

XIII Seminario Urbanismo Internacional

Ciudad de oportunidades
e innovación

Acciones sustentables en la nueva agenda urbana

del 17 al 21 de abril del 2017

Museo Franz Mayer, Ciudad de México

sui Seminario de
**Urbanismo
Internacional**

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Compilador

Dr. Sergio Padilla Galicia

Coordinación General

Dra. Elizabeth Espinosa Dorantes

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DG. Karen Jazmín Valdez Angeles

Coordinación Ejecutiva

DG. Karen Jazmín Valdez Angeles

Programación, formación y diseño

13° Seminario de Urbanismo Internacional

Universidad Autónoma Metropolitana-Azcapotzalco

Av. San Pablo No. 180, Col. Reynosa Tamaulipas.

Del. Azcapotzalco 02200, México, D.F.

Tel: 53 18 91 79 / 53 18 91 80

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Abril de 2017

Esta publicación es un producto compilado y editado por el Área de Arquitectura y Urbanismo Internacional, del Departamento de Evaluación del Diseño en el Tiempo, de la División de Ciencias y Artes para el Diseño, Universidad Autónoma Metropolitana. El contenido de la presentación es propiedad intelectual del autor. Todos los derechos reservados conforme a la legislación correspondiente. Ciudad de México, 2017

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Carl Steinitz (Estados Unidos)

- Es Profesor Emérito, Alexander y Victoria Wiley de Arquitectura del Paisaje y Planificación en la Graduate School of Design de la Universidad de Harvard.
- Los temas de interés de Carl Steinitz se reflejan en su enseñanza y trabajos de investigación sobre los cambios en el paisaje, métodos de análisis del paisaje, calidad visual y planificación de paisaje y diseño.
- Sus cursos incluyen teorías y métodos de planificación del paisaje, dirige un seminario sobre paisaje visual.
- Los trabajos de investigación de Steinitz se orientan al mejoramiento de los métodos que los planificadores y diseñadores deben seguir para organizar y analizar información sobre las grandes áreas de la tierra y cómo tomar decisiones importantes para el diseño.
- En 1984, recibió el Premio de educador excepcional del Consejo de Educadores en Arquitectura del Paisaje; también recibió el premio al Profesional Distinguido de 1996 de la Asociación Internacional para la Ecología del Paisaje.
- Obtuvo una distinción como profesorado honorario en 1987 por la Universidad de Silvicultura de Beijing, China.

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GEODISEÑO

El geodiseño es un concepto y una metodología que posibilita una colaboración más efectiva y simbiótica entre las profesiones de las ciencias del territorio y aquellas cuyo fin es proyectar y planificar, los profesionales de la información y la población local, en especial cuando se aplica para mejorar las transformaciones medio ambientales y sociales.

La metodología propuesta, puede contribuir a ese objetivo de transformación positiva del territorio, concebida como una actividad colectiva, un esfuerzo en equipo, que incluye profesionales de las ciencias del territorio y del proyecto, conectados mediante la tecnología para posibilitar una retroalimentación y ágil comunicación, siempre supeditado a una comunicación transparente con la población local.

La presentación trata sobre la necesaria colaboración entre proyectistas y científicos, centrándose en aspectos fundamentales de las áreas de estudio, la escala, y el tamaño. La metodología propuesta señala seis cuestiones clave y sus correspondientes tipos de modelos a integrar en el geodiseño. La propuesta del profesor Steinitz es un método personal que está basada en la experiencia del autor y elaborada con la intención de ayudar a los participantes en procesos de planificación y diseño para obtener beneficios prácticos del concepto del geodiseño.

GEODESIGN DYNAMICS

WHY GEODESIGN?

A FRAMEWORK FOR GEODESIGN

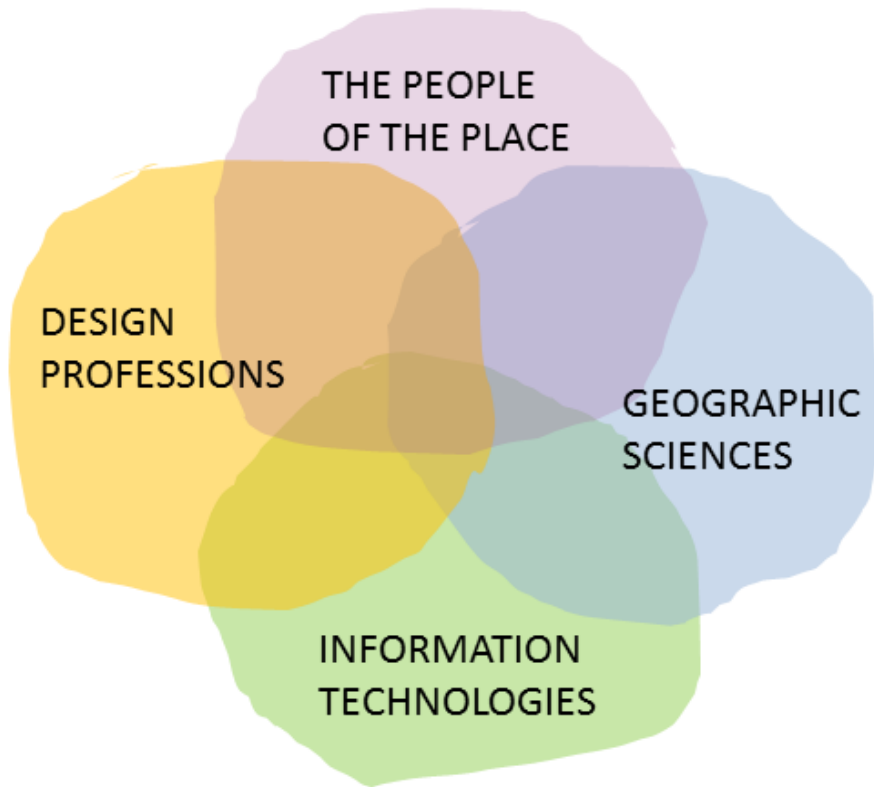
A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN

SOME RECENT EXAMPLES (BRIEFLY PRESENTED)

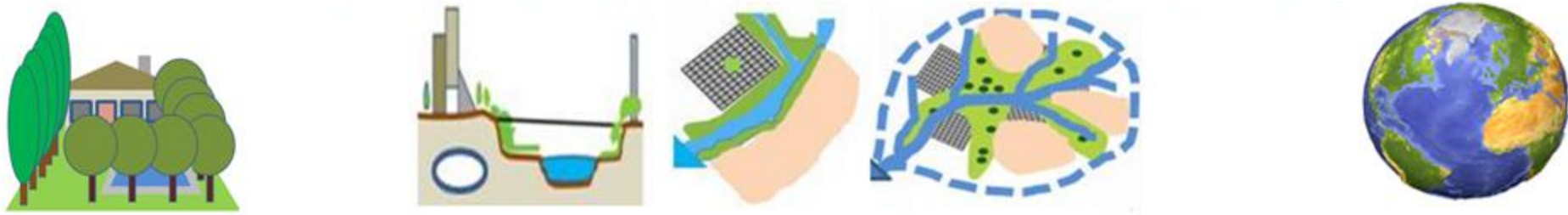
Carl Steinitz

GEODESIGN DYNAMICS

WHY GEODESIGN?



It is clear that for serious societal and environmental issues, designing for change cannot be a solitary activity. Rather, it is inevitably a collaborative endeavor, with participants from various design professions and geographic sciences, linked by technology from several locations for rapid communication and feedback, and reliant on transparent communication with the people of the place who are also direct participants.

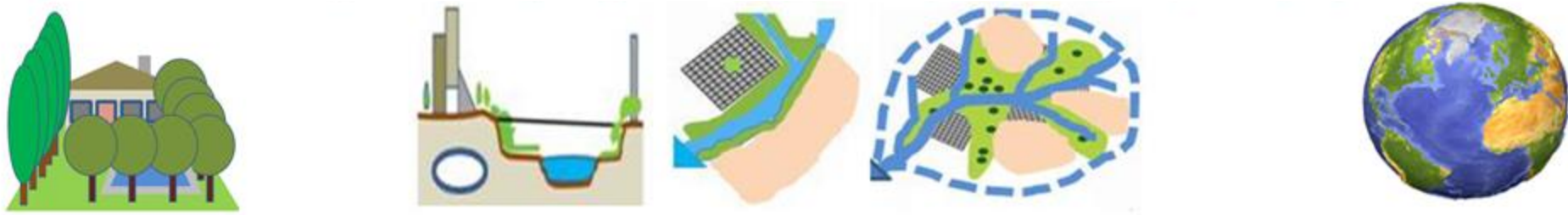


"Geodesign changes geography by design."

"Geodesign is a method which tightly couples **systems-thinking** with the creation of proposals for change and impact simulations informed by geographic contexts, normally supported by digital technology."

CS after Tess Canfield, Michael Flaxman and Stephen Ervin

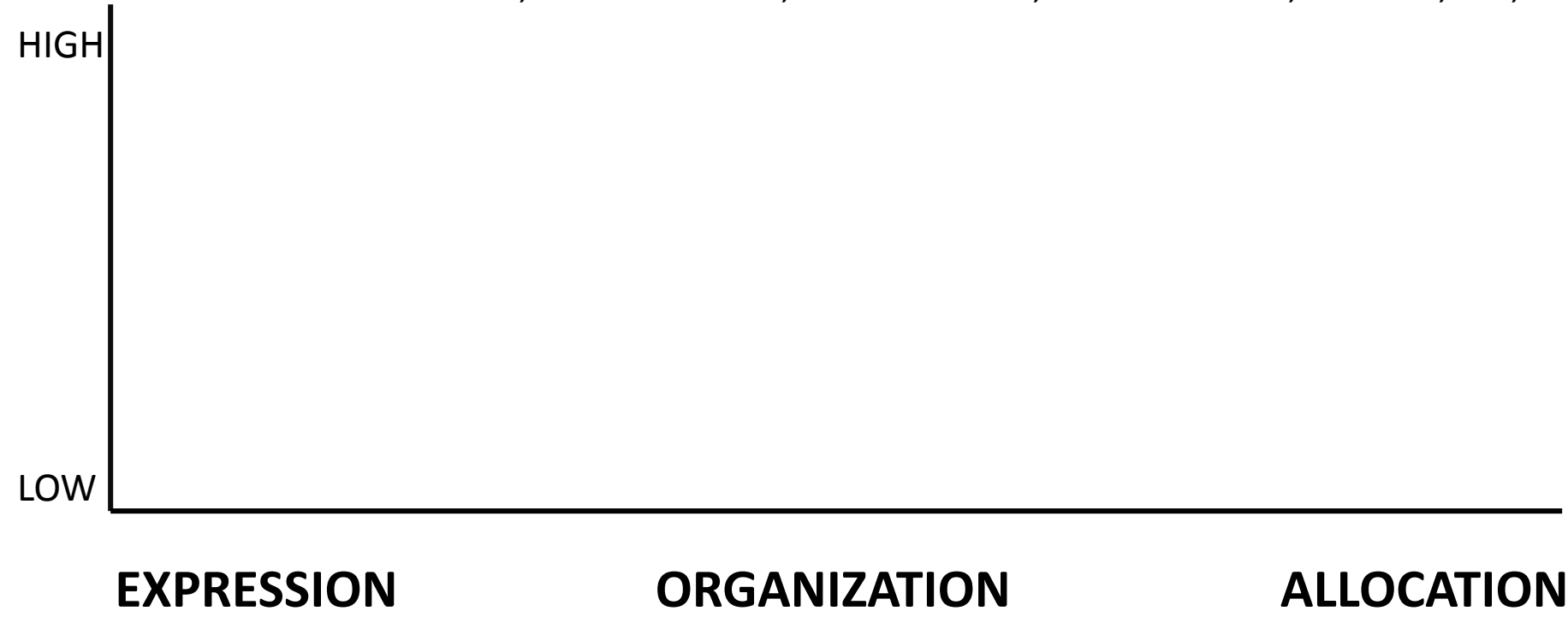
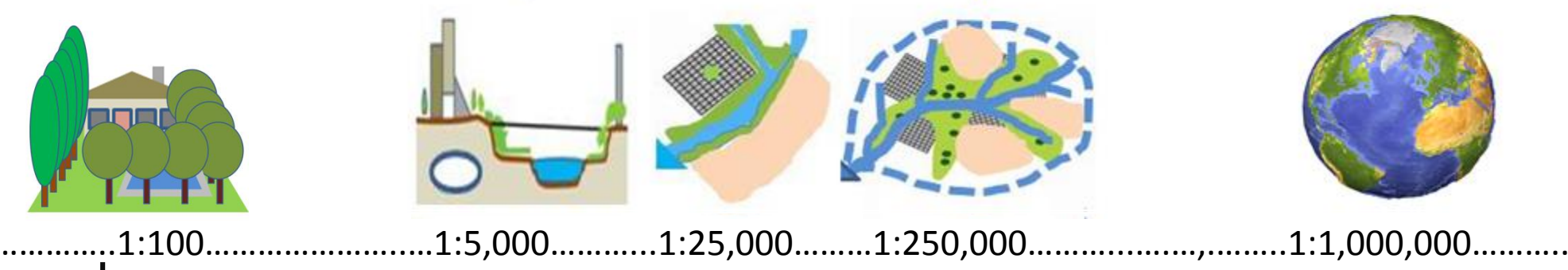
adapted from C.Steinitz, 2012, *A Framework for Geodesign* , preface



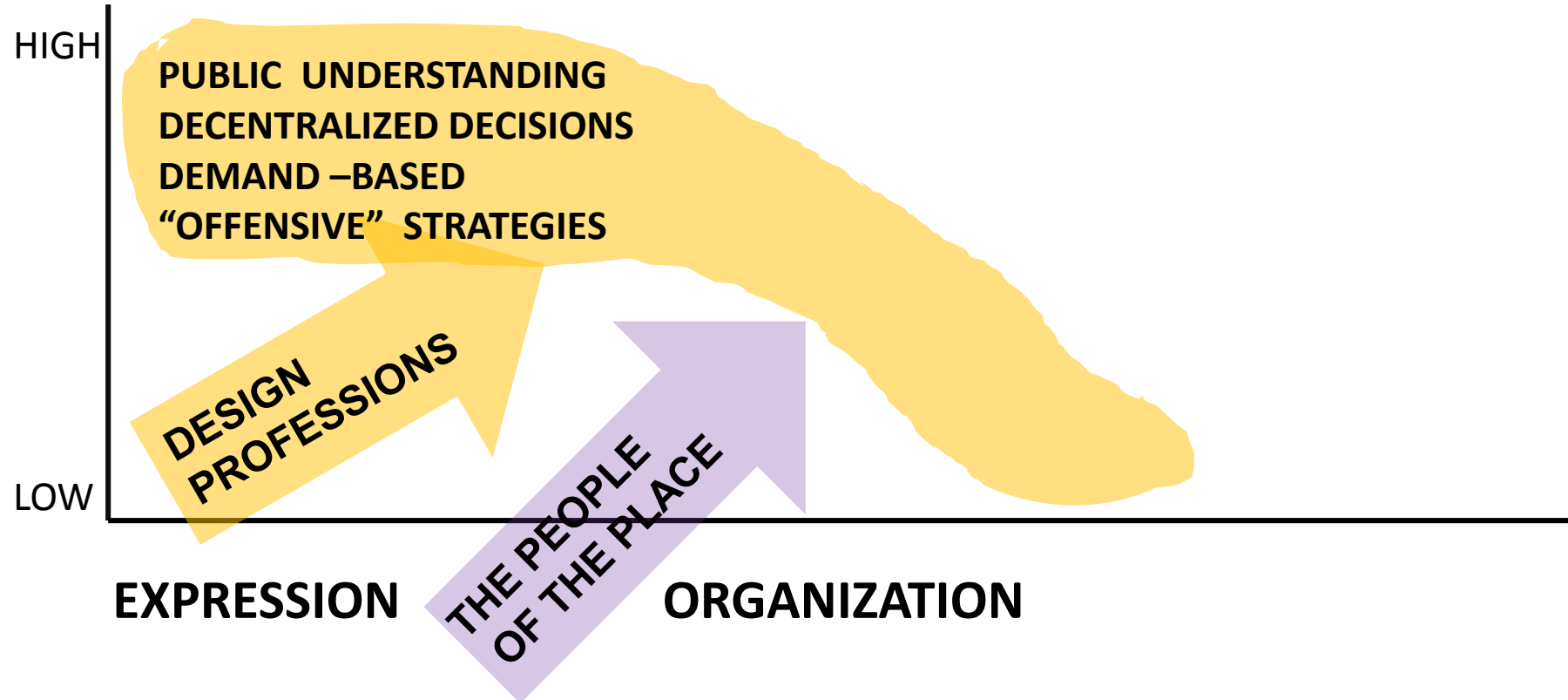
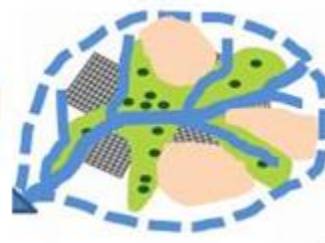
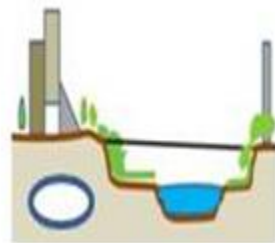
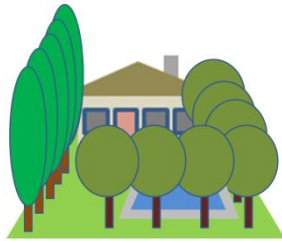
“Geodesign” is an invented word, and a very useful term to describe **a collaborative activity** that is not the exclusive territory of any design profession, geographic science or information technology. Each participant must know and be able to contribute something that the others cannot or do not.yet during the process, ***no one need lose his or her professional, scientific or personal identity.***

DESIGN PROFESSIONS

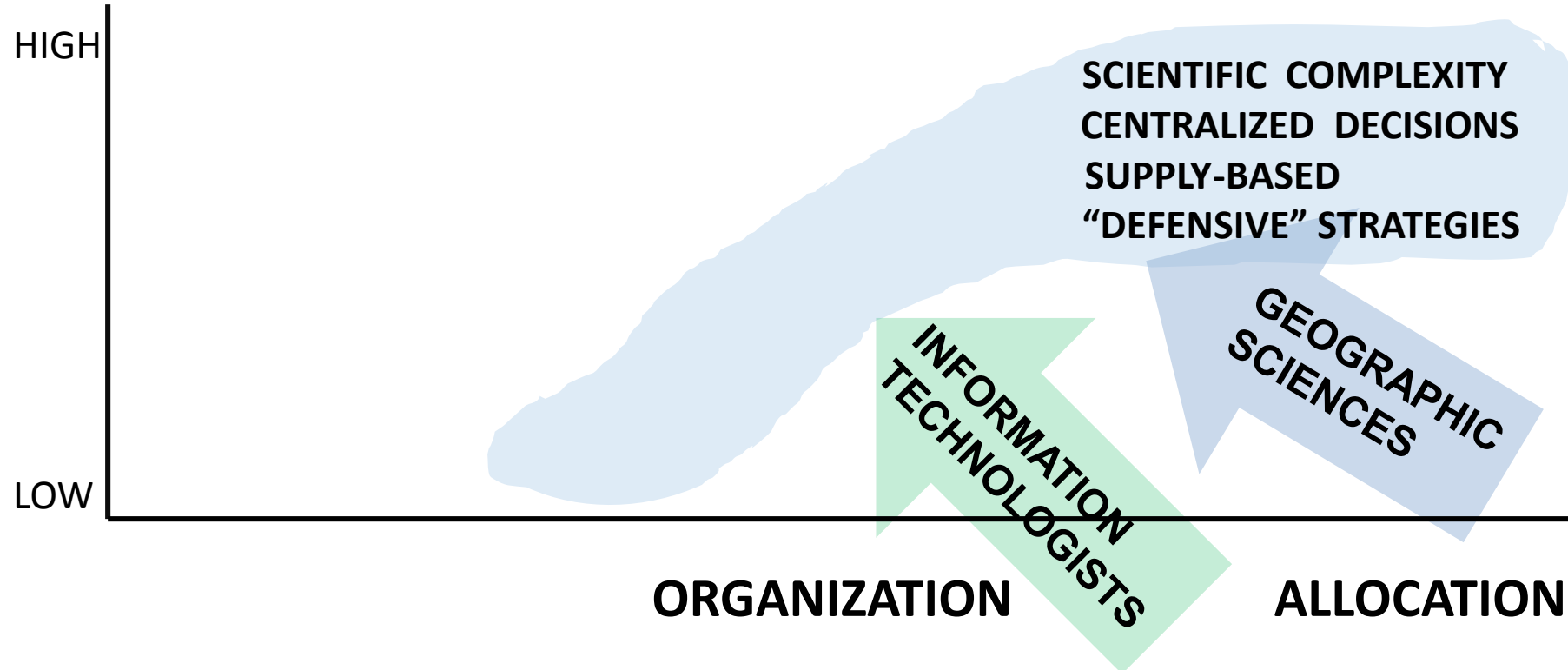
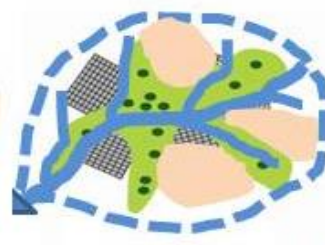
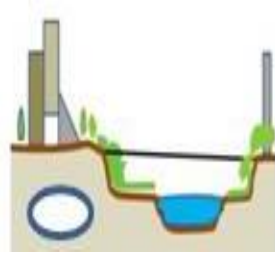
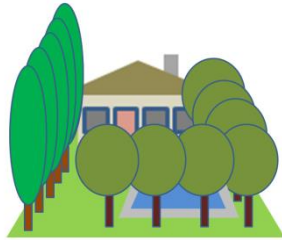
GEOGRAPHIC SCIENCES



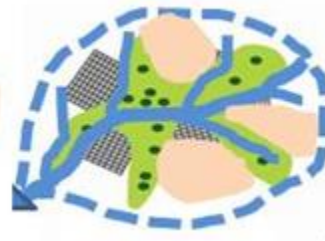
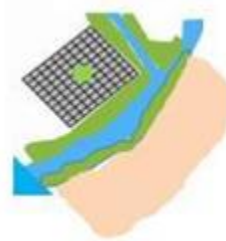
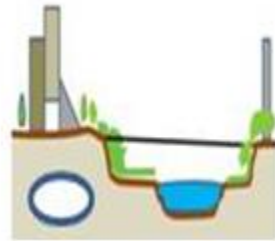
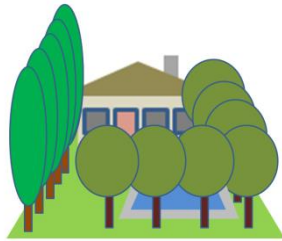
DESIGN PROFESSIONS



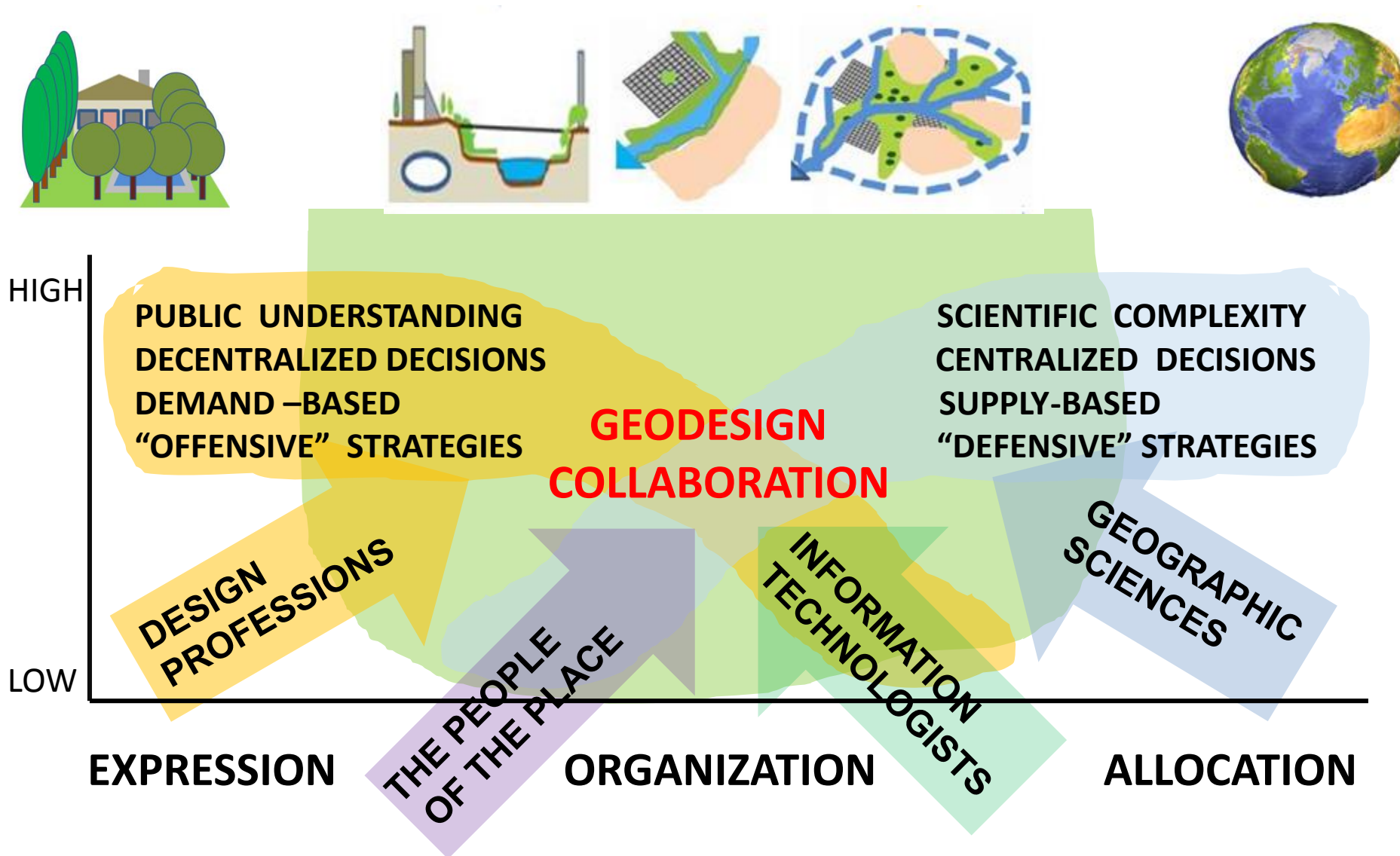
GEOGRAPHIC SCIENCES



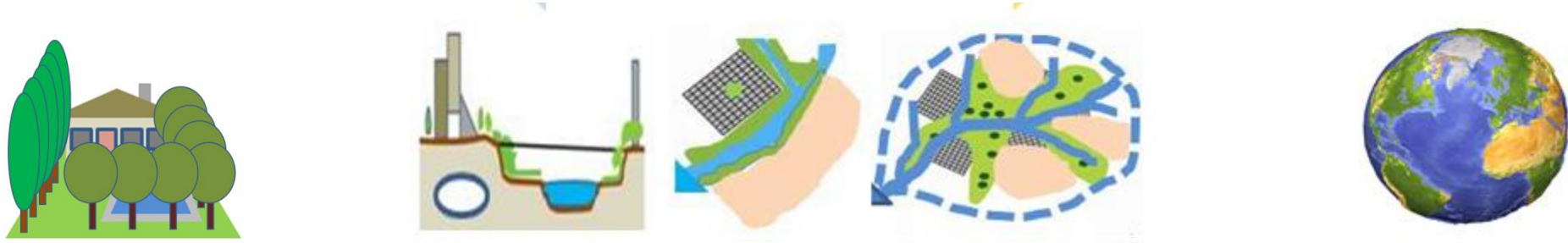
This is where I think we are.



This is where I think collaboration in geodesign can be most significant.

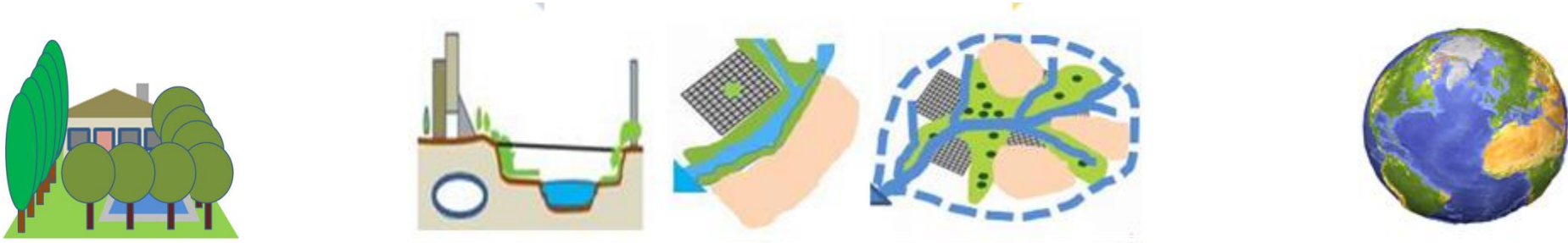


GEODESIGN IS SERIOUS



There are **IMPORTANT PROBLEMS** and—frequently—
there is **LITTLE TIME** FOR DECISION AND ACTION.
PEOPLE/GROUPS HAVE DIFFERENT INTERESTS AND PRIORITIES.
EACH seeks/NEEDS **LEGITIMACY** in/via design.
GEODESIGN does *NOT* normally produce A *FINAL* PRODUCT.
IT IS LIKELY TO MOST USEFUL AT THE BEGINNING
of thinking about and deciding on
THE **STRATEGY** of what to do....

GEODESIGN IS COMPLEX



THERE ARE **UNCERTAINTIES**:

Multiple GEOGRAPHIC SCOPES: political boundaries, watersheds, etc.

Complex CONTENT: SYSTEMS which vary by size, location, threat, etc.

CHANGE REQUIREMENTS are many.

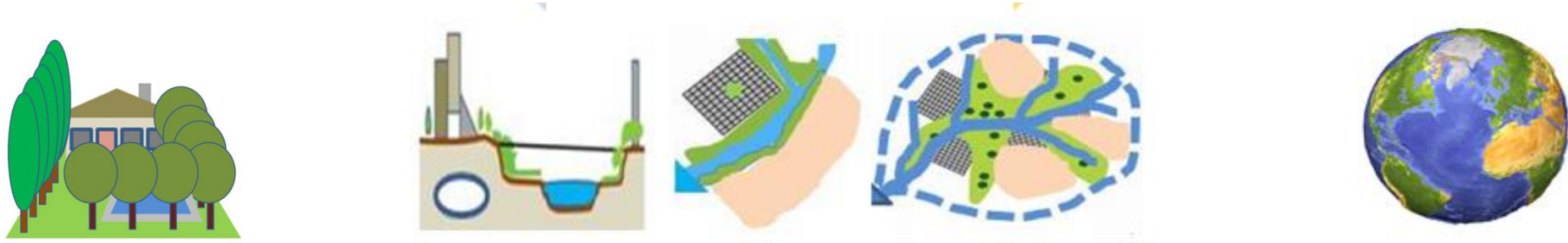
GEODESIGN METHODS do not scale and do not exactly-repeat.

THEY SHOULD FIT THE CONTEXT.

Therefore GEODESIGN and its technical support must be

FLEXIBLE, ITERATIVE, TRANSPARENT AND RAPID.

GEODESIGN IS DYNAMIC



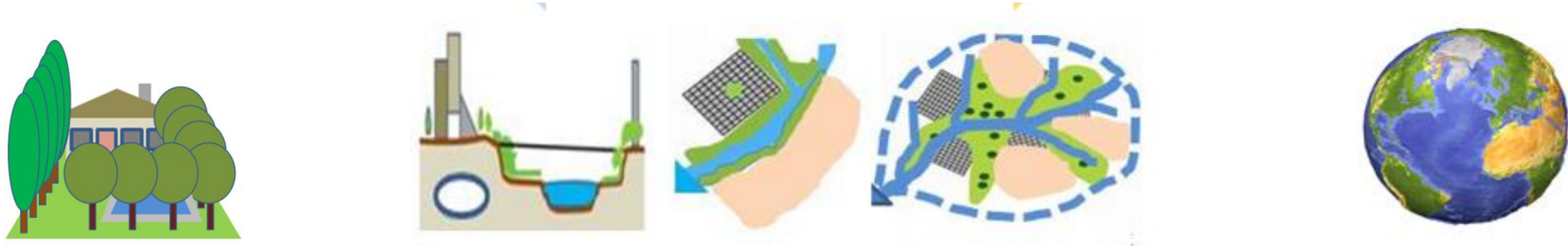
CHANGE in a design is a ***RELATIONAL SYNTHESIS*** in SPACE and TIME
of SETS of system-based **POLICIES AND PROJECTS**
....AND **THE SEQUENCE MATTERS.**

DESIGN(S) SHOULD BE ASSESSED AND ITERATIVELY IMPROVED,
KNOWING THAT **ANY CHANGE CHANGES ALL THE SYSTEMS.**

Therefore, a primary aim of GEODESIGN is to RAPIDLY MOVE from infinite
possible designs towards an socially, environmentally and economically
FEASIBLE DECISION.

THE GEODESIGN ENDGAME MUST SUPPORT **INFORMED NEGOTIATION.**

GEODESIGN IS COMMUNICATION



GEODESIGN is likely to be **COLLABORATIVE**.

Therefore--

ALL ASPECTS OF GEODESIGN SUPPORT MUST BE EASILY LEARNED,
EASILY USED AND EASILY COMMUNICATED --and most importantly--

THE “LANGUAGE” of GEODESIGN MUST BE **EASILY UNDERSTOOD** BY ALL.

GEODESIGN IS A COLLABORATIVE,

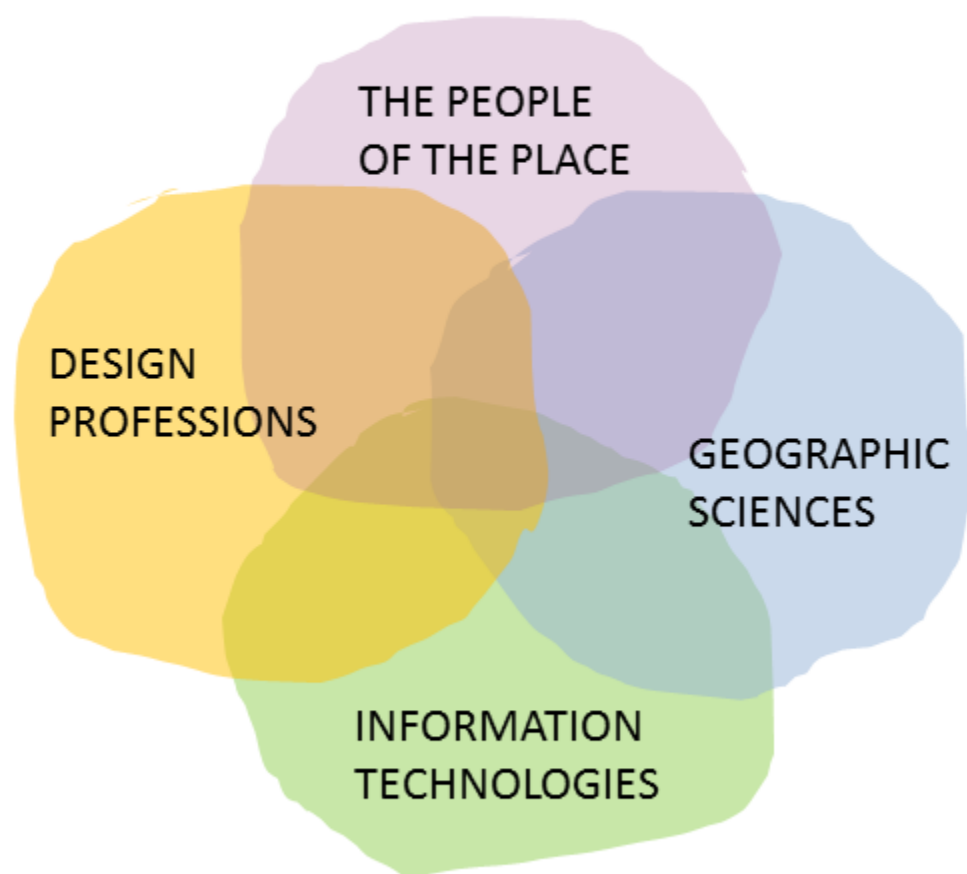
SOCIAL- POLITICAL PROCESS OF DESIGN.

GEODESIGN DYNAMICS

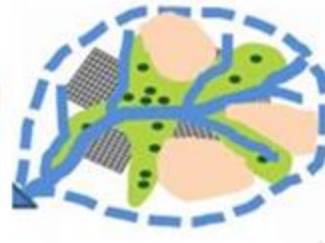
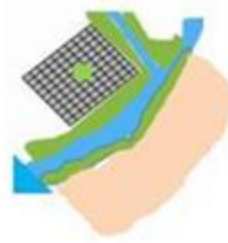
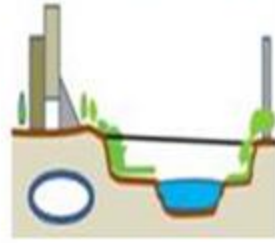
A FRAMEWORK FOR GEODESIGN

A FRAMEWORK FOR GEODESIGN

Carl Steinitz

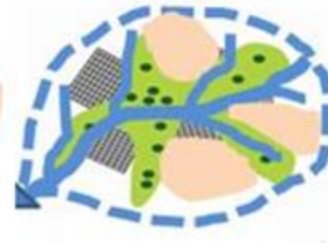
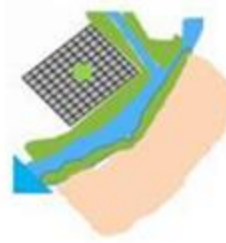
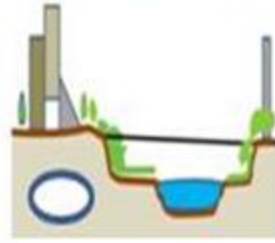
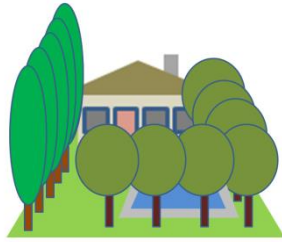


GEODESIGN CHANGES GEOGRAPHY BY DESIGN



“Put in simplest terms, a theory explains,
a model predicts and a framework organizes.
A framework can be judged on its reasonableness
and its utility, but claims no exclusivity vis-a-vis
other frameworks”.

Amos Rapaport



- 1. How should the context be described?**
- 2. How does the context function?**
- 3. Is the context working well?**
- 4. How might the context be altered?**
- 5. What differences might the changes cause?**
- 6. How should the context be changed?**

ASSESSMENT

DATA

KNOWLEDGE

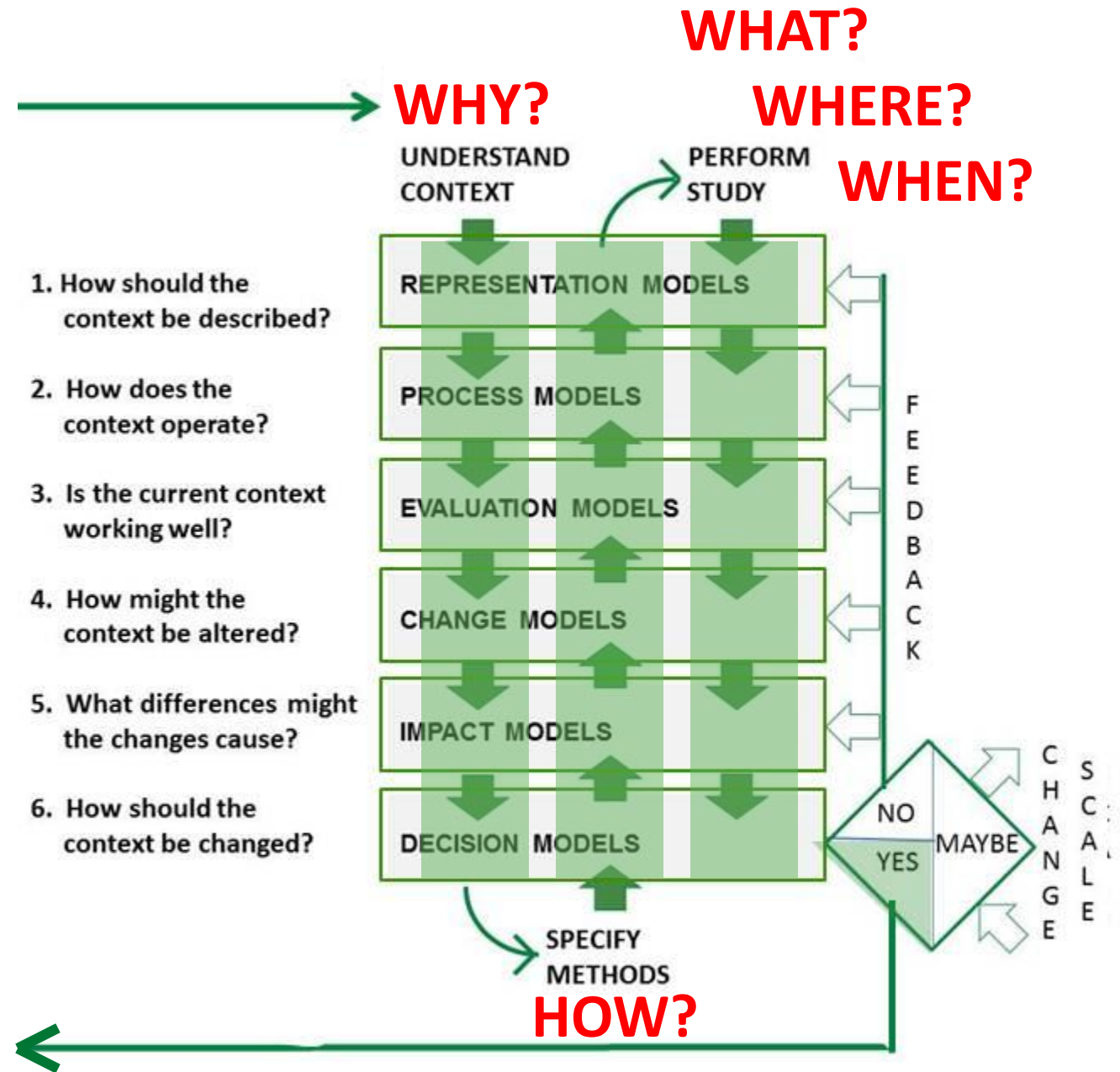
VALUES

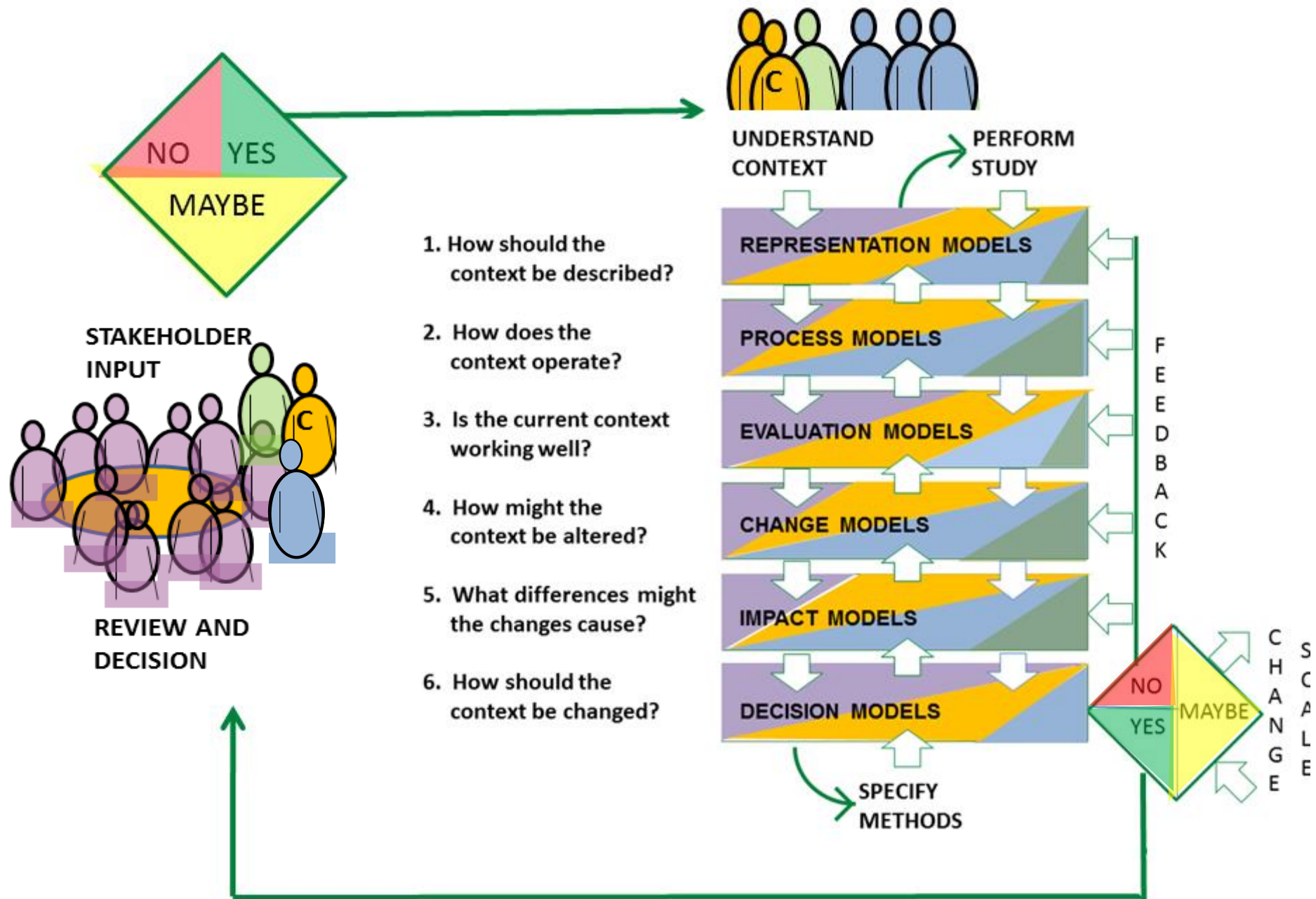
INTERVENTION

DATA

KNOWLEDGE

VALUES





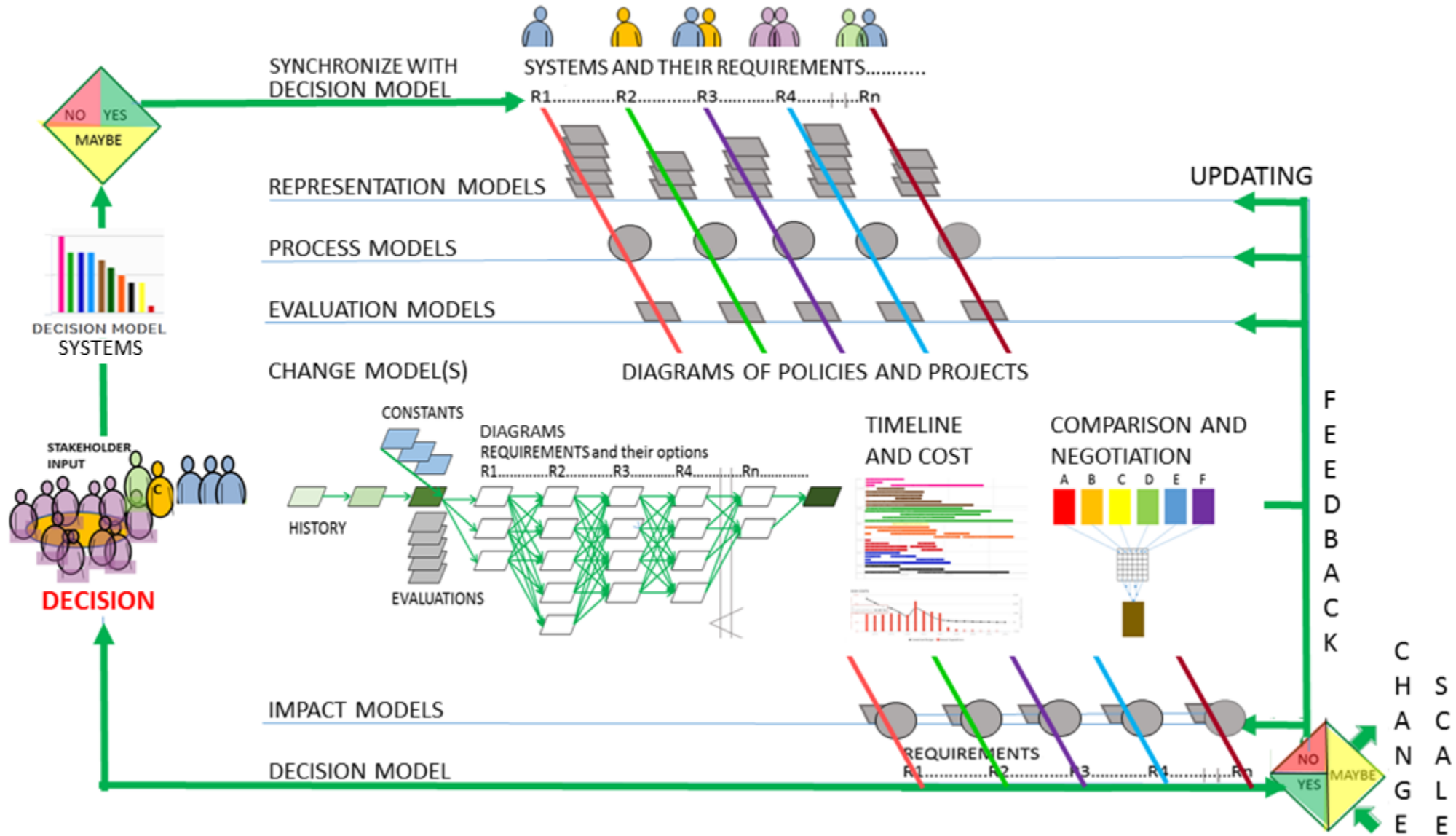
GEODESIGN DYNAMICS

A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN

Dynamic geodesign links change in a design *as it is being made* to responses in its changing context: its systems, space and time.

