

Cumulative Impacts Assessment and Management

Basic Concepts

Cortex Consultants Inc.

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CIA Basics Objectives

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1. To clarify terminology and basic concepts used in cumulative impacts assessment and management
2. To review approaches to cumulative impacts assessment
3. To discuss what is involved in cumulative impacts management

CIA Basics

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Agenda

1. Overview of CIA terminology, concepts
2. CIA approaches
3. CIA in BC
4. Cumulative impacts management
5. Discussion

Terminology

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- Effects
- Impacts
- Cumulative impacts (CI)
- Cumulative impacts assessment (CIA)
- Cumulative impacts management (CIM)

Terminology

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- **Effects:**
Measurable changes (indicators) due to activities on the landbase (e.g., water sedimentation, sulphur emissions)

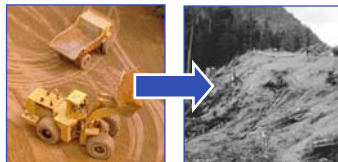
CIA Basics Source of effects

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Actions on
Actions



Actions on
Environment



Environment on
Environment



Terminology

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- **Effects:**
Measurable changes (indicators) due to activities on the landbase (e.g., water sedimentation, sulphur emissions)
- **Impacts:**
Measurable changes (+/-) in values of interest to stakeholders (e.g., environment, employment, community wellbeing)

Terminology

Cumulative impacts

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- **Result from:**
Interactions of many incremental activities, each of which may have an insignificant effect when viewed alone, but which become cumulatively significant in the aggregate
- **Consider:**
Potential effects of a project when combined with those of other past, existing, and imminent projects and activities
- **May:**
 - interact in an additive or synergistic way
 - occur onsite or offsite
 - have short-term or long-term effects
 - occur soon after disturbance or be delayed

Terminology

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Cumulative impacts assessment

