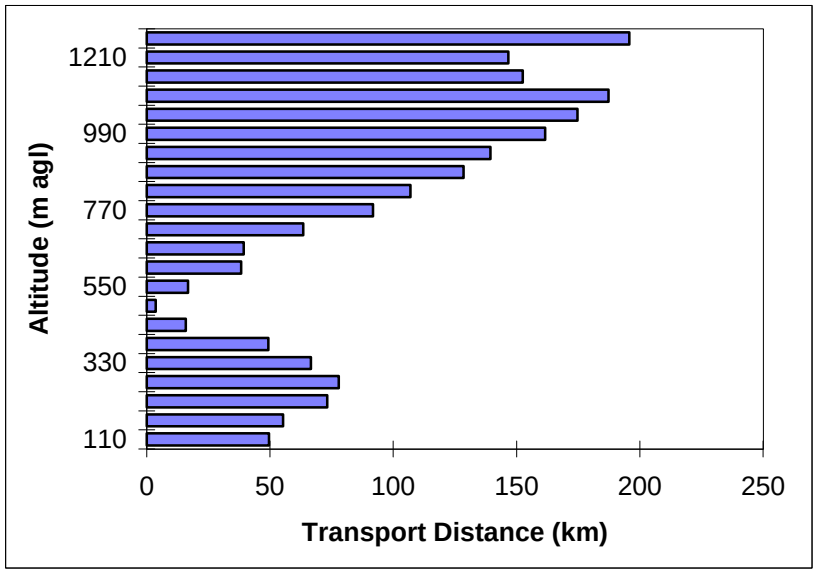

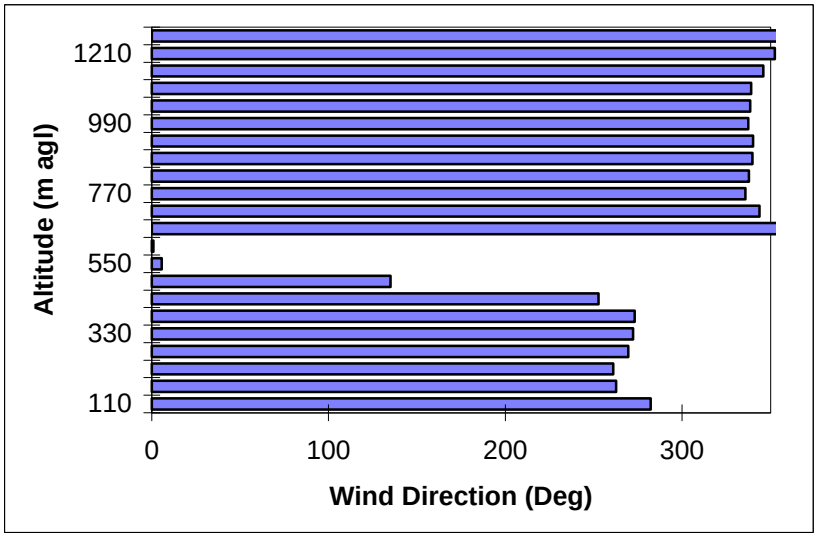

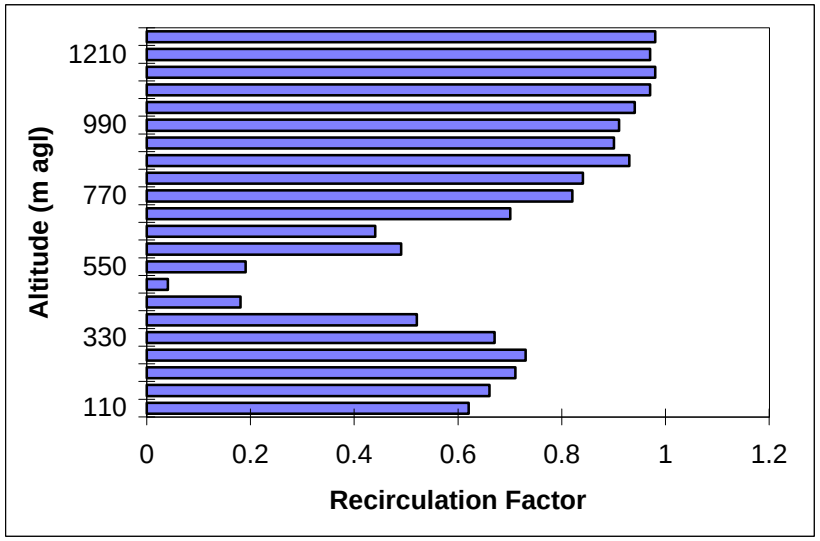

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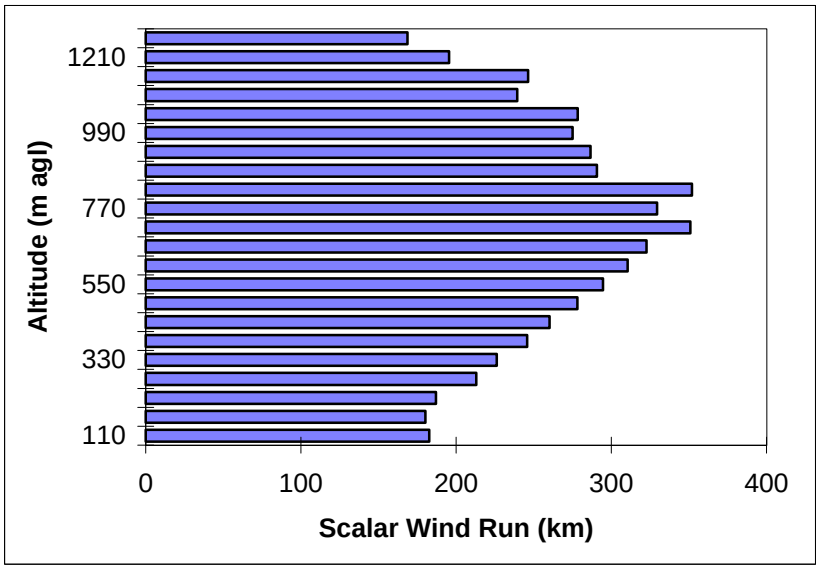

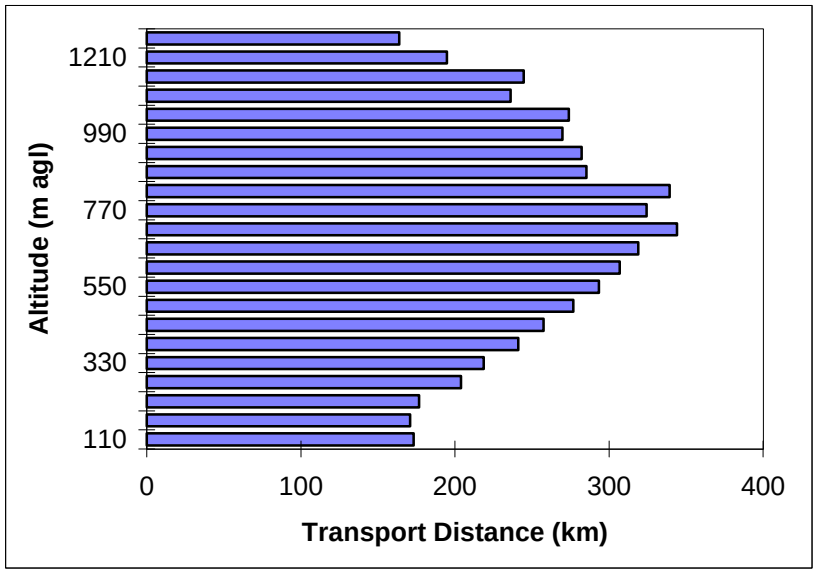

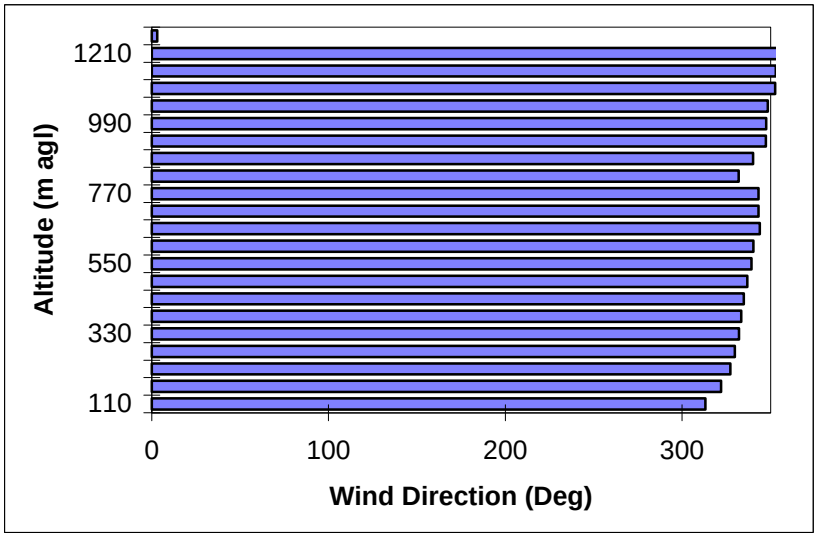

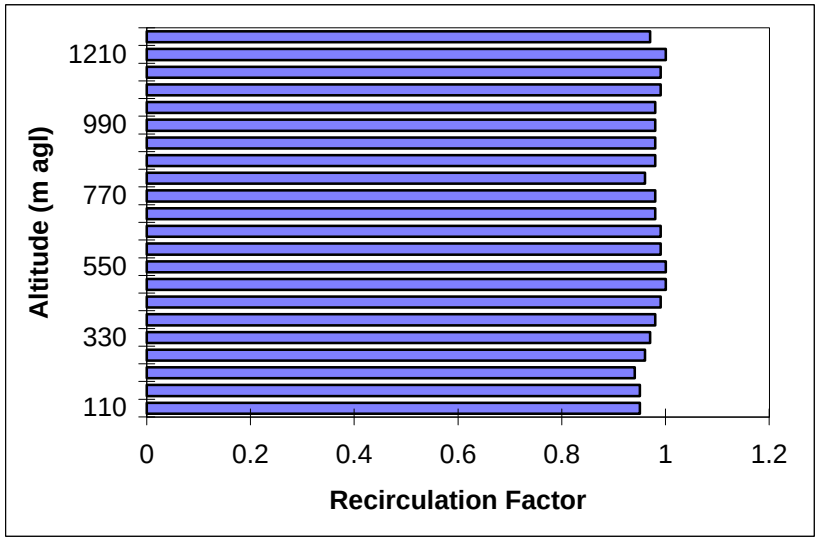

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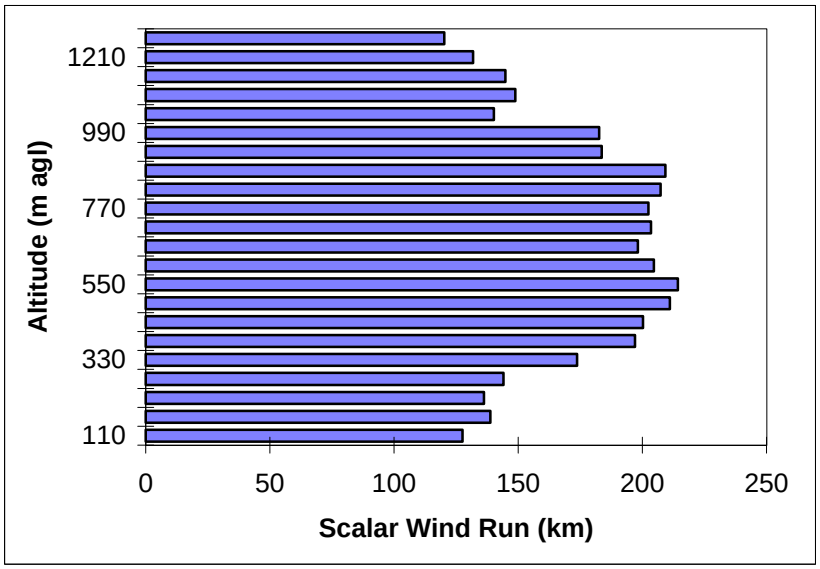

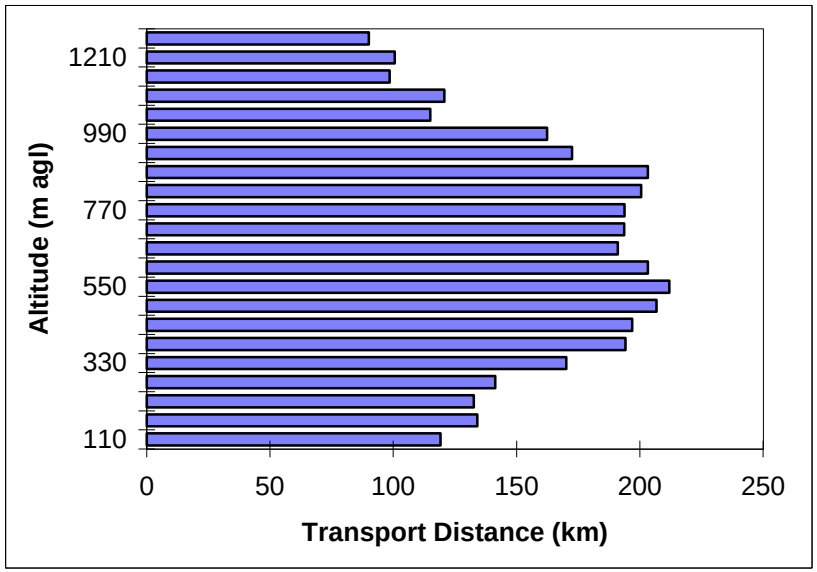

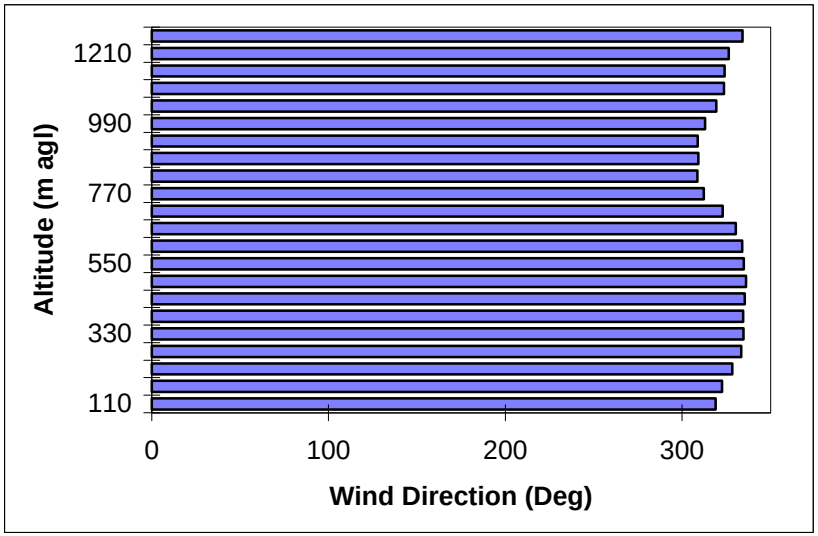

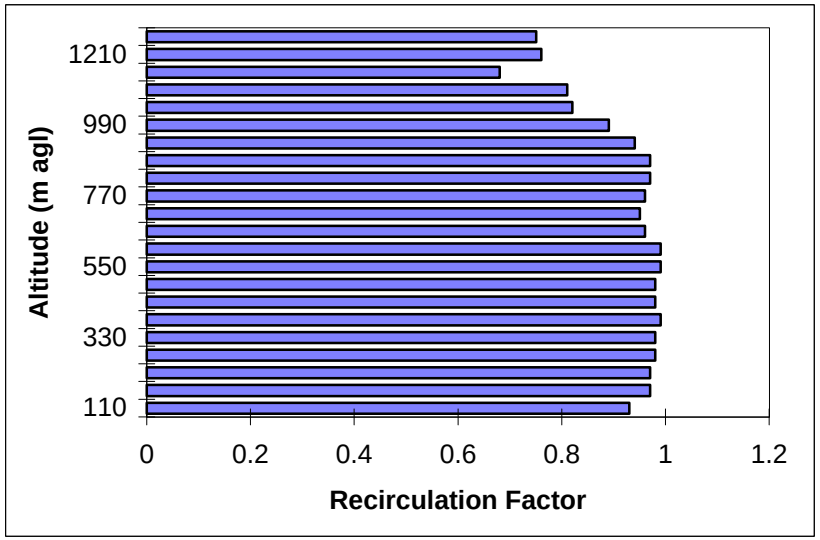

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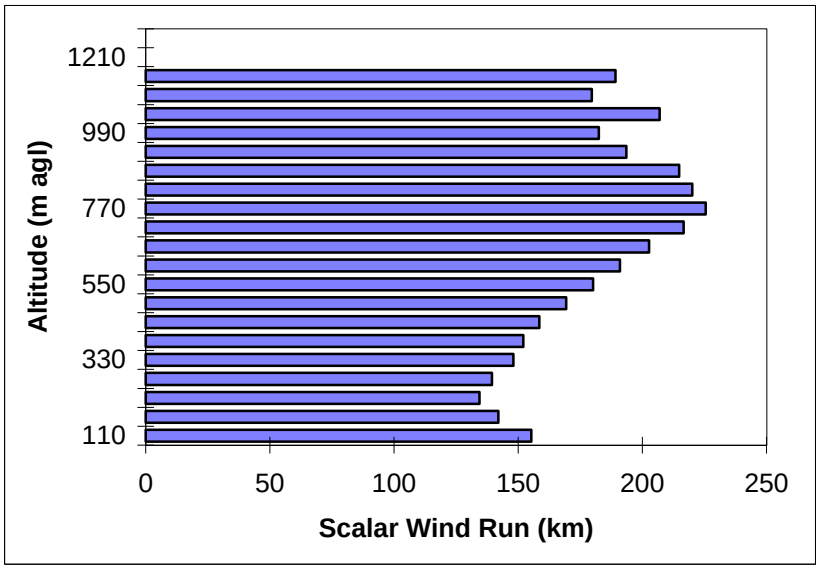

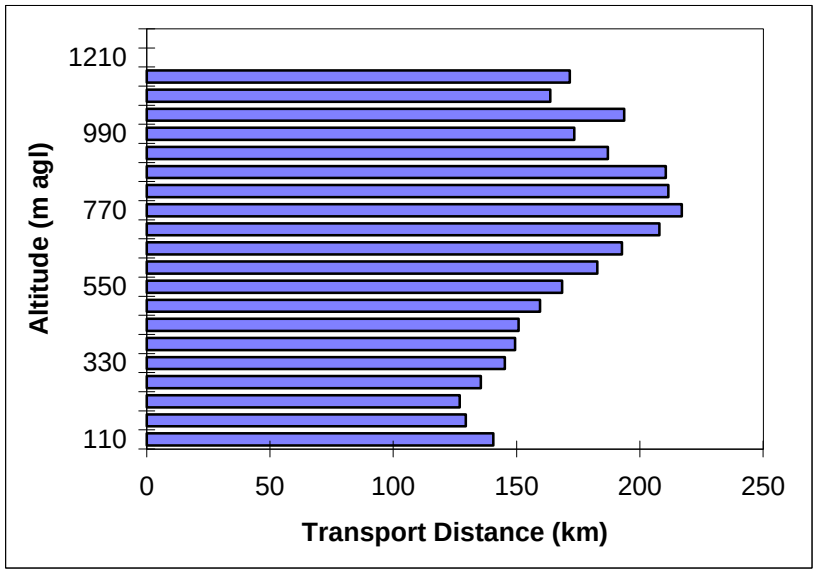

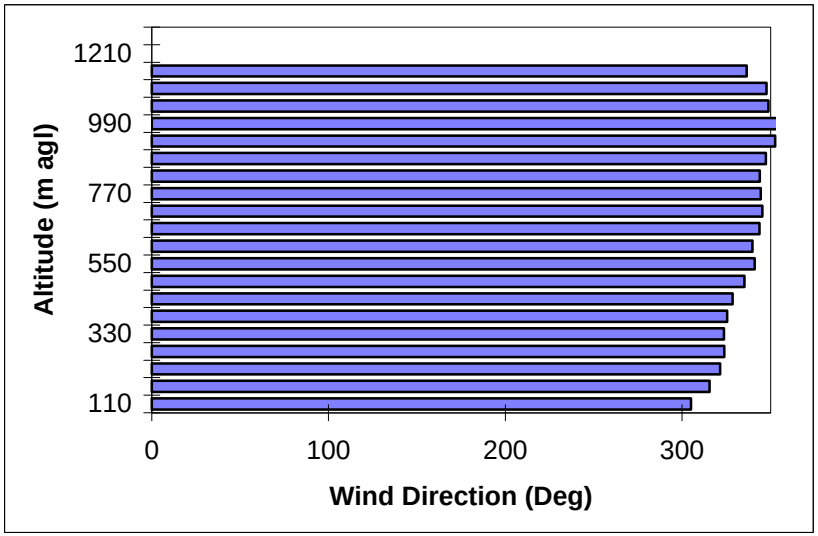

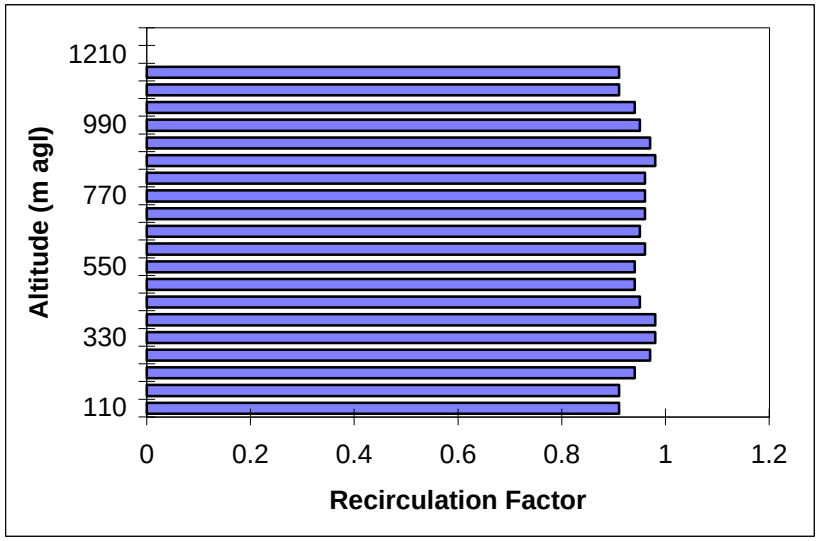

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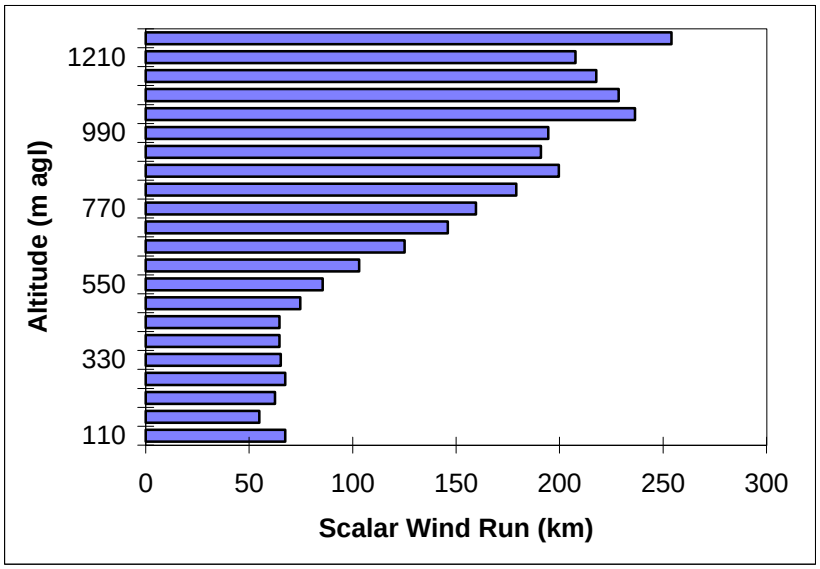

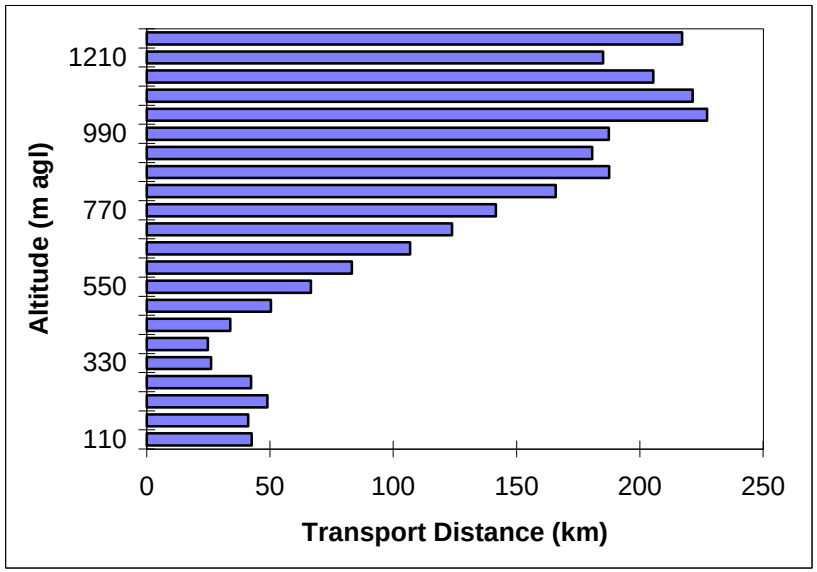

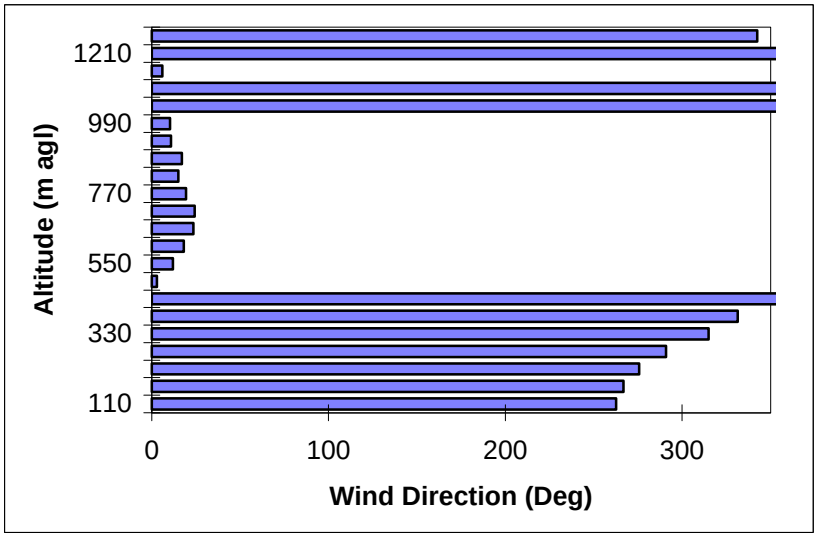

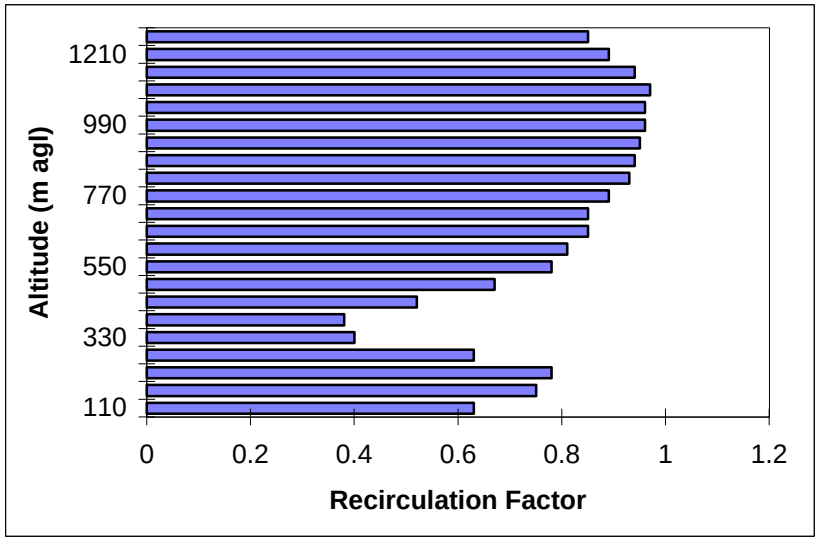

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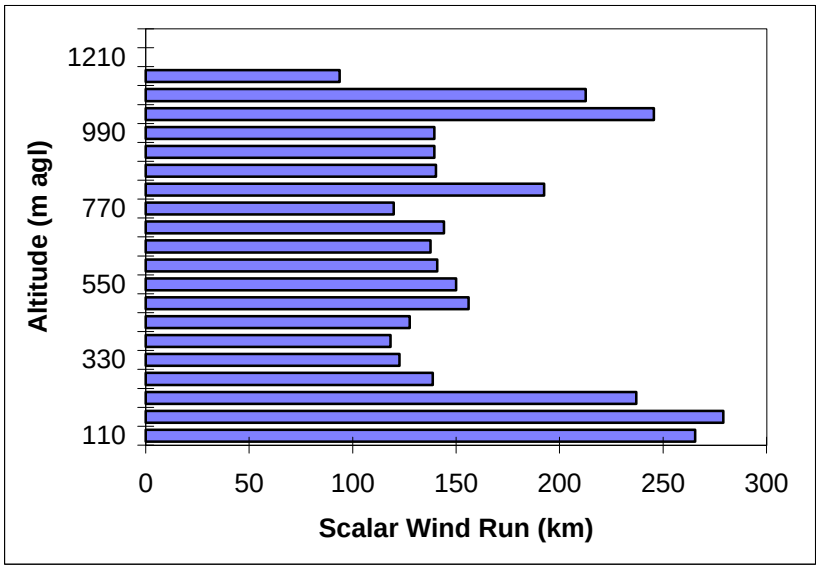

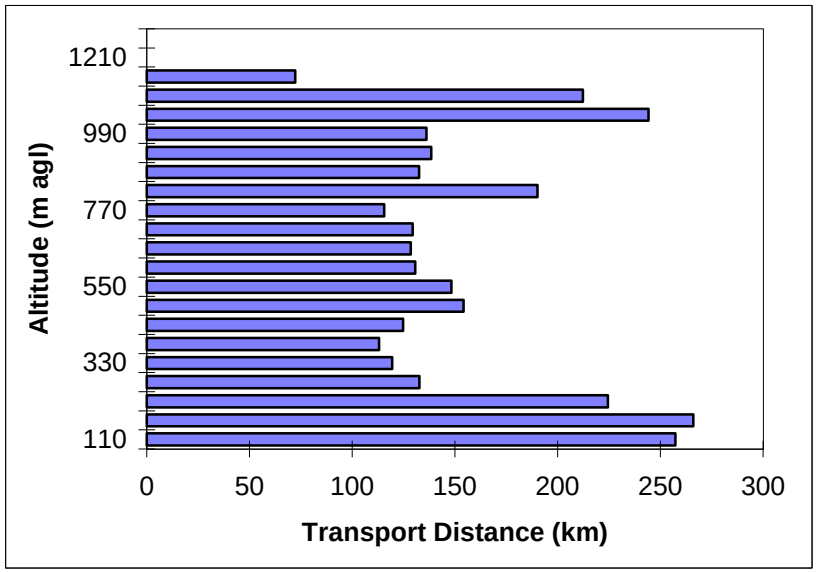

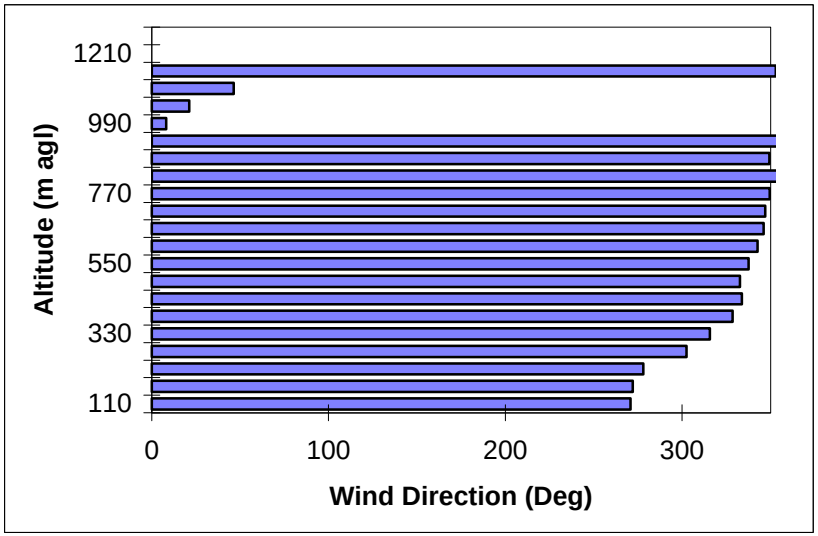

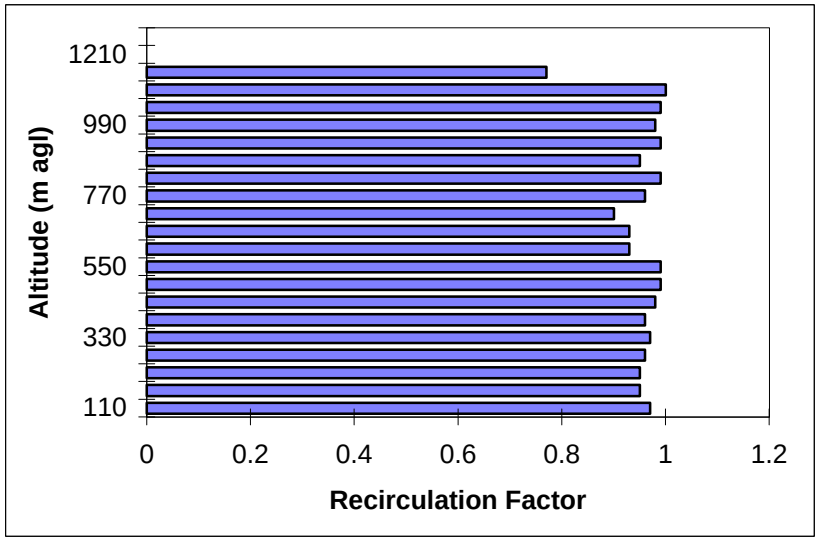

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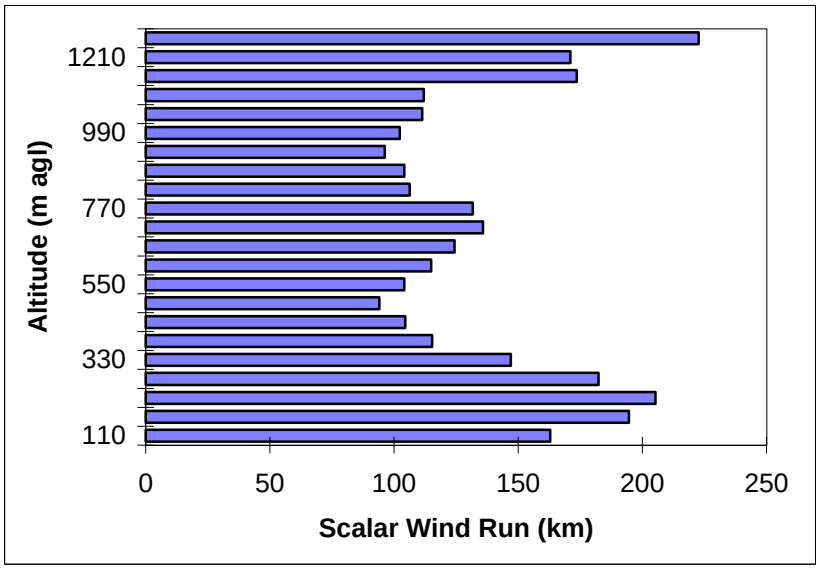