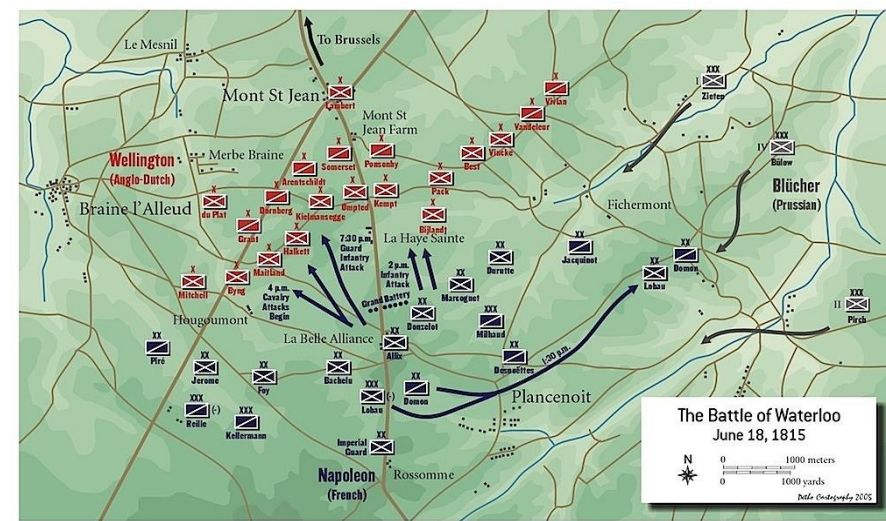
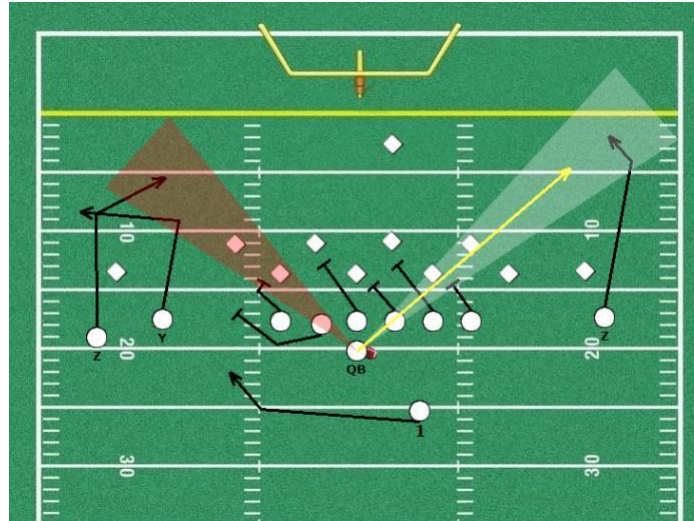
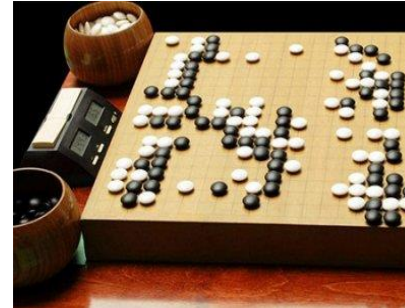
Carl Steinitz, 2016

A WORKFLOW FOR GEODESIGN



THE DYNAMICS OF SEQUENCE AND TIMING

SEQUENCE MATTERS: EVERY MOVE CHANGES EVERYTHING

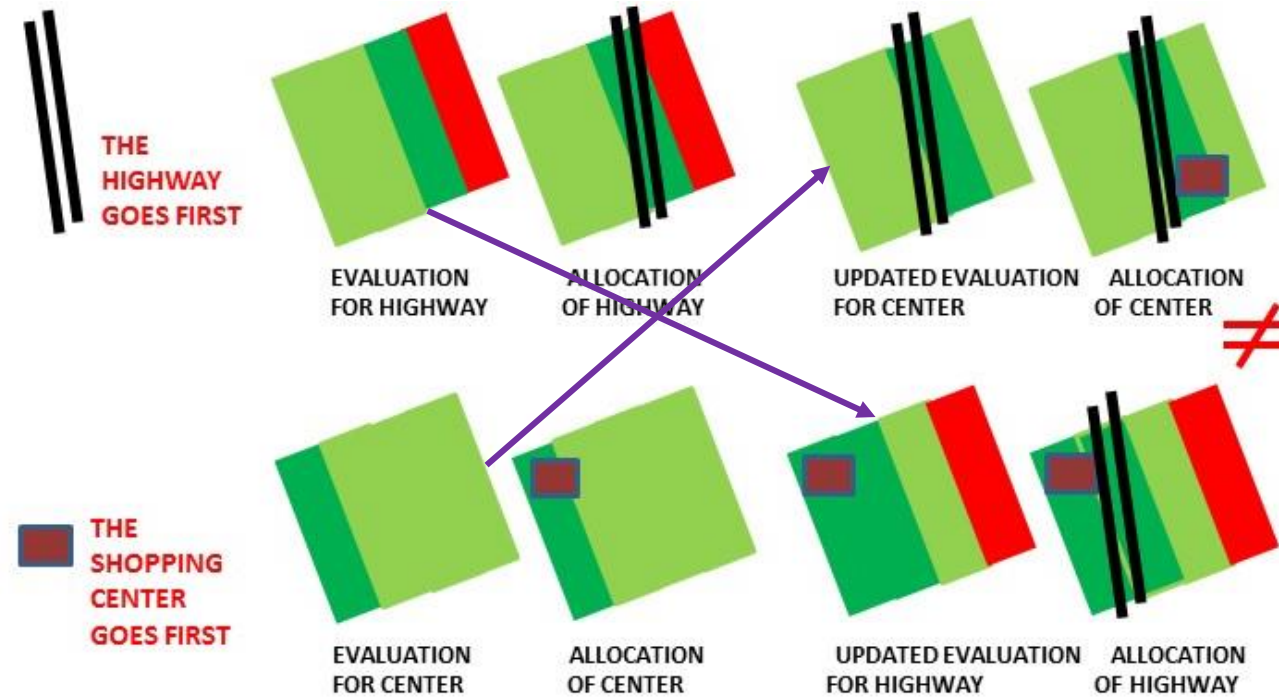


THEREFORE, ENABLE UPDATING OF ALL SYSTEMS AS THE DESIGN DEVELOPS

THE DYNAMICS OF SEQUENCE AND TIMING

SEQUENCE MATTERS: EVERY MOVE CHANGES EVERYTHING

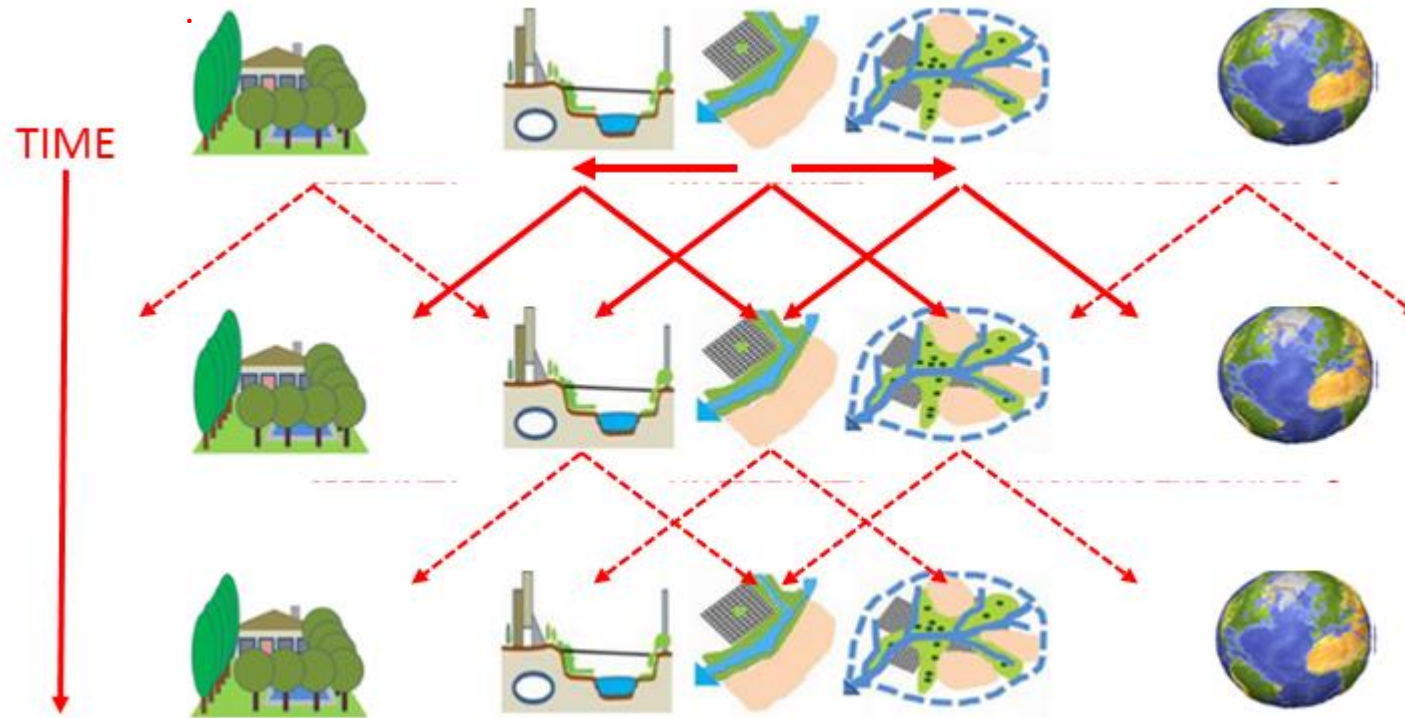
THE CHICKEN AND THE EGG...or...THE HIGHWAY AND THE SHOPPING CENTER...OR...



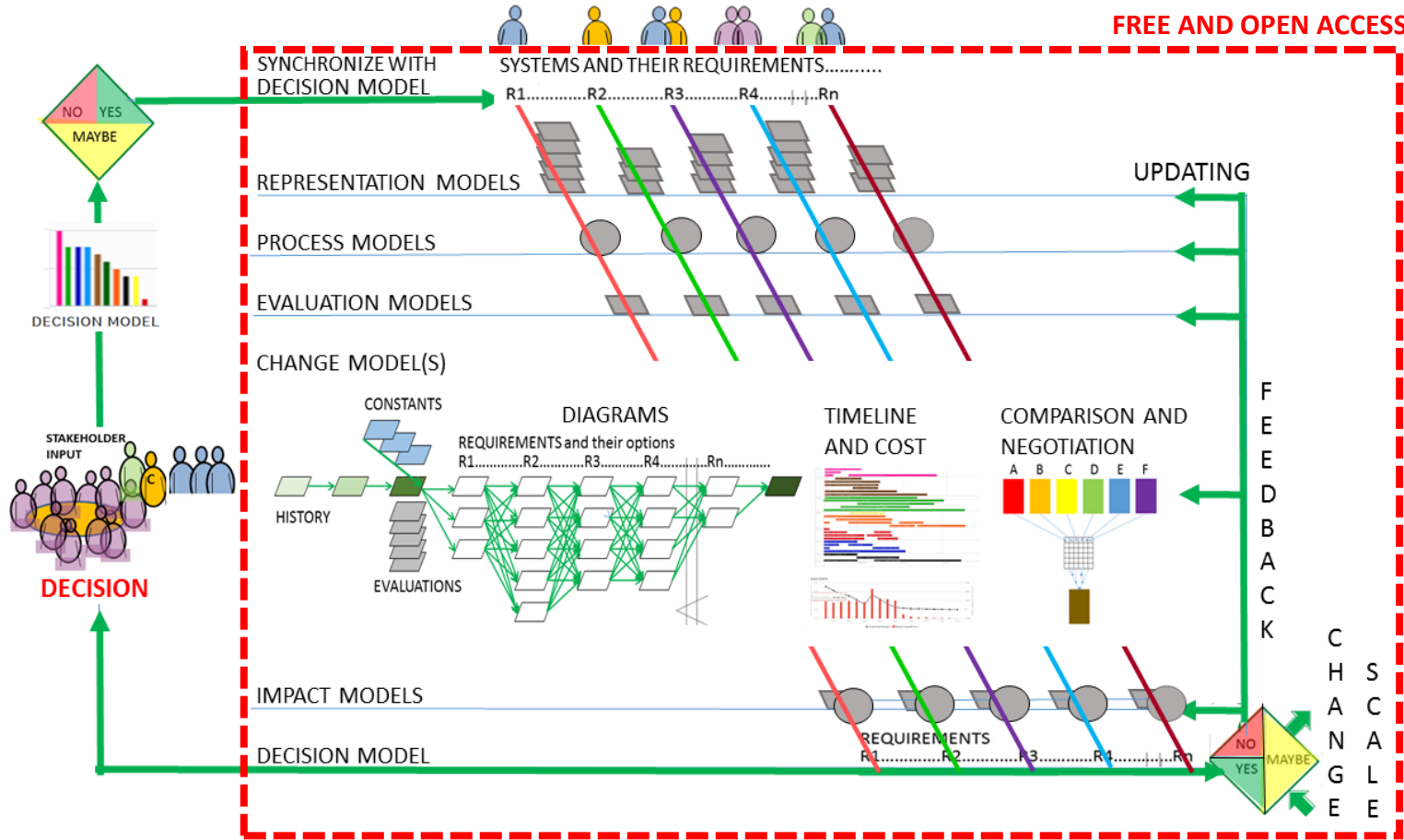
THEREFORE, ENABLE UPDATING OF ALL SYSTEMS AS THE DESIGN DEVELOPS

THE DYNAMICS OF SIZE, SCALE AND TIME

SIZE, SCALE AND TIME MATTER: EVERY MOVE CHANGES EVERYTHING



THEREFORE, ENABLE SIMULTANEOUS AND SEQUENTIALLY LINKED DESIGN AT MORE THAN ONE SIZE/SCALE/AREA



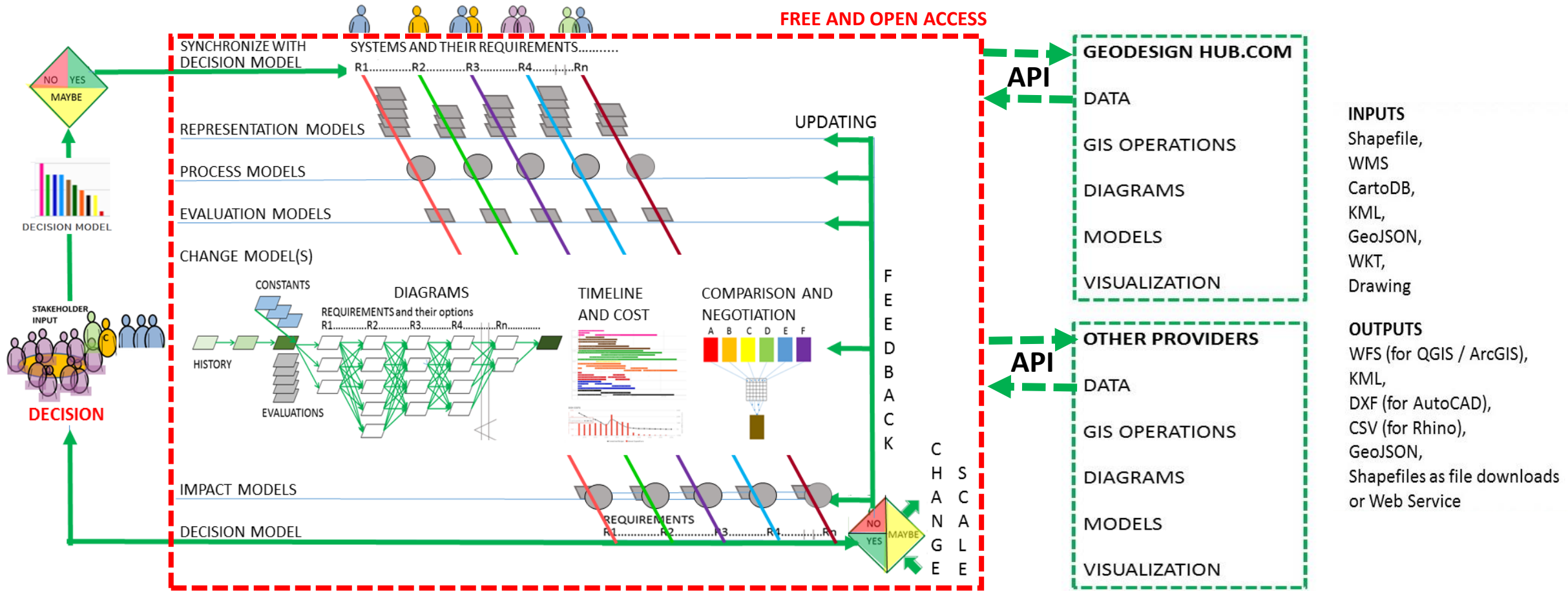
Geodesignhub is a cloud-based, free and open access, open platform software built by Hrishi Ballal in cooperation with Carl Steinitz and Stephen Ervin. It is designed to link with other tools and models, rather than to contain complex substantive algorithms itself. It is used to manage geodesign for large, complex, politically contentious projects and studies in their early conceptual and strategic phases when the process is at its most dynamic

Geodesignhub is designed to support collaboration and negotiation towards agreement. It aims to be as simple as possible: easy to learn, set up, use and (most importantly) easy to understand.

A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN

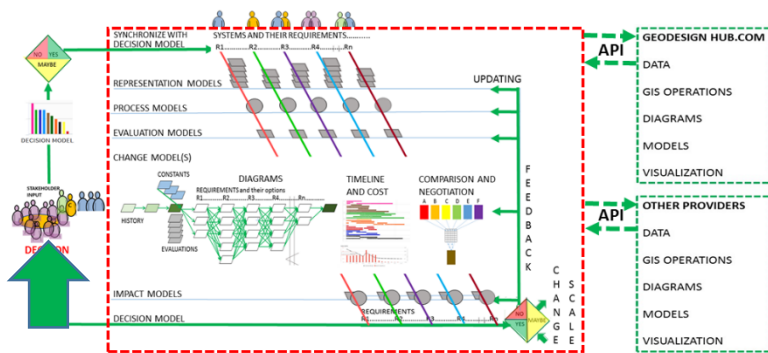
GEODESIGNHUB

APPLICATION PROGRAMMING INTERFACE



The Geodesignhub application programming interface (API) is an extendable specification and format enabling data interoperability between Geodesignhub and other software systems. It enables external models to be incorporated seamlessly within the Geodesignhub workflow. The API also enables other automated and external geodesign processes, such as generating diagrams, producing special-purpose representations, and converting data from Geodesignhub for use in other software systems. Geodesignhub supports all common geospatial data formats.

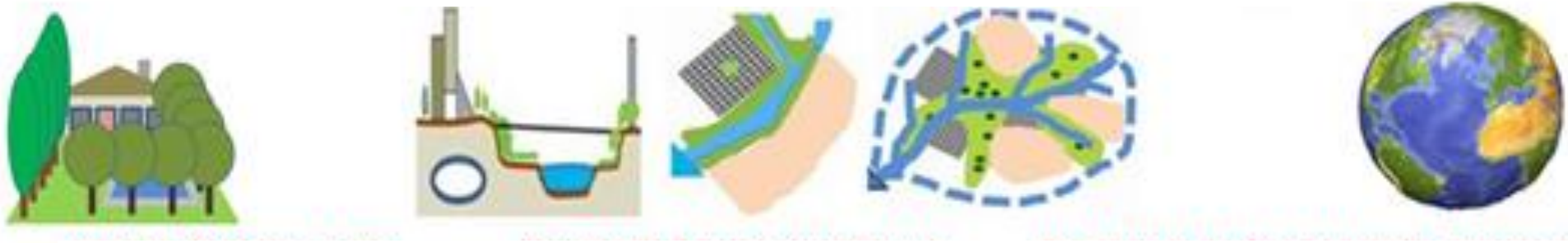
A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN



GEODESIGNHUB

EDUCATION AND TRAINING WORKSHOPS





WHY APPLY GEODESIGN IN A COLLABORATIVE WORKSHOP FORMAT ?

- **WHEN WORKING THROUGH A GEODESIGN FRAMEWORK IN ORDER TO UNDERSTAND IT**
- **WHEN APPLYING GEODESIGN AND THERE IS LITTLE TIME AND SMALL DATA**
- **WHEN STARTING FAST TO IDENTIFY CENTRAL ISSUES, OPTIONS AND CHOICES**
- **WHEN IT TAKES A DESIGN TO KNOW WHAT THE QUESTIONS REALLY ARE**
- **WHEN IT TAKES A DESIGN TO KNOW WHAT IS REALLY WANTED**

WORKSHOP SCHEDULE

Pre-workshop Geodesign team Tour of Study Area

17:30 – 19:30 Public Lecture by Carl Steinitz

Workshop Day One

08:30 – 09:00 Set up and connect to Geodesignhub

09:00 – 09:45 Personal Introductions and Description of Study Area and Organization of Workshop

09:45 – 09:50 Pre-workshop Survey

10:00 – 10:30 Geodesignhub tutorial

10:30 – 12:15 System teams make at least 10 diagrams of policies and projects

12:15 – 12:30 Form Change-design teams

12:30 – 13:30 Lunch

13:30 – 13 50 Geodesignhub tutorial

13:50 – 15:00 Create Decision model and Change design Version 1, assess Impacts, independently

15:00 – 16:30 Create Change design Version 2, assess Impacts, Independently

16:30 – 17:30 Timeline, cost and 3-D

Workshop Day Two

09:00 -- 10:00 Presentations of Change designs Version 2

10:00 – 12:30 Create Change design Version 3, with negotiation as needed, assess Impacts and cost, and make Timeline

12:00 -- 13:00 Lunch

13:00 – 13:30 Presentations

13:30 – 14:00 Comparision and Negotiation tools

14:00 – 14:30 Sociogram and Negotiation strategy

14:30 – 15:30 First Negotiation round , create Versions 4, assess Impacts and costs, staging and 3-D

15:30 – 17:00 Final Negotiation round, create Version 5 in public, assess Impacts and costs, staging and 3-D

17:00 – 17:30 Discussion and END

17:30 – 18:00 Post-workshop survey and debrief participants

WORKSHOP PARTICIPANTS

Gustavson, Nils, Liberty County Planning Commission

Hayes, Christa, Coastal Ecology Researcher

Samson, Doug, Coastal Ecology Researcher

VanParreren, Suzanne, Sapelo Island NERR

McIntosh, Patty, City of Savannah—Planner, Chatham Cty

McMillan, Charles, Georgia Conservancy-Coastal Director

Russell, Madeleine, Georgia Sea Grant Marine Extension

Sudanshu Panda, Academic, University of North Georgia

Westin, Lisa, Senior GIS Specialist, GA Dept. of Community Affairs

Brian Orland, Professor of Geodesign, College of Environment and Design, UGA

Kyler, David, Center for a Sustainable Coast

Lambert, Christi, The Nature Conservancy

Rosanna Rivero, Landscape Architecture, College of Environment and Design, UGA

Washington, Clemontine, Mayor of Midway, Liberty Cty

Tibbs, Kyle, City Administrator Woodbine

Hunter Key, GIS Manager, Coastal Regional Commission

Alison Smith, Landscape Architecture, College of Environment and Design, UGA

Jesse Wuest, Assistant Manager, Wormsloe

Lupita McClenning, Director of Planning, Coastal Regional Commission of GA

Matt Hauer, Demographer, Carl Vinson Institute of Government, UGA

Sarah Ross, Director Center for Research & Education Wormsloe

Andrew Bailey, Jacobs Engineering, Atlanta

Jones, Melissa, Liberty County Planning Commission

Poon, Wincy, City of Hinesville

Greenway, Eric, Planning Director Bryan Co.

Stephen Ramos, Academic, UGA, Planning.

Avin, Uri, Professor, University of Maryland

Bursa, Karl, Glynn County - Director of Planning

Reams Dain, City of Pembroke - Planning and Zoning

Jennings, Tara, Coastal GA Indicators Coalition

Patton, Patrick, Building Development Inspector Garden City

Macleod, Kevin, SAGIS

Centeno, John, Glynn County

Landon, Eric, Camden Co. Planning Director

Fulton, Lisa, CRC-Senior Planner/GIS Analyst

Nyers, Robert, Glynn County

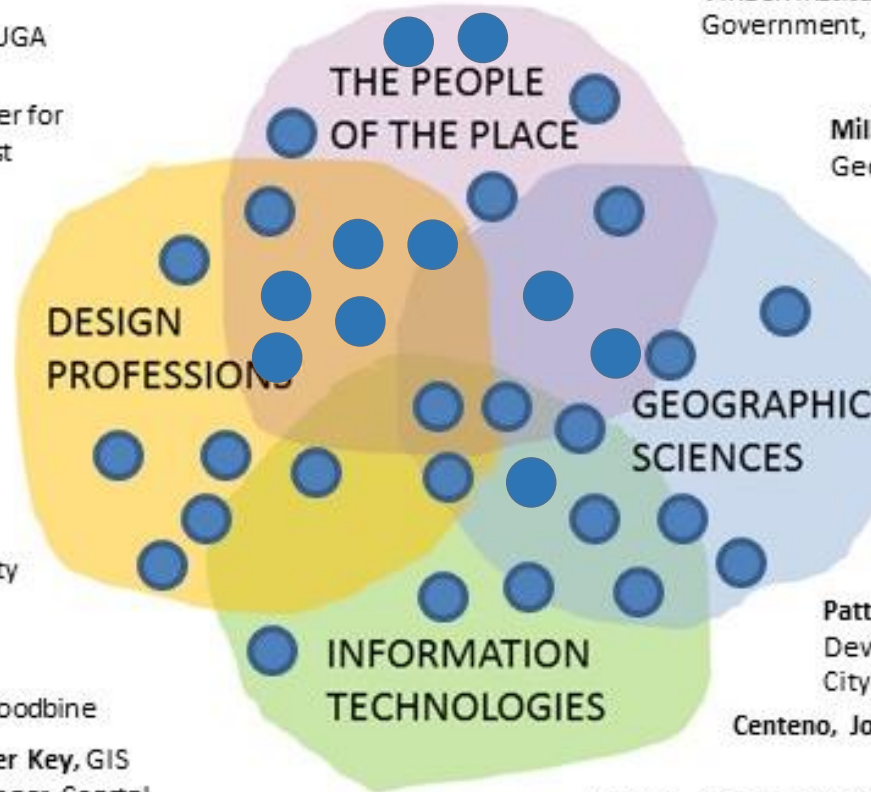
Wolven, Meizi, CRC - Grant Specialist

Fordham, Jennifer, Georgia Dept. of Community Affairs, Bullock

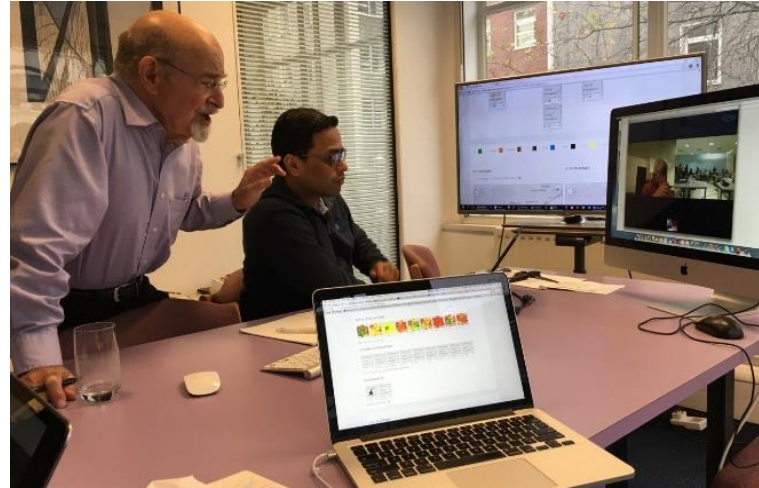
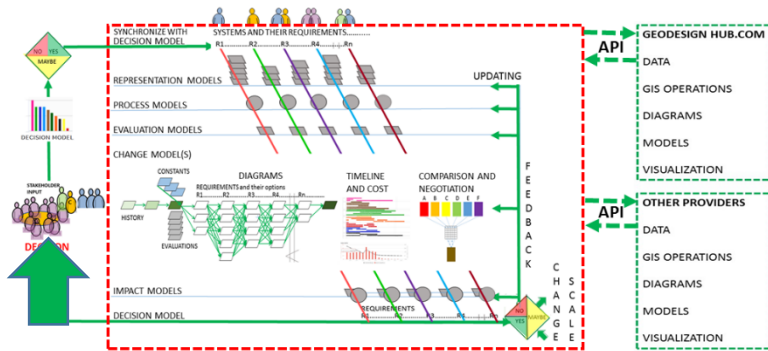
Clay, Batoul, Students Geography

Walton, Margaret M., Senior Planner II, Land Planning, Atkins

Jon Calabria, Landscape Architecture, College of Environment and Design, UGA



A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN



Carl and Hrishi in London, UK,

GEODESIGNHUB

EXTERNAL API LINKS

INTERNET LINKS FOR COMMUNICATION,
TRAINING, WORKSHOPS AND CARRYING
OUT LONGER STUDIES



Prashant in Davis CA, USA

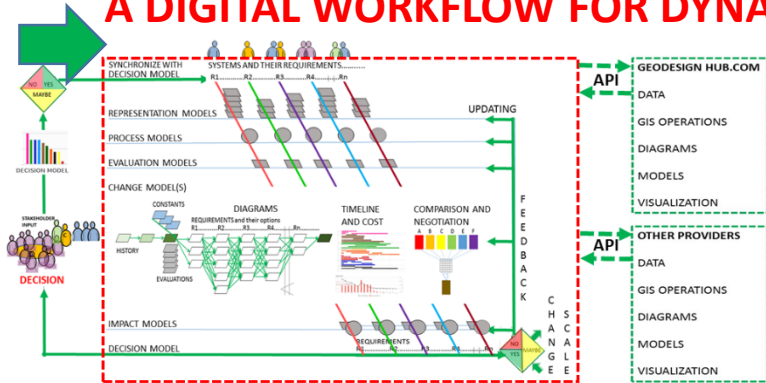


Mohan and others in Bangalore, India



Mohan Rao, Prashant Hedao, Hampi, Karnataka, India, Integrated Design, Bangalore, India, 2015

A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN

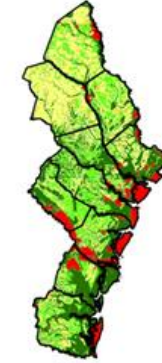
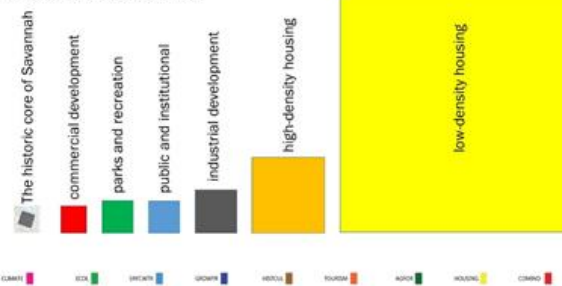


THE STUDY REGION



THE REQUIREMENTS

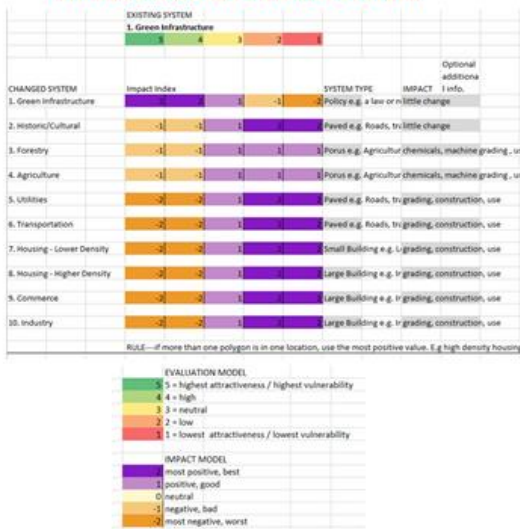
What do these areas look like?



EVALUATION MODELS FOR THE TEN +- SYSTEMS

01 - Green Infrastructure: Parks/Recreation/Conservation/Ecological connectivity/Climate Change mitigation as a function of GI			
System #	Context 1: Part Name	Map Marker	
1	Historic	Historic	
Description of evaluation: Group A			
Identify habitats with high priority for conservation, existing conservation lands, impact connectivity among existing and future protected lands for vegetation, wildlife, natural, and associated water and land movement needs, including surface water and groundwater recharge.			
Green: Prime land for protection (already protected by law, or high environmental risk)			
Light Green: Highest Priority for priority for conservation based on ESRI's GI (connectivity/priority)			
Not already on protected list	YEASIBLE	SUITABLE	CAPABLE
Areas to be protected by law (or close to law) because of environmental threat or environmental risk, including wetland areas protected under Wetland Protection Act (WPA), FEMA 100yr floodplain, floodwater recharge areas, CWD (See Land Use (L) 8)	Areas to be protected by law (or close to law) because of environmental threat or environmental risk, including wetland areas protected under Wetland Protection Act (WPA), FEMA 100yr floodplain, floodwater recharge areas, CWD (See Land Use (L) 8)	Areas to be protected by law (or close to law) because of environmental threat or environmental risk, including wetland areas protected under Wetland Protection Act (WPA), FEMA 100yr floodplain, floodwater recharge areas, CWD (See Land Use (L) 8)	Areas already protected by highly established property ownership, management, or easements. Excludes all military properties (Fort Stewart, Hunter AB, King Base, and 3 other fort properties).

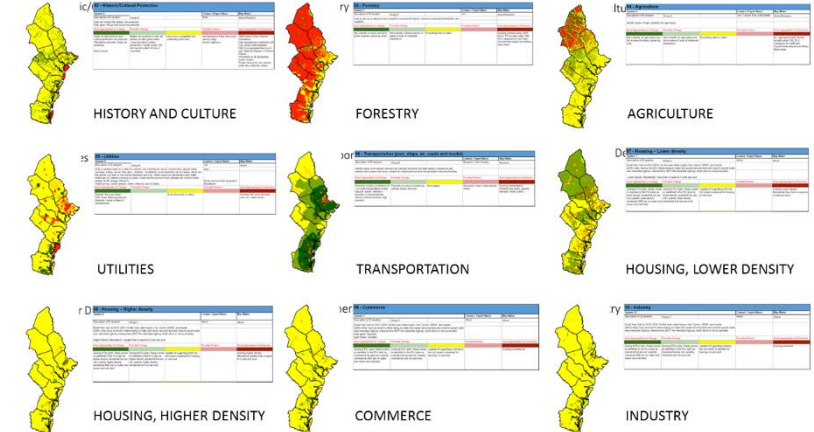
IMPACTS MODEL FOR EACH SYSTEM



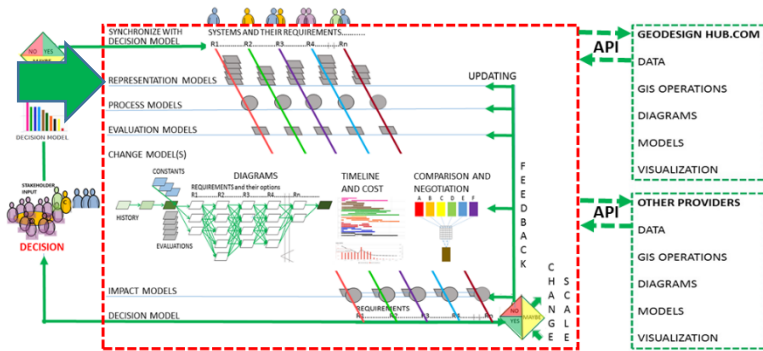
CROSS-IMPACTS MODEL



COSTS MODEL



A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN



GEODESIGNHUB

DATA REQUIRED FOR EVALUATION MODELS' CRITERIA, BASE MAPS AND OTHER USES

La Paz Evaluation Models

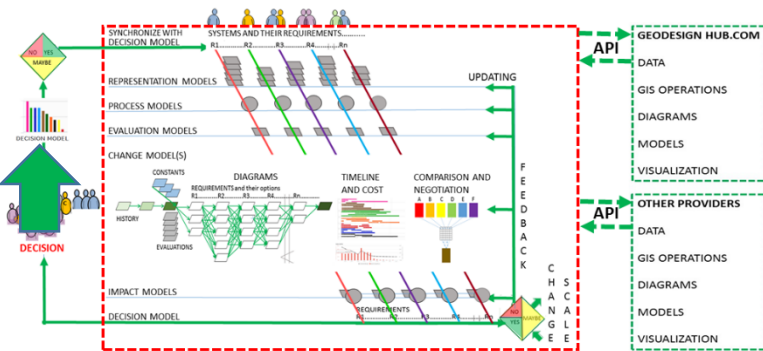
- HAZARDS
- INDUSTRY/COMMERCE
- TOURISM
- URBAN HOUSING
- SOCIAL HOUSING
- INFORMAL HOUSING
- AGRICULTURE
- GREEN INFRASTRUCTURE
- BLUE/GRAY INFRASTRUCTURE
- SOCIAL SERVICES

		FEASIBLE			SUITABLE			CAPABLE			NOT CAPABLE			EXISTING			
		System	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	
1	HAZARDS	System	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	
2	INDUSTRY/COMMERCE	System	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	
3	TOURISM	System	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	
4	URBAN HOUSING	System	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	
5	SOCIAL HOUSING	System	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	
6	INFORMAL HOUSING	System	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	
7	AGRICULTURE	System	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	
8	GREEN INFRASTRUCTURE	System	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	
9	BLUE/GRAY INFRASTRUCTURE	System	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	
10	SOCIAL SERVICES	System	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	Ex. from	Support	Cost	

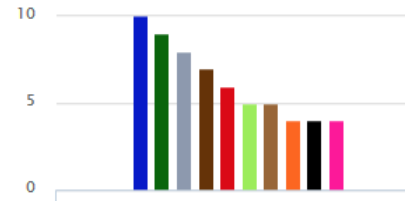
A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN

GEODESIGNHUB

DECISION MODEL PRIORITIES
WHICH SYNCHRONIZE THE FORMAT



DECISION MODEL

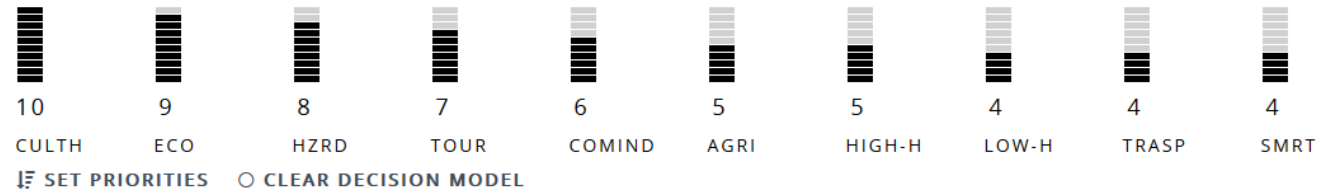


SYSTEMS

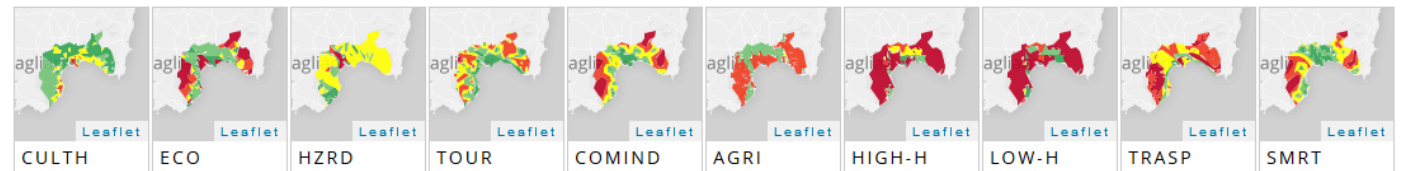
COLUMNS & DISPLAY

☐ Sync with decision model

SYSTEM PRIORITIES

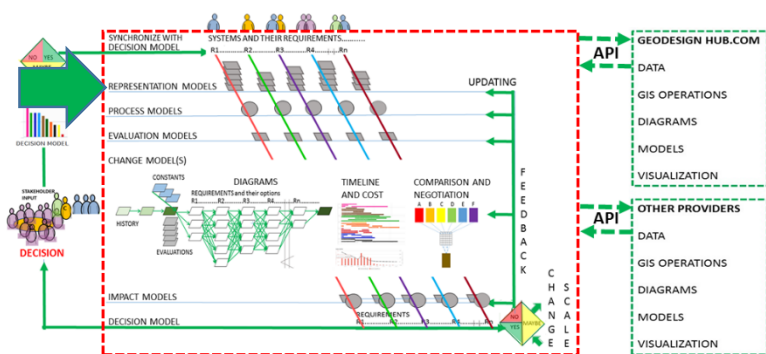


INITIAL EVALUATIONS

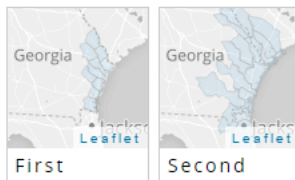


EXPLORE INITIAL EVALUATIONS

A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN

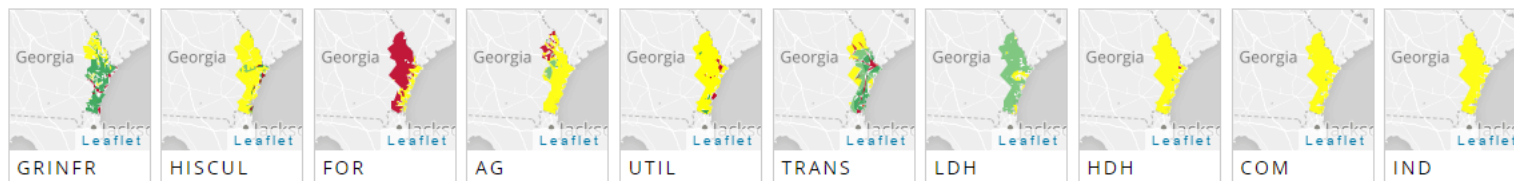


BOUNDARIES



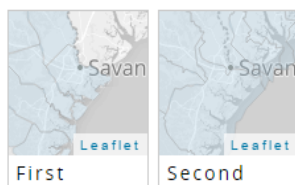
SET WORKING BOUNDARIES

INITIAL EVALUATIONS



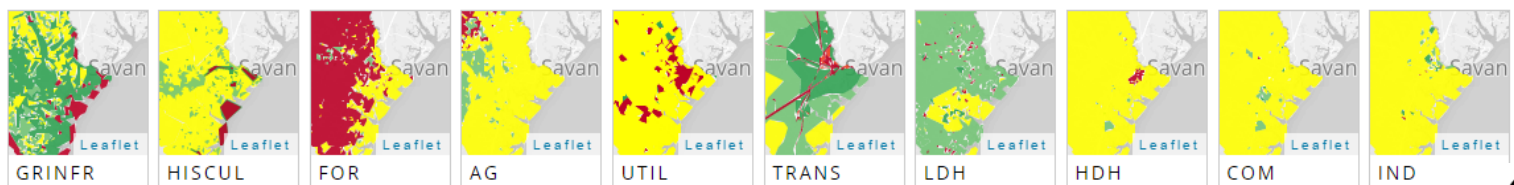
EXPLORE INITIAL EVALUATIONS

BOUNDARIES

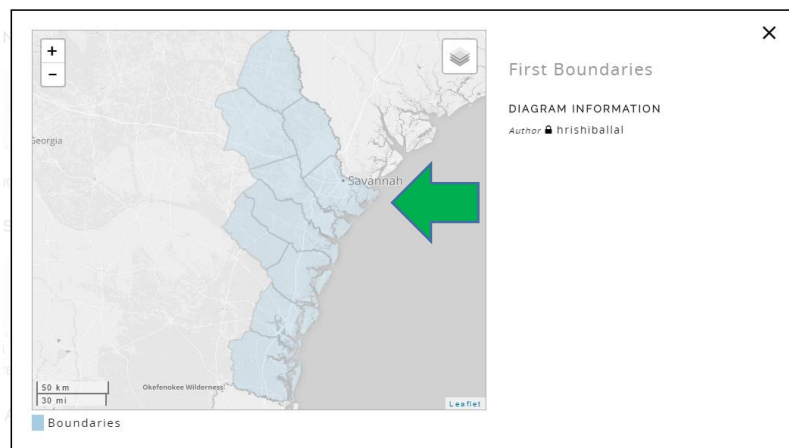


SET WORKING BOUNDARIES

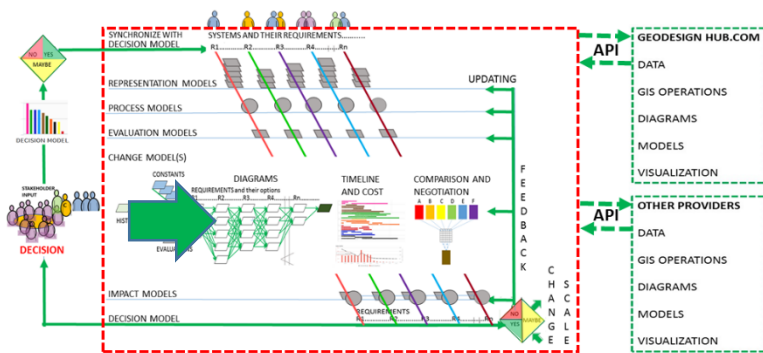
INITIAL EVALUATIONS



EXPLORE INITIAL EVALUATIONS



A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN



GEODESIGNHUB

DRAWING AND EDITING OF DIAGRAMS
WITH EXPLORATION OF EVALUATION MAPS

ADD A NEW DIAGRAM

CHOOSE A SYSTEM :

GREEN

WTR

HAB

VIS

GRAYIN

LDH

MDH

COM

IND

INST

Describe your diagram

55 chars. left

CONTENT :

Project

Policy

FEATURE TYPE :

Line

Polygon

Estimated start and end time

2017

2019

2042

Import from external file

Estimated cost :

per hectare

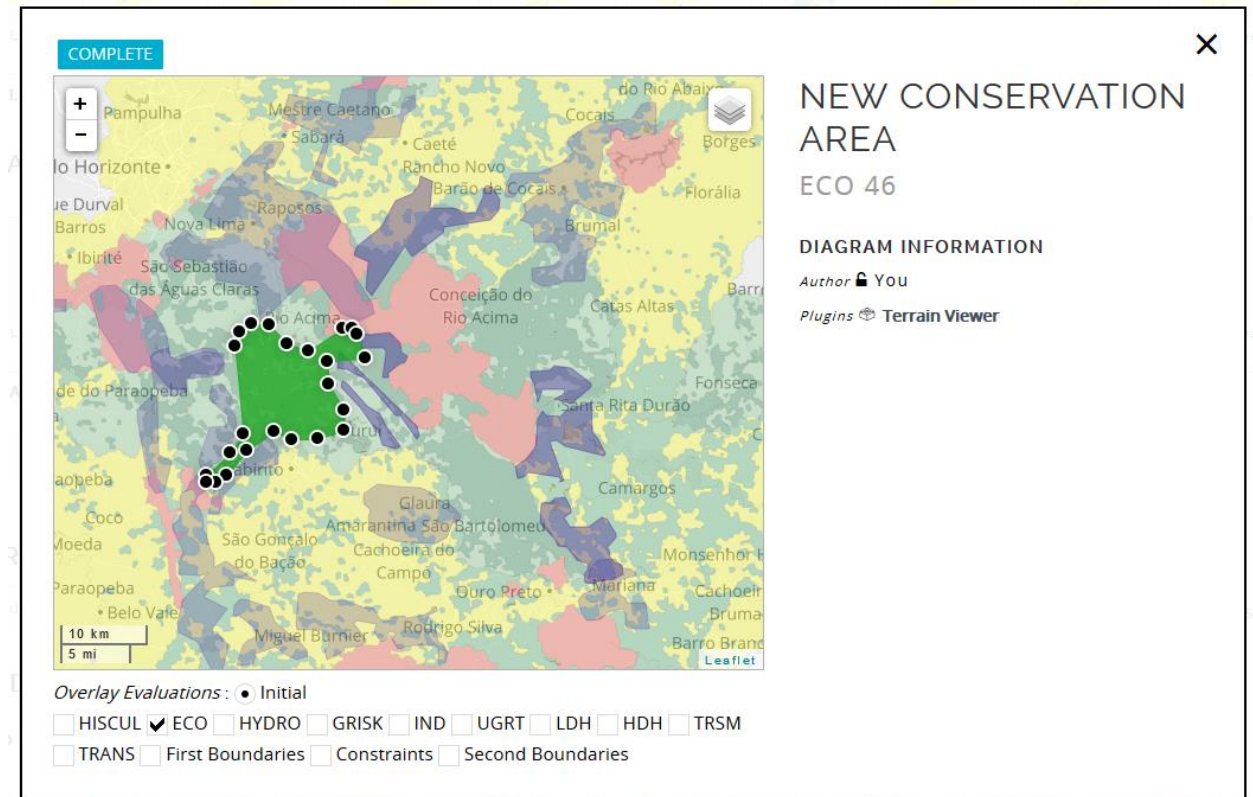
Total

0 EUR

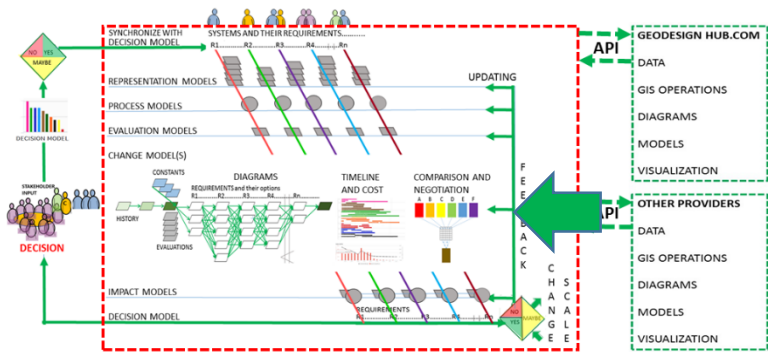
9 000 000 EUR

ADD DIAGRAM

ADVANCED OPTIONS



A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN



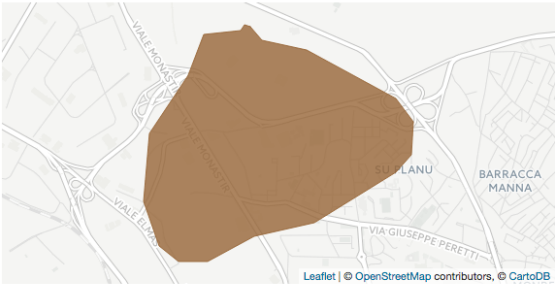
GEODESIGNHUB

EXTERNAL API LINK
BUFFER AND TRANSFER DIAGRAM
TO ANOTHER SYSTEM

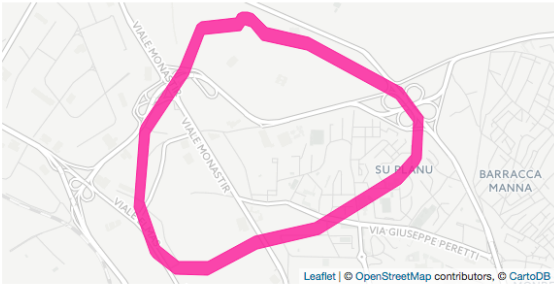
Geodesign Hub Diagram Buffer

This plugin downloads a diagram from Geodesign Hub and provides a way to buffer it and upload it back as a new diagram to the project. This project uses the [Geodesign Hub API](#) and is opensource and the code is available on [GitHub](#).

