The Value of GIS as a System of Engagement for Building a Culture of Health
Towards a New Healthographic Synthesis
This Session

» Multi-factor, cross-sector approaches are needed in order to effectively and equitably promote healthier, more resilient communities → CULTURE OF HEALTH

» The value of GIS as a platform for advancing the new healthographic (place-based) synthesis → INTEGRATED, COMPREHENSIVE APPROACHES AND VIEWS OF HEALTH.

» The emergence of GIS as SYSTEMS OF ENGAGEMENT → ACTION WITHIN AND ACROSS SECTORS.
The New Public Health: New Approaches to Persistent Challenges
Persistence of Chronic Diseases Rooted in Behavioral Choices
U.S. Losing Ground in Health

Within the U.S., we have shocking differences in life expectancy based on...

Where we live
- 15 years

Our income
- 10 years

Our education
- 9 years

Our race
- 7 years

Even our most advantaged people live shorter lives than peers in other countries.
Short Distance: Large Disparities

Babies born within five miles of downtown Richmond face up to a 20-yr difference in life expectancy. Life expectancy can differ by as much as 16 years in the nine miles that separate The Strip from Southeast Las Vegas. 

Modifiable Factors & Health Outcomes

- Health Behaviors: 30%
- Social & Economic Factors: 40%
- Environment: 10%
- Clinical Care: 20%

Social, environmental and individual factors influence our health as well as the opportunity to make healthy choices.
The Healthiest Nation in One Generation
Building a Culture of Health
Building a Culture of Health: The Action Framework
The Healthographic Synthesis
The Intellectual and Conceptual Framework
“Modern public health sees the environment as social and psychological, not merely as physical. In this sense, then, ‘environment’ and ‘place’ converge to provide a spatial context for health that transcends the individual’s own behavior and health outcomes”

Nonclinical determinants of community health are critical drivers of health improvement.
Contextual Health
- Linking public health knowledge with personal healthcare

Geomedicine: our environmental DNA
Geomedicine: The Future

Geodocs will assess a patient’s health risks, lifestyle stressors, and environmental context in the medical encounter in order to determine a diagnosis and prescribe treatment.

- Ex.: A patient with asthma who smokes.
- Ex.: A patient who would benefit by weight loss and a better diet.
Genetic GIScience: Toward a Place-Based Synthesis of the Genome, Exposome, and Behavome

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Exposomics: Mating The Exposome

Exposome: Time for Transformative Research

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Redox biology: Interface of the exposome with the proteome, epigenome and genome
Young-Mi Go, Dean P. Jones* Redox Biology 2 (2014) 358–360

The Public Health Exposome: A Population-Based, Exposure Science Approach to Health Disparities Research
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Exposome

- A comprehensive measurement of all exposure events (exogenous and endogenous) from conception to death

PUBLIC HEALTH EXPOSOME

Natural Environment
- Air, Climate, Water, Land Cover & Land Use
- Remotely Sensed Data
- Ground Measurements

Built Environment
- Places We Live, Work, Learn, and Play

Social Environment
- Social, Demographic, Political, Economic Institutions and Conditions

Policy Environment
- Federal, State, Local
- Laws, Ordinances, and Regulations

CONCEPTUAL MODEL

PERSONAL ATTRIBUTES
- Genes
- Omics
- Determined Factors
- Psychosocial Factors

STRESSORS
- Exposure
- Duration
- Lifespace

COMMUNITY
- Natural Environment
- Built Environment
- Social Environment
- Policy Environment

ENVIRONMENT

MODERATING FACTORS
- Social Support
- Community Assets
- Access to Care
- Existing Conditions

POPULATION HEALTH OUTCOMES

HISTORICAL

INDIVIDUAL

LIFESPAN
Conception to Death

PERSONAL HEALTH OUTCOMES
The Healthographic Synthesis: Genomic GIScience
Geographic Information Systems of Engagement (GISe)

The Information Systems & Technology Framework
Paths of African American (purple) and Asian American (blue) women in Portland, Oregon, over the course of a typical day. The vertical dimension is time.

Mei-Po Kwan, Department of Geography, Ohio State University
Cross-sector Approaches: IS/IT Perspective

- Multiple authoritative data streams
- Metrics for cross-sector collaboration
- Data Clearing Houses
- From single-location DMSs to SYSTEMS OF ENGAGEMENT

Keywords: critical engagement, research, conversation, dialogue, politics, communities, movement
GIS

From a system of record
to a platform of engagement
Critical Engagement: Transforming the Role of GIS Systems of Record are brought together (geospatial integration; data layers are overlaid according to place), catalogued, shared, and consumed via portal which creates the System of Engagement.
Governments

System of Record

Healthcare Agencies

Businesses

System of

Academic

Community
Geographic Information Systems of Integration (GISe)—Shared Vision & Shared Passion