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# ENVIRONMENTAL Fact Sheet

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## Water Efficiency: Snowmaking

Most snowmaking water conservation efforts focus on efficient water-to-snow conversion and accurate snow placement, minimizing evaporative and runoff losses. The following management practices address effective snow application to prevent water losses.

### Efficient Snowmaking Practices

- Operate snow guns with air and water rates appropriate for slope location and environmental conditions such as temperature, wind direction, and slope topography. Producing snow without optimal air-to-water rates results in using more water to achieve the desired snow pack depth.
  - High relative air-to-water ratios produce small droplets that result in dryer snow with a greater potential to be blown or skied off the slopes and greater evaporative water losses.
  - Low relative air-to-water ratios typically produce large droplets that fail to freeze and make wetter snow which melts faster. As a result, less desirable skiing conditions are generated, requiring additional surface snow production.
- Continuous monitoring of temperature, wind and humidity enables operators to adjust snow guns for optimal performance. Use computerized monitoring and control systems that check environmental conditions and adjust snow gun air/water ratios to optimize the snowmaking process.
- Use snow additives, designed to induce snow formation, that raise water's wet bulb nucleation temperature from 16°-17° F to 26°-27° F. Additives potentially achieve 20% to 80% more snow production with the same water quantity and less air.
- Use high-pressure, low-flow snow guns.

### Snow Pack Management Practices

- Limit snowmaking to times when temperature and wind conditions result in efficient droplet formation and minimal drifting.
- Groom slopes by using the existing snow and eliminate the need to make new snow.
- Design narrow trails in wind-prone areas to maximize wind protection from trees.

### **Snowmaking System Designs**

Incorporate quality, conservation-minded engineering designs in the snowmaking system. The following practices address the water savings associated with effective snowmaking system designs:

- Consider installing a computerized control system that monitors environmental conditions and regulates snow gun applications.
- Install return flow/drain back lines instead of end-line valves to prevent pipe freezing. Eliminate all dead-end bleeder valves. Efficient pressure control limits the need to run water for freeze control.
- Collect runoff in downslope holding ponds.
- Employ a routine leak detection program.
- Consider reusing water from other sources (gray water, wastewater treatment plant effluent) for snowmaking. Apply water reuse practices wherever and whenever possible. Federal and state agencies regulate “used” water or treatment plant effluent use. Obtain the appropriate permits before applying reuse techniques.

### **For More Information**

Please contact the Drinking Water and Groundwater Bureau at (603) 271-2513 or [dwgbinfo@des.nh.gov](mailto:dwgbinfo@des.nh.gov) or visit our website at [www.des.nh.gov](http://www.des.nh.gov).

### **References**

New England Interstate Water Pollution Control Commission; *MRI Water Conservation Technical Bulletin #13, Water Conservation Best Management Practices for Snow Making*; New England Interstate Water Pollution Control Commission; Lowell, MA; 1996.

Note: This fact sheet is accurate as of July 2019. Statutory or regulatory changes or the availability of additional information after this date may render this information inaccurate or incomplete.