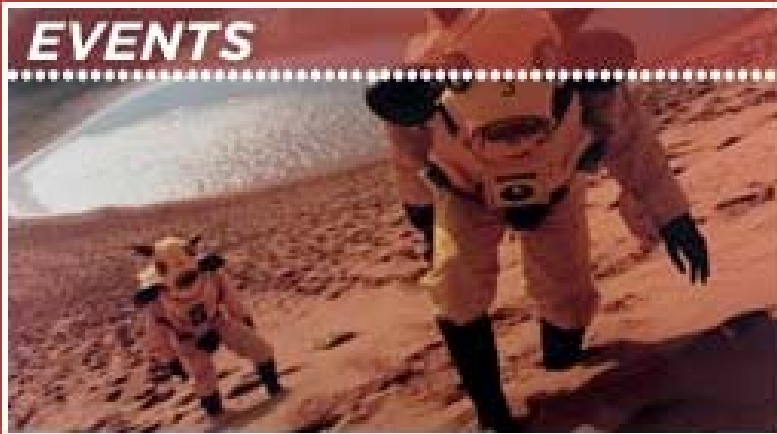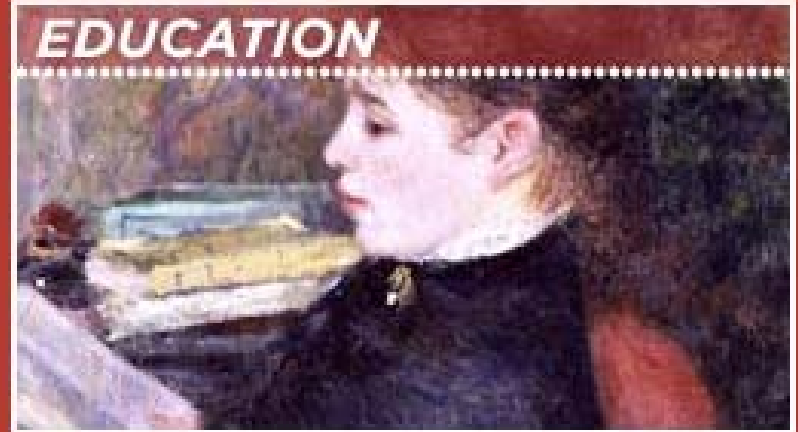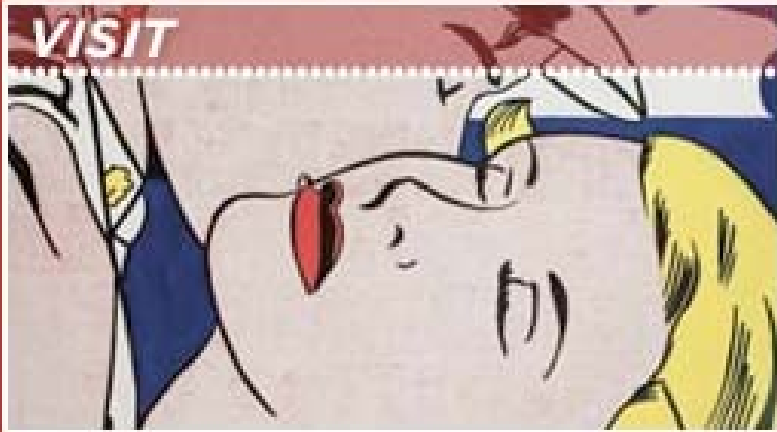# Experience Music Project

Double Take
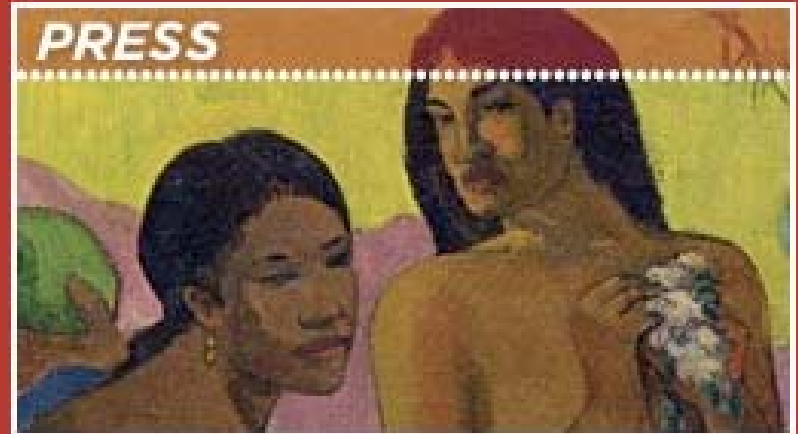
Scientific Roles or Levels of Experts

- **Proponent** -individual evaluates data and develops a particular hypothesis to explain the data.