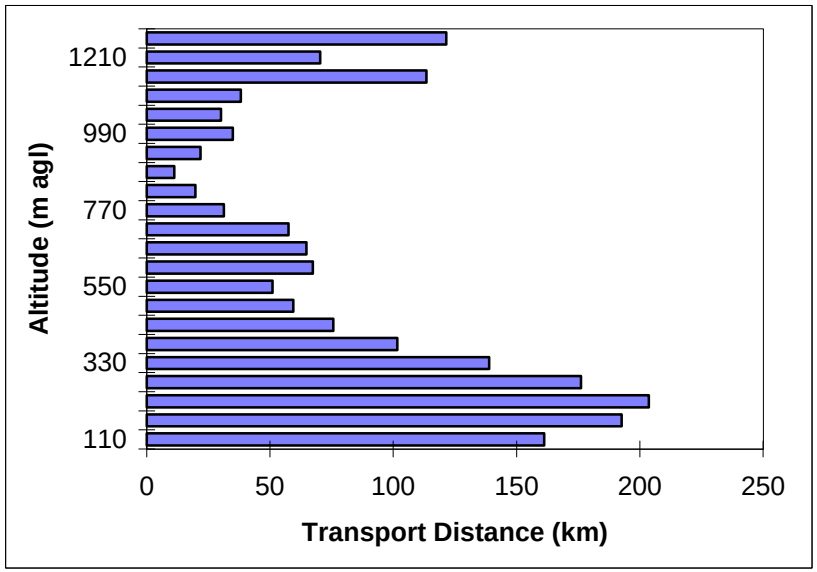

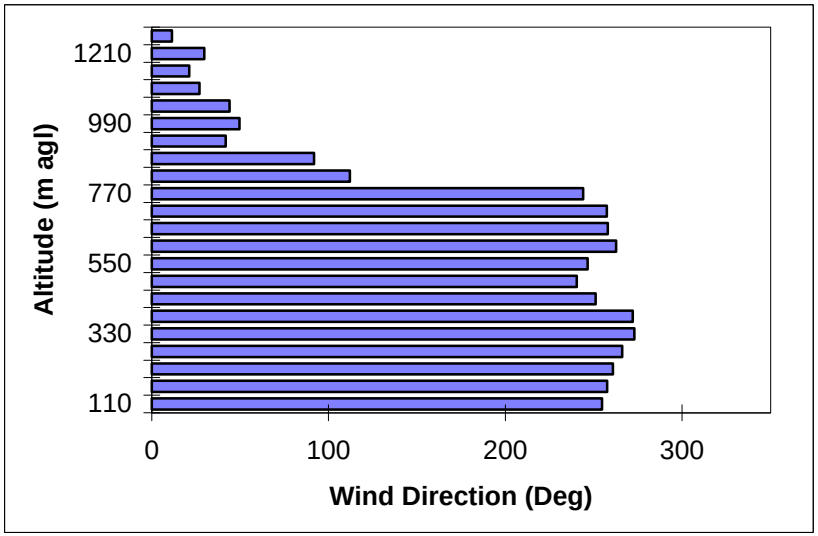

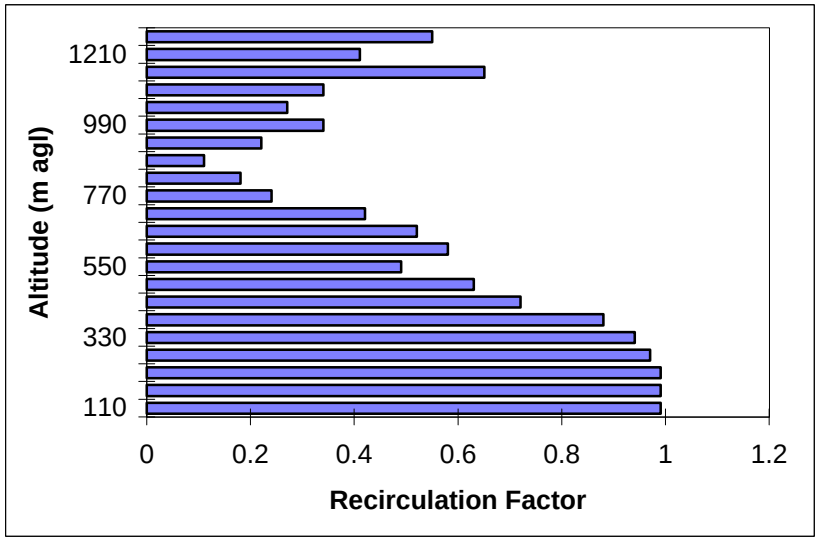

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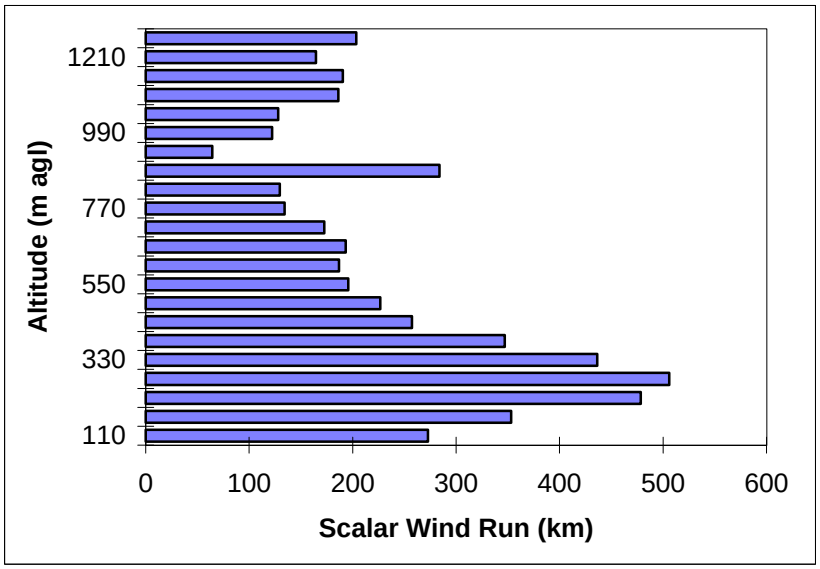

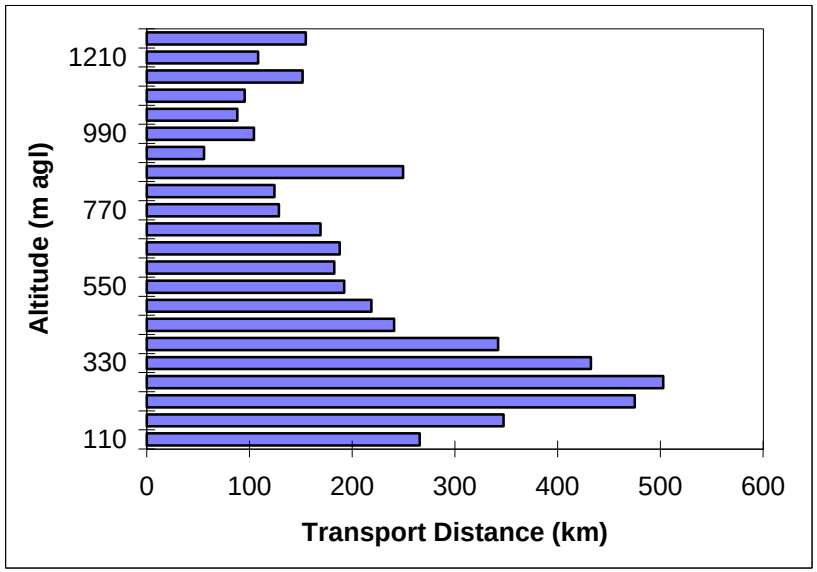

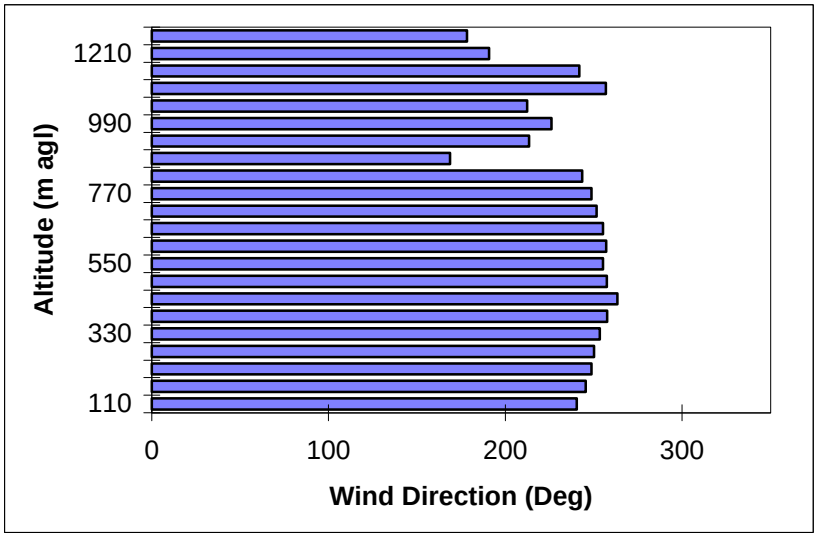

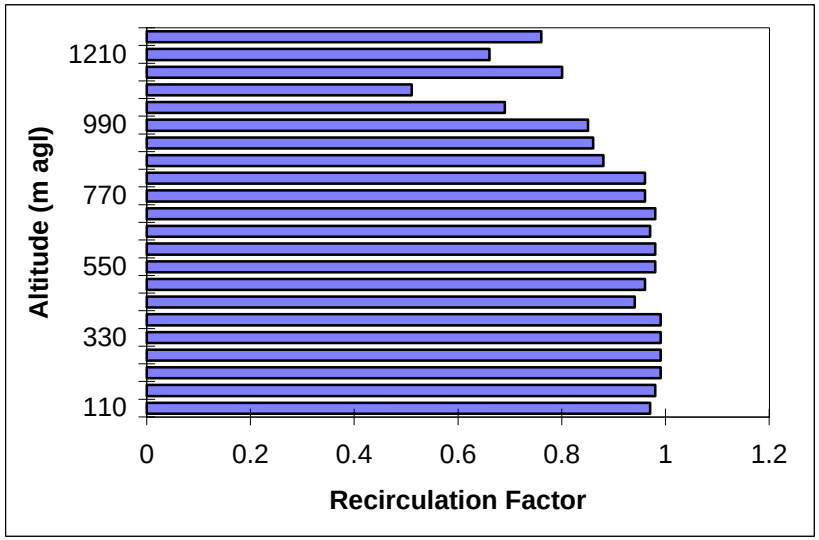

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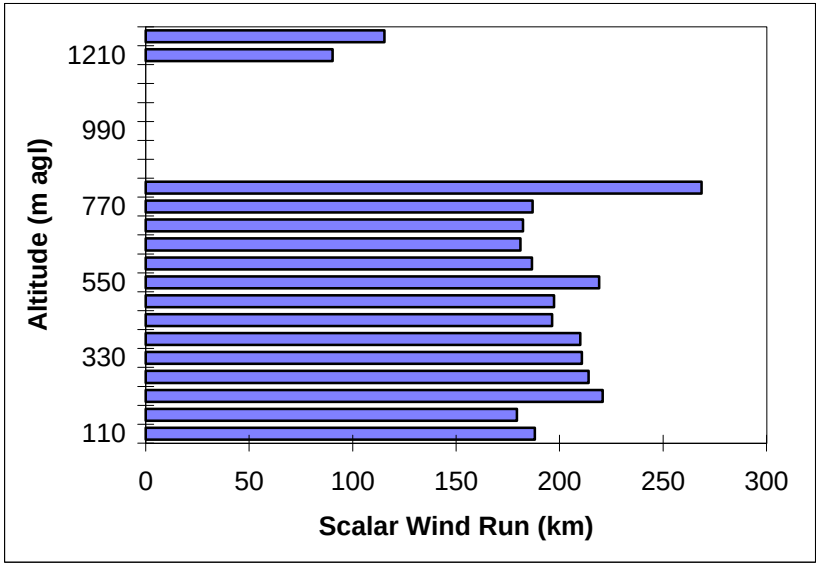
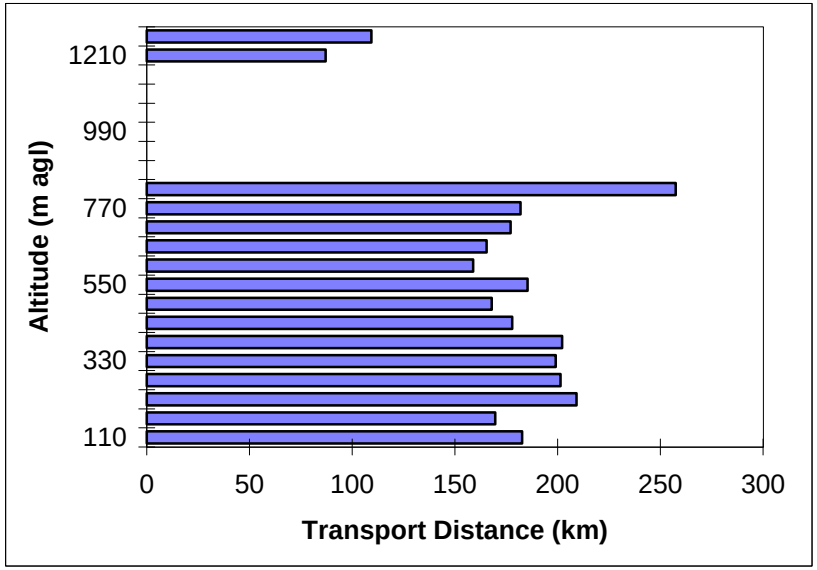
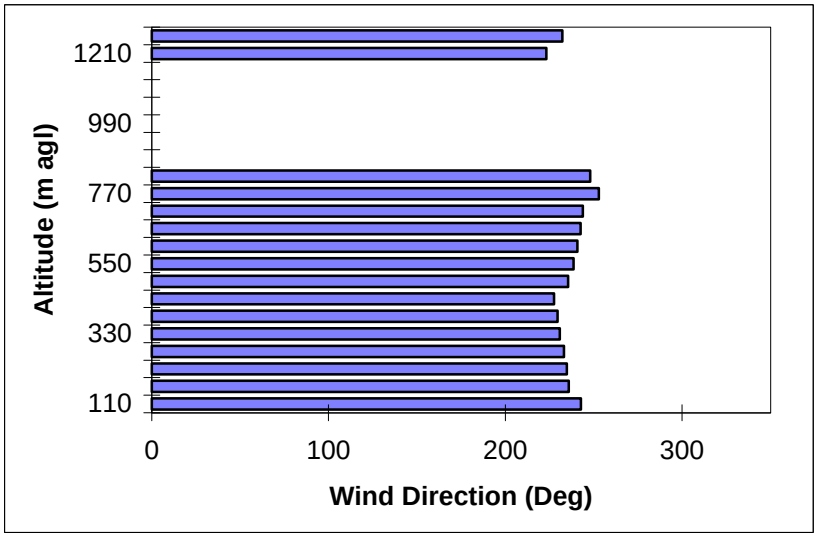
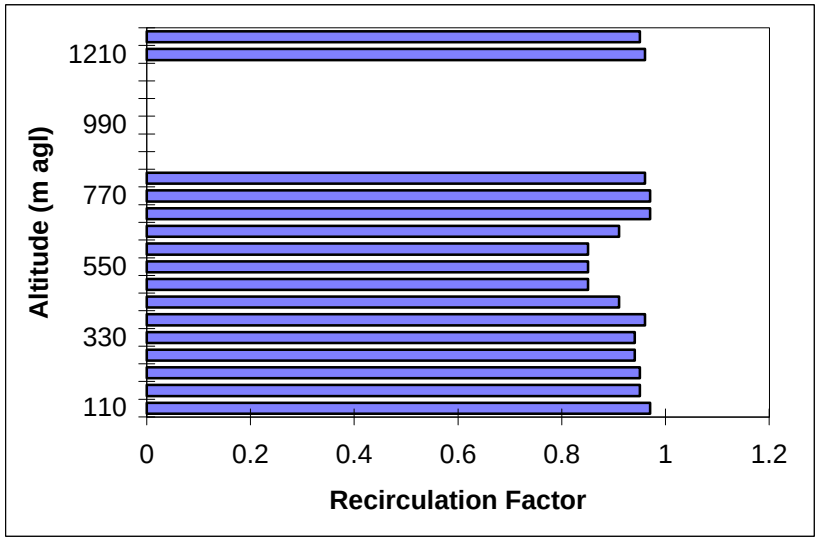
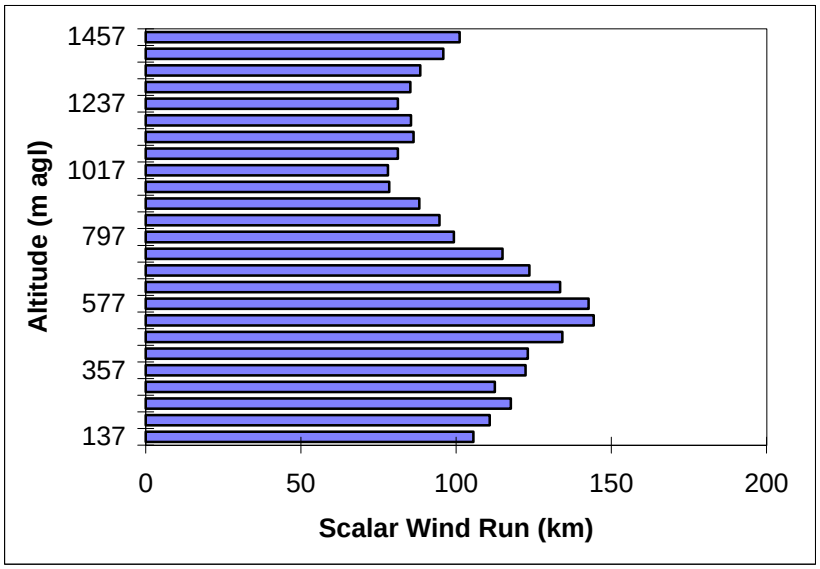


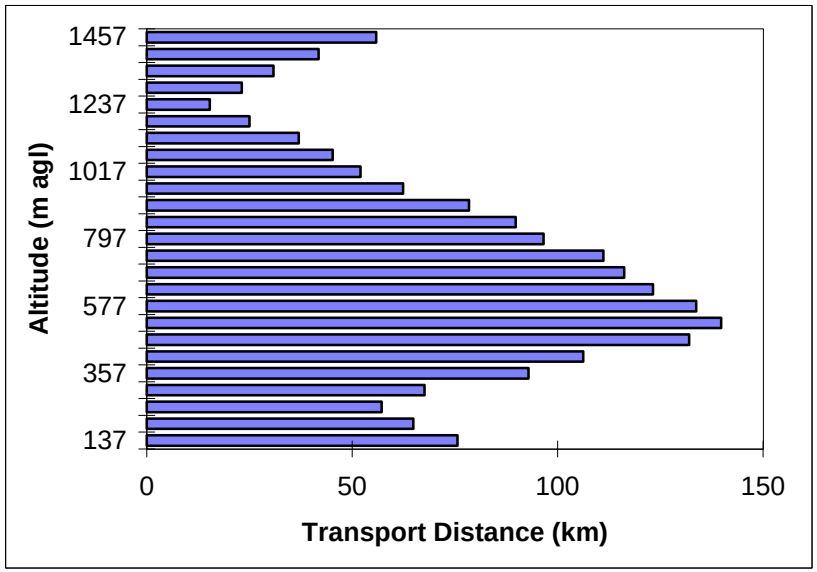


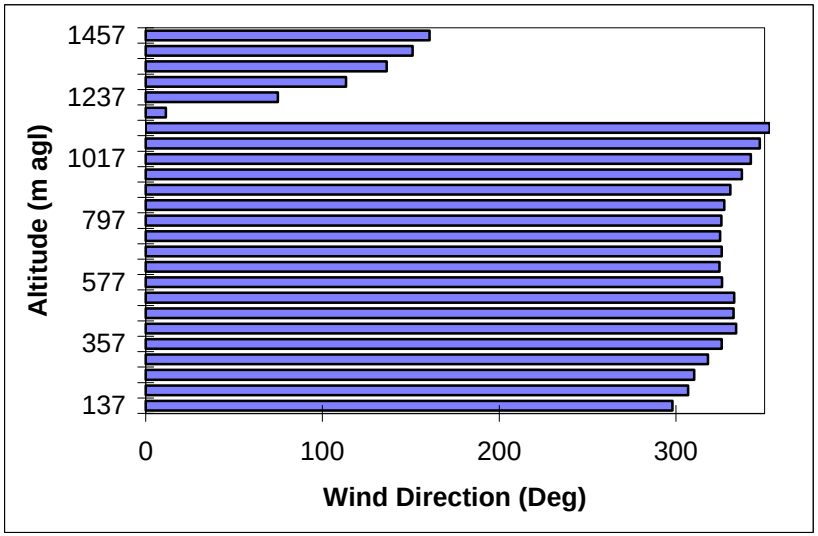


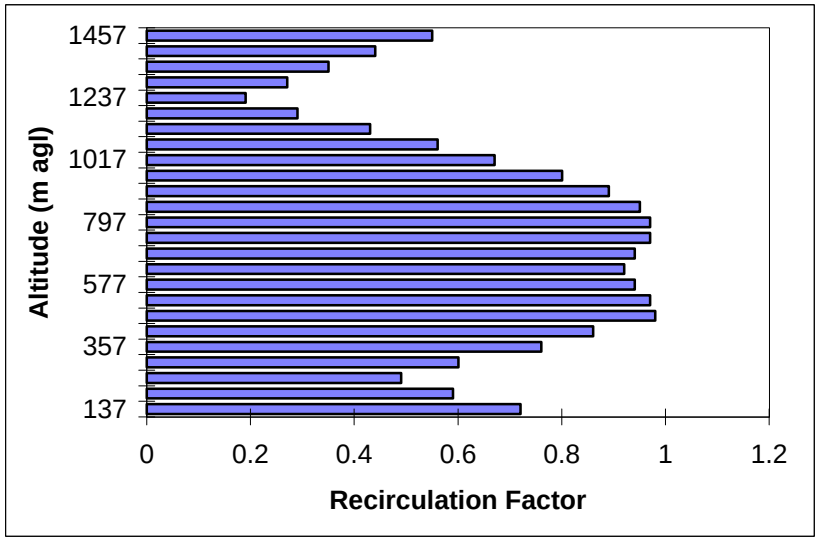


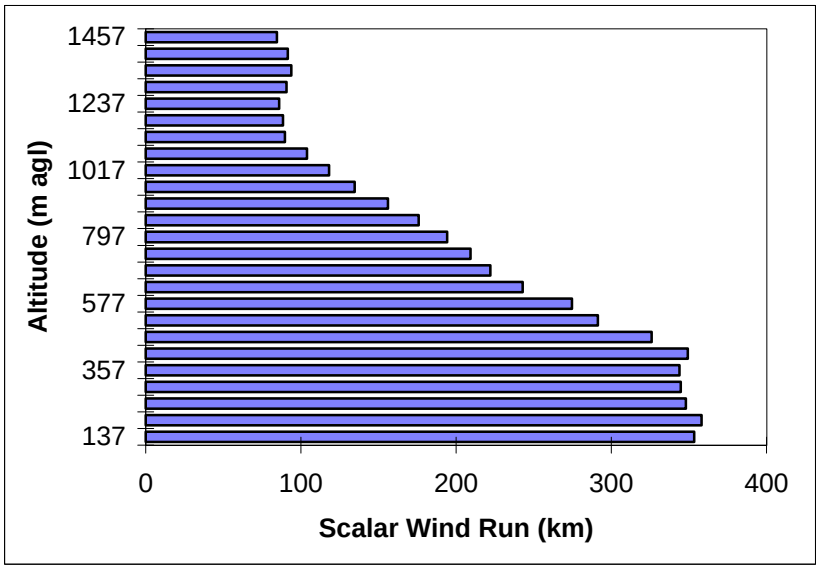
SJV 08-08-98 0400 to 1600.xls

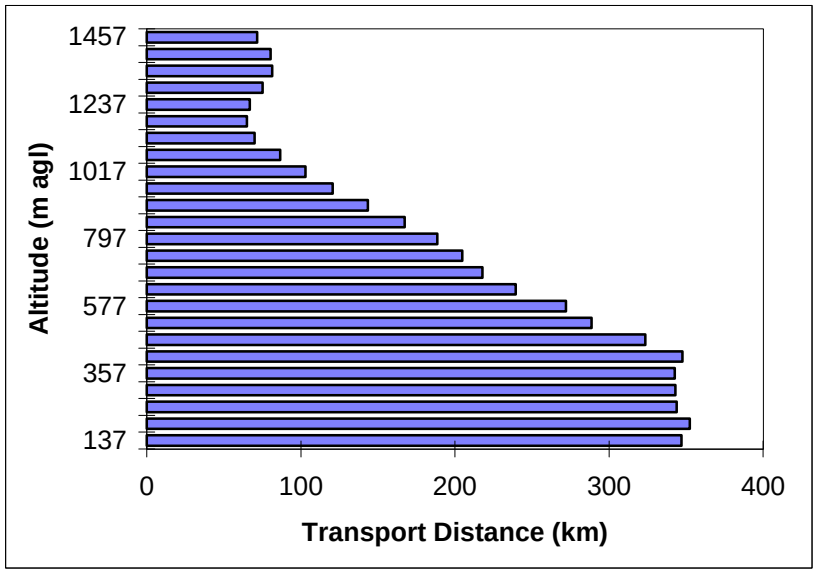


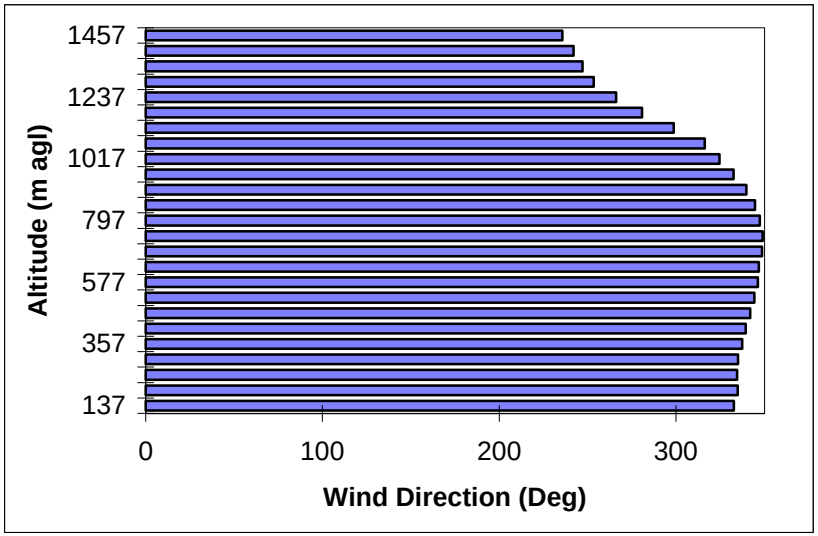


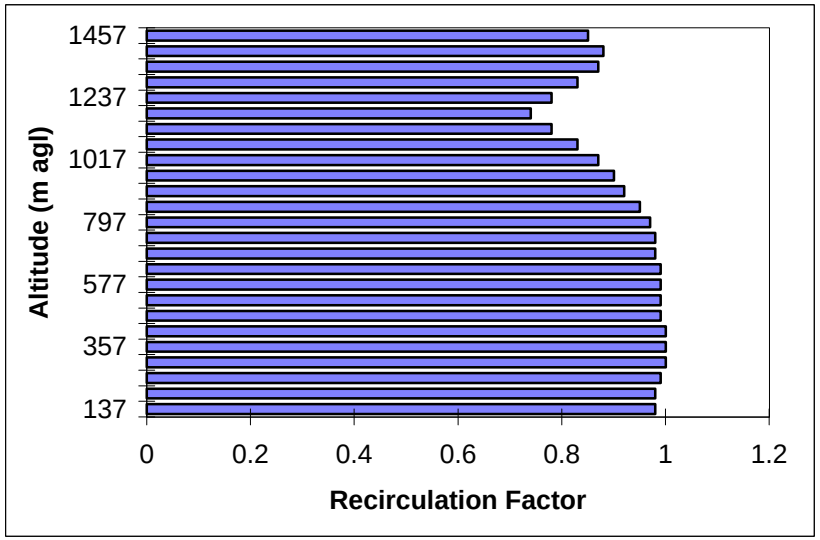




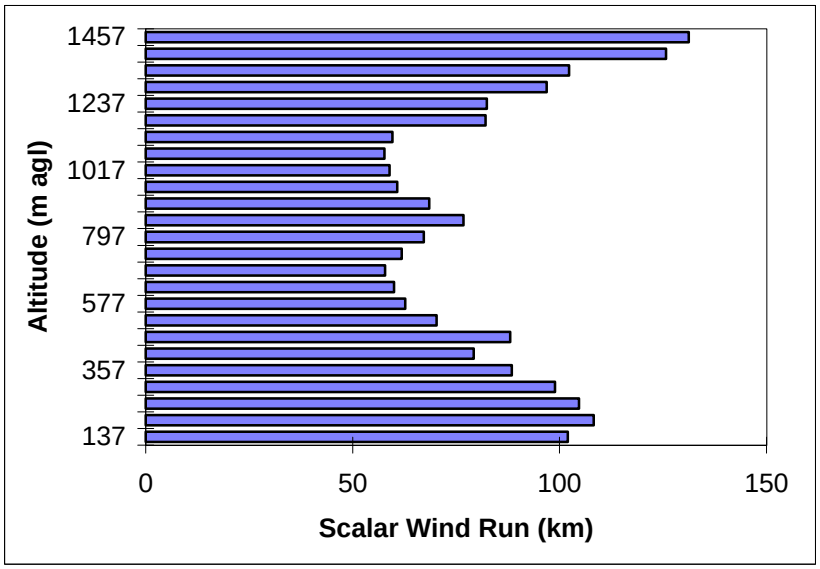

Altitude (m agl)
1457
1237
1017
797
577
357
137
0
100
200
300
400
Scalar Wind Run (km)

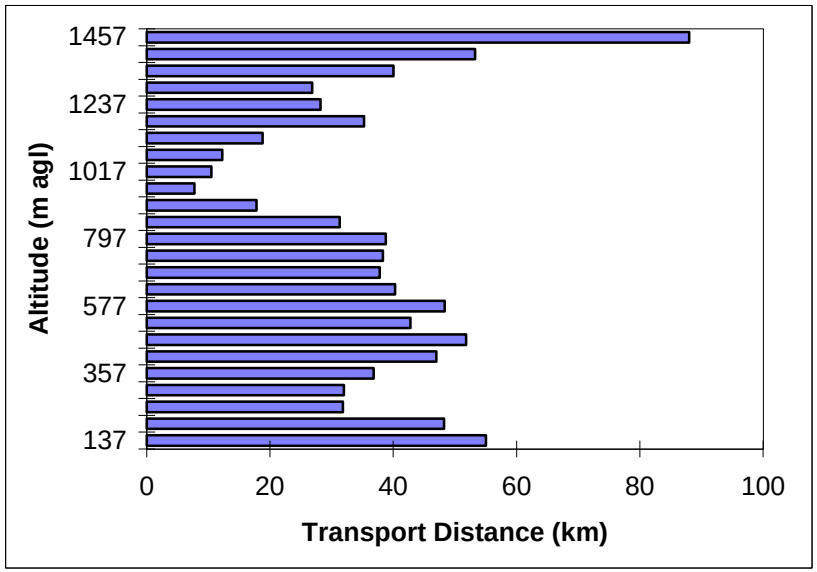

Altitude (m agl)
1457
1237
1017
797
577
357
137
0
100
200
300
400
Transport Distance (km)

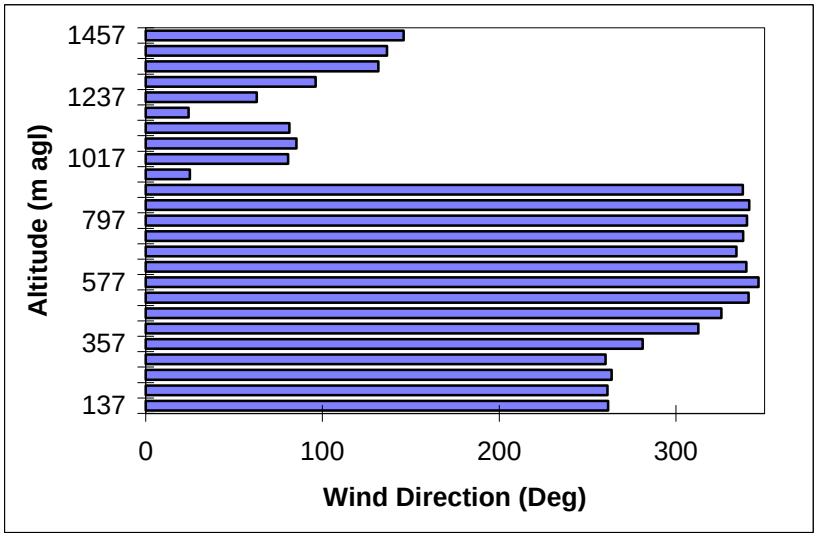

Altitude (m agl)
1457
1237
1017
797
577
357
137
0
100
200
300
Wind Direction (Deg)

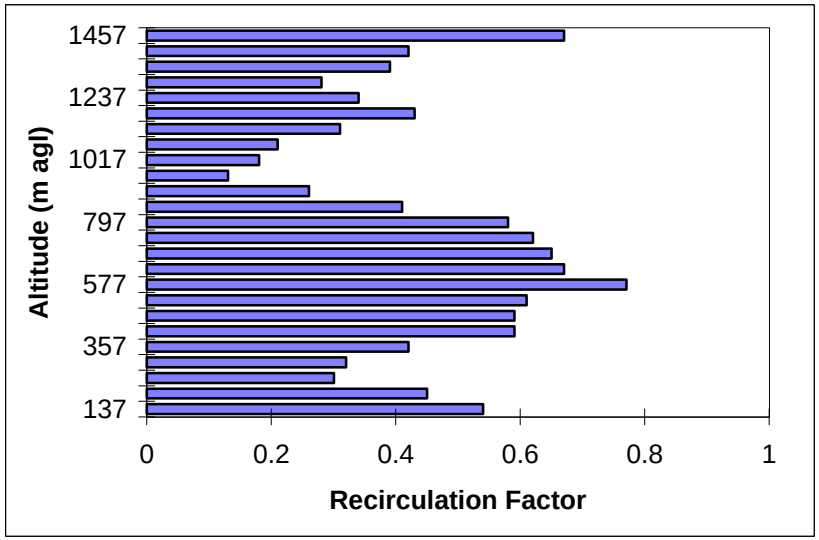

Altitude (m agl)
1457
1237
1017
797
577
357
137
0
0.2
0.4
0.6
0.8
1
1.2
Recirculation Factor

