CLE47 and CLE52

LATITUDE STUDY UPDATE

I have compared the summertime results coming from CLE52 with the wintertime ones from CLE47.
In both CLEs we listened within 2 hours of midday, local time, and across the same frequency range.
The aim was to see if there were any significant differences in reception for listeners at different latitudes.

When we looked just at the winter results, there did seem to be some evidence of longer distance reception for the listeners at the highest latitudes - perhaps not surprising with the sun very low in the sky there, even around midday.

To compare winter and summer results, first we can count the **number of NDBs** heard by each listener.
The results are in the following table.
The reporters' results are shown in descending order of latitude - i.e. from the north down towards the equator.

The more interesting columns are the last ones showing figures for the 14 listeners who took part in both CLEs.
They show counts of NDBs that were only heard in the winter CLE and ones that were only heard in the summer CLE.

E.g. Bo, at latitude 63.4 degrees north, logged 63 NDBs in the winter CLE and 42 in the summer one.
40 of the NDBs were heard in both CLEs, another 23 in the winter only and 2 in the summer only.
I have added flags to help show which were greater - the counts for 'winter only's (W) or for 'summer only's (S).

Reporter	Lat. Rptr	Long. Rptr	Winter NDBs heard	Summer NDBs heard	Heard BOTH CLEs	Winter ONLY	Summer ONLY	flag
NOR bm	70.9	29.1	31					
SWE bn	63.4	18.6	63	42	40	23	2	**W**
FIN te	61.5	27.4		21				
NOR tb	59.4	5.3	14	8	7	7	1	**W**
SWE tn	58.8	17.0	13					
SWE ld	58.6	15.3		12				
SCT b1	57.5	-5.7		25				
SCT pw	55.5	-4.7	26					

ENG tm	54.6	-1.0		37				
NIR ry	54.1	-6.0	19					
ENG b2	53.9	-1.1		75				
ENG ag	53.6	-2.2	41	45	33	8	12	**s**
IRL rd	53.4	-6.3	28	26	21	7	5	**=**
HOL rb	51.5	3.6	50	81	47	3	34	**S**
ENG bk	51.3	-0.5	101					
DEU mz	51.1	14.0	52	16	14	38	2	**W**
ENG py	50.8	0.6	30					
CZE ze	50.8	15.2	16	4	4	12	0	**W**
FRA jj	50.5	2.6	42	49	39	3	10	**S**
GSY lr	49.5	-2.6	48					
DEU ud	48.0	7.8	25					
USA OR sr	45.6	-117.9		24				
FRA pv	45.5	6.0	28					
USA OR mc	45.4	-122.7		8				
USA OR jw	44.4	-124.1	4	3	3	1	0	**=**
CAN ON mf	43.9	-79.4	33	21	20	13	1	**W**
USA NY bg	43.0	-78.9		13				
USA MI ar	42.3	-85.6	67	39	36	31	3	**W**
USA IL dt	41.8	-88.0	63					
SAR gc	39.5	8.8	23	26	21	2	5	**s**
USA CO jh	39.3	-104.2	75					
USA CA ml	37.7	-122.5	13	6	6	7	0	**W**
USA NC th	35.1	-80.8	20					
USA AZ sr	32.0	-111.1	25					
USA AZ dp	31.9	-111.0	15	1	1	14	0	**W**
USA FL fm	28.0	-82.8	20					
TWN eb	23.0	120.4	4					

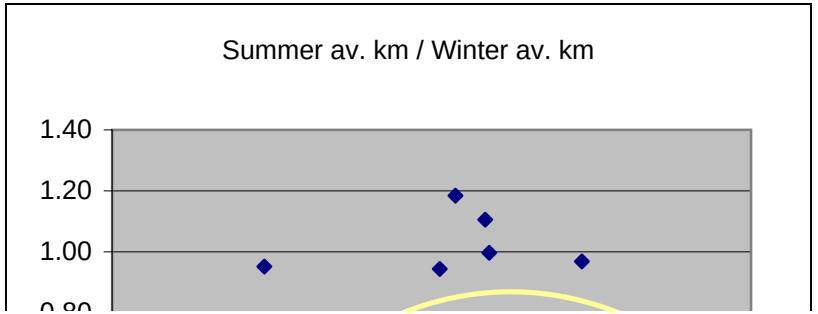
The results seem to show a preference for winter reception in the higher latitudes (a lot more 'winter only's than 'summer only's).
There seem to be no consistent differences between winter and summer for the more intermediate latitudes.
For the lower latitudes, there is again a preference for winter reception.