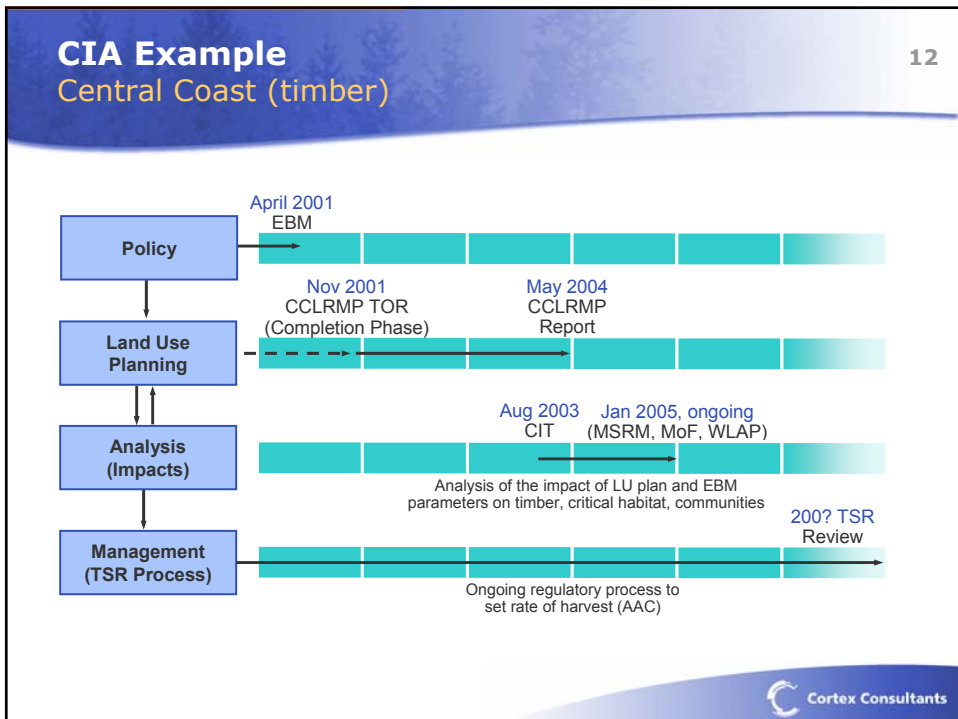
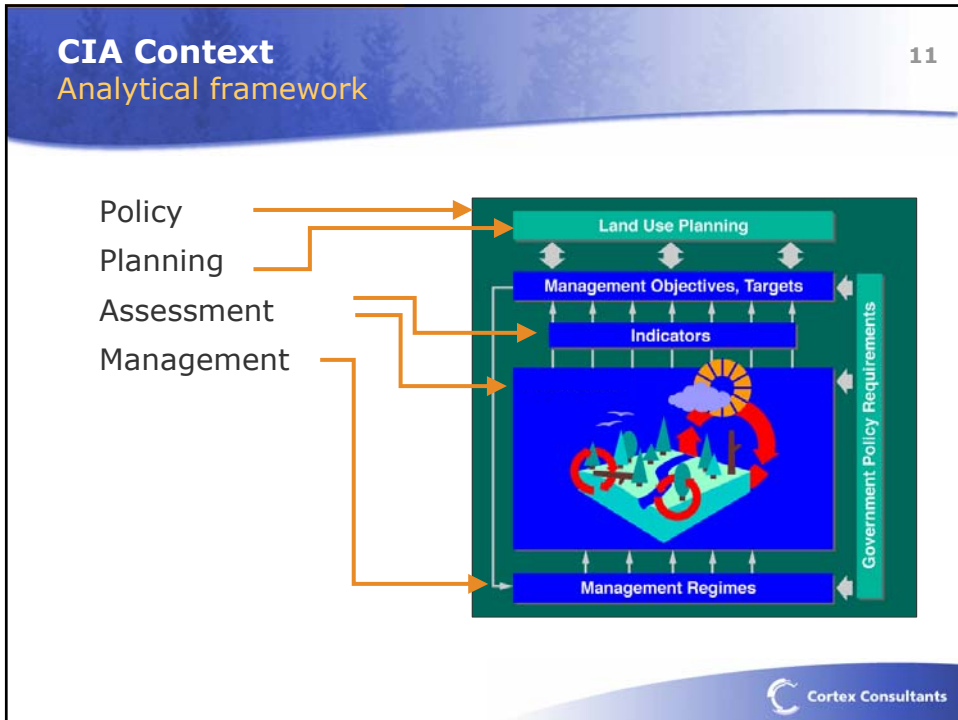
- A methodology to identify, document, and forecast the accumulation of effects and their impacts
- Purposes:
 - to consider potential effects in decision making
 - to minimize or avoid adverse effects before they occur
- Outputs:
 - identifies possible effects of past, present, future actions
 - proposes measures to mitigate adverse effects

Terminology

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Cumulative impacts management

- Evaluates the importance of possible impacts
- Determines the management measures needed to eliminate or minimize these impacts
- Monitors for achievement of desired results



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Key points

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- Cumulative impacts assessment
 - is a methodology, not a policy
 - takes place within a larger analytical framework
 - obtains its parameters from policies
 - identifies potential impacts from specified management activities

