ANAC | Administración Nacional de Aviación Civil

Argentina

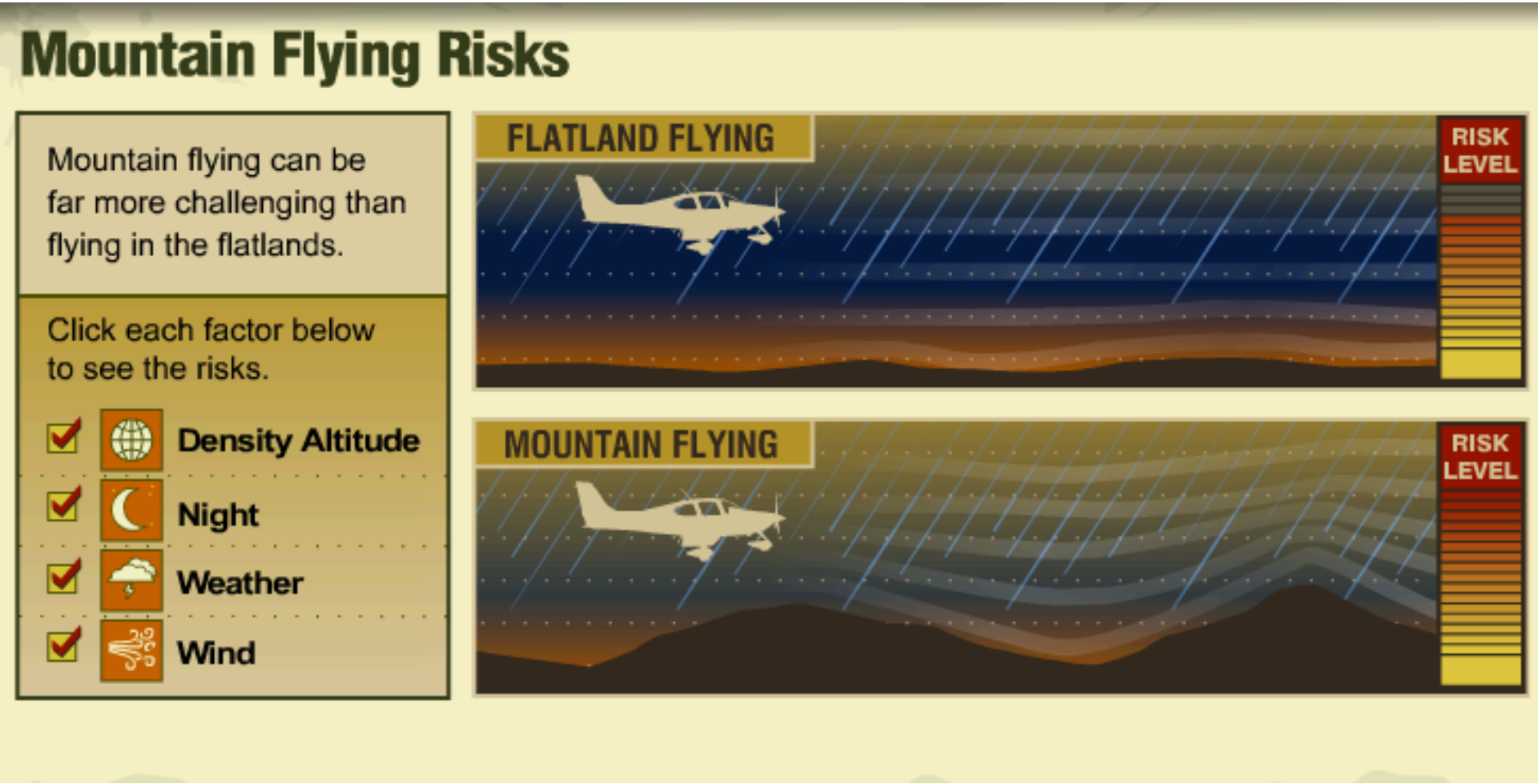
Ministerio del Interior y Transporte
Presidencia de la Nación