Input Diagram



Output Diagram



high density centro cagliari

Buffer distance: ☐ 10m ☐ 50m ☒ 100m ☐ 200m ☐ 500m

☒ Compute Buffer

Add Buffer as a new diagram

Choose destination System

☐ TRANSP ☐ Hydro ☒ SMRT ☐ LOW-H ☐ HIGH-H ☐ AGR ☐ COMIND ☐ TOUR ☐ ECO ☐ CULTH

Upload as Project or Policy

☒ Project ☐ Policy

Give the Diagram a name

High Density Housing Buffer

☒ Add as new Diagram

ADD A NEW DIAGRAM

CHOOSE A SYSTEM : ☒ GREEN ☐ WTR ☐ HAB ☐ VIS ☐ GRAYIN ☐ LDH ☐ MDH ☐ COM ☐ IND ☐ INST

Describe your diagram

55 chars. left

CONTENT : ☐ Project ☐ Policy

FEATURE TYPE : ☐ Line ☐ Polygon

Estimated start and end time

2017 — 2019

2042

☐ Import from external file

Estimated cost : ☒ per hectare ☐ Total

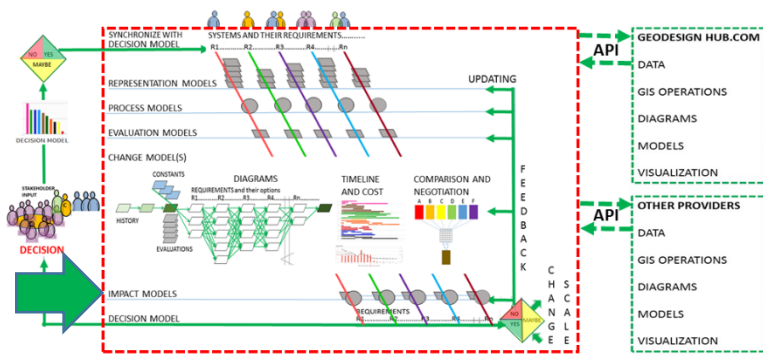
0 EUR

9 000 000 EUR

ADD DIAGRAM

ADVANCED OPTIONS

A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN



GEODESIGNHUB

TIME-LINE AND COST ESTIMATION LINKED TO DIAGRAMS OF POLICIES AND PROJECTS AS DESIGNS ARE MADE

ADD A NEW DIAGRAM

CHOOSE A SYSTEM :

☒ GREEN
 ☐ WTR
 ☐ HAB
 ☐ VIS
 ☐ GRAYIN
 ☐ LDH
 ☐ MDH
 ☐ COM
 ☐ IND
 ☐ INST

Describe your diagram

55 chars. left

CONTENT :

☐ Project
 ☐ Policy

FEATURE TYPE :

☐ Line
 ☐ Polygon

Estimated start and end time

2017 - 2019

2042

Import from external file

ADVANCED OPTIONS

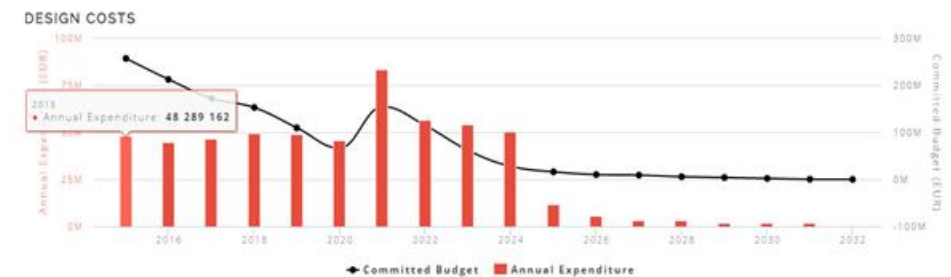
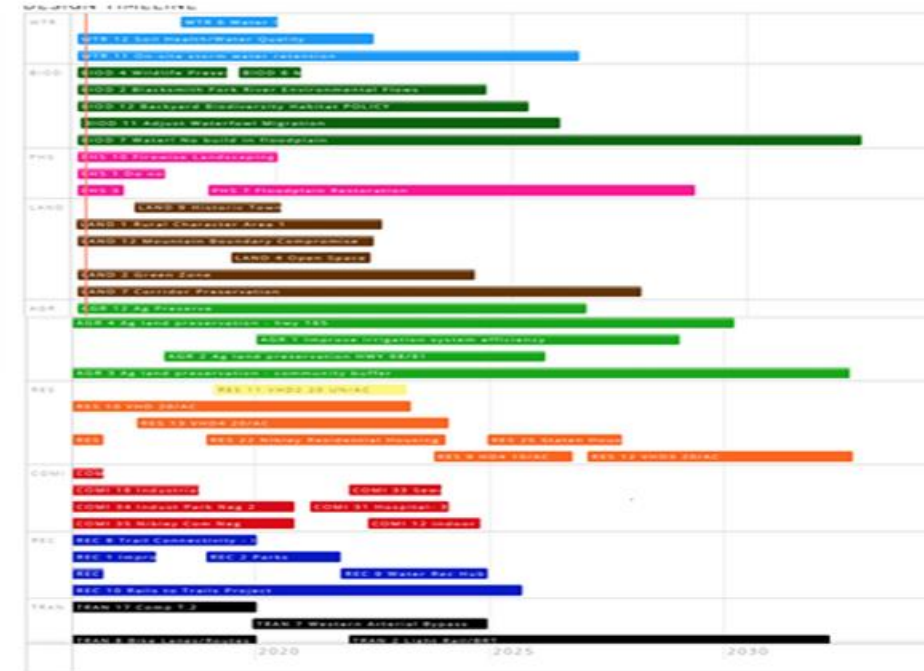
Estimated cost :

☒ per hectare
 ☐ Total

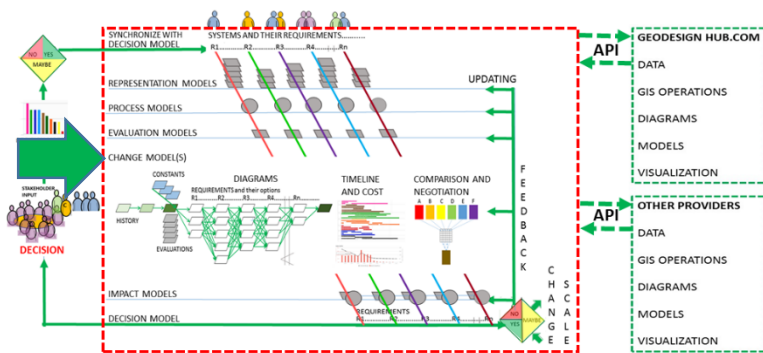
0 EUR

9 000 000 EUR

ADD DIAGRAM



A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN



ATTRIBUTES:

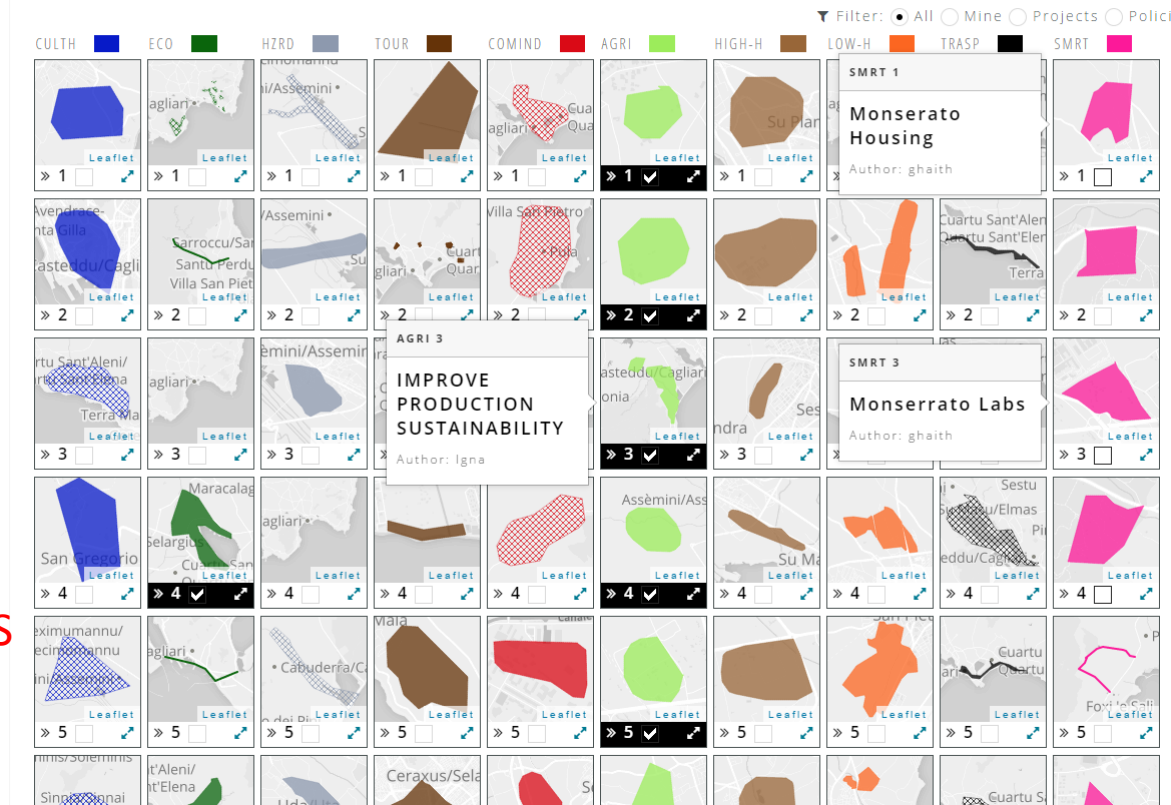
- SYSTEM
- BOUNDARY
- POLICY OR PROJECT
- SIZE
- SHAPE
- LOCATION
- STARTING TIME
- DURATION TIME
- INVESTMENT COST
- EXPENDITURE/TIME
- SYSTEM IMPACTS
- CROSS-SYSTEM IMPACTS
- COLOR LEGEND
- 3-D SHAPE
- SCALE

GEODESIGNHUB

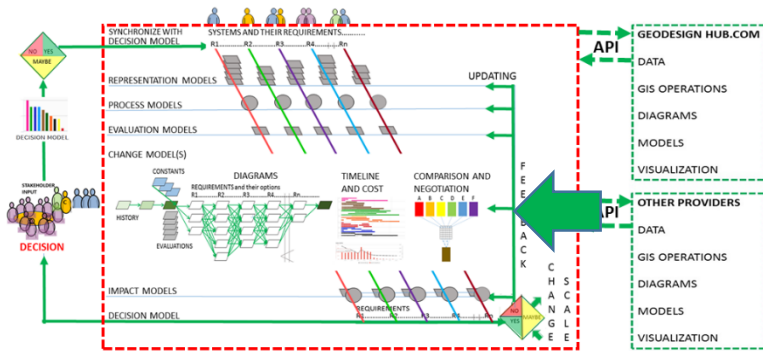
DRAWN AND IMPORTED DIAGRAMS ARE LINKED TO A TIME LINE AND COST. DIAGRAMS FILTER TO BOUNDARIES AND ZOOM IN VARIED DETAIL

ALL DIAGRAMS

+ ADD A DIAGRAM COPY AND EDIT A DIAGRAM CLEAR ALL SELECTIONS



A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN



GEODESIGNHUB

EXTERNAL API LINK
IMPORTING DIAGRAMS
OF POLICIES AND PROJECTS
AND VIEWING IN 3-D CONTEXT

Geodesign Hub Terrain Viewer

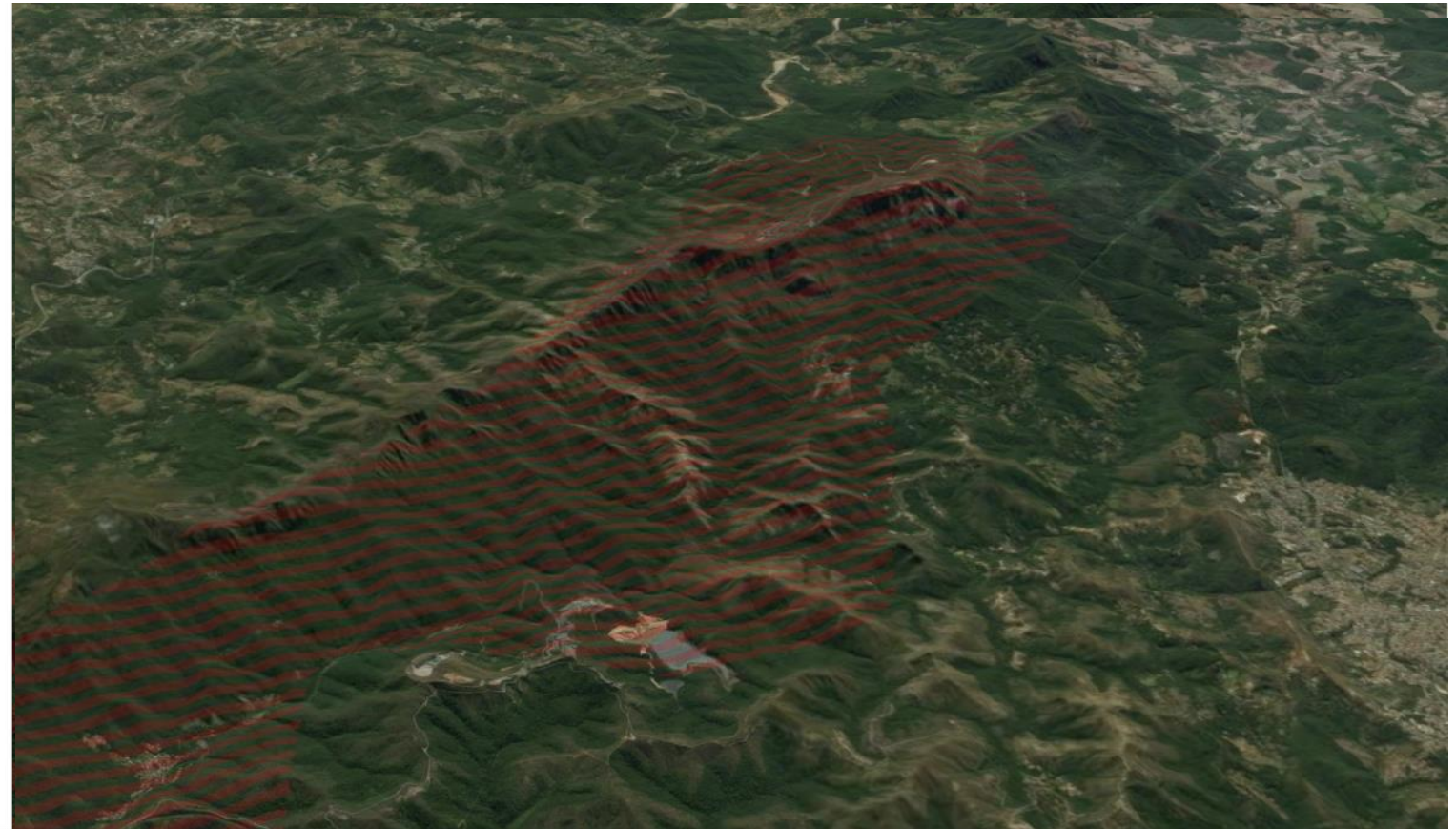
Geodesignhub Terrain Viewer

This project uses [CesiumJS](#) library for visualization and design data from [Geodesign Hub](#). Please see the [GitHub repository](#) for more information.

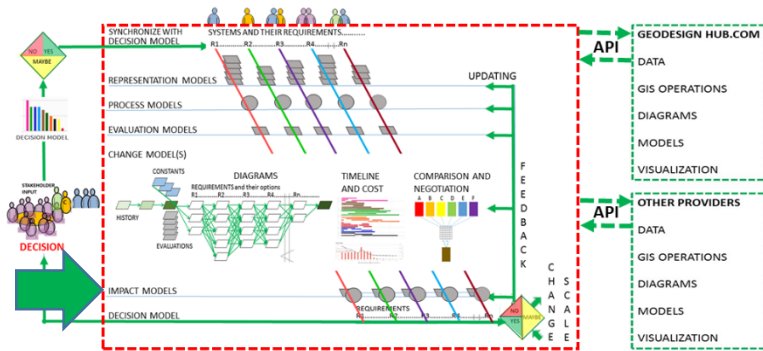
- 1 Scroll or pan the globe to move the diagram
- 2 Once the diagram is loaded, change the base map or camera heading using the controls below.

Basemap

Camera Heading

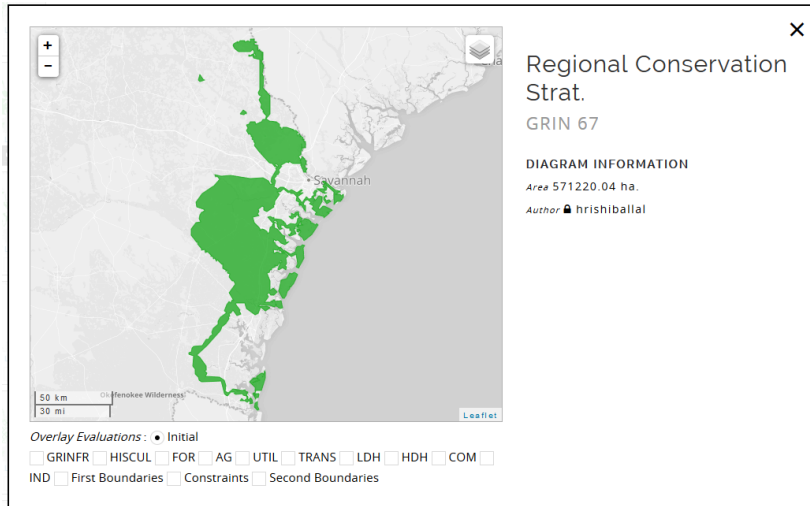


A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN



A GIS- IMPORTED
PROJECT DIAGRAM'S
REQUIREMENTS,
SYSTEM-IMPACTS,
CROSS-SYSTEM IMPACTS
AND COST

A GIS-IMPORTED PROJECT DIAGRAM

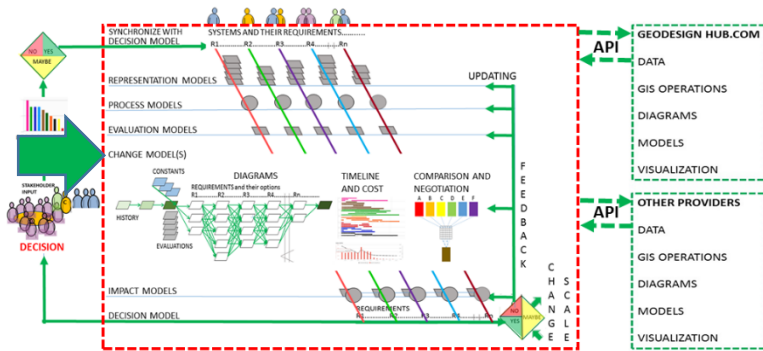


GEODESIGNHUB

REQUIREMENTS, IMPACTS,
CROSS-IMPACTS AND COST
FILTER TO BOUNDARIES



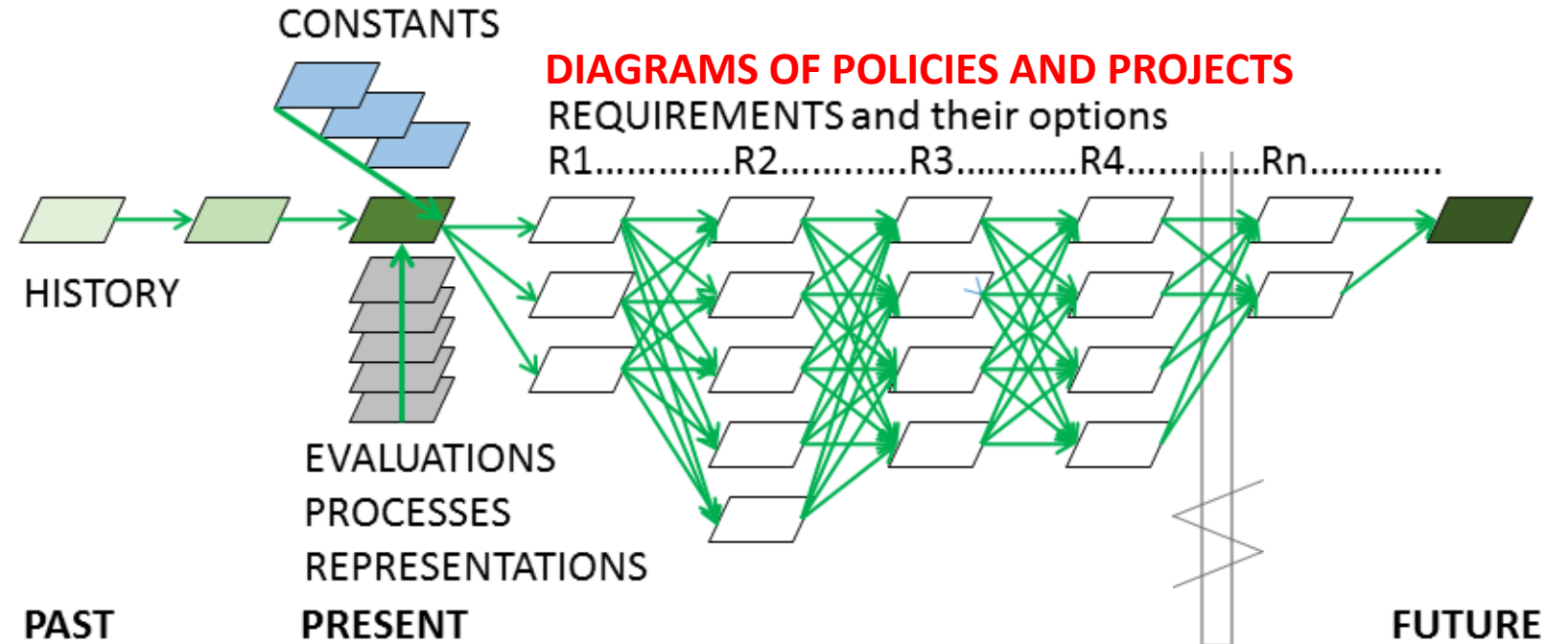
A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN



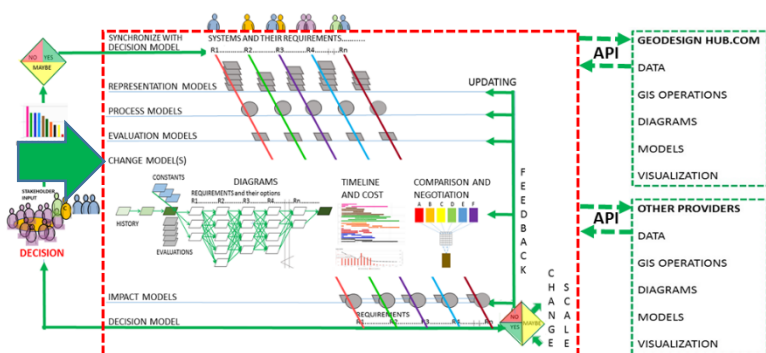
GEODESIGNHUB

THE CHANGE MODEL STRATEGIES
--THE WAYS OF DESIGNING--
DETERMINE HOW POLICIES AND PROJECTS
TO IMPROVE AND MANAGE THE SYSTEMS
ARE JOINED IN A DESIGN

ASSESSMENT INTERVENTION

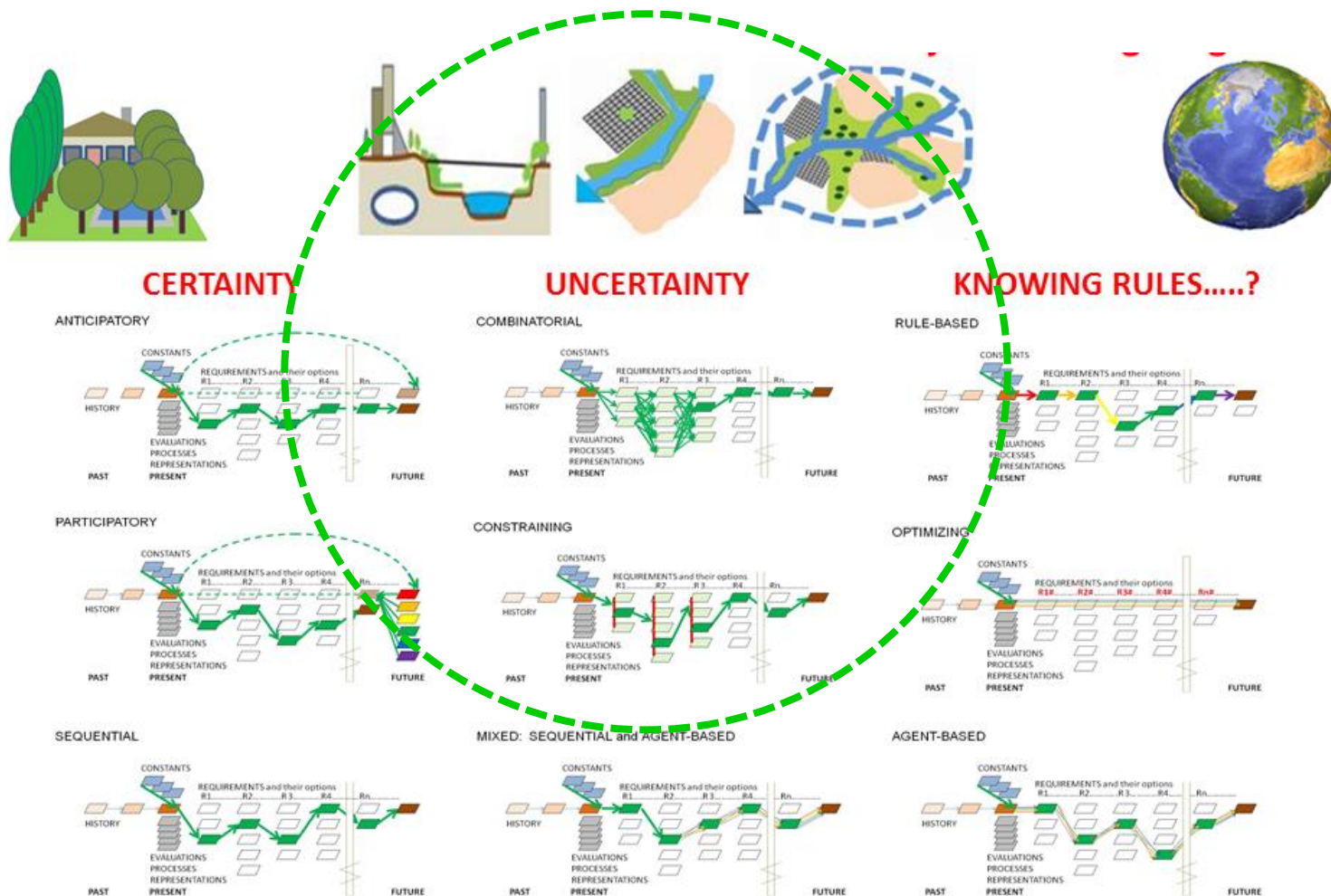


A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN

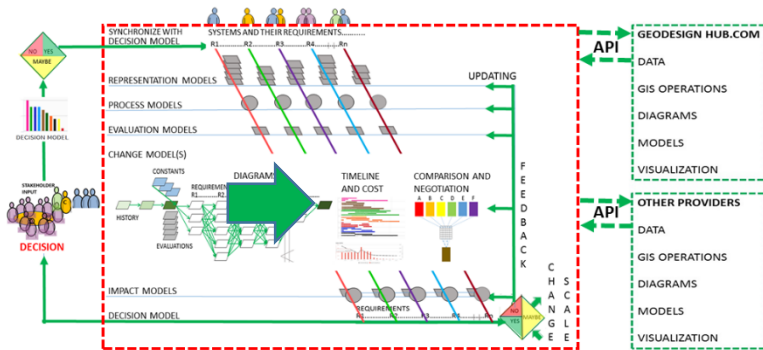


GEODESIGNHUB

THE CHANGE MODEL STRATEGIES
--THE WAYS OF DESIGNING--
DETERMINE HOW POLICIES AND PROJECTS
TO IMPROVE AND MANAGE THE SYSTEMS
ARE JOINED IN A DESIGN

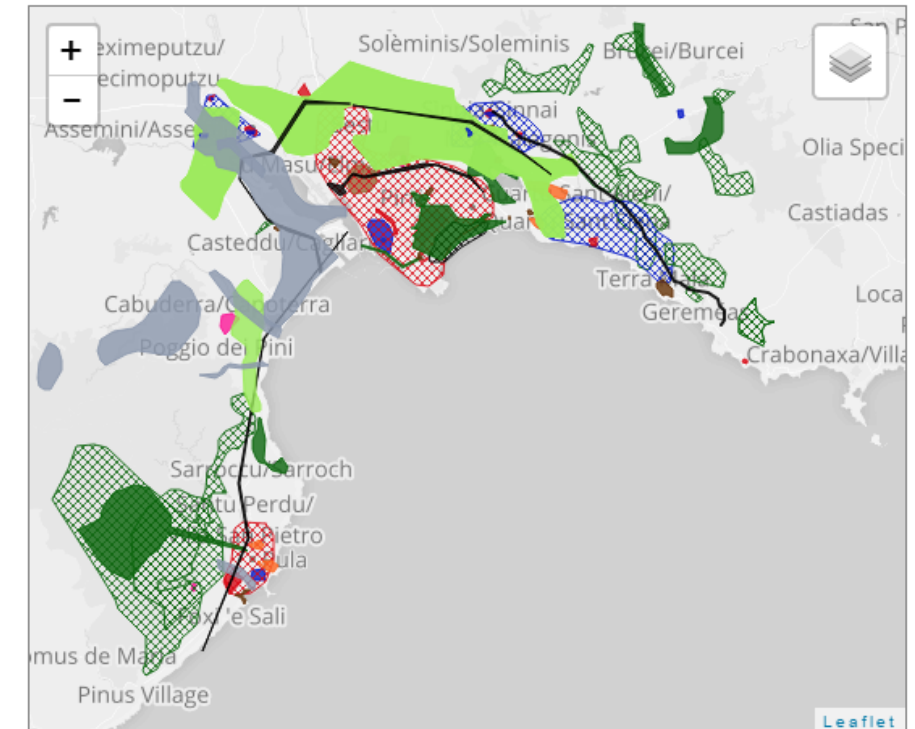


A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN

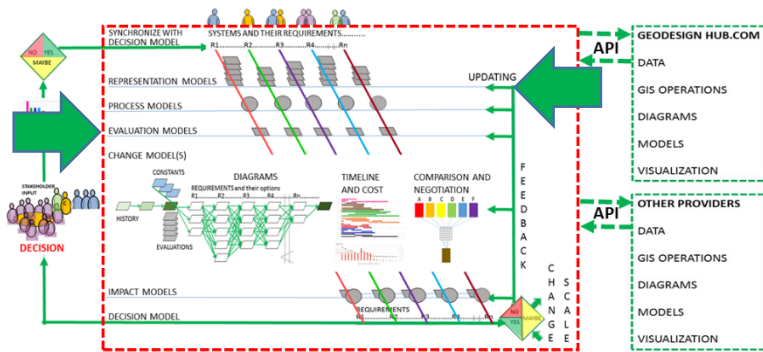


GEODESIGNHUB

MAKING THE DESIGN BY SELECTING
DIAGRAMS OF POLICIES AND PROJECTS

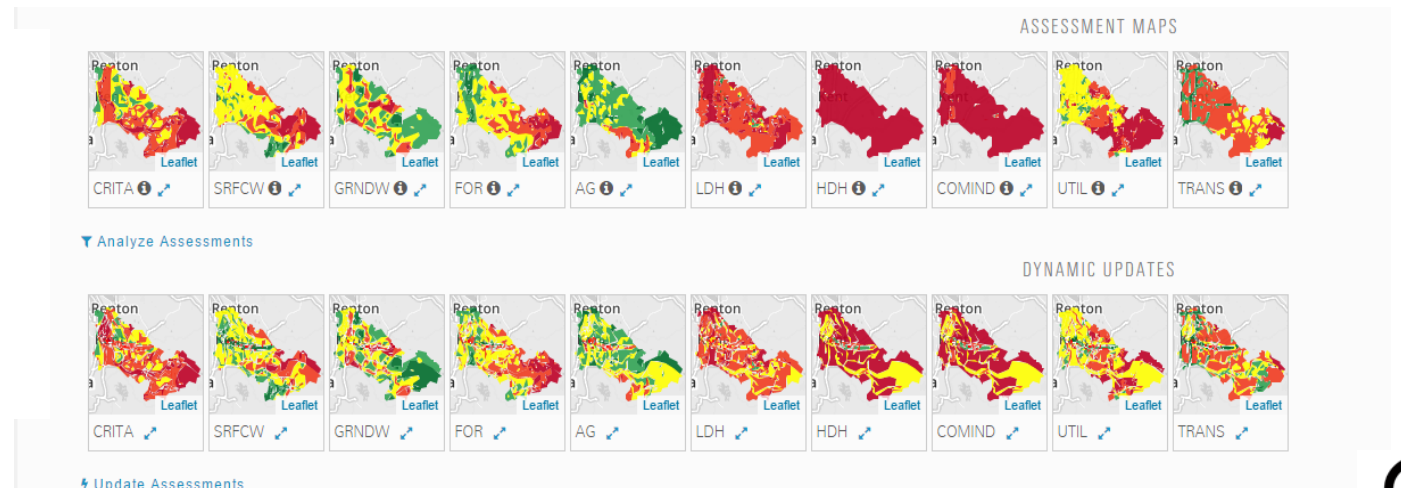
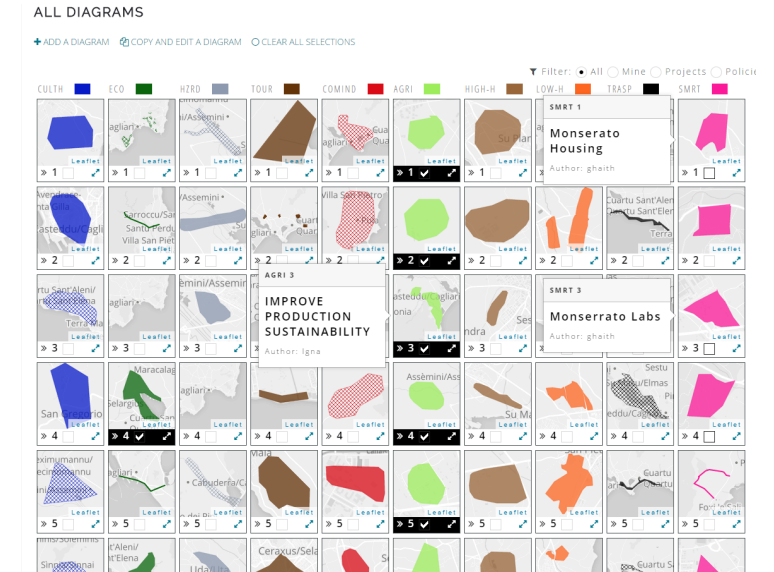


A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN



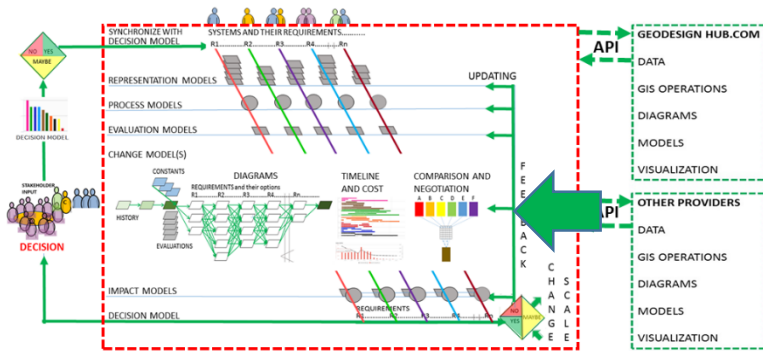
GEODESIGNHUB

UPDATING OF EVALUATION MODELS
AS DESIGNS ARE STAGED
e.g.Green Infrastructure

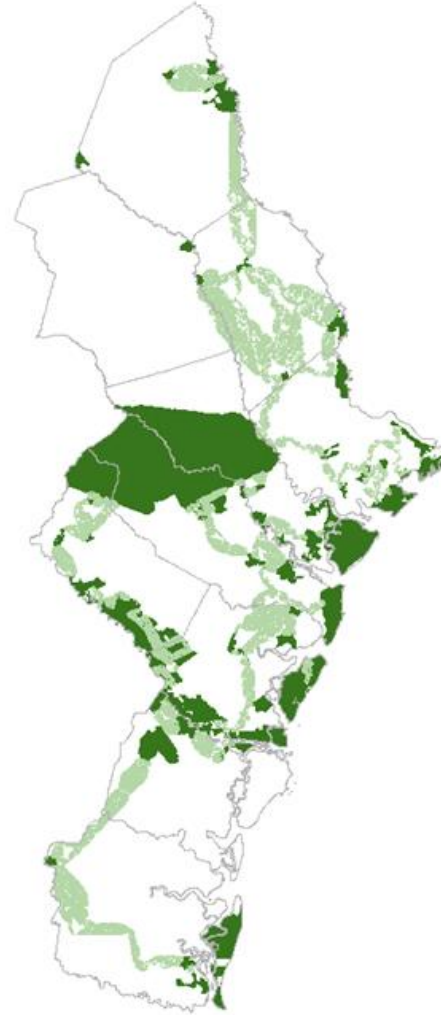


Tim Nyerges, et al., Seattle, Washington, USA, University of Washington, 2015

A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN

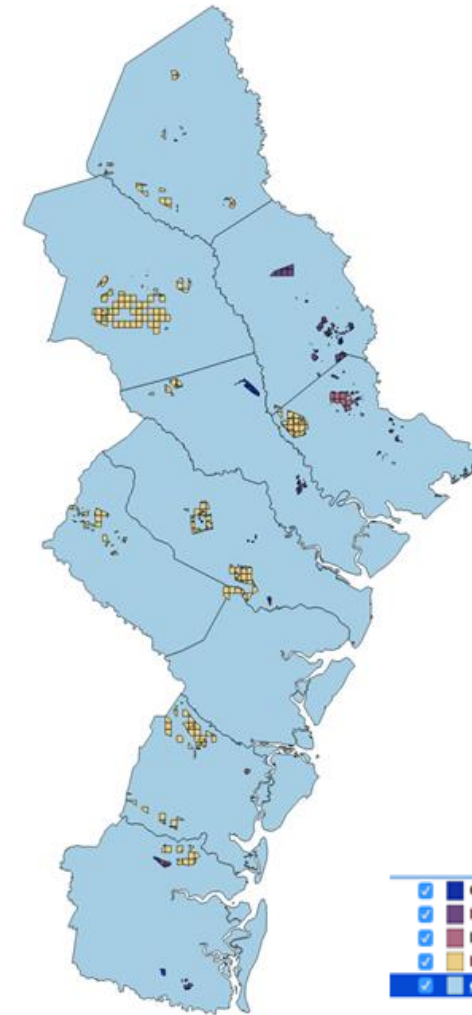


**BASELINE CONTINUITY CORRIDORS
OF GREEN INFRASTRUCTURE**
by the exogenous
landscape structure model of
Ryan Perkl, University of Arizona



GEODESIGNHUB

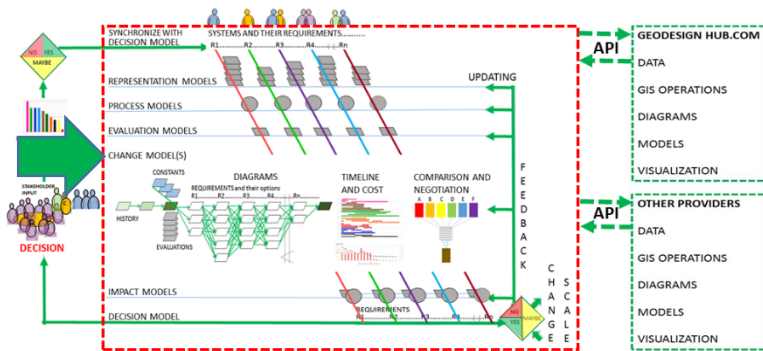
LINKS TO EXTERNAL ALLOCATION MODELS



**REGIONAL
URBAN LAND USES
ALLOCATION BASED ON
THE FINAL RESULT
OF NEGOTIATIONS
BETWEEN THE REGIONAL
CONSENSUS DESIGN
AND THE TEN COUNTY
CHANGE TEAMS**
by the exogenous
Geodesignhub
allocation model

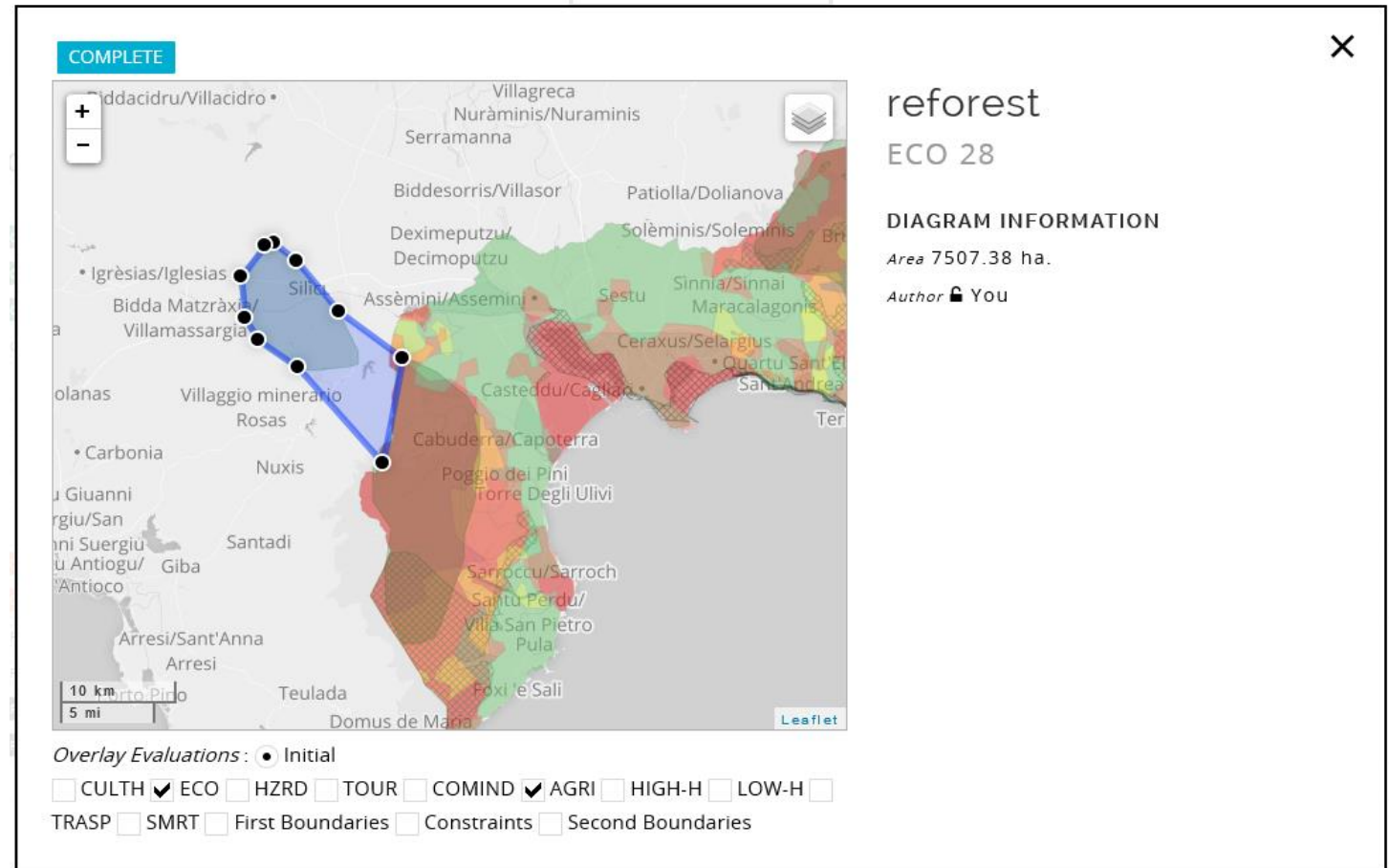
- ☒ Commerce-op OGRGeoJSON Polygon
- ☒ HD Housing-op OGRGeoJSON Polygon
- ☒ Industry-op OGRGeoJSON Polygon
- ☒ LD Housing-op OGRGeoJSON Polygon
- ☒ county-boundaries-simplified OGRGeoJSON MultiPolygon

A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN

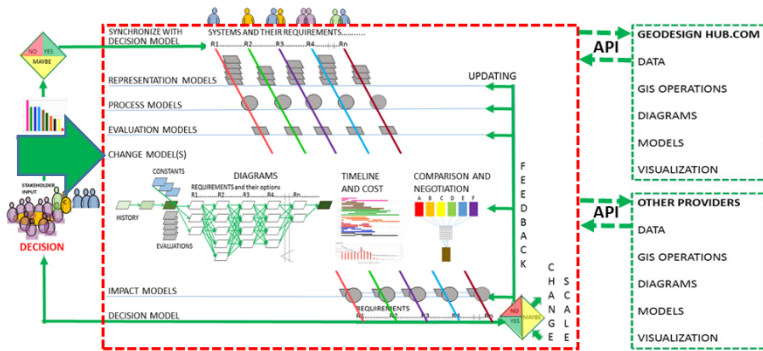


GEODESIGNHUB

EDITING A COMPONENT DIAGRAM
AT ANY TIME
IN THE CONTEXT OF PRIOR DESIGN
DECISIONS AND EVALUATION MODELS



A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN

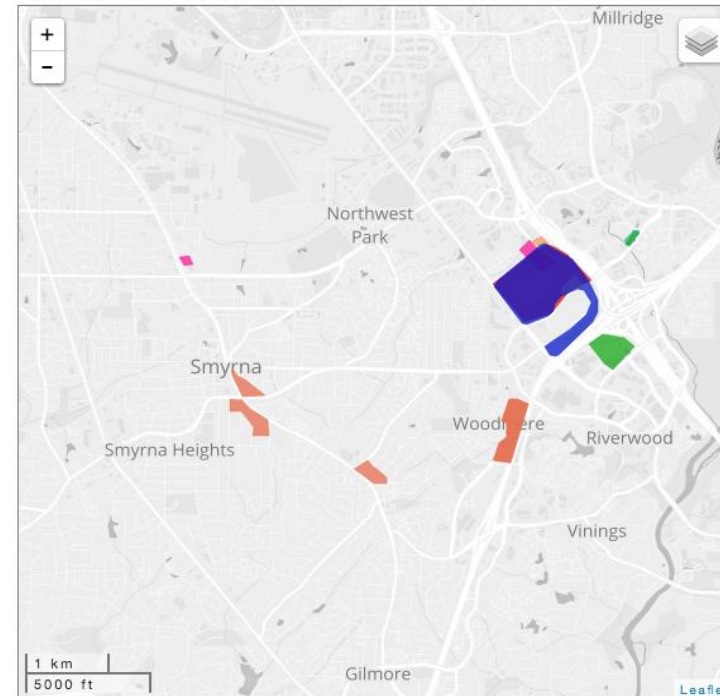


GEODESIGNHUB

CHANGES ARE SHARED AND COORDINATED AMONG THE COLLABORATING TEAM, INCLUDING OVER THE INTERNET

MY CHANGES

☐ Sync Maps



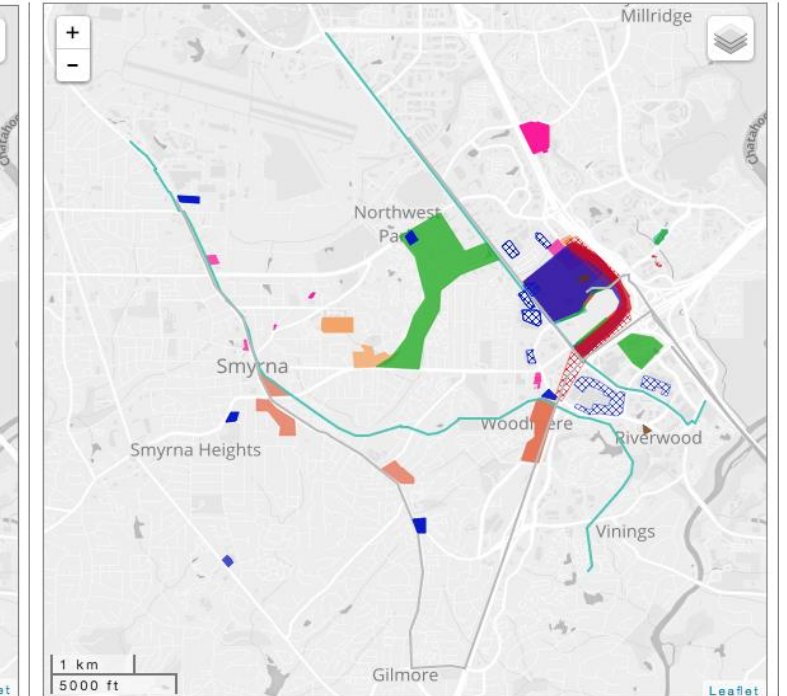
Existing Capable Suitable Feasible

Evaluations: ☒ Initial

☐ FAC ☐ RTRAN ☐ PEDE ☐ COM ☐ HDH ☐ LDH ☐ PPS ☐ PUBT ☐ P ☐ YTH ☐ Second Boundaries ☐ Constraints ☐ First Boundaries

Hover over a feature to show details

OUR CHANGES

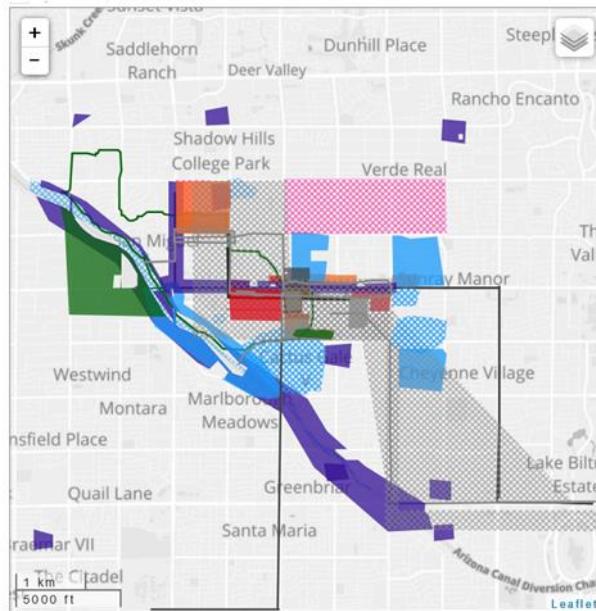
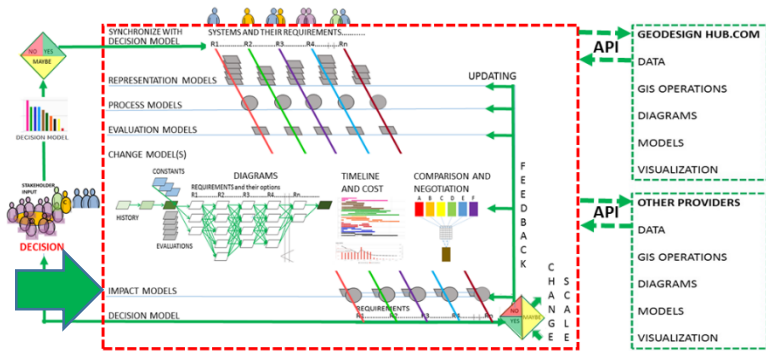


