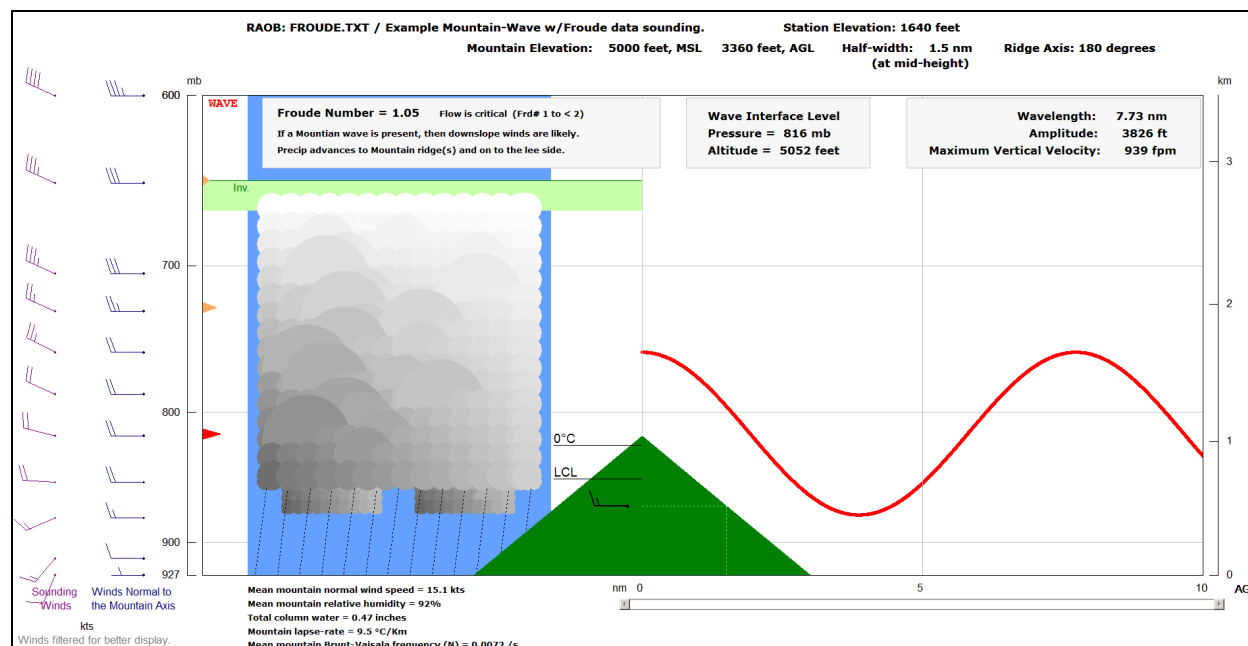


19.4 Mountain Wave & Froude Number Display.

The prior page describes RAOB's standard mountain wave display screen, which is available to all RAOB program versions. The below image was created by the new Expanded display screen, which requires use of both the optional Analytic module and a wide-screen computer monitor.



The above expanded mountain wave screen not only displays the same standard mountain-wave images and functions, but it also displays Froude Number data. Froude Number data is important to forecasting enhanced mountain precipitation (rain & snow), and potential for mountain-gap wind funneling and downslope winds (such as Foehn and Chinook winds).

This screen also displays RAOB's RICAPS cloud & precipitation analyses, which is represented by the blue region upwind (left) of the mountain. This RICAPS analysis display represents weather associated with the analyzed sounding, which ideally is situated in a valley just upwind of the mountain. Inversions are also plotted as horizontal green bars. The black colored wind, that is plotted mid-way up the mountain's windward side, represents the mean normal wind, which is used to calculate the Froude Number ...

$$\text{Froude Number} = U / (N \times H)$$

where: U = the mean normal wind between the surface and mountain peak
 N = the mean Brunt-Vaisala frequency from the surface to mountain peak.
 H = the height of the mountain.

Studies show that Froude Numbers less than 1 reflect blocked mountain wind flow, while numbers greater than 1 indicate winds that flow freely over mountains, thereby increasing potential for downslope winds. RAOB's expanded screen will display the following based on these Froude Number categories:

Froude No.	Expected Wind Flow & Weather Pattern
< 0.5	Upslope clouds/precipitation backed farther upwind of and up to mountain crest.
0.5 to < 1.0	Upslope clouds/precipitation falls immediately upwind of mountain crest.
1.0 to < 2.0	Precipitation advances to mountain ridge and on to the lee side.
>= 2.0	Air flows freely over mountain crest along with scattered downwind weather.