SJV 08-09-98 0400 to 1600.xls

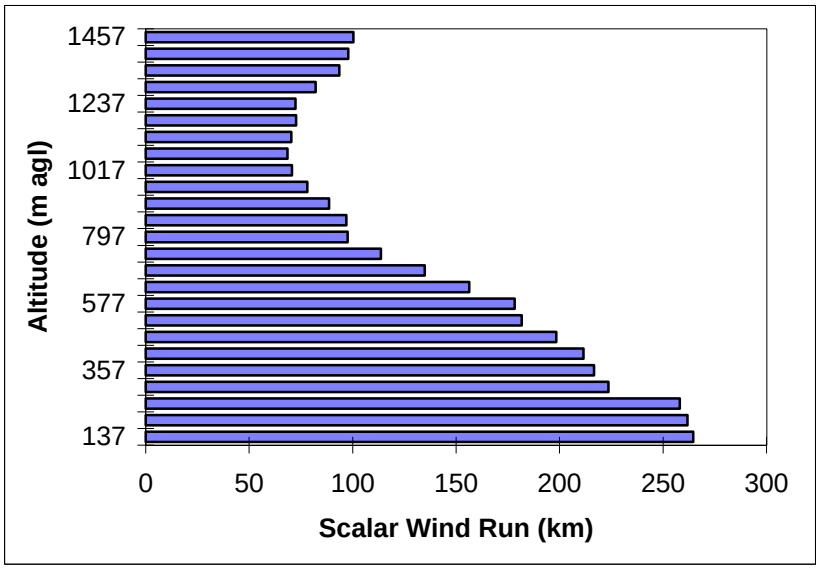


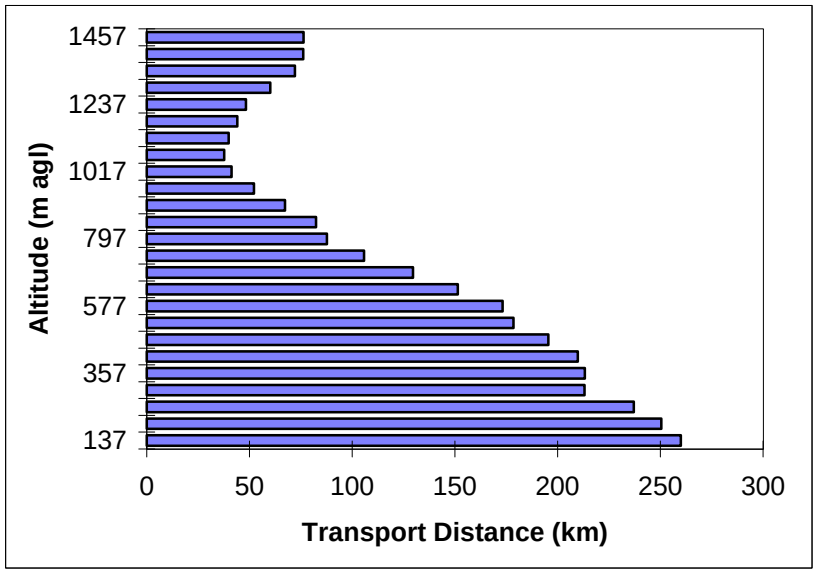


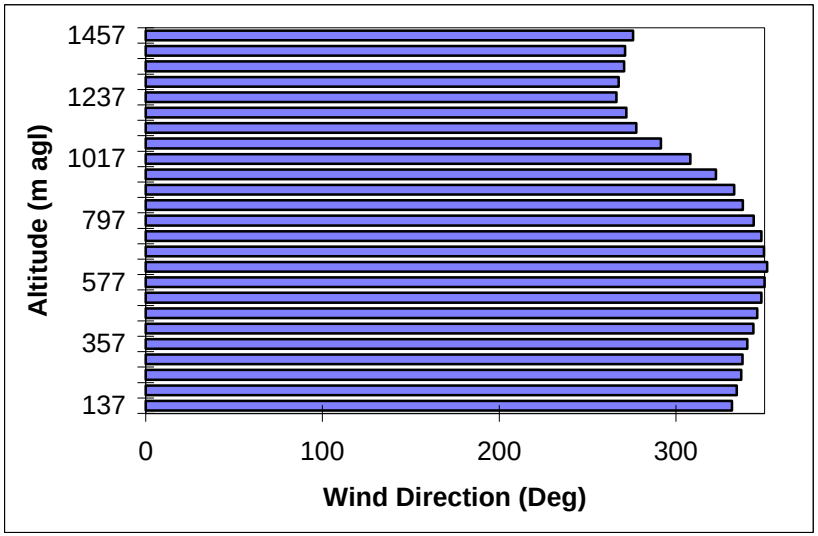


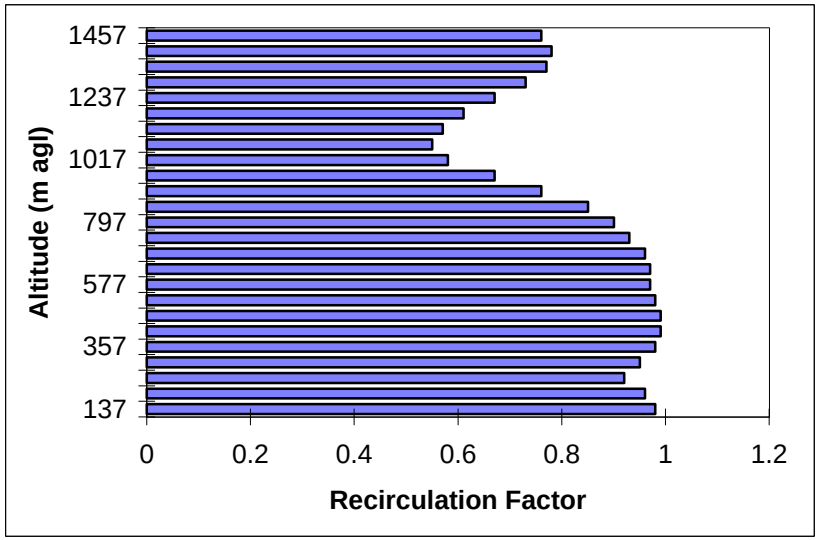


SJV 08-09-98 1600 to 0400.xls

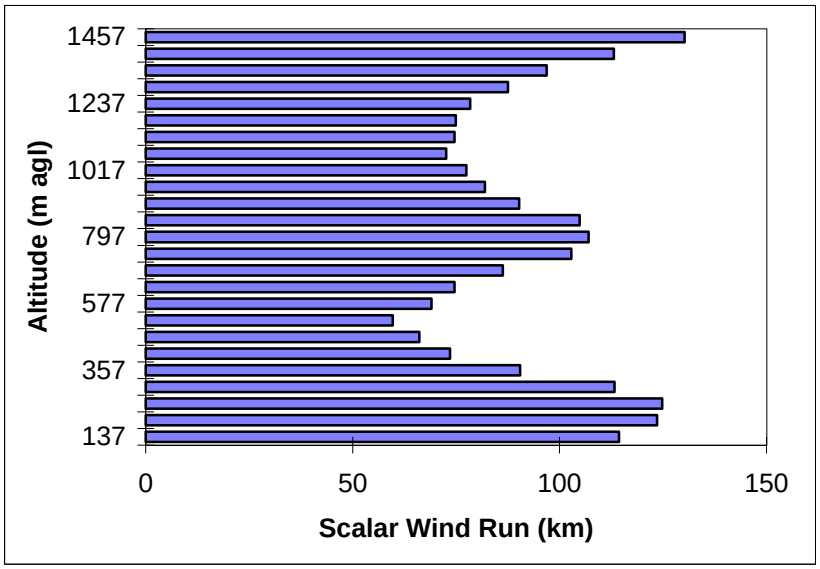


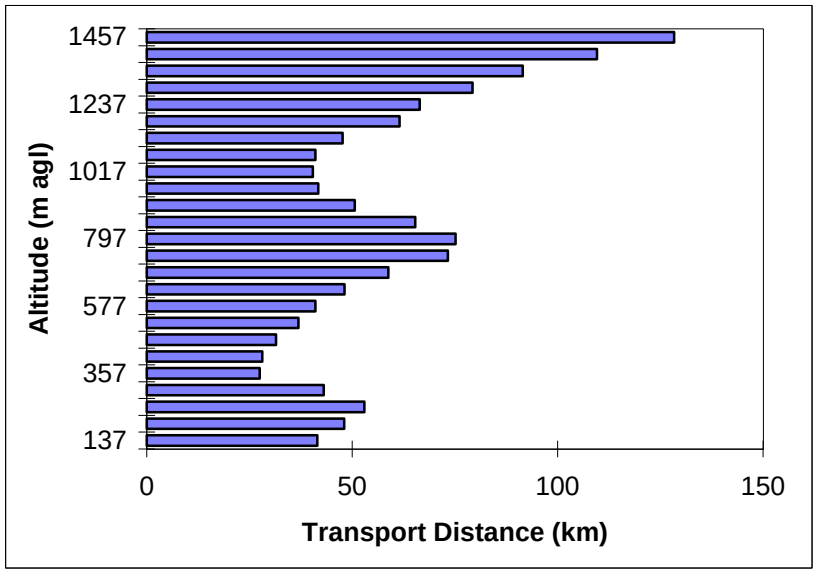


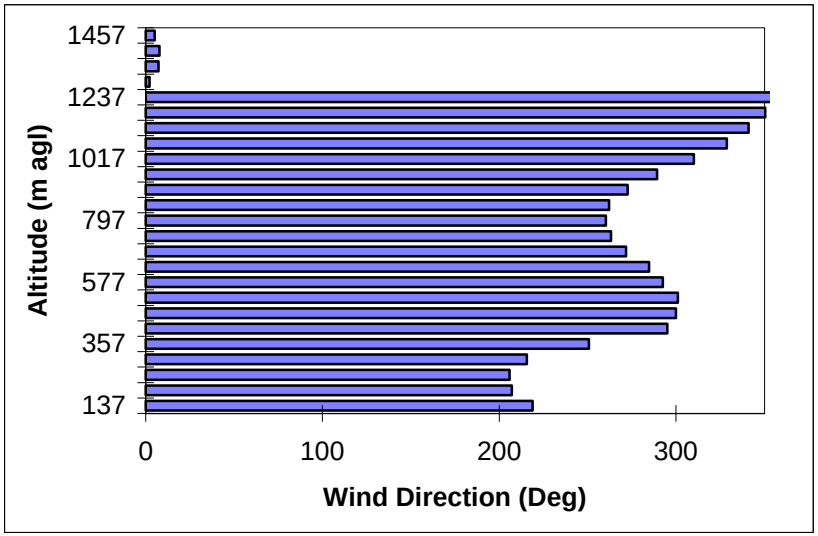


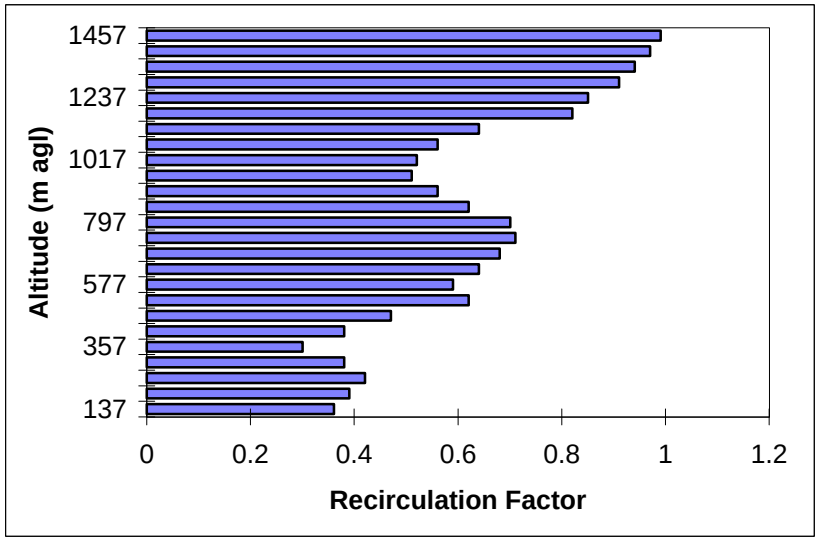


SJV 08-10-98 0400 to 1600.xls

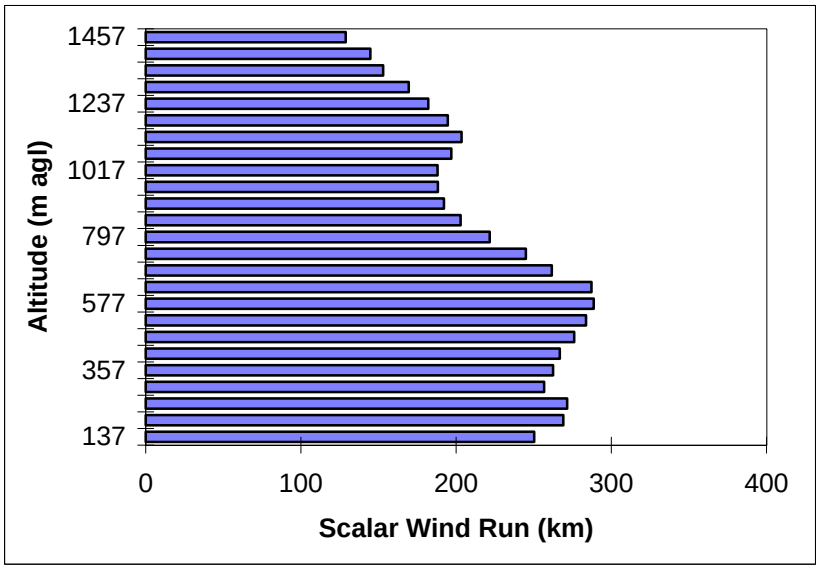


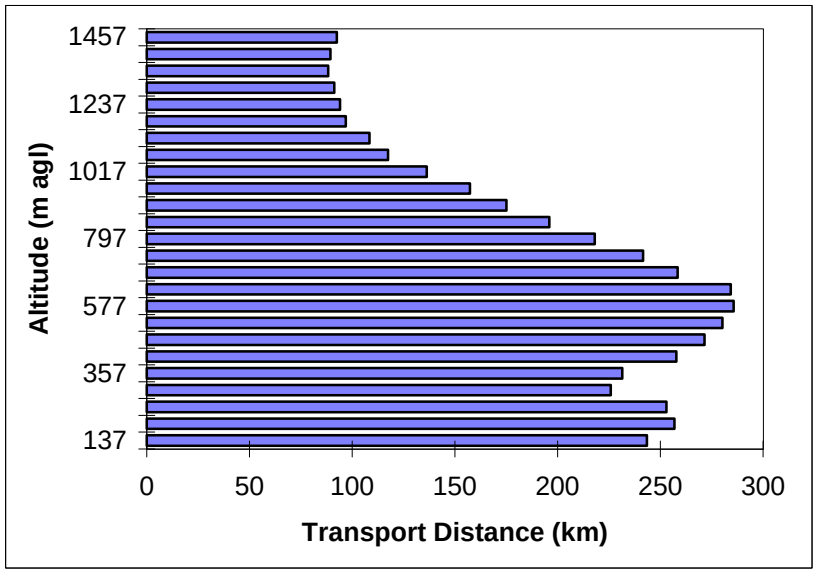


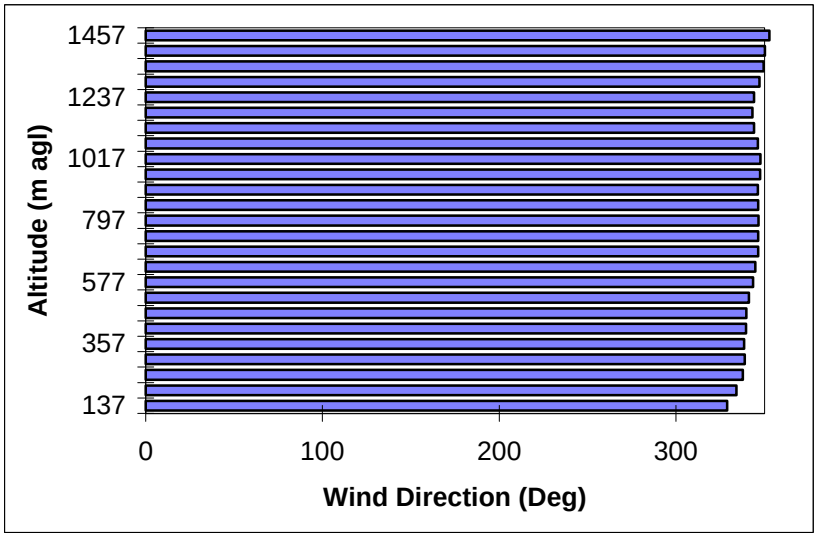


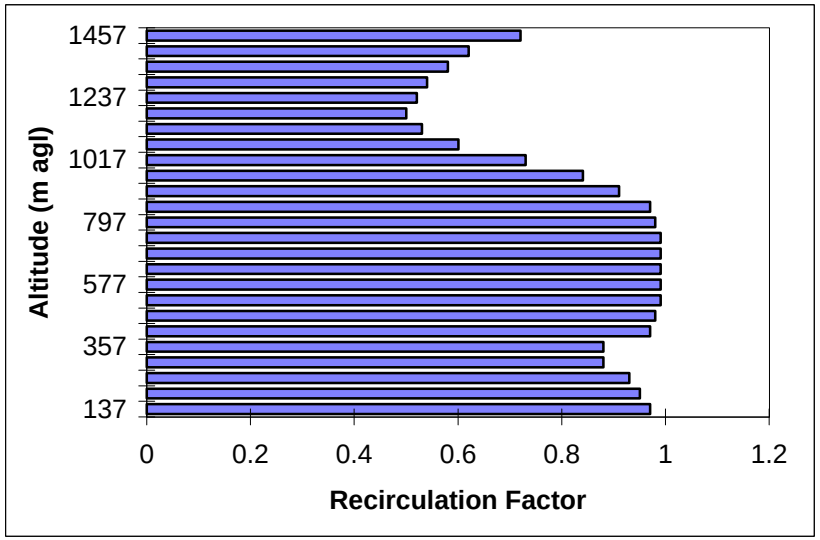


SJV 08-10-98 1600 to 0400.xls

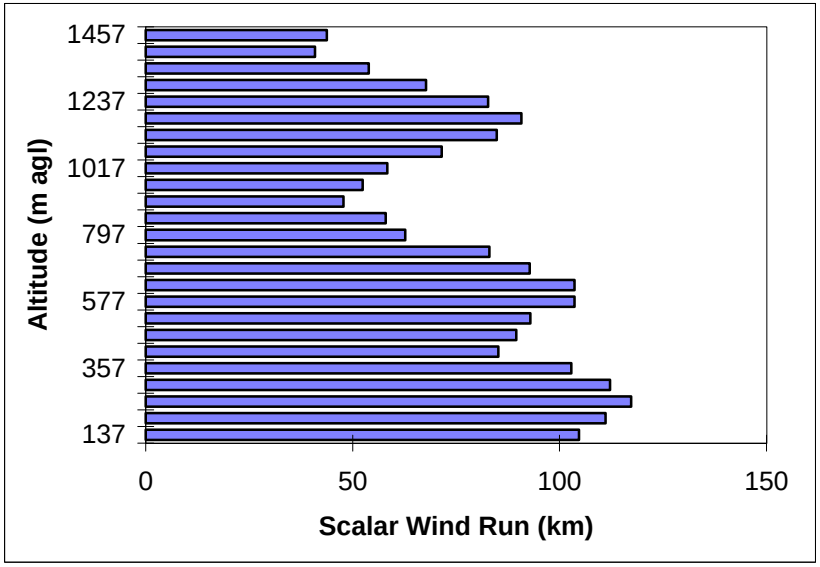


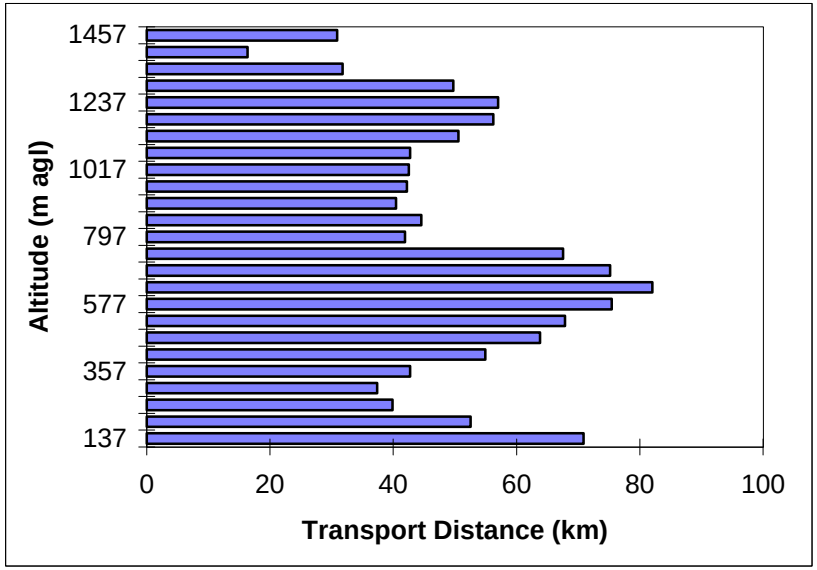


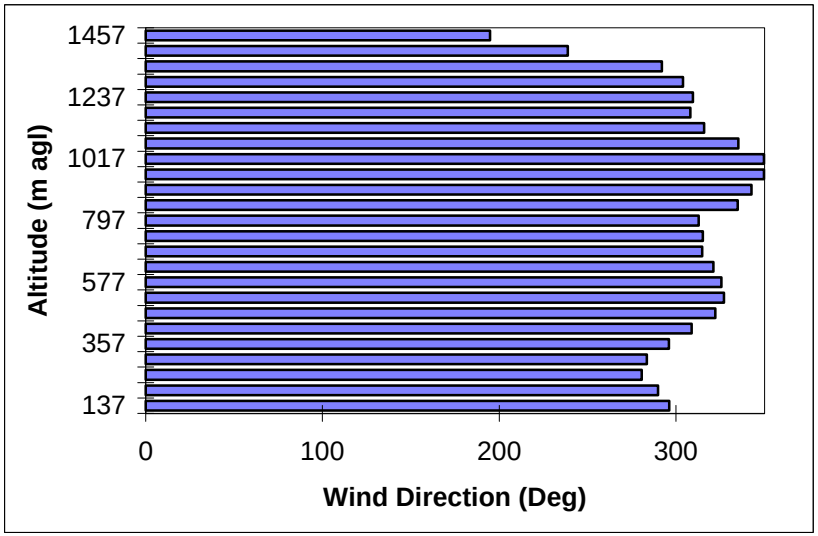


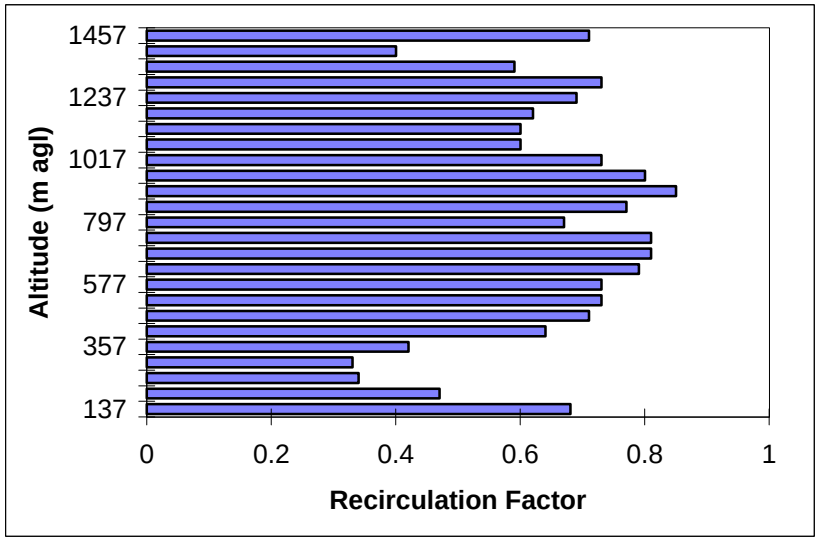


SJV 08-26-98 0400 to 1600.xls

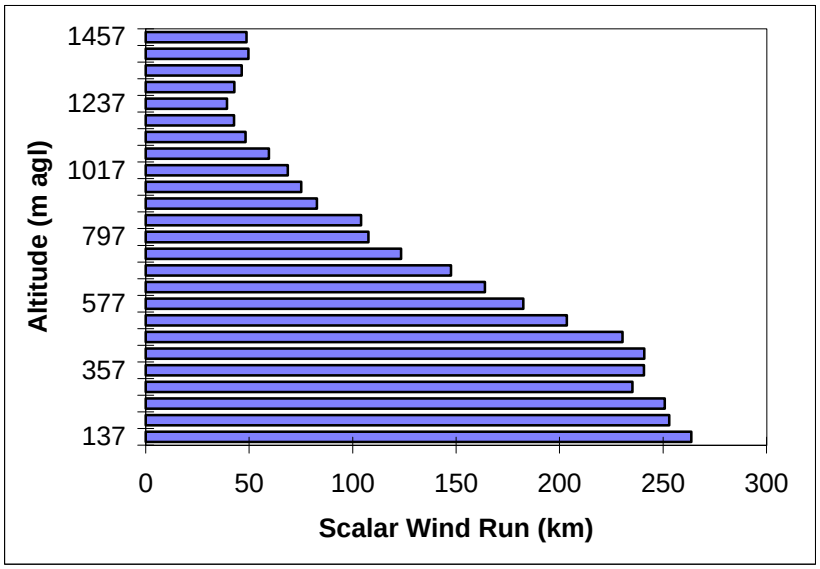


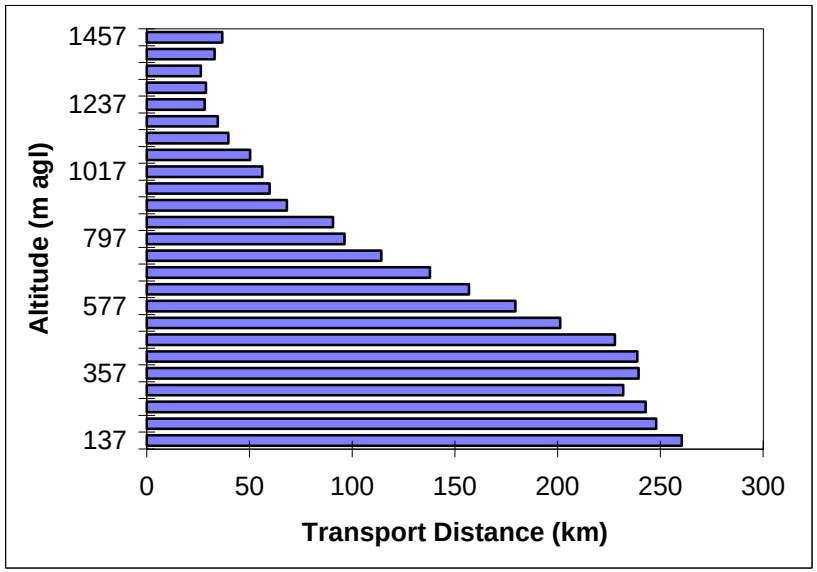


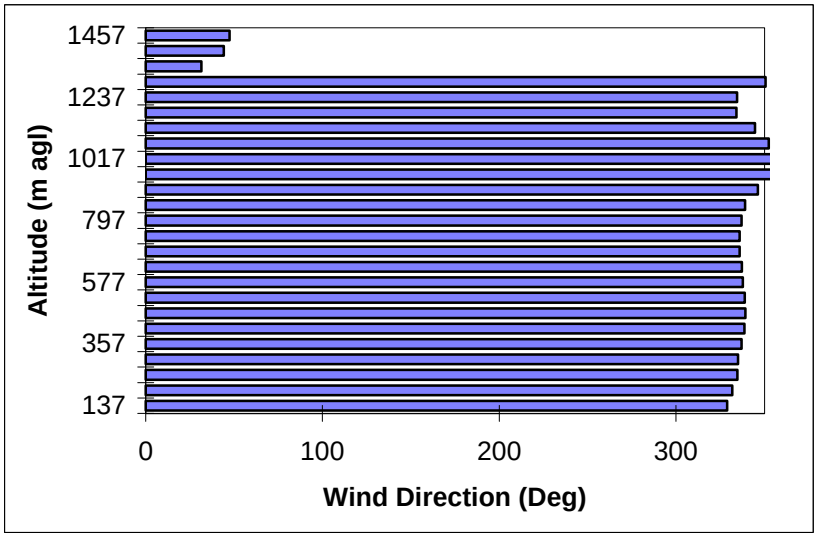


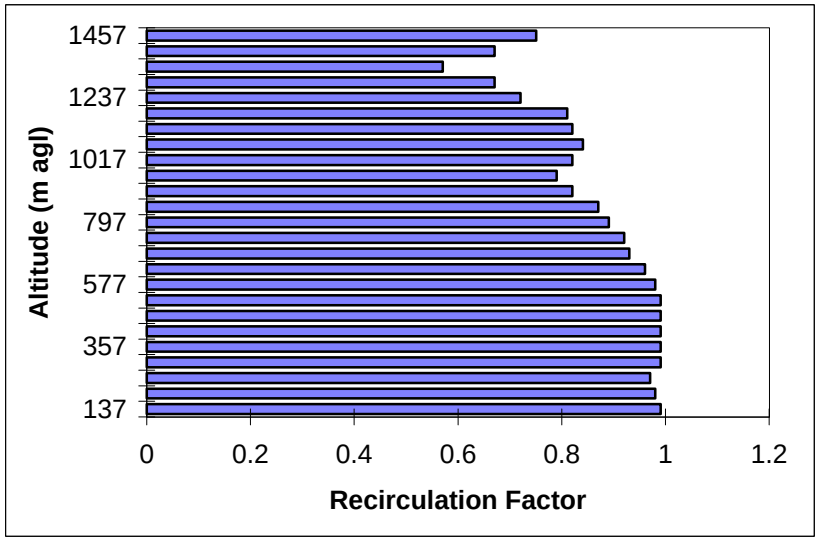


SJV 08-26-98 1600 to 0400.xls

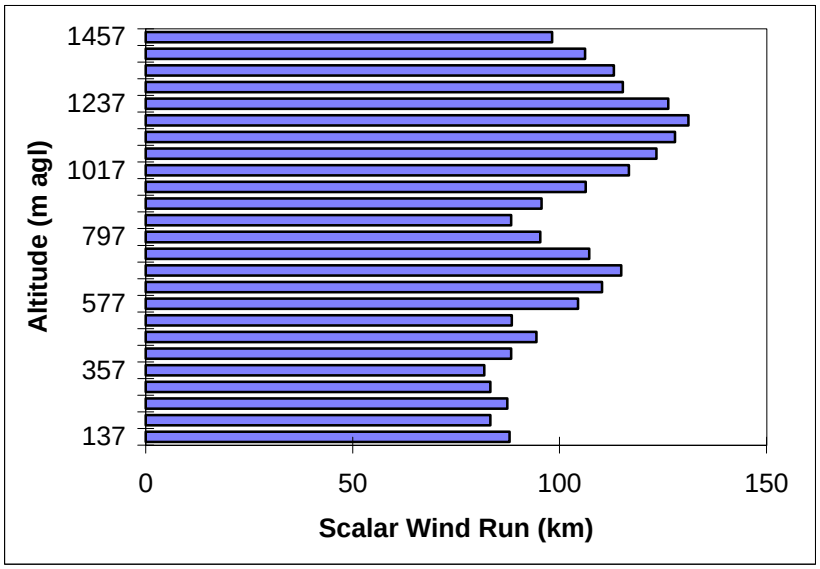


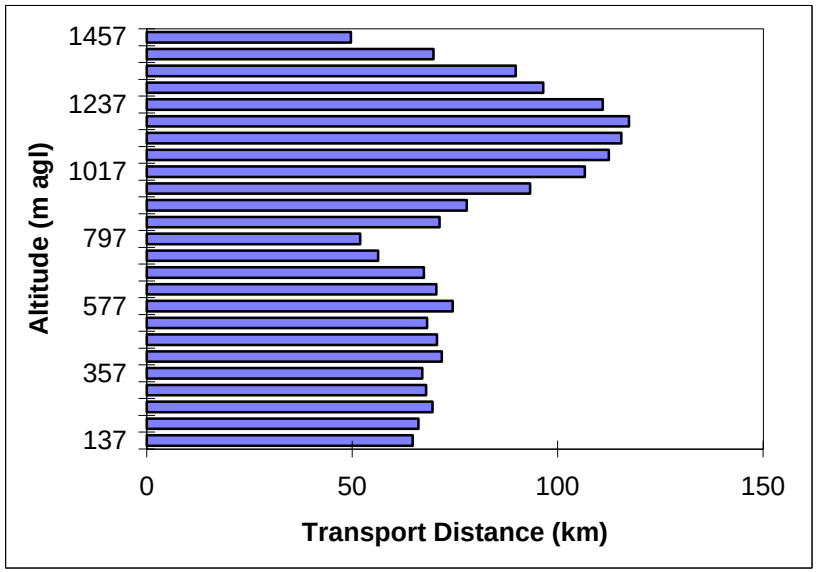


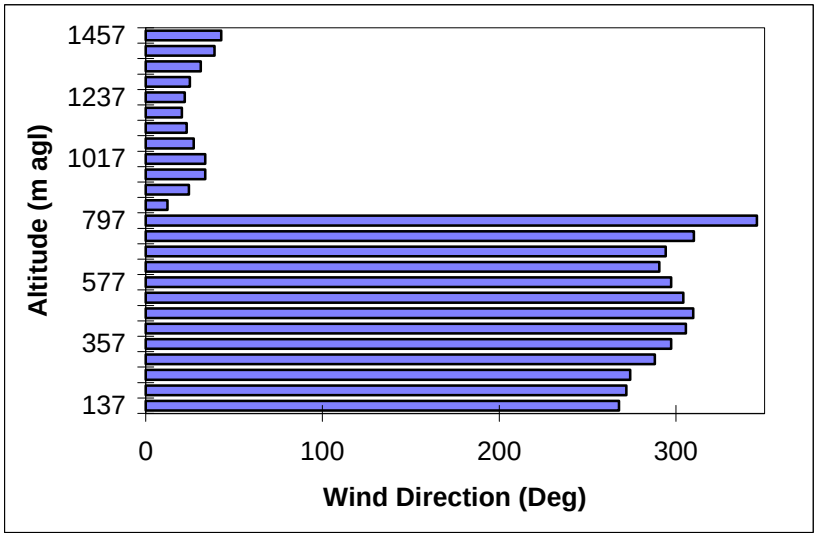


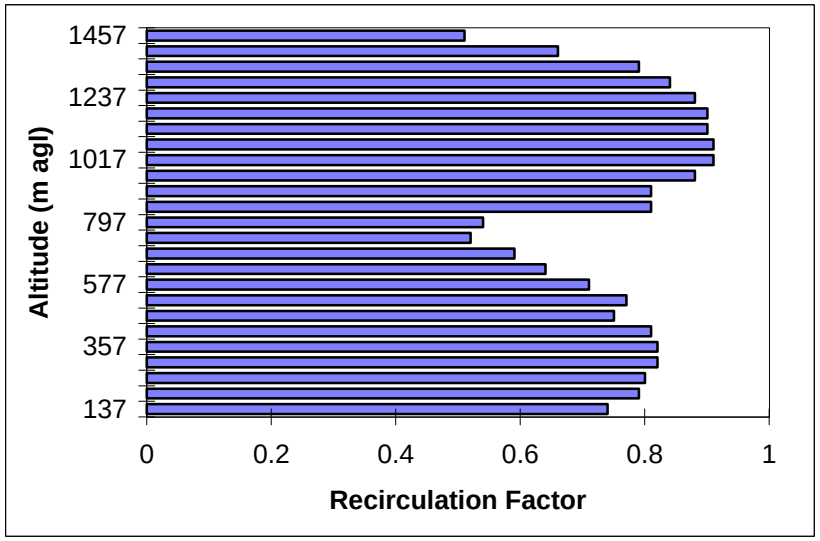


SJV 08-27-98 0400 to 1600.xls

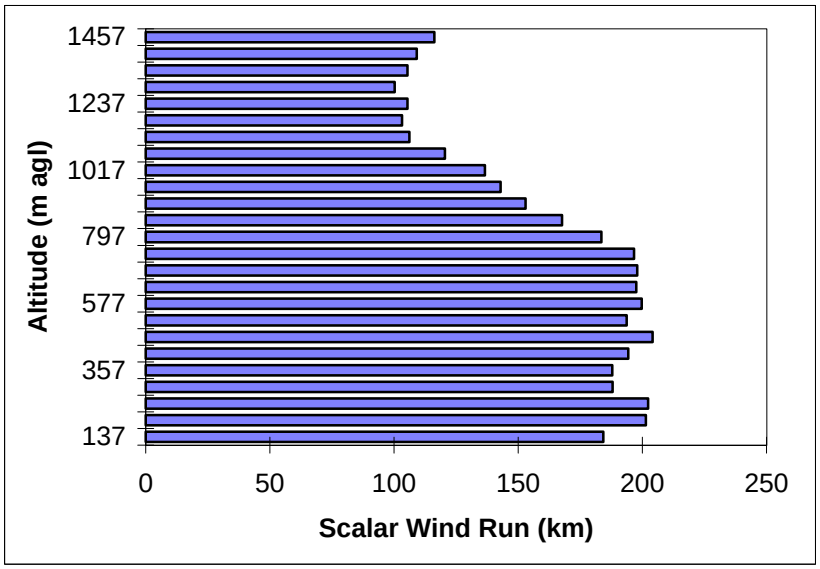


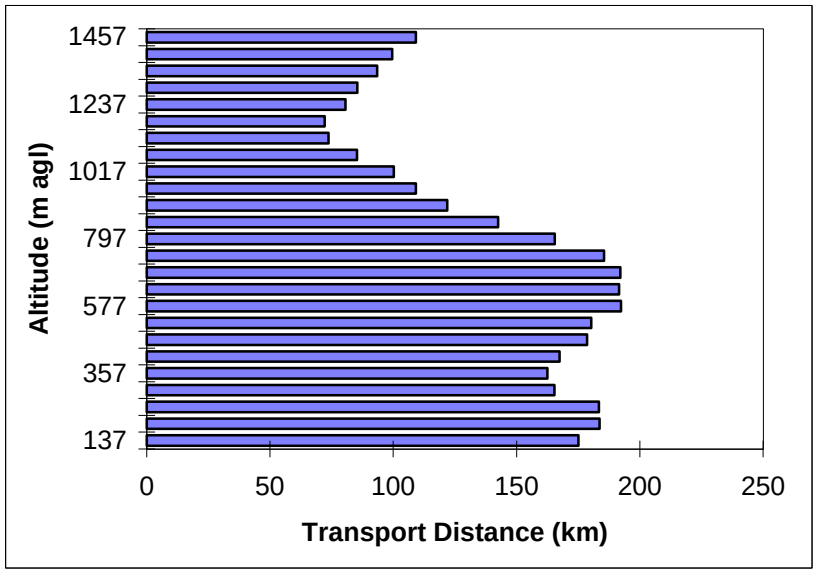


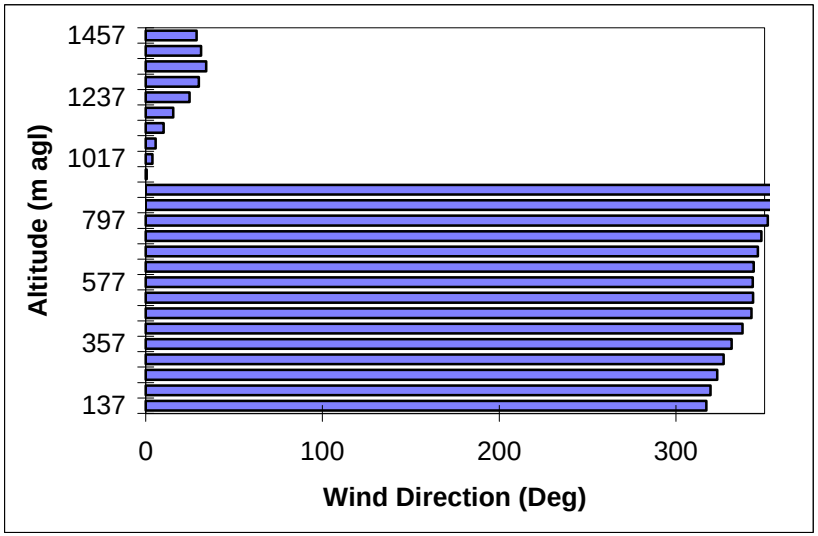


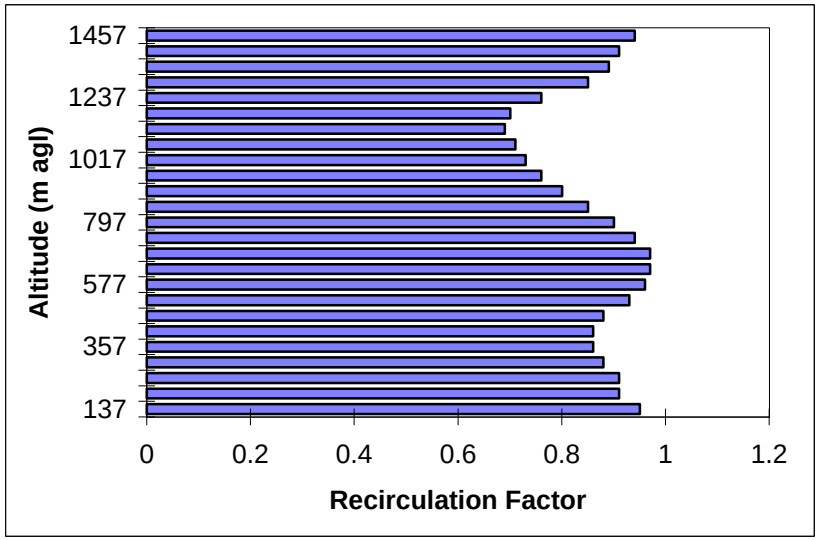