AORDI736

REFRESH DESIGN

IMPORT DESIGN

A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN

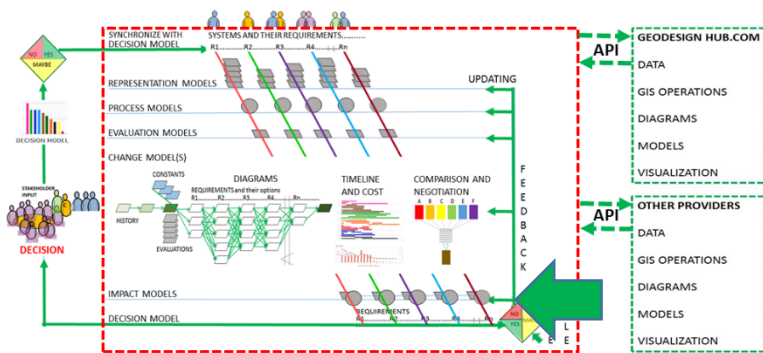


GEODESIGNHUB

ASSESSING PROGRAM TARGET ACHIEVEMENT,
SYSTEMS AND CROSS-SYSTEMS IMPACTS
AND CAPITAL COST



A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN



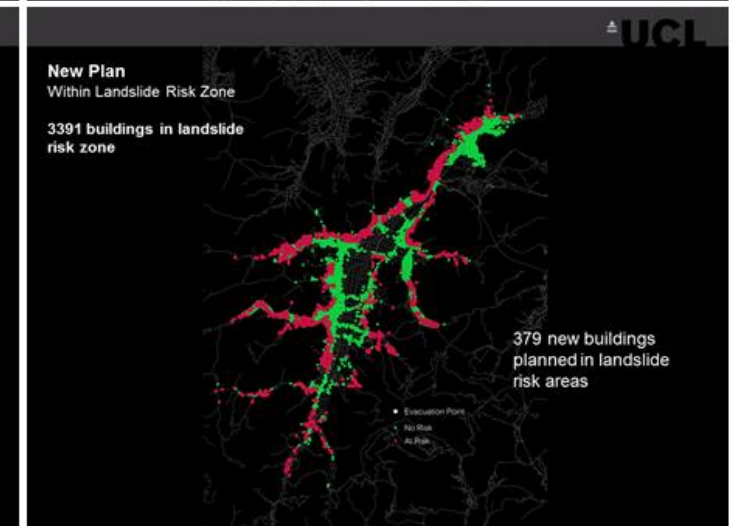
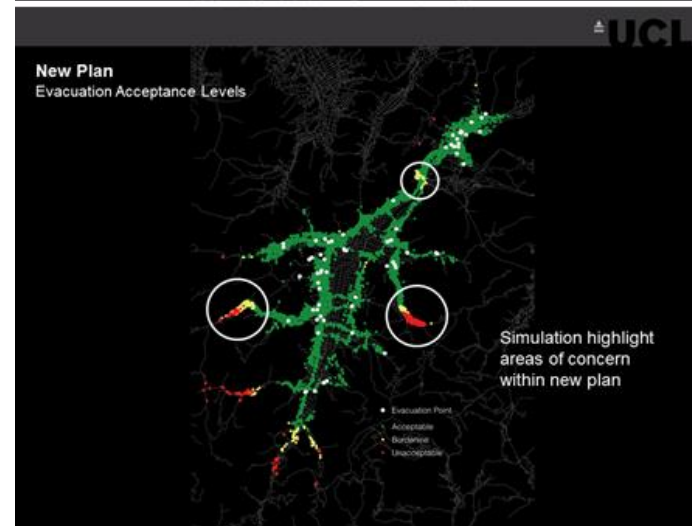
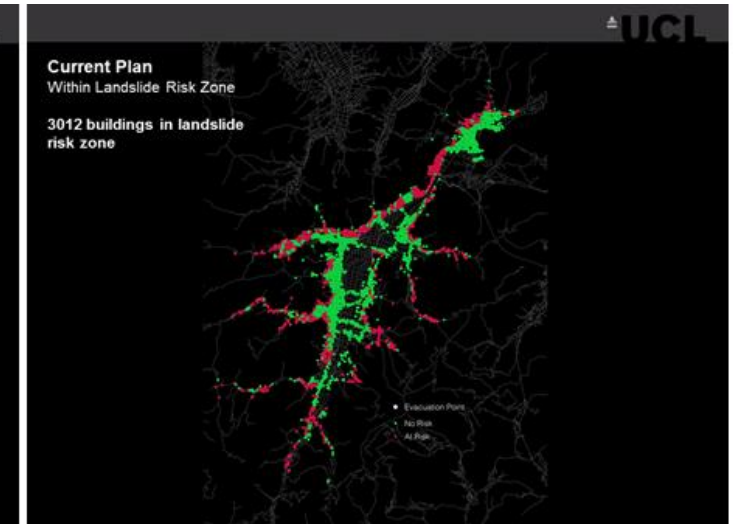
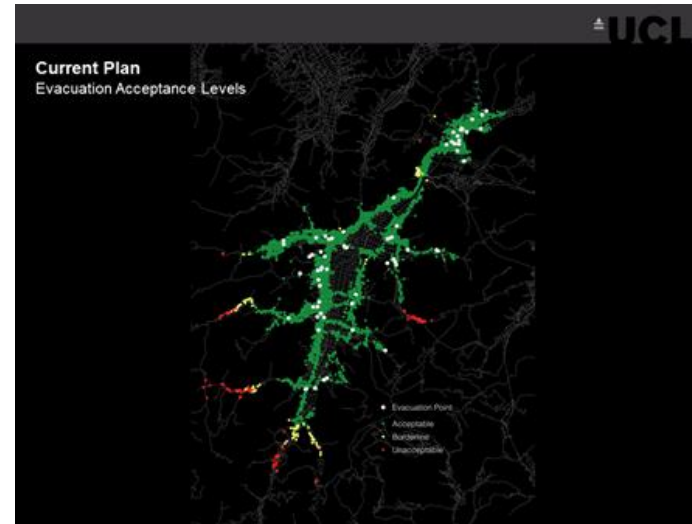
GEODESIGNHUB

EXTERNAL API LINKS
TO EXTERNAL IMPACT ASSESSMENT MODELS

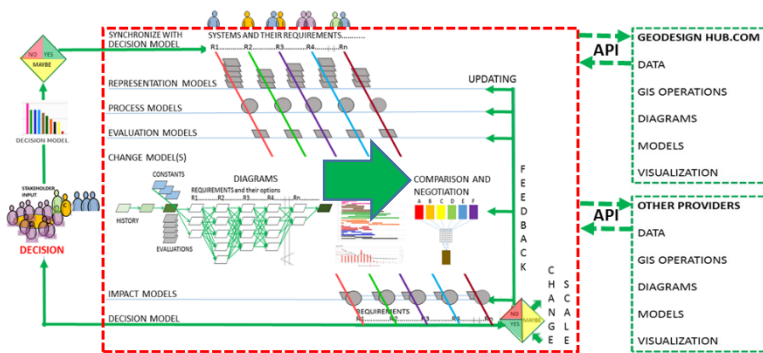
CURRENT CONDITIONS

AND ECON PLAN

AGENT-BASED MODEL
OF EVACUATION FOR
RISK OF LANDSLIDE
AND FLOODING
Yosano City , Japan



A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN



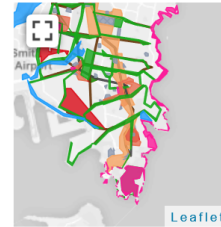
GEODESIGNHUB

MULTIPLE VERSIONS AND ALTERNATIVES,
WITH TOOLS FOR COMPARISON OF
SIMILARITIES AND DIFFERENCES

COMPACT

GINFRA BINFRA TOUR

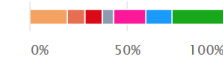
SYNTHESIS MAP



3D VIEWER

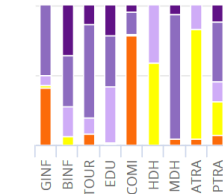
DESIGN HISTORY

PROJECTS AREA



REPORT

IMPACT SUMMARY



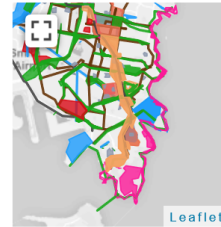
TOTAL COST EUR

3.47b
608.82m
16.54b
260.36m
Total: 24.77b

DEVELOPMENT

GINFRA BINFRA TOUR

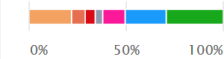
SYNTHESIS MAP



3D VIEWER

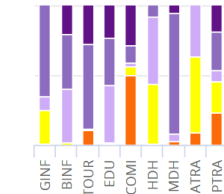
DESIGN HISTORY

PROJECTS AREA



REPORT

IMPACT SUMMARY



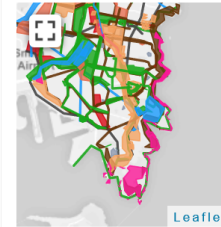
TOTAL COST EUR

6.91b
1.61b
24.25b
273.61m
Total: 37.13b

ENVIRONMENT SERVICES

EDU COMIND HDH

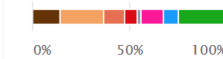
SYNTHESIS MAP



3D VIEWER

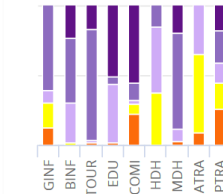
DESIGN HISTORY

PROJECTS AREA



REPORT

IMPACT SUMMARY



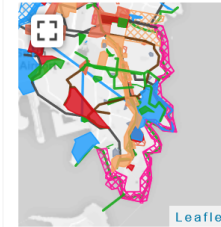
TOTAL COST EUR

3.97b
4.81b
20.58b
313.87m
Total: 33.01b

SERVICES

EDU COMIND HDH

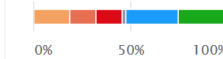
SYNTHESIS MAP



3D VIEWER

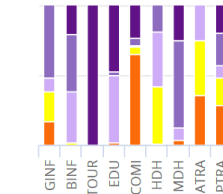
DESIGN HISTORY

PROJECTS AREA



REPORT

IMPACT SUMMARY



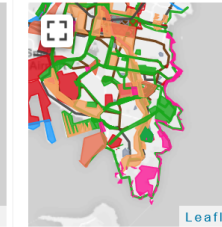
TOTAL COST EUR

4.94b
1.11b
14.15b
396.51m
Total: 20.6b

TOURISM

MDH

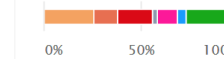
SYNTHESIS MAP



3D VIEWER

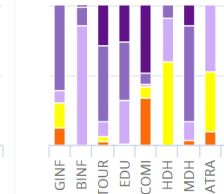
DESIGN HISTORY

PROJECTS AREA



REPORT

IMPACT SUMMARY



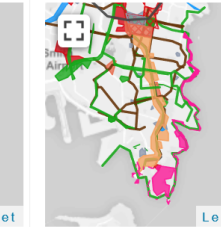
TOTAL COST EUR

5.19b
1.85b
33.22b
781.91m
Total: 45.53b

UNSW+HOSPITAL

MDH ATRANS PTRANS

SYNTHESIS MAP



3D VIEWER

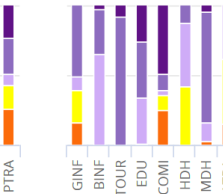
DESIGN HISTORY

PROJECTS AREA



REPORT

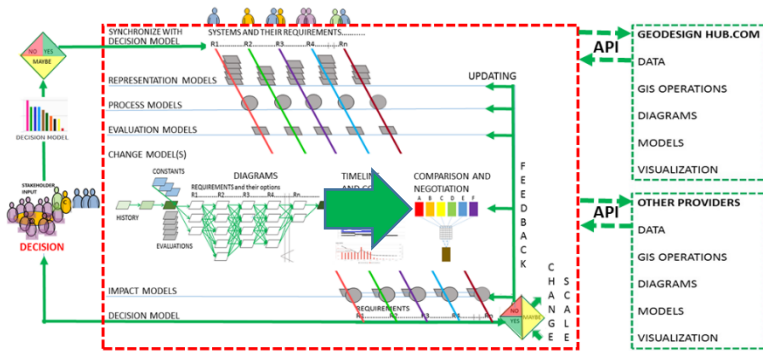
IMPACT SUMMARY



TOTAL COST EUR

1.55b
921.9m
11.72b
182.78m
Total: 17.25b

A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN



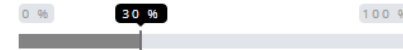
GEODESIGNHUB

TOOLS TO SUPPORT NEGOTIATION
AND FACILITATE AGREEMENT

COMBINED ANALYSIS

Combined synthesis of all the change team designs selected above.
Change features visibility using slider below:

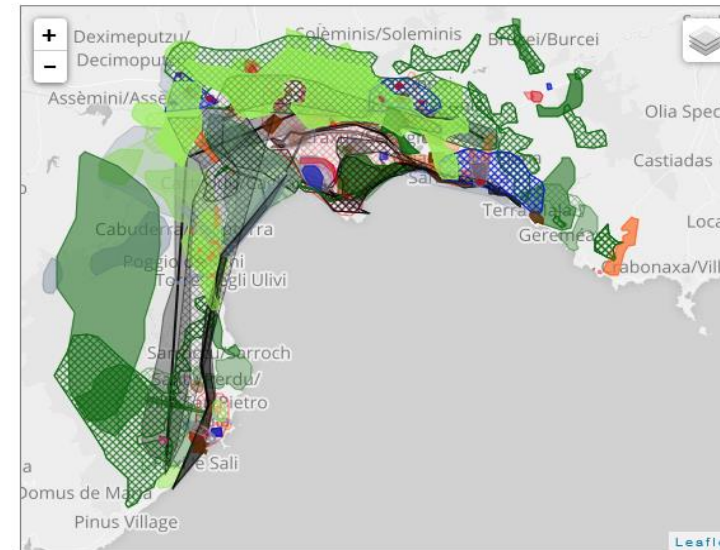
0 = No Visibility / 100 = Max Visibility



FILTER BY SYSTEM

☐ CULTH ☐ ECO ☐ HZRD ☐ TOUR ☐ COMIND ☐ AGRI ☐ HIGH-H
☐ LOW-H ☐ TRASP ☐ SMRT

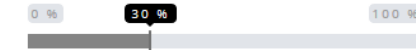
SHOW ALL DIAGRAMS



COMBINED ANALYSIS

Combined synthesis of all the change team designs selected above.
Change features visibility using slider below:

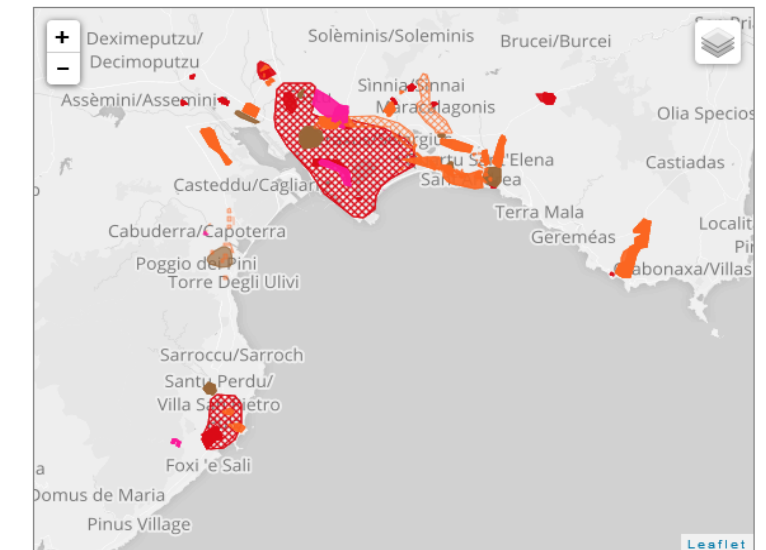
0 = No Visibility / 100 = Max Visibility



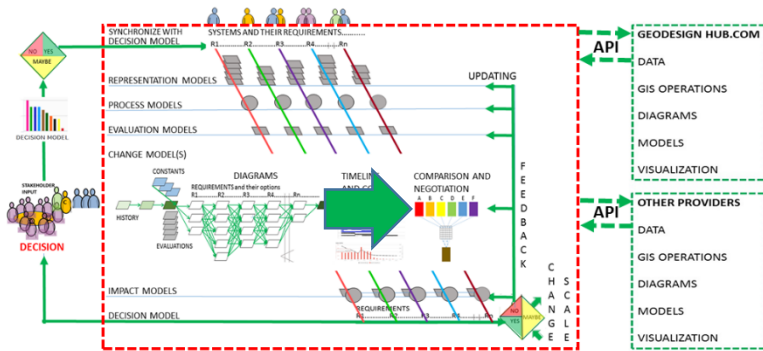
FILTER BY SYSTEM

☐ CULTH ☐ ECO ☐ HZRD ☐ TOUR ☒ COMIND ☐ AGRI ☒ HIGH-H
☒ LOW-H ☐ TRASP ☒ SMRT

SHOW ALL DIAGRAMS



A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN



GEODESIGNHUB

TOOLS TO SUPPORT NEGOTIATION
AND FACILITATE AGREEMENT

DIAGRAM FREQUENCY

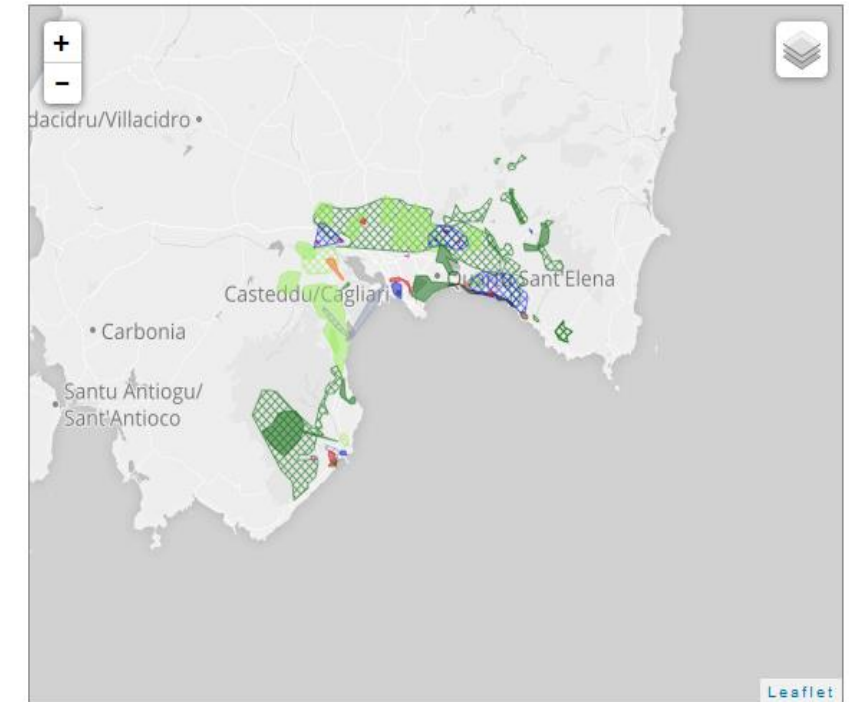
The grid below shows the count of the diagrams for the synthesis that are loaded.

	CULT	ECO	HZRD	TOUR	COMI	AGRI	HIGH	LOW-	TRAS	SMRT
1	6	4	1	3	2	3	2	1	2	2
2	6		1	2	2	3	1	2	3	4
3	5		1	1		3	2	4	2	4
4	4	5		4		3	1	1	2	3
5	3	2	3	5	4	1	1	2	1	
6	3	2	1	1	2	3	1	2	1	1
7	2		2		4	3		1		1
8		3	3		6	3	1			
9		1	1	1	2	4	2			
10	1		3	4	1	4	1	1		
11	3	3	1	1	2	3	2	1		1
39									1	
40										
41									1	

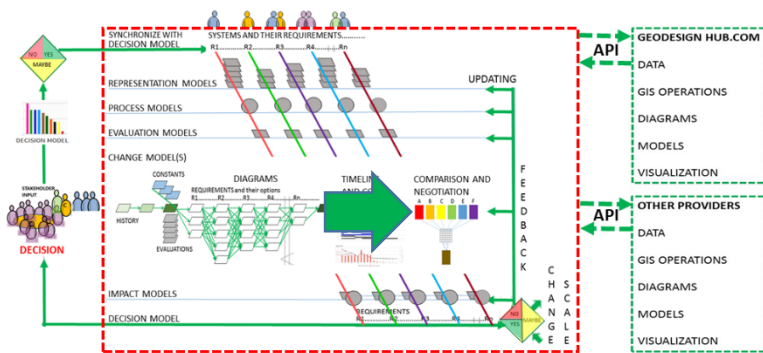
Select the frequencies to build a composite design.

☐ 1 ☐ 2 ☐ 3 ☒ 4 ☒ 5 ☒ 6

© IMPORT FREQUENCY DESIGN

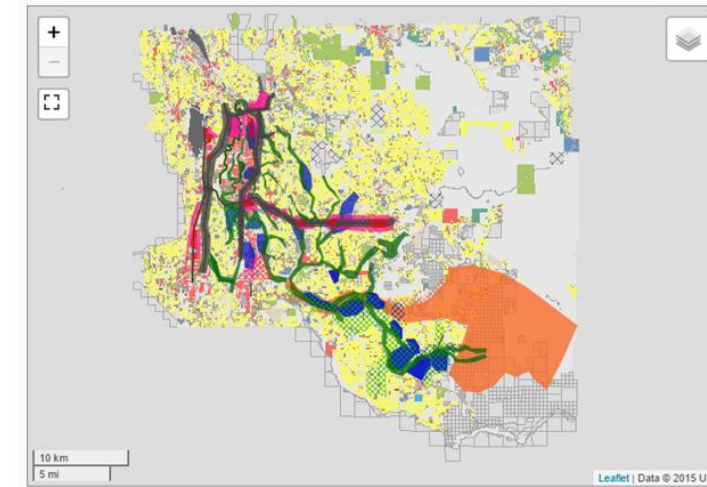
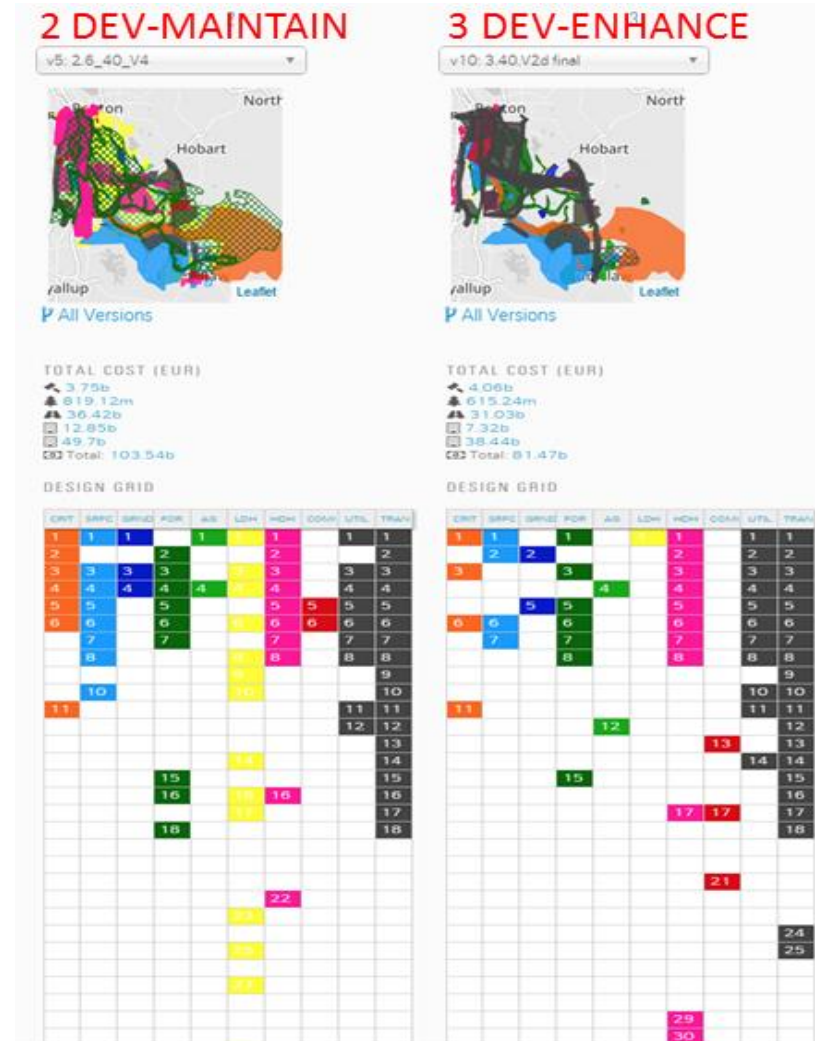


A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN



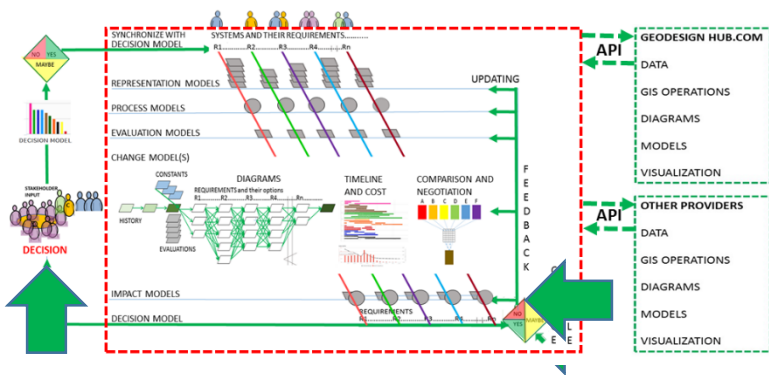
GEODESIGNHUB

TOOLS TO SUPPORT NEGOTIATION
AND FACILITATE AGREEMENT



LAND USE +40 years
THE NEGOTIATED FINAL CHANGE-DESIGN

A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN



GEODESIGNHUB

EXTERNAL API LINKS

TO 2, 3, 4-DIMENSIONAL VISUALIZATION

Geodesign Hub 3D Viewer

This plugin uses [OSM Buildings](#) library for visualization and design data from [Geodesign Hub](#). See the [GitHub repository](#).

- 1 Wait till the processing is complete
- 2 Turn on or off streets and systems
- 3 Click "Regenerate Scene" button to rebuild

Streets

☐ Display generated streets

Systems

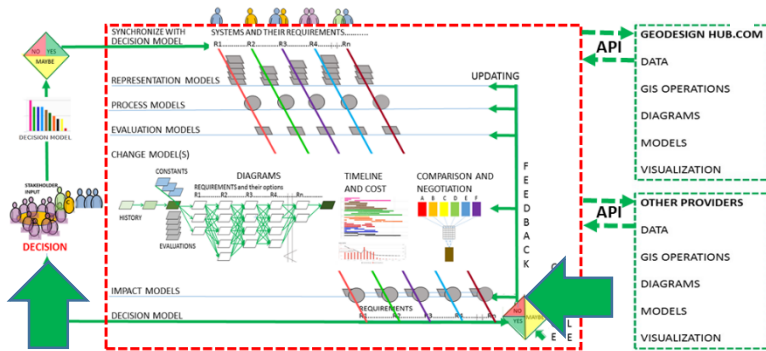
☒ PTRANS ☒ ATRANS ☒
☒ MDH ☒ HDH ☒ COMIND ☒
☒ EDU ☒ TOUR ☒ BINFRA ☒
☐ GINFRA

Refresh

Regenerate Scene



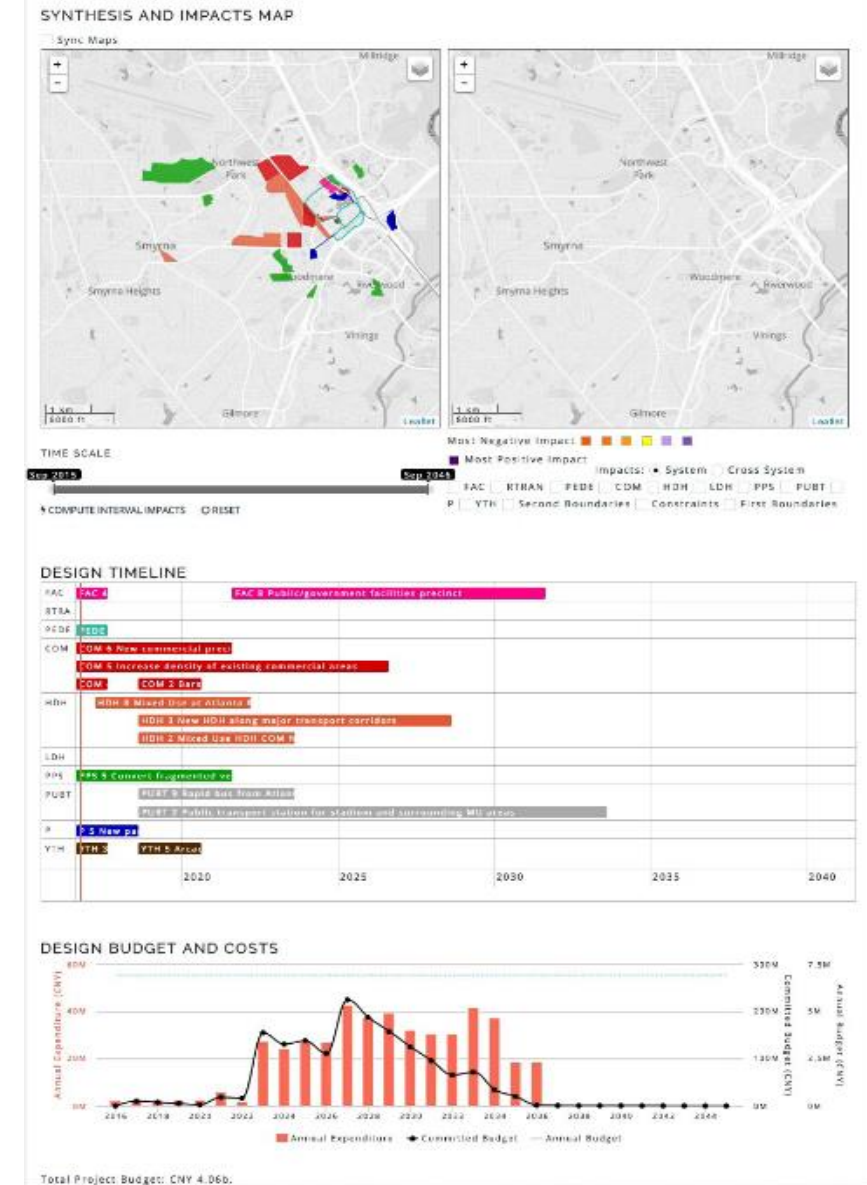
A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN



VISUALIZATION OF PROJECTED IMPLEMENTATION IN STAGES IS LINKED TO THE DESIGN AND ITS TIME-LINES, COSTS AND IMPACTS. ALL ASPECTS (+-) CAN BE MANIPULATED IN THE DESIGN AND NEGOTIATION PROCESS.

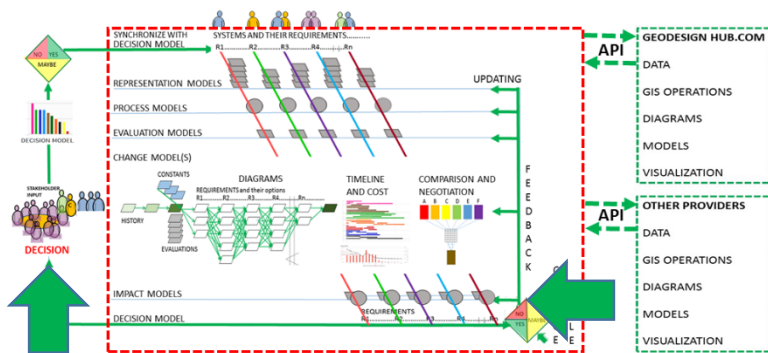
VIDEO

GEODESIGNHUB



Amy Orling, Smyrna Georgia, USA, The Pennsylvania State University Geodesign program's virtual studio.

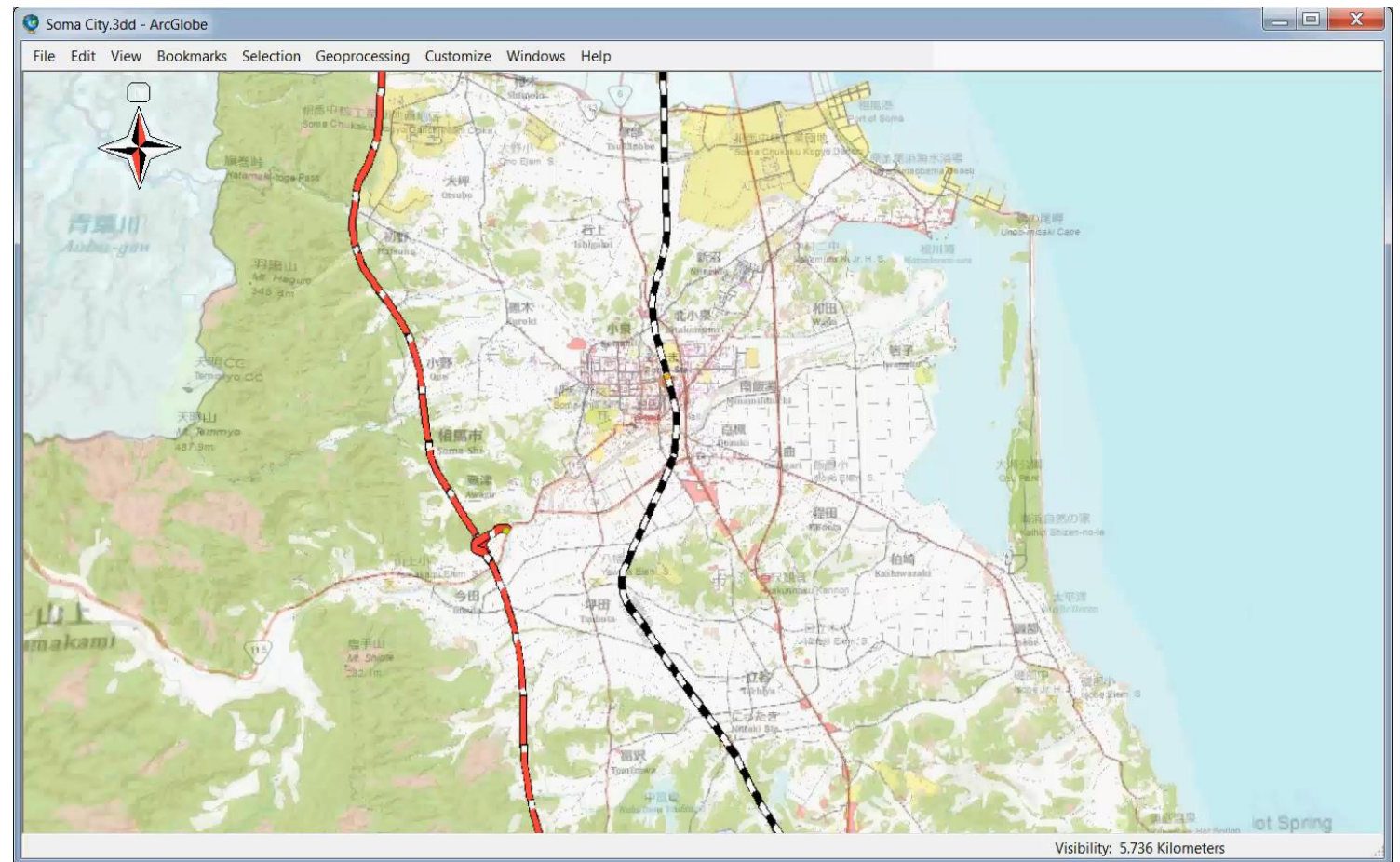
A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN



GEODESIGNHUB

EXTERNAL API LINKS

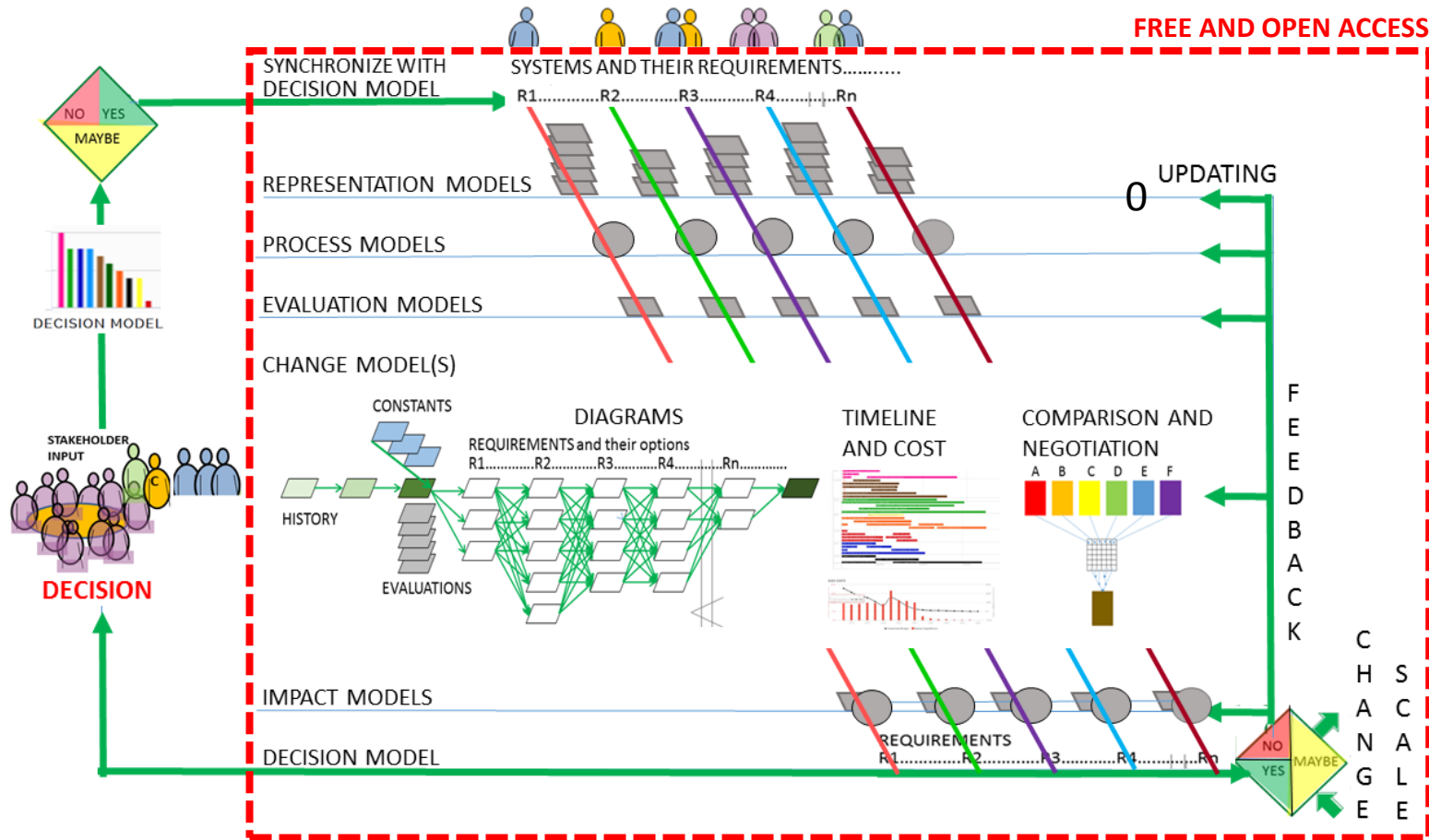
TO 2, 3, 4-DIMENSIONAL VISUALIZATION
TOOLS, INCLUDING CITYENGINE
AND OTHERS



VIDEO

Keiji Yano, Yuzuru Isoda, Eric Wittner (CityEngine), et.al., Soma City, Fukushima, Japan, 2012, 2015

A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN



DYNAMICS IN GEODESIGNHUB

DECISION MODELS VIA DECISION

REQUIREMENTS VIA DECISION

REGIONS/SUBREGIONS OF FOCUS

SCALE VIA GDH ZOOMING

CONSTRAINTS VIA UPDATING

EVALUATION MODELS VIA UPDATING

DIAGRAMS VIA ADDING, EDITING

DESIGNS VIA REDESIGN, VERSIONS

IMPACTS VIA REDESIGN

TIMING VIA DECISION

COSTS VIA DECISION, REDESIGN

VISUALIZATION VIA REDESIGN

COMPARISON VIA DECISION

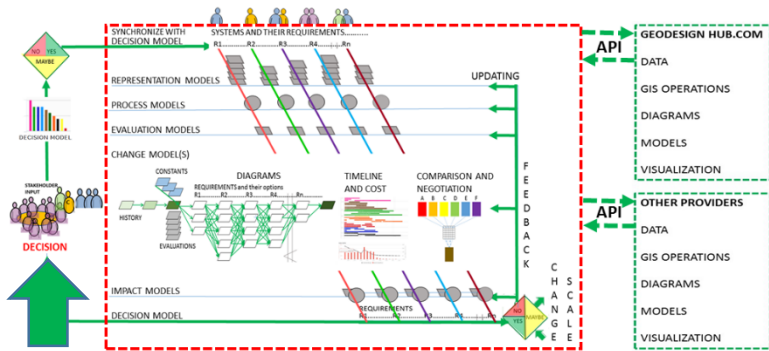
NEGOTIATION VIA REDESIGN, DECISION

DECISION VIA DECISION

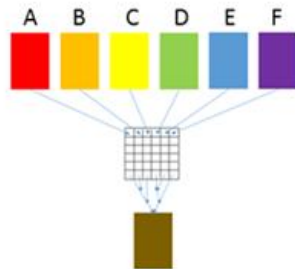
GEODESIGN DYNAMICS

SOME RECENT EXAMPLES (BRIEFLY PRESENTED)

A DIGITAL WORKFLOW FOR DYNAMIC GEODESIGN

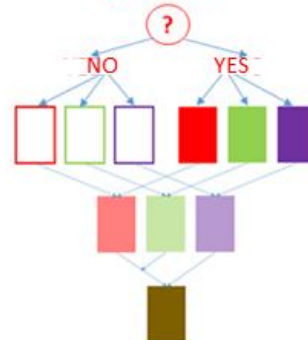


MULTIPLE CONSTITUENCIES



The Eastern Suburbs,
Sydney, Australia

SENSITIVITY



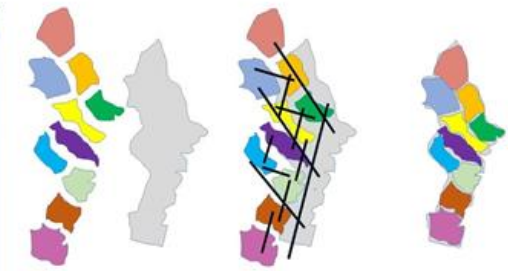
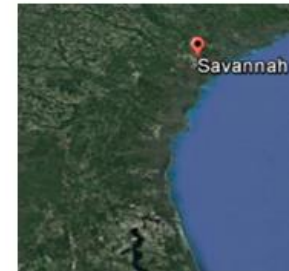
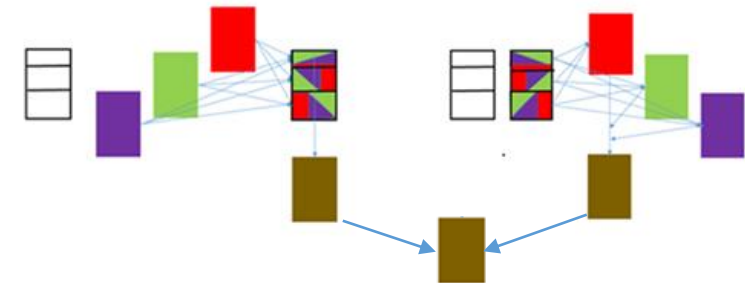
Iron Mining in Minas Gerais,
Brazil

GEODESIGNHUB

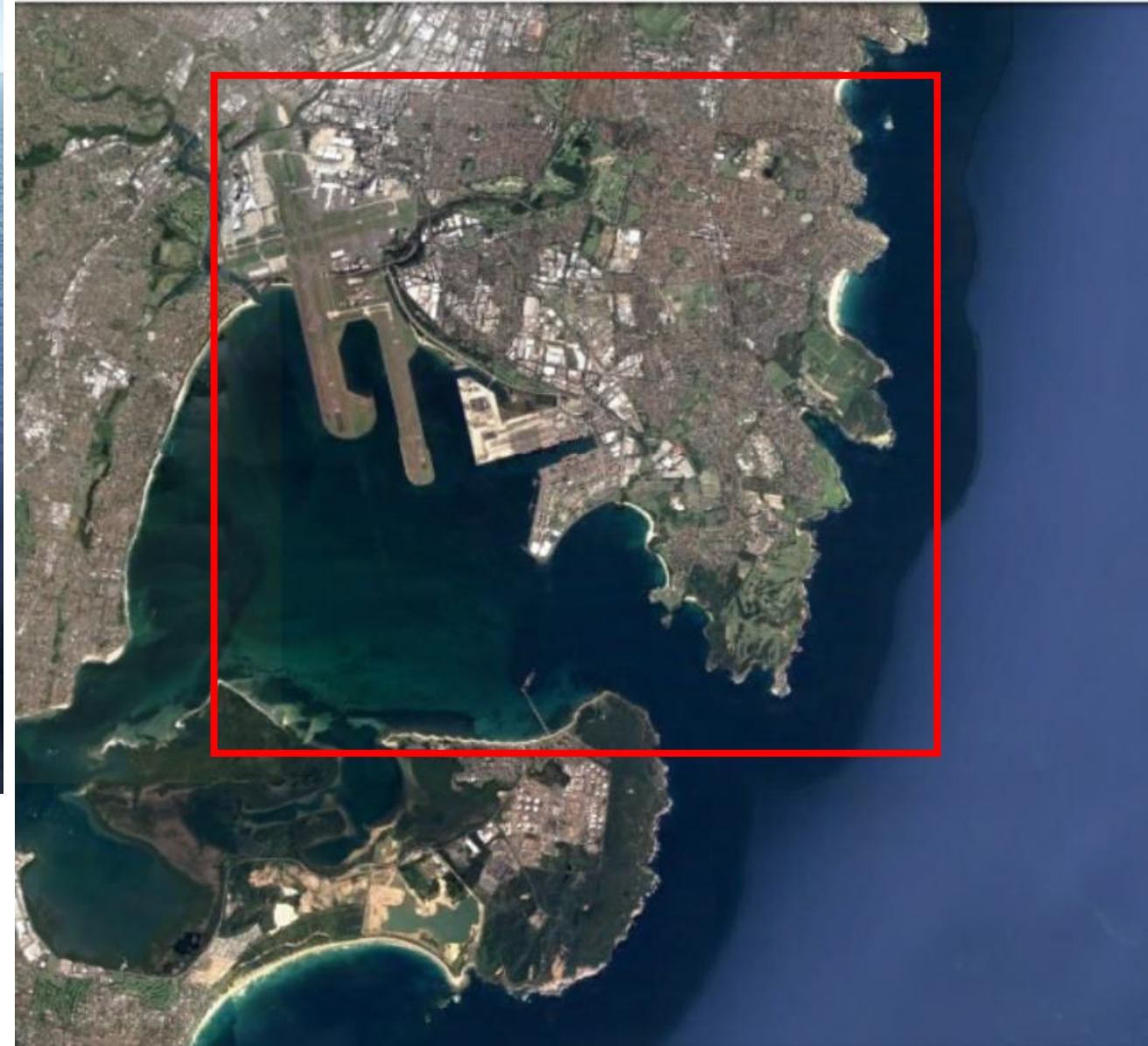
WAYS TO ORGANIZE A WORKFLOW
BASED ON NEGOTIATION STRATEGY

MULTIPLE JURISDICTIONS

REGION TO LOCAL LOCAL TO REGION



The Georgia Coastal Zone,
U S A



AN ALTERNATIVE FUTURE FOR EASTERN SUBURBS, SYDNEY, AUSTRALIA,
including UNSW and the hospital district, the port, and the airport which is proposed for relocation

Chris Pettit et. al., University of New South Wales, Sydney, Australia November 2016

WORKSHOP
PARTICIPANTS

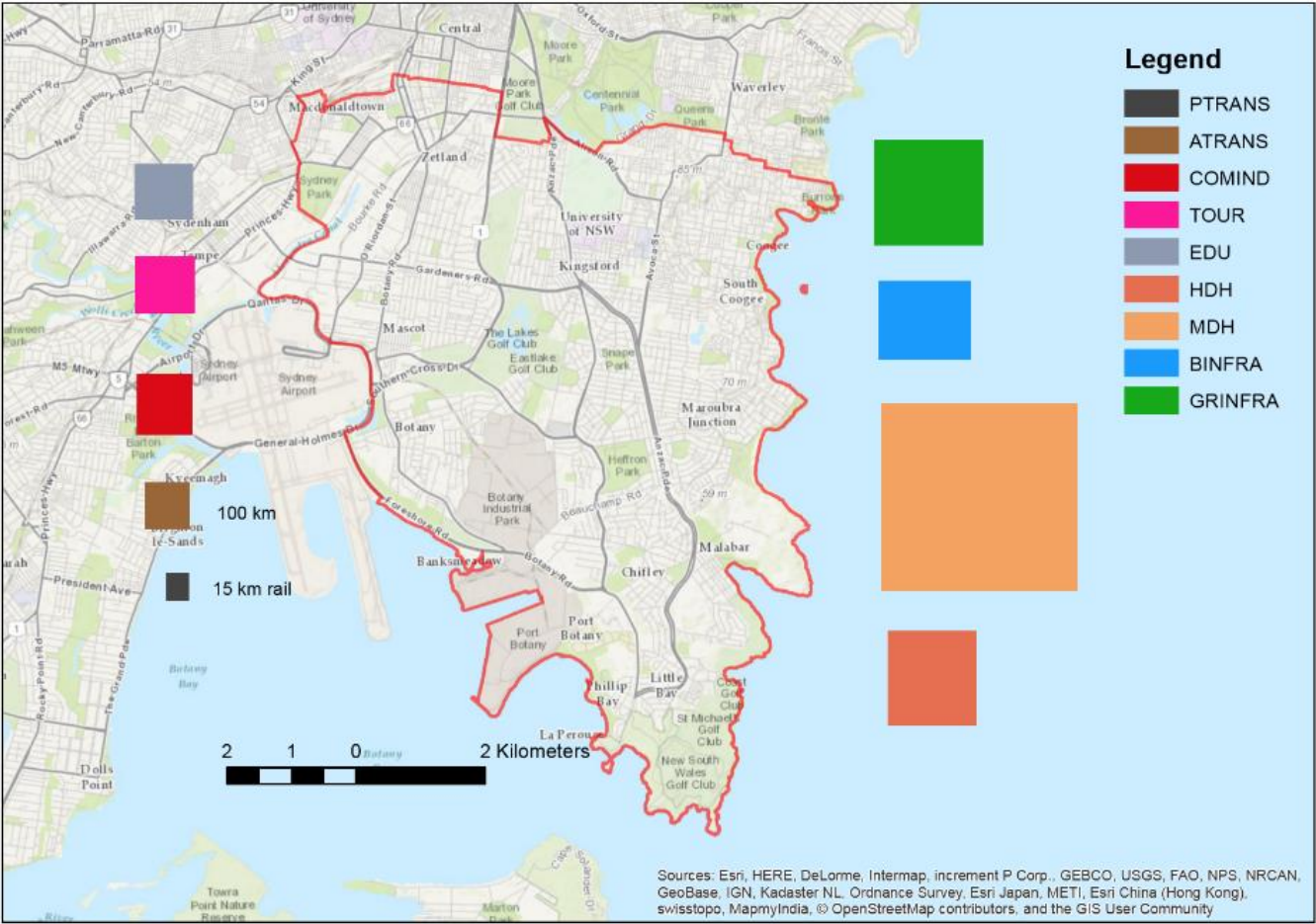
4	Organisation	Names	Roles/Titles				
5	Sydney Water	Luther Uthayakumaran	Senio Leader in Strategy, Analytics and Innovation				
6	Sydney Water	Marcia Dawson	Principal Analyst/Project manager				
7	Sydney Water	Fernando Gamboa	Planner, Liveable City Solutions				
8	Sydney Water	Emma James	Senior Water Sensitive Urban Designer				
9	Arup	Oliver Lock	Urban Planner and Data Scientist				
10	Arup	Sian Elliot	GIS Specialist				
11	Arup	Chris Schmid	Senior Planner				
12	EY	Sarah Duignan	Partner/NSW Government Leader, Oceania Leader-Policy, Economics and Regulation				
13	Randwick City Council	Gary Ella	Coordinator Community Development				
14	Randwick City Council	David Ongkili	Acting Manager Strategic Planning				
15	Botany Bay City Council	Anne Qin	Urban Designer, Strategic Planning				
16	Infrastructure NSW	Sean O'Shannassy	Exectuive Director				
17	Land and Housing Corporation	Andre Szczepanski	Senior Planner				
18	Land and Housing Corporation	Michael Carnuccio	Principal Planner				
19	Greater Sydney Commission	Alex Gold	Special Advisor				
20	Greater Sydney Commission	Clare Donovan	Project Lead - Sustainability				
21	Urban Growth NSW	Alexandra Vella	Program Director				
22	Transport NSW	Kyle Sharpe	Senior Transport Planner				
23	Transport NSW	David Turner	GIS Analyst				
24	Department of Planing and Environment	Andrew Hargreaves	Senior Officer for Strategic Open Space and Social Infrastructure Planning				
25	Department of Planing and Environment	Jennifer Richardson	Team Leader-Transport an Strategic Infrastructure Planning				
26	Department of Education NSW	Susanne Johnson	Senior Assets Planner				
27	UNSW	Hal Pawson	Associate Director, CFRC				
28	UNSW	Sara Padget Kjaersgaard	Lecturer - Landscape Architecture				
29	UNSW	Katrina Simon	Senior Lecturer - Landscape Architecture				
30	UNSW	Mike Harris	Senior Lecturer				
31	UNSW	James Weirick	Program Director, Urban Development and Design				
32	University of Canberra	Hitomi Nakanishi	Assistant Professor in Urban & Regional Planning				
33	Core team	Chris Pettit	Associate Director, City Future Research Centre				
34	Core team	Scott Hawken	Lecturer, Urban Development and Design				
35	Core team	Scott Lieske	Research Fellow				
36	Core team	Simone Zarpelon Leao	Research Fellow				
37	Core team	Aida Afrooz	Technical Specialist				
38	Core team	Karolina Peret	Intern, visiting post-graduate student				

