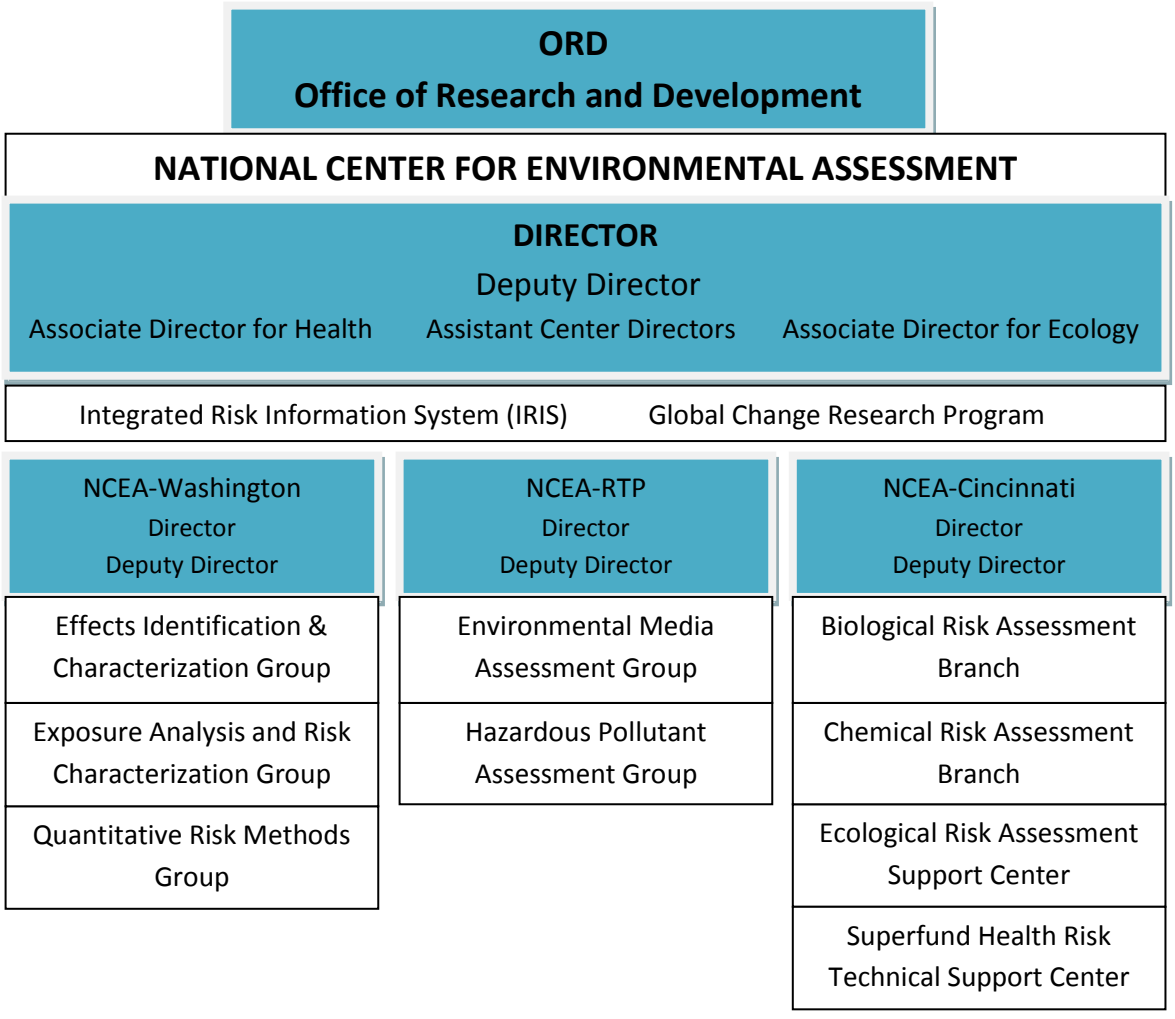
NATIONAL CENTER FOR ENVIRONMENTAL ASSESSMENT (NCEA) OVERVIEW

Organizational Structure

The National Center for Environmental Assessment (NCEA) is EPA's national resource center for human health and ecological risk assessment. NCEA conducts risk assessments, carries out research to improve the state-of-the-science of risk assessment, and provides guidance and support to risk assessors. NCEA occupies a critical position in ORD between researchers in other ORD laboratories and offices and regulators in the EPA program offices and regions who make regulatory, enforcement, and remedial action decisions.

