

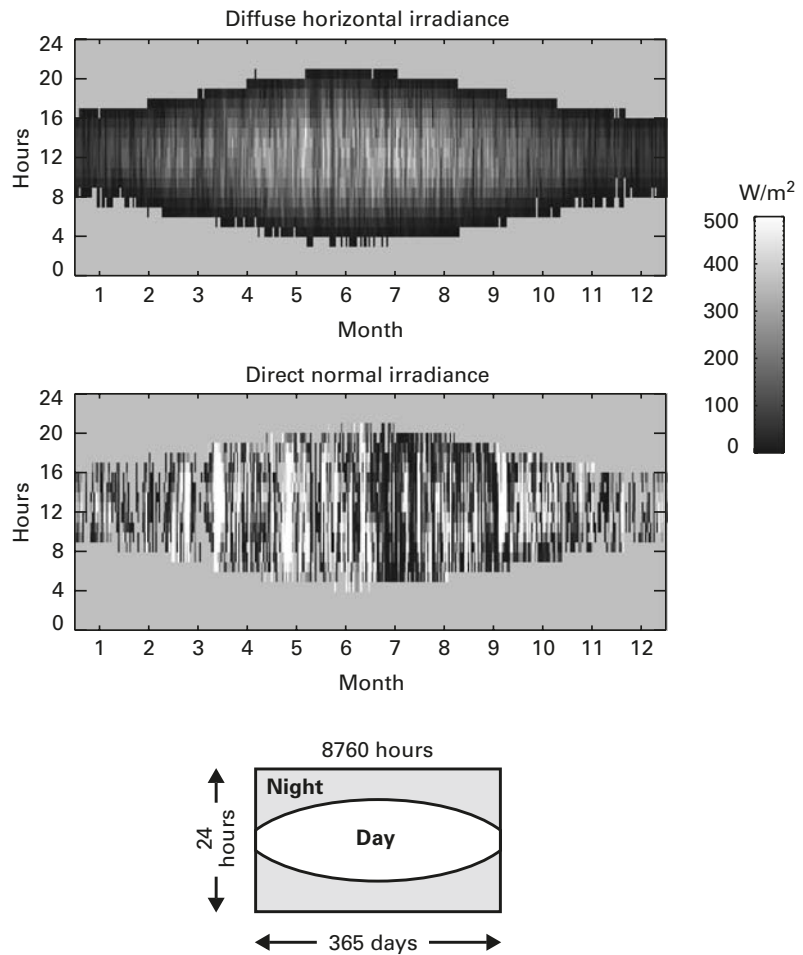
Figure 19.2  
Overcast sky approach.

Where attempts have been made to recommend (usually) minimum levels of solar access, the definitions vary and are largely incompatible. For example, in San Jose (USA) solar access is defined as the unobstructed availability of direct sunlight at solar noon on December 21; the winter solstice. Whereas in Boulder (Colorado, USA) an ordinance was enacted to guarantee unobstructed sunlight availability between 10 a.m. and 2 p.m. on December 21. These could be tested using the shadow pattern technique. Other definitions make a less specific measure of solar access, for example, the solar envelope (Knowles, 1981).

The current situation with the evaluation of solar access has arisen because the fundamentals of the two most commonly used approaches have changed little over the past 50 years. Indeed, they are now part of the mental landscape of the majority of practitioners and researchers, be they planners, architects or engineers. Computer modelling may be used nowadays in preference to scale models to generate shadow patterns and predict illuminance under standard overcast sky conditions. This however gives only the illusion of progress because the fundamental limitations are an intrinsic part of the methodology itself, not the means by which it is carried out.

The reality of our everyday experience of the daylit luminous environment differs markedly from what the two most commonly used assessment methods can tell us. Light from the sun and the sky (overcast, clear, etc.), both directly and indirectly, illuminates the urban environment. And, of course, the sun and sky act *together* to provide illumination. Direct sunlight accounts, overall, for about half of the available daylight energy. The remainder comes from the sky and is usually referred to as *diffuse light*. Of the diffuse (sky) light, less than half of that, depending on locale, is due to conditions that approximate standard overcast. It is evident therefore that the

Figure 19.3  
Visualization of meteorological data.



shadow casting and overcast sky methods, either independently or together, provide only a very limited insight into solar access. To advance our perception of solar access, indeed to make some measure of it that is closer to our experience of the daylight environment, we first need to examine the underlying meteorological conditions.

### And the forecast is ...

The quantity and character of light from the sun and sky are subject to regular daily and seasonal patterns of variation together with irregular events governed by local meteorological conditions. An illustration of the dynamic nature of sky and sun conditions is given in Figure 19.3. Hourly values of diffuse horizontal irradiance and direct normal irradiance over a period