Hrishi Ballal,
Tess Canfield,
Carl Steinitz

SYSTEM
REQUIREMENTS
FOR THE
STUDY AREA
BY YEAR 2050

	Year 2016 ^a	Year 2050 ^b
Population	407250	770000
Number of households	184850	360000

System	Description	Additional provision needed (ha)
MDH – Medium Density Housing	New medium density housing of 4-7 storeys accommodating 200 persons/ha	900 ha
HDH – High Density Housing	New high density housing of 8-25 storeys accommodating 800 persons/ha	300 ha
PTRANS – Public transport	Train and light rail development	15 ha (15km length x 10m width)
ATRANS – Active Transport	Cycling infrastructure	50 ha (100km length x 5m width)
GINFRA – Green Infrastructure	Installing elements of urban greenery; e.g. rain gardens, green roofs	700 ha
COMIND – Commerce and Industry	Commercial/industrial development	200 ha
BINFRA – Blue Infrastructure	Swales, green space for promoting water sensitive urban design	400 ha
EDU – Education	Development/expansion of Primary/secondary/tertiary education facilities	200 ha
TOUR – Tourism	Developing new points of interest for recreation and entertainment, and/or expanding tourist areas	200 ha





ALL DIAGRAMS

+ ADD A DIAGRAM COPY AND EDIT A DIAGRAM CLEAR ALL SELECTIONS

GINFRA BINFRA TOUR EDU COMIND HDH MDH ATRANS PTRANS

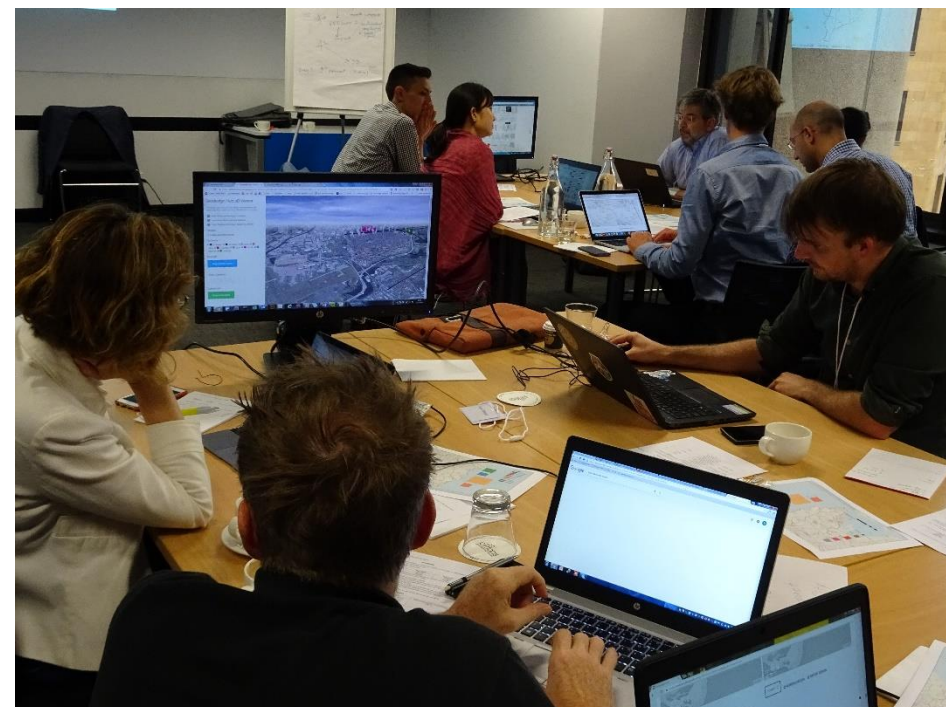
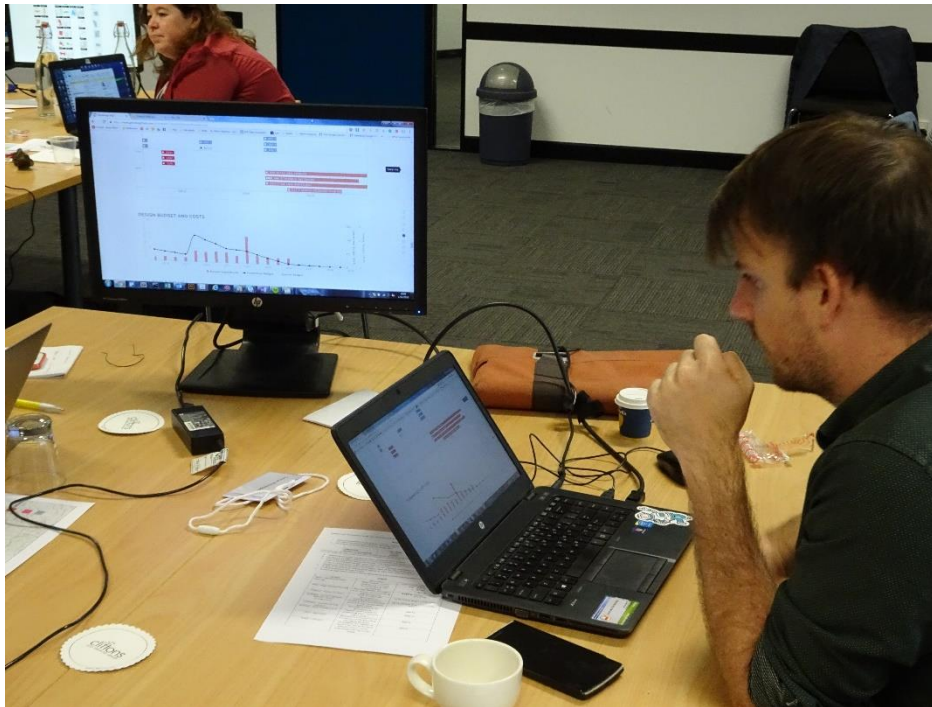
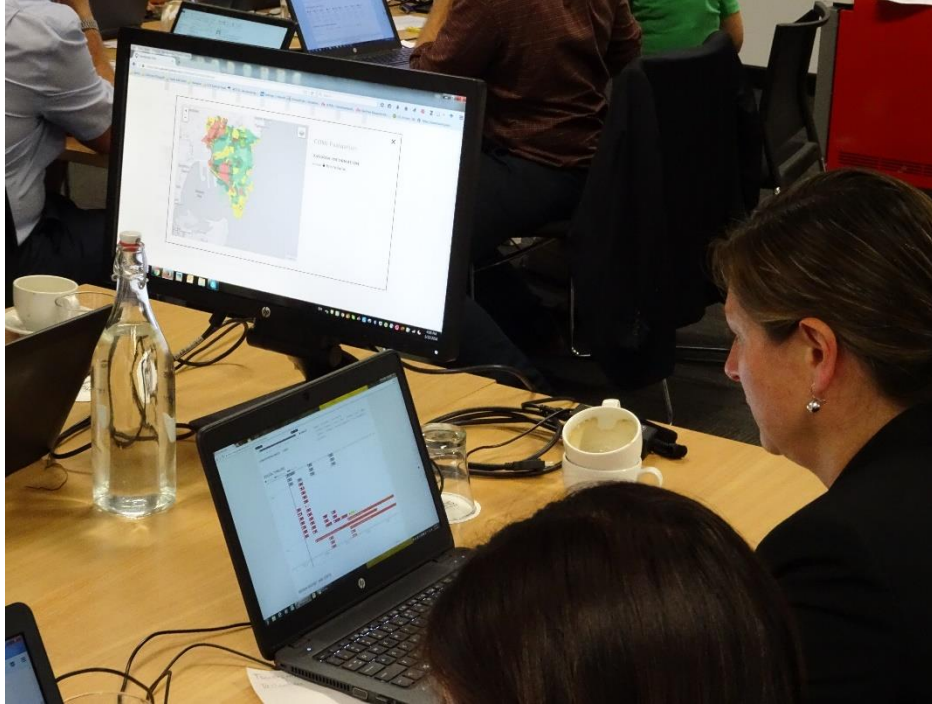
Grid of 27 map diagrams (3 rows x 9 columns) showing various colored regions and lines on a map background. Each diagram includes a 'Leaflet' logo and a selection count (e.g., » 1, » 2, » 3).

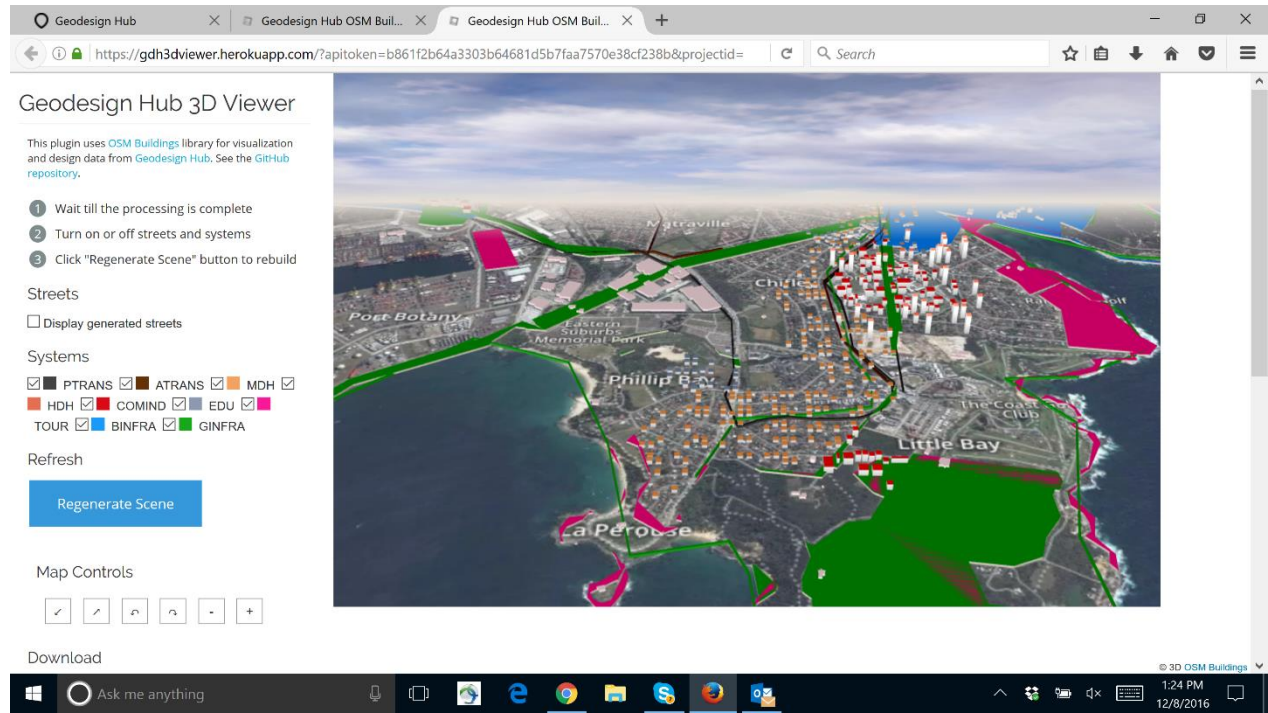
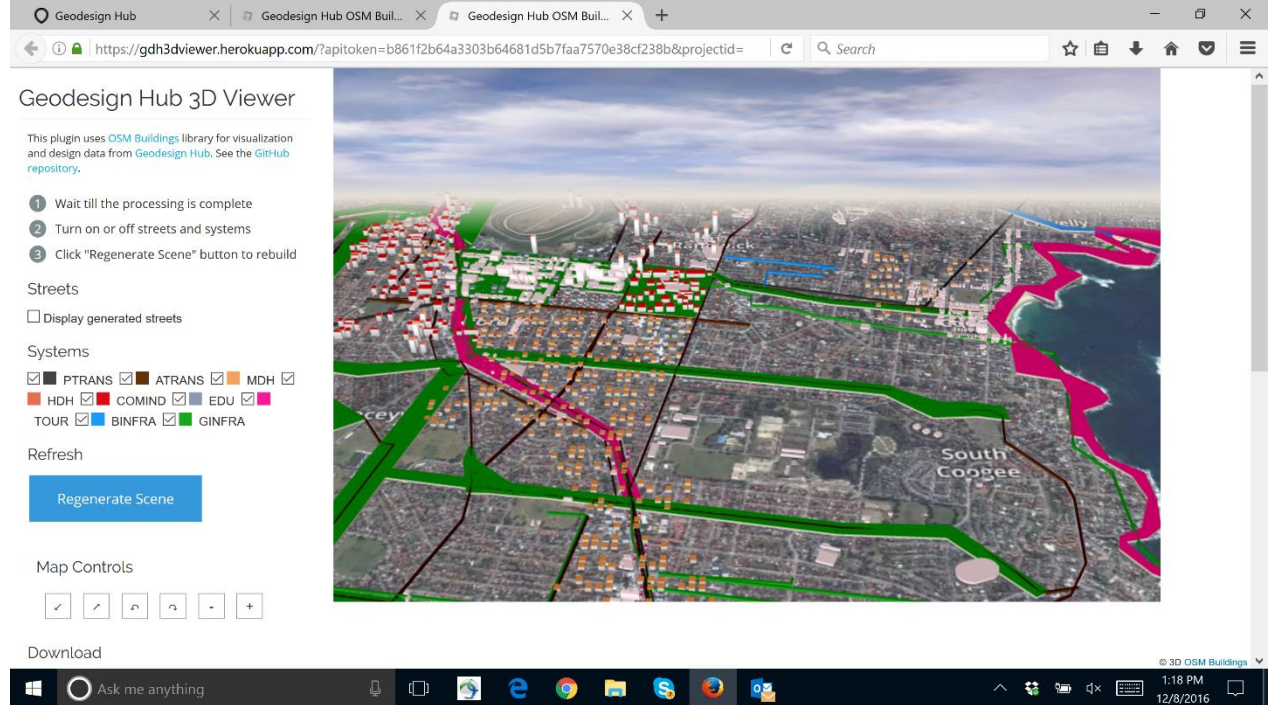
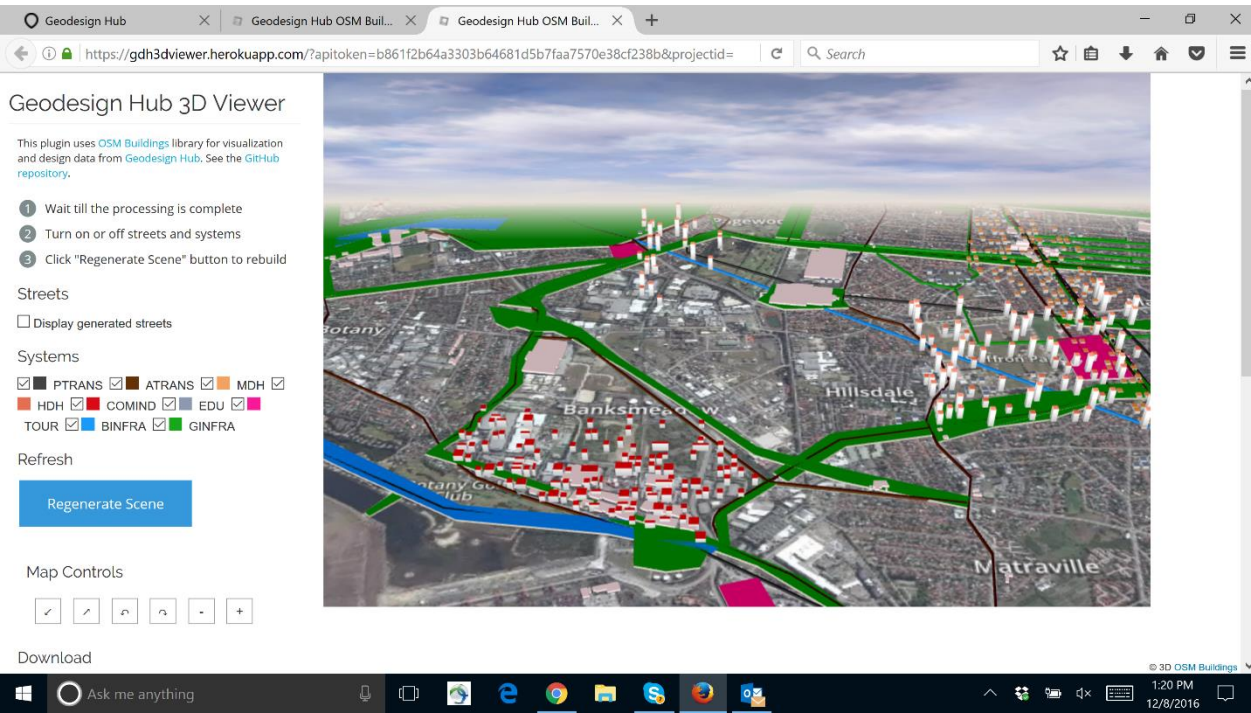
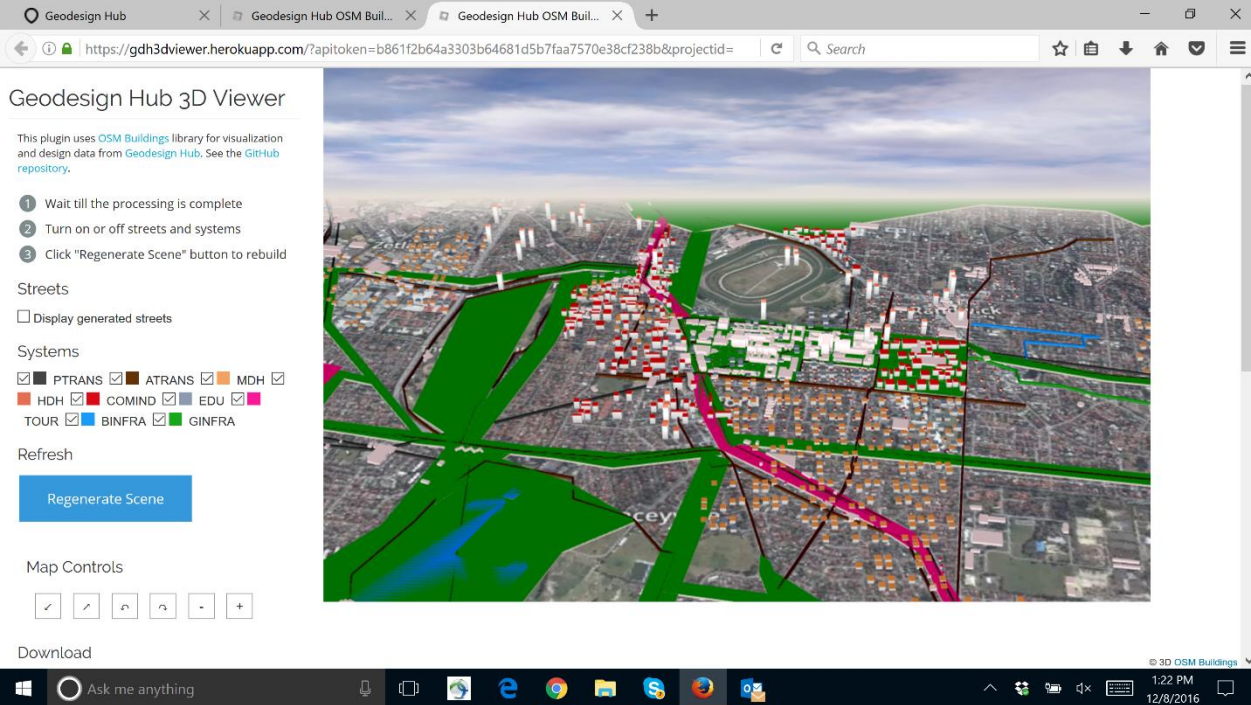
Day 1 1:20pm
CHANGE VERSION 1
AND IMPACTS,
INDEPENDENTLY BY TEAM



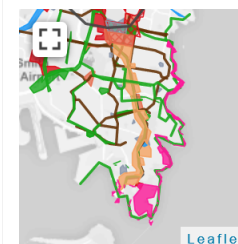
Day 1 3:00pm

**CHANGE VERSION 2+
AND IMPACTS,
TIMELINE AND COST
AND 3-D,
INDEPENDENTLY BY TEAM**



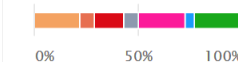


SYNTHESIS MAP

 3D VIEWER

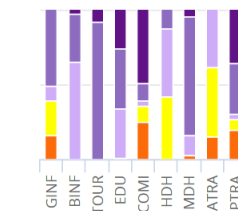
DESIGN HISTORY

PROJECTS AREA








REPORT

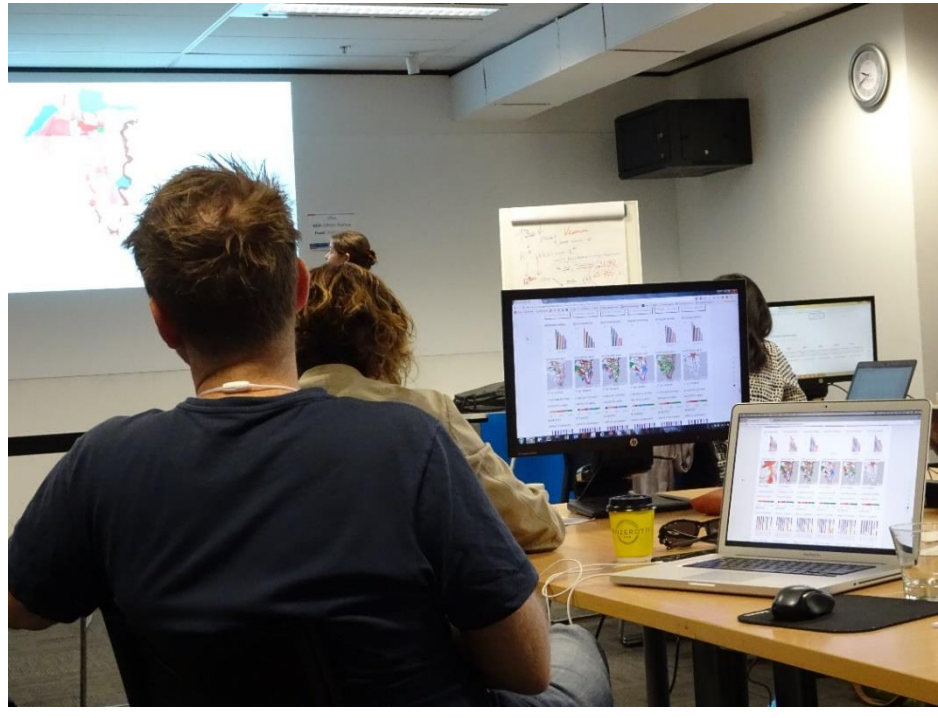
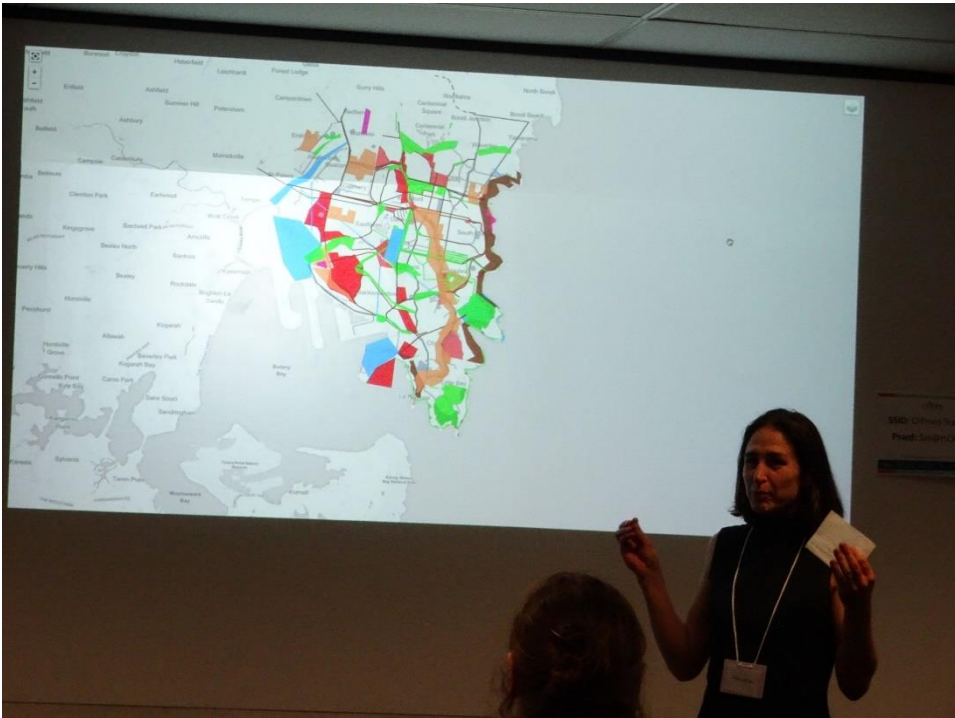
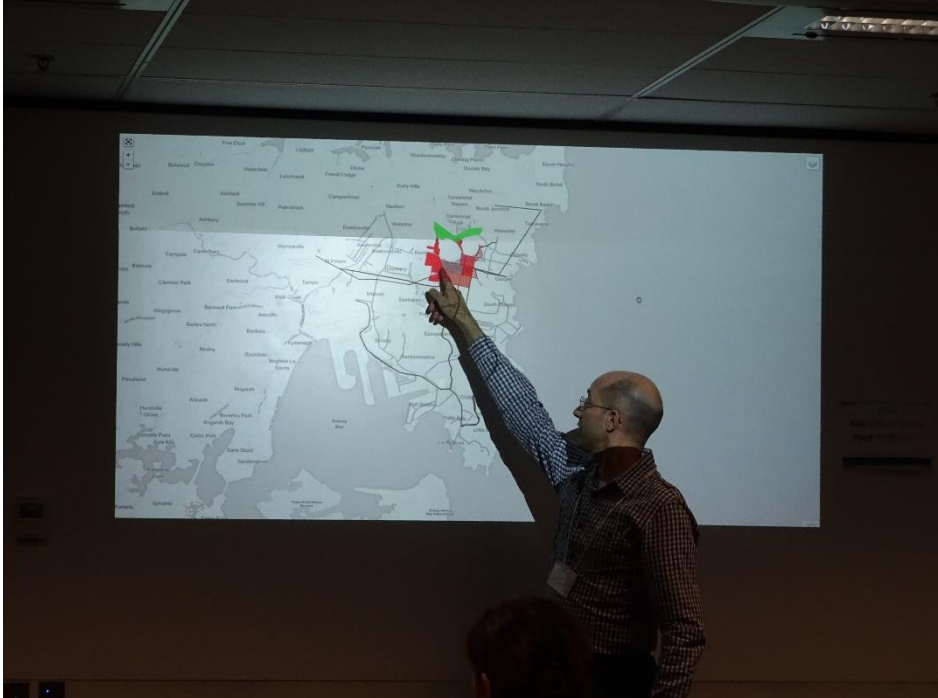
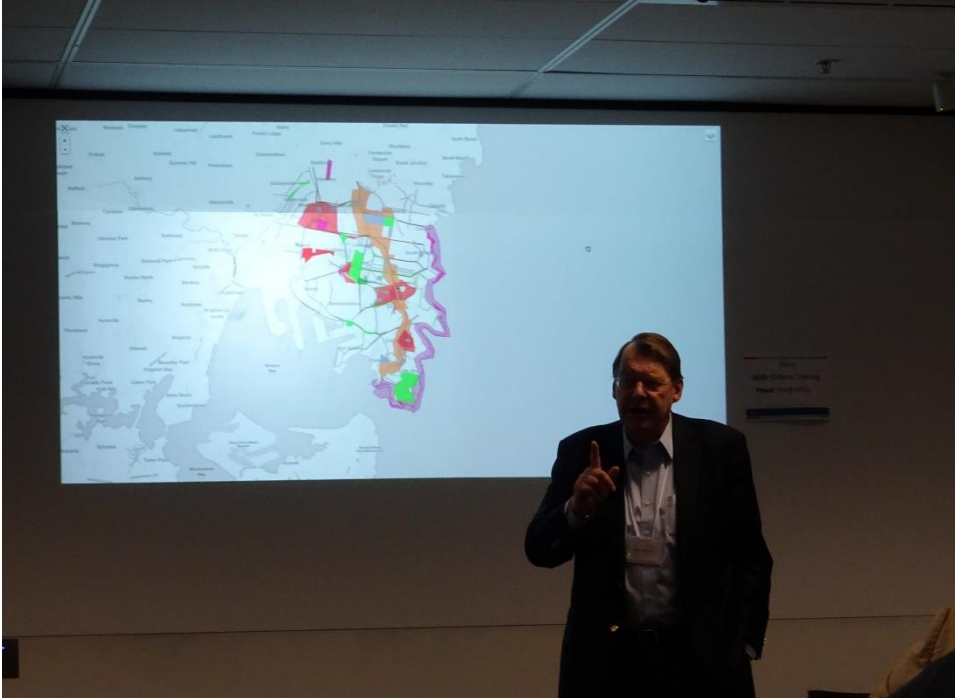
IMPACT SUMMARY



TOTAL COST EUR

-  1.55b
-  921.9m
-  11.72b
-  182.78m
-  Total: 17.25b

Day 2 9:00am
REVIEW AND
PRESENTATIONS (6)



Day 2 10am
CHANGE VERSION 3+
WITH NEGOTIATION
AMONG TEAMS AS NEEDED



VERSION 3+ MAJOR SAVED

COMPC 3.1

DEV4.5

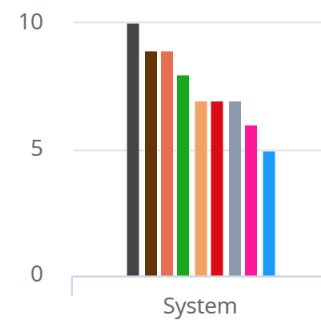
ENV3.1

PUB3.7

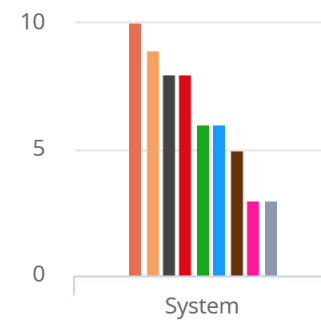
TOUR 3.4

UNIH 2.6

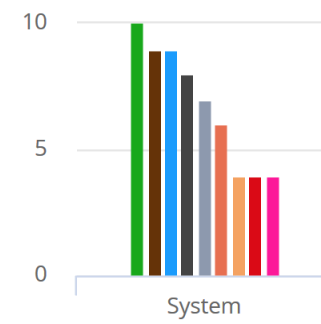
DECISION MODEL



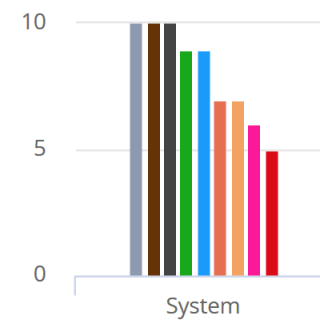
DECISION MODEL



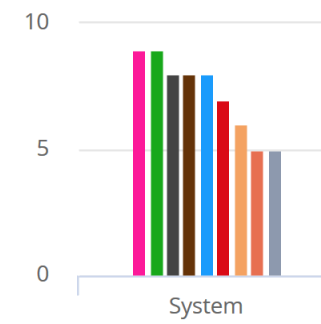
DECISION MODEL



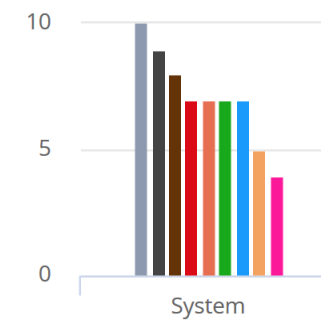
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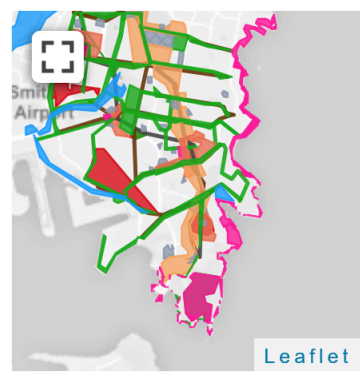
DECISION MODEL



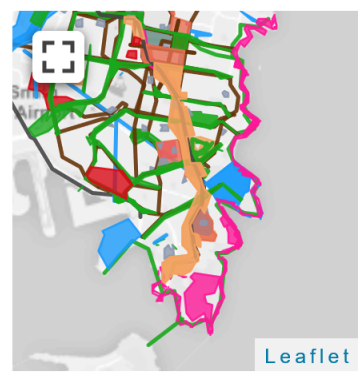
DECISION MODEL



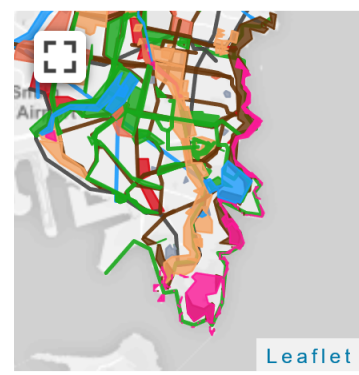
SYNTHESIS MAP



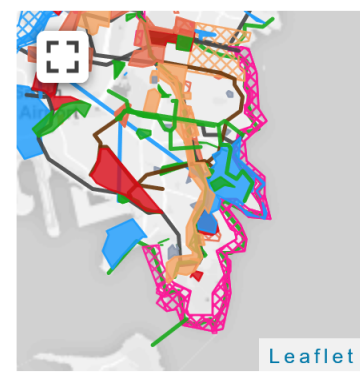
SYNTHESIS MAP



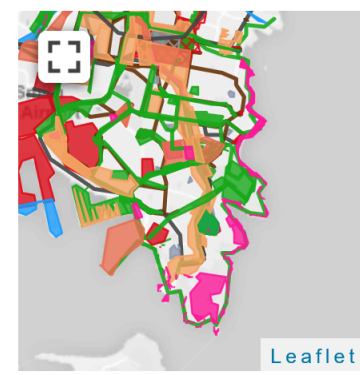
SYNTHESIS MAP



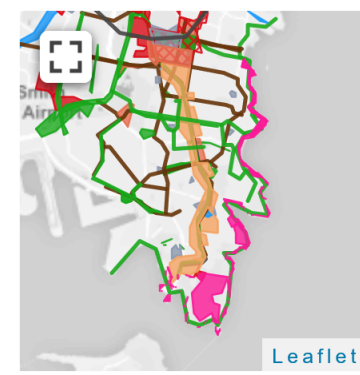
SYNTHESIS MAP



SYNTHESIS MAP



SYNTHESIS MAP



3D VIEWER

3D VIEWER

3D VIEWER

3D VIEWER

3D VIEWER

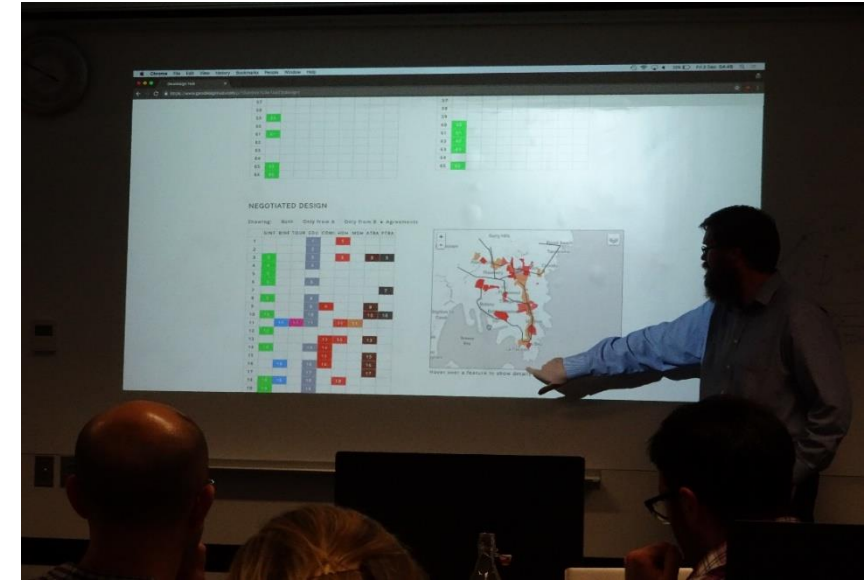
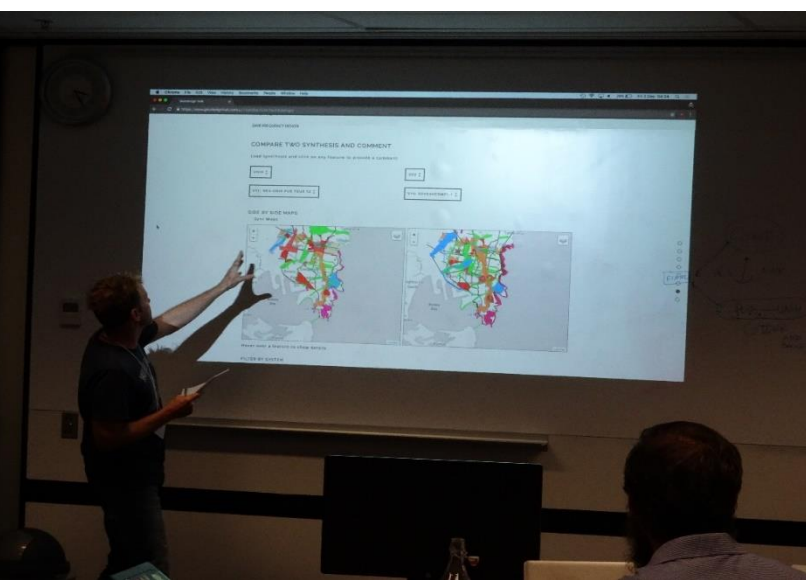
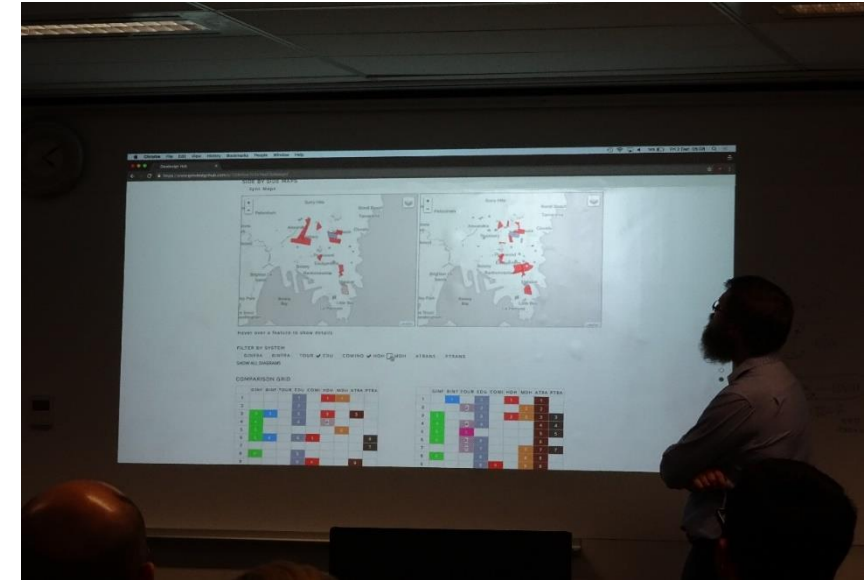
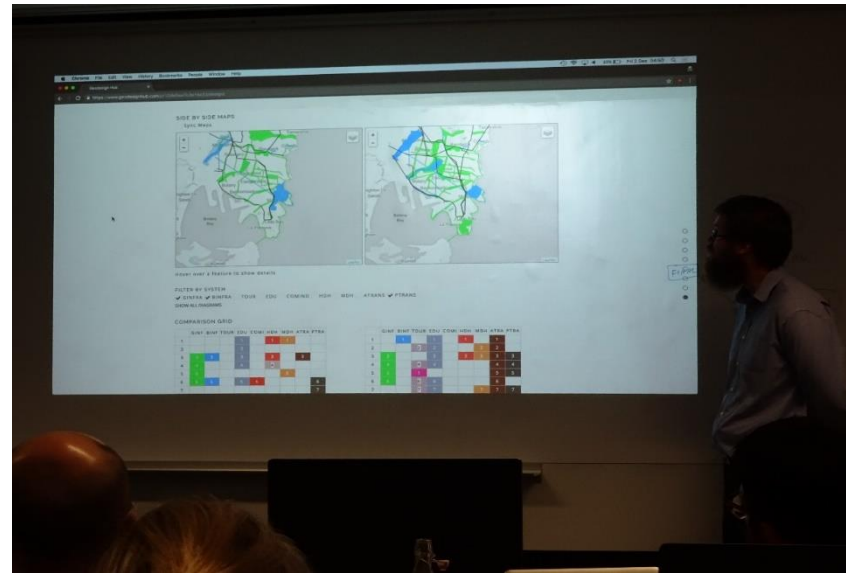
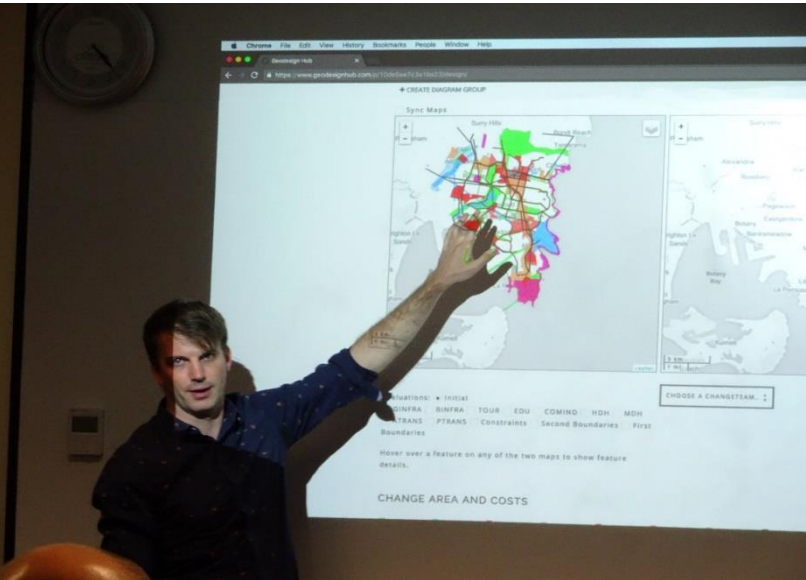
3D VIEWER

Day 2 1:15pm
TUTORIAL:
COMPARISON TOOLS
NEGOTIATION TOOLS

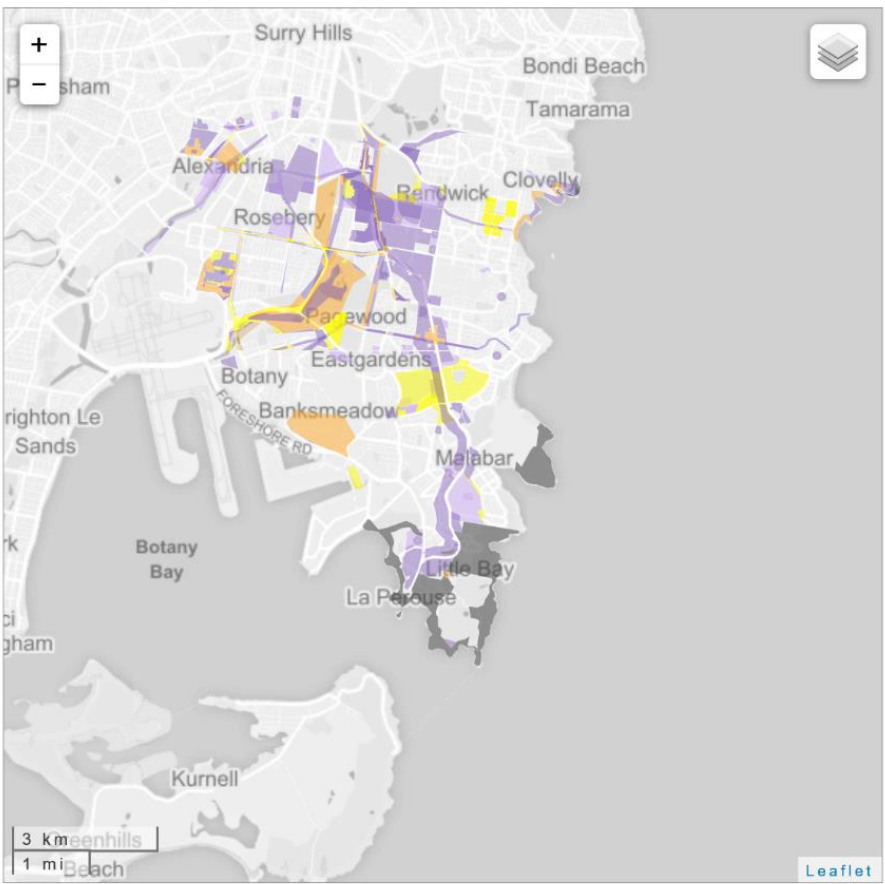
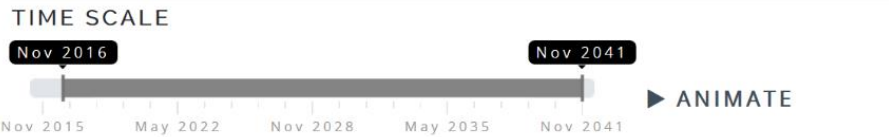


Day 2 3:00pm

CHANGE VERSION 4 AND IMPACTS, TIMELINE, COST AND 3-D, IN FINAL NEGOTIATION TOWARDS ONE STAGED DESIGN



THE FINAL
NEGOTIATED
DESIGN



Most Negative Impact ■ ■ ■ Most Positive Impact

Impacts: ☒ System ☐ Cross System

☒ GINFRA ☒ BINFRA ☒ TOUR ☒ EDU ☒ COMIND ☒ HDH ☒ MDH

☒ ATRANS ☒ PTRANS ☐ Second Boundaries ☒ Constraints ☐ First Boundaries

N.4

DECISION MODEL

SYNTHESIS MAP

3D VIEWER

DESIGN HISTORY

PROJECTS AREA

REPORT

IMPACT SUMMARY

TOTAL COST EUR

THE FINAL
NEGOTIATED
STAGED
DESIGN

DESIGN TIMELINE												
	Low Cost			Medium Cost			High Cost					
LINE												
ENV												
FOUR												
ERG												
TECH												
WDR												
MDR												
ATRA												
PTRA												
	Dec 2014	Jan 2015	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov

DESIGN BUDGET AND COSTS



TOTAL PROJECT BUDGET USD 0

COMPUTE DETAILED IMPACTS

SYNTHESIS MAP

IMPACTS MAP



- Impacts: ☒ System ☐ Cross System
- ☒ GINFRA ☒ BINFRA ☒ TOUR ☒ EDU ☒ COMING ☒ MDR ☒ MDR
- ☒ ATRANS ☒ PTRANS ☐ Second Boundaries ☐ First Boundaries
- Constraints

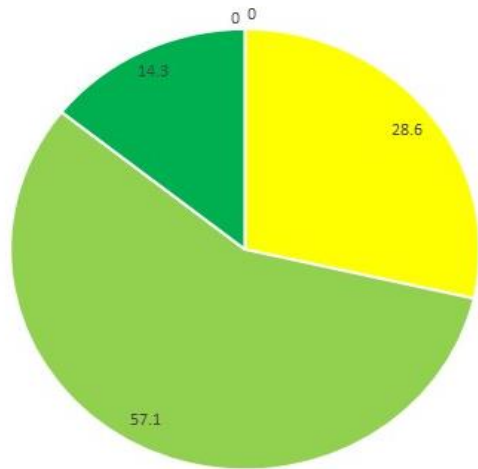
SAVE DESIGN

SYNTHESIS COMPARISONS



Feedback from participants

Did you find the Geodesign process difficult or easy to follow?



■ Difficult

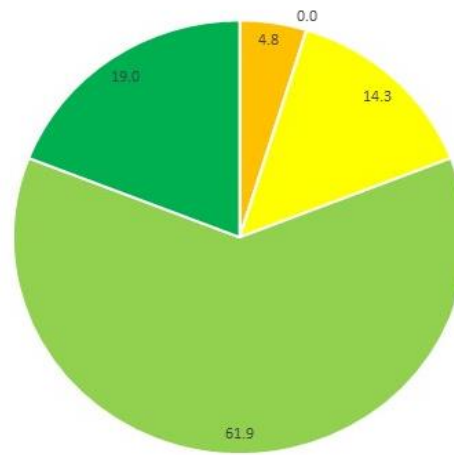
■ somewhat difficult

■ fair

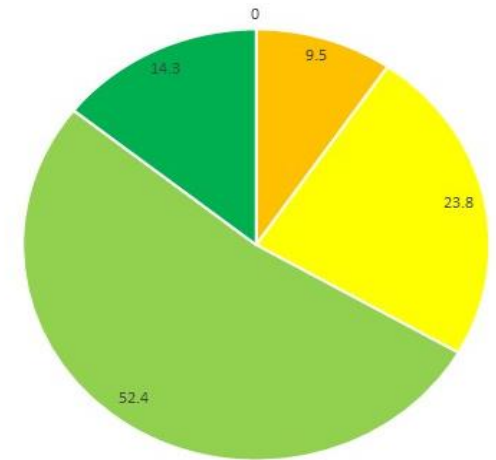
■ somewhat easy

■ easy

How well do you think your team's interests were addressed or included in the final proposal?



Do you agree with the final proposal?



Which workshop tools/resources did you find most helpful and/or influential?

- Negotiation process
- Geodesignhub's tools for comparing different team designs



Quadrilátero Ferrífero (The Iron Quadrilateral) is a 7000 sq km region located in the State of Minas Gerais, Brazil. It is the largest domestic producer of iron ore. Settlement began with the gold mining boom in the 17th Century. At the end of 19th Century with the founding of Belo Horizonte, there was a new stage of development into what now is one of Brazil's most important regions.



Quadrilátero Ferrífero (The Iron Quadrilateral) is a 7000 sq km region located in the State of Minas Gerais, Brazil. It is the largest domestic producer of iron ore. Settlement began with the gold mining boom in the 17th Century. At the end of 19th Century with the founding of Belo Horizonte, there was a new stage of development into what now is one of Brazil's most important regions.

Ana Clara Mouro et. al., University of Minas Gerais, Brazil, July 2016



What are alternative futures for the "Quadrilátero Ferrífero", which includes Belo Horizonte and the UNESCO World Heritage city of Ouro Preto, in 2050?

Ana Clara Mouro et. al., University of Minas Gerais, Brazil, July 2016



BUSINESS

BHP, Vale Face \$44 Billion Lawsuit Over Brazil Dam Disaster

Lawsuit could upend initial settlement reached between companies and government in March

By **PAUL KIERNAN**

3 COMMENTS

Updated May 3, 2016 10:48 p.m. ET

RIO DE JANEIRO—Brazilian federal prosecutors [filed a civil lawsuit Tuesday](#) demanding that mining companies responsible for a [catastrophic dam failure in November](#) shell out up to 155 billion reais (\$43.55 billion) for cleanup and remediation, far more than the government initially estimated.