- **Evaluator** -expert who is capable of evaluating the relative credibility of multiple alternative hypotheses to explain all potential hypotheses

- **Resource Expert** - a technical expert with particular knowledge of a particular data set of importance to the analysis. Site specific experience.

Types of Consensus

1. Each expert believes in the **same deterministic model** or the same value for a variable or model parameter.

2. Each expert believes in the **same probability distribution** for an uncertain variable or model parameter.

3. All experts agree that a **particular composite probability distribution represents them as a group**.

4. All experts agree that a particular composite probability distribution represents the **overall scientific community**.

Tuesday Breakout Activities

Place of Refuge

Operational Decision Making

Wednesday Breakout Activities

Influence Diagram

Wiring Diagram for an Integrated Model

Influence Diagram (AKA Knowledge Map)

These are verbs and clauses

These are nouns

Version 1
Knowledge Map

cell component

Protein   GENE

property   Organism

kinase

is a

Bub1p

Mad2p

nucleus

58-kD

shares homologies   interacts with   is found in

weighs

MAD3   codes for   Mad3p   is found   spindle checkpoint

interacts with   is found in   is found in

Bub3p   is not essential   yeast   a kind of   budding

interacts with

Cdc20p   viability

Copyright (c) 2000 - L. Van Warren
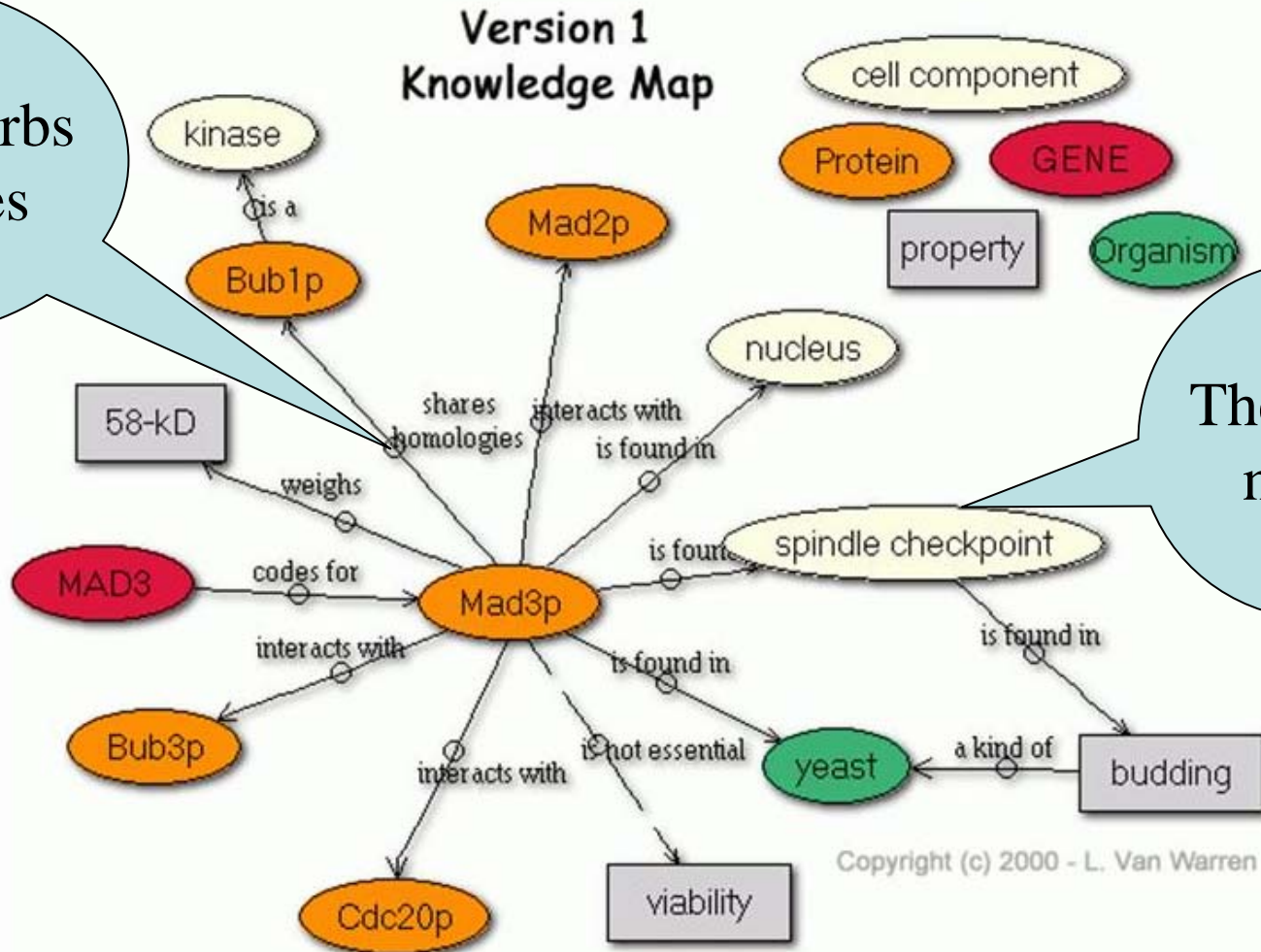
Our Task: Create an Influence Diagram with these two elements.

