WW2010™ University of Illinois

WW2010
welcome
online guides
archives
educational cd-rom
current weather
about ww2010
index

Online Guides
introduction
meteorology
remote sensing
reading maps
projects, activities

Meteorology
introduction
air masses, fronts
clouds, precipitation
el nino
forces, winds
hurricanes
hydrologic cycle
light, optics
midlatitude cyclones
severe storms
weather forecasting

Air Masses, Fronts
introduction
air masses
fronts
advection

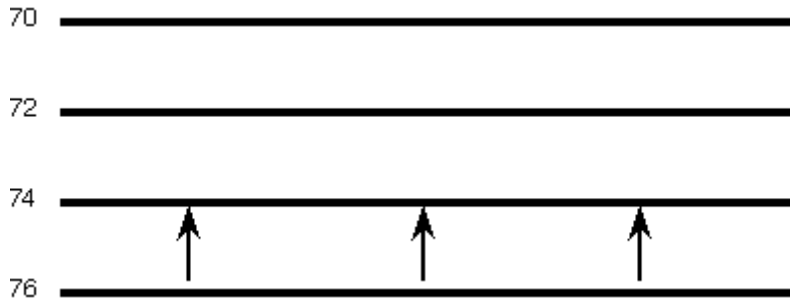
Advection
advection
cold advection
warm advection
850 temp advection
moisture advection
voriticity advection

User Interface
graphics text

Warm Advection

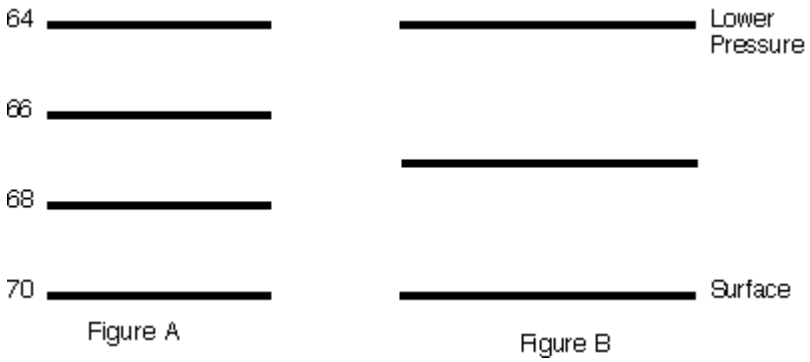
warm air moves into a cooler region

Warm advection is the process in which the wind blows from a region of warm air to a region of cooler air. The following animation depicts a very simple example of warm advection. The horizontal lines are isotherms in degrees Fahrenheit and the arrows represent wind vectors. Winds are blowing from a region of warm air to a region of colder air, which results in a warming of the colder region. As the warm advection persists, temperatures in the colder region will begin to increase as the warmer air moves into the region of colder air.



Animation by: Van Dorn

The net result of warm advection is to make a region warmer. The animation below shows (in a very general sense) how warm advection can produce upward motion. Warm advection is occurring in Figure A while Figure B shows a vertical cross section through the region of warm advection. It is important to realize that Figure A is along the ground and that Figure B is from the ground up to a higher level in the atmosphere, directly over the region of warm advection.



Animation by: Van Dorn

With the onset of warm advection (Figure A), the isobar in Figure B starts to bend upward since warmer air is less dense and occupies more space than colder air. The bending of the isobar due to warm advection creates a localized area of high pressure ("H" in Figure B), thus altering the pressure gradient force. As air moves from the local region of high pressure to the regions of lower pressure ("L" in Figure B), air is drawn upward from below, which is the rising motion produced by warm advection.

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cold advection

Terms for using data resources. CD-ROM available.

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850 temp advection