SJV 08-27-98 1600 to 0400.xls

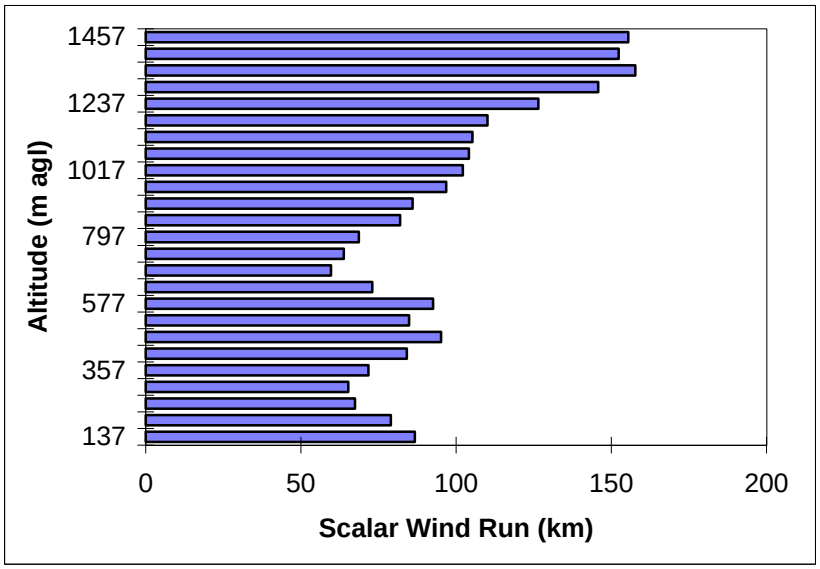


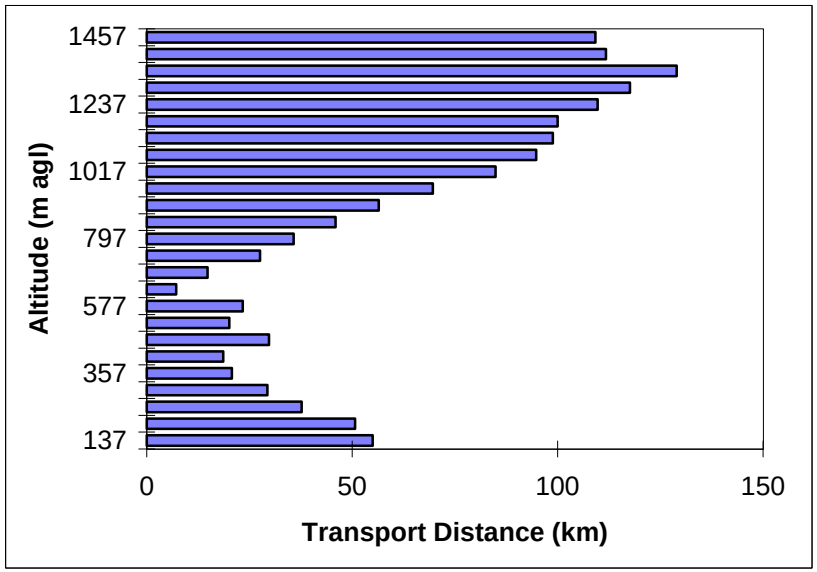


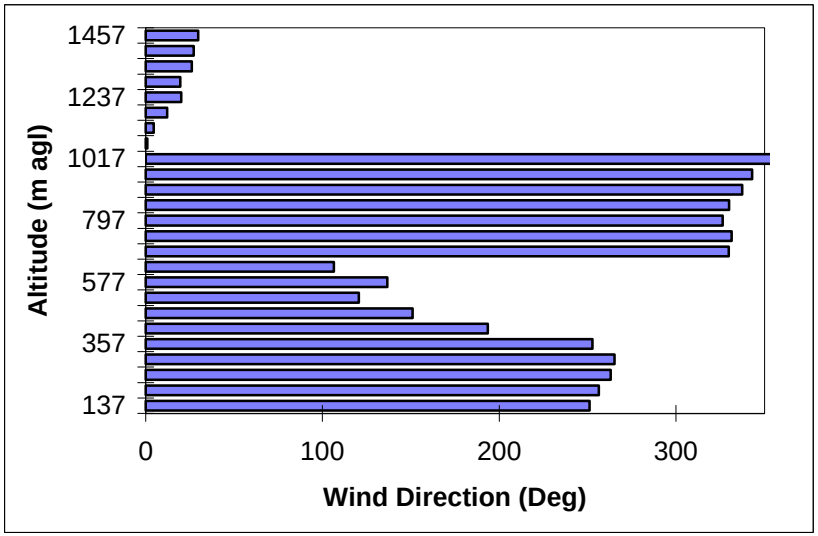


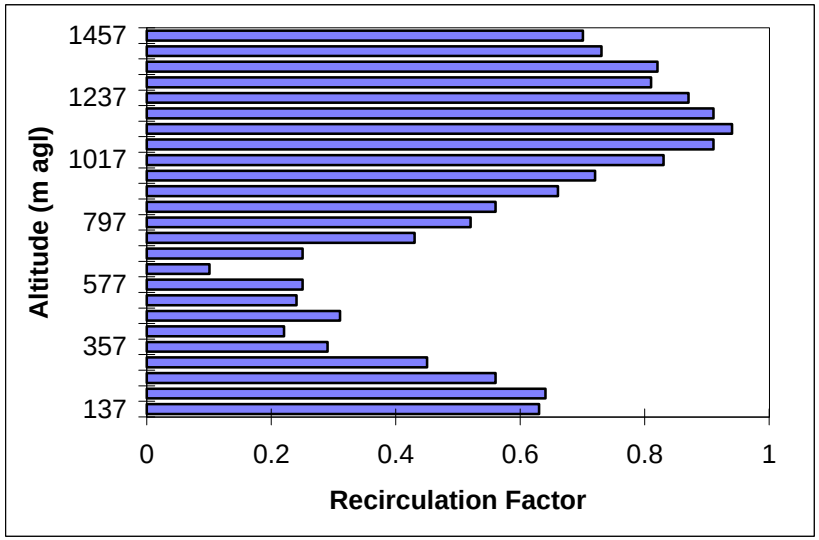


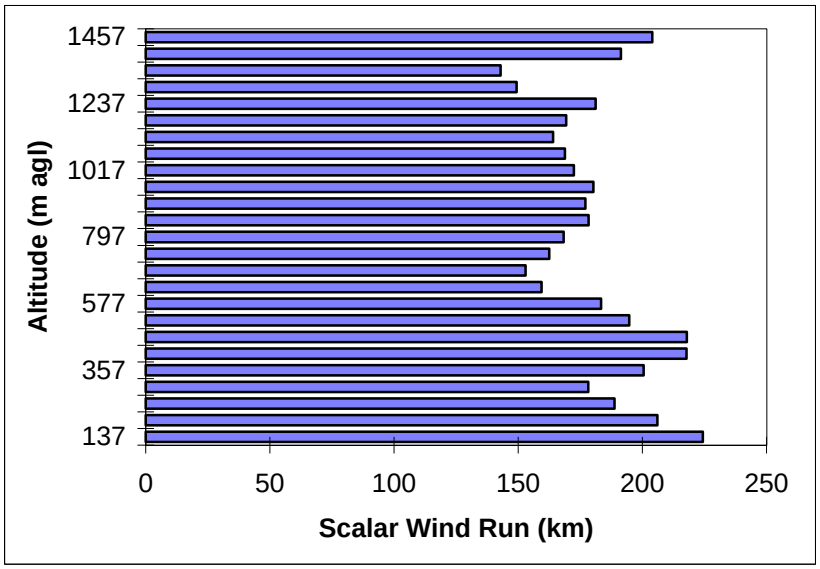
SJV 08-28-98 0400 to 1600.xls

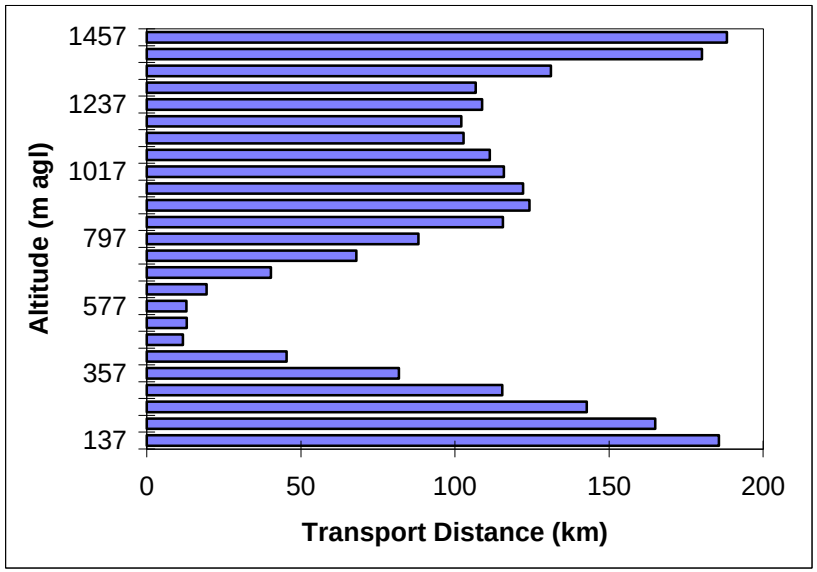


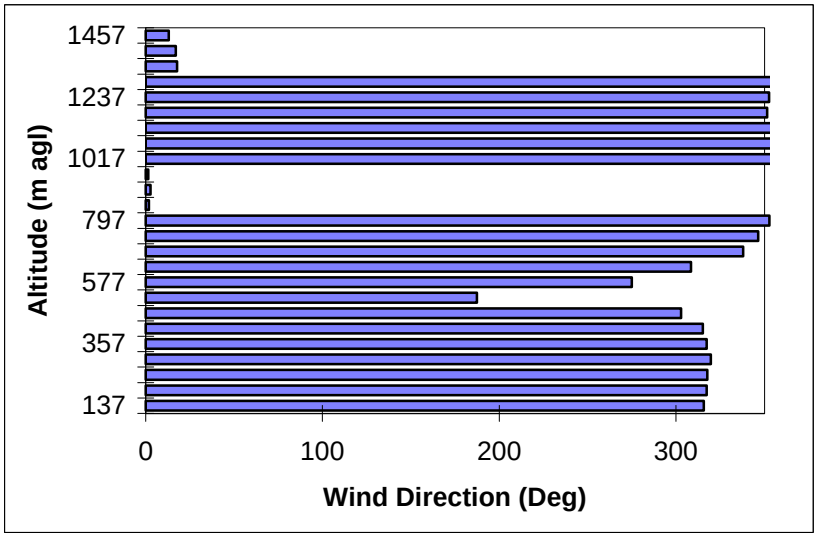






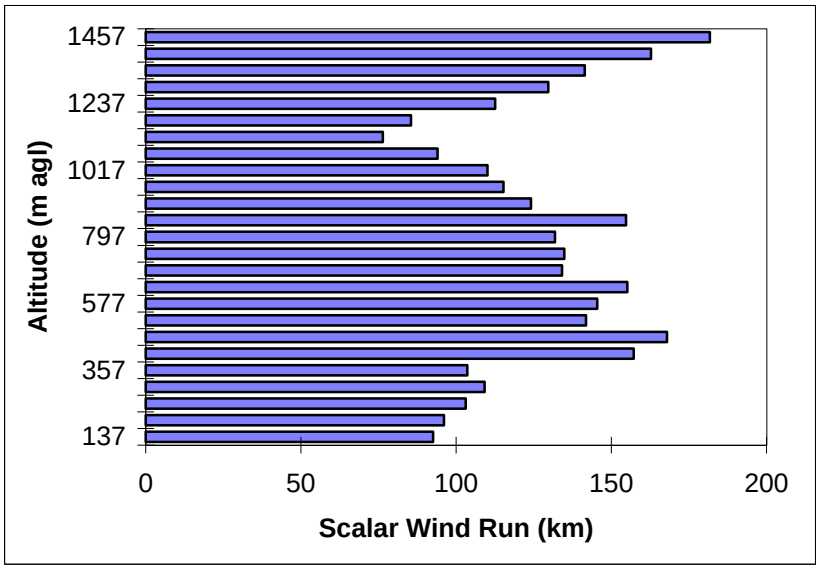

Altitude (m agl)
1457
1237
1017
797
577
357
137
0
50
100
150
200
250
Scalar Wind Run (km)

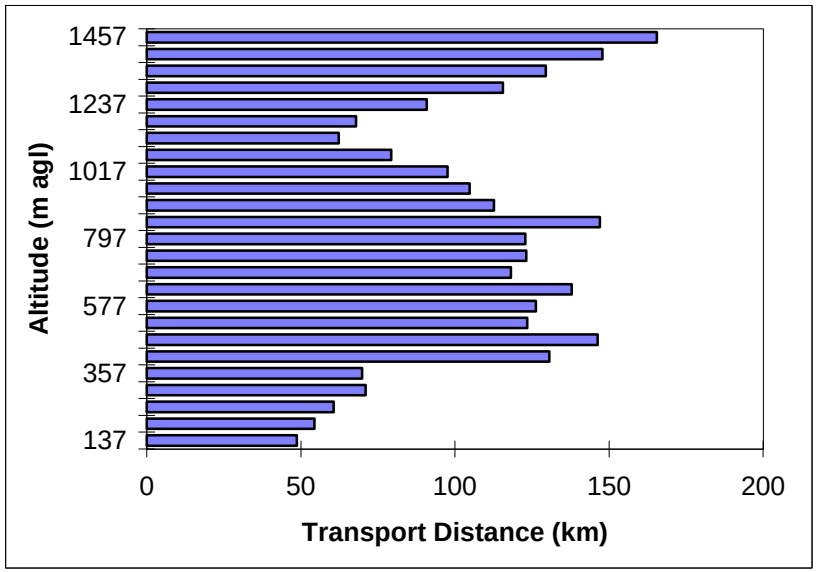

Altitude (m agl)
1457
1237
1017
797
577
357
137
0
50
100
150
200
Transport Distance (km)

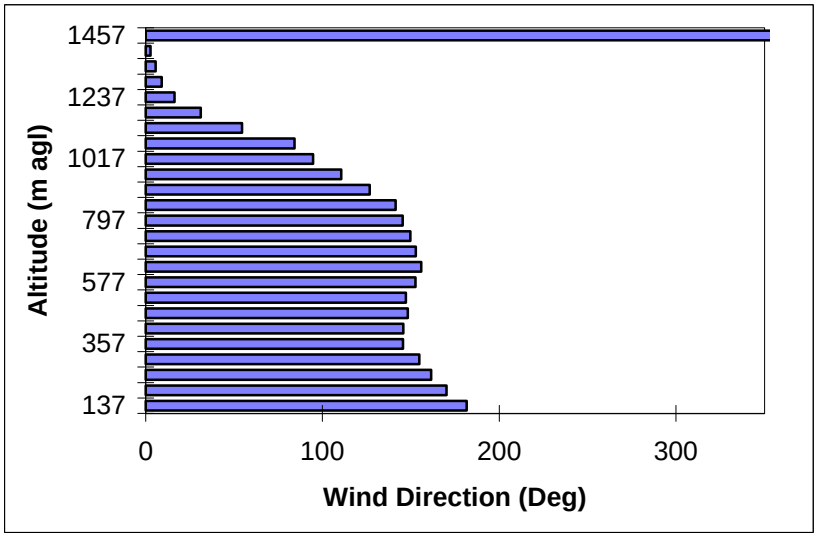

Altitude (m agl)
1457
1237
1017
797
577
357
137
0
100
200
300
Wind Direction (Deg)

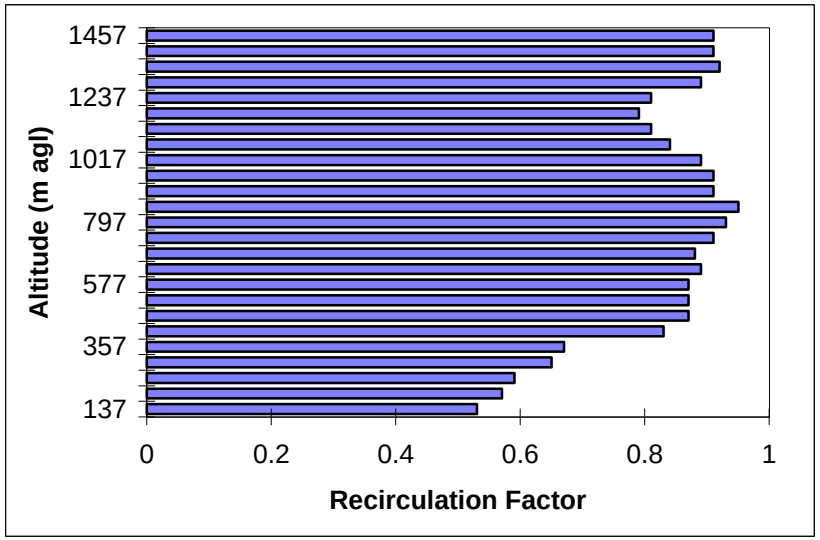
Altitude (m agl)
1457
1237
1017
797
577
357
137
0
0.2
0.4
0.6
0.8
1
Recirculation Factor

SJV 08-29-98 0400 to 1600.xls

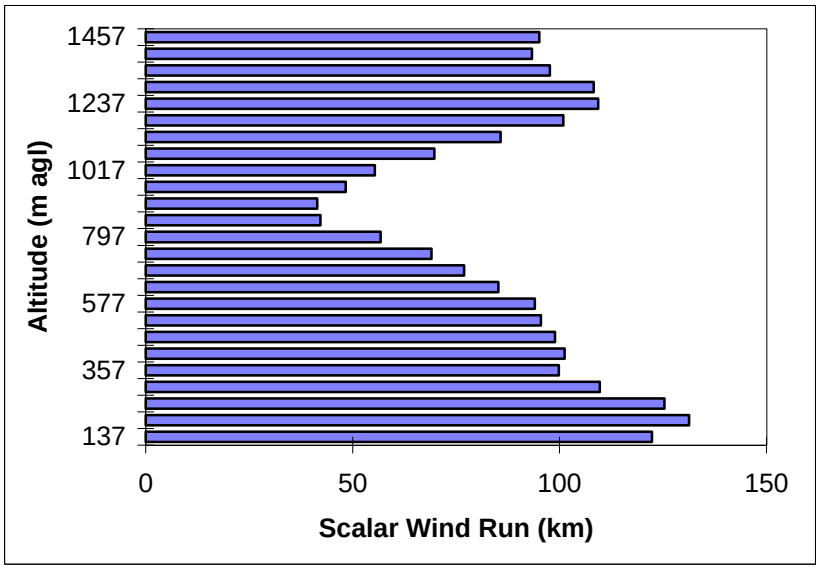


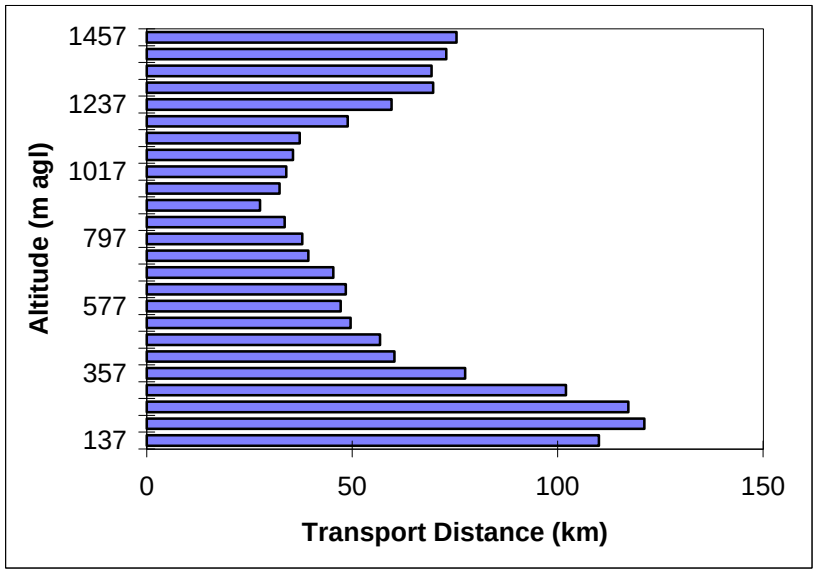


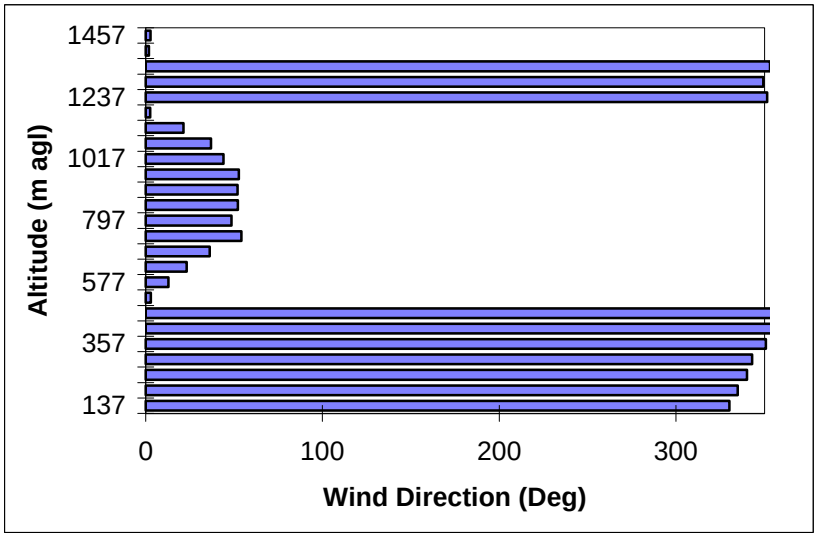


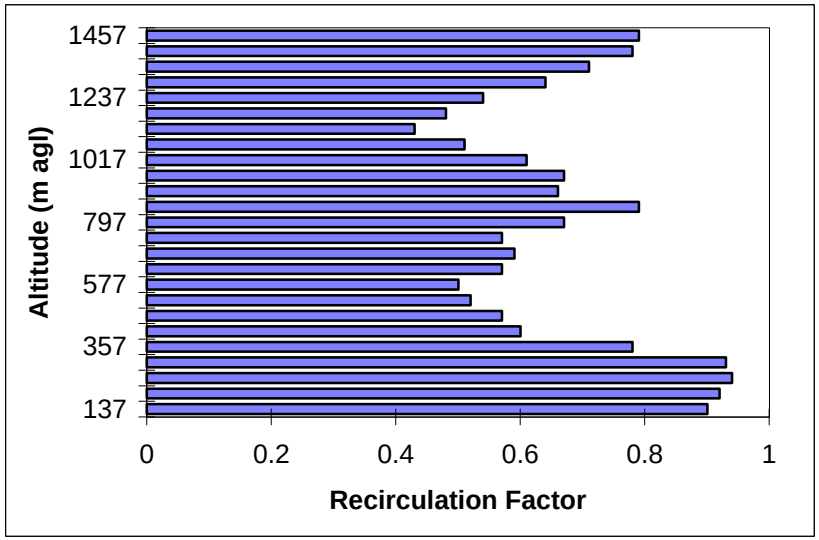


SJV 08-29-98 1600 to 0400.xls

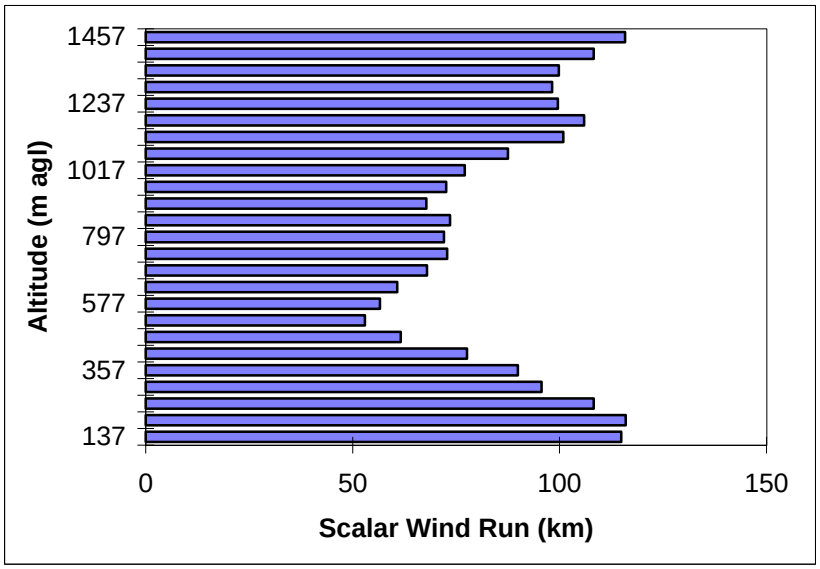


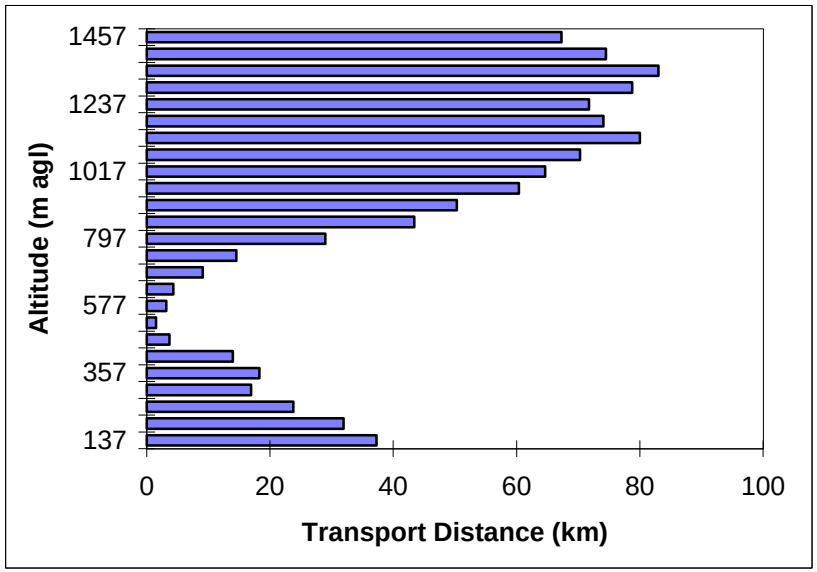


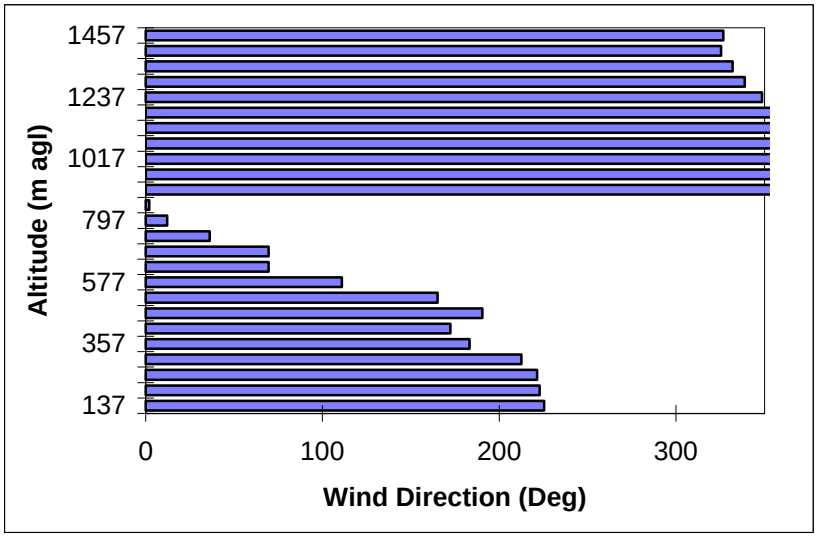


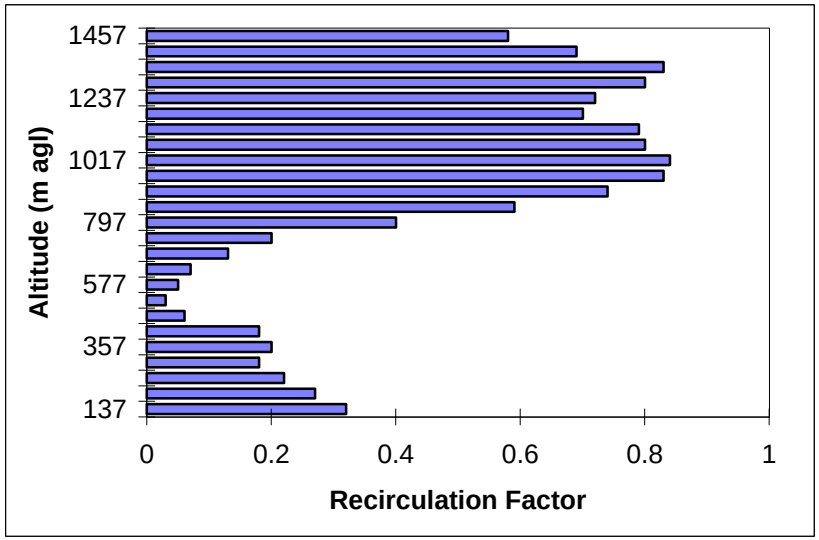


SJV 08-30-98 0400 to 1600.xls









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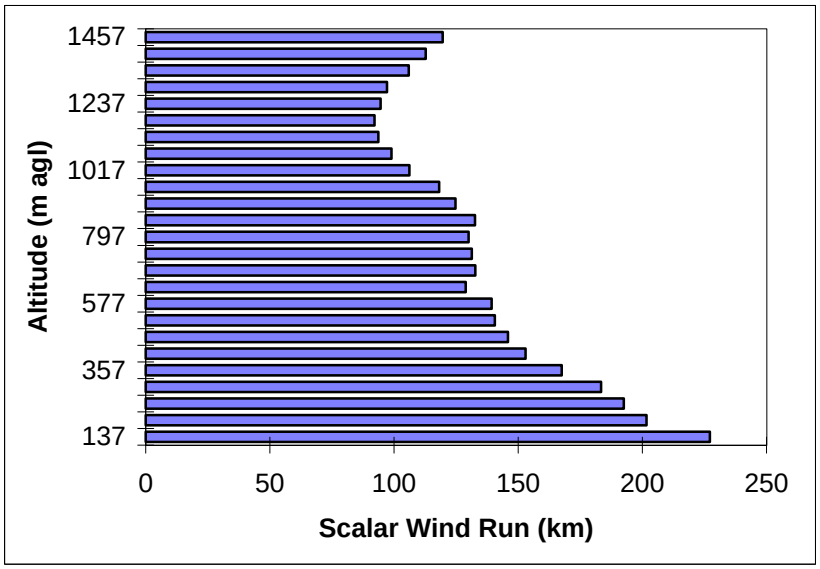