NCEA is headquartered in Washington, DC, with offices in Washington, DC, Cincinnati, OH, and Research Triangle Park, NC that specialize in various areas of human health and environmental assessment. The current organizational structure is diagrammed in the figure below.



NCEA's Mission

The mission of the U.S. Environmental Protection Agency (EPA) is to protect human health and to safeguard the air, water, and land upon which life depends. EPA's Office of Research and Development (ORD) conducts research to help ensure that efforts to reduce environmental risks are based on the best available scientific information. In support of the Agency's and ORD's mission to protect human health and safeguard the environment, NCEA focuses its work in three major areas:

Conduct assessments of contaminants and sites of national significance

- Integrated Risk Information System (IRIS) assessments
- Integrated Science Assessments (ISAs)
- Provisional Peer Reviewed Toxicity Assessments (PPRTVs)
- Special assessments (e.g., BP dispersants, Katrina cleanup, World Trade Center)

Development of methodologies that reduce uncertainties in current approaches

- Dose-response models and factors
- Exposure models and factors
- Probabilistic models
- Community-based risk assessment

Provide guidance and support to risk assessors

- Expert tools and data bases
- Expert consultation and program support
- Risk assessment training
- Risk assessment guidelines
- Health and Environmental Research Online (HERO)

NCEA-WA

NCEA-Washington is comprised of three groups with focus areas that correspond to the risk assessment paradigm. The Exposure Analysis and Risk Characterization Group (EARCG) works to improve the state of the art of human and ecological exposure assessment science and to promote improved risk characterizations for human health and ecological assessments in NCEA and throughout the Agency. This work involves both methods development and direct program support implementing new methods into site and chemical-specific assessments.

The Quantitative Risk Methods Group (QRMG) primarily works to address critical quantitative risk assessment issues dealing with the dose-response portion of the risk paradigm. The goal is to use more kinds of information in quantitative risk assessments, especially information about human variability, uncertainty, and alternative models and assumptions. Activities span a range from biologically based modeling using pharmacokinetic and mechanistic information to developing credible default procedures that can be applied to the information that is more generally available. QRMG also develops tools and guidance that enable others to do credible quantitative assessments on their own.

The principal goal of the Effects Identification and Characterization Group (EICG) is to identify and characterize adverse health and ecological effects due to exposure to environmental agents. The EICG works to conduct and promote methods development research and critical evaluation of toxicity data. The EICG also conducts and assists QRMG in addressing dose-response issues involving biologically-based dose-response models, pharmacokinetics, and animal models and has a lead in developing and coordinating risk assessment training and guidance for the ORD/EPA.

NCEA-CINC

NCEA-CINC is a scientific center of excellence dedicated to the development and application of methods to assess human health and ecological risks associated with environmental pollutants. NCEA-CINC focuses primarily on supporting the Office of Water and the Office of Solid Waste and Emergency Response. Focal areas of research include mixtures risk assessment, microbial risk assessment and causal relationships in ecological risk assessment. This research includes the development of methods and guidance, and their application to case study assessments. In addition, assessments of the toxicity of individual chemicals and the pathogenicity of individual microbes are performed for the Integrated Risk Information System (IRIS) database and for specific programmatic and regional needs. Environmental economics is an emerging area of research for the Division, which integrates ecological and human health risk assessments with economic analysis to support decisions. Superfund technical support centers for human health and ecology provide guidance in response to requests from regional risk assessors and the program office.

NCEA-RTP

NCEA-RTP conducts programs designed to provide methods and guidelines needed for performing human health and ecological risk assessments, carries out such assessments, provides extensive scientific consultation/technical assistance, and conducts research to improve risk assessment methods for inhaled chemicals and to advance dose-response modeling. Important functions of NCEA-RTP are the development of integrated science assessments for major air pollutants (PM, SOx, O3, NOx, CO, Pb) in support of National Ambient Air Quality Standards decision-making. NCEA-RTP is currently in the process of developing plans to conduct a multipollutant science assessment whereby the health effects of exposures to mixtures of air pollutants, particularly the criteria air pollutants, may be systematically evaluated.

