

NOTES ON E7

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BACKGROUND

E7 is the name of a Bar Tailed Godwit *Limosa lapponica* which recently made its flights between New Zealand and Alaska. It carried a satellite tracking transmitter and so the 2007 flight paths are clearly known.

A good reference is http://alaska.usgs.gov/science/biology/shorebirds/pacific_migration.html. There is lot of other information on this site which is part of the Pacific Shorebird Migration Project. Select "Bar Tailed Godwit" and then "Updates".

I also looked at <http://www.shorebirdsnetwork.org/news070909migration.html>

The New Zealand site is the Thames River estuary 37° S 175° 30' E. The Alaskan breeding grounds are on the Kuskoswim River 59° 52' N 162° 22' W.

In flying south, leaving on 29 August and arriving on 07 September, the bird flew in a south west oriented curve a great circle distance of about 10,960 km. The average speed is about 50 kph.

In flying north the bird did not fly back along its southward passage. It left New Zealand on 17 March 2007 and flew generally northwest to N Korea, nominal position 42° 0' N 127° 0' E where it arrived on 25 March. The great circle distance is 10,070 km.

The bird rested until 01 May and then flew generally east some 5046 km until it reached Alaska. Average speed is about 42 kph. It seems from the plots that the birds flew near enough East until 170°E and then turned more north to pick up the line of the Aluetians.

INITIAL COMMENTS

In my initial Line Following paper, I discussed the flight of the Lesser Golden Plover, *Pluvialis pluvialis*, which flew from Alaska to Hawaii in the autumn, the much lesser distance of some 5,000 km. This bird, I worked out, can fly back to Alaska in the spring by (more or less) following a return path. Therefore I was surprised that E7 did not do the same thing.

This northward distance flown by E7 is a total of 15,116 km which is some 40% greater than the southern flight distance, and there has to be some very good reason for this.

CALCULATIONS

Southward Flight (If the bird were flying a great circle the departure bearing would be 197°)

The bird started on 29 August 2007, Julian date = 2454342. Departure point 59° 52' N 162° 22' W. If it sets dsr = 24h 15m and flies at 50 kph then it will arrive at the destination. All this Flight Path A.

| Date | Position | Bearing |
|-------------------|----------------------------|---------|
| 29 August 2007 | 59° 52' 0"N 162° 22' 0"W | 171 |
| 30 August 2007 | 49° 4' 37"N 159° 46' 48"W | 179 |
| 31 August 2007 | 38° 11' 6"N 159° 46' 48"W | 185 |
| 01 September 2007 | 27° 19' 45"N 160° 50' 5"W | 190 |
| 02 September 2007 | 16° 35' 19"N 162° 47' 22"W | 191 |
| 03 September 2007 | 5° 53' 16"N 164° 51' 47"W | 193 |
| 04 September 2007 | 4° 43' 36"S 167° 18' 34"W | 193 |
| 05 September 2007 | 15° 19' 50"S 169° 50' 24"W | 193 |
| 06 September 2007 | 25° 55' 24"S 172° 33' 10"W | 191 |
| 07 September 2007 | 36° 35' 25"S 175° 8' 15"W | |

dsr = 24h 0 m takes the birds to the East of New Zealand dsr = 24h 30 m takes the birds to the West.

Northward Flight Part 1 (If the bird were flying a great circle the departure bearing would be 326°)

The bird started on 17 March 2007 Julian date = 2454176. Departure point 37° S 175° 30' E.

The bird has two choices. With dsr = 23h 45m and at 50 kph the bird can fly directly to the Alaskan coast, so you would think it would try this. Call this Flight Path B

| Date | Position | Bearing |
|---------------|----------------------------|---------|
| 17 March 2007 | 37° 0' 0"S 175° 30' 0"E | 22 |
| 18 March 2007 | 27° 1' 17"S 179° 57' 37"E | 21 |
| 19 March 2007 | 17° 0' 29"S 176° 3' 54"W | 21 |
| 20 March 2007 | 7° 1' 5"S 172° 14' 5"W | 21 |
| 21 March 2007 | 2° 56' 54"N 168° 25' 27"W | 19 |
| 22 March 2007 | 13° 1' 16"N 164° 52' 22"W | 16 |
| 23 March 2007 | 23° 15' 2"N 161° 40' 59"W | 14 |
| 24 March 2007 | 33° 34' 5"N 158° 35' 46"W | 11 |
| 25 March 2007 | 44° 0' 29"N 155° 46' 32"W | 7 |
| 26 March 2007 | 54° 34' 33"N 153° 31' 58"W | 11 |
| 27 March 2007 | 64° 58' 28"N 148° 44' 28"W | |

It can also set dsr = 24h 23m and 50 kph will take it to a point in N Korea. Call this Flight Path C

| Date | Position | Bearing |
|---------------|---------------------------|---------|
| 16 March 2007 | 37° 0' 0"S 175° 30' 0"E | 336 |
| 17 March 2007 | 26° 53' 11"S 170° 32' 1"E | 332 |
| 18 March 2007 | 17° 7' 11"S 165° 10' 43"E | 329 |
| 19 March 2007 | 7° 39' 51"S 159° 30' 44"E | 329 |
| 20 March 2007 | 1° 44' 39"N 153° 53' 34"E | 328 |
| 21 March 2007 | 11° 0' 18"N 148° 0' 11"E | 329 |
| 22 March 2007 | 20° 19' 12"N 142° 0' 46"E | 330 |
| 23 March 2007 | 29° 41' 1"N 135° 43' 57"E | 332 |
| 24 March 2007 | 39° 11' 29"N 129° 7' 16"E | 336 |
| 25 March 2007 | 49° 1' 3"N 122° 21' 11"E | |

You would not expect a bird to take a longer route where there was a shorter option. Possible the winds are a factor. The SE trades generally come from ESE, but whether they are important at the flying altitude of 2000 m I do not know.

Northward Flight Part 2 (If the bird were flying a great circle the departure bearing would be 42°)

The bird started on 01 May 2007 Julian date = 2454222. Departure point 42° 0' N 127° 0' E

There is no Allowed Line from N Korea which goes directly to the Kuskoswim River in Alaska. With dsr = 22h 45m or thereabouts, the bird can hit the Canadian coast and then fly northwards along the coast. Alternatively the bird can take this Eastward looking course for four days and then simply abandon it and fly approximately northwards. It will then hit the Aleutians.

| Date | Position | Bearing |
|-------------|----------------------------|---------|
| 01 May 2007 | 42° 0' 0"N 127° 0' 0"E | 67 |
| 02 May 2007 | 45° 41' 8"N 143° 15' 7"E | 79 |
| 03 May 2007 | 46° 40' 39"N 160° 56' 33"E | 81 |
| 04 May 2007 | 47° 11' 45"N 178° 55' 28"E | 81 |
| 05 May 2007 | 47° 41' 21"N 162° 55' 7"W | 83 |
| 06 May 2007 | 47° 44' 9"N 144° 39' 8"W | 83 |
| 07 May 2007 | 47° 46' 45"N 126° 22' 11"W | |