VUELO EN MONTANA

FUNDAMENTOS

CHOLILA
OCTUBRE 2014

ANALISIS DE RIESGOS



VUELO EN MONTAÑA

IRREGULARIDADES DEL TERRENO


VUELO EN MONTAÑA
NO HAY HORIZONTE

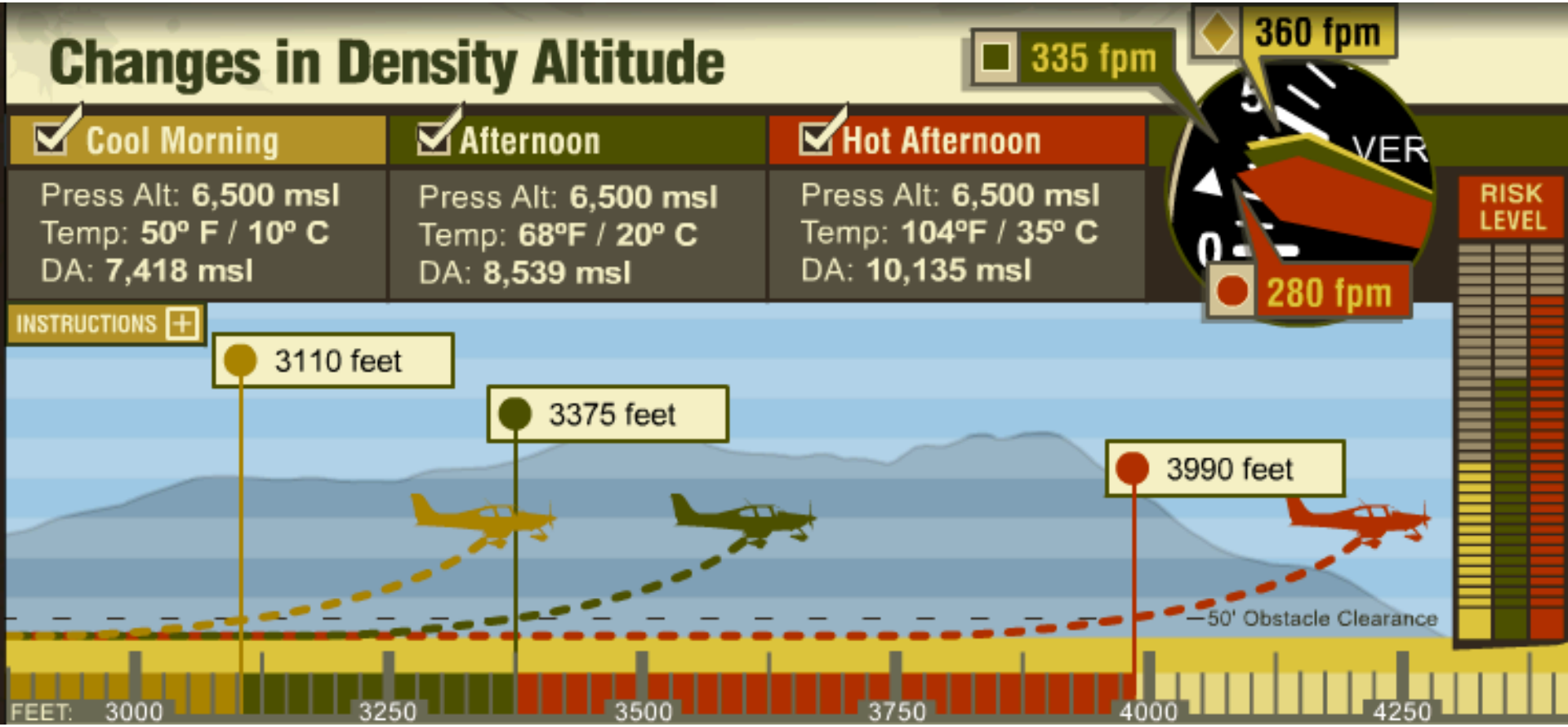

VUELO EN MONTAÑA
LA NIEVE / AGUA CAMBIAN
LAS REFERENCIAS


Base de conocimiento
ZONA A SOBREVOLAR
AERODROMOS / LADs


Base de conocimiento
LIMITES PERSONALES
CONCIENCIA SITUACIONAL

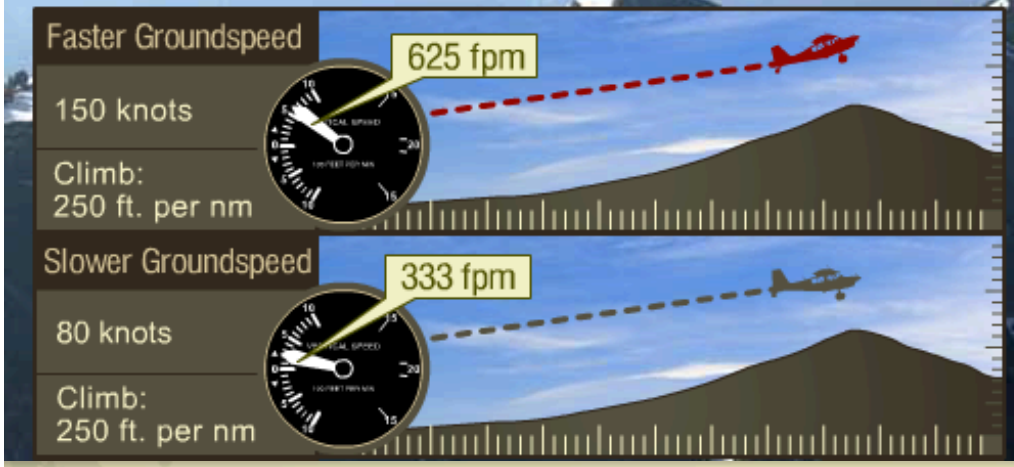
Base de conocimiento

AERONAVE PERFORMANCE

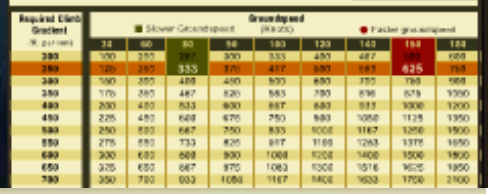

Changes in Density Altitude
Cool Morning
Press Alt: 6,500 msl
Temp: 50° F / 10° C
DA: 7,418 msl
Afternoon
Press Alt: 6,500 msl
Temp: 68°F / 20° C
DA: 8,539 msl
Hot Afternoon
Press Alt: 6,500 msl
Temp: 104°F / 35° C
DA: 10,135 msl
335 fpm
360 fpm
280 fpm
RISK LEVEL
INSTRUCTIONS
3110 feet
3375 feet
3990 feet
50' Obstacle Clearance
FEET: 3000 3250 3500 3750 4000 4250

Climb Gradient

Unlike rate of climb, which is measured in feet per minute (fpm), climb gradient is measured in feet per nautical mile (nm) and is a function of rate of climb *and* ground speed. The faster an aircraft's groundspeed, the greater the rate of climb needed to avoid obstacles.