Another way of comparing the winter and summer results is to look at the **average distance** from each listener

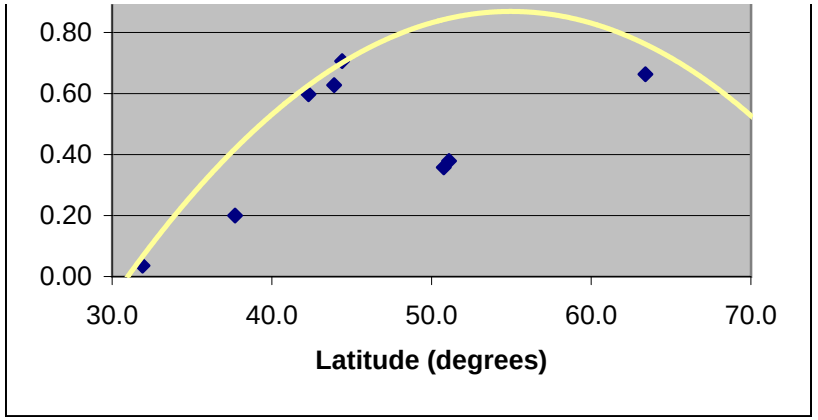
E.g. for Bo, who took part in both CLEs, the average distance to all his 63 winter loggings was 523 km
while the average distance to the 42 summer loggings was 347 km.

The final column is the ratio of summer to winter average distances - 0.66 or 66% for Bo.

Reporter	Lat. Rptr	Long. Rptr	Winter average Distance (km)	Summer average Distance (km)	Summer av. km / Winter av. km
NOR bm	70.9	29.1	1054		
SWE bn	63.4	18.6	523	347	0.66
FIN te	61.5	27.4		263	
NOR tb	59.4	5.3	352	341	0.97
SWE tn	58.8	17.0	310		
SWE ld	58.6	15.3		151	
SCT b1	57.5	-5.7		495	
SCT pw	55.5	-4.7	332		
ENG tm	54.6	-1.0		326	
NIR ry	54.1	-6.0	246		
ENG b2	53.9	-1.1		426	
ENG ag	53.6	-2.2	308	307	1.00
IRL rd	53.4	-6.3	293	324	1.11
HOL rb	51.5	3.6	347	411	1.18
ENG bk	51.3	-0.5	528		
DEU mz	51.1	14.0	520	197	0.38
ENG py	50.8	0.6	271		
CZE ze	50.8	15.2	232	83	0.36
FRA jj	50.5	2.6	304	287	0.94
GSY lr	49.5	-2.6	338		
DEU ud	48.0	7.8	321		
USA OR sr	45.6	-117.9		533	
FRA pv	45.5	6.0	425		
USA OR mc	45.4	-122.7		210	
USA OR jw	44.4	-124.1	344	243	0.71



CAN ON mf	43.9	-79.4	537	337	0.63
USA NY bg	43.0	-78.9		235	
USA MI ar	42.3	-85.6	492	294	0.60
USA IL dt	41.8	-88.0	447		
SAR gc	39.5	8.8	459	437	0.95
USA CO jh	39.3	-104.2	854		
USA CA ml	37.7	-122.5	691	138	0.20
USA NC th	35.1	-80.8	297		
USA AZ sr	32.0	-111.1	958		
USA AZ dp	31.9	-111.0	955	34	0.04
USA FL fm	28.0	-82.8	420		
TWN eb	23.0	120.4	270		



I could imagine a trend line when I plotted the distance ratio against Latitude - and of course Excel was happy to add one!
It is rather artificial - e.g. obviously it shouldn't really fall all the way to zero - and the possible pot of gold at 31 degrees latitude.

However, it does support the same conclusions as those coming from the first table.

Our results do seem to show that midday reception in winter was favoured at higher latitudes and ALSO that
at the lower latitudes winter is better than summer, while at the intermediate latitudes (say 45 - 60 degrees)
there was little difference between winter and summer.
I think this is because only the higher latitudes could benefit much from midday sky wave reception in winter,
the intermediate latitudes had much the same normal ground wave conditions during both CLEs
while lower latitude reception is often upset by static interference in summer, causing a higher noise level that masks
the weaker signals.

Our results must also have been affected by the random conditions that applied over the two particular weekends,
by any changes we made in our listening equipment over the 6 months, etc.
I guess it's easy to find explanations to fit the evidence, but not necessarily the right ones!
Any other ideas will be received with interest.

73 Brian

Latitude Study Update 5.xls
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