NCEA-RTP also develops IRIS assessments of air toxics in support of decision-making on hazardous air pollutants, and provides assessments and scientific assistance on fuels/fuel additives in support of Agency mobile source rulemaking actions and on nanomaterials using a comprehensive environmental assessment framework. Additionally, NCEA-RTP provides risk assessment information and assistance on air pollution problems and has the lead for development of risk assessment training for EPA Regions, other Federal government agencies, state and local authorities, and international agencies. NCEA-RTP provides key scientific assessments and assistance to many EPA Policy offices (OAR, OW, OSWER, OPPTS) with regard to lead and other metals, and is an internationally recognized center of expertise on metals as well as on air pollution exposure/health effects.

NCEA-RTP provides training and information to Agency researchers, policy makers, and the public through workshops, public meetings, and publications, and has developed the Health and Environmental Research Online (HERO) system for improving transparency and public access to the scientific information used in NCEA assessments.

Global Change

NCEA's Global Change Research Program provides critical information to improve society's ability to effectively respond to the risks and opportunities presented by global change. The program addresses the potential consequences of global climate change on air and water quality, aquatic ecosystems, human health, and socioeconomic systems in the United States. It also generates decision-support tools for resource managers coping with a changing climate. These products are used by EPA, communities, states, and others in adapting to climate variability and change.

The Global Change Research Program has three major areas of emphasis: air quality, water quality/aquatic ecosystems, and human health impacts from global change. NCEA scientists are involved in a multi-lab collaboration that assesses the consequences of global change for U.S. air quality. NCEA also evaluates the sensitivity to climate change of water quality goals and the opportunities available within the provisions of the Clean Water Act and the Safe Drinking Water Act to address anticipated impacts. For example, NCEA scientists are engaged in assessments covering a range of aquatic ecosystems and issues including coral reefs, watersheds, estuaries, biocriteria and aquatic invasive species. These efforts are done in collaboration with the Office of Air and Radiation and the Office of Water.

NCEA will continue to be actively involved in the Interagency Climate Change Science Program. NCEA will also continue to advance assessment science by developing innovative interactive tools for understanding local scale systems and their sensitivities. The long-term goal of NCEA's efforts is to provide the approaches, methods, and models to quantitatively evaluate the effects of global change on air and water quality, associated impacts on aquatic ecosystems and human health and adaptive responses to ameliorate adverse consequences of these changes.

Integrated Risk Information System (IRIS)

EPA's IRIS is a human health assessment program that evaluates quantitative and qualitative risk information on effects that may result from exposure to chemical substances found in the environment. Through the IRIS program, EPA provides the highest quality science-based human health assessments to support the Agency's regulatory activities. The IRIS database contains information for more than 550 chemical substances that can be used to support the first two steps (hazard identification and dose-response evaluations) of the risk assessment process. When supported by available data, IRIS provides oral reference doses (RfDs) and inhalation reference concentrations (RfCs) for chronic noncancer health effects as well as the assessment of potential carcinogenic effects resulting from chronic exposure. Both public and private sector organizations use IRIS toxicity values in combination with information on specific exposure, to characterize the risk that chemicals pose to public health.

The process for developing IRIS assessments is scientifically rigorous and collaborative, involving several rounds of scientific review. Toxicologists, biologists, health scientists, epidemiologists, and statisticians develop the assessments using available scientific findings

from the peer-reviewed literature. Biologically based mathematical models and data on mode of action by which chemicals exert their toxic effects are used to answer questions about the human relevance of animal studies, to extrapolate between animals and humans, to identify and assess sensitive subpopulations, and to select appropriate methods to extrapolate from experimental doses to the generally low doses that people may encounter in their environments. Because the assessments must reflect EPA's opinion, they undergo in-depth reviews by scientists throughout the Agency. The draft assessments also receive review by scientists in other federal agencies and by highly-qualified independent external experts whose scientific disciplines are appropriate for the chemical under review. On occasion, an assessment may be reviewed by independent expert panels formed by the National Research Council of the National Academy of Sciences. The public also has opportunities to comment on draft assessments and contribute data.

Each year, EPA publishes in the Federal Register a list of ongoing and new assessments. NCEA solicits nominations for new and updated assessments from the public and within EPA. Assessments are updated as new scientific information or methods evolve that could significantly change IRIS information.