Resource dosage caused by a chemical plume passing by

Population level effects caused by a chemical plume passing by

# Integrated Model Wiring Diagram: Modules for Consideration

Initial Information

- Spill Information
- Habitat and Species
- Field Sampling

Modules

- Case History Database
- 3D Circulation Model
- Source Function Model
- Transport Models
- Chemical Database
- Toxicology Database
- Species Equivalency Database
- Chemical Weathering, Reactions and Fate
- Oil Weathering and Fate
- Oil Toxicity
- 4D Visualization and Analysis
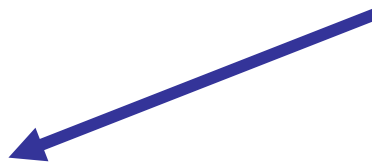
Products

Thursday Breakout Activities

Refinement of Wiring Diagrams

Plus one of the following:

Question / Table / 3 graphs

…see next pages…

Environmental Information for Naval Warfare

National Academies Press

Types of Uncertainty

- **Objective Uncertainty**: Underlying stochastic variability of system dynamics. "Aleatory Uncertainty": the uncertainty inherent in a nondeterministic (stochastic, random) phenomenon; "off or depending on chance, luck, or contingency" (Webster's Dictionary).

- **Subjective Uncertainty**: Incomplete knowledge of the system. "Epistemic Uncertainty": the uncertainty attributable to incomplete knowledge about a phenomenon that affect our ability to model it; "of or having to do with knowledge" (Webster's Dictionary).