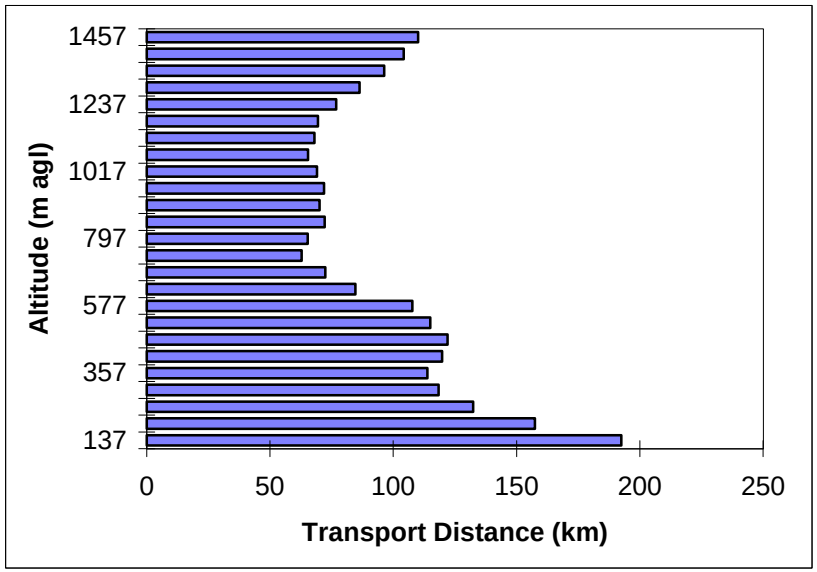

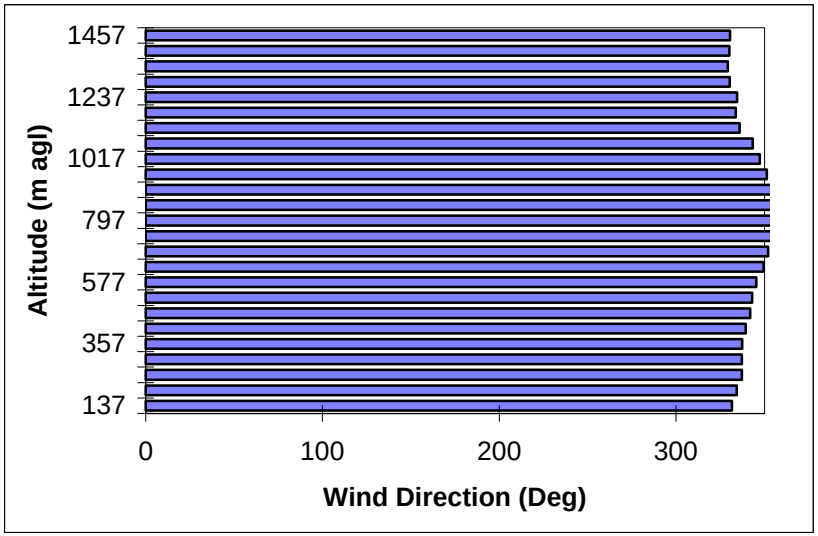

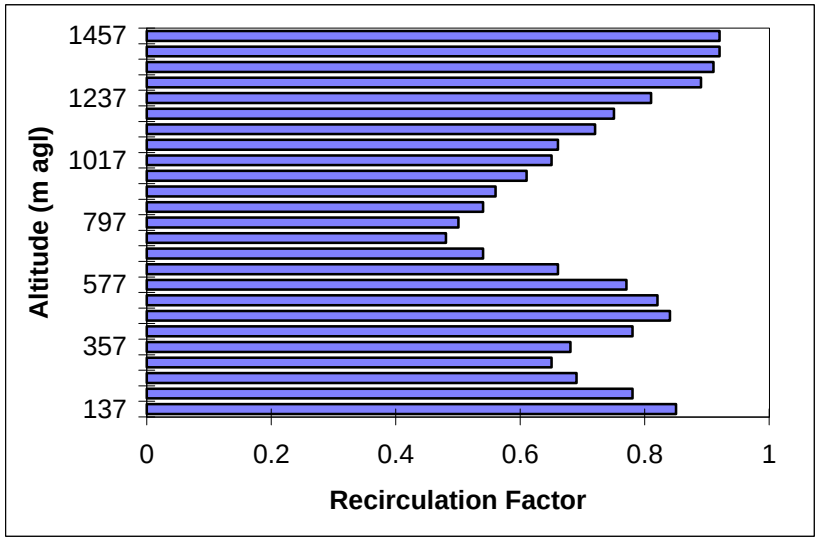

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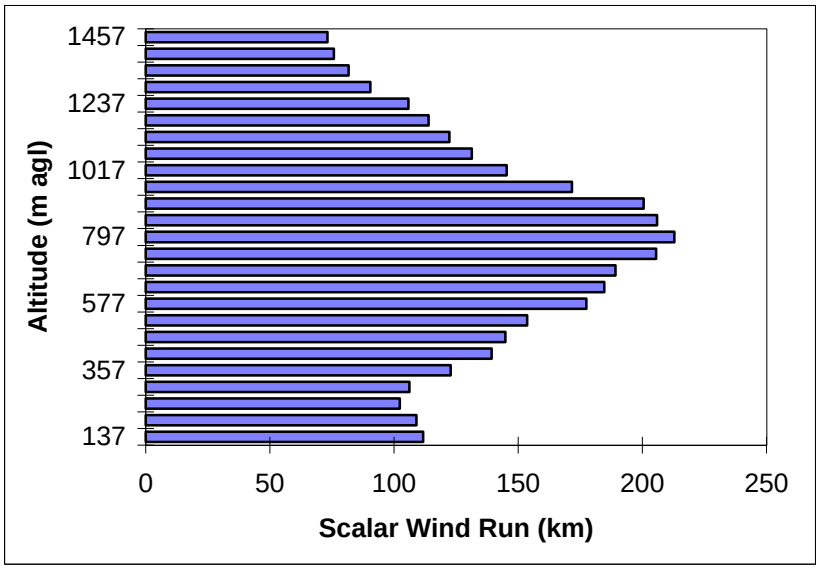

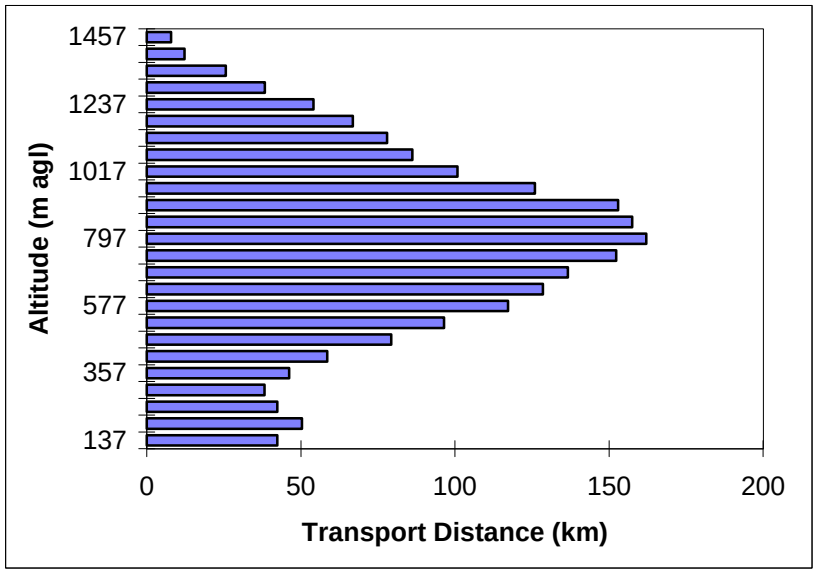

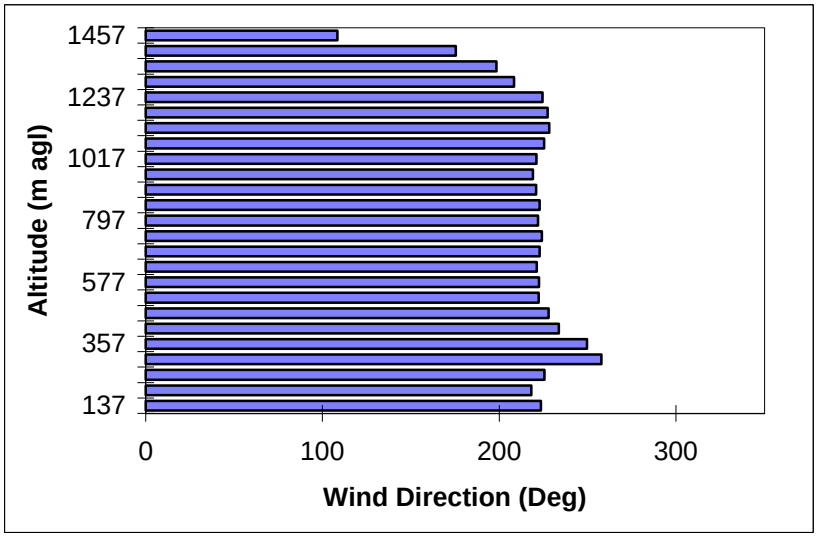

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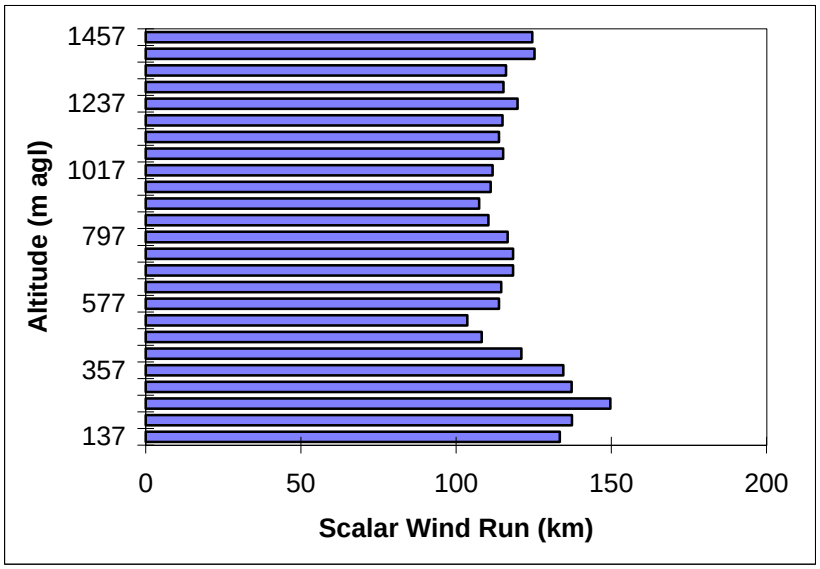
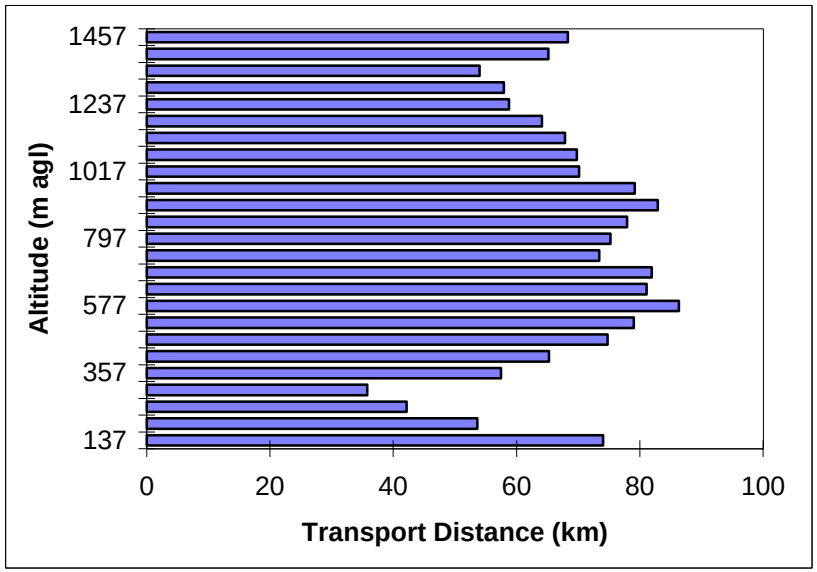
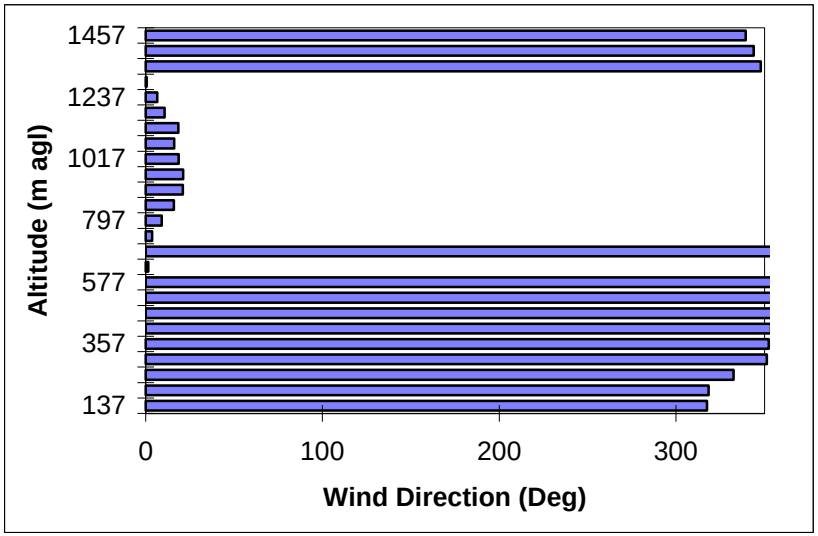
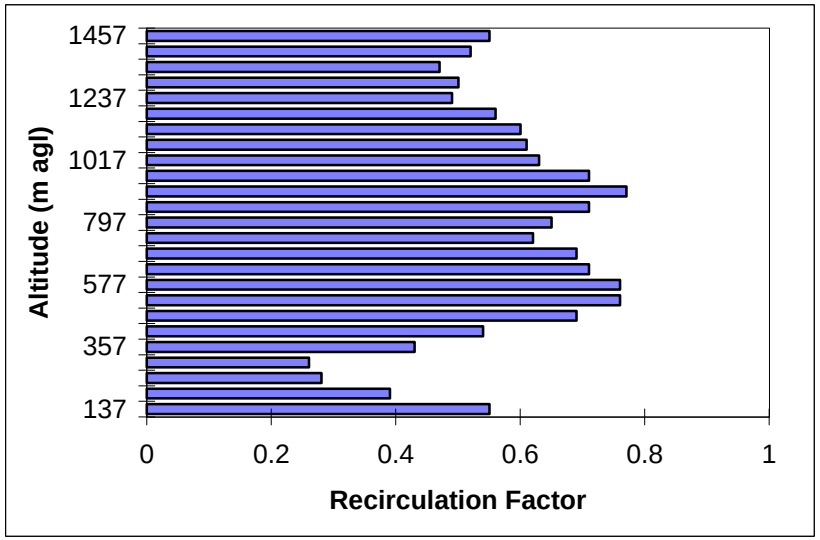
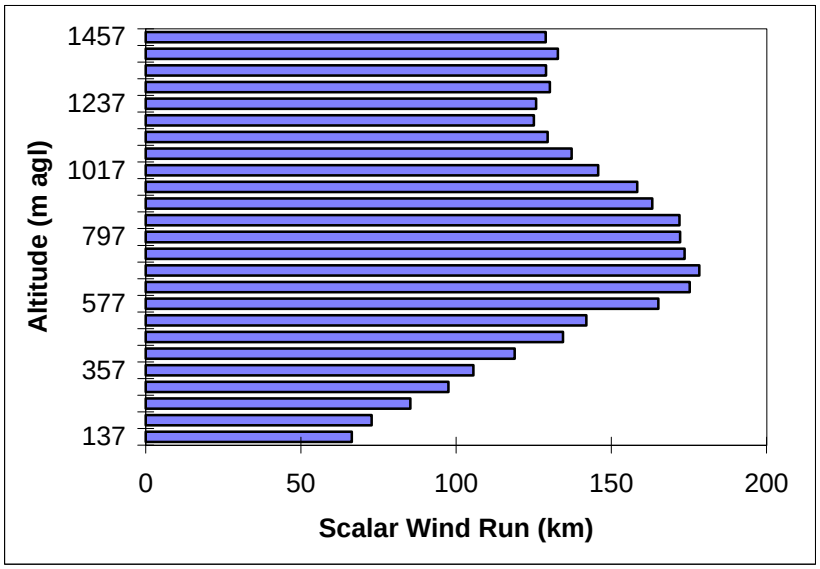


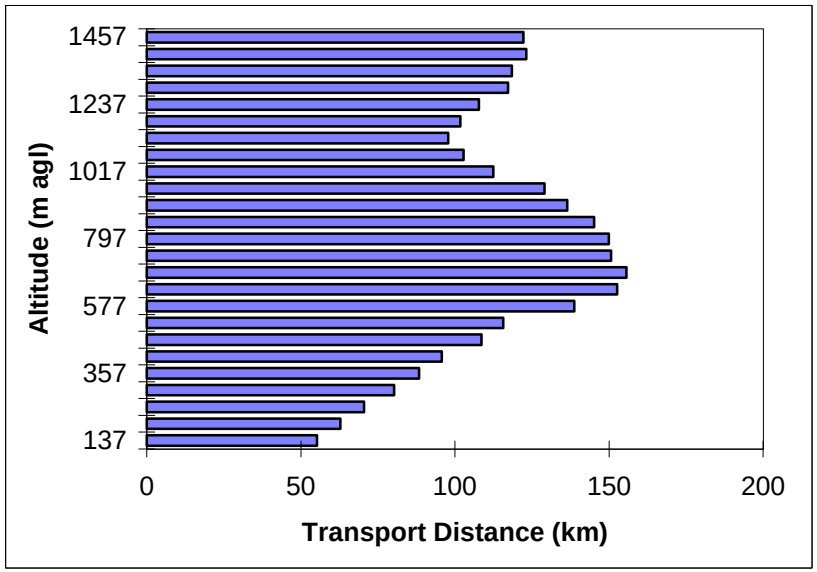


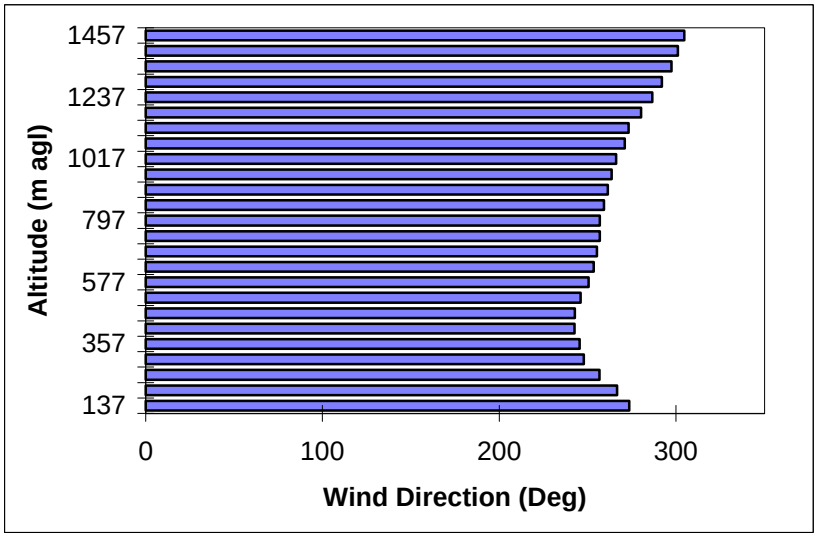


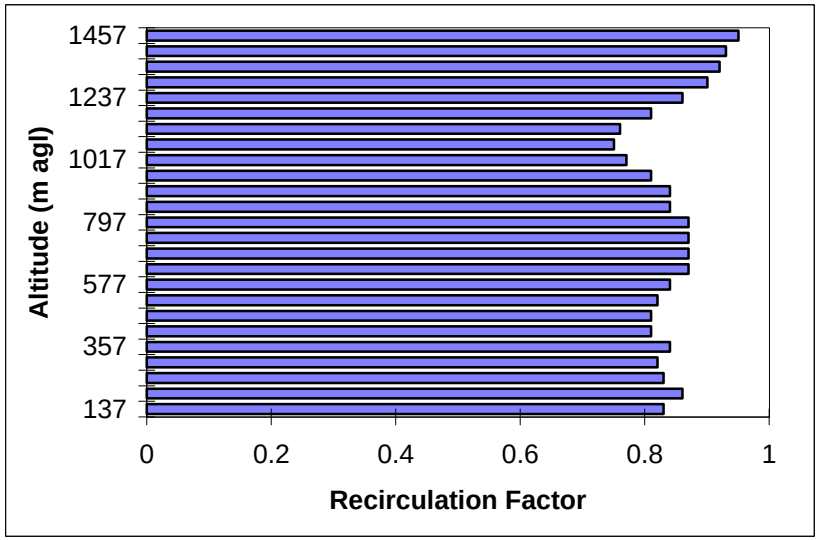


SJV 09-01-98 0400 to 1600.xls









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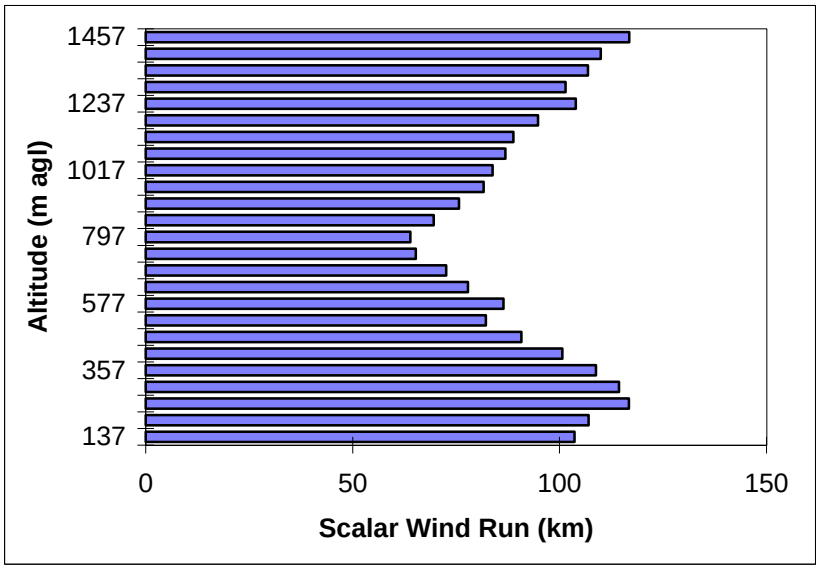

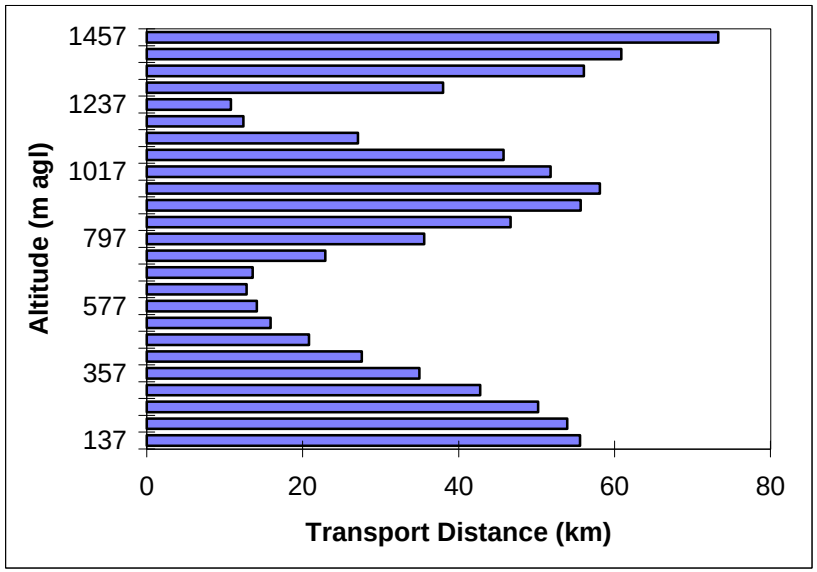

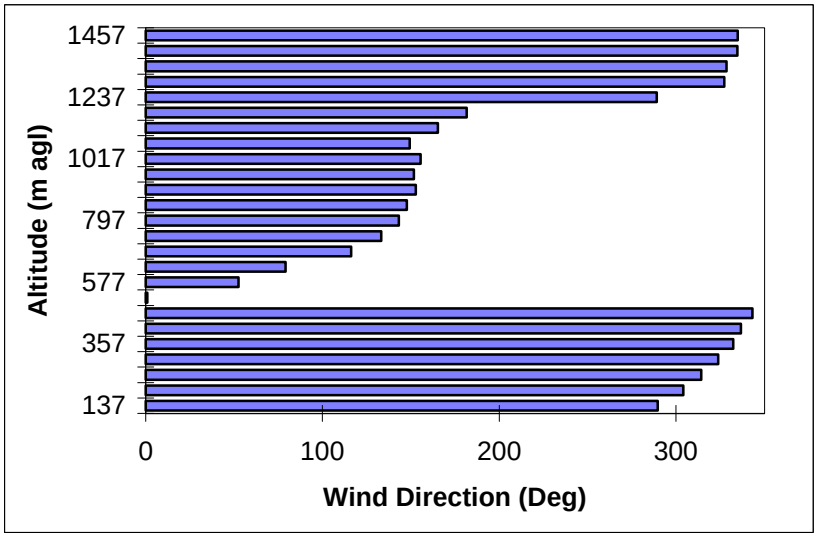

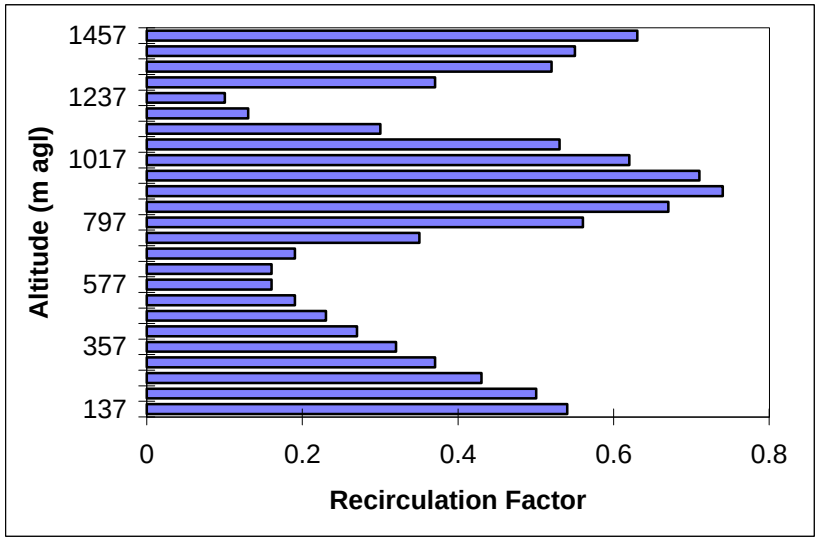

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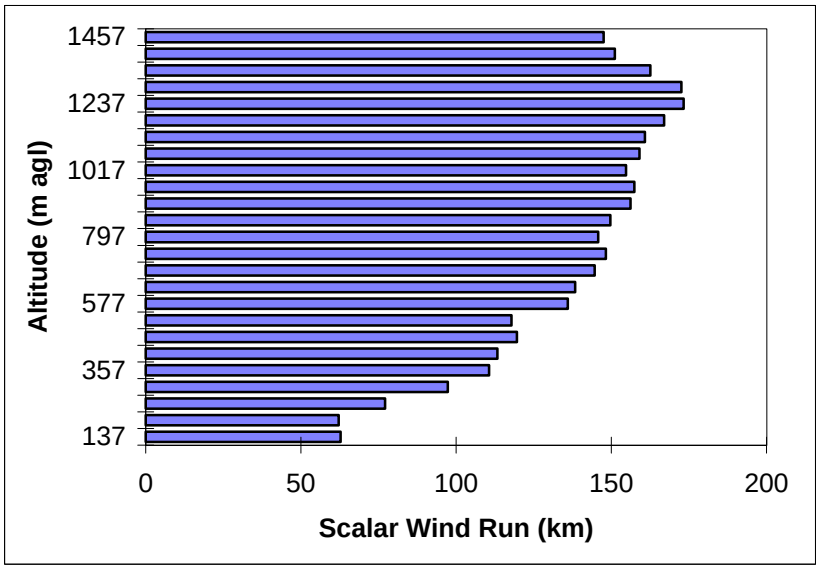

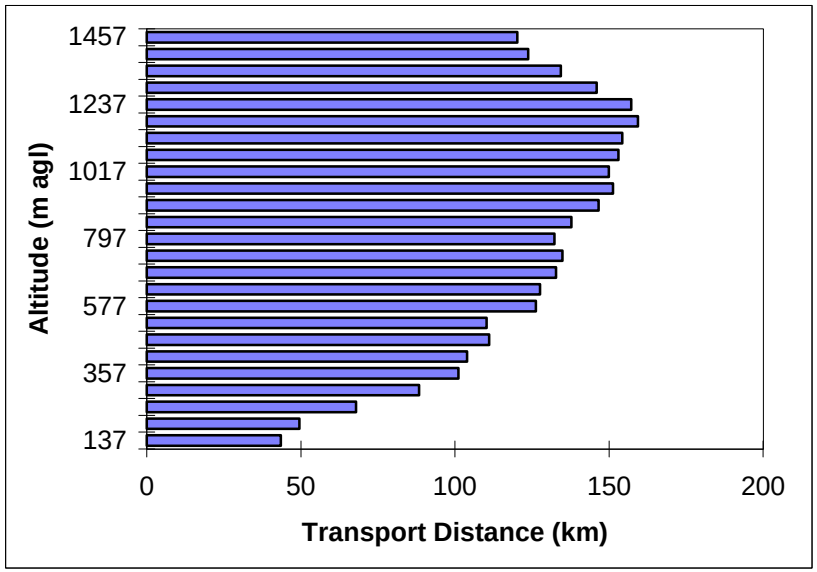

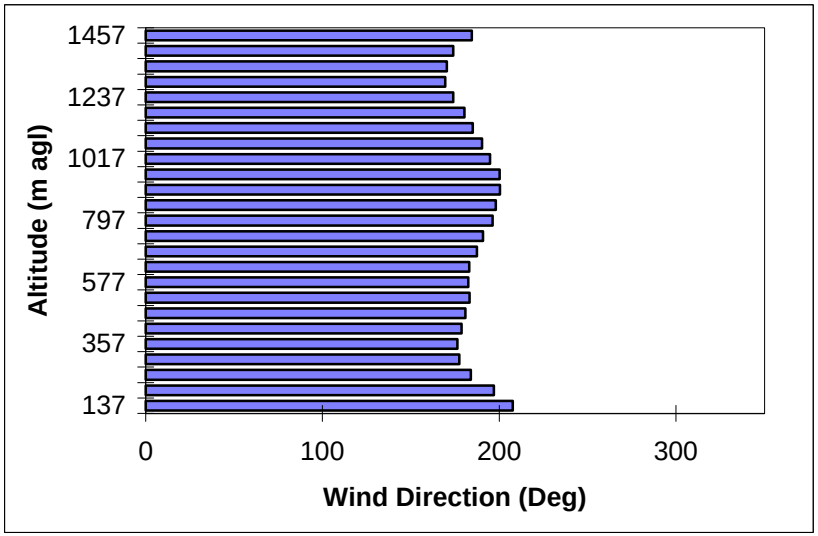

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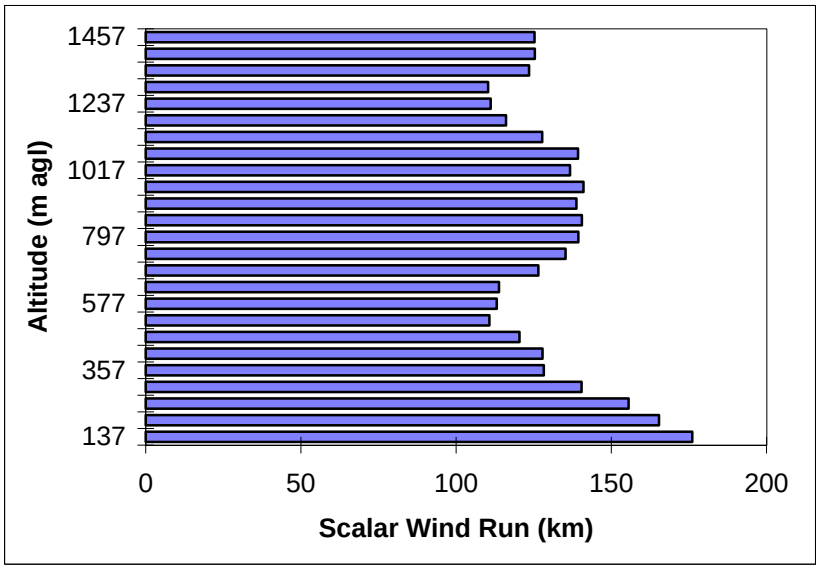

