Problem given 12 March 2015

REGIONAL

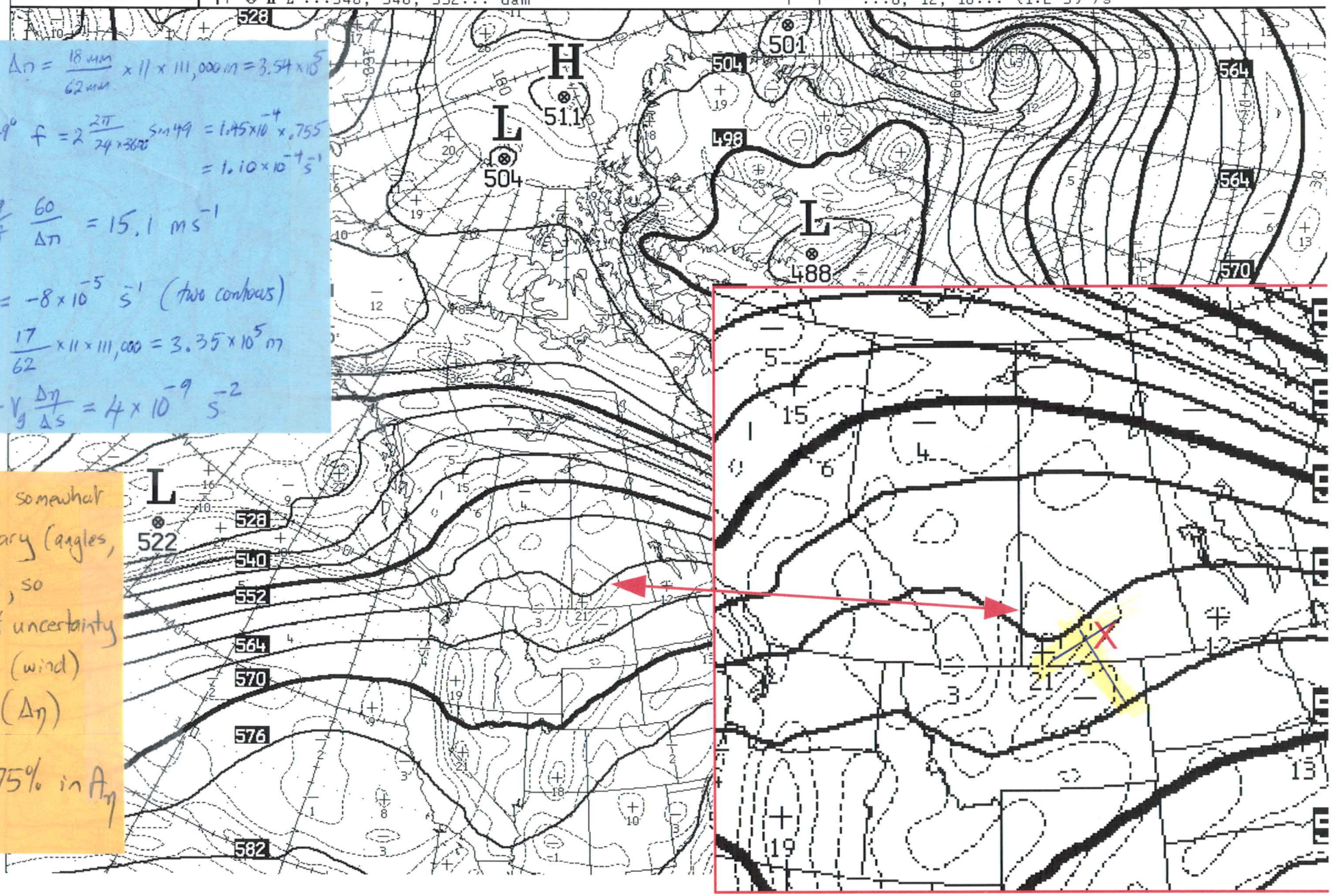
GEM

00H FORECAST - PREVISION 00h
V06Z THU-JEU 12 MAR-MAR 15

500 hPa HEIGHT-HAUTEUR VORTICITY-TOURBILLON

HEIGHT - HAUTEUR
⊗ H L ...540, 546, 552... dam

VORTICITY - TOURBILLON
+ − ...8, 12, 16... (1.E-5) /s



Wind $\Delta n = \frac{18\text{ mm}}{62\text{ mm}} \times 11 \times 111{,}000\text{ m} = 3.54 \times 10^5$

Lat ~ 49° $f = 2\frac{2\pi}{24 \times 3600}\sin 49 = 1.45 \times 10^{-4} \times .755$
$= 1.10 \times 10^{-4}\ s^{-1}$

$V_g = \frac{g}{f}\frac{60}{\Delta n} = 15.1\ ms^{-1}$

$\Delta\eta = -8 \times 10^{-5}\ s^{-1}$ (two contours)

$\Delta s = \frac{17}{62} \times 11 \times 111{,}000 = 3.35 \times 10^5\ m$

$A_\eta = -V_g\frac{\Delta\eta}{\Delta s} = 4 \times 10^{-9}\ s^{-2}$

Choices somewhat arbitrary (angles, lengths), so levels of uncertainty ~25% (wind) ~50% ($\Delta\eta$)

∴ ~75% in A_η