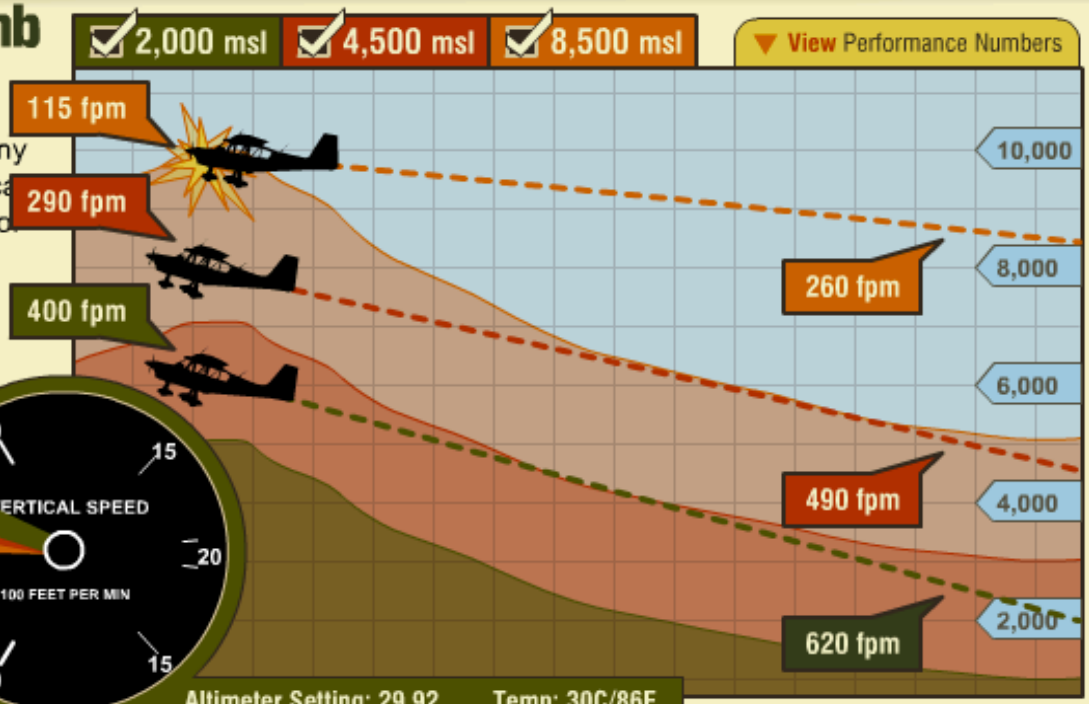
Rate of Climb Table ▲ VIEW



Diminishing Climb Performance

At high density altitudes, many normally-aspirated engines ca only provide enough power fo a 200 or 300 foot-per-minute climb…and a mountain downdraft can easily reduce that to zero (or even turn it into a descent).

Select each departure altitude at the top of the chart to see the effect on climb performance.



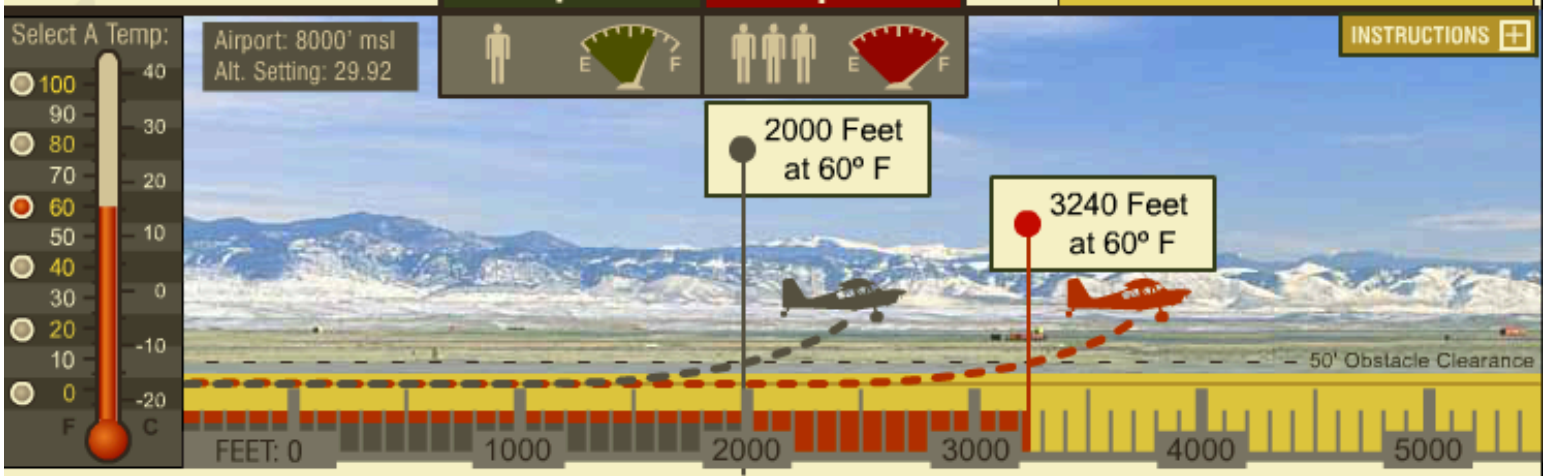
True Airspeed

True airspeed increases with altitude. Pilots making their first high-altitude takeoff or landing are surprised to see how fastthe ground is whizzing by, even though they are correctly using the same indicated airspeed as at sea level.