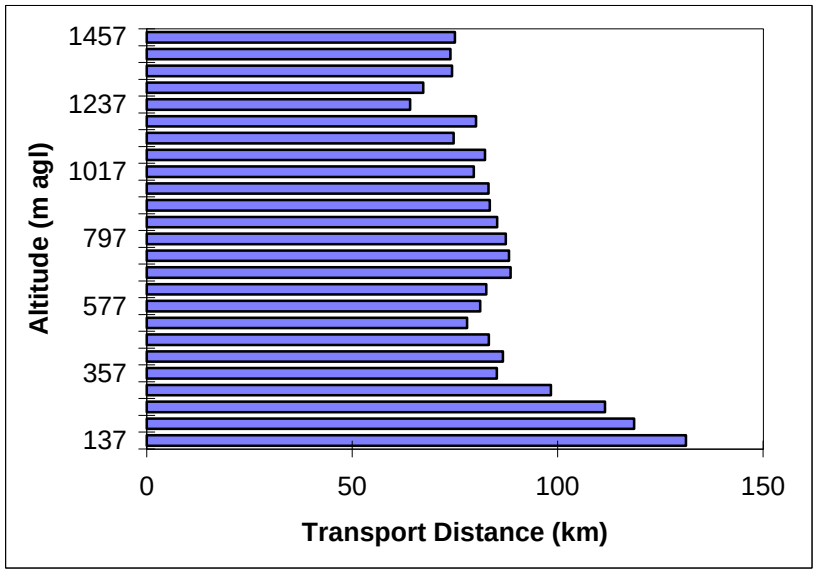

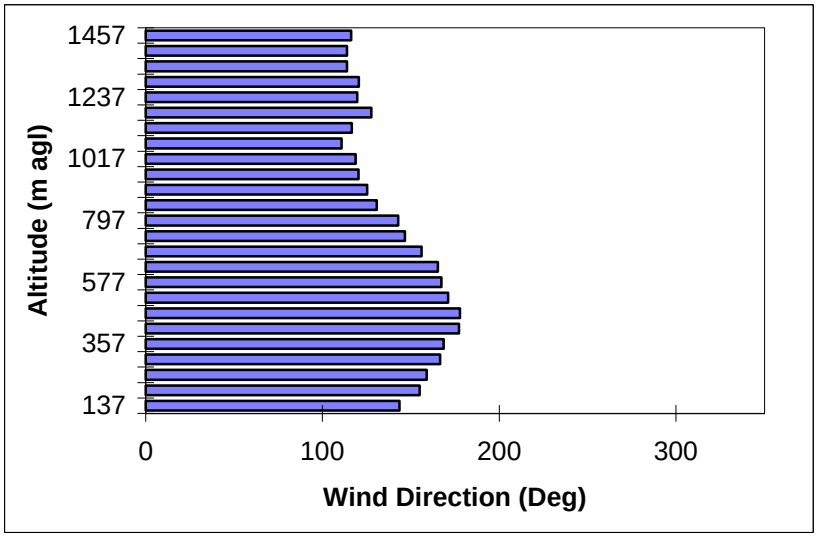

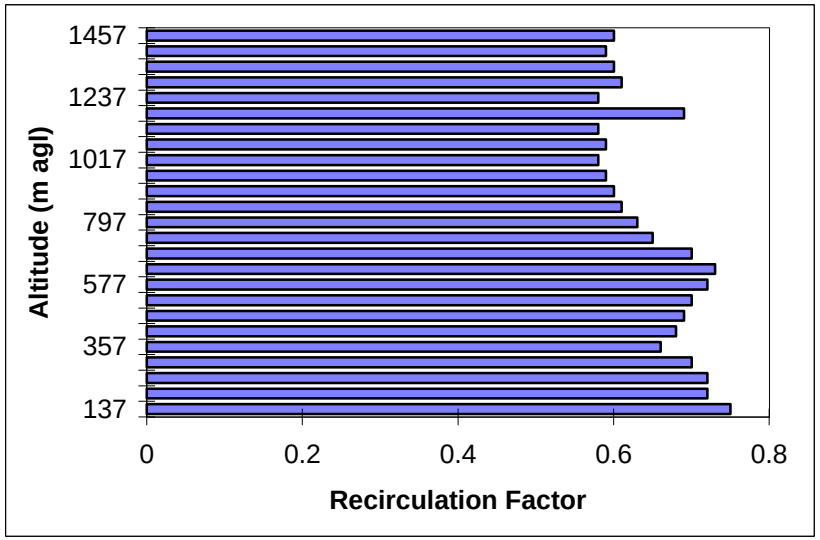

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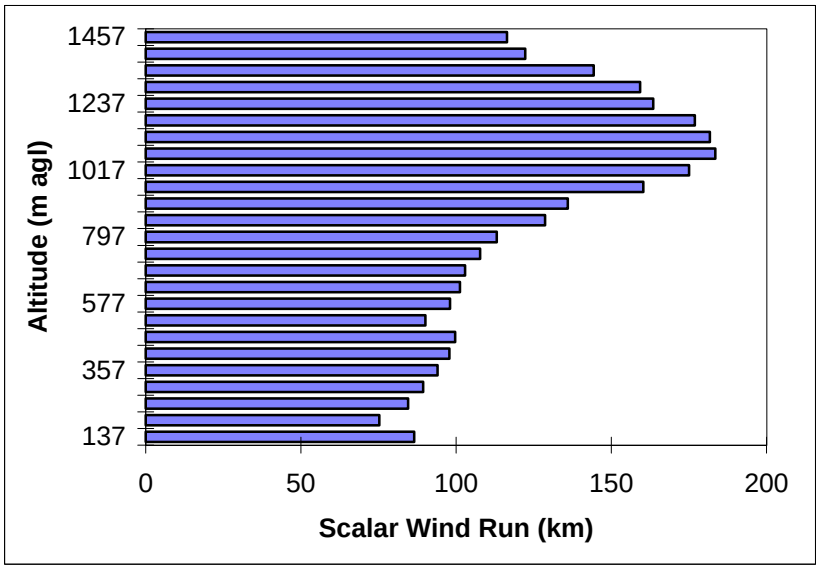
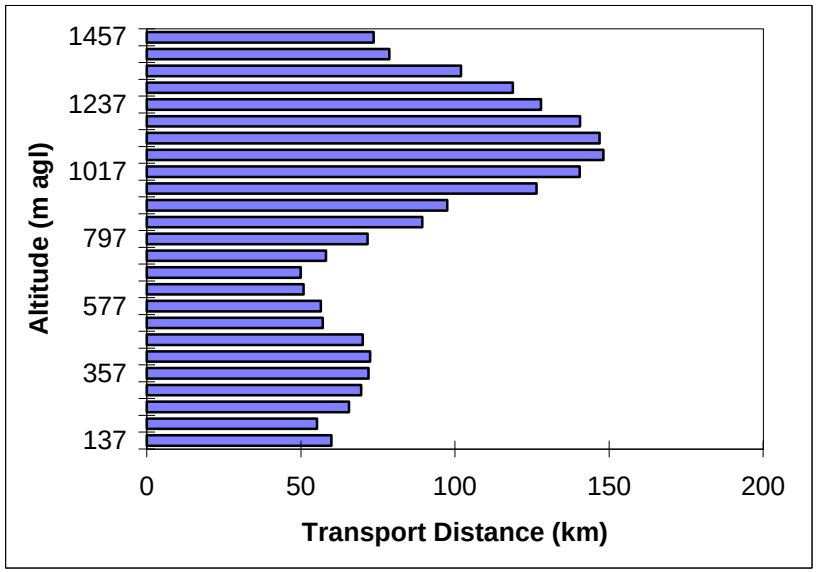
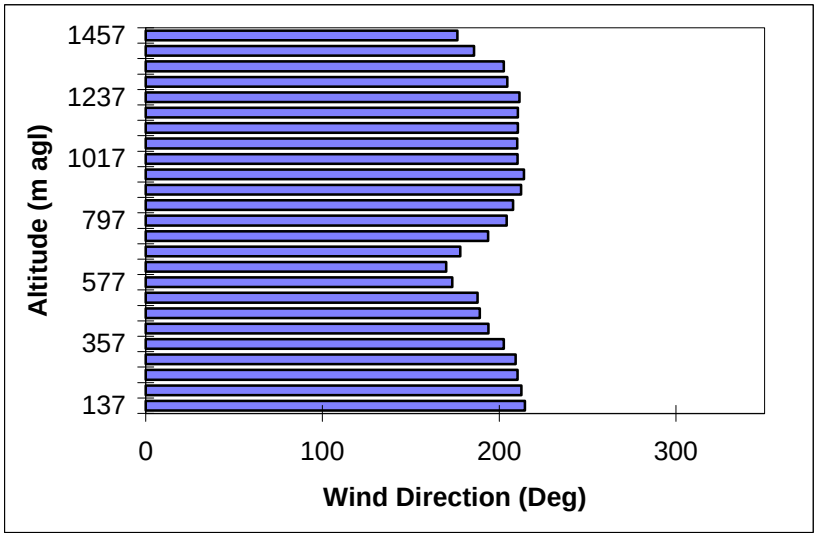
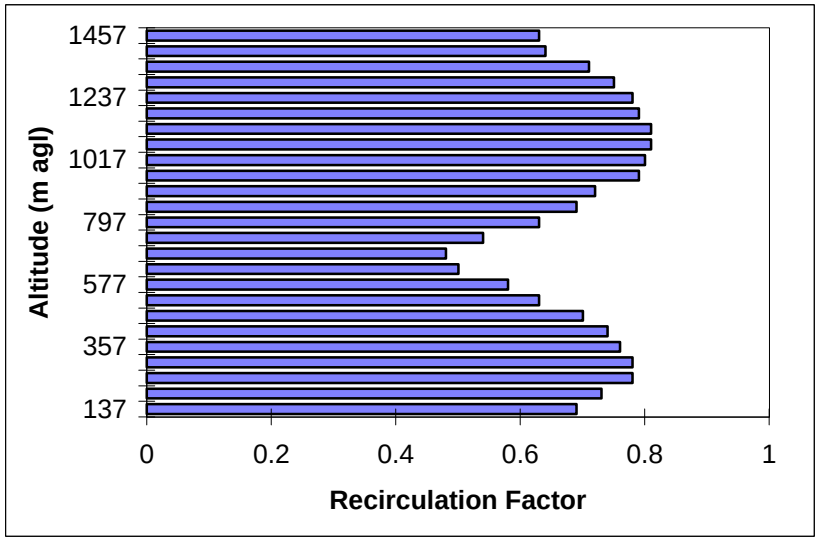
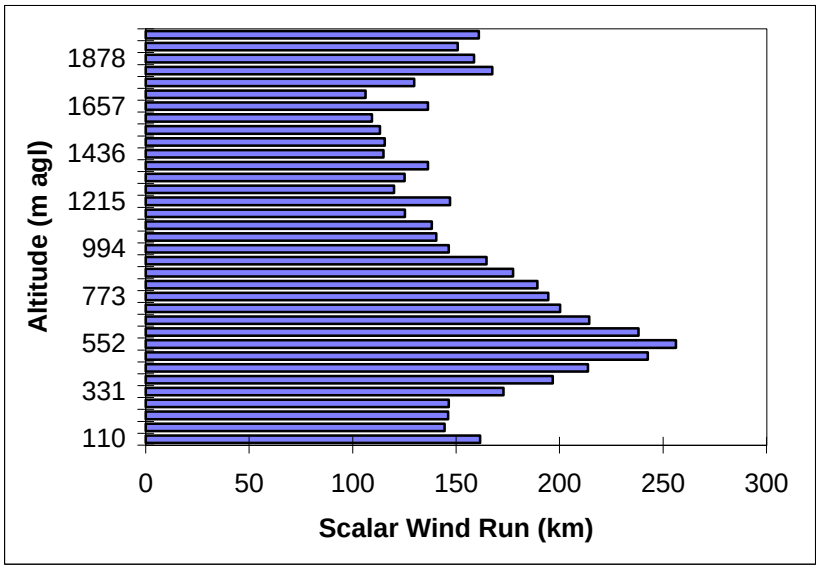


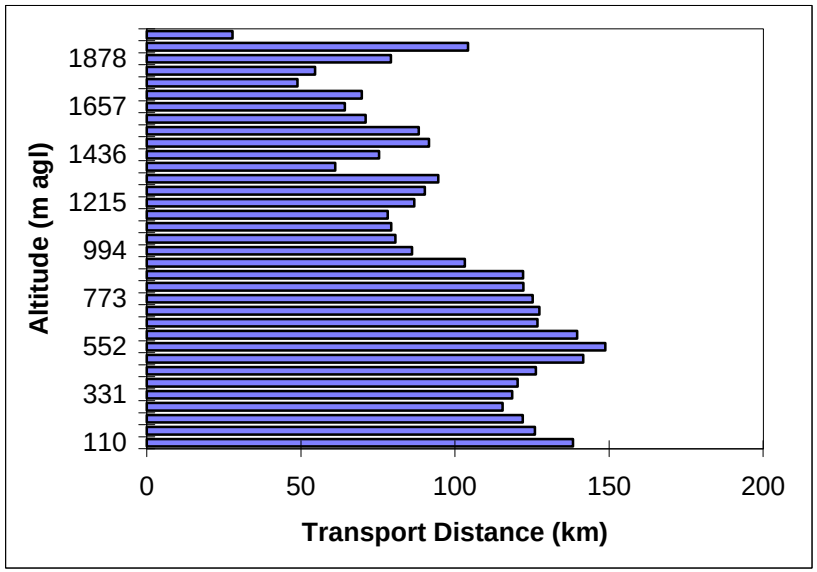


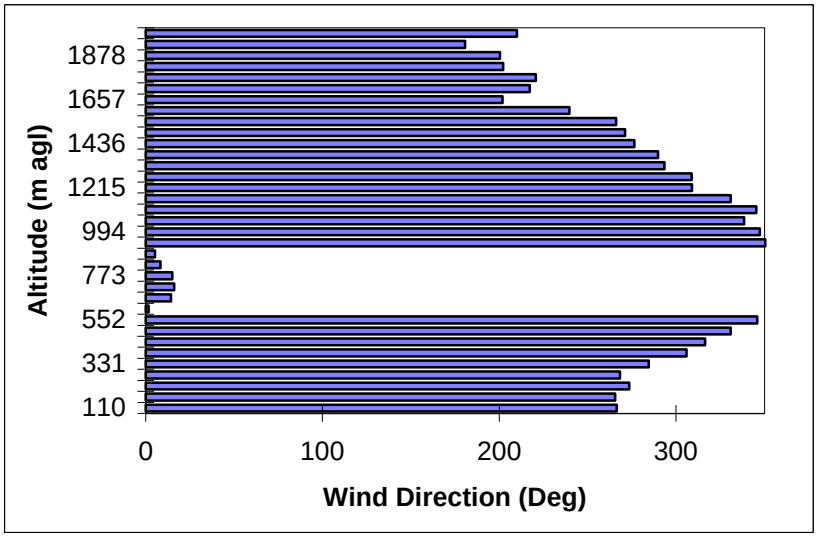


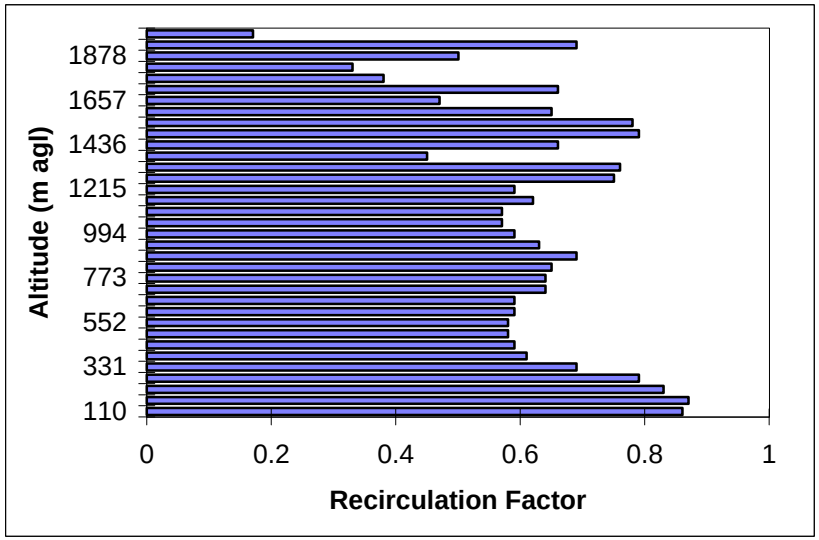


Ventura 08-05-97 0400 to 1600.xls









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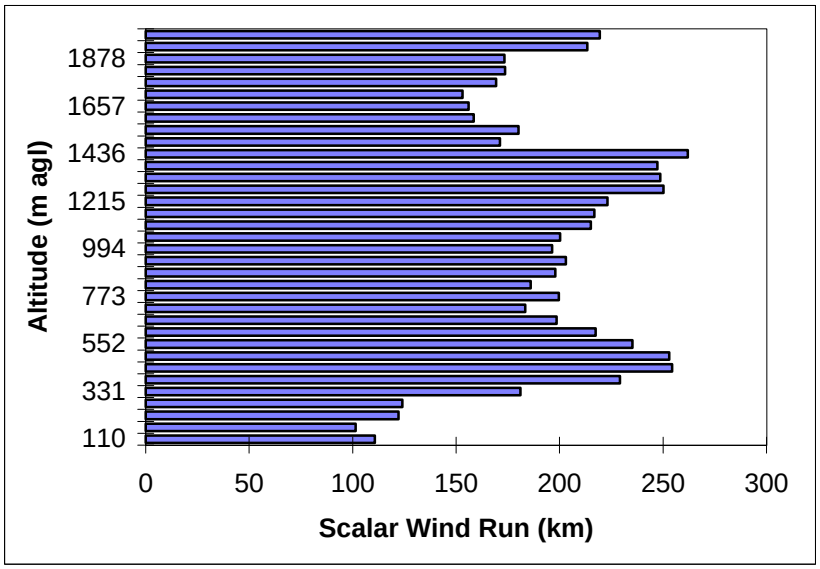
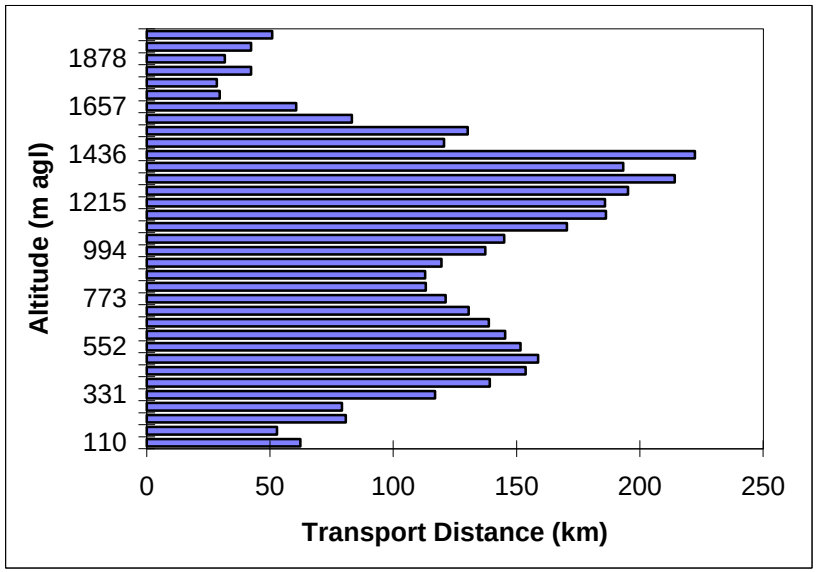
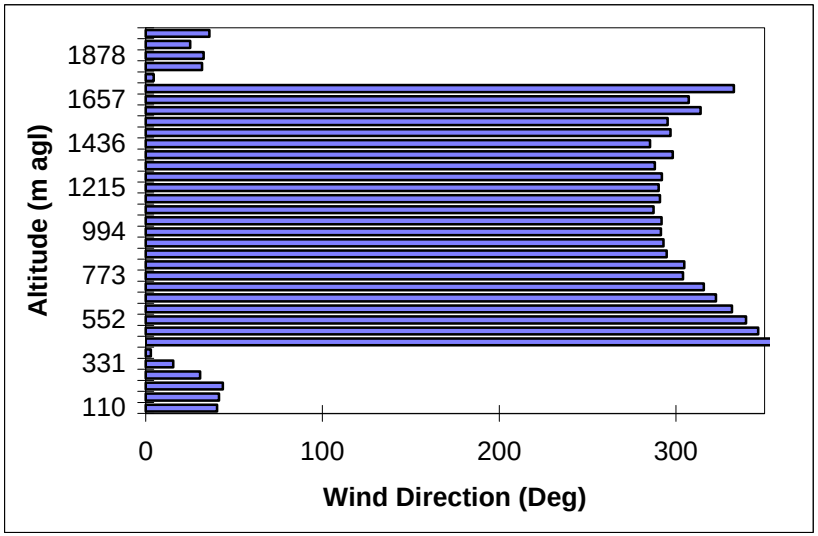
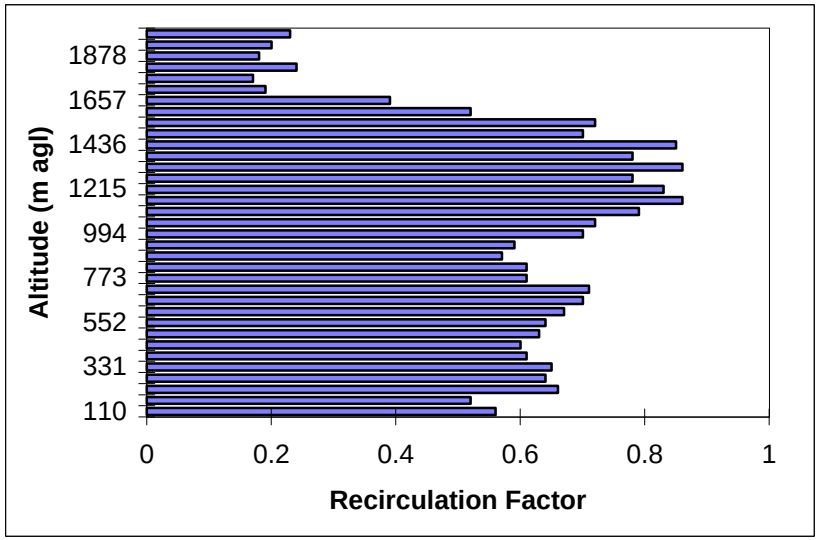
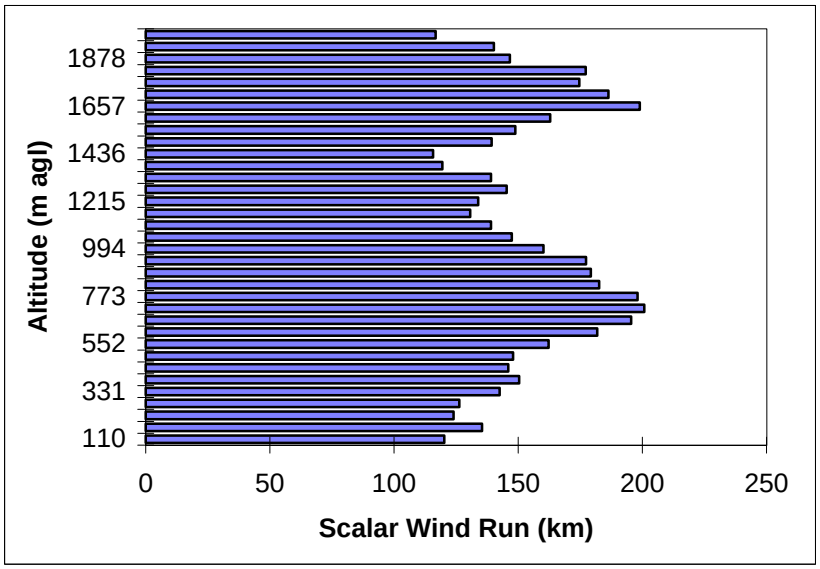


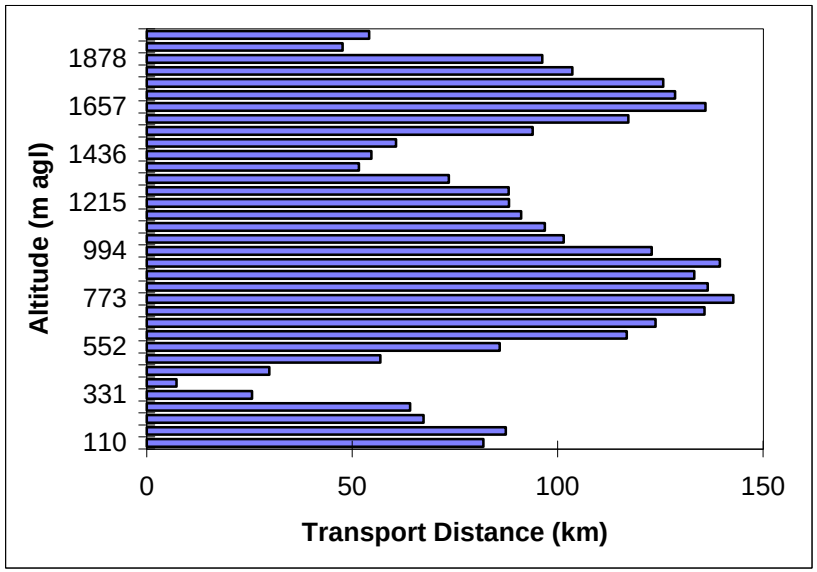


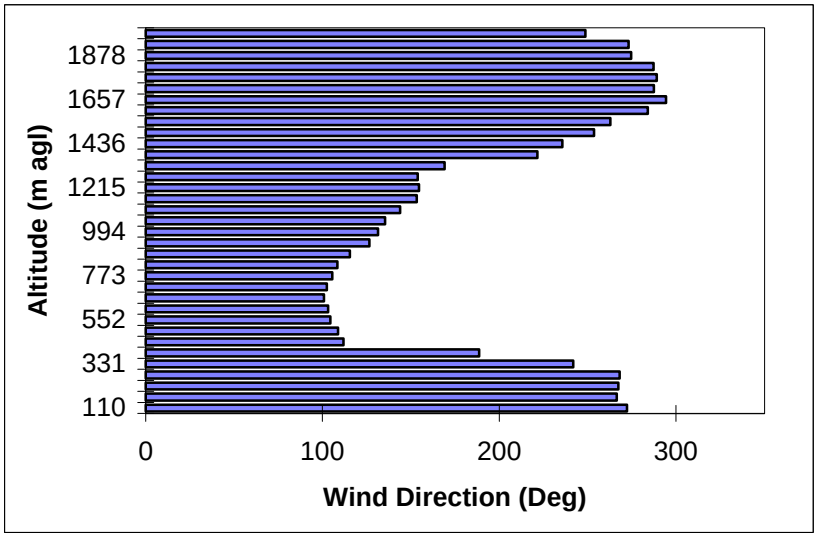


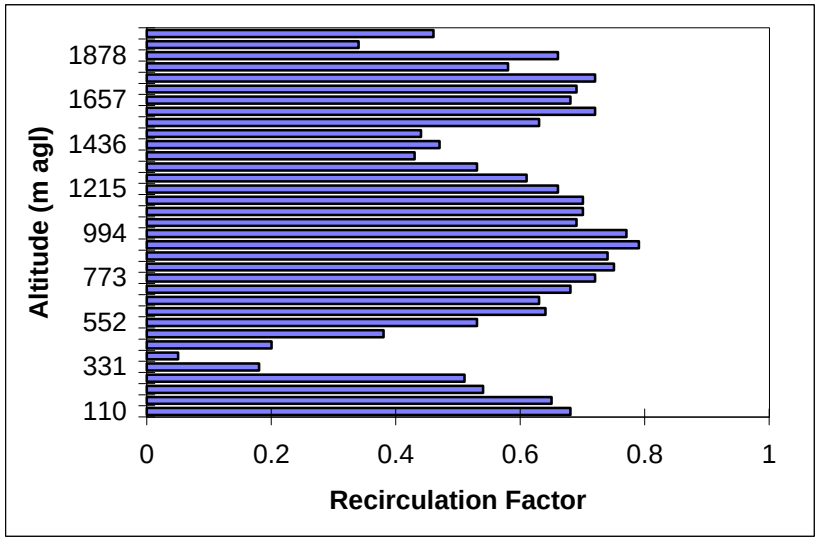


Ventura 08-06-97 0400 to 1600.xls









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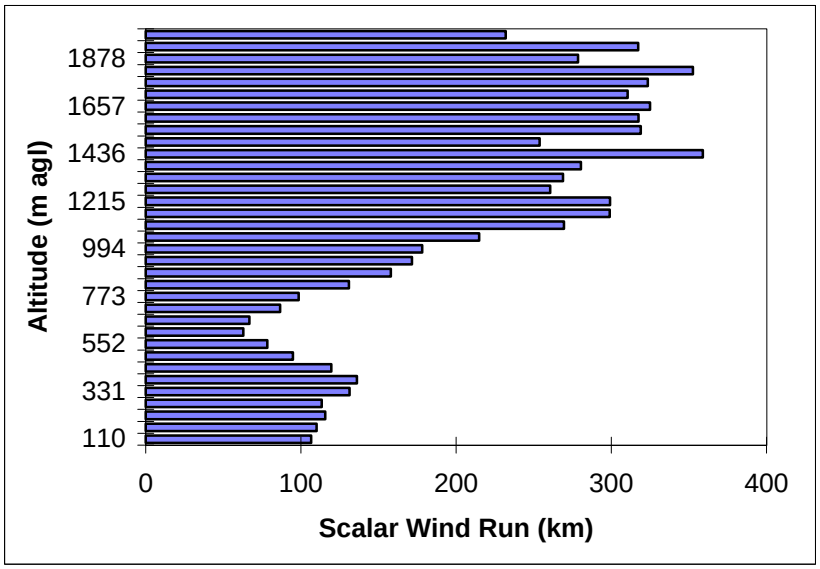
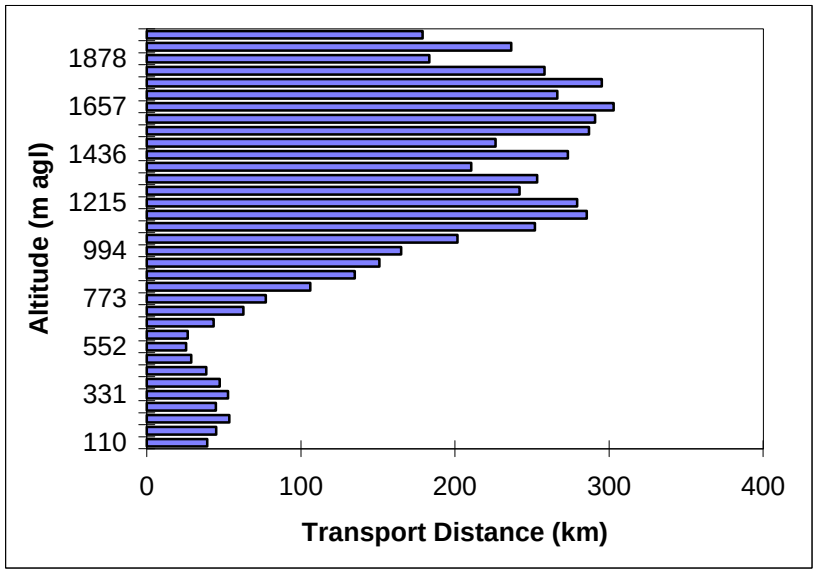
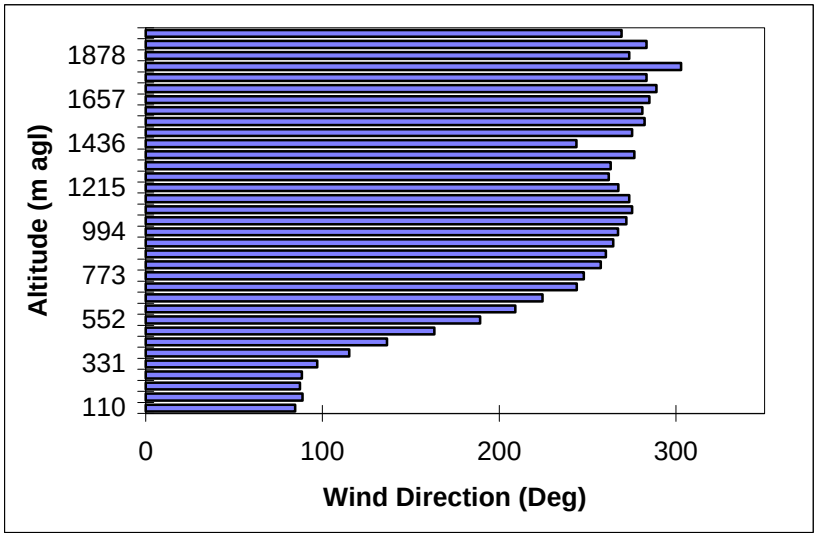
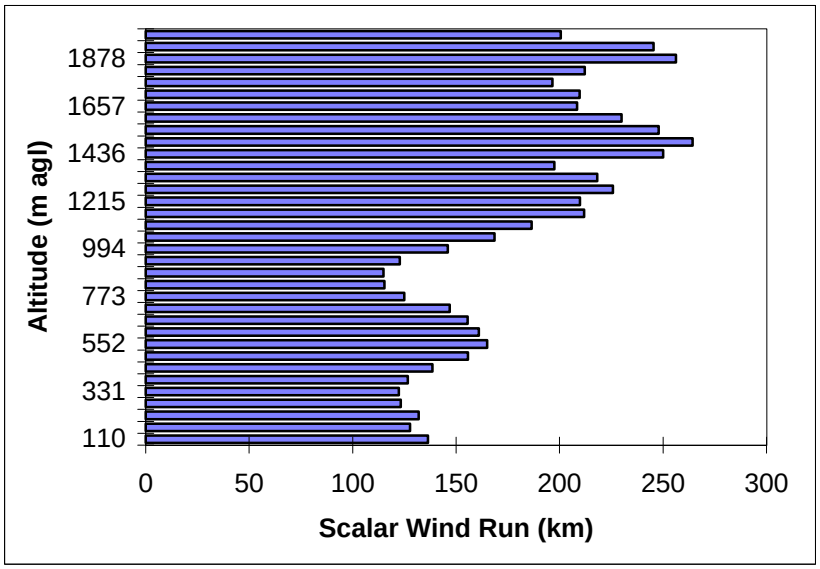
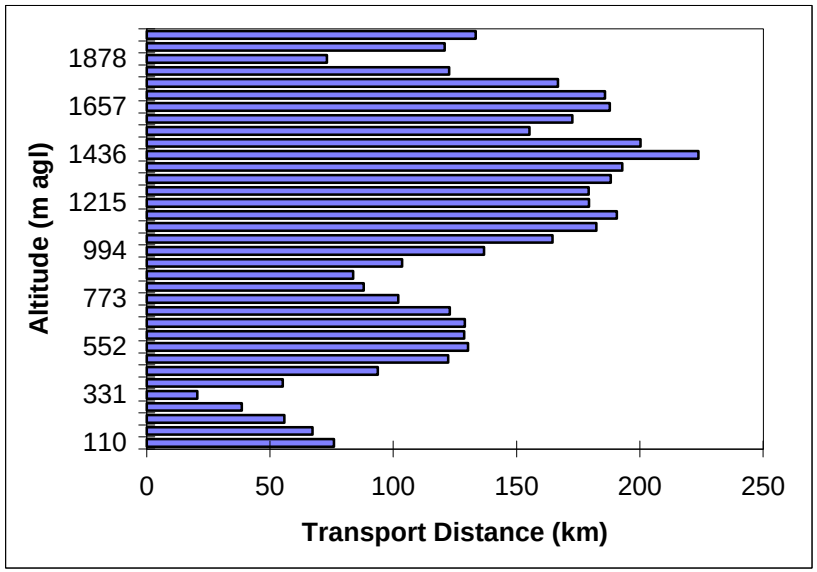


