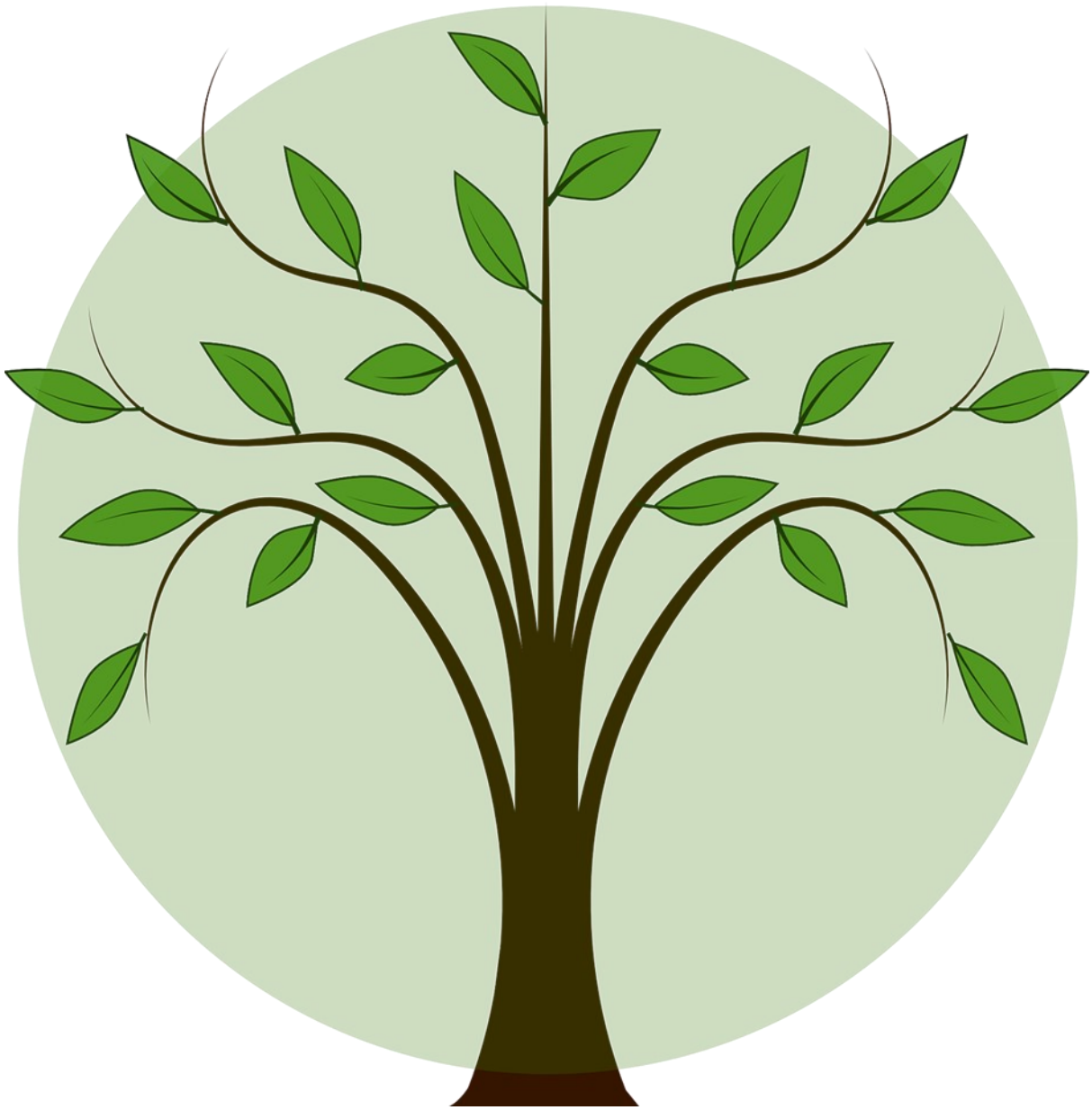
MANCHESTER ECO DIOCESE RESOURCES: ECOLOGY SCIENCE



THE CHURCH OF ENGLAND
Diocese of Manchester

CHURCH FOR A DIFFERENT WORLD

Produced by the Diocesan Environment Working Group

ECOLOGY SCIENCE

Background to climate science

Science proceeds through a combination of experimentation to collect information (which we might call 'data' and 'evidence') and comparing this information with ideas that help explain these observations (which we usually call 'theories' and 'models').

