22. The volume of the water that fell is

$$\begin{aligned} V &= (26\,\mathrm{km}^2)(2.0\,\mathrm{in.}) \\ &= (26\,\mathrm{km}^2)\left(\frac{1000\,\mathrm{m}}{1\,\mathrm{km}}\right)^2(2.0\,\mathrm{in.})\left(\frac{0.0254\,\mathrm{m}}{1\ \mathrm{in.}}\right) \\ &= (26\times10^6\,\mathrm{m}^2)(0.0508\,\mathrm{m}) \\ &= 1.3\times10^6\ \mathrm{m}^3\ . \end{aligned}$$

We write the mass-per-unit-volume (density) of the water as:

$$\rho = \frac{m}{V} = 1\times10^3\ \mathrm{kg/m}^3\ .$$

The mass of the water that fell is therefore given by $m = \rho V$:

$$\begin{aligned} m &= \left(1\times10^3\,\mathrm{kg/m}^3\right)\left(1.3\times10^6\,\mathrm{m}^3\right) \\ &= 1.3\times10^9\ \mathrm{kg}\ . \end{aligned}$$