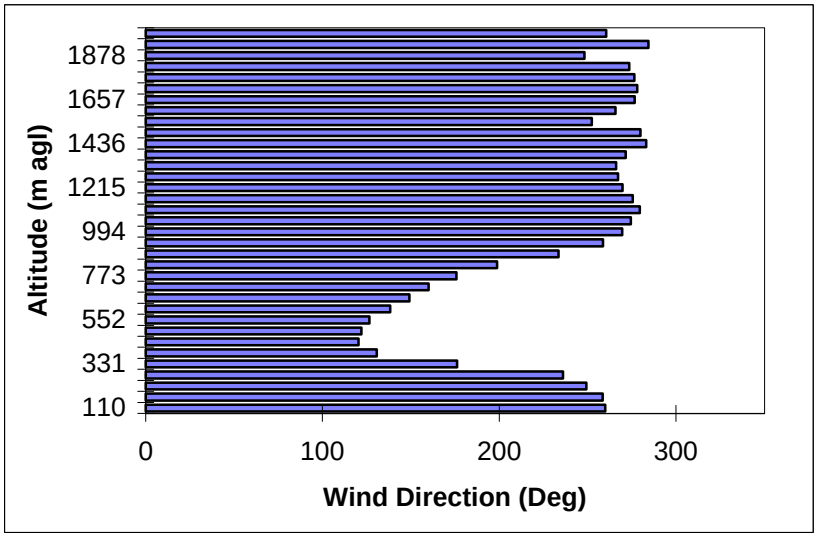


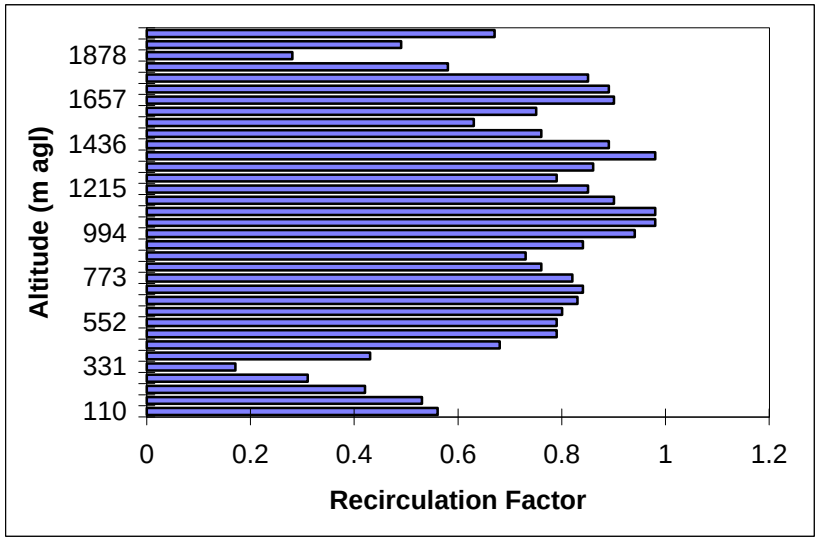


Ventura 08-07-97 0400 to 1600.xls

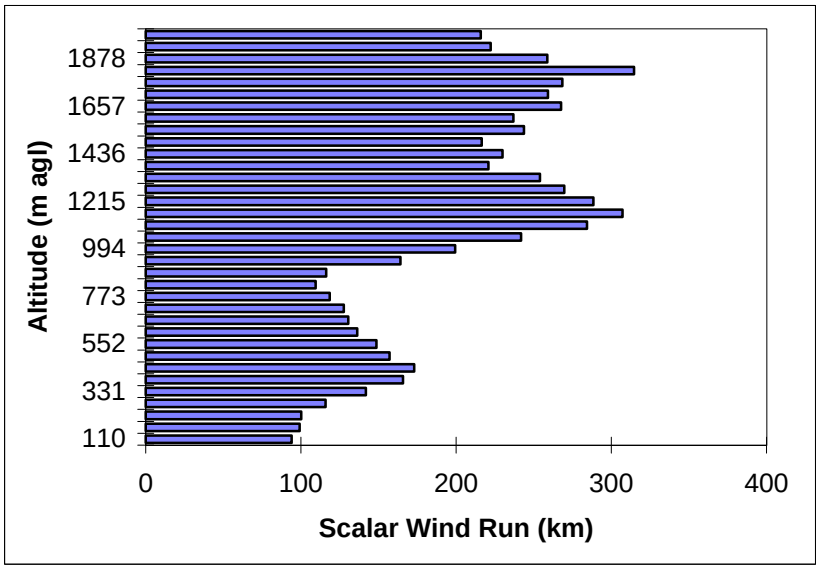


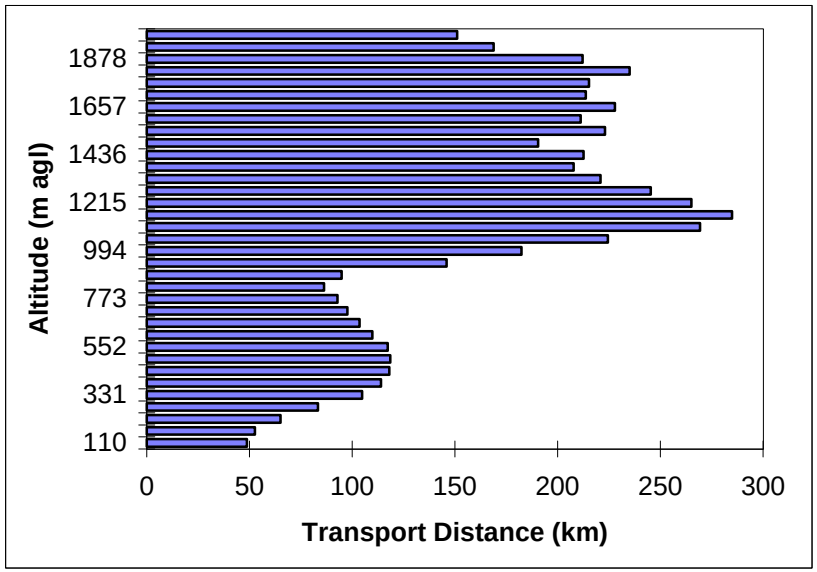


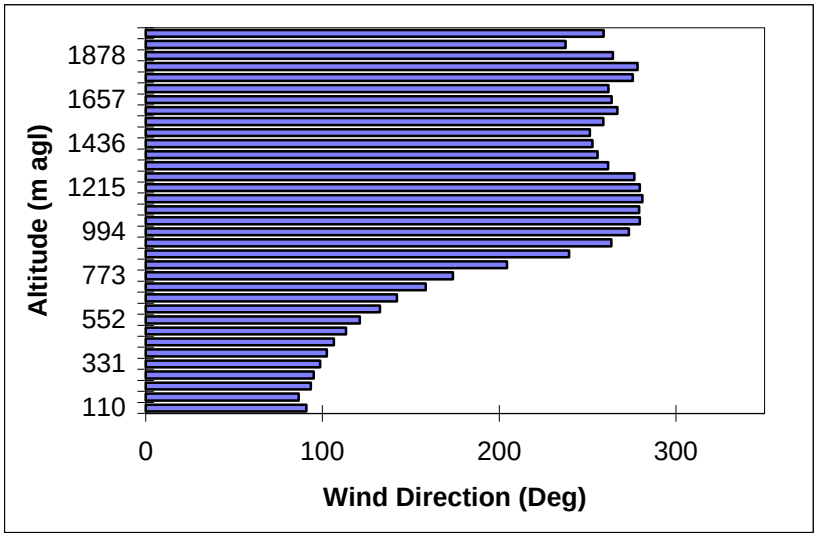


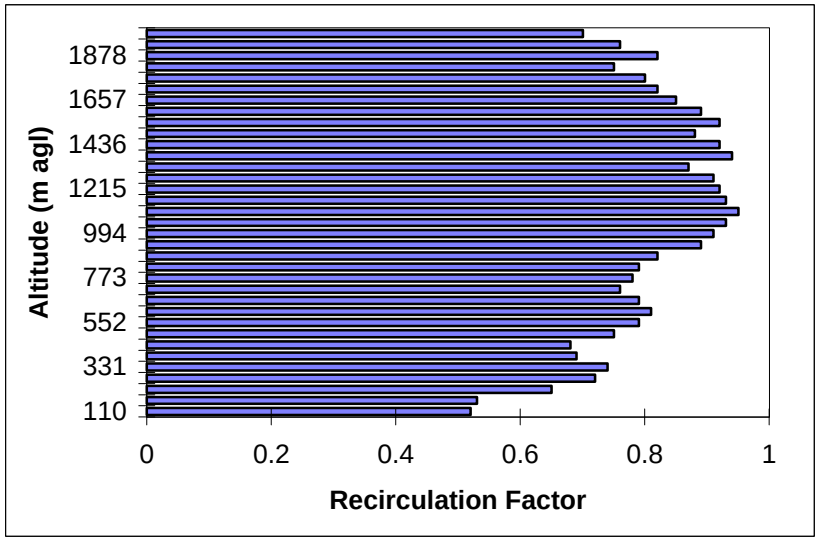


Ventura 08-07-97 1600 to 0400.xls

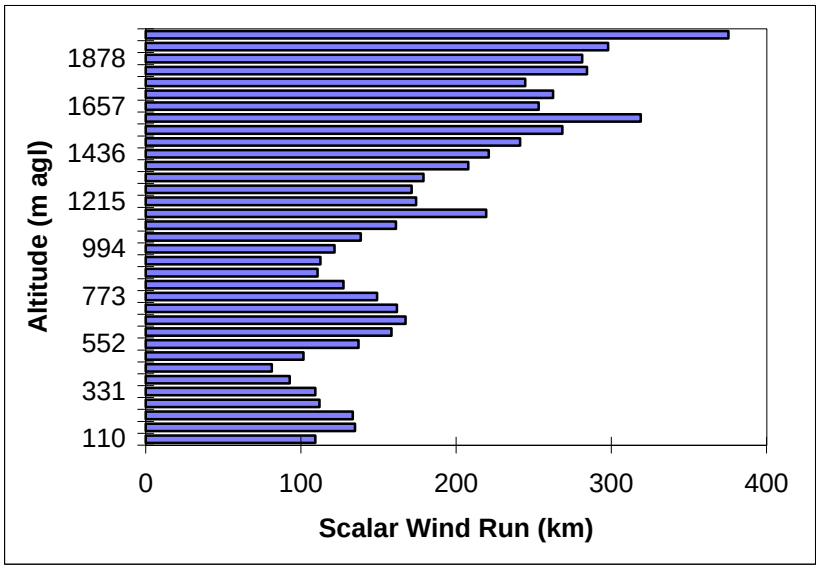


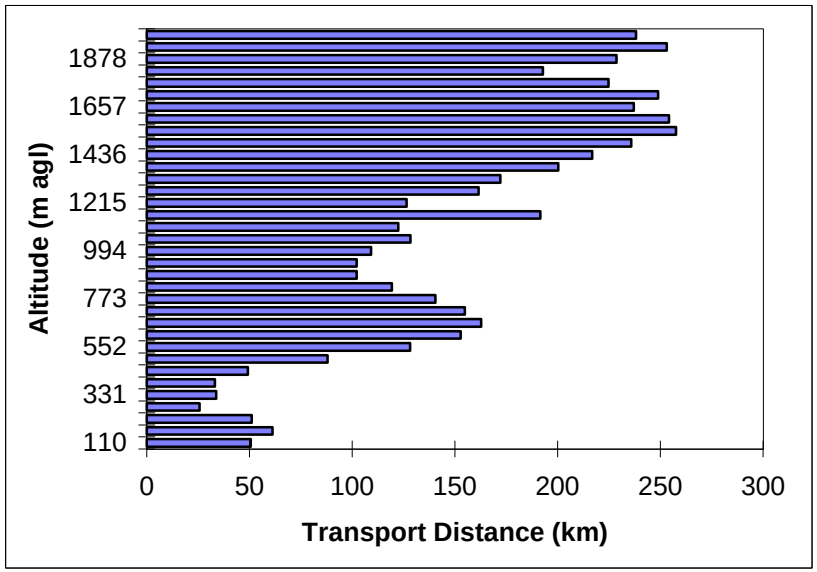


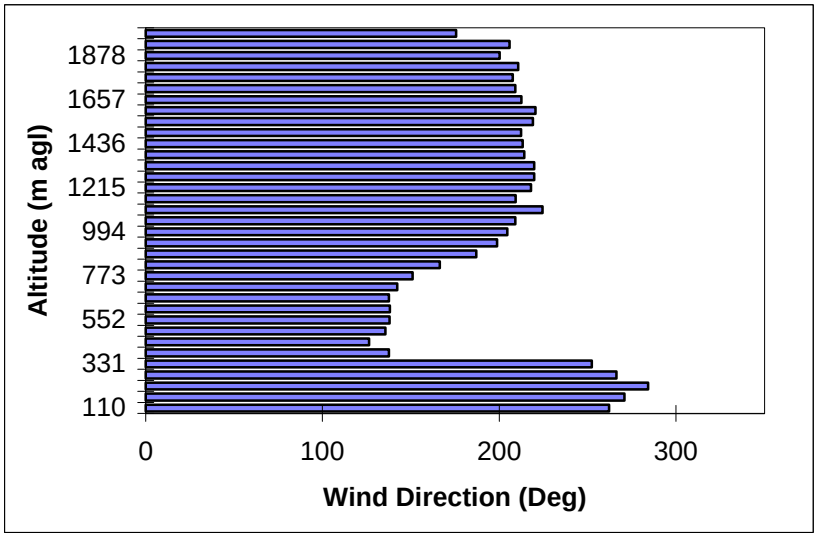


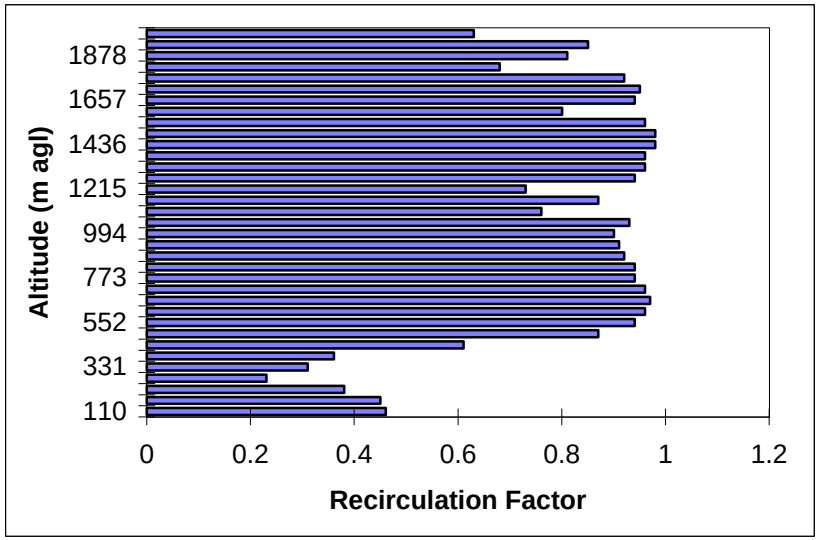


Ventura 08-08-97 0400 to 1600.xls









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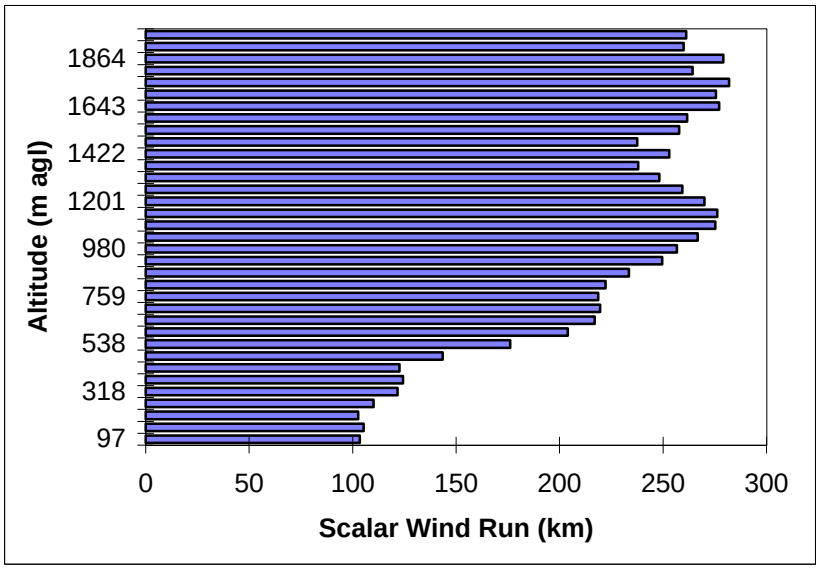
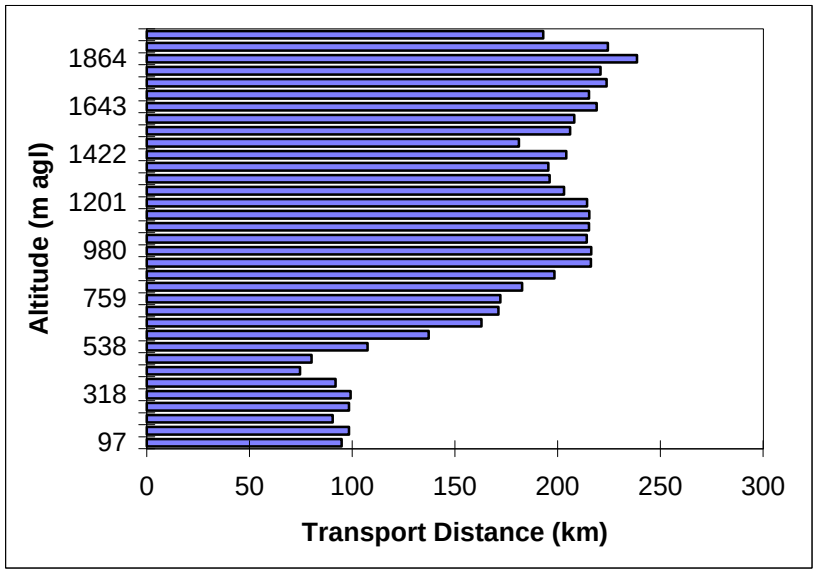
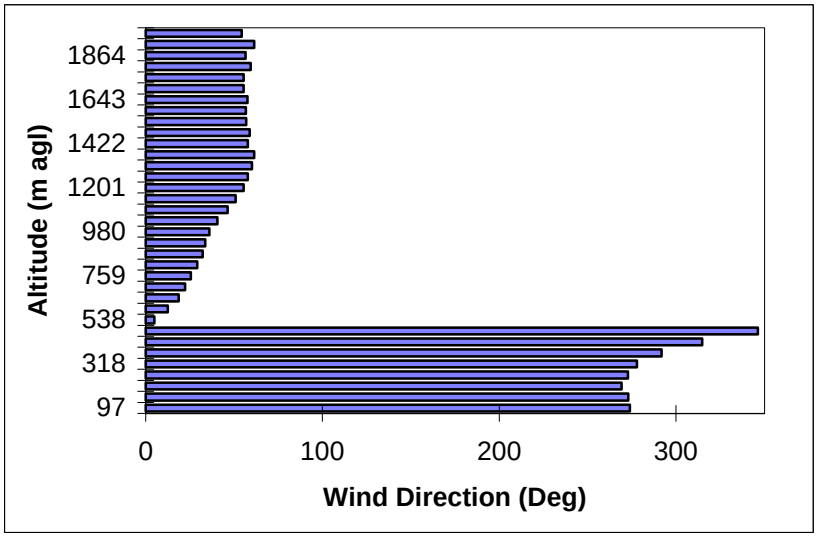
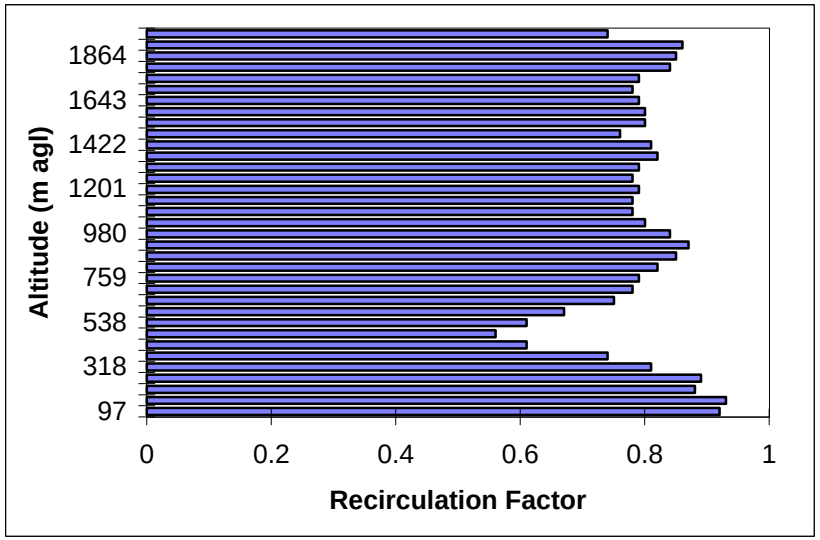
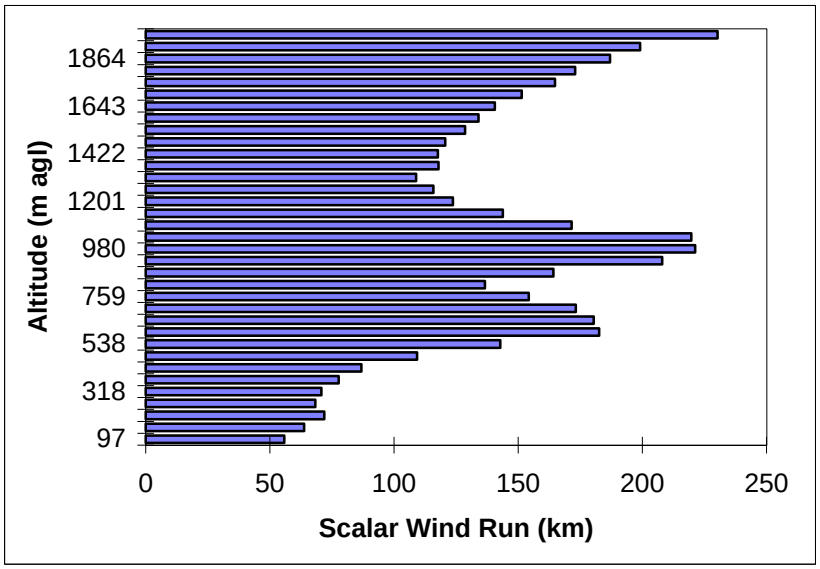


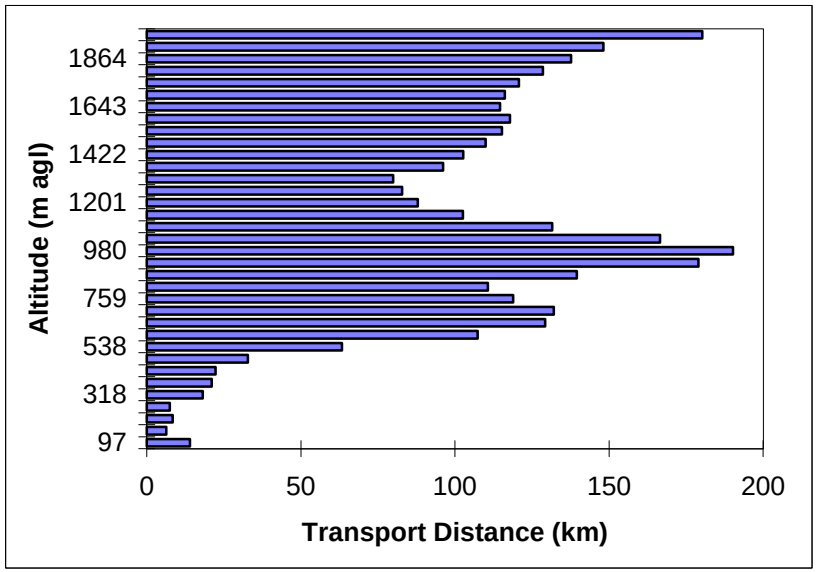


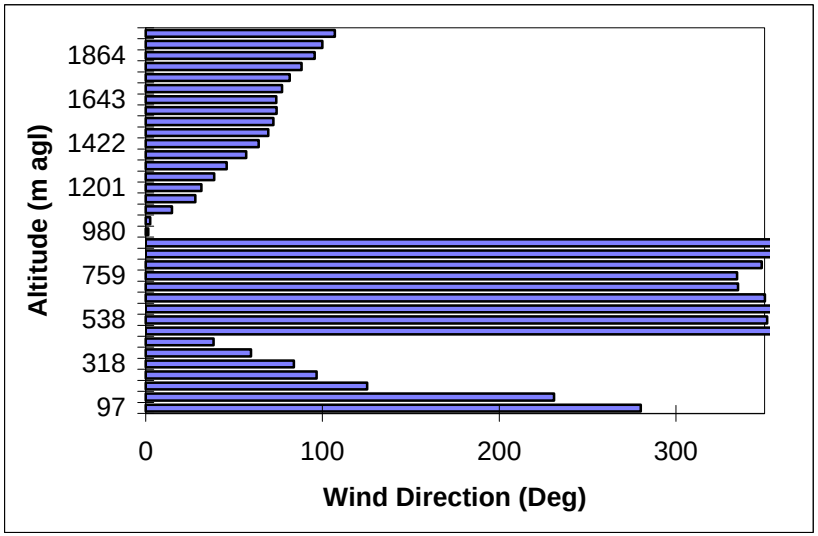


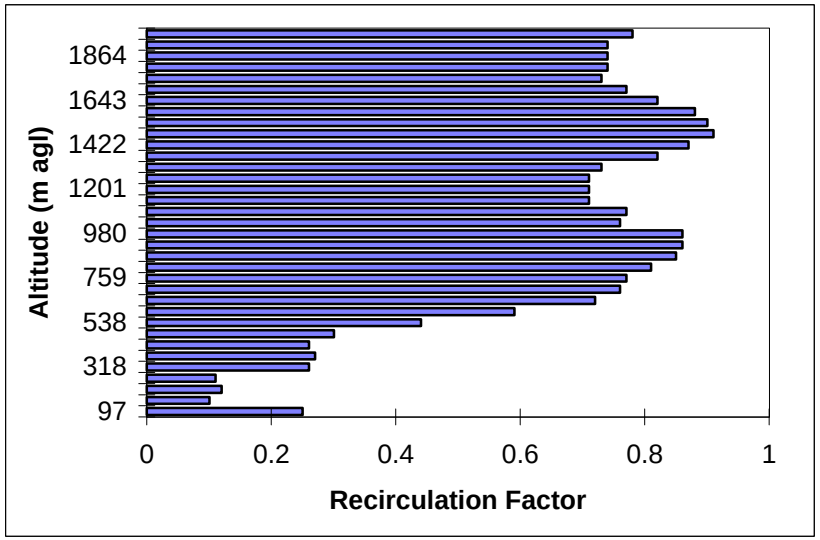


Ventura 07-15-98 1600 to 0400.xls

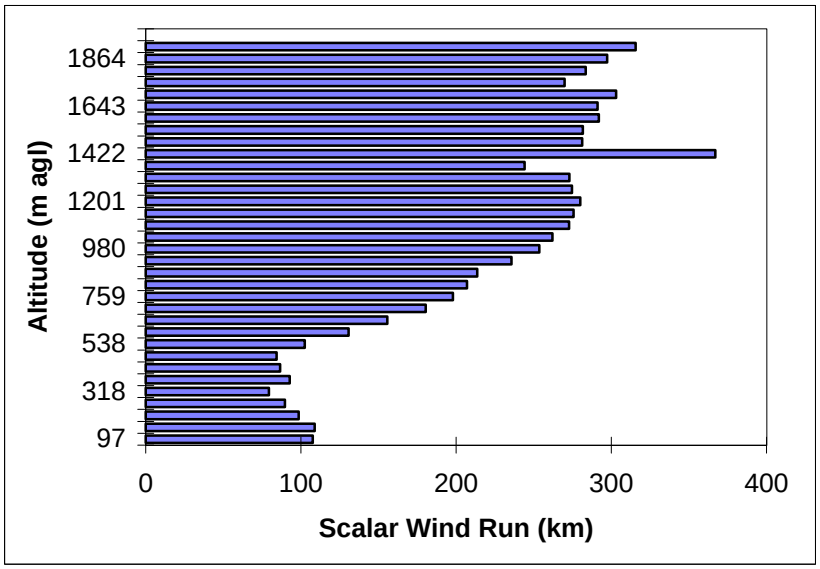


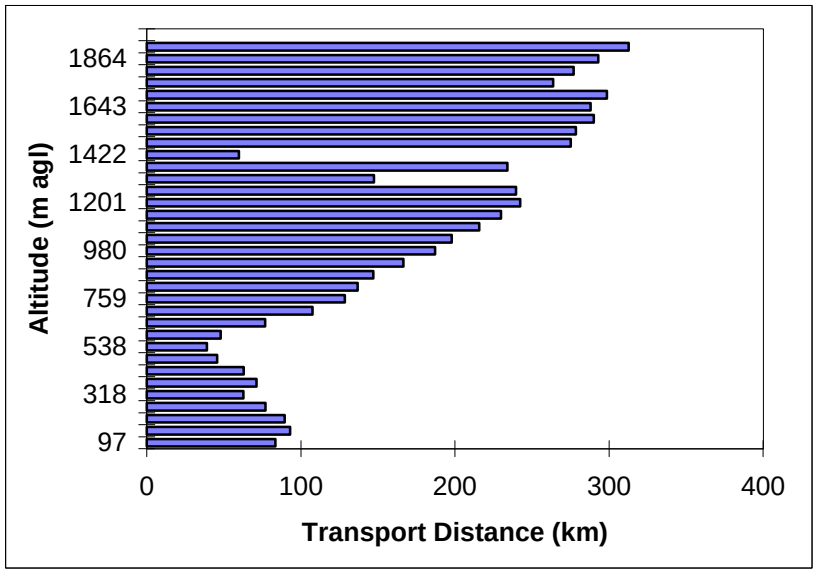


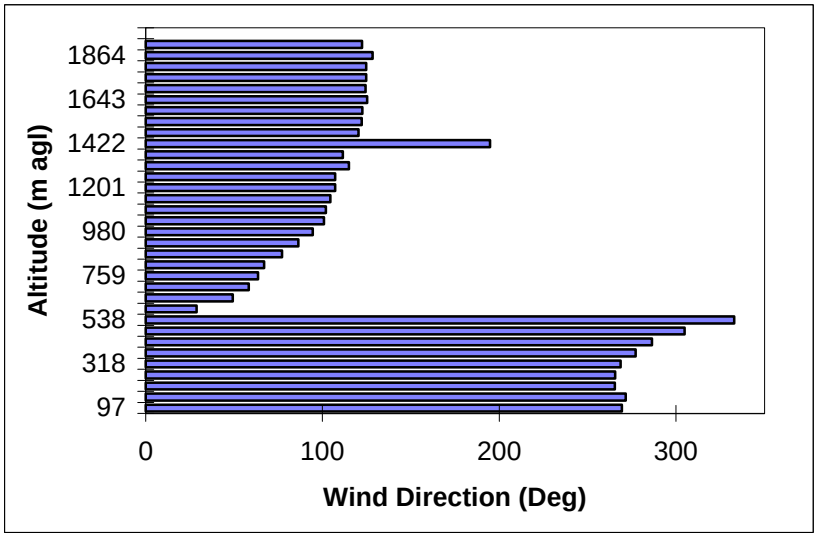




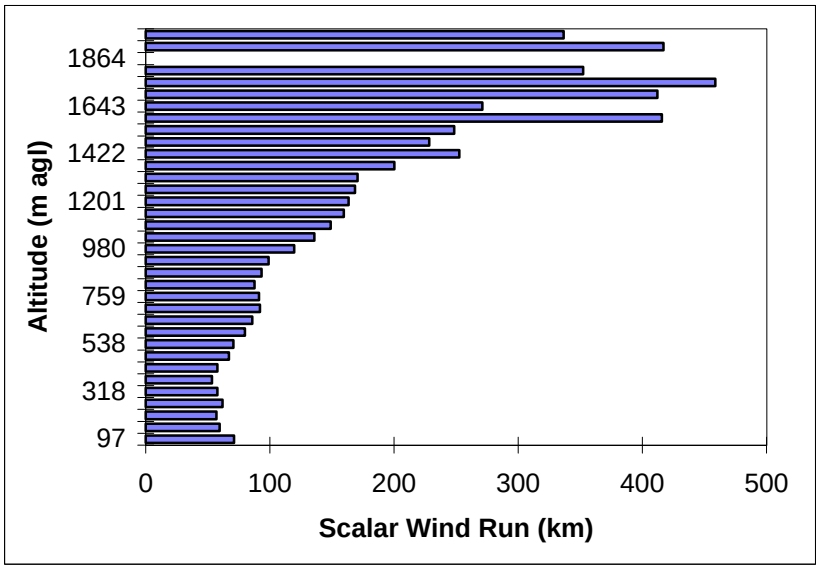
Ventura 07-16-98 0400 to 1600.xls

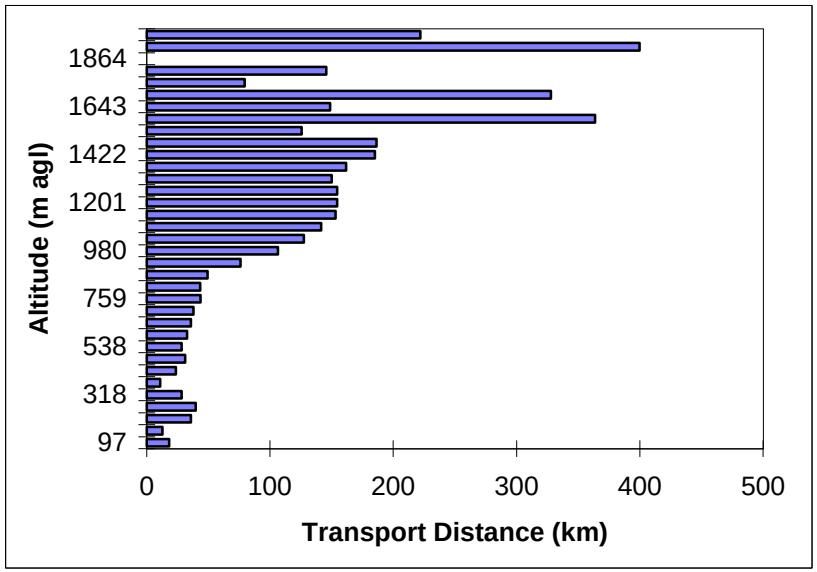


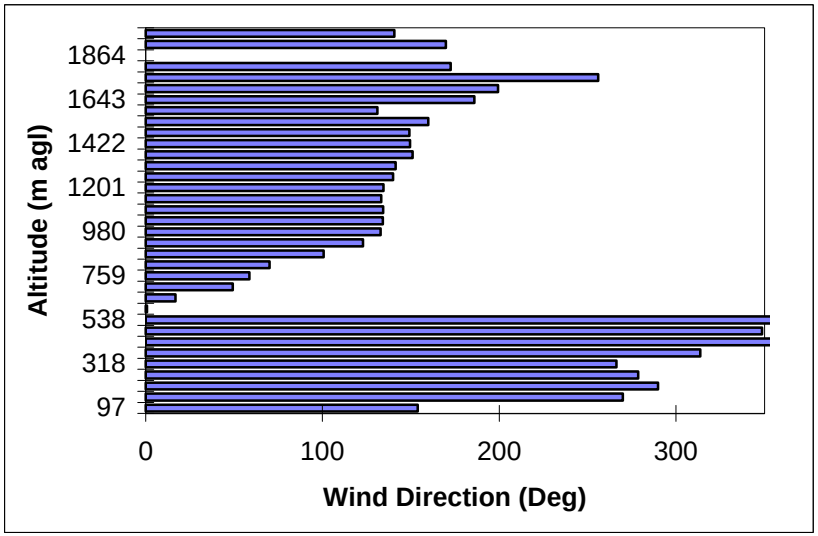


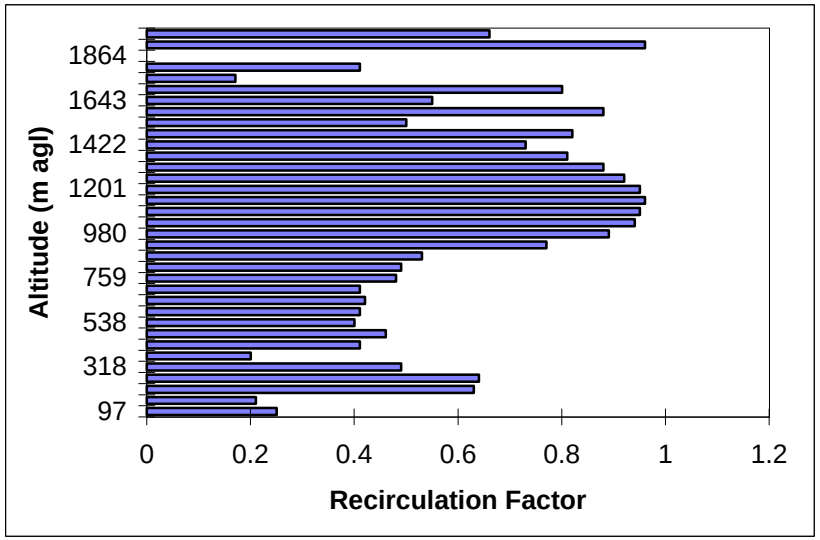


Ventura 07-16-98 1600 to 0400.xls









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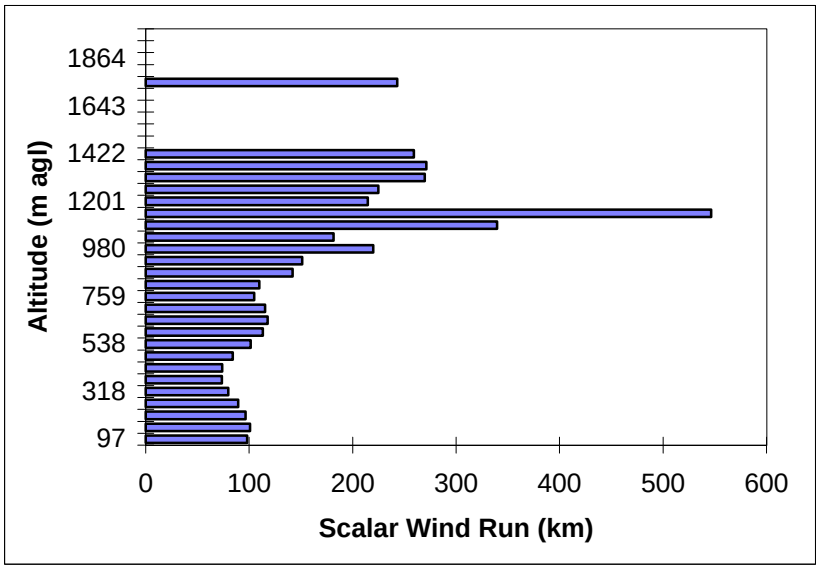
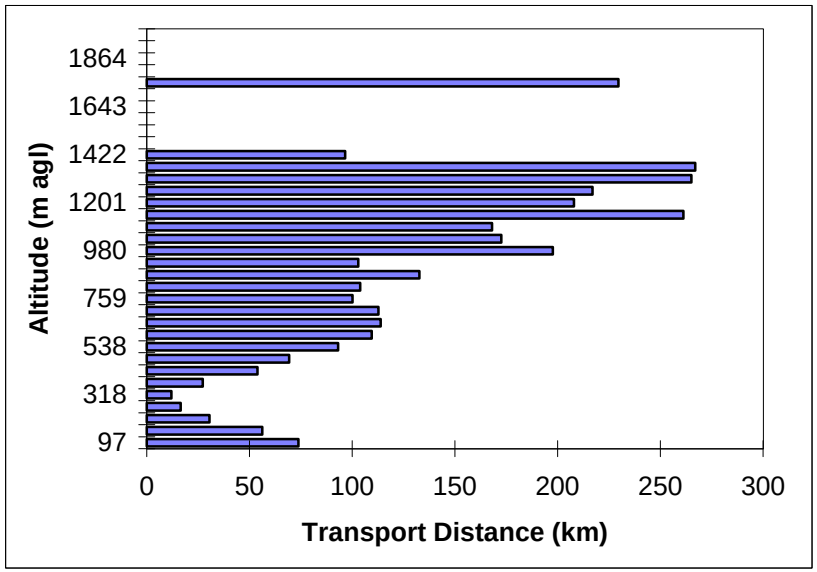
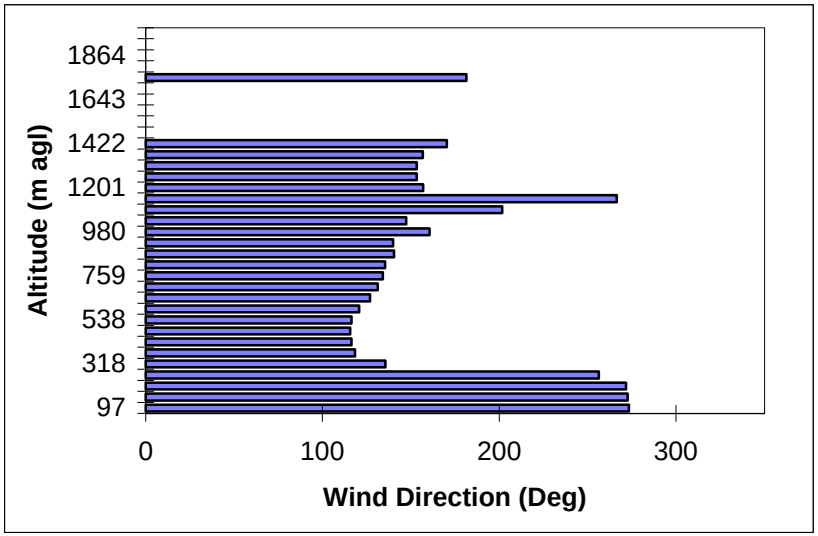
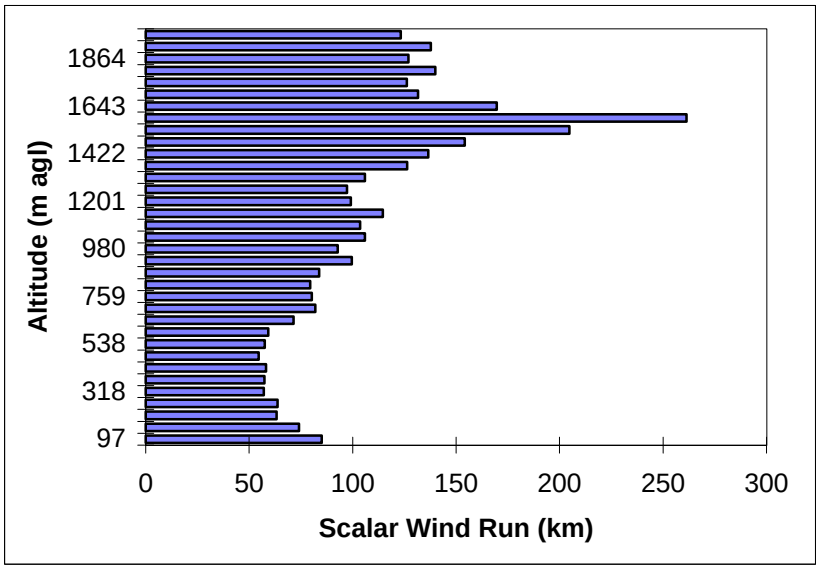
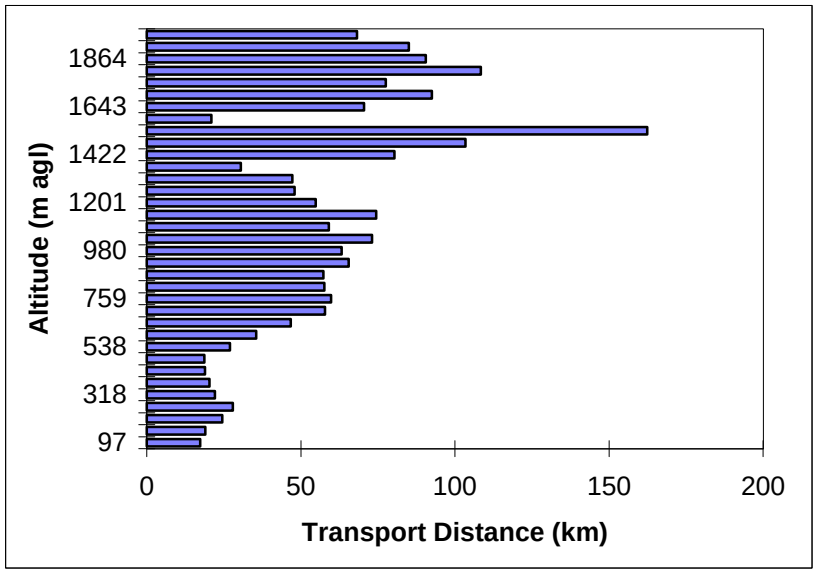