Ferson and Ginzburg (F&G) (1996) "Different methods are needed to propagate ingnorances and variability." Reliability Engineering and System Safety 54:133-144.
Senior Seismic Hazard Analysis Committee (SSHAC), "Recommendation for Probabilitstic Seismic Hazard Analysis; Guidance on Uncertainty and Use of Experts" NUREG/CF-6372 UCRL-ID-122160 Vol I.
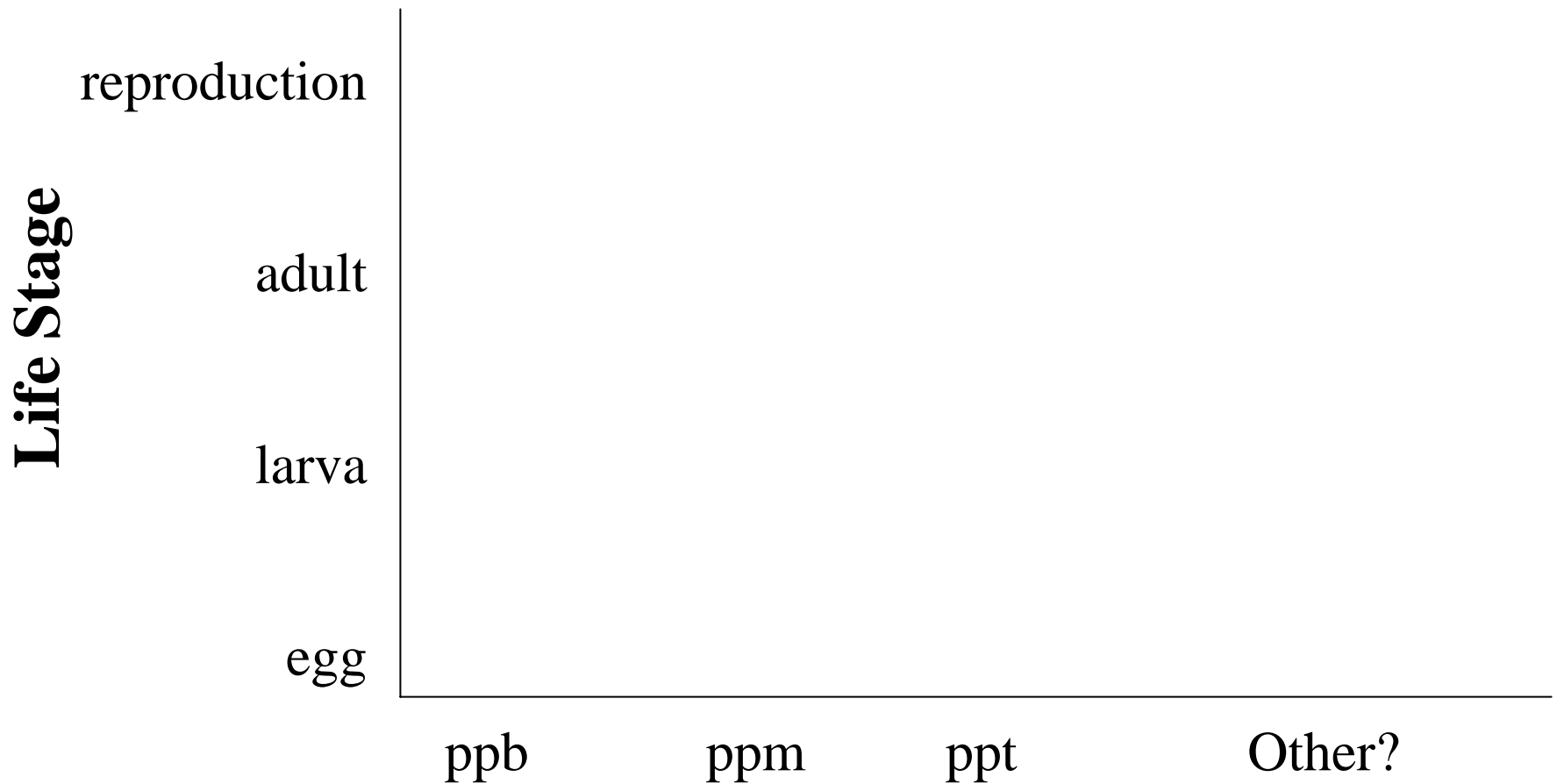
Questions

- What are acceptable/useful levels of prediction for biological/resource decision making?
  (50 ppb +/- 50 ppb at 50 m accuracy or bust!)

- What future effects can be predicted from biological models during response time-scale for use by decision makers?

- What spill information is needed on response time-scale (first hours to days) for resource prediction?

Resource Prediction and Types of Uncertainty

	Define Predictive Ability	Objective Uncertainty	Subjective Uncertainty
Acceptable Predictive Skill			
Moderate Predictive Skill			
Some Predictive Skill			
Low or No Predictive Skill			

Concentration Levels for Resource Prediction

Life Stage (y-axis): egg, larva, adult, reproduction

X-axis: ppb, ppm, ppt, Other?