If upheld by a judge, the lawsuit would require Brazil's Vale SA, Anglo-Australian miner BHP Billiton Ltd., and their joint-venture Samarco Mineração to make an initial deposit of 7.7 billion reais to an independent fund responsible for cleaning up the fallout from the Fundão tailings dam collapse on Nov. 5. The accident, believed to be Brazil's worst environmental disaster ever, released an avalanche of sludge that killed 19 people, destroyed villages and polluted more than 400 miles of rivers before spewing into the Atlantic Ocean weeks later.

Shares in BHP Billiton fell more than 6% in early trading in London.

Related Video



Massive tailings dams, like this functional one near Antonio Pereira, Brazil, are built by mining companies to hold back the sludge left behind when a mill separates metals from ore. But the dams fail often enough that industry engineers are sounding alarms. Photo: João Pina for The Wall Street Journal

The lawsuit represents authorities' biggest response yet to the disaster. It also threatens to upend a landmark settlement reached between the mining companies and Brazil's government in early March. In that deal, the companies agreed to spend as little as 9.46 billion reais through 2030 via a foundation run mostly by their own appointees.

Many investors interpreted the settlement to mean that Vale and BHP Billiton had left the bulk of Samarco's liabilities behind them.

Shares of both companies, after plunging in the wake of the disaster, have rebounded in recent

THE TIMES | Friday October 21 2016 1GM

BHP staff charged over mine disaster

Marcus Leroux

BHP Billiton staff were among 26 people charged yesterday by Brazilian prosecutors for their role in the Samarco mine disaster that killed 19 people and left a trail of damage for hundreds of miles in its wake.

Some 21 of the accused were charged with aggravated homicide and the Brazilian subsidiary of the FTSE 100 mining group was also charged over the dam collapse at an iron ore mine in Minas Gerais province last November.

BHP said in a statement last night that it and the affected staff had yet to be formally notified of the charges but that it "rejects outright" the allegations: "We will defend the charges against the company, and fully support each of the affected individuals in their defence of the charges against them."

The move came at a press conference in Belo Horizonte, Brazil, hours after BHP had faced criticism at its annual general meeting in London from resi-

dents and farmers affected by the incident. It is understood that eight present and former BHP staff were charged, including the five representatives on Samarco's board of directors at the time.

Prosecutors at the conference said that executives of the company, which

Inside today
Chairman announces he is standing down

Page 38

is jointly owned by BHP and its Brazilian rival Vale, were aware that the dam could fail but put profit over safety.

BHP and Vale had earlier tried to draw a line under their liabilities by striking a 20 billion reais (£5.2 billion) deal with the federal government and the state governments of Minas Gerais and Espírito Santo, which lies down-

stream on the River Doce and was deluged by sludge after the accident. However, the agreement was suspended by a court in the summer.

The prosecutors' move came after BHP warned that it would walk away from the disaster-struck mine if Samarco's lenders refused to compromise.

While BHP emphasised that the clean-up operation and compensation schemes for residents would be unaffected by the failure of Samarco as an independent business, the closure of Samarco would be considered another hammer blow for the region.

Speaking to reporters at the BHP annual general meeting, Dean Dalla Valle, the executive leading the Brazilian relief effort for the company, said: "Samarco is a commercial entity with a large amount of debt and an unclear site to restart. I couldn't describe it any more simply than that."

He added that whether it reopens will "probably be down to factors beyond
Continued on page 38, col 2

<http://www.wsj.com/articles/bhp-vale-face-44-billion-lawsuit-over-brazil-dam-disaster-1462322048>

WORKSHOP PARTICIPANTS

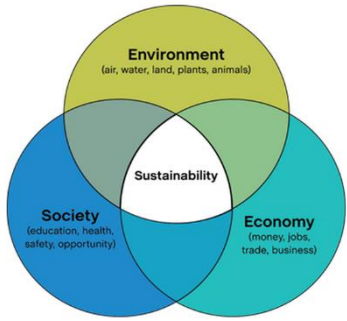
Participants from Society	Renata Herculano	renataherculano@yahoo.com.br	Housing (Student, Private Sector)
	Christiane C. Malheiros	christiane.malheiros@vale.com	VALE Mineração (Vale Mining)
	Sérgio Luiz Lima	sergioluizml@yahoo.com.br	VALLOUREC Mineração (Vallourec Mining)
	Renato Ciminelli	presidencia@geoparkquadrilatero.org	GEOPARK QF
	Paulo Rodrigues	global@gmail.com	CDTN (Nuclear Development Center)
	Cláudia Salles	claudia@ibram.org.br	IBRAM (Brazilian Mining Institute)
	Lívia de Oliveira Monteiro	liviaomonteiro@pbh.gov.br	PBH (BH Municipality)
	Ana Paula Maciel Peixoto	ana.peixoto@cidadades.gov.br	MINISTÉRIO DAS CIDADES (Ministry of Cities, Federal Government)
	Grazielle Anjos Carvalho	grazielleanjoo@gmail.com	CUME (Private Sector)
	Karla A. V. Borges	karla@pbh.gov.br	PBH (Prefeitura de Belo Horizonte - BH Municipality)
	Laura Lage	lblage@yahoo.com.br	Cultural Heritage (IEPHA - State Institute Cultural and Heritage)
	Sandra Silva	sandra.silva@cprm.gov.br	CPRM (Geological Survey of Brazil, Federal Government)
	Filipe Framil	filipe.framil@inhotim.org.br	INHOTIM (Inhotim Park)
	Eduardo Parussolo	eduardo.parussolo@vale.com	VALE Mineração (Vale Mining)

Invited Professors	Michele Campagna – UNICA, Cagliari, Itália	campagna@unica.it	Planning
	Paulo Pellegrino – FAU/USP	prmpelle@usp.br	Landscape Planning
	Tiago Badre Marino – IGA/UFRJ	tiagomarino@hotmail.com	Information Technologies, Computer Science

Coordinators Professors	Ana Clara Mourão Moura - UFMG/EA	anaclara@ufmg.br	Visual Axis
	Alfio Conti - UFMG/EA	alfioconti@hotmail.com	Transport, Dynamicity, Urban Planning
	Braúlio Magalhães Fonseca - UFMG/IGC	brauliomagalhaes@gmail.com	Risks, Geomorphology, Hydrology
	Flávio de Lemos Carsalade – UFMG/EA	flavio.carsalade@gmail.com	Cultural Heritage
	Clodoveu Davis Júnior – UFMG/DCC	clodoveu@gmail.com	Information Technologies, Computer Science
	Elisângela de A. Chiquito Martins - UFMG/EA	lis_arq@yahoo.com.br	Housing, Urban Planning
	Márcia Magela Machado – UFMG/IGC		Geology, Mining
	Ursula Ruchkys de Azevedo - UFMG/IGC		Tourism, Geopark
	Silvio Romero Fonseca Motta - PUCMINAS	silvio.motta@gmail.com	Information Technologies, Computer Science
	Rogério Palhares Zschaber Araújo- UFMG/EA	rogerio@praxisbh.com.br	Housing, Urban Planning

Team	Nicole Rocha	nicarocha.jf@gmail.com	Vegetation, Green Infrastructure
	Pedro Benedito Casagrande	pedrobcasagrande@gmail.com	Geology, Mining
	Priscila Lisboa de Paula	priscilalpaula@msn.com	Housing, Infrastructure
	Camila Zyngier	camila.zyngier@gmail.com	Visualization PSS, Planning
	Suellen Ribeiro	suellen_ribeiro15@yahoo.com.br	Information Technologies, Computer Science
	Diogo Guadalupe	diogocastroguadalupe@gmail.com	Information Technologies, Computer Science
	Gustavo Adolfo Martinez	gustavo.a.t.m.12345@hotmail.com	Transport, Dynamicity
	Italo Sena	italosena@gmail.com	Tourism, Ecology
	Junia Borges		Eco

Carl Steinitz
Hrishi Ballal
Tess Canfield



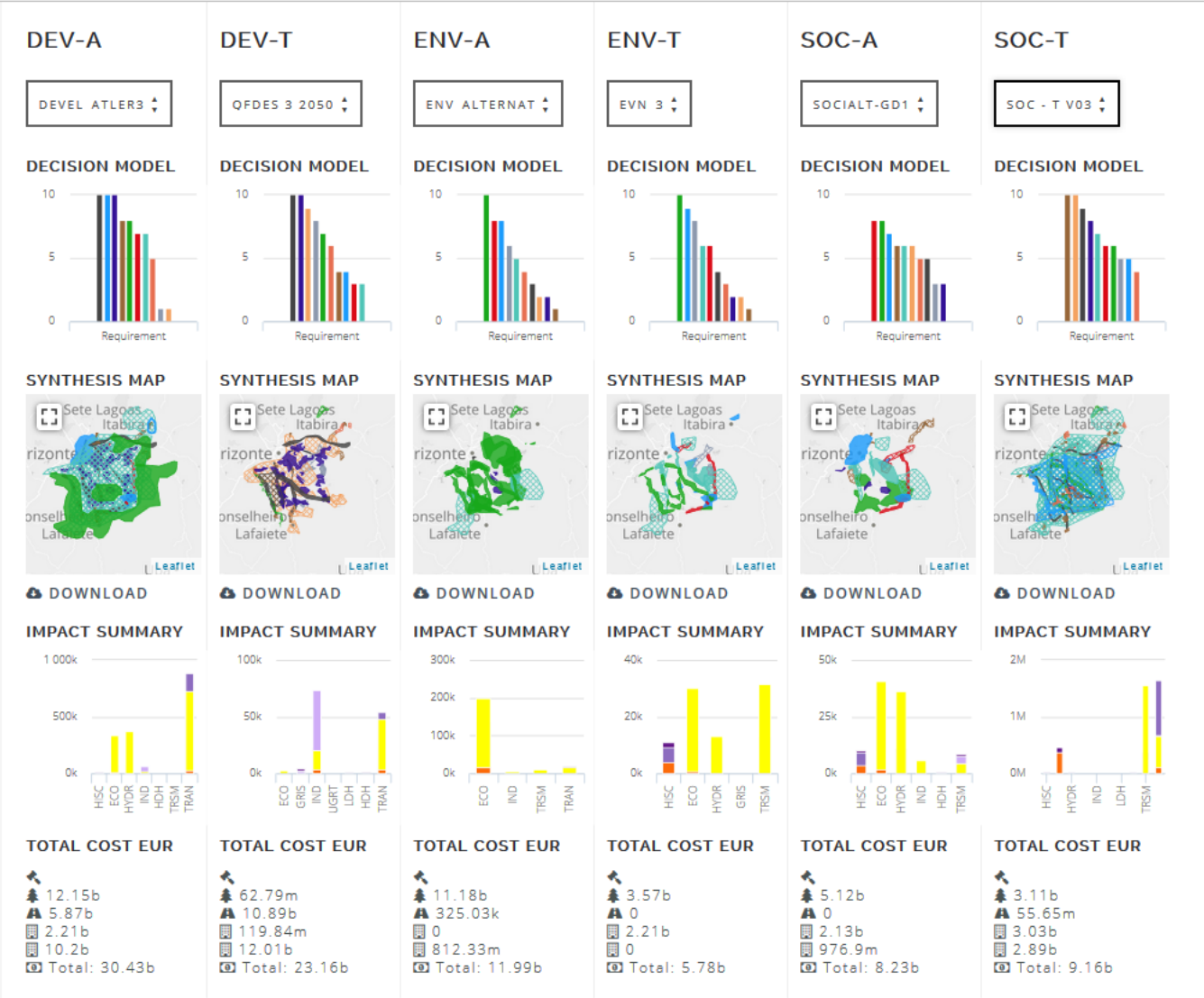
"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

Report of the World Commission on Environment and Development: Our Common Future
United Nations, 1987 "The Brundtland Report"

SIX CHANGE TEAMS DESIGN VERSION 1 BY OBTAINING, MAKING, EDITING, ADDING AND SELECTING DIAGRAMS OF POLICIES AND PROJECTS

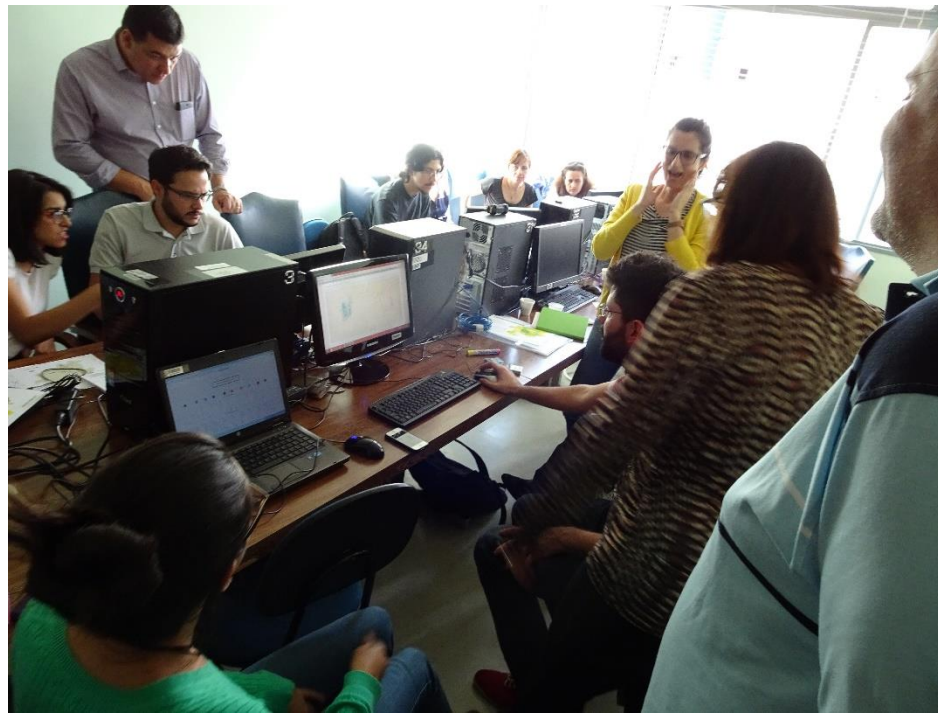


SIX CHANGE TEAMS' DESIGNS VERSION 3+



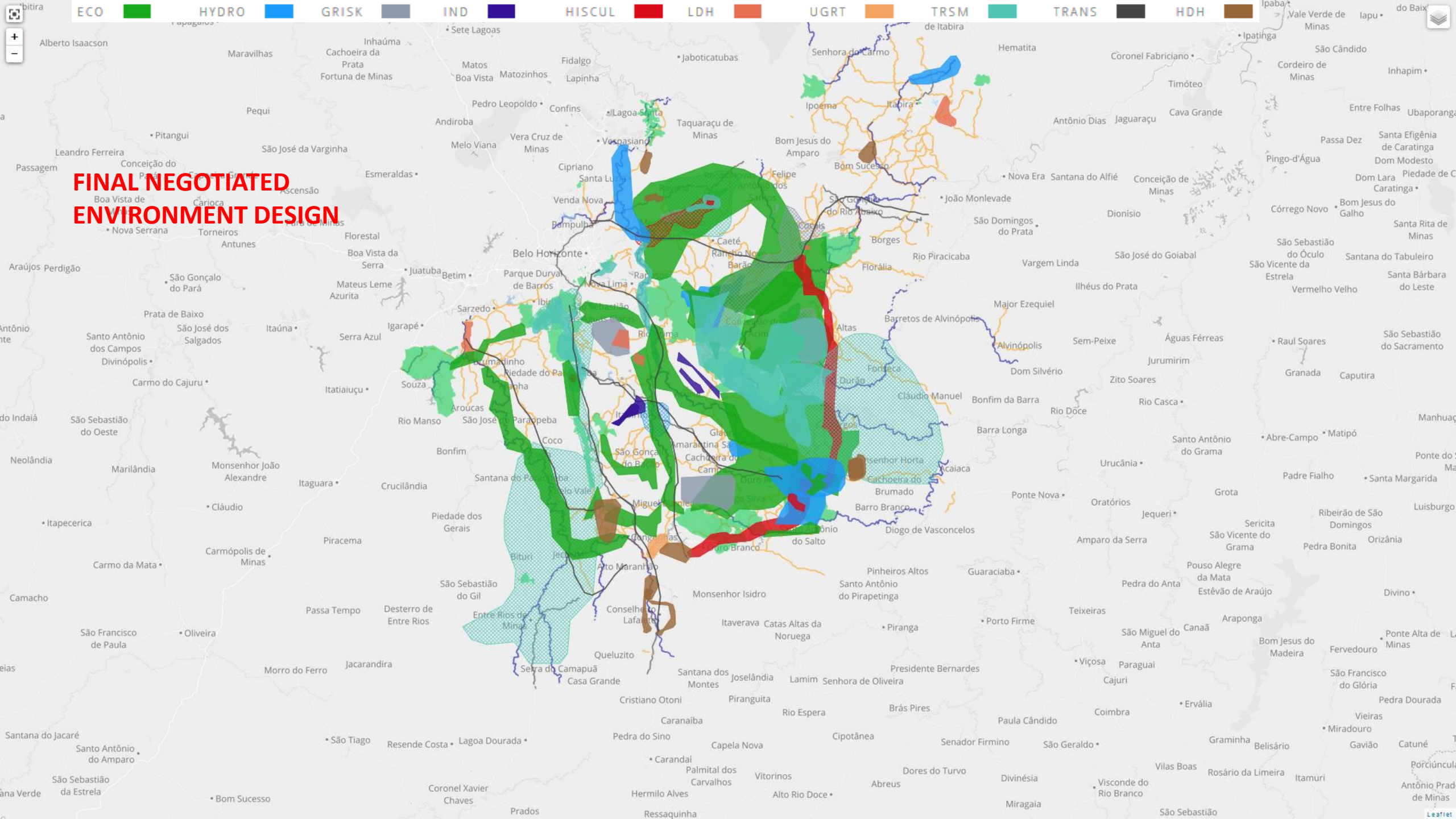
Filter: All Versions Major Versions Only

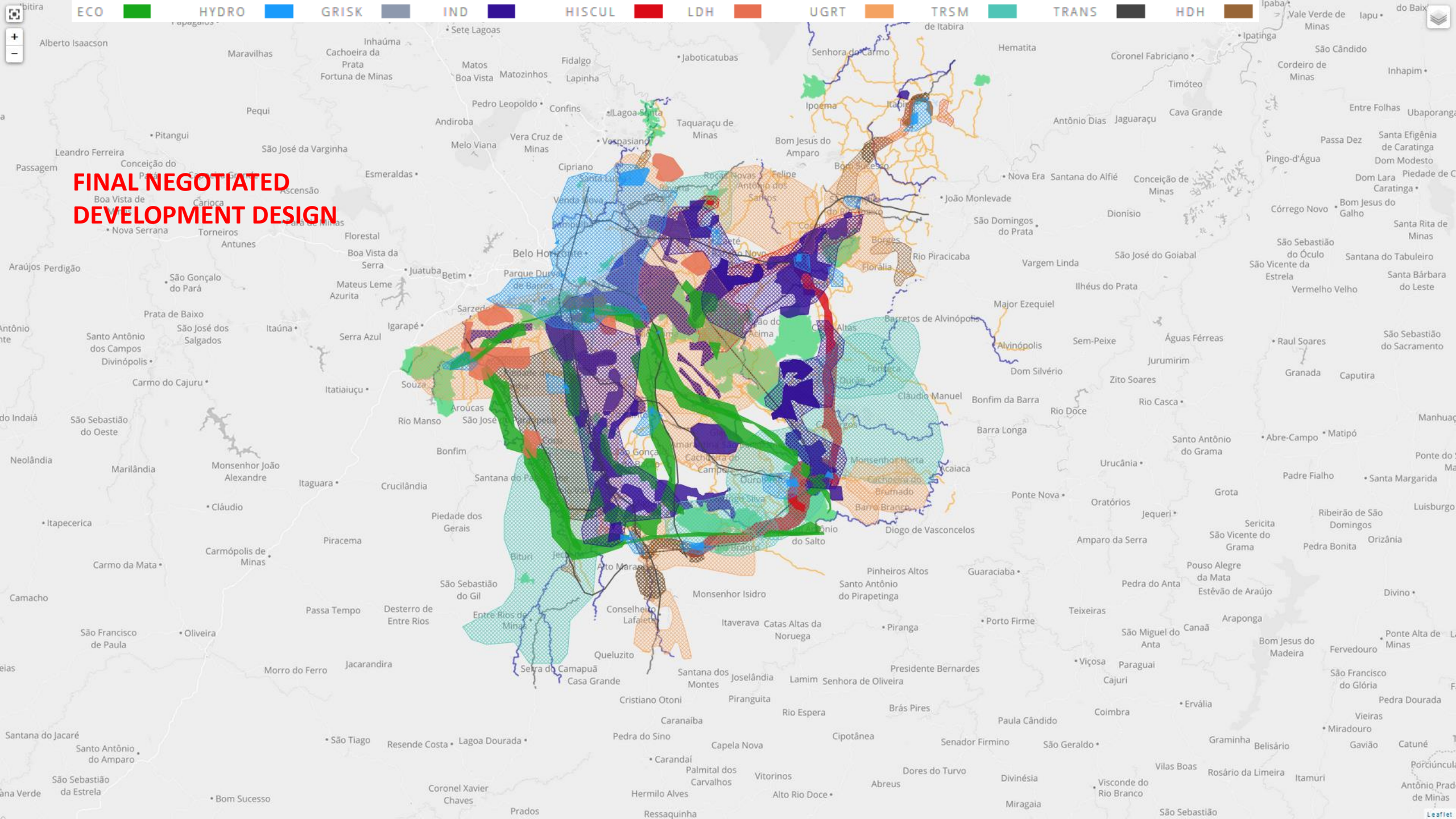
AFTER ASSESSING THE
IMPACTS OF VERSION 1,
THE SIX CHANGE TEAMS
DESIGN VERSION 2,
INCLUDING
BY NEGOTIATION,
EDITING, ADDING AND
SELECTING DIAGRAMS

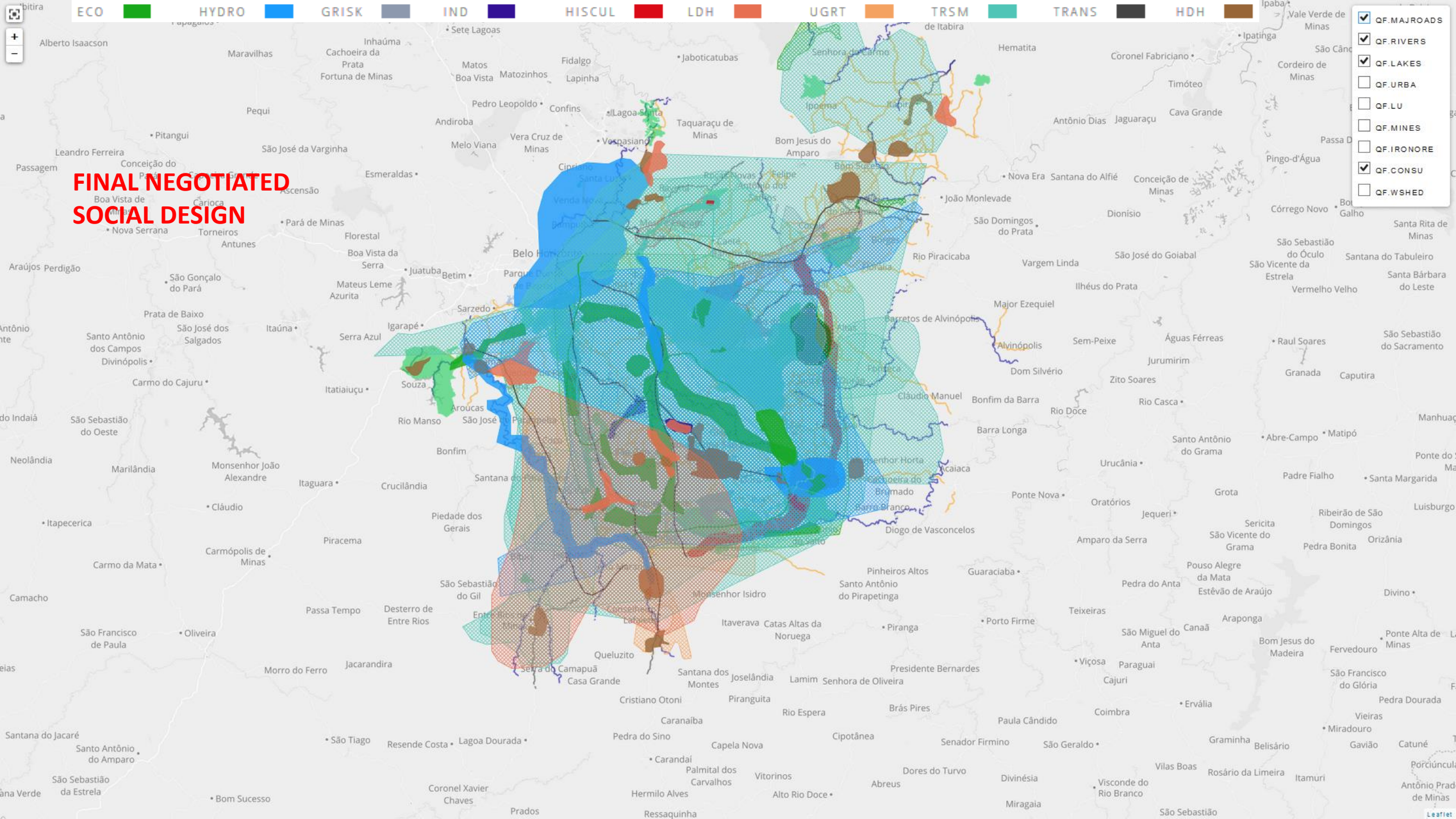


PUBLIC NEGOTIATION IS
ORGANIZED AMONG
REPRESENTATIVES OF
THE PAIRED TEAMS FOR
ECOLOGY, DEVELOPMENT
AND SOCIETY.
THE FINAL DESIGN IS
MADE, INCLUDING
BY NEGOTIATION,
EDITING, ADDING AND
SELECTING DIAGRAMS







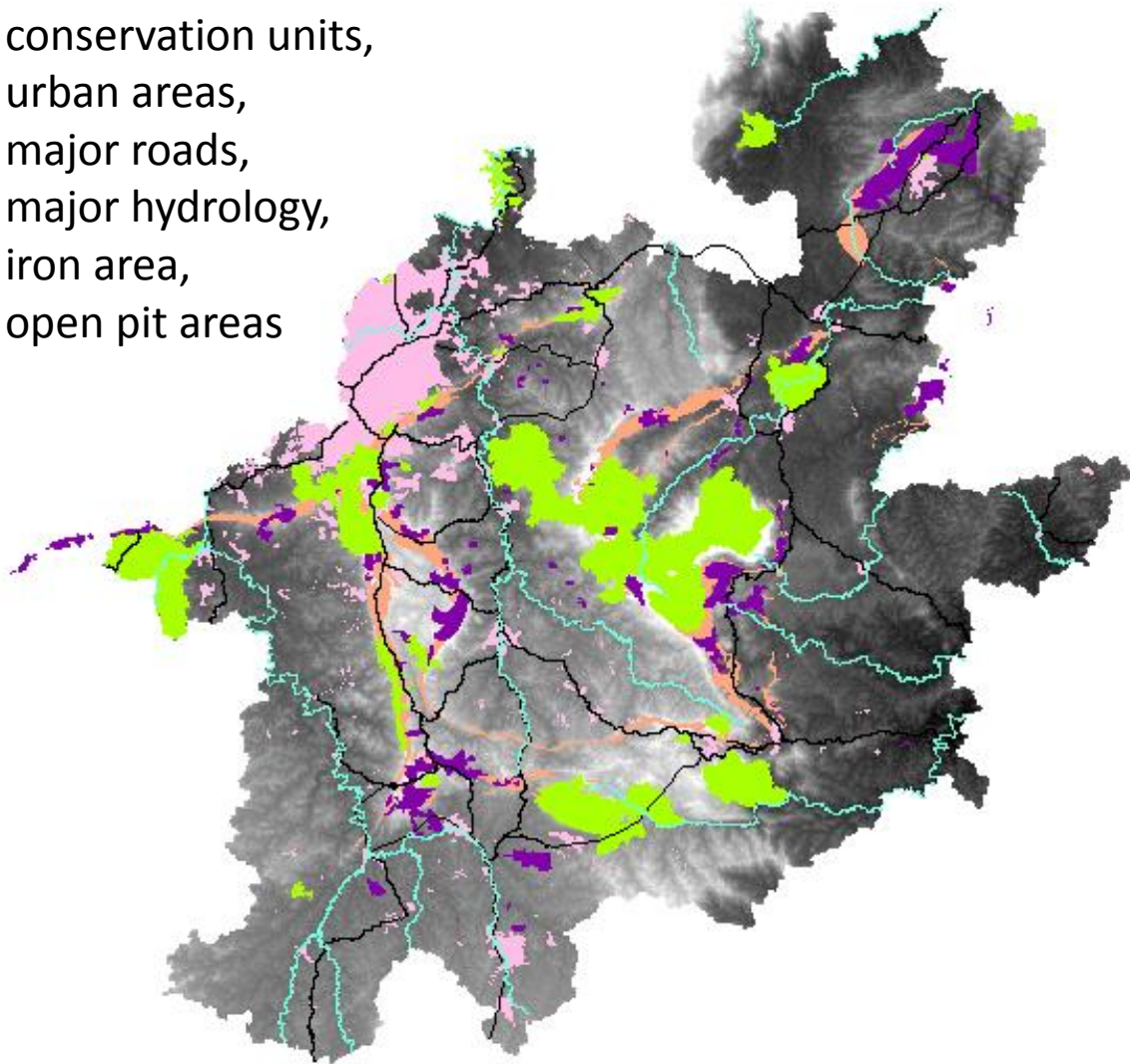


THE FINAL DESIGN IS NEGOTIATED

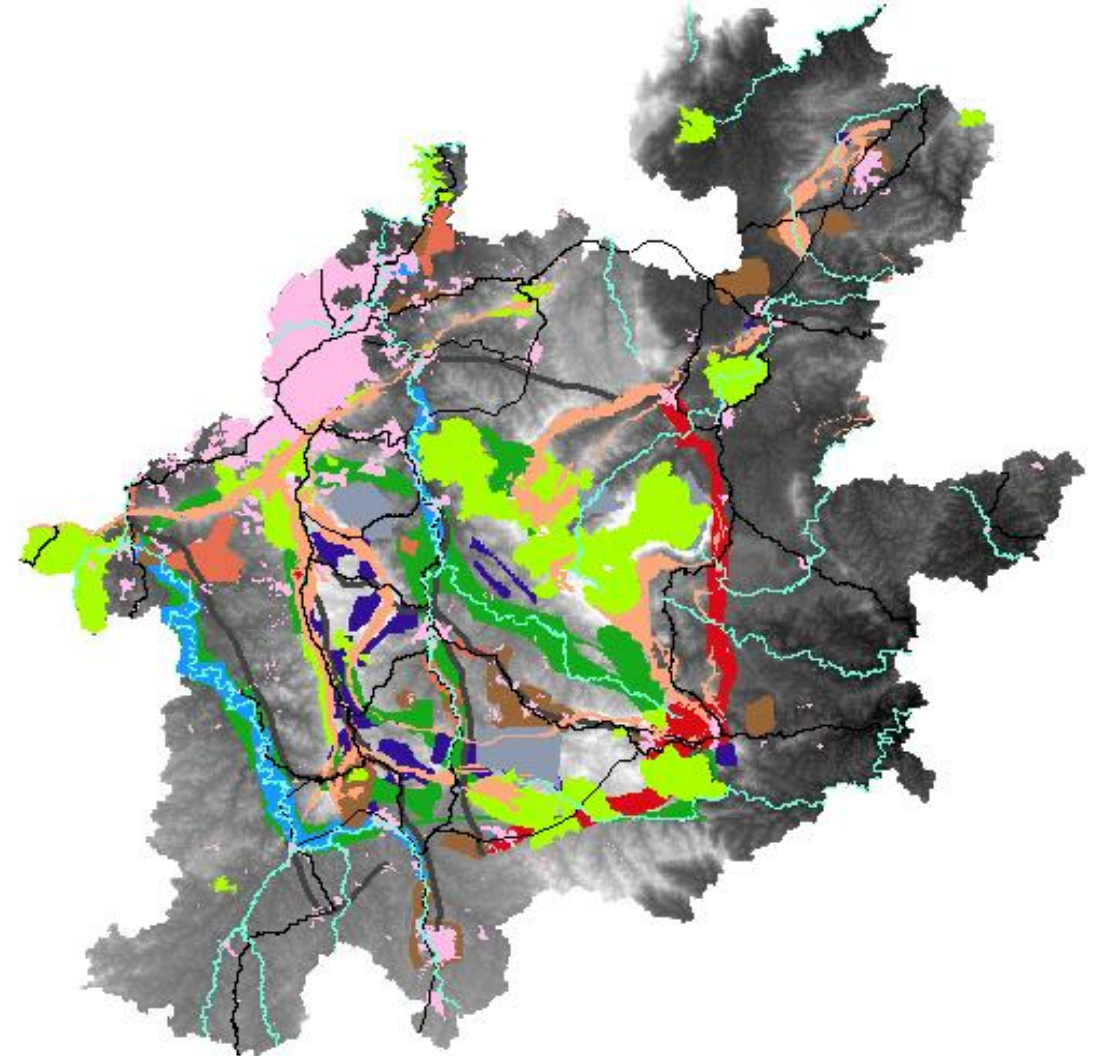


EXISTING CONDITIONS:

conservation units,
urban areas,
major roads,
major hydrology,
iron area,
open pit areas



THE FINAL NEGOTIATED DESIGN THE "IRON QUADRANT" 2050

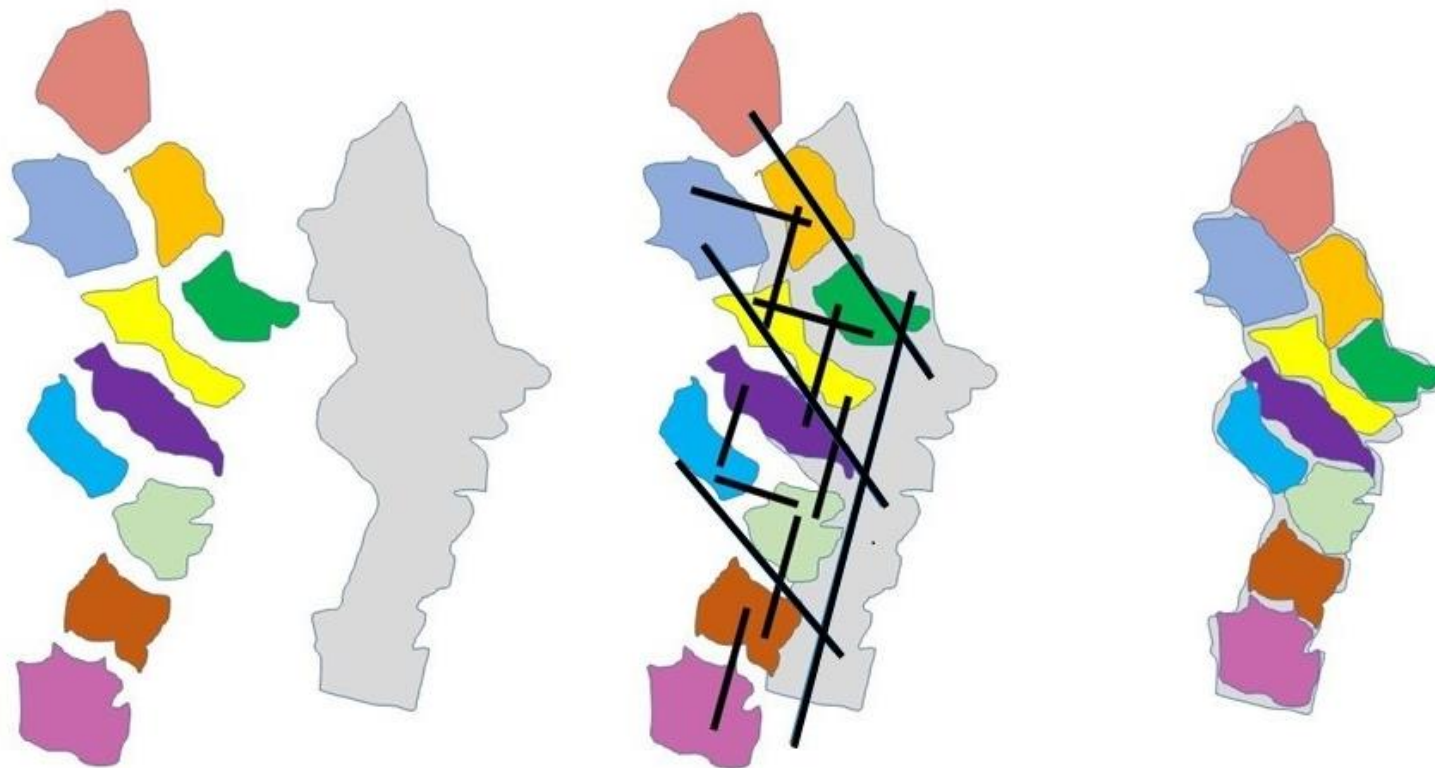


AN ALTERNATIVE FUTURE FOR THE COASTAL ZONE OF GEORGIA, USA

AN EXPERIMENT IN MULTI-SCALE AND MULTI-JURISDICTIONAL GEODESIGN DYNAMICS



April 20-21, 2016

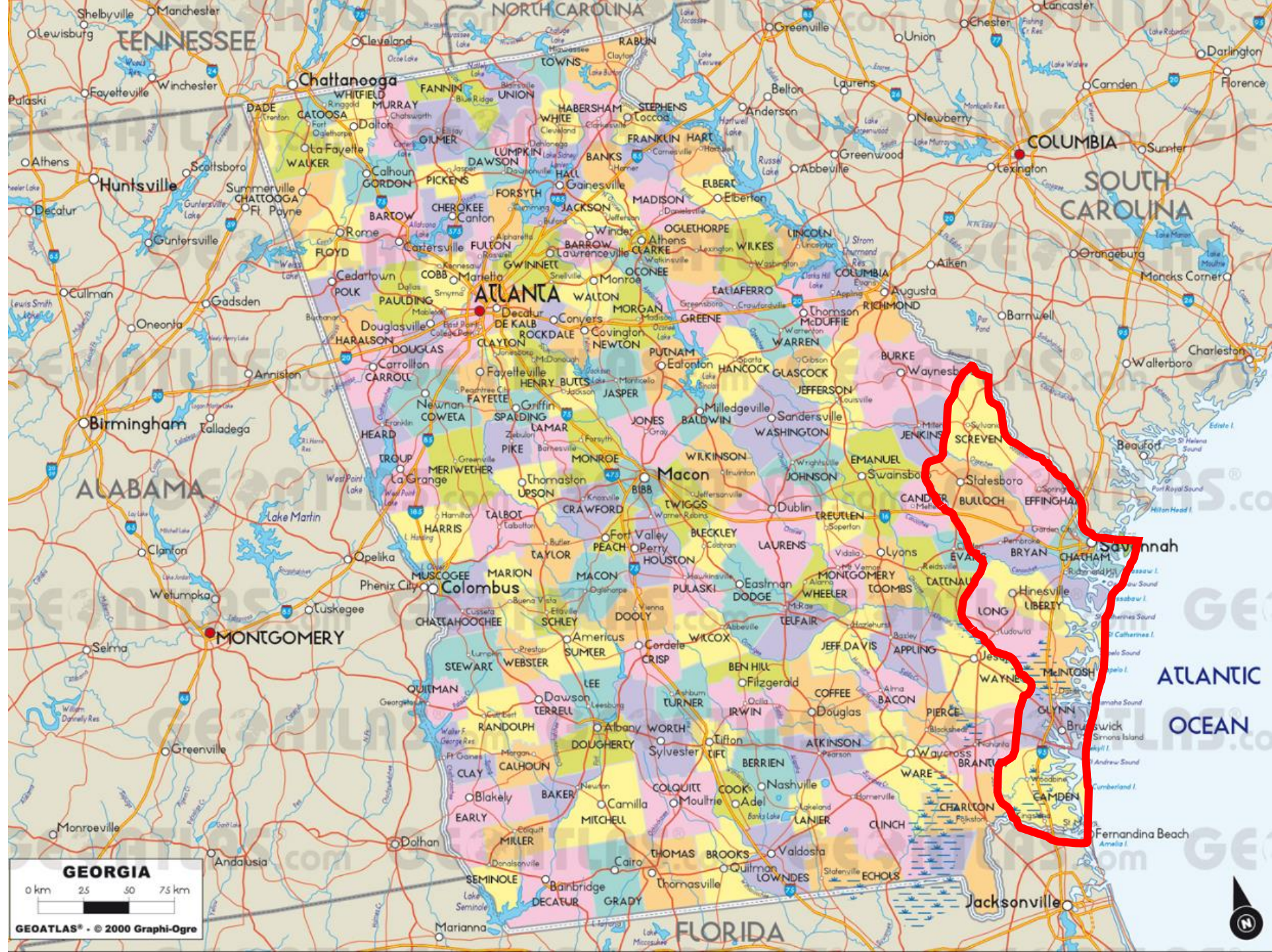


INDEPENDENT \Rightarrow **RELATED** \Rightarrow **INTEGRATED**

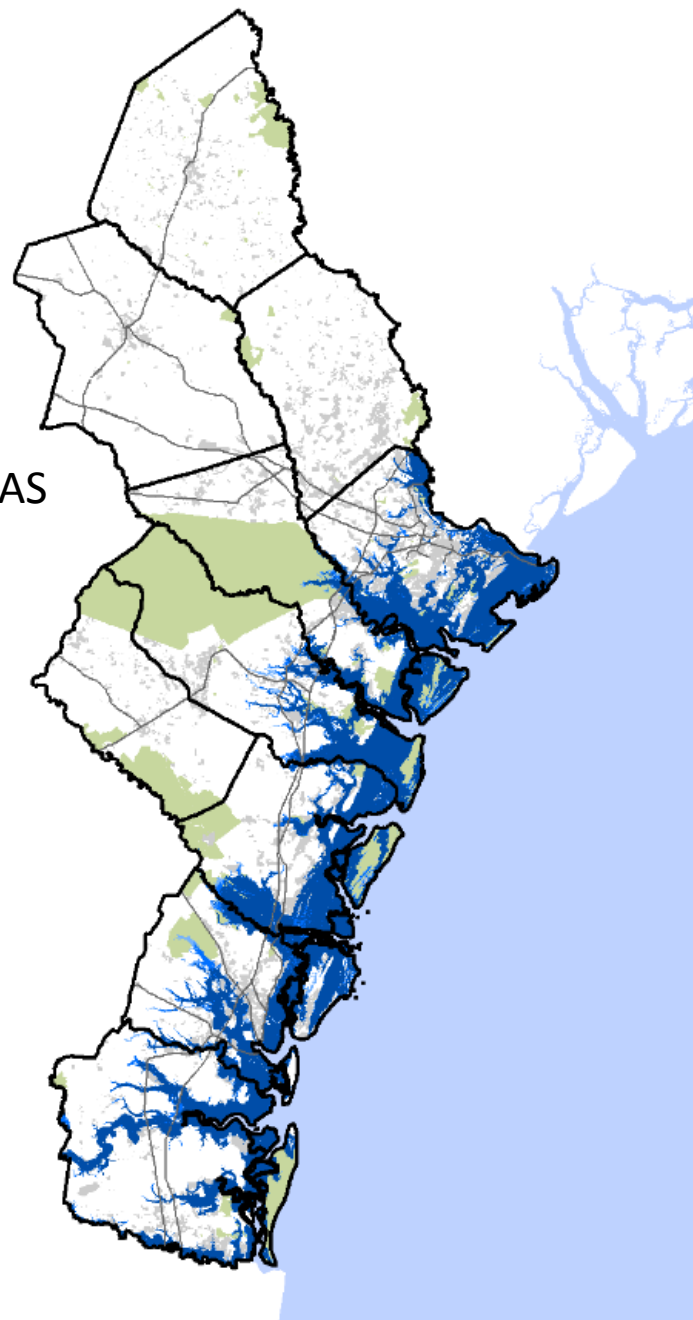
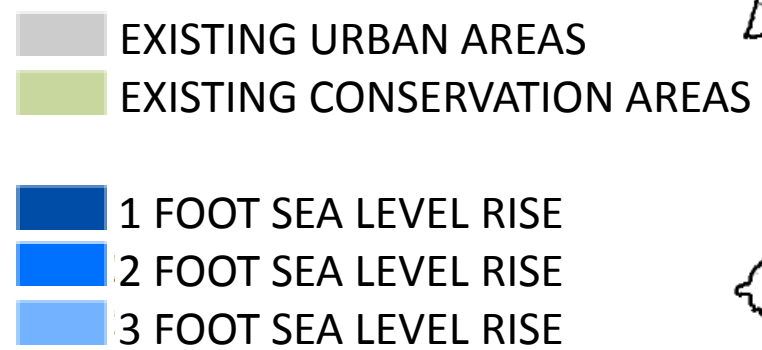


Lupita McLenning, Hunter Key, Georgia Coastal Regional Commission
Rosanna Rivero, Alison Smith, Brian Orland, Jon Calabria, University of Georgia
Carl Steinitz, Hrishi Ballal, Tess Canfield, Geodesignhub.com

THE STUDY REGION

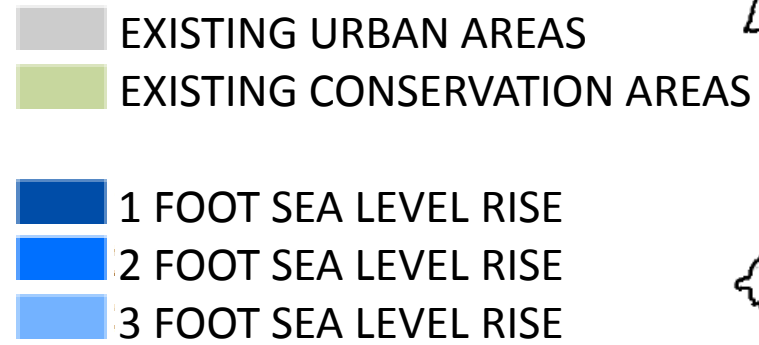


NOAA FORECAST SEA LEVEL RISE

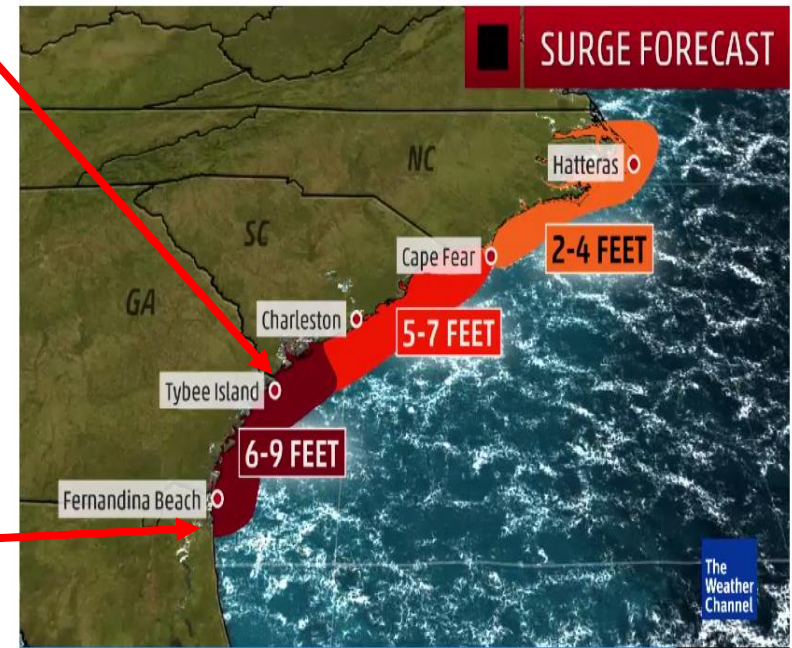
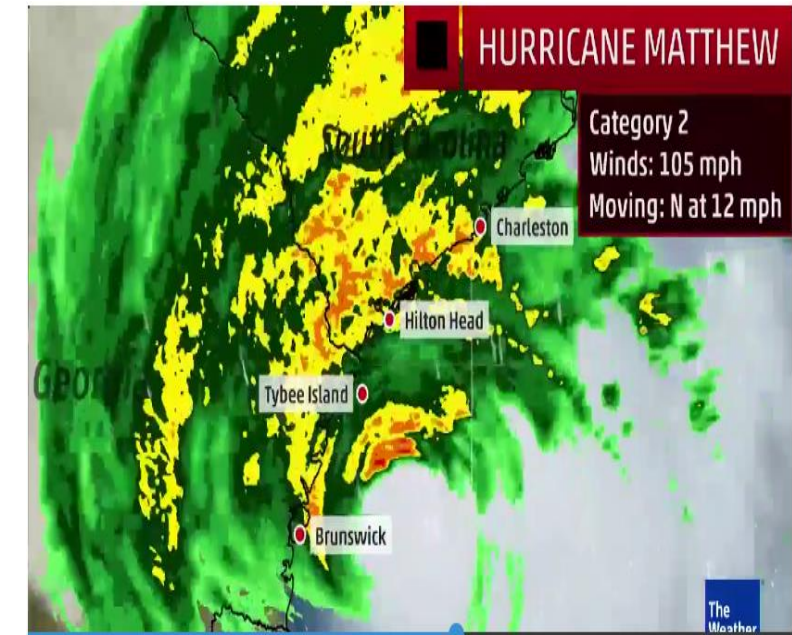
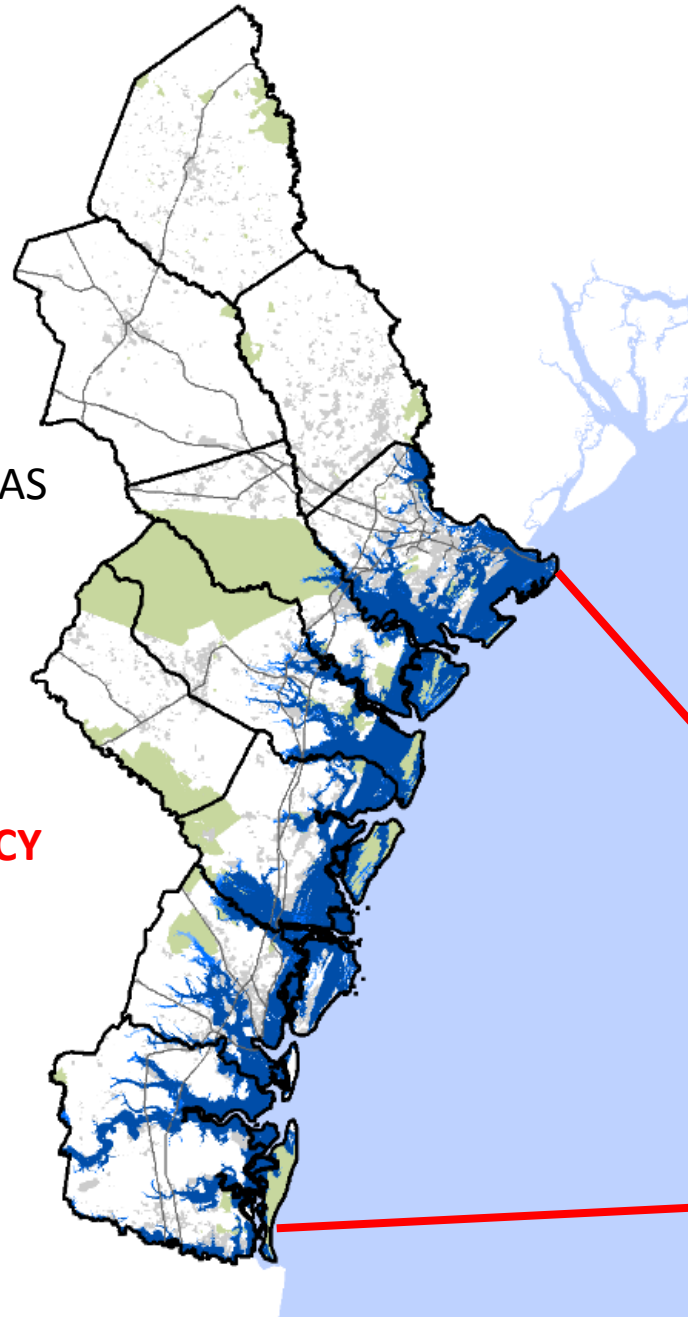


October 8, 2016 storm surge

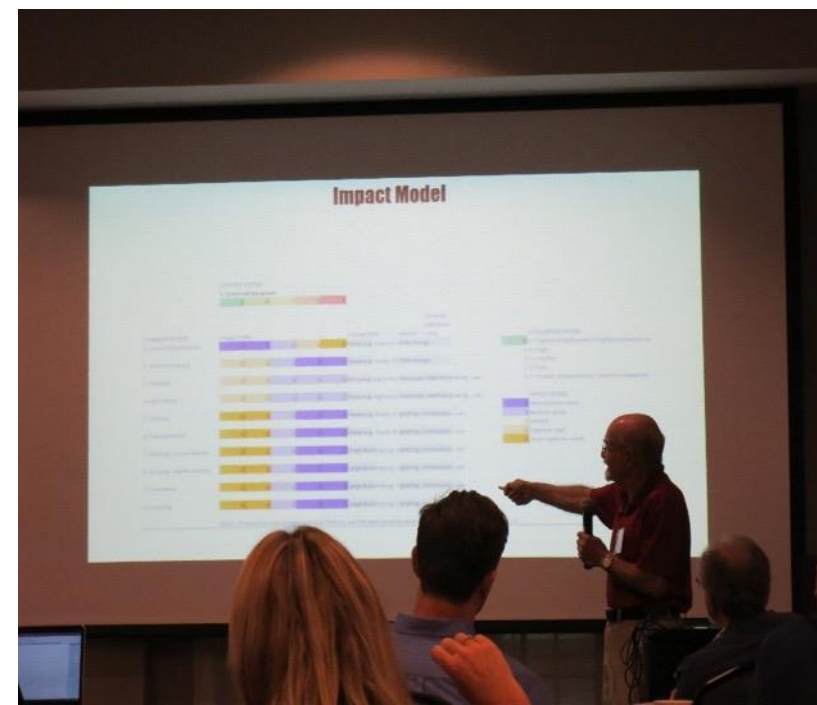
NOAA FORECAST SEA LEVEL RISE



INCREASED HURRICANE FREQUENCY



Happening Now: Eyewall Moves Ashore in South Carolina



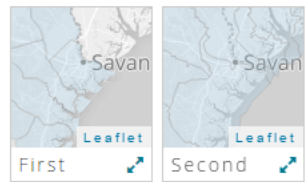
A REGIONAL SCENARIO FOR 2050

This is one among many, but useful as a first draft for a workshop:

- 320,000 new people in the region—natural growth+migration.
 - 95,000 people displaced by 3ft sea-level rise as projected by NOAA.
 - 190,000 new housing units needed.
 - 2,700 acres of new commercial development.
 - 15,400 acres of new industrial development.
 - 10,000 acres of new parks, recreation and conservation.
 - 10,000 acres of new schools, municipal etc. development.
 - each of the ten Counties has a share of the growth
-
- The Port of Savannah doubles in capacity, creating an additional 3,000 jobs, needing 2,300 housing units.
 - A SpacePort for Camden County proceeds, creating 2,500 jobs needing 1,900 housing units.