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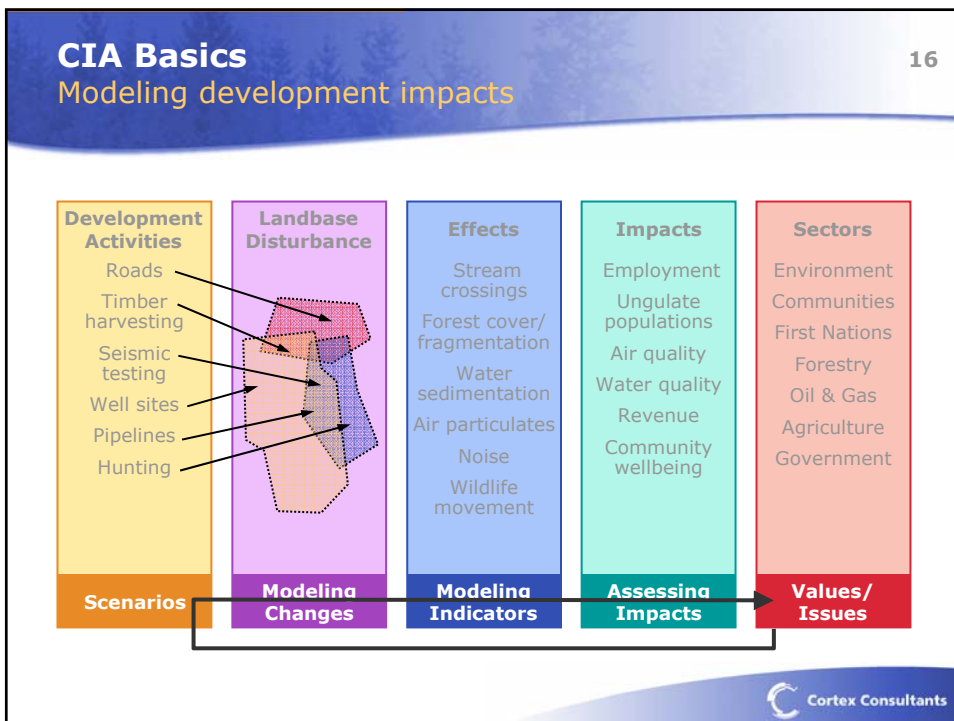
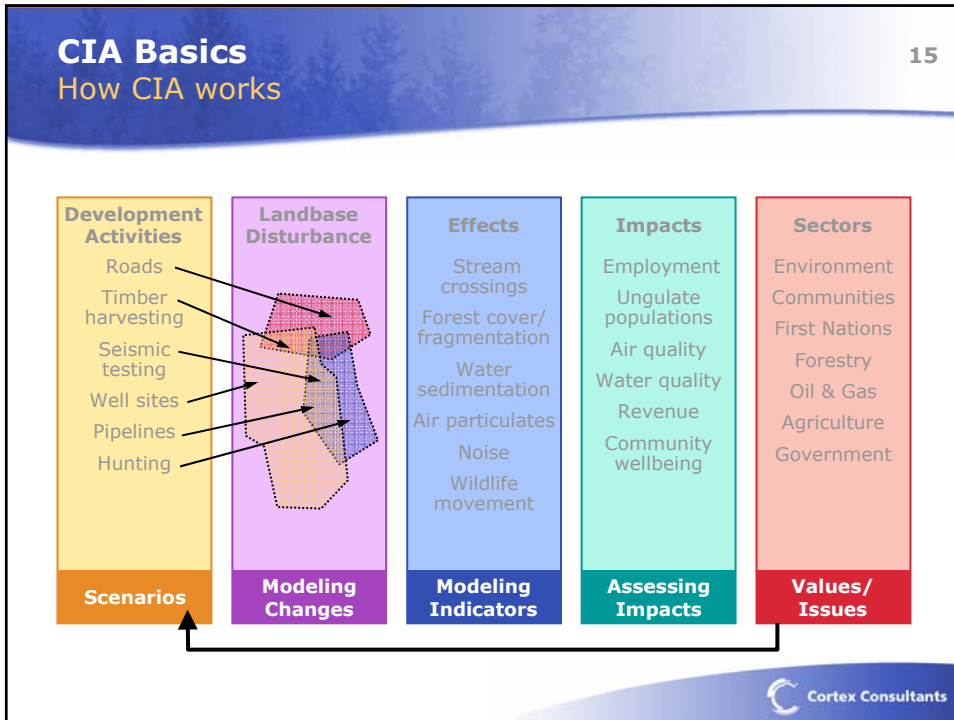
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How activities generate impacts

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Development Activities	Landbase Disturbance	Effects	Impacts	Sectors
Roads Timber harvesting Seismic testing Well sites Pipelines Hunting		Stream crossings Forest cover/fragmentation Water sedimentation Air particulates Noise Wildlife movement	Employment Ungulate populations Air quality Water quality Revenue Community wellbeing	Environment Communities First Nations Forestry Oil & Gas Agriculture Government

