

Sustainable Development

- ✦ Humanity has the ability to make development sustainable – to ensure that it meets the needs of the present without compromising the ability of future generations to meet their needs.

Our Common Future

World Commission on Environment
and Development, 1987

Cumulative Effects in the Yukon

A scenic view of a campsite in the Yukon. Numerous motorhomes are parked on a gravel shore next to a lake. In the background, there are mountains with patches of snow under a cloudy sky.

- **what are cumulative effects?**
- **why we need to pay attention to them**
- **explain some of the language and concepts**
- **extract a number of examples**

Rob Walker

Cumulative Effects

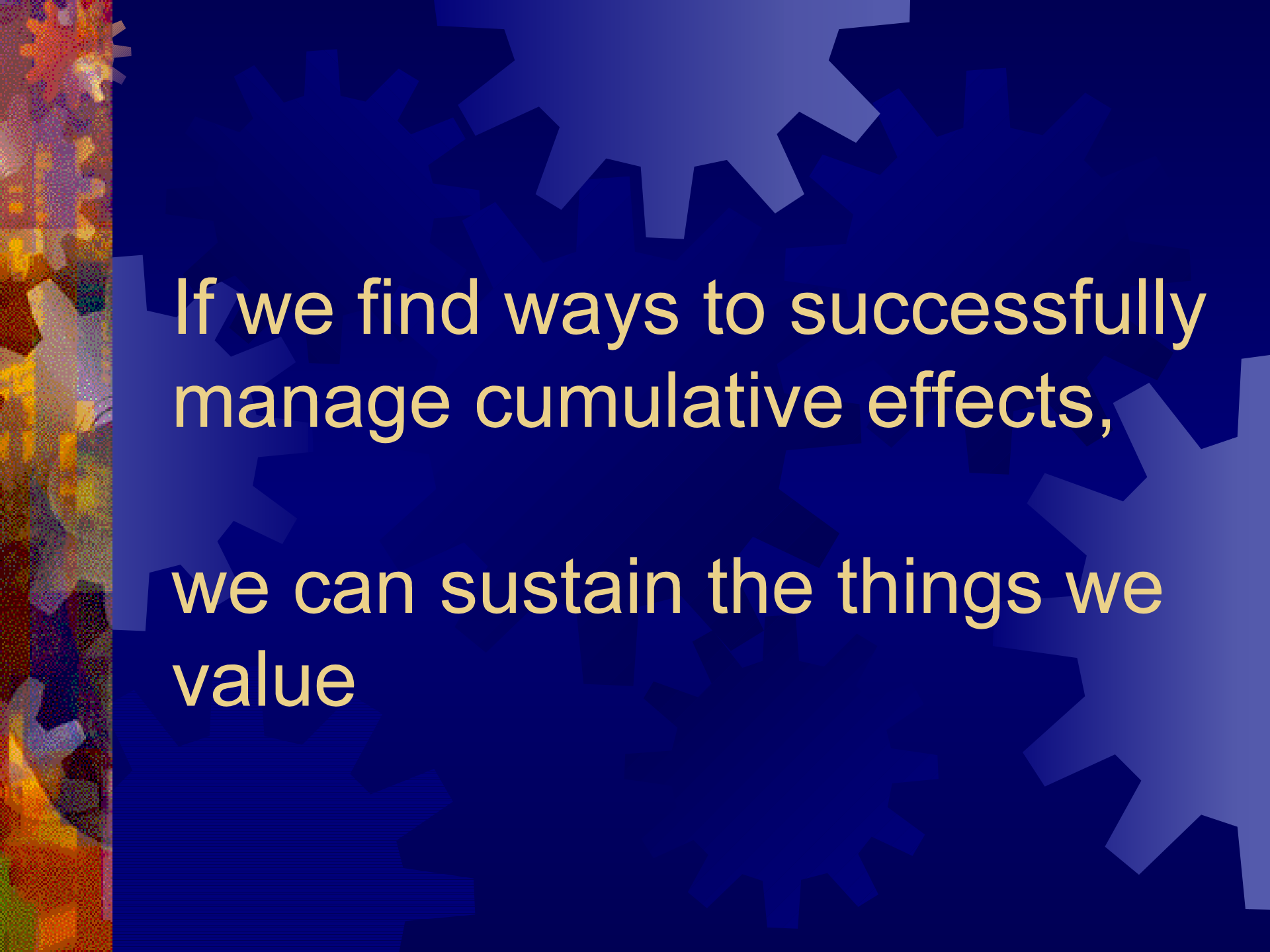
- ★ The effects of one or more action combined to create a greater or different effect



Cumulative Effects lead to change

- ✦ effects from large and small projects and activities, can combine with each other and with Natural and global change to affect things we value,....

...to loose things we value.