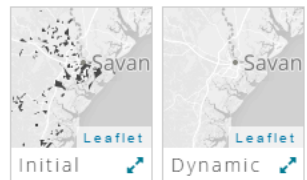
THE STUDY REGION

BOUNDARIES



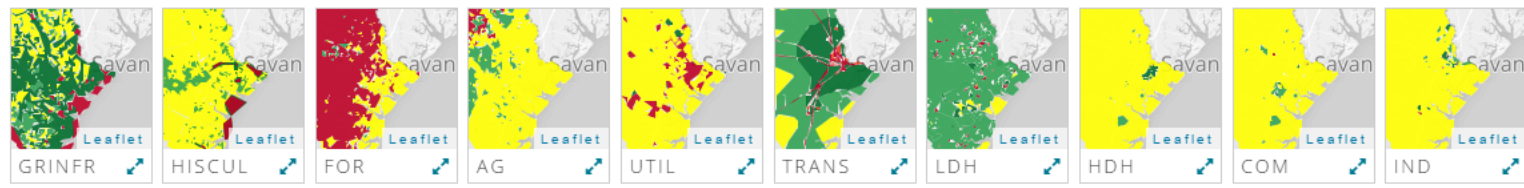
SET WORKING BOUNDARIES

CONSTRAINTS



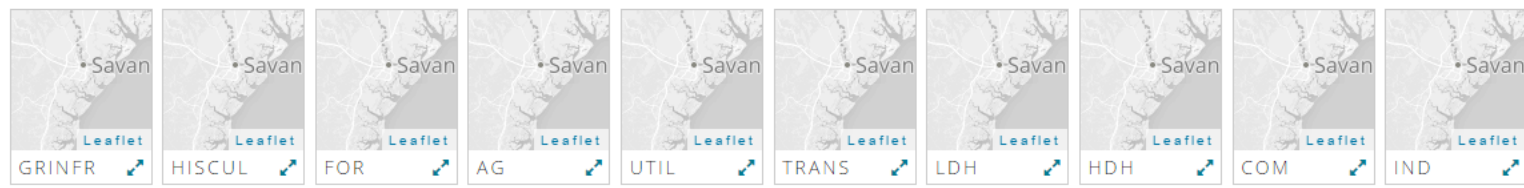
UPDATE CONSTRAINTS

INITIAL EVALUATIONS



EXPLORE INITIAL EVALUATIONS

DYNAMIC EVALUATIONS

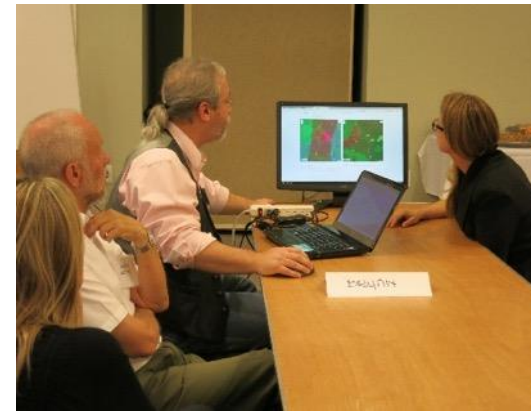


ZOOMED AND
SYNCHRONIZED
INTO ANY COUNTY
VIA BOUNDARIES
CONTROL

**TEN COUNTY TEAMS
MAKING VERSIONS 1
AND 2 OF THE
CHANGE DESIGNS**



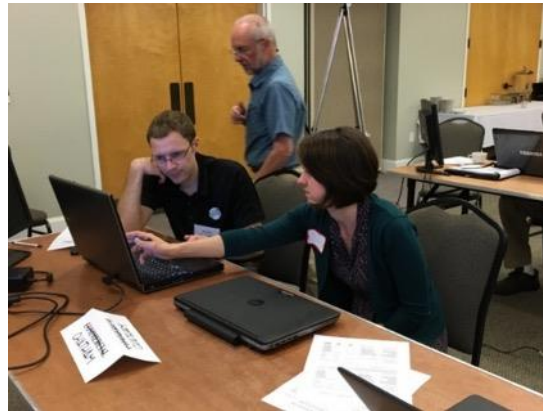
Long



Bryan



McIntosh



Chatham



Camden



Liberty



Bulloch



Glynn



Screven

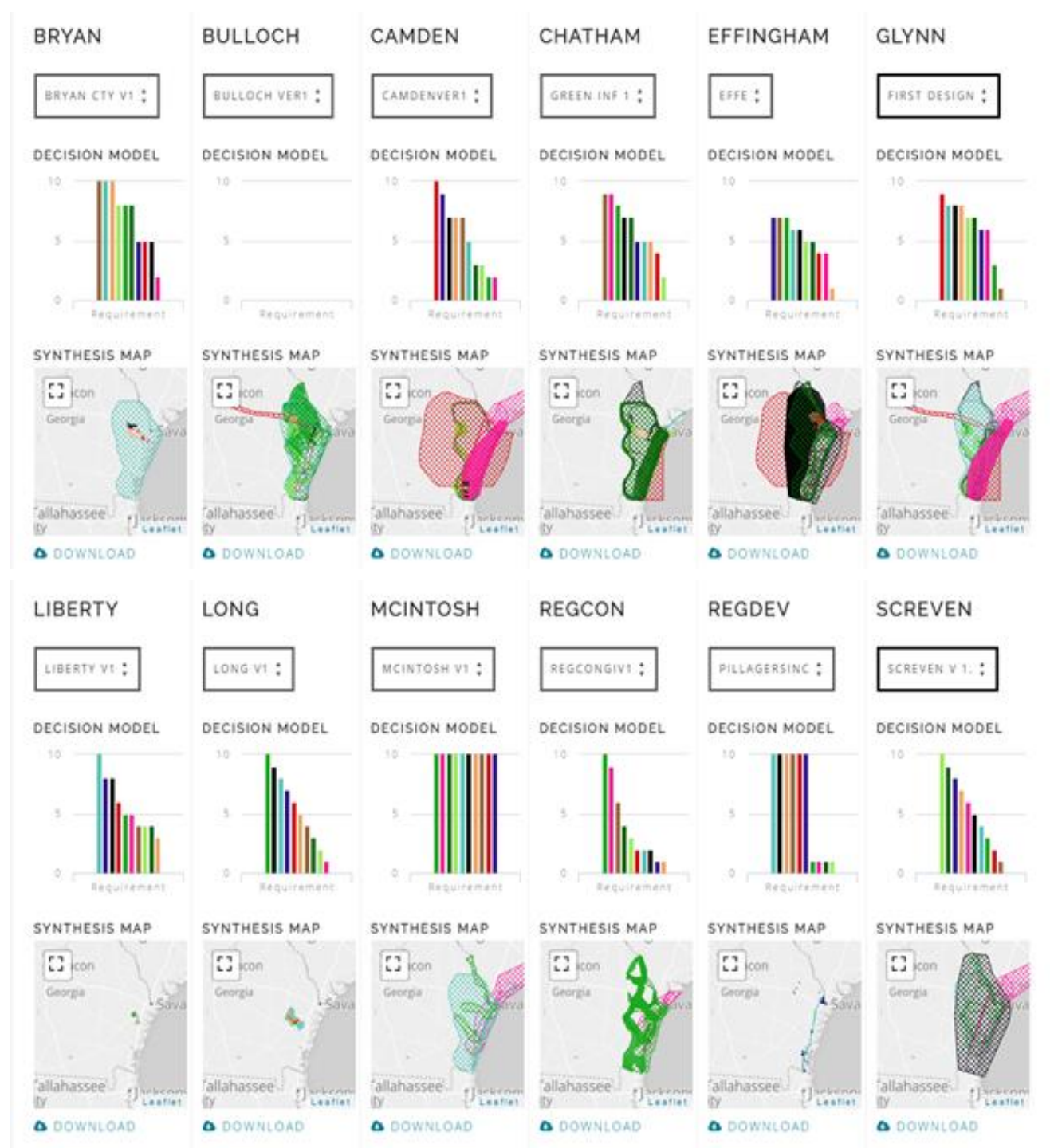


Effingham

VERSIONS 1 AND 2 OF THE CHANGE DESIGNS

Note how differently
Counties shape their
Decision models and
related Change designs.

END OF DAY 1
OF THE WORKSHOP



DAY 2

**MAKING ADDITIONAL
VERSIONS OF THE
DESIGNS, NEGOTIATING
BETWEEN COUNTIES AS
NEEDED**



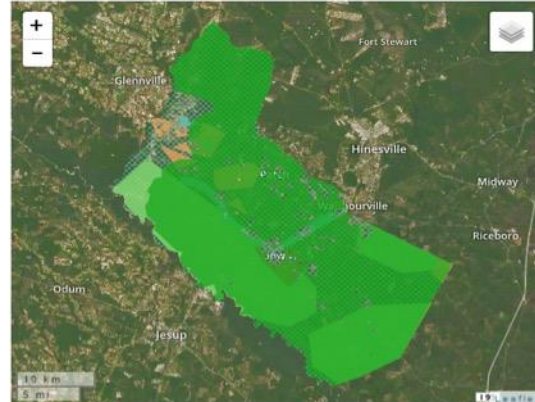
Making designs



THE FINAL VERSIONS OF THE CHANGE DESIGNS MADE WITH THE INDEPENDENT DECISION MODELS

Note how much more similar
the Change designs have
become.





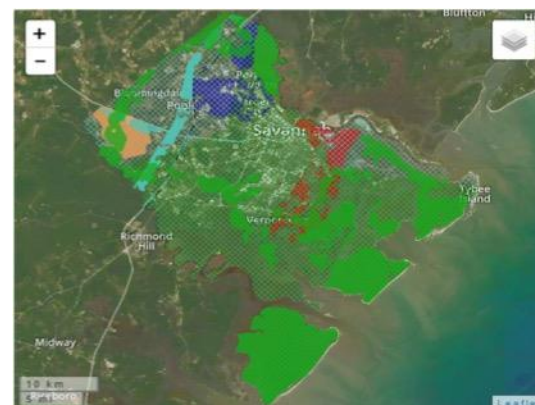
Long



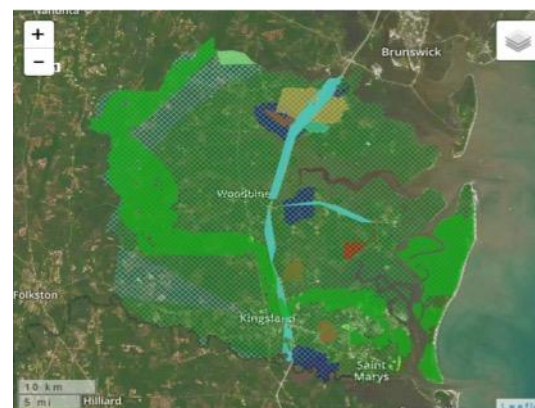
Bryan



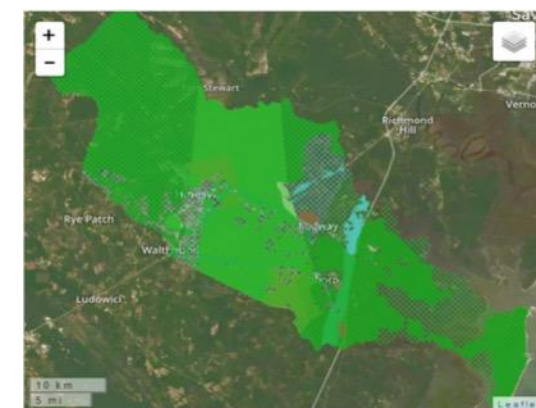
McIntosh



Chatham



Camden



Liberty



Bulloch



Glynn



Screven



Effingham

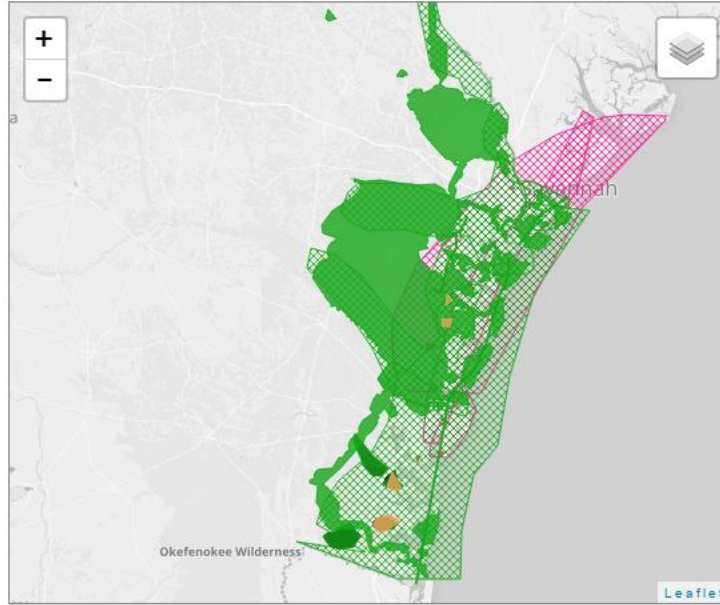
COMPARING
ANY TWO OF
THE CHANGE
DESIGNS

V1: REGCONGIV1

REGIONAL CONSERVATION

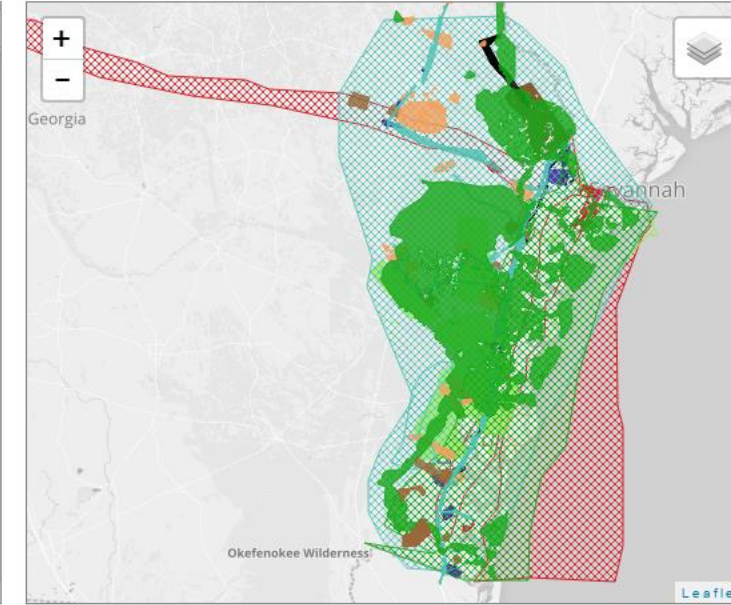
SIDE BY SIDE MAPS

✓ Sync Maps



V1: PILLAGERSINC

REGIONAL DEVELOPMENT



Hover over a feature to show details

FILTER BY SYSTEM

☐ GRINFR ☐ HISCU ☐ FOR ☐ AG ☐ UTIL ☐ TRANS ☐ LDH ☐ HDH

SHOW ALL DIAGRAMS

SYNTHESIS GRID

	GRI	HIS	FOR	AG	UTI	TRA	LDH	HDH	COM	IND
1		1								
2		2								
3		3								
4										
5										
6										

Note that prior to negotiation, and even after REGDEV added several green infrastructure diagrams from REGCON REGDEV has many more priority development projects.

	GRI	HIS	FOR	AG	UTI	TRA	LDH	HDH	COM	IND
1				1				1	1	1
2						2	2	2	2	2
3							3	3	3	3
4		4						4	4	4
5					5		5	5	5	5
6					6			6	6	6

**NEGOTIATION
BETWEEN
REGCON AND REGDEV**



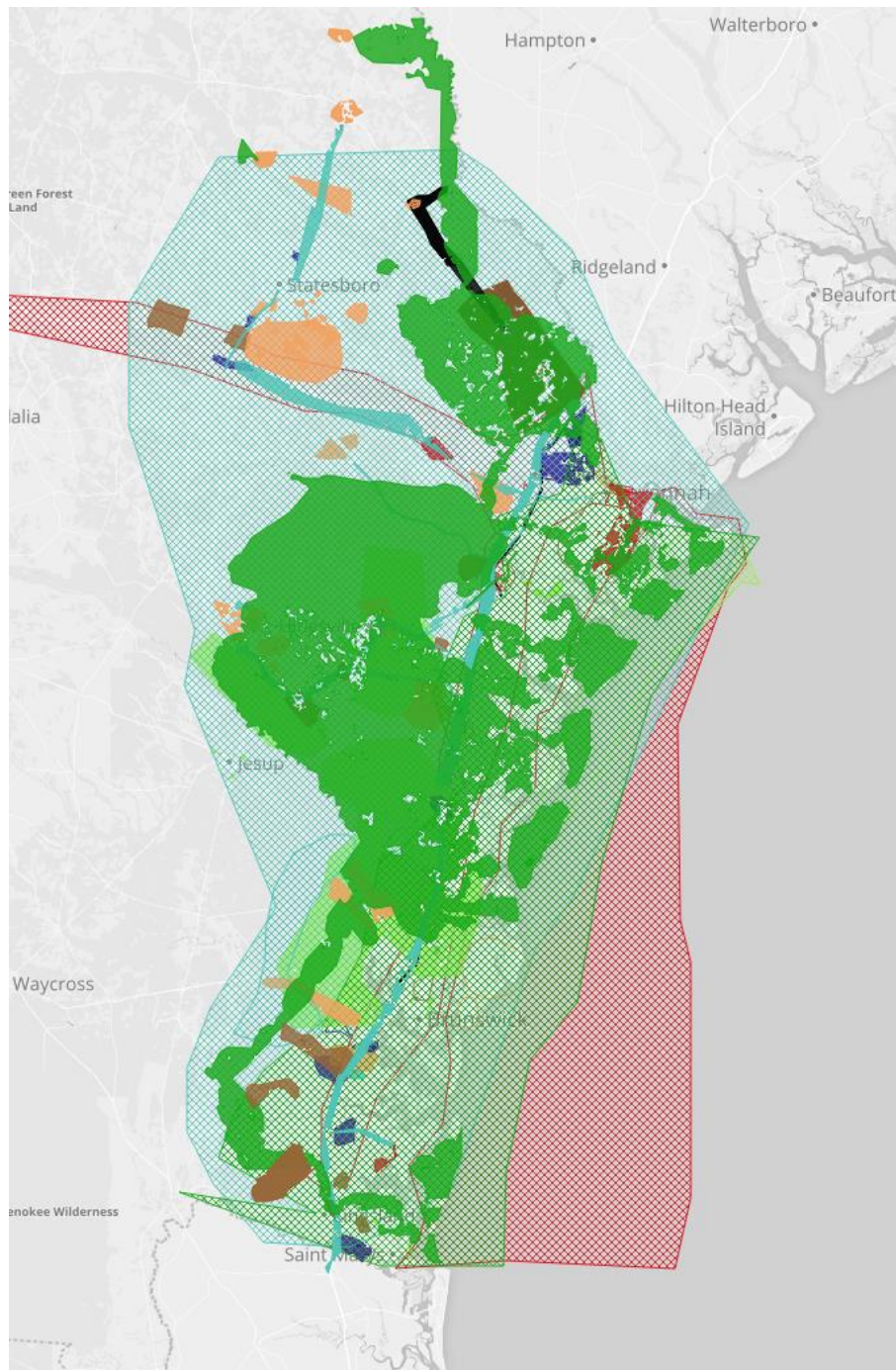
**NEGOTIATION
BETWEEN
REGCON AND REGDEV**

**DRAWING AND ADDING
A NEW DIAGRAM
SHOWING PRIME
SEA TURTLE HABITAT**



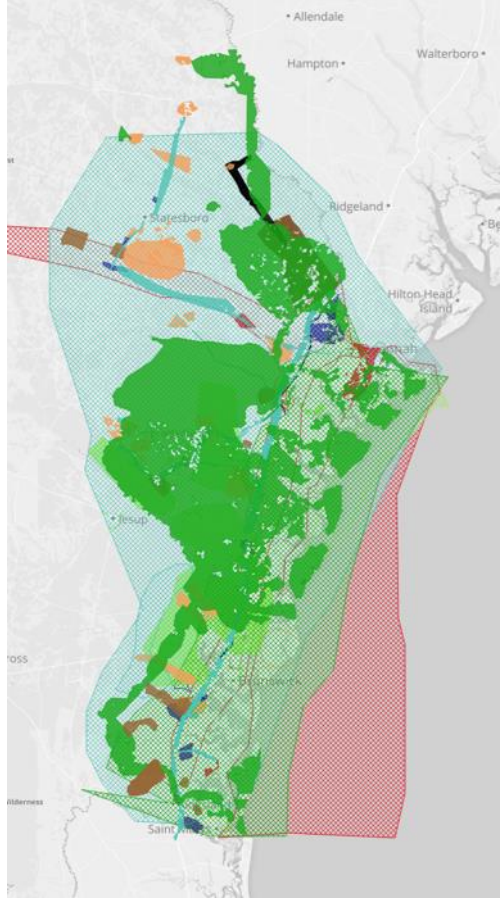
RESULT OF
NEGOTIATION
BETWEEN
REGCON AND REGDEV

AND THE NEED TO
NEGOTIATE WITH
THE TEN COUNTY
CHANGE TEAMS

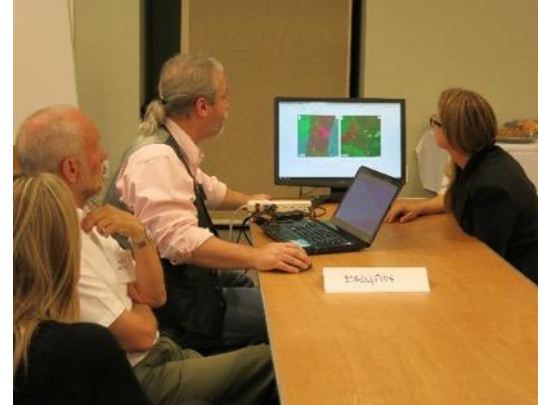


GEODESIGNHUB DESIGN VERSION NAMES

TEAMS	FIRST DESIGN v1	END OF DAY 1 v2	LAST/FINAL DESIGN v3
① BRYAN	Bryan Cty v1	Bryan Cty v2	Bryan Cty v5
② BULLOCH	Bulloch Dgn v1	Bulloch Cty v1	Bulloch FV LCI
③ CAMDEN	Camden v1	Camden v2	Camden v3
④ CHATHAM	Green Infra 1	chert v7	Conserv Final
⑤ EFFINGHAM	Effingham v1	Effing2	Effingham v5
⑥ GLYNN	first design	Second design	Glynn 9
⑦ LIBERTY	LIBERTY v1	LIBERTY v2	LIBERTY v4
⑧ LONG	Long v1	Long v2	Long v3
⑨ MCINTOSH	McIntosh v1	McIntosh v3	McIntosh v4
⑩ SCREEN	3.1	3.6	V6.1
⑪ REG. CON	REGCON v1	REGCON v2	REGCON v14
⑫ REG. DEV	REGDEV 1	REGDEV 2	REGDEV 4



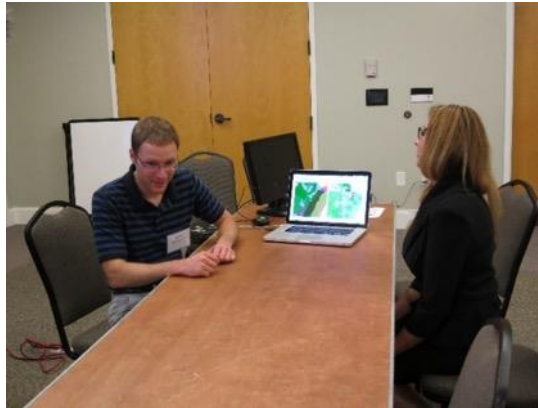
Long



Bryan



McIntosh



Chatham



Camden



Liberty



Bulloch



Glynn



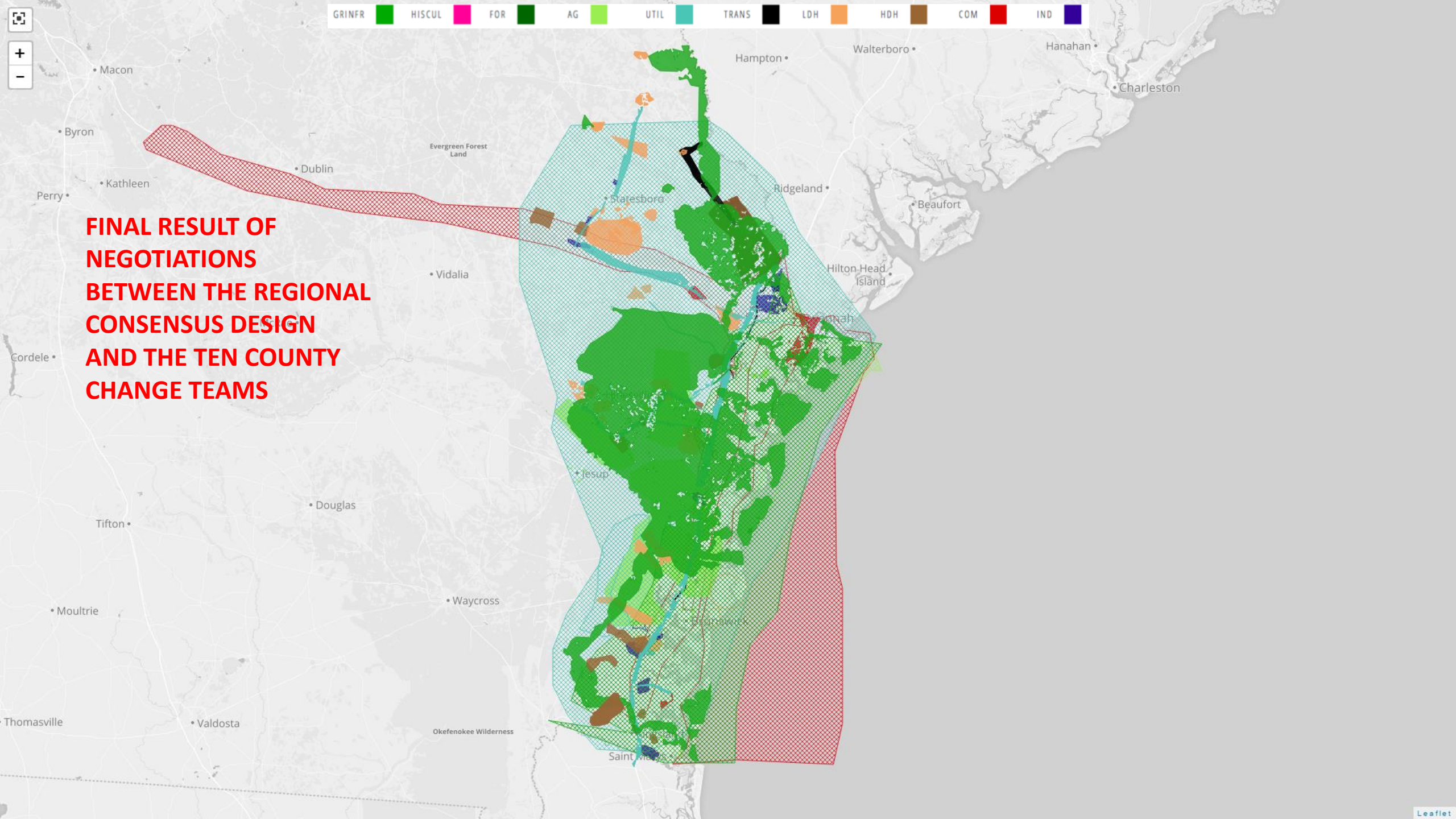
Screven



Effingham

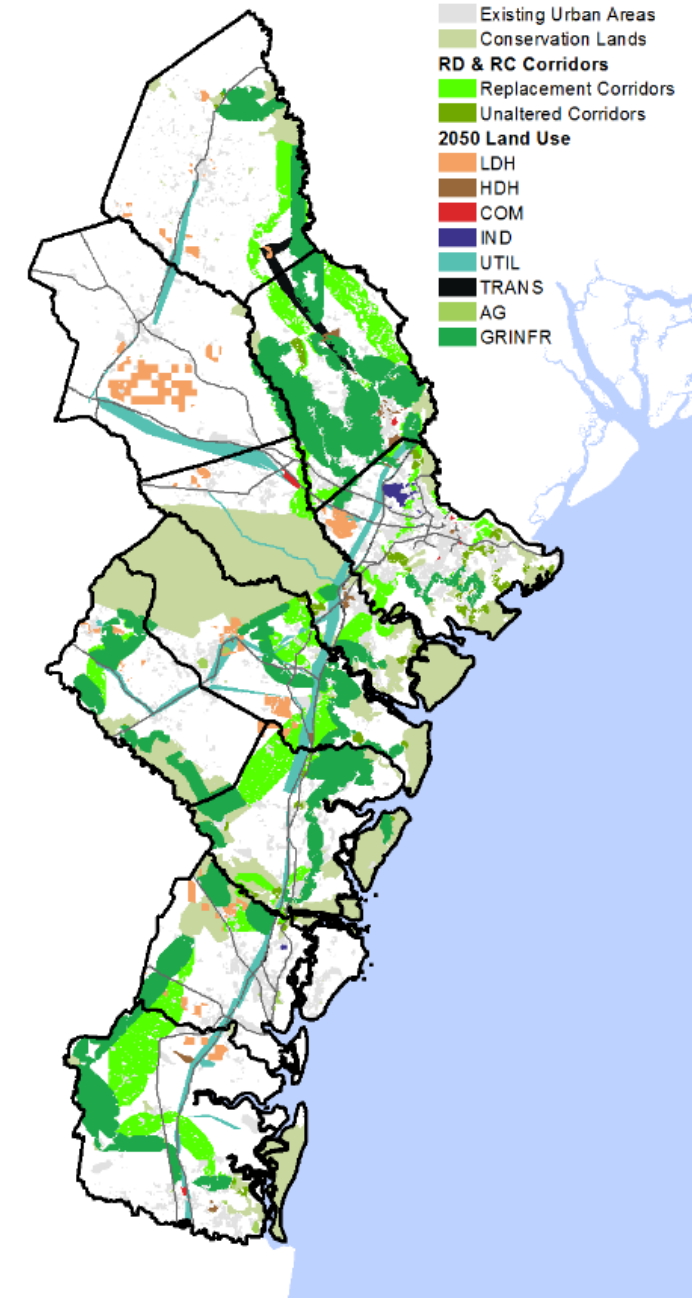
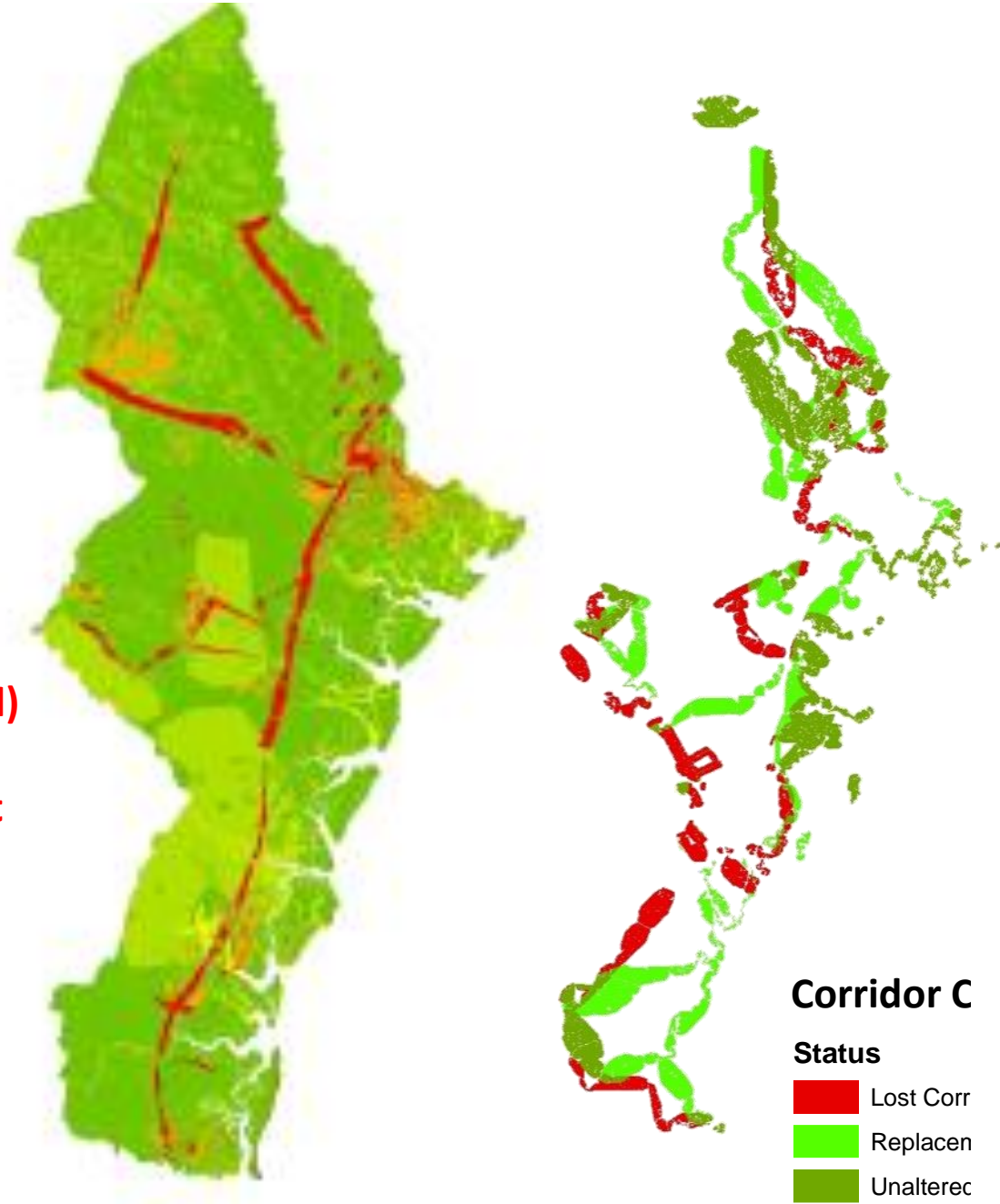


**FINAL RESULT OF
NEGOTIATIONS
BETWEEN THE REGIONAL
CONSENSUS DESIGN
AND THE TEN COUNTY
CHANGE TEAMS**



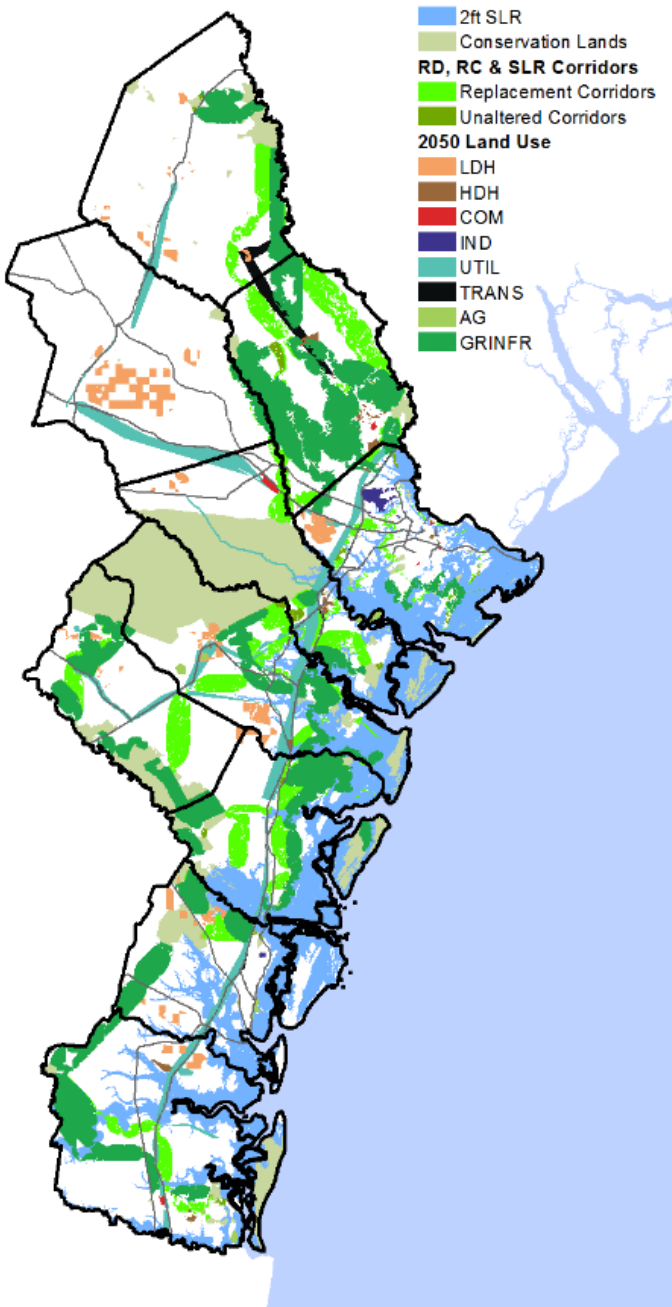
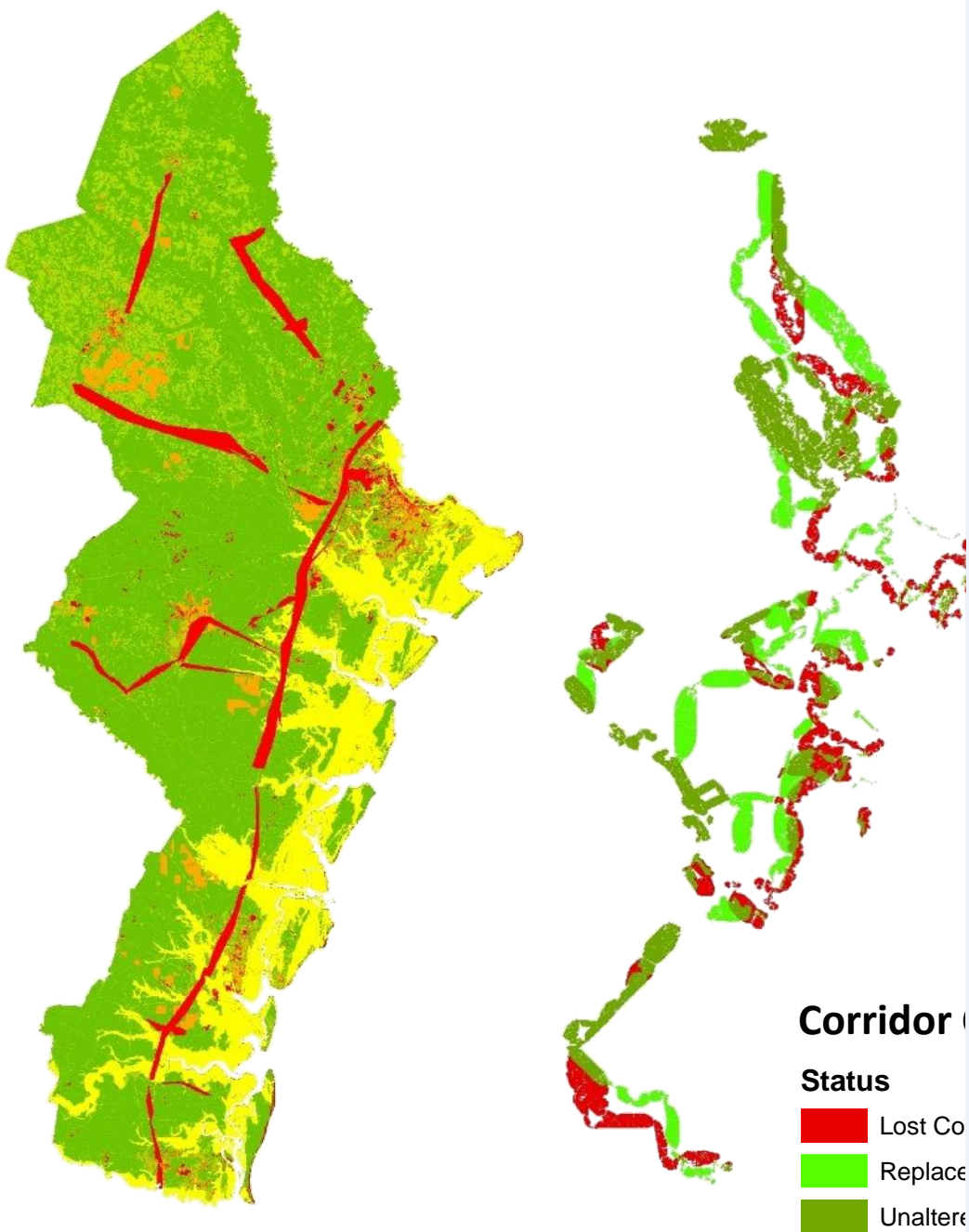
FUTURE 2050 CHANGES IN GREEN INFRASTRUCTURE CONNECTIVITY BASED ON EXISTING LAND USES, PROPOSED CONNECTIVITY CORRIDORS AND PROJECTED FUTURE LAND USE POLICIES AND ALLOCATED PROJECTS

The majority of lost connectivity in this workshop example (dark red) results from proposed agricultural projects without proposed policies to manage agriculture in a manner compatible with Green Infrastructure objectives. Replacement corridors are proposed (bright green).

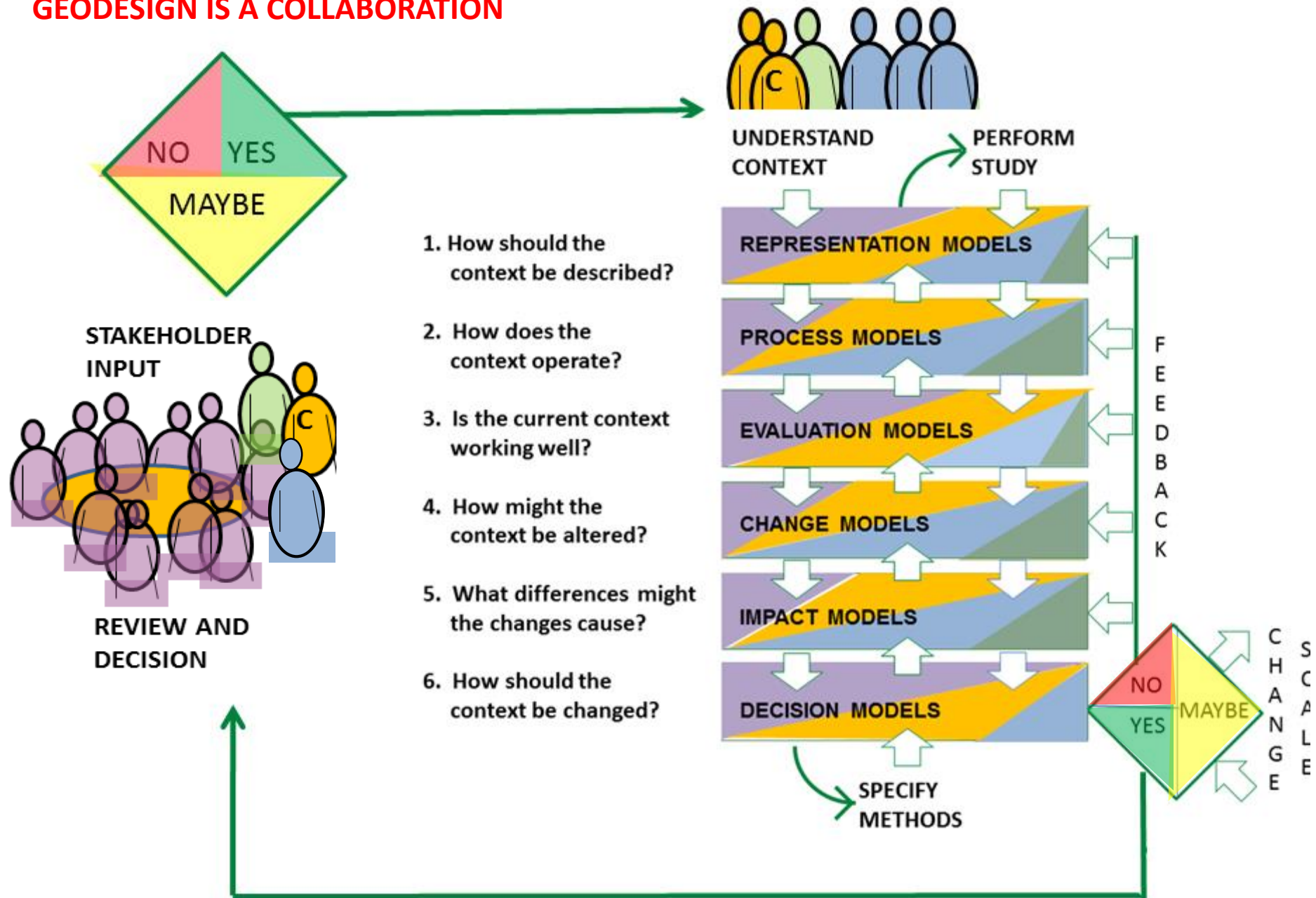


FUTURE CHANGES IN GREEN INFRASTRUCTURE CONNECTIVITY BY 2050 BASED ON EXISTING LAND USES, PROJECTED FUTURE LAND USE POLICIES AND ALLOCATED PROJECTS AND NEW AND REVISED PROPOSED CONNECTIVITY CORRIDORS TO REFELECT 2 FOOT SEA RISE.

