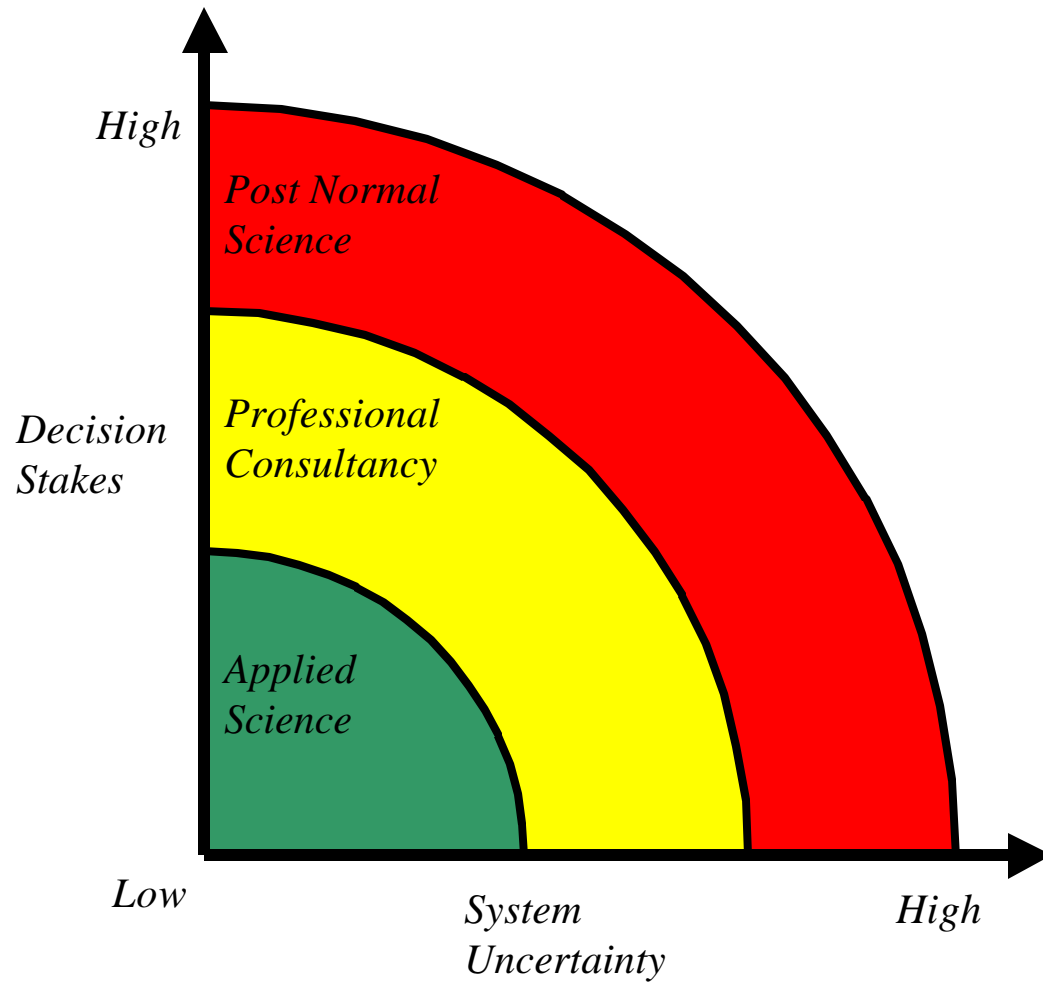




Post Normal Science and eXtreme Programming

*How can we come to understand the impacts
of eXtreme Programming and other Agile
methods in the absence of scientific data?*

What is Post-Normal Science?



Three Kinds of “Science”

◆ *Normal Science*

- Uses standard scientific techniques and procedures
- Peer review processes ensure quality and validity
- Appropriate in situations with high levels of certainty and low levels of risk

◆ *Professional Consultancy*

- Applies science through “experts”
- Appropriate for situations with less certainty, some “art” is required and error is a matter of personal judgment.
- Quality and validity responsibility extended to “clients”

◆ *Post Normal Science* [Funtowicz 92]

- Community responsible for ensuring quality and validity
- Quality and validity responsibility extended to “all stakeholders”

What is Normal and Post–Normal Science?

◆ *Research Processes*

- Ontologies – the nature of existence
- Epistemologies – the nature of knowledge
- Methodologies – the process of understanding

◆ *Science is a*

- Methodology

◆ *Post–Normal Science is a:*

- Methodology
- Epistemology

Post–Normal Science Domain

- ◆ *Situations that involve post–normal science are ones where:*
 - Facts are uncertain
 - Stakes are high
 - Decision are urgent
- ◆ *Differences from Science and Consultancy*
 - Extended peer community involvement
 - Extended facts including anecdotal evidence
 - Public debate

What are the Phases of a “Revolution?”

What is Normal Science?

- ◆ *Normal Science is:*

- Firmly based on one or more past scientific achievements.
- Achievements that the scientific community acknowledges for a time as supplying the foundation for its further practice [Kuhn 70].

- ◆ *Although normal science seems restrictive:*

- When paradigms are taken for granted, the field does not need to be built anew each time.
- “Restrictions born from confidence in a paradigm, turn out to be essential to the development of science,” [Kuhn 70], pp. 24.

What is a Pre-Paradigm Phase?

Bibliography

[Kuhn 70] *Structure of Scientific Revolutions*, Thomas Kuhn, Cambridge University Press, 1970.

[Funtowicz 92] "Three Kinds of Risk Assessment and the Emergence of Post Normal Science," S. O. Funtowicz and J. R. Ravetz, in *Social Theories of Risk*, S. Krimsky and D. Golding editors, Greenwood Publishing Group, 1992.