The scientific models describing climate change are evolving with time because scientists continually collect ever more information. Scientists continually adjust and improve their models, refining them until the model can better explain the information. It's likely the model is essentially correct when it can explain the information. Climate science is close to reaching this state of understanding climate change.

The information on climate change describes a model in which pollution is damaging the climate at an ever-increasing rate. Climate scientists believe it is possible to halt climate change, but they also believe the necessary timescale is urgently short — probably only a few years. None of the current models allows any doubt about these consequences. The only serious doubt concerns the timescales at which these events will occur.

If the changes to the amounts of pollution entering the atmosphere do not decrease drastically during this short timescale, climate scientists believe that the earth's climate may never recover, or it may require thousands of years after humankind has become extinct.

The climate-change model and ecology

Many kinds of pollution exist such as light-pollution, plastic, litter, and gas-based emissions. This discussion concentrates on the gases that enter the environment and cause it damage.

Pollution can occur naturally, but most of it is a result of human activity. The amount of natural pollution has not changed much over time, but the amount of human-made pollution has increased considerably since the Industrial Revolution about 250 years ago. The observed large increases in pollution are therefore the result of human activity.

The amount of human-made pollution in the world shows no sign of decreasing. It might even be increasing.

Pollution has increased the average temperature of the world's atmosphere. This rise in temperature has itself changed the world's climate. That is why the world is experiencing storms of greater violence and more hurricanes, and disturbed patterns of rainfall (more / less rain per annum in different parts of the world, in different seasons, etc.). These changes in climate affect all living things that live on the earth.

The rise in global temperature is causing the polar ice caps to melt. This conversion of ice to form water is causing the level of the sea to rise. Millions of people living in low-lying islands and coastal regions are at risk of becoming homeless as their homes become submerged. Stated differently, millions of people will have to migrate elsewhere, to higher ground.

The change in global climate is causing the extinction of many species. The resulting changes to the earth's biodiversity is itself changing habitats and threatening the food chain we all depend on. Millions of people will starve or must migrate in search of enough food.

Scientists believe that revering the changes caused by the rise in average global temperature is unlikely within a viable timescale. Permanent damage to the world's ecology seems increasingly likely.

Responding to climate change

Humans create the pollution that is causing climate change. The only solution is to decrease the amounts of pollution that humans create. No other option will make a big enough change.

Governments and organisations such as schools and churches often set emission targets. These goals help measure the amounts of pollution they produce and help when quantifying their success in decreasing the amount of pollution they create. Many organisations want a target of 'net-zero' which means the amount of pollution generated is the same as the amount of pollution removed. All targets require that an emitter knows how much pollution they create and will take into consideration many factors. Commonly, the measurable factors include buildings, travel, diet, etc.

Humans have many ways of decreasing the amounts of pollution they cause. All will involve personal sacrifice.

The simplest way to decrease the amounts of pollution we create is to stop those processes that involve burning. To that end, almost all forms of travel must decrease very significantly — in particular, all forms of air travel and, to a lesser extent, the use of petrol or diesel-consuming vehicles. Those vehicles remaining will need to be small and powered by electricity. The energy we consume for heat must stop using gas.

Householders and organisations must switch their energy supplier to a source that is renewable.

Humans can also adapt their diet and lifestyle to decrease the amounts of pollution we create. Decreasing meat consumption diminishes the impact on land because arable farming produces less environmental damage than faming animals. And animals bred for slaughter usually produce large amounts of gases.

In summary, all humans must stop consuming and wasting the resources of the world. All of us must therefore learn to reduce and therefore adapt what we do; reuse and therefore mend rather than buying new; and recycle.