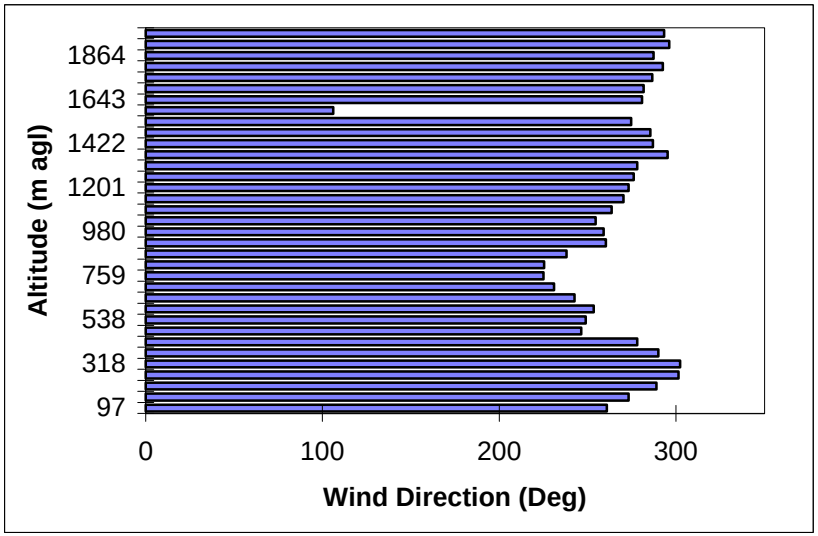


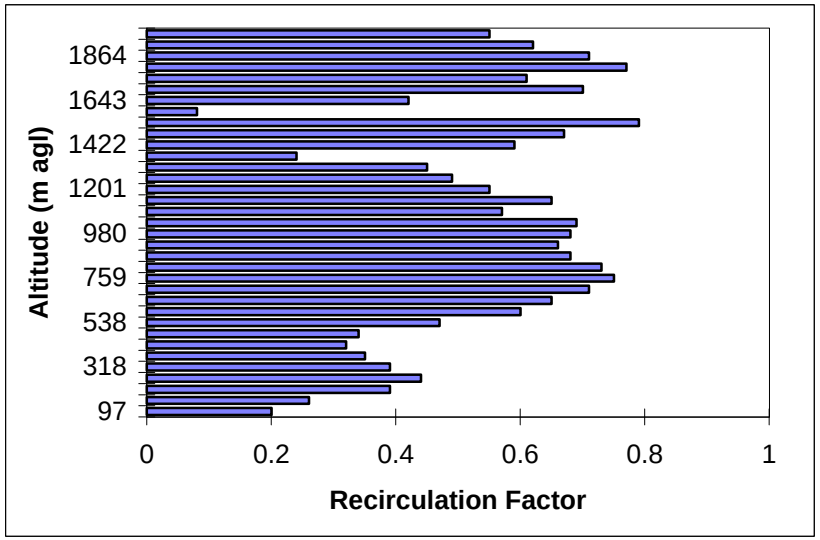


Ventura 07-17-98 1600 to 0400.xls

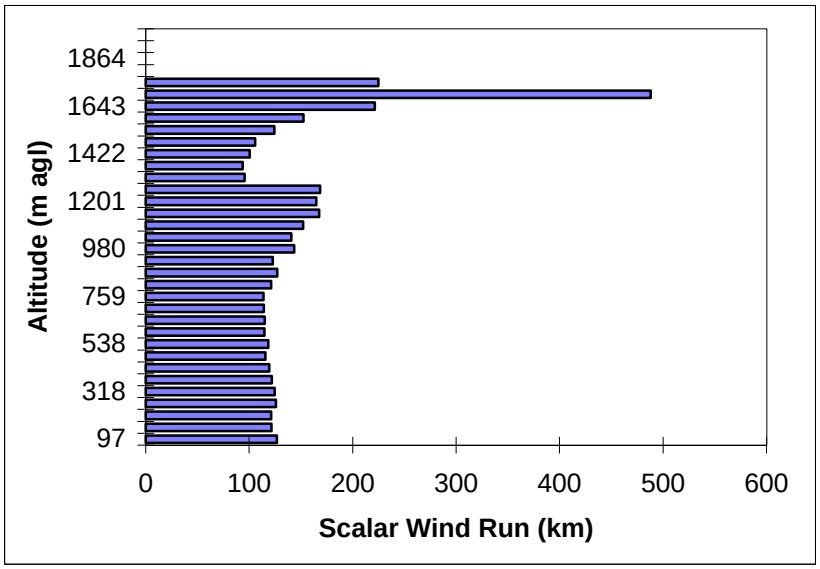


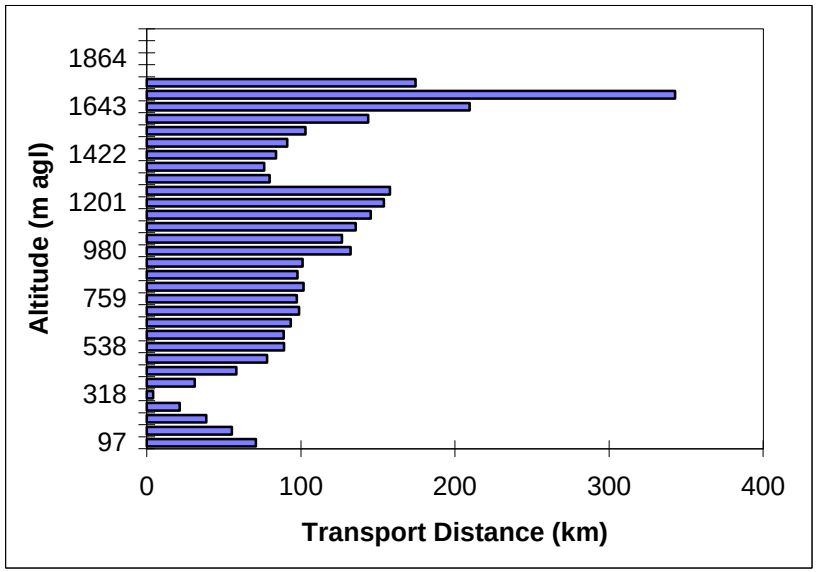


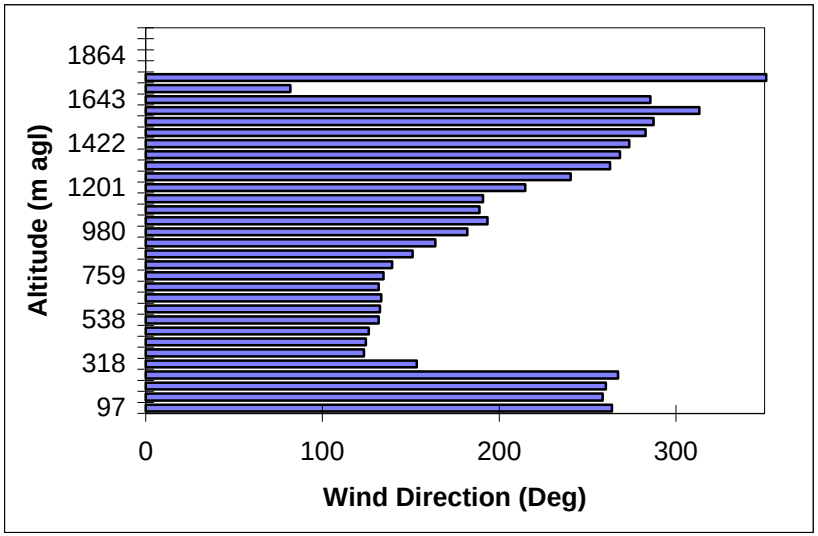


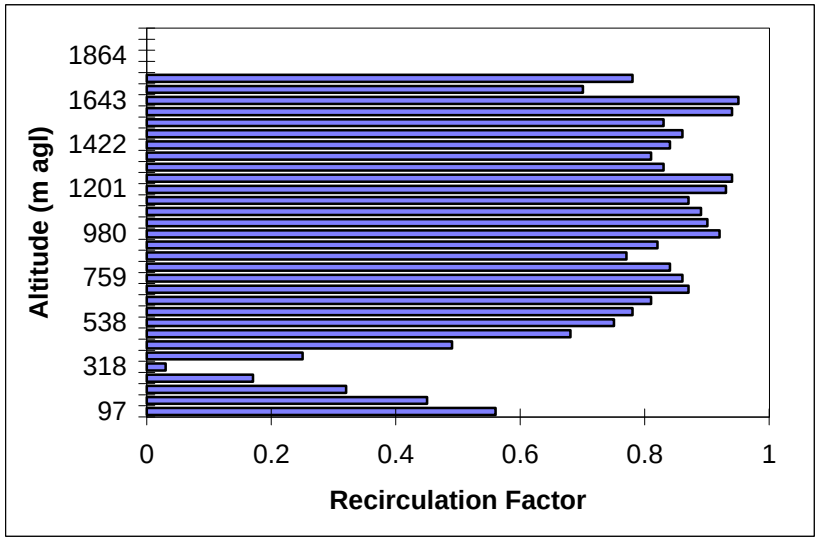


Ventura 07-18-98 0400 to 1600.xls

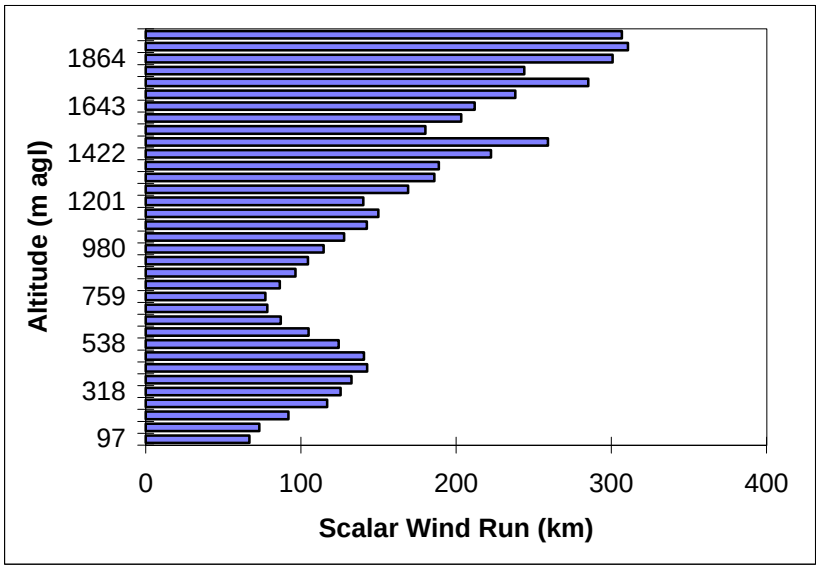


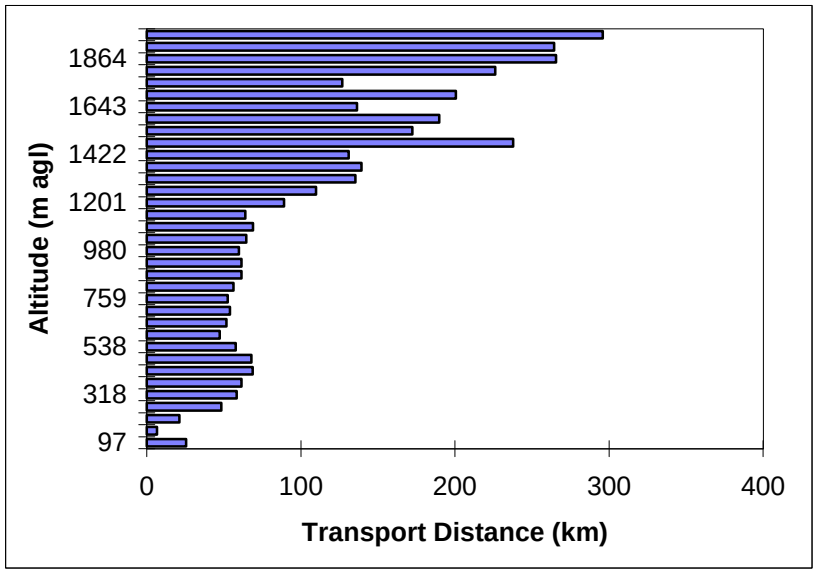


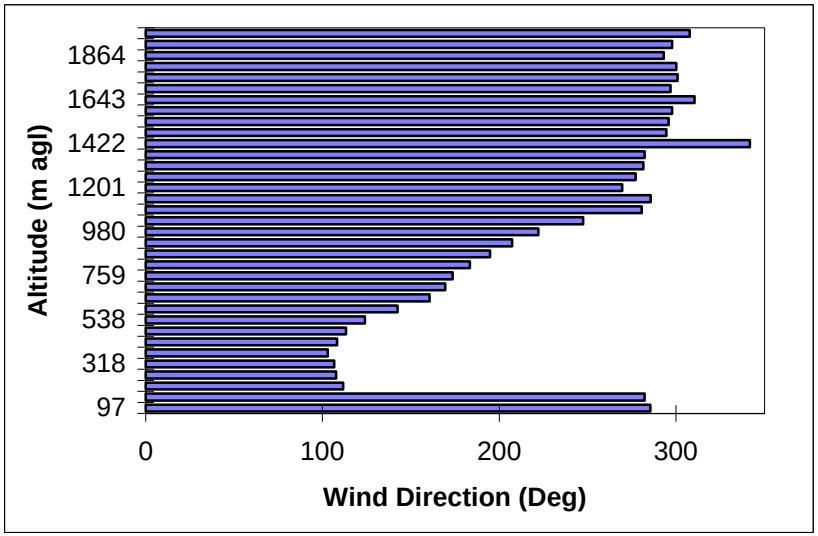


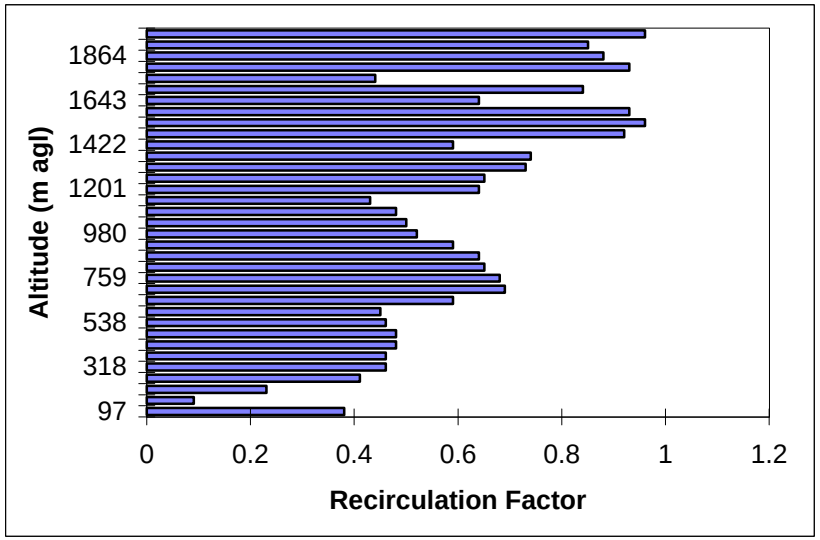


Ventura 07-18-98 1600 to 0400.xls

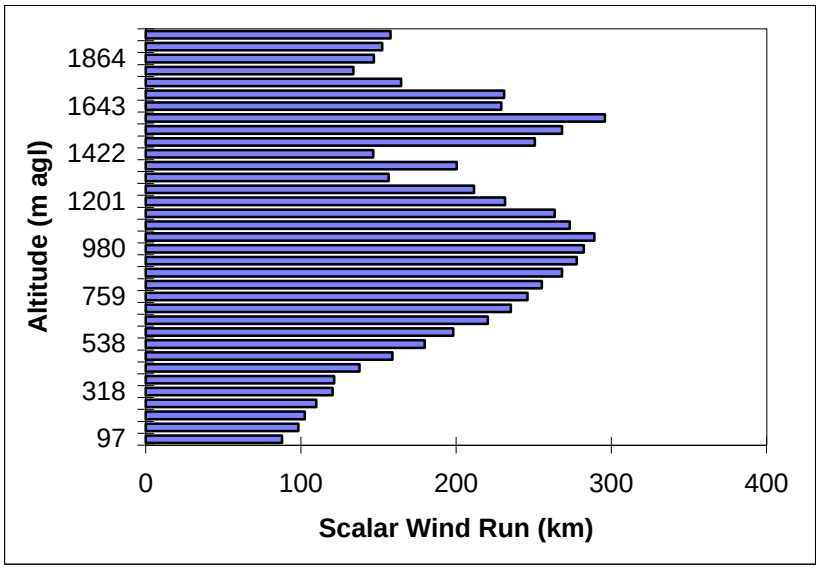


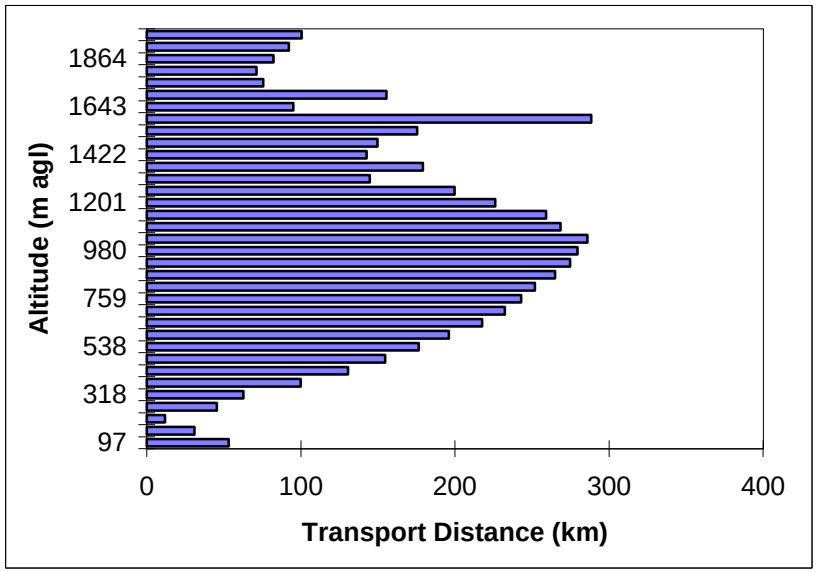


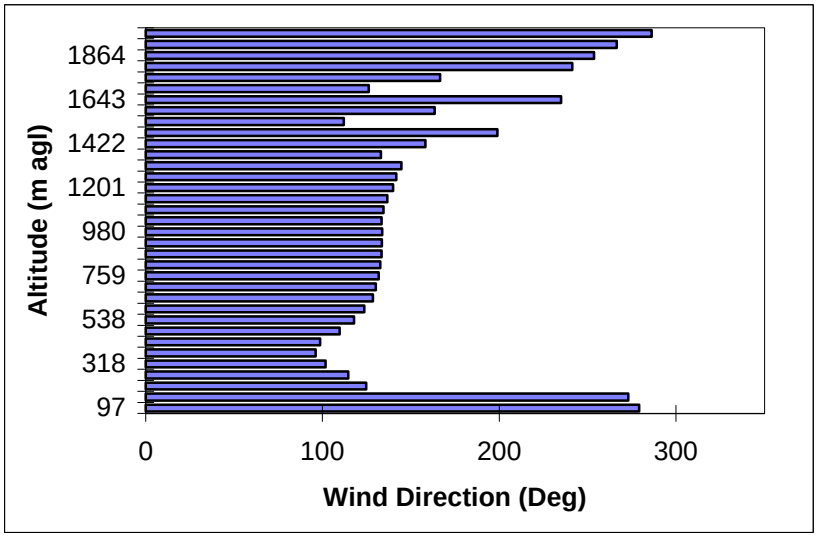


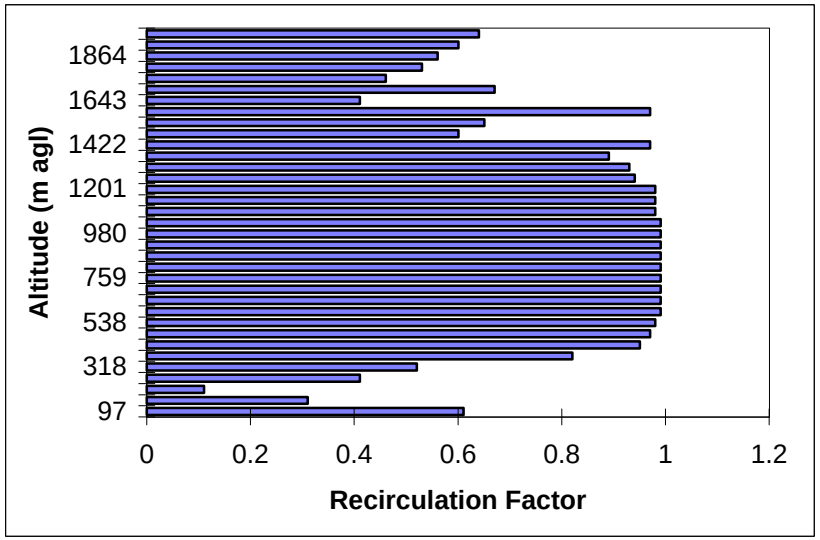


Ventura 07-19-98 0400 to 1600.xls

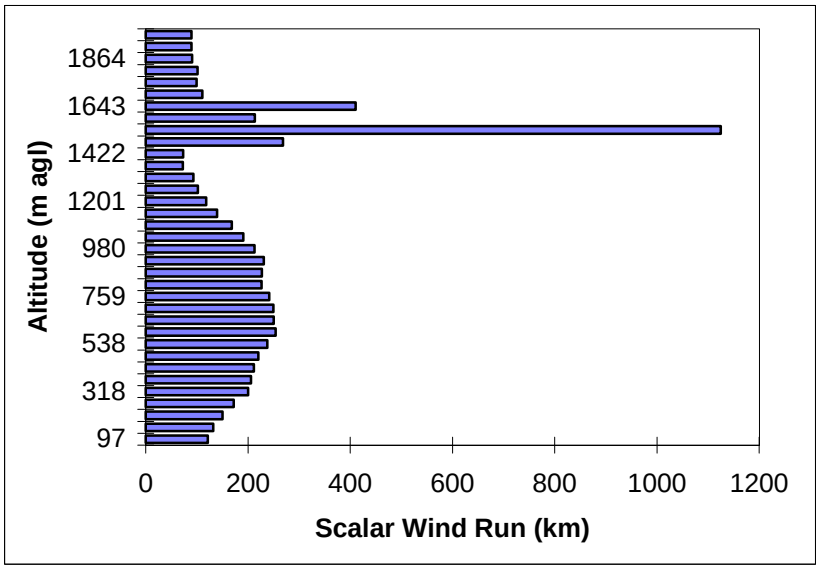


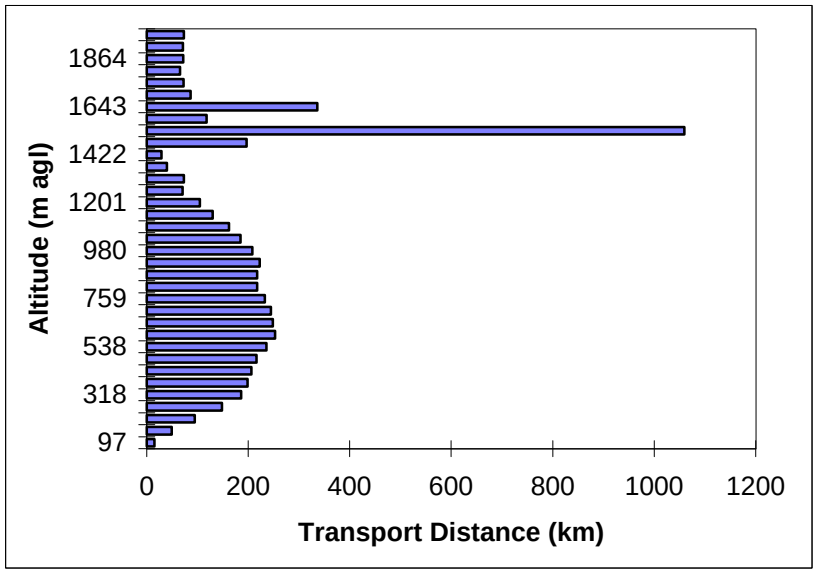


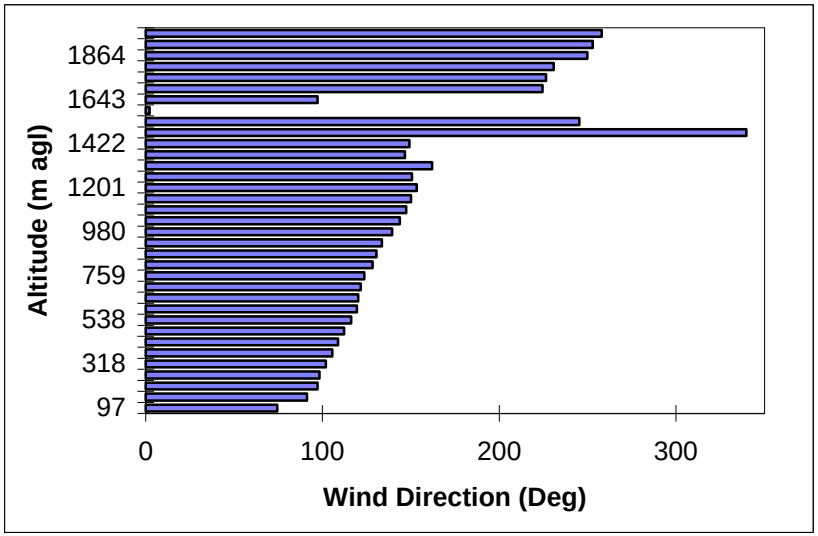


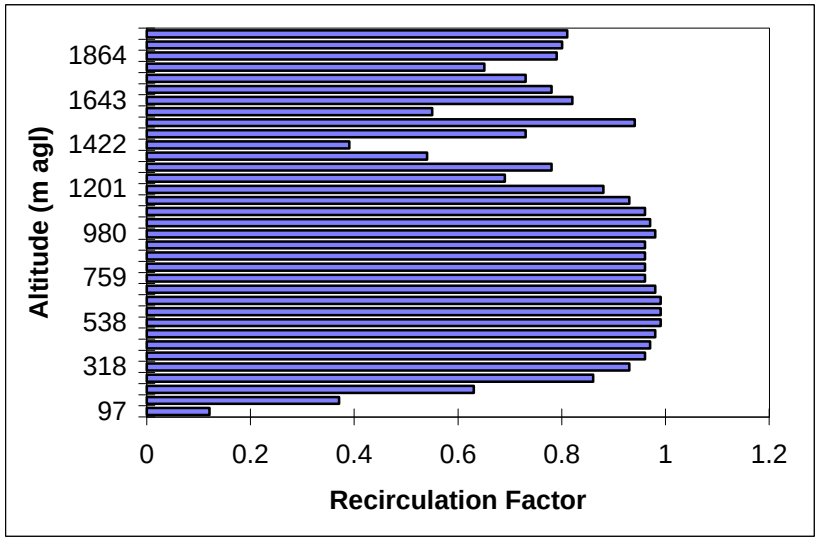
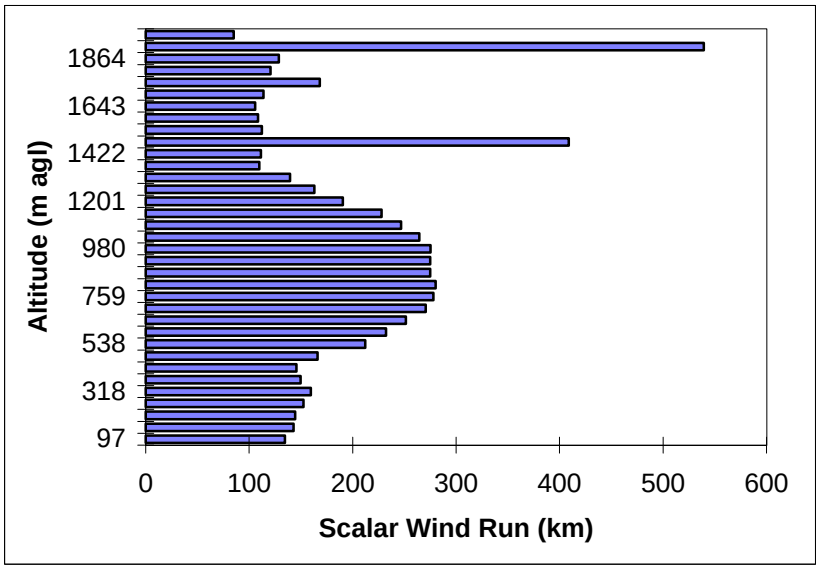
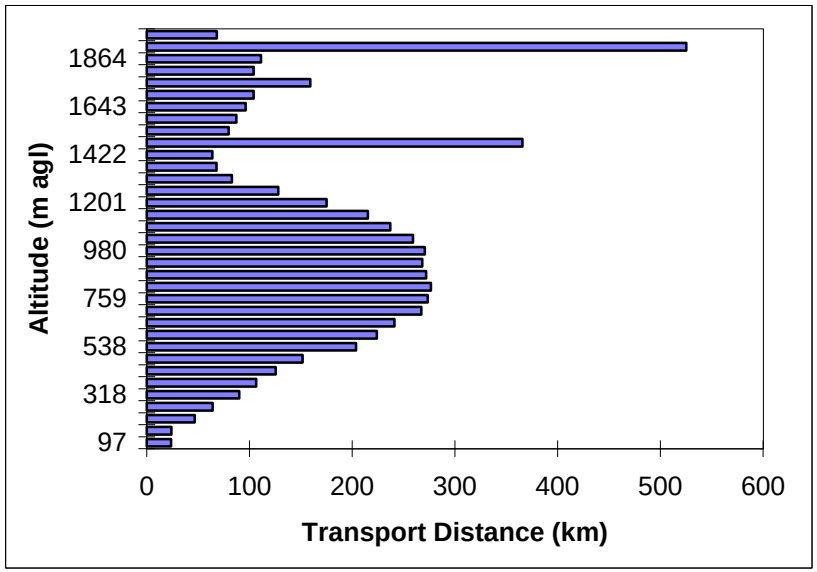
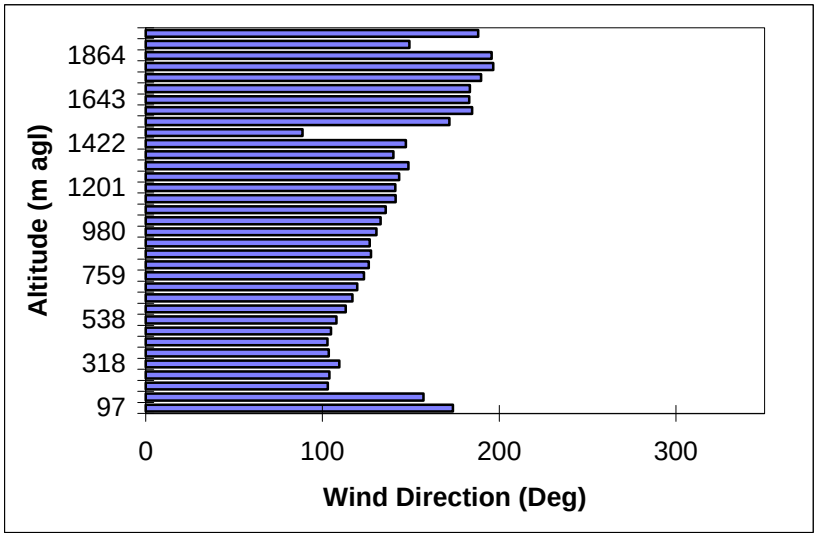
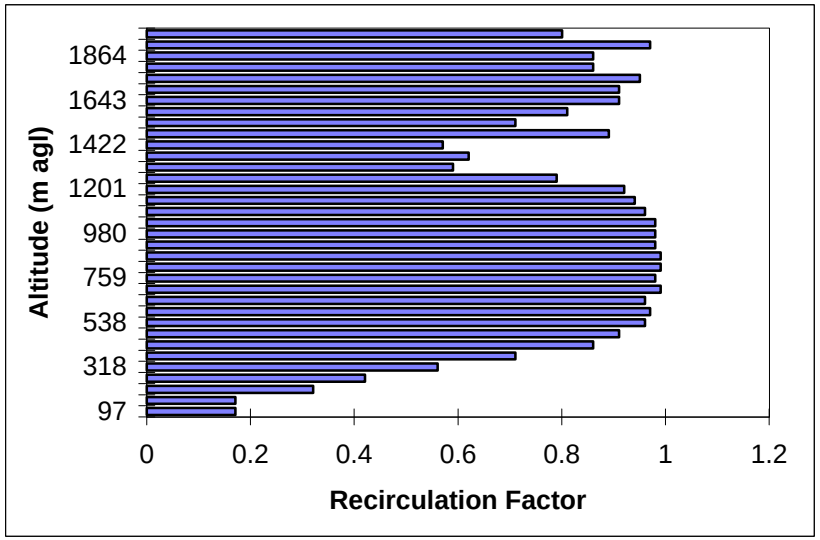


Ventura 07-19-98 1600 to 0400.xls









Ventura 07-20-98 0400 to 1600.xls