WHAT IS A CONCEPTUAL DIAGRAM?

The term *concept* means something conceived in the mind and the term *diagram* refers to a drawing that shows relations. A *conceptual diagram* is essentially an illustration depicting the arrangement and relationships of key attributes within a system by using a variety of appropriate symbols that are easily understood. Put simply, conceptual diagrams are “thought drawings.”

**con·cept /ˈkænsep/**
noun: Something conceived in the mind

**di·a·gram /ˈdīə gram/**
noun: A drawing that shows relations

**conceptual diagram/**
A diagram using symbols that depicts the essential attributes of a system

WHY SHOULD YOU USE CONCEPTUAL DIAGRAMS?

Conceptual diagrams are an effective tool to communicate complex messages in a simple and informative manner. It can take many letters, words, sentences, and paragraphs to describe the processes that make up an ecosystem. Conceptual diagrams can take our current understanding of science, help to identify priorities and environmental values, and create a shared vision. If a picture is worth a thousand words then a conceptual diagram must be worth ten thousand words.

There are four important reasons to use conceptual diagrams:

1. To help communicate key messages and visualize scientific data.
2. To provide a better understanding of the ‘big picture’ that can’t be captured in a single photograph.
3. To span cultural boundaries and language barriers.
4. To better define words that are ambiguous by committing the image to the message being portrayed.

CONCEPTUAL DIAGRAMS
Tools for science communication

This series of diagrams (right) show some of the pressures facing the Chilika Lake ecosystem in India. The symbols are embedded into the text of the legend to help explain what is happening in each scenario.

Pollution
The recent abundance of fish stocks is not sustainable with overfishing and so many fishers. At landings, dead fish thrown back into the water contaminate the lake. Active shrimp pens and abandoned nets trap sediment and kill juvenile fish.

Sedimentation
During monsoon season, an excess of sediment is deposited in the Lake, mostly from Mahanadi River tributaries, nearby settlements, and agricultural lands. As the Lake becomes more shallow and its sea outlets fill in with sediment increased flooding occurs.

Fishing and Aquaculture
As land use changes from forest to settlements and paddy agriculture, sewage, and fertilizer and pesticides runoff increases into the Lake. Algae blooms that float and sit on the bottom are the result of that extra nutrient input.
High turbidity and sediment loading reduce water clarity and degrades seagrass communities. High crown of thorns abundance indicates a disturbed ecosystem. Low coral cover and richness indicates vulnerable coral communities. Low fish biomass and richness indicates unsustainable inshore fisheries.

Low turbidity and sediment loading support clear water and healthy and diverse seagrass communities. Low crown of thorns abundance indicates an intact ecosystem. High coral cover and richness indicates resilient coral communities. High fish biomass and richness supports sustainable inshore fisheries.
HUMANS ARE VISUAL CREATURES

People perceive objects in one of five ways: by sound, sight, touch, smell, or taste. Eyes are one of the strongest muscles humans have and through sight, we interpret information by collecting data and presenting it in a visual form so that the information conveyed can be better understood.

This figure (left) showing connections within an ecosystem was originally a box and arrow diagram that required two pages of accompanying explanatory text. By making it visual, it attracts the eye of the reader and makes the connections easier to understand.

CONCEPTUAL DIAGRAMS CAN BE USED OVER & OVER ... & OVER

Whether you are sharing your research, synthesizing others’ research, monitoring an ecosystem, or creating management practices, conceptual diagrams can help you share your key message. Once you’ve made the investment in creating a conceptual diagram, they can be used online, for presentations, and in a wide range of print media.
MAKE YOUR OWN CONCEPTUAL DIAGRAM

So you want to take the plunge and create your own conceptual diagram. Here are some questions to get you started...

- who is your audience?
- what is the story you want to tell?
- have you identified the key features you want to show on your diagram?

Once you have the answer to these questions, pick up a pencil and paper and start drawing a rough sketch. Experiment with different ways to visualize the key issues. Sometimes it can take several iterations to figure out the best way to fully capture the message you want to share. Make sure you get input and feedback from your colleagues. Is your message clear and easy to understand?

DOWNLOAD THE IAN SYMBOL LIBRARIES

The Integration and Application Network (IAN) has produced a series of scientific symbol libraries, for use with Adobe Illustrator. The libraries contain over 2,800 custom-made symbols designed specifically for enhancing science communication.

Create your own diagram with minimal graphical skills using the click-and-drag functionality of our symbol libraries.

The IAN symbol libraries are available cost- and royalty-free when you follow our attribution requirements. Our aim is to make them a standard resource for scientists, resource managers, community groups, and environmentalists worldwide.

To download the IAN Symbol libraries go to:
ian.umces.edu/symbols

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