If we find ways to successfully
manage cumulative effects,
we can sustain the things we
value



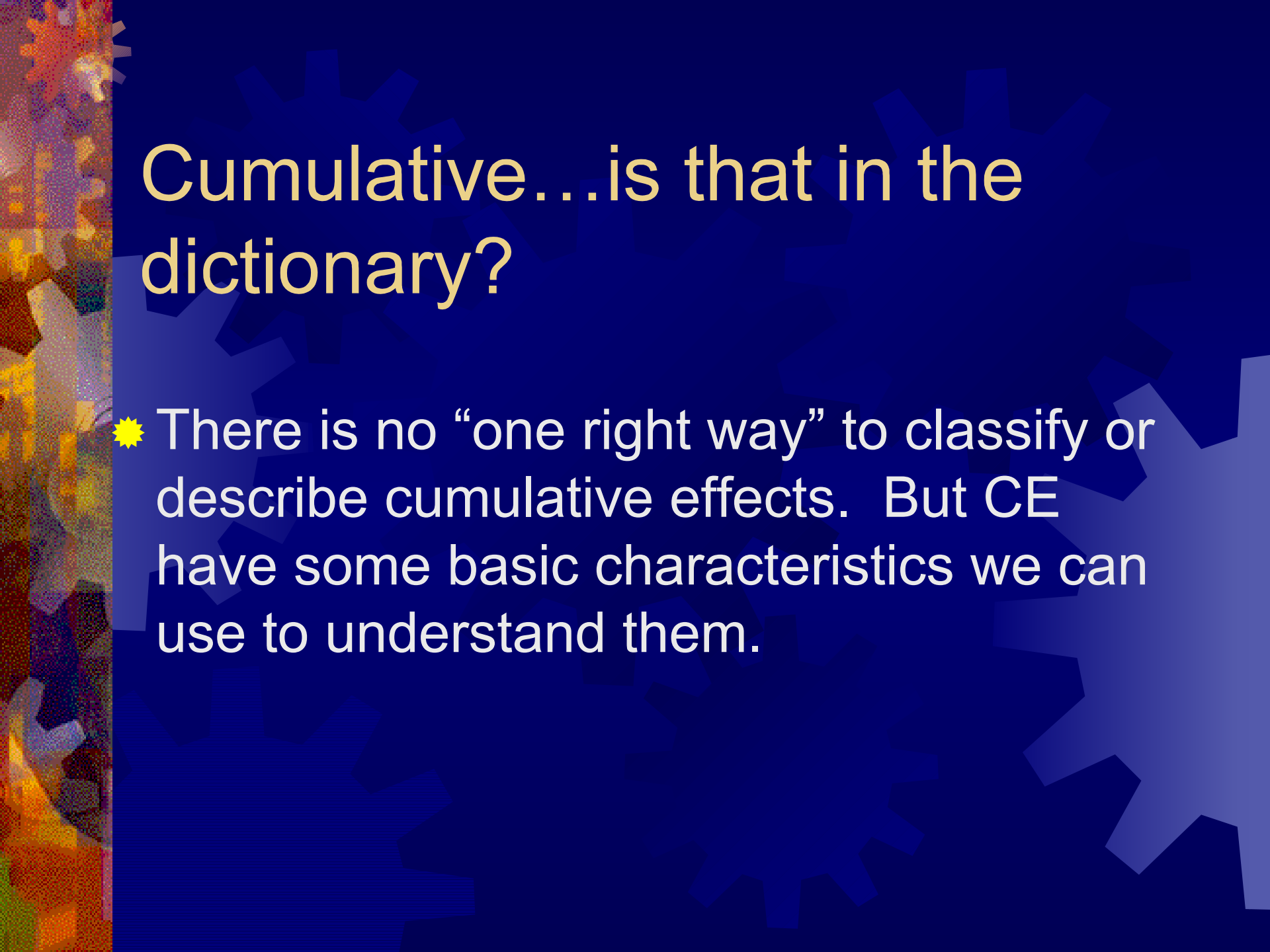
A CE Primer

The world is a complicated place.

The world is interconnected.

When we affect some component of the world
the effects can be felt along the connections
to other components

Because things are connected,
effects on one thing can combine with
effects other actions



Cumulative...is that in the dictionary?

- ★ There is no “one right way” to classify or describe cumulative effects. But CE have some basic characteristics we can use to understand them.



CE Types

The action repeats before the effects of the first action fade away

- Crowding in time

CE Types

The same action occurs over and over in a small area

- Crowding in space
- Nibbling effect
- Incremental sequestration of habitats



CE Types

Many actions with different effects

The effects may interact

Interactive Effects

- neutral or additive
- multiplying
- masking
- synergistic



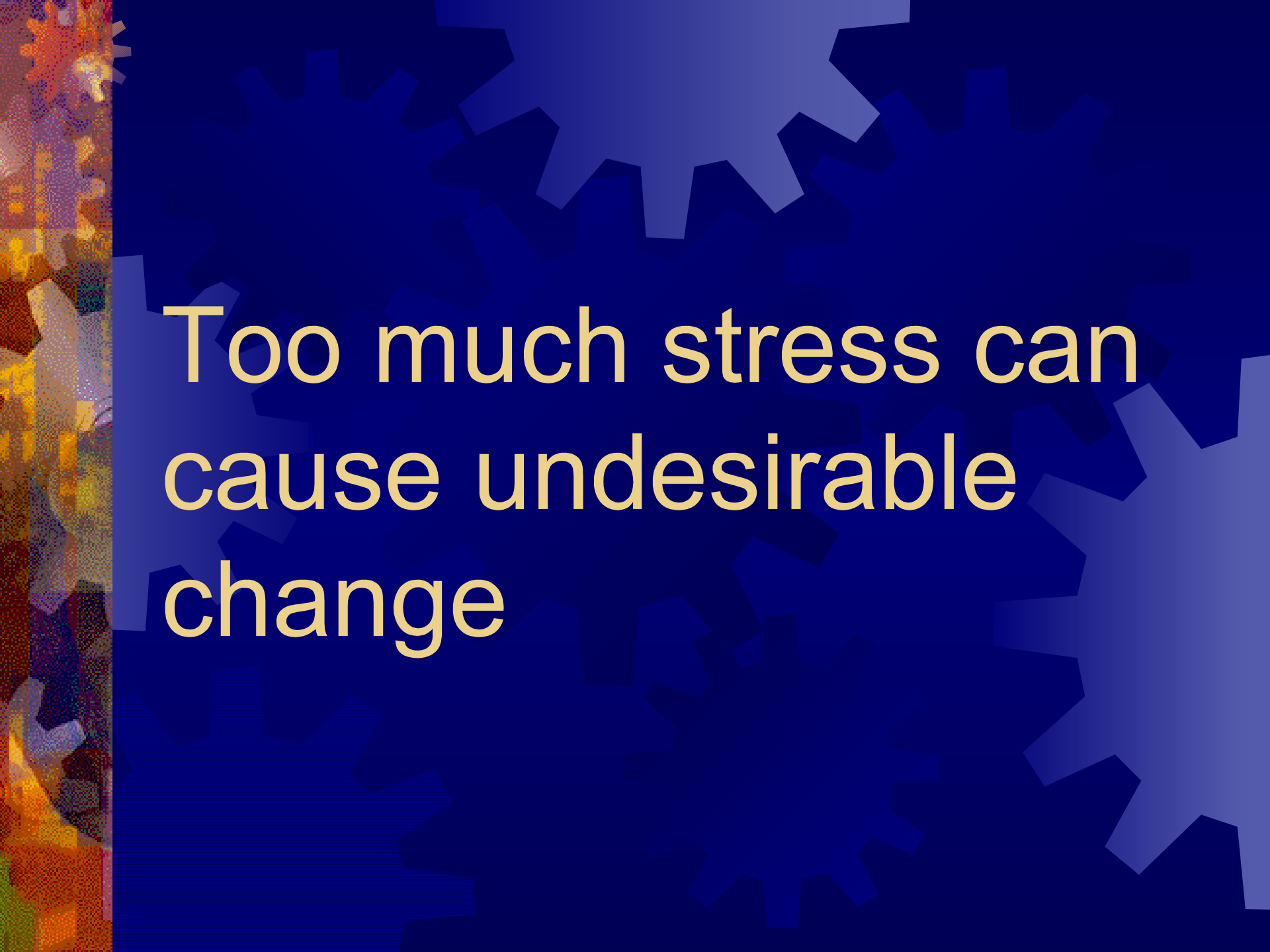
Growth Inducing

★ Developments that make further developments more likely

- ★ Roads

- ★ Energy projects

	Additive process	Interactive Process
Single Action	Type 1- Repeated “additive” effects from a single proposed project	Type 2- Stressors from a single source that interact with receiving biota to have an “interactive” (non-linear) effect
Multiple Action	Type 3- Effects arising from multiple sources (projects, point sources, or general effects associated with development) that affect environmental resources additively.	Type 4- Effects arising from multiple sources that affect environmental resources in an interactive (i.e., countervailing or synergistic) fashion.



Too much stress can
cause undesirable
change



Our Common Future goes on to say...

The concept of sustainable development does imply limits – not absolute limits but limitations imposed by the present state of technology and **social organization** on environmental resources and the ability of the biosphere to absorb the effects of human activities. But technology and social organization can be managed and improved to make way for a new era of economic growth.