Weight Considerations

Select An Airplane Or Compare Both: Airplane 1 Airplane 2

View the Performance Numbers



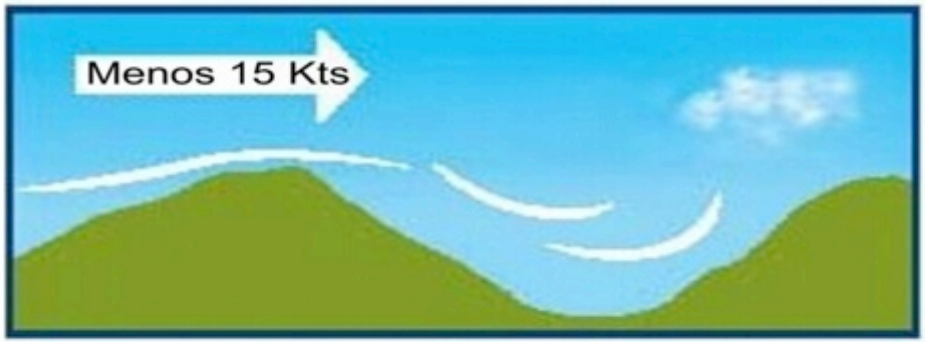
Operating at maximum gross weight may not be an option in the mountains. If it isn't practical to take fewer passengers or less cargo, consider reducing your fuel load—even if it means making an extra fuel stop en route.