**There considerable loss of connectivity due to sea rise.
Replacement corridors are proposed (bright green).**

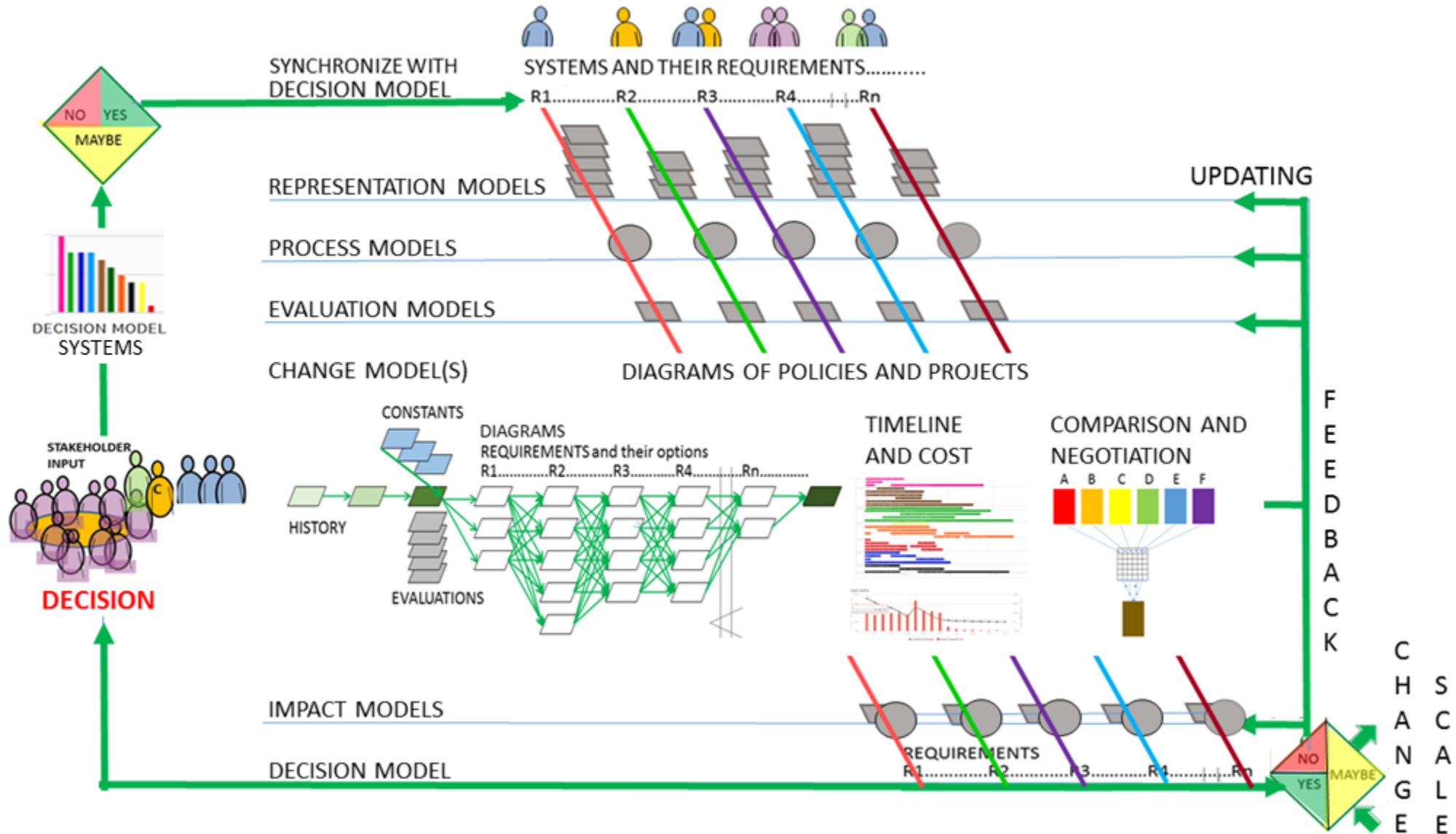


GEODESIGN IS A COLLABORATION

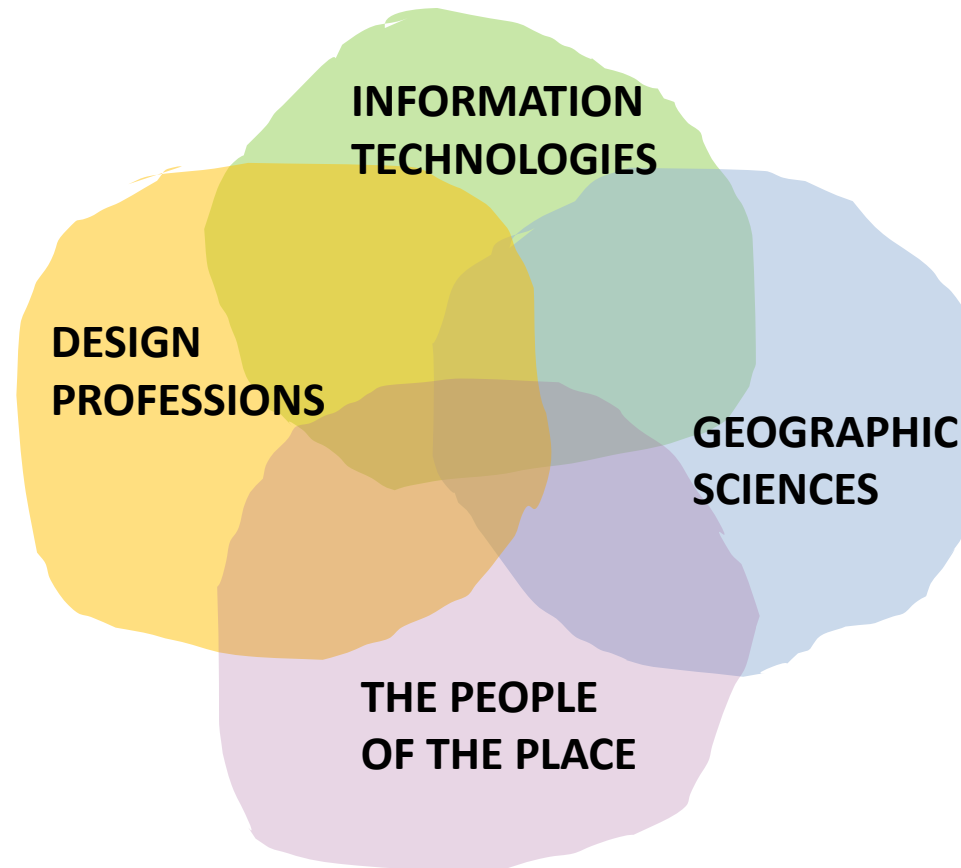
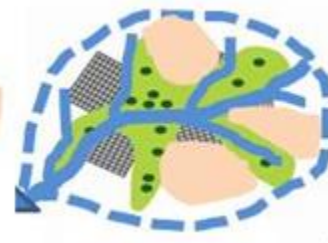
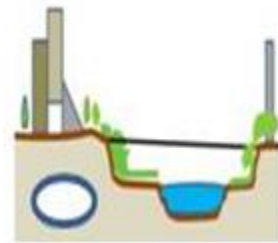
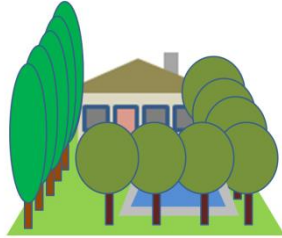


A collaboration needs a coordinator...C...and this can be anyone...and we need thousands of these.....

A WORKFLOW FOR GEODESIGN

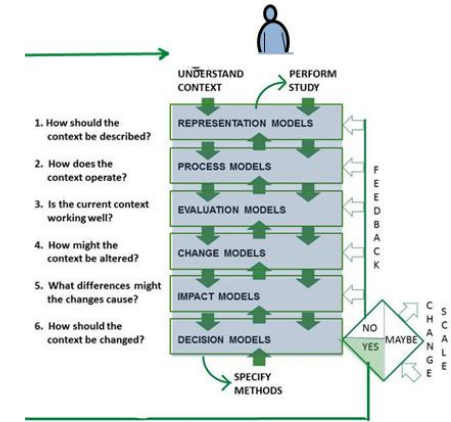
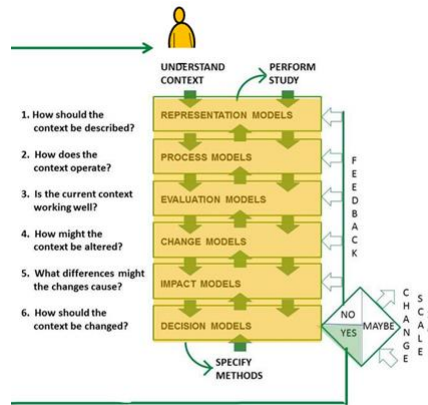
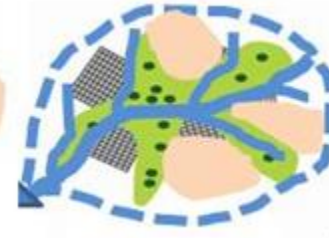
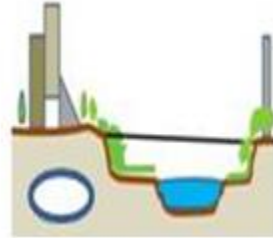
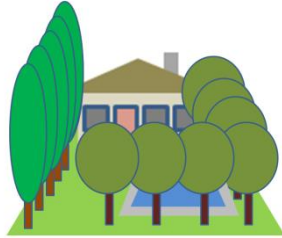


ORGANIZING GEODESIGN EDUCATION



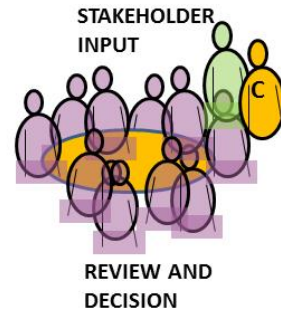
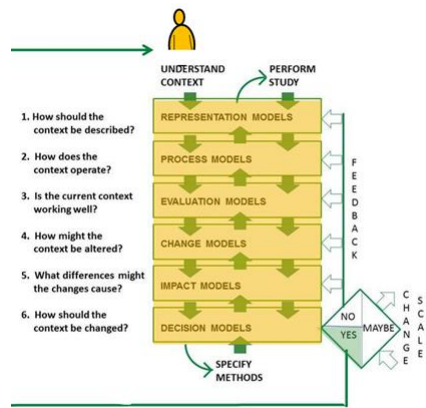
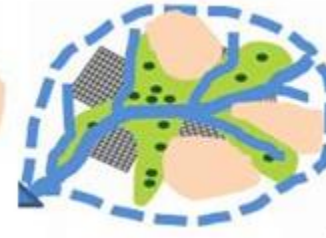
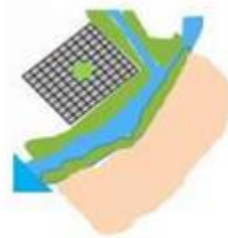
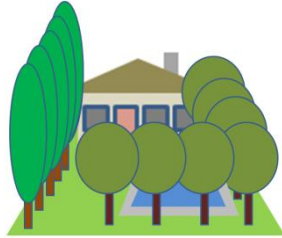
DESIGN PROFESSIONS

GEOGRAPHIC SCIENCES

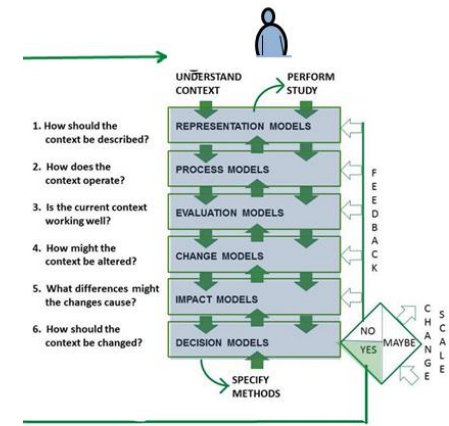
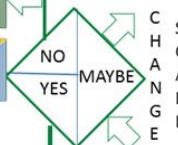
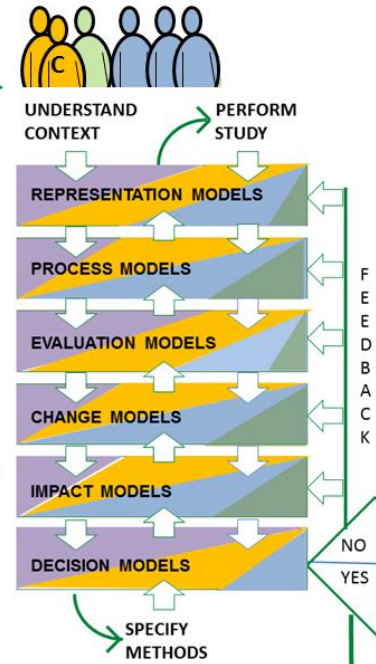


DESIGN PROFESSIONS

GEOGRAPHIC SCIENCES

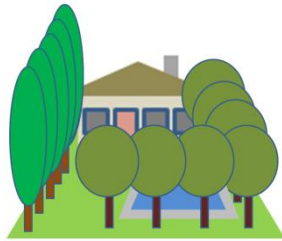


1. How should the context be described?
2. How does the context operate?
3. Is the current context working well?
4. How might the context be altered?
5. What differences might the changes cause?
6. How should the context be changed?

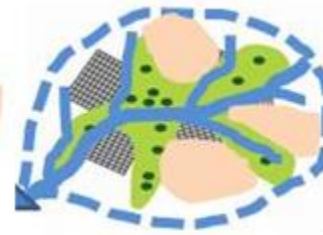
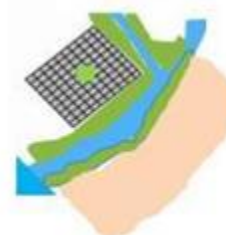
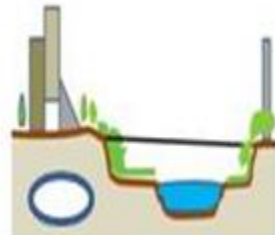


DESIGN PROFESSIONS

GEOGRAPHIC SCIENCES



GENIUS LOCI



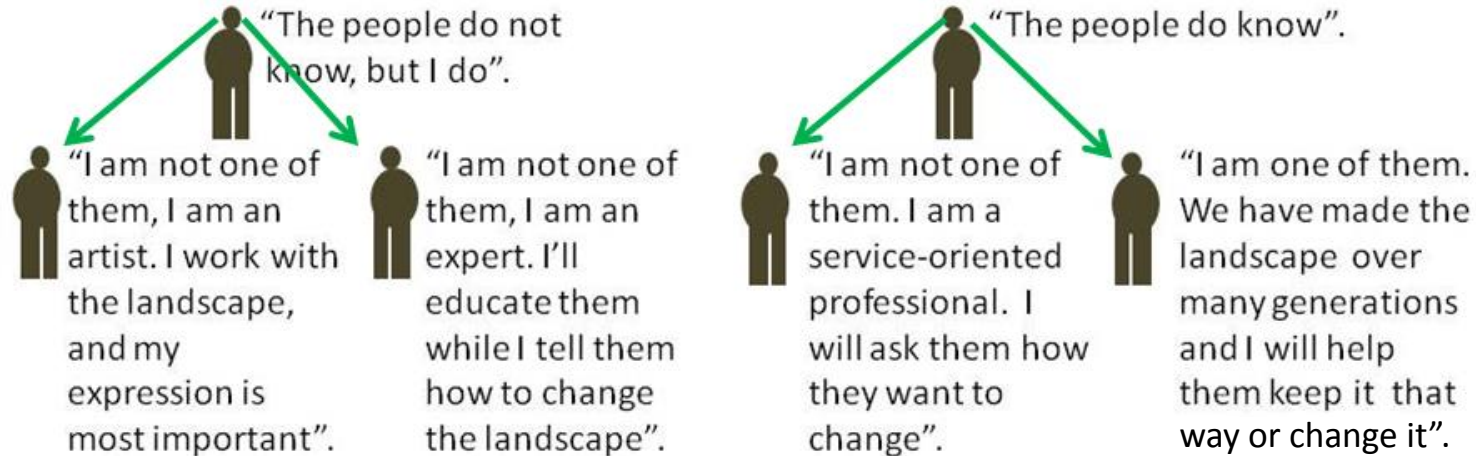
GEOGRAPHICAL CONTEXT

ECO-REGIONS

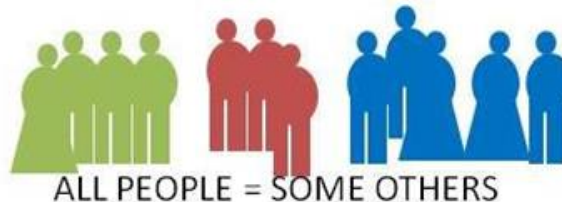


GLOBAL

VALUES AND ROLES

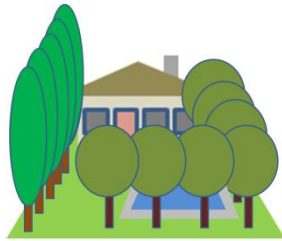


THE PEOPLE OF THE PLACE

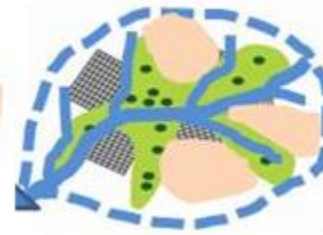
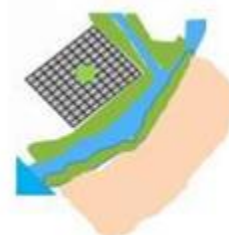
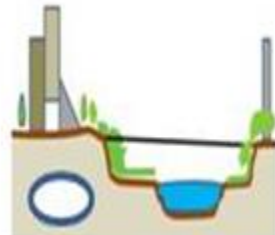


DESIGN PROFESSIONS

GEOGRAPHIC SCIENCES



GENIUS LOCI



GEOGRAPHICAL CONTEXT

ECO-REGIONS



GLOBAL

VALUES AND ROLES

GEODESIGN COLLABORATION

"The people do not know, but I do".

"I am not one of them, I am an artist. I work with the landscape, and my expression is most important".

"I am not one of them, I am an expert. I'll educate them while I tell them how to change the landscape".

"The people do know".

"I am not one of them, I am a service-oriented professional. I will ask them how they want to change".

"I am one of them. We have made the landscape over many generations and I will help them keep it that way or change it".

THE PEOPLE OF THE PLACE



ALL PEOPLE = NO OTHERS



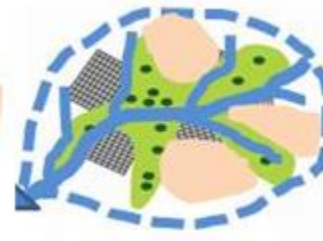
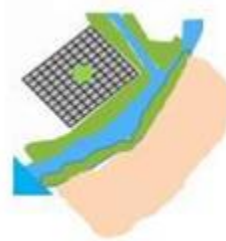
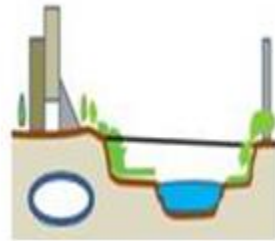
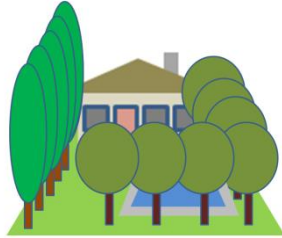
ALL PEOPLE = SOME OTHERS



ALL PEOPLE = ALL OTHERS

DESIGN PROFESSIONS

GEOGRAPHIC SCIENCES



**DEMAND-BASED
"OFFENSIVE" STRATEGIES**

**SUPPLY-BASED
"DEFENSIVE" STRATEGIES**

**GEODESIGN
COLLABORATION**

EXPRESSION

**THE PEOPLE
OF THE PLACE**

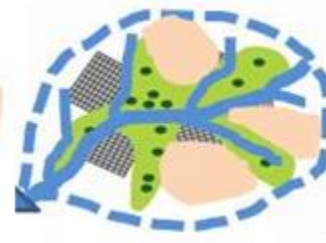
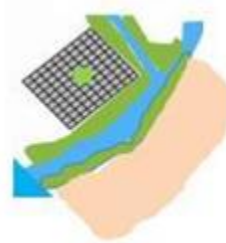
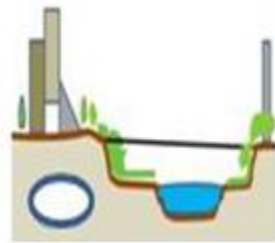
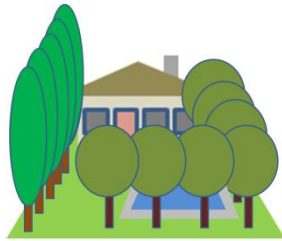
ORGANIZATION

**INFORMATION
TECHNOLOGISTS**

ALLOCATION

DESIGN PROFESSIONS

GEOGRAPHIC SCIENCES



**DEMAND-BASED
"OFFENSIVE" STRATEGIES**

**SUPPLY-BASED
"DEFENSIVE" STRATEGIES**

EXPRESSION

**THE PEOPLE
OF THE PLACE**

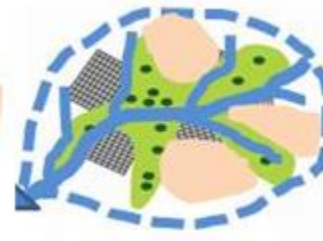
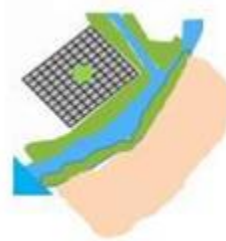
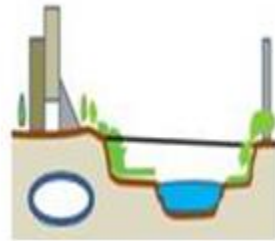
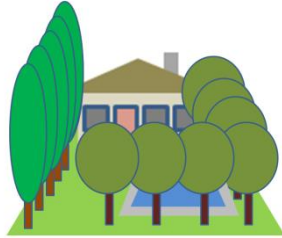
ORGANIZATION

**INFORMATION
TECHNOLOGISTS**

ALLOCATION

DESIGN PROFESSIONS

GEOGRAPHIC SCIENCES



**DEMAND-BASED
"OFFENSIVE" STRATEGIES**

**SUPPLY-BASED
"DEFENSIVE" STRATEGIES**

**GEODESIGN
COLLABORATION**

EXPRESSION

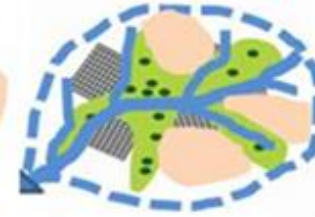
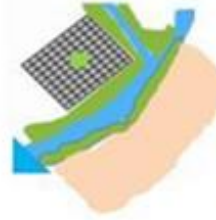
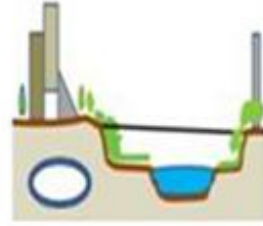
**THE PEOPLE
OF THE PLACE**

ORGANIZATION

**INFORMATION
TECHNOLOGISTS**

ALLOCATION

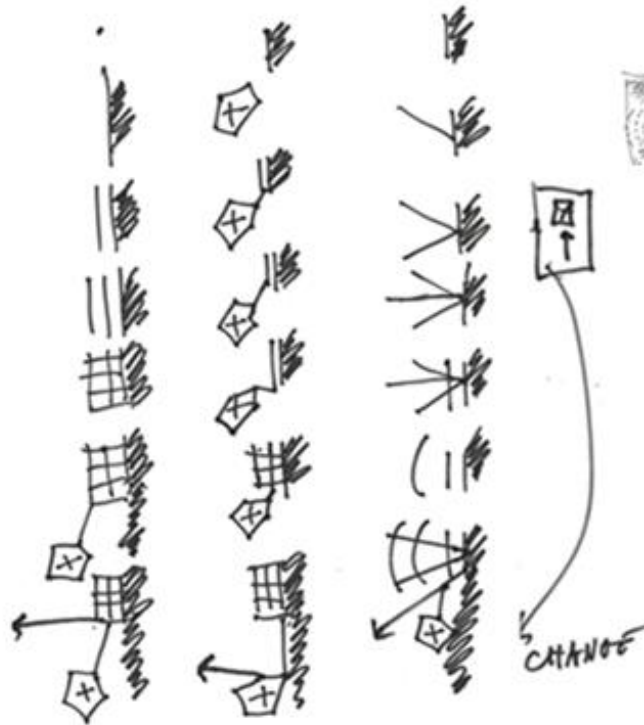
CHANGE MODEL STRATEGIES: "ways of designing"



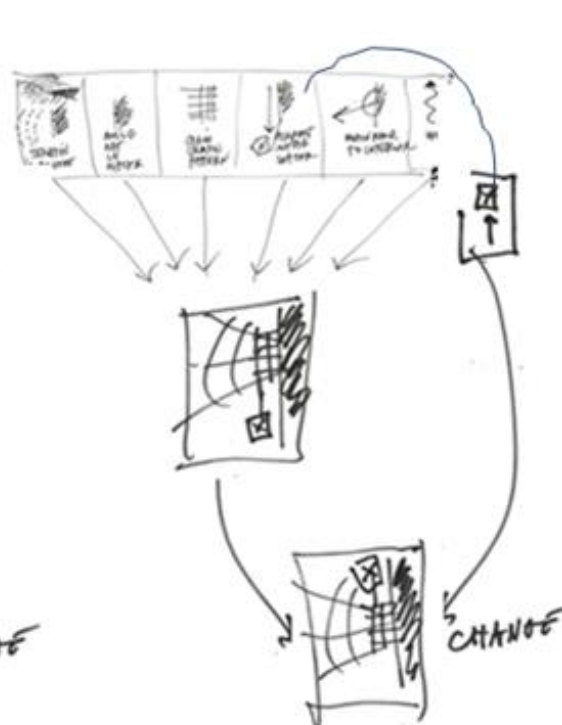
SERIAL "SKETCHING"

SYSTEM-BASED DIAGRAMS

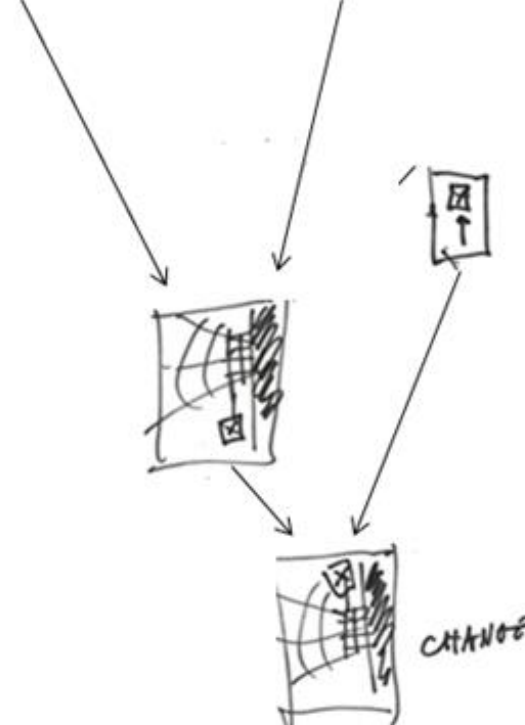
RULE AND MATHEMATICAL MODELS



ANTICIPATORY
PARTICIPATORY
SEQUENTIAL

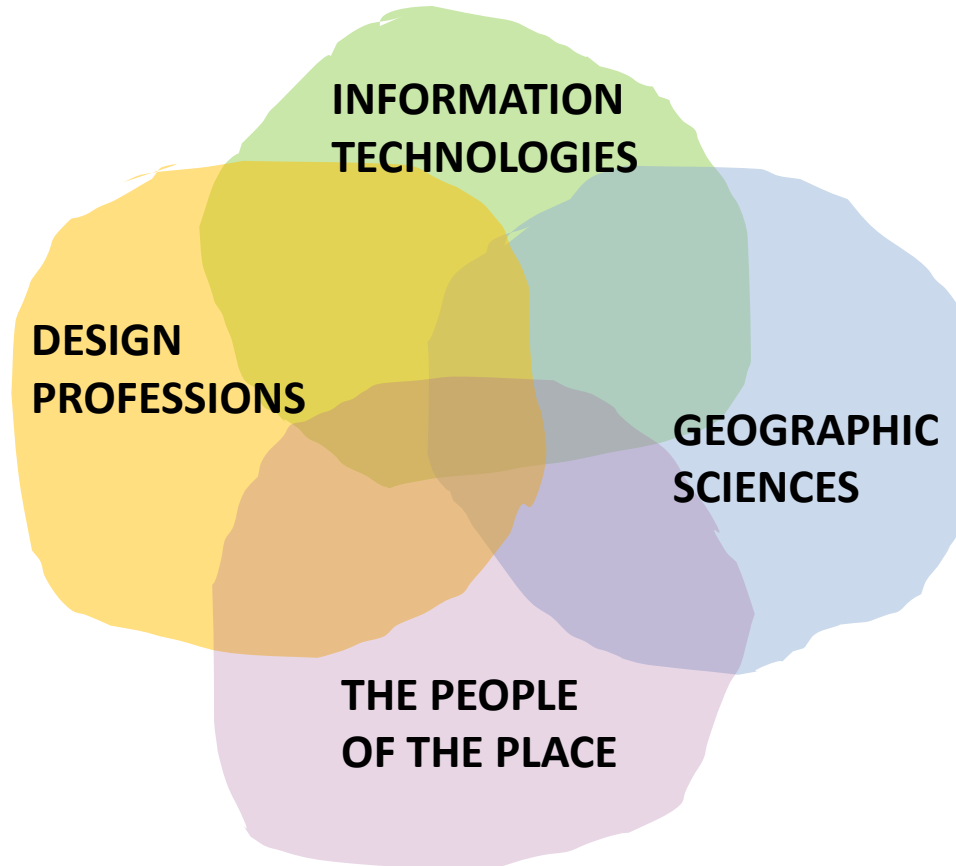
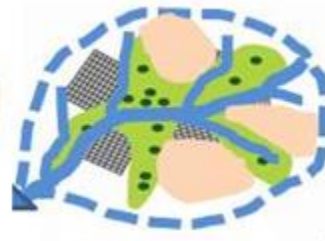
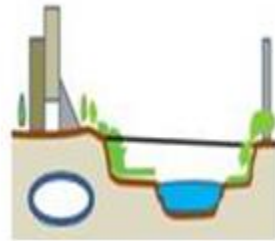
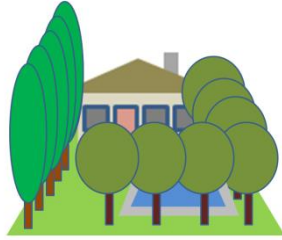


CONSTRAINING
COMBINATORIAL
(MIXED)



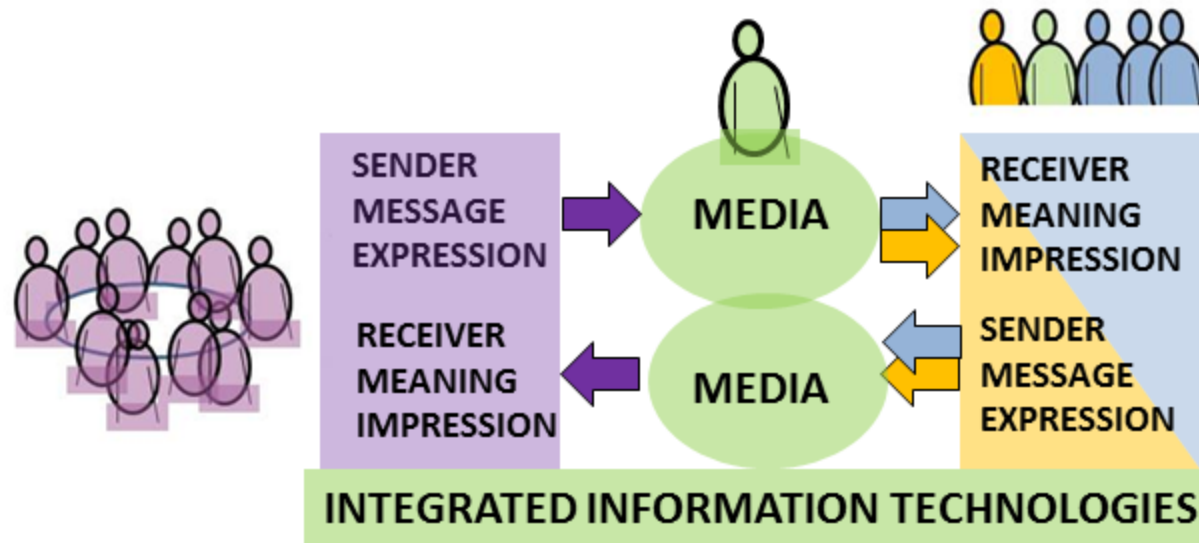
RULE-BASED
OPTIMIZING
AGENT-BASED

ACADEMIC ASSETS: IDENTIFY THE FACULTY BY SIZES/SCALES OF EXPERIENCE AND ROLES
IDENTIFY FACULTY NEEDS



COMMUNICATION

SHARED KNOWLEDGE OF THE SUBJECT
SHARED ASSUMPTIONS
SHARED LANGUAGE



A GEODESIGN SUPPORT SYSTEM: INTEGRATED TOOLS AND HELPERS

SEMANTICS: MEANING AND LINKAGES



COLLABORATION



ABSTRACTION



DIAGRAMS



TIME



LIBRARY

SYNTAX: PARTS AND RELATIONS



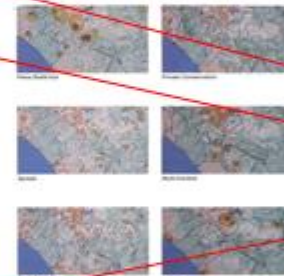
CONTEXT BASE



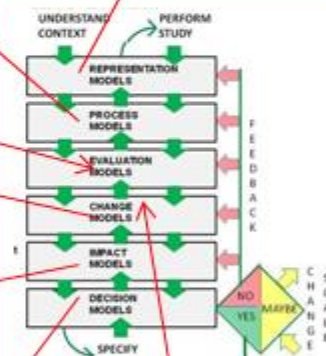
OBJECTS



CONSTRAINTS



CONFIGURATION

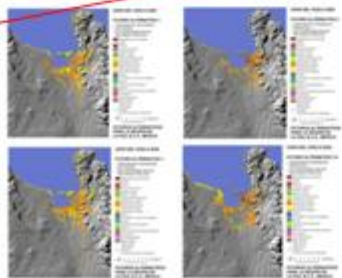


HYPERLINKS

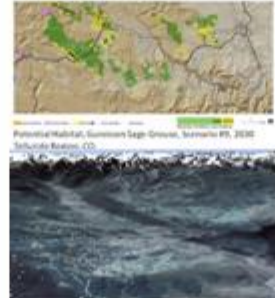
DYNAMICS: BEHAVIOR AND PERFORMANCE



MODEL SCRIPTS



VERSIONS



SIMULATION



DASHBOARD



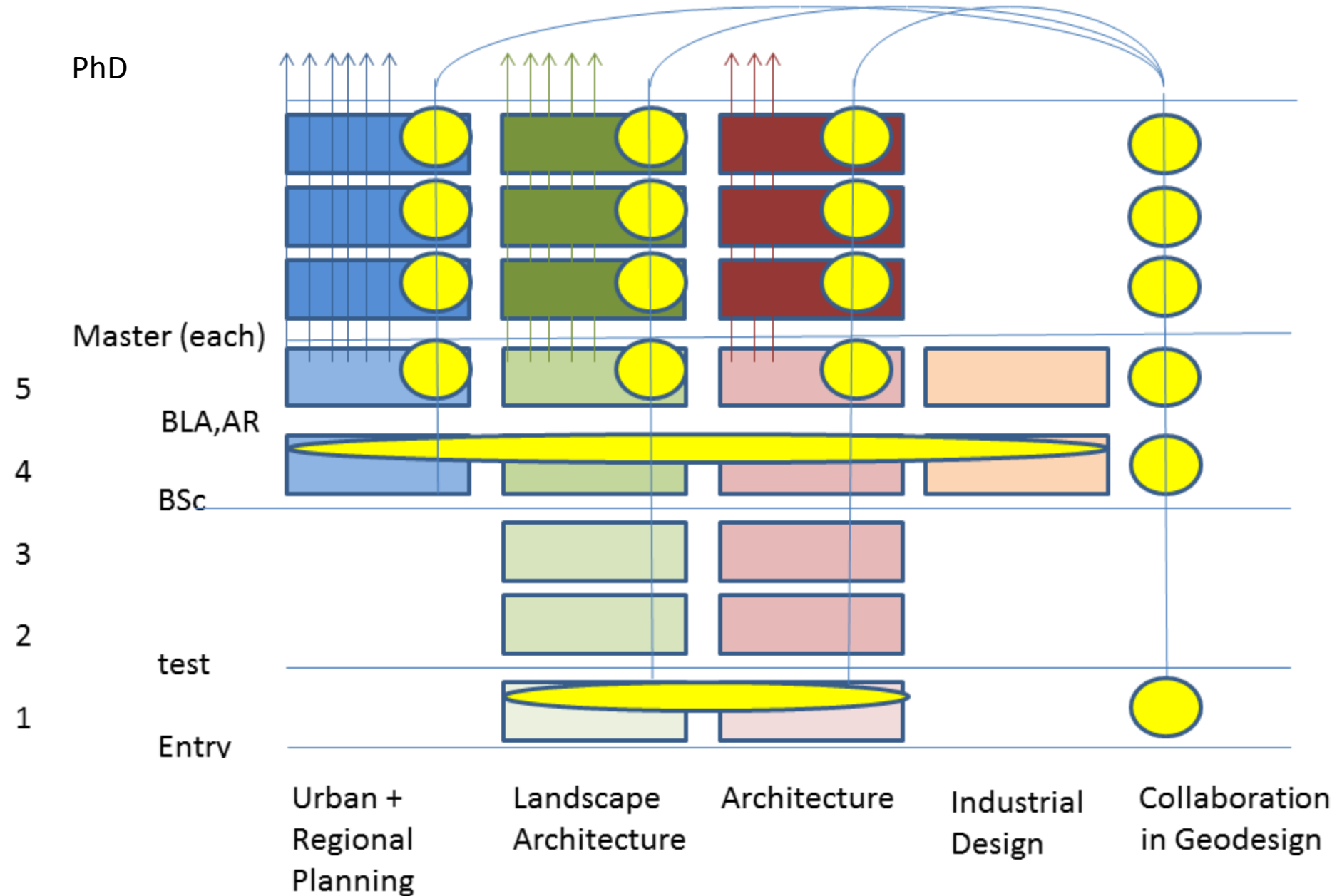
METHODS COACH

LEVELS OF EDUCATION IN GEODESIGN

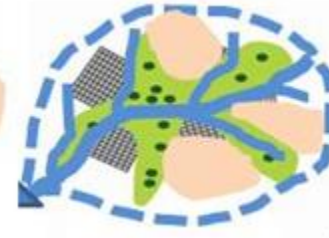
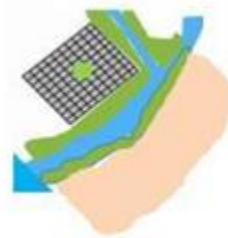
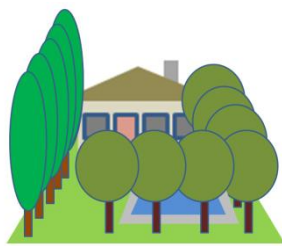
LEVEL OF INQUIRY	Professional Entry ↓ given problem	Postprofessional ↓ select problem	Research Professional ↓ seek problem
I. Representation Models	introduced basic	specialized in-depth	invented experimental
II. Process Models	common knowledge "rules of thumb"	researched diagrammatic	empirical replicable
III. Evaluation Models	as told simple	as experienced prof. judgment	as sought informed
IV. Change Models	precedent archetypes	experience adaptations	hypothesis innovations
V. Impact Models	case studies reasonable guess	formal models rationale	experiments evidence
VI. Decision Models	profession + faculty conservative	faculty + mentor speculative	mentor + self theoretical
	given method ↑	select method ↑	create method ↑

Figure 11.1: Toward a curriculum in geodesign. | Source: Carl Steinitz.

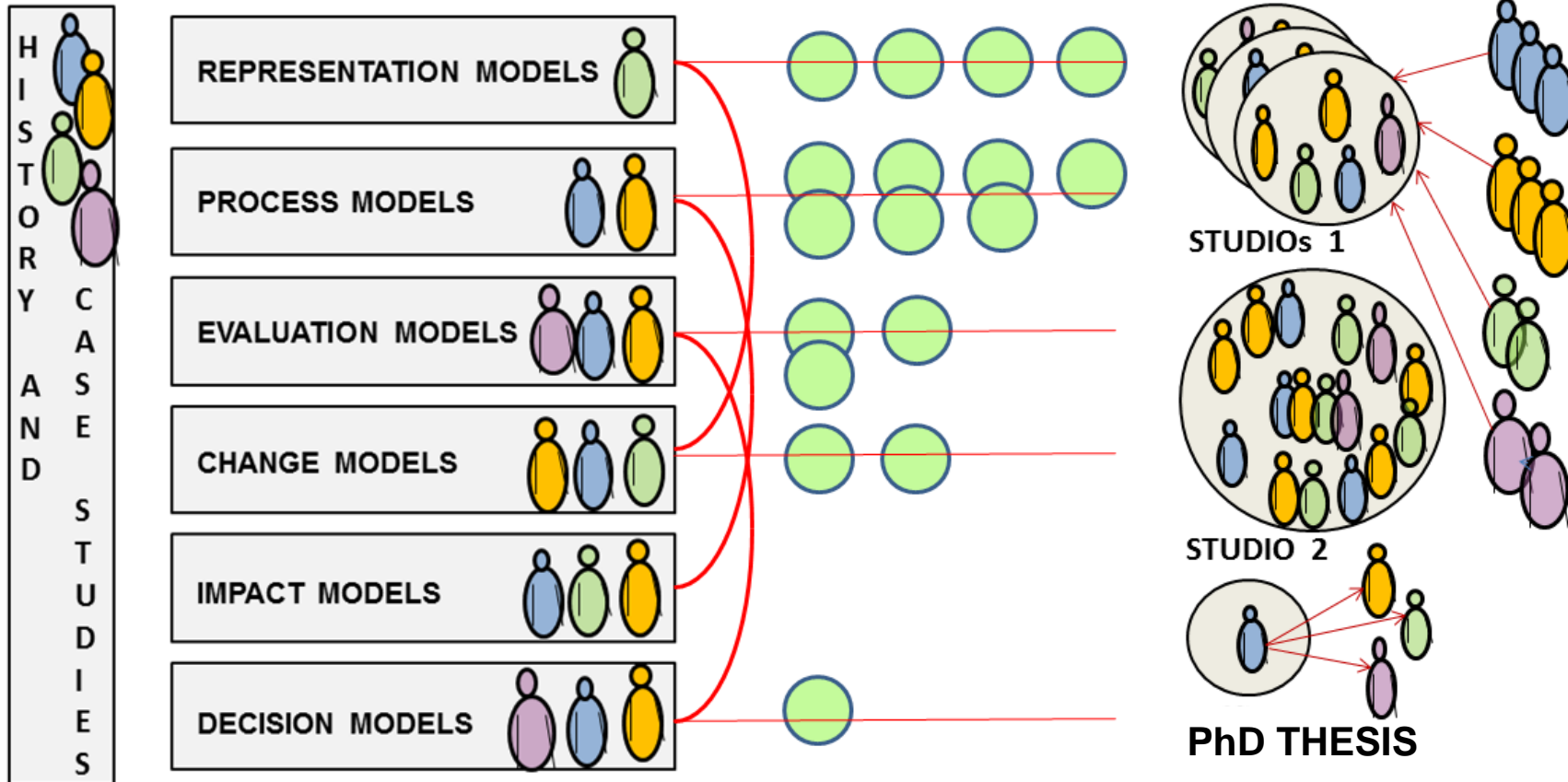
This is where I think a geodesign-oriented school should and can be.



ACADEMIC ASSETS: IDENTIFY COURSES BY MODEL TYPES AND ROLES
IDENTIFY COURSE AND INFORMATION TECHNOLOGY TUTORIAL NEEDS



INFORMATION TECHNOLOGIES TUTORIALS



GENERAL EDUCATION and UNDERGRADUATE ELECTIVES IN DESIGN AND SCIENCE

Framework


History of Ideas

Historic
Case Studies
adapted via the
framework to
current study :
WHY?
HOW?
WHERE?

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1, 2. **FRAMEWORK**

3, Context and Content

4. Size and Scale

5. Representation

6. Data Types

7. Data Needs

8. Data Management

9. Processes

10, Complexity

11. Evaluation

12. Delphi

13. Change

14. Escape of Tigers

15. Religion and Culture

16. Concepts

17. Ways of Designing

18. Adaptability

19. Impact

20. Carrying Capacity

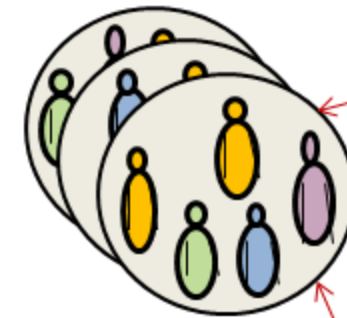
21. Decision

22. Presentation

23. Feedback

24. Summary

EACH WITH EXAMPLES AND EXERCISES



STUDIOS 1

**CURRENT
STUDY**

Representation

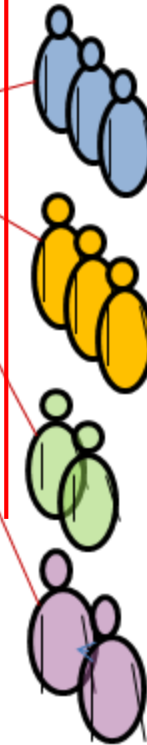
Process

Evaluation

Change

Impact

Decision



TECHNOLOGY TUTORIALS

MASTER OF [-----] in GEODESIGN

SEMESTER 1

Framework

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current study :
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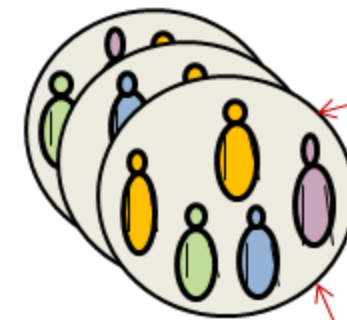
20. Carrying Capacity

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23. Feedback

24. Summary

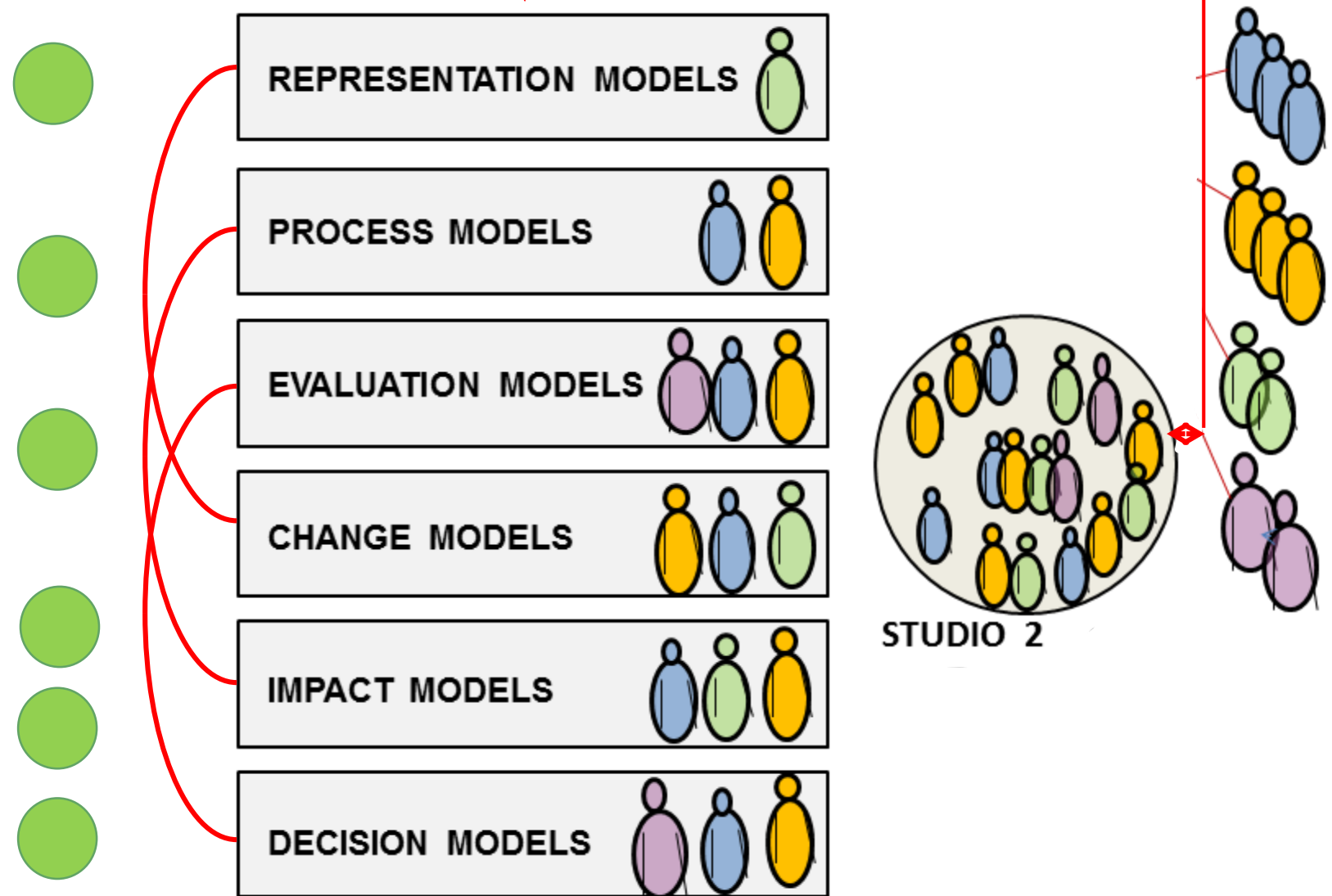
EACH WITH EXAMPLES AND EXERCISES**TECHNOLOGY TUTORIALS****STUDIOS 1****CURRENT
STUDY**

Representation
Process
Evaluation
Change
Impact
Decision



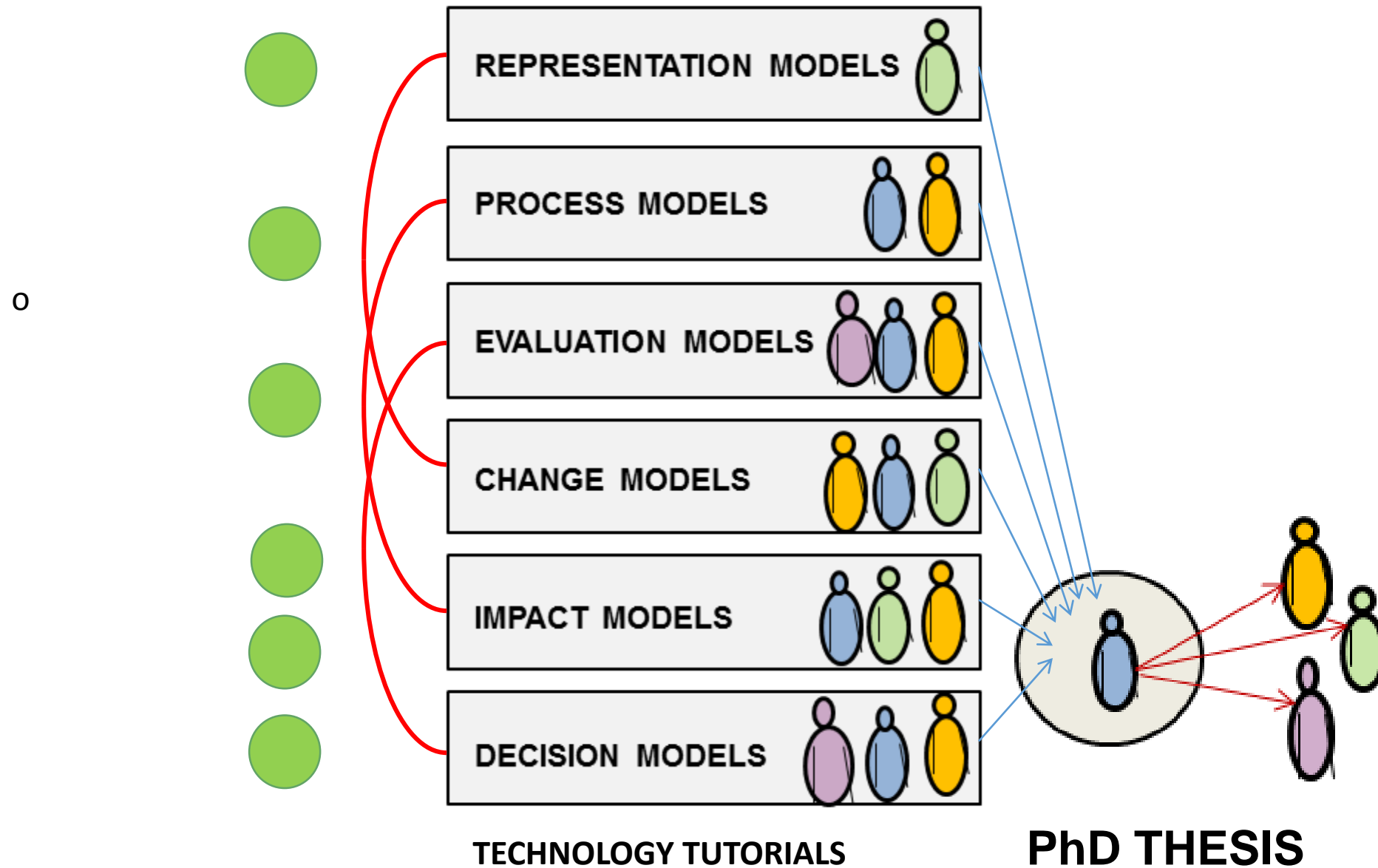
MASTER OