Reduced complexity air conditioning

Museum stores are easily controlled by simple methods but popular museums need more research and demonstration buildings
Conservation heating

Used to keep RH moderate in ancient buildings with unstoppable ventilation
Buffered conservation heating at the Suffolk County Record Office

The only climate control is winter heating
The climate in the archive

Energy analysis of the actual climate, assuming no RH buffering.
With RH buffering, the summer heating energy is shifted to the winter heating. This provides the latent heat to dehumidify the archive, which is released again in summer.
Climate control by dehumidification alone

Temperature allowed to drift; summer dehumidification

![Graph showing relative humidity, temperature, temperature outside, water vapour concentration difference, and dehumidifier energy over months in 2009-10.]
The energy cost has been exaggerated by setting a high air exchange rate.

Dehumidification load peaks in summer.

Heating load is taken by thermal buffering from the ground.
Heat pumps are most efficient over a small temperature difference, as in winter in the Suffolk County Record Office.
Dehumidification can be achieved by condensation as already explained but it can also be done by sorption into a desiccant which is intermittently regenerated by passing hot air from outside through it. With a rotating desiccant drum the process can be made continuous.
Because dehumidification is needed only in summer, solar energy can be used.

The method sketched here depends on the fact that the equilibrium RH around absorbent materials hardly changes with temperature, so it is possible to pump humidity against the gradient.
Applying simple climate control to modern museums will require a considerable change in engineering practice.