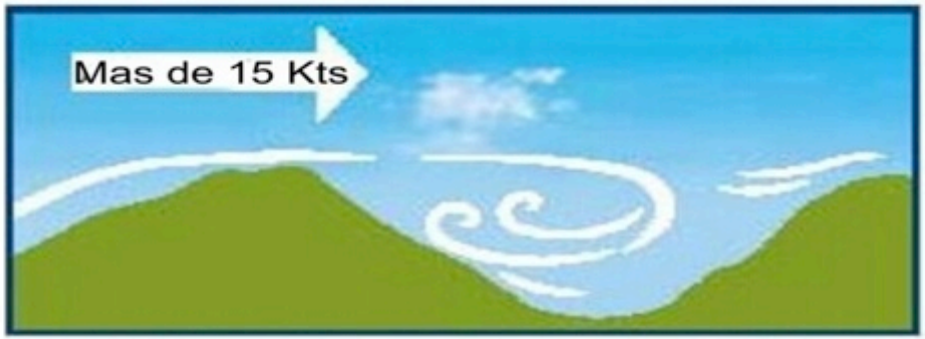
Base de conocimiento

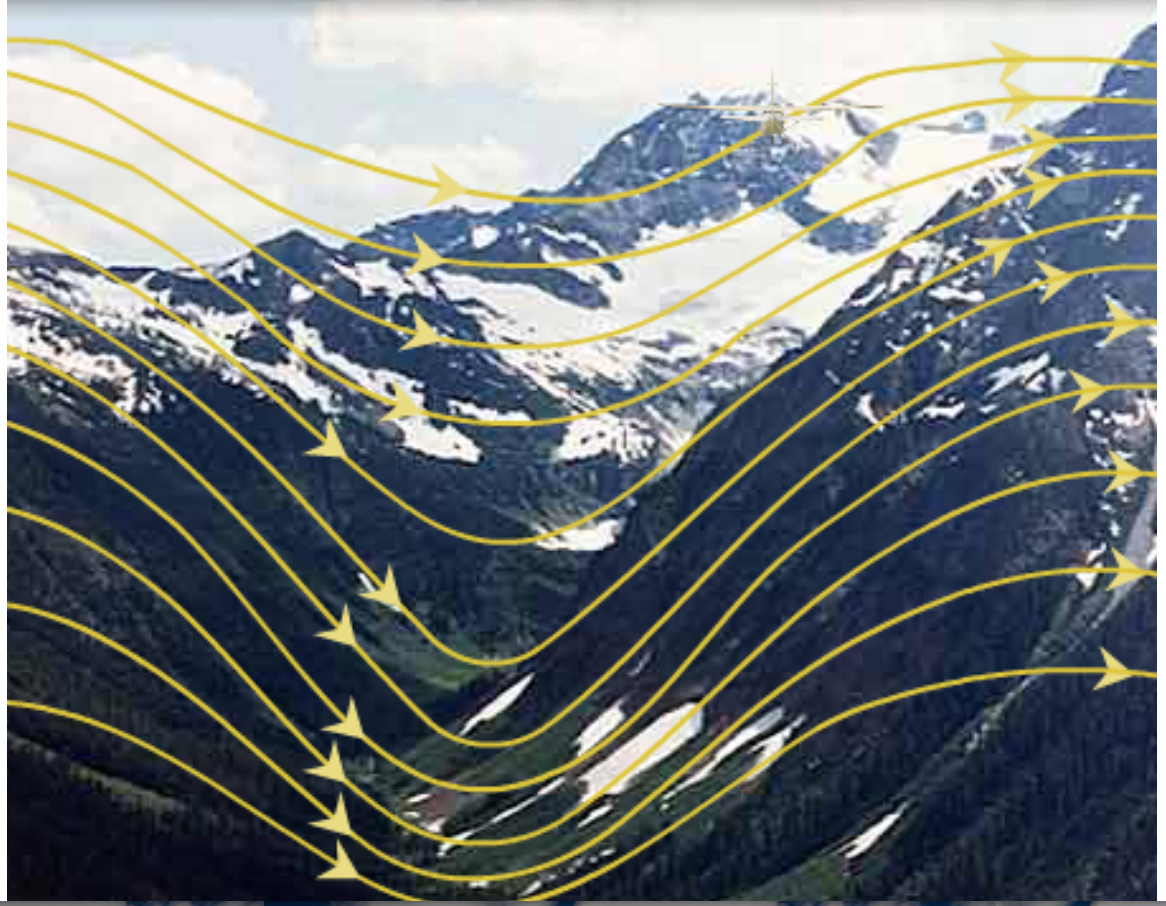
METEOROLOGIA
HORA DEL DIA

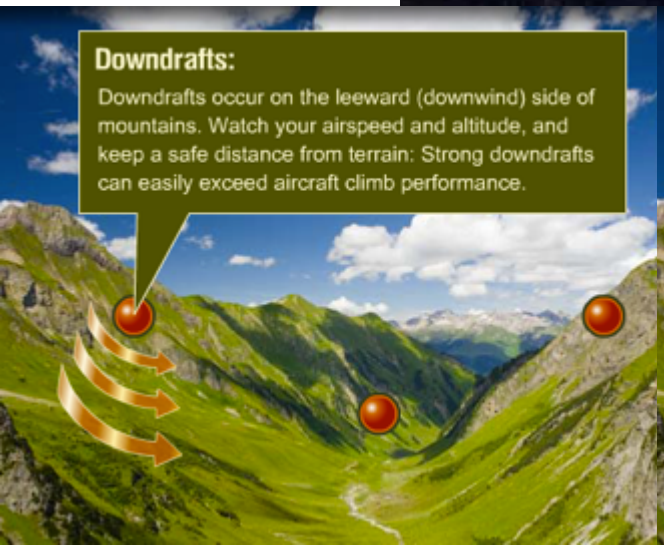

El aire no se mueve en forma laminar

El aire tiene diferentes velocidades








Downdrafts:
Downdrafts occur on the leeward (downwind) side of mountains. Watch your airspeed and altitude, and keep a safe distance from terrain: Strong downdrafts can easily exceed aircraft climb performance.