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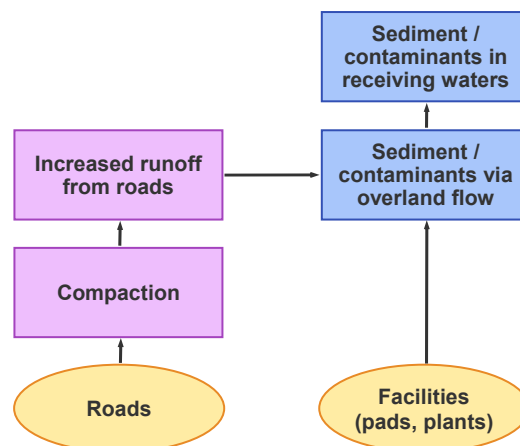
Why is it so complex?

- Stakeholder values may be unknown, complex, and/or contradictory
- Linkages between actions and effects are complicated and often unknown

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Effect pathways



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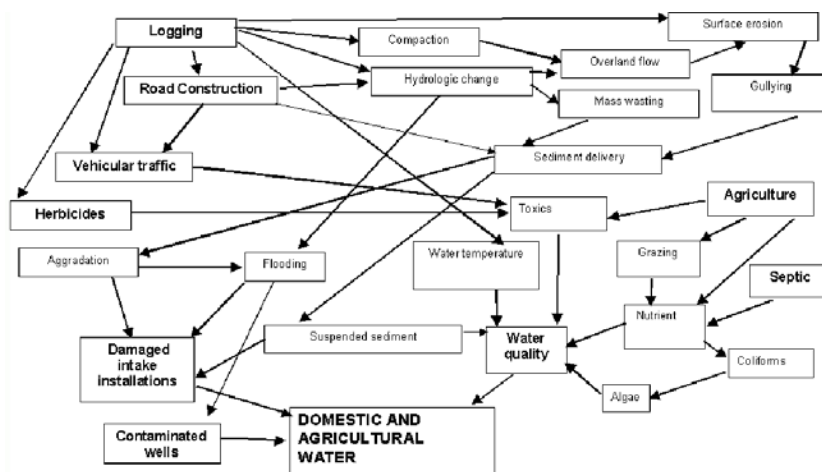
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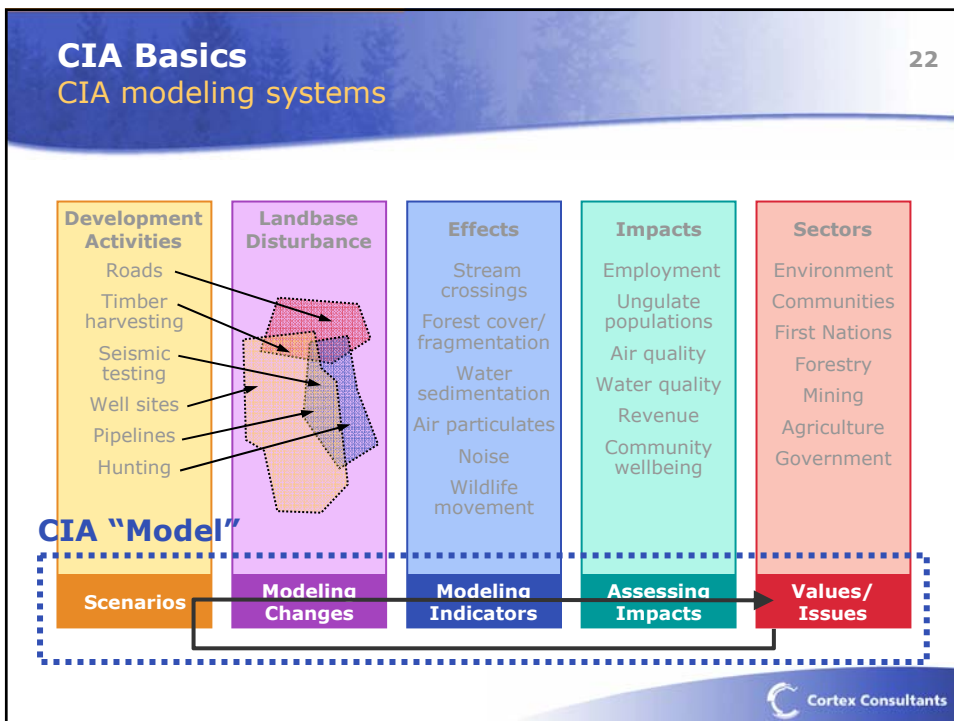
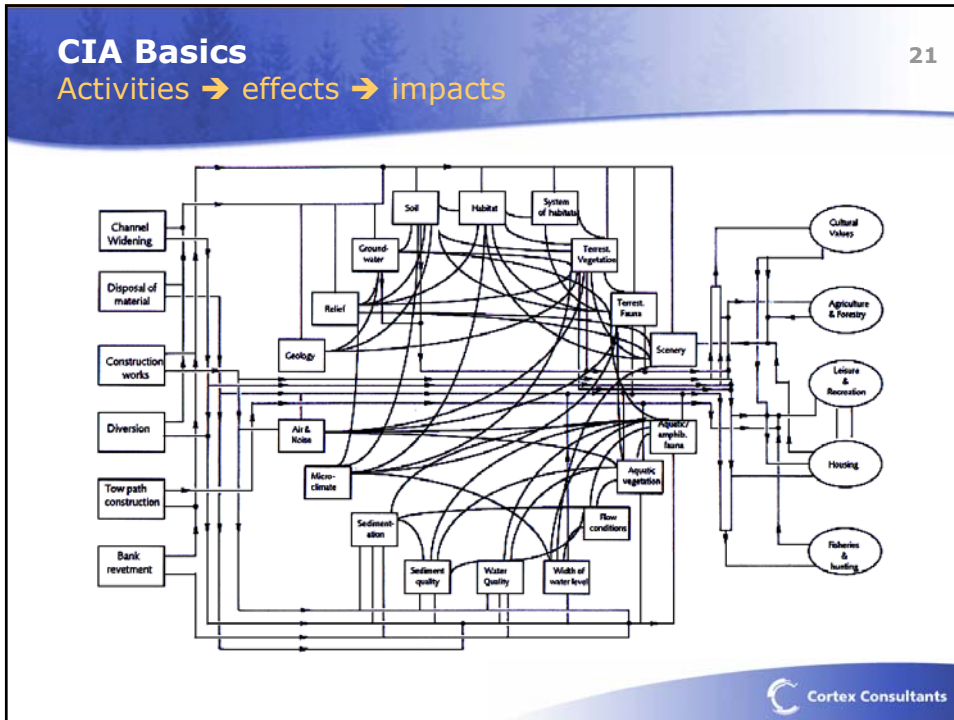
- Stakeholder values may be unknown, complex, and/or contradictory
- Linkages between actions and effects are complicated and often unknown
- Actions on the landbase operate at different spatial and temporal scales

CIA Basics

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Activities → effects





CIA methods*

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- Ad Hoc techniques
- Checklists
- Matrices
- Networks (system diagrams)
- Cartographic techniques
- Mathematical modeling
- Evaluation techniques
- Adaptive methods

*World Wildlife Fund

CIA in BC Users

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- MSRM
- MOF
- WLAP
- Oil & Gas Commission

CIA in BC

Overview

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- Focus on:
 - site specific development
 - past and present activities
 - single sector projects/activities
 - impacts to environmental values
- Differing:
 - users
 - policy and planning contexts
 - applications/purposes
 - approaches/methodologies/models
- CIM framework in development (Northeast BC)

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Cumulative Impacts Management

Definition

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- A framework for evaluating the importance of possible impacts (in the context of stakeholder values), determining the management measures needed to eliminate or minimize these impacts, and monitoring implementation for achievement of desired results
- Objectives
 - common, coordinated approach for all resource activities
 - practical (measurable, implementable, demonstrable)
 - meaningful (inclusive)