Timescales of Resource Prediction

Life Stage (y-axis): reproduction, adult, larva, egg

x-axis: hours, days, months, years
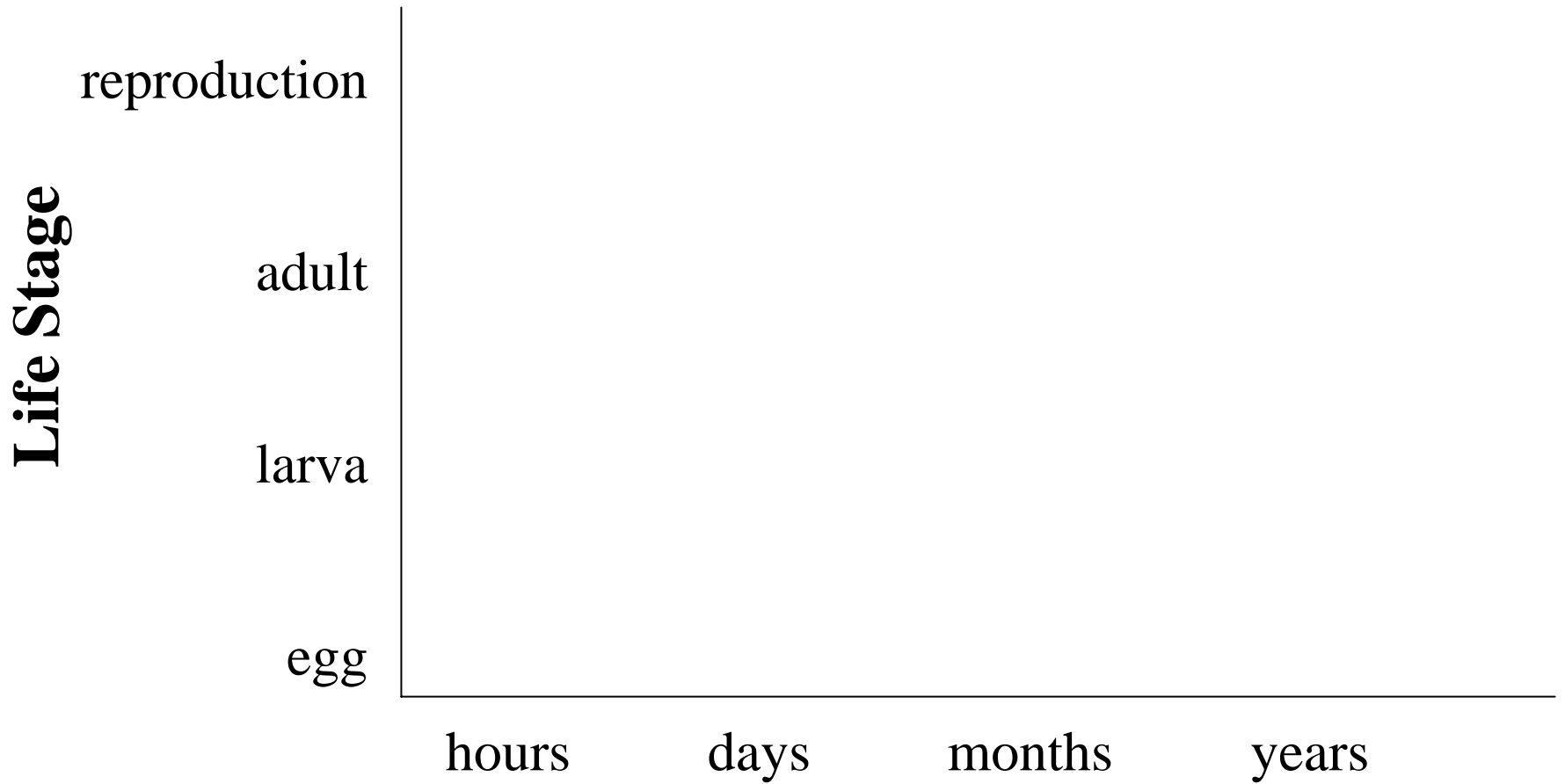
Identify Abilities and Needs
for Prediction

Species

Population

Group

Individual

Organ System

cm   m   100s m   Many km

Accuracy needed from chemical plume trajectory / concentrations