Turbulence / Wind Shear:
Turbulence and/or wind shear can occur where downdrafts and updrafts meet (i.e., in the canyon valley). If you must fly in this area, maintain sufficient altitude and distance from terrain to safely turn around.


Updrafts:
Updrafts occur on the windward (upwind) side of mountains. Use caution to avoid being "lifted" into thin air and/or adverse weather.

Cloud Types

Cloud types often indicate what kind of air—smooth or turbulent—you're likely to experience in flight. Roll over each area for more information.

Caution! Strong turbulence and/or wind shear.

Typically smoother air—good for gliders.

Cap Clouds

Cap clouds are formed by moist air that is pushed up the windward side of the mountain, where it cools and condenses, and down the leeward side where it warms and dissipates.

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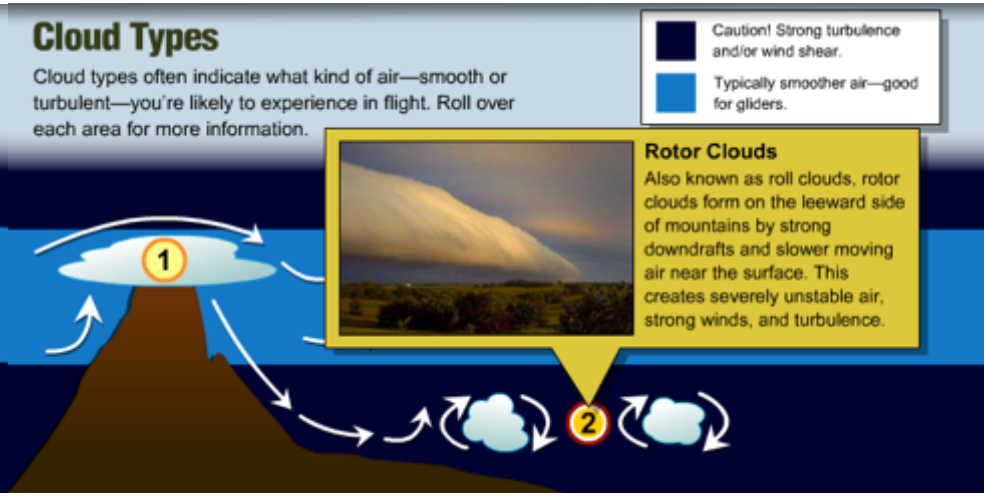
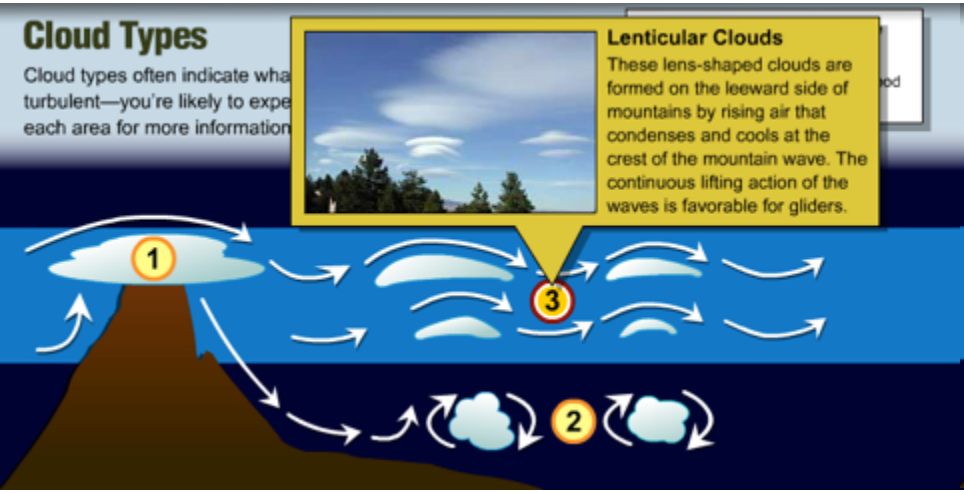


Rotor Clouds

Also known as roll clouds, rotor clouds form on the leeward side of mountains by strong downdrafts and slower moving air near the surface. This creates severely unstable air, strong winds, and turbulence.