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Cumulative Impacts Management Challenges

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- Science
 - finding scientists who work on multiple issues or domains
 - distinguishing effects that are attributable to human activity
- Institutional
 - resolution of policies at different levels
 - databases not maintained at needed geographic or time scales
 - compartmentalization of disciplines; jurisdictions
 - annual funding
- Information
 - lack of baseline information
 - access to proprietary data

Cumulative Impacts Management Requirements

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- Common language and conceptual framework for scientists and policy makers
- Integration of science and policy in:
 - identifying and documenting CI
 - setting management goals, research priorities
 - identifying baseline conditions
 - identifying methods, indicators, and causal models for evaluating CI
 - developing effective institutional frameworks for CIM

Cumulative Impacts Management

Northeast BC framework

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- Regional approach
- Focus on issues of greatest concern
- Information on environment and land use conditions is shared
- Stakeholders involved
- Used to assist in review of individual project applications *and* understand longer-term trends at regional scale

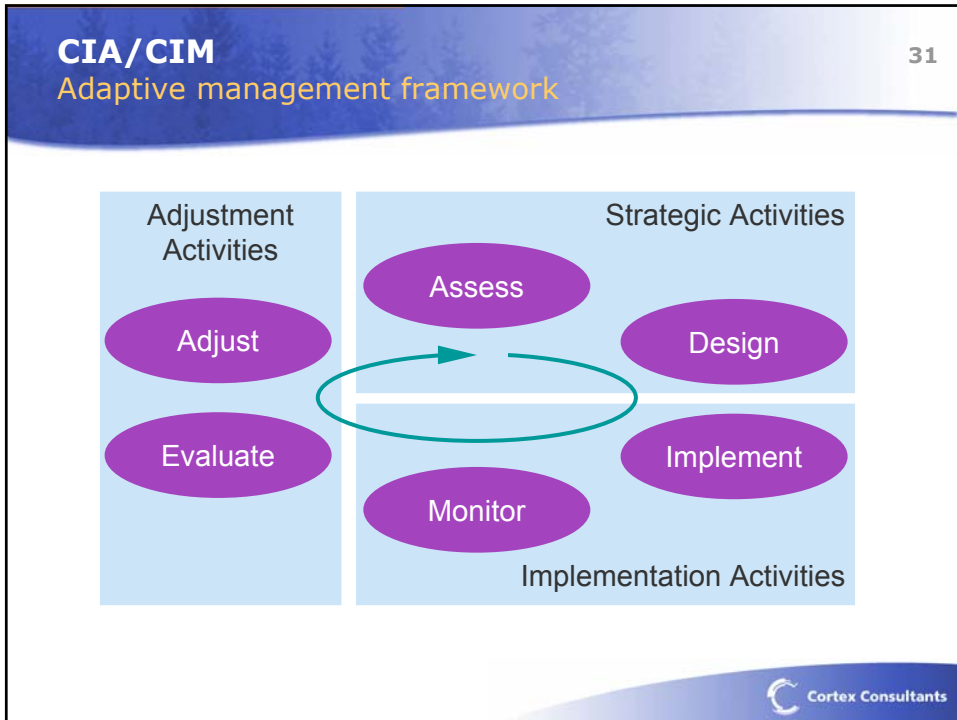
Cumulative Impacts Management

NEBC key components

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Sustainable Resource Management Strategy

- Regional assessment
 - values
 - existing impacts
 - areas of potential concern
- Project "screener"
- Impact management measures
- Indicators and thresholds
- Research, monitoring, adaptive management



- ## Summary
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- Cumulative impacts assessment
 - is a methodology, not a policy
 - takes place within a larger analytical framework (policy, planning, management)
 - obtains its parameters from policies
 - identifies potential impacts from specified management activities (activities → effects → impacts)
 - CIA should begin with identifying stakeholder values, defining the question(s) and information required, determining the spatial and temporal bounds and resolution, and *finally*, considering appropriate modeling technologies
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