Cloud Types

Cloud types often indicate wha
turbulent—you're likely to expe
each area for more information



Lenticular Clouds

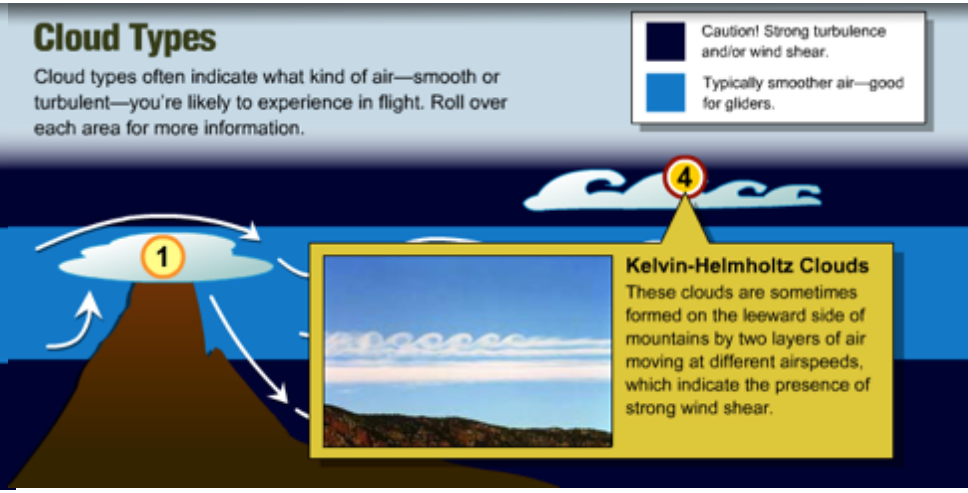
These lens-shaped clouds are formed on the leeward side of mountains by rising air that condenses and cools at the crest of the mountain wave. The continuous lifting action of the waves is favorable for gliders.

Cloud Types

Cloud types often indicate what kind of air—smooth or turbulent—you're likely to experience in flight. Roll over each area for more information.

Caution! Strong turbulence and/or wind shear.

Typically smoother air—good for gliders.



Kelvin-Helmholtz Clouds

These clouds are sometimes formed on the leeward side of mountains by two layers of air moving at different airspeeds, which indicate the presence of strong wind shear.

Otras consideraciones

HIPOXIA +5k a 10k feet (noche-día)

DESHIDRATACION

SUPERVIVENCIA (KIT)

Otras consideraciones

EFECTOS OPTICOS

Sombras

Escalas relativas

Otras consideraciones

COMUNICACIONES

Otras consideraciones

Técnicas y trucos

- **Cruce**
- Vuelo en el valle
- Rutas de escape / ALTERNATIVAS / EMERGENCIAS
- Aproximación y aterrizajes
- Despegues

Técnicas y trucos

- Cruce
- **Vuelo en el valle**
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Técnicas y trucos

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Técnicas y trucos

- **Aproximación y aterrizajes**

Técnicas y trucos

- Cruce
- Vuelo en el valle
- Rutas de escape
- Aproximación y aterrizajes
- **Despegues**

TIPs FINALES

- Entrenamiento y mantenimiento de la competencia en Vuelo en Montaña.
- Recordar en todo momento que la altitud de densidad afecta la performance del avión.
- Manejar la corrección de mezcla en aviones pistoneros.
- Planificación e información previa al vuelo es mandatorio.

TIPs FINALES

- **Las condiciones meteorológicas pueden cambiar rápidamente. Actualizar reportes y observación de las condiciones (nubes, etc.)**
- **Evaluar posibles desvíos y aeródromos de alternativa en ruta.**
- **Si es factible, hacer plan de vuelo y mantener las comunicaciones TWR, TMA o ACC. (SAR).**
- **VOLAR VFR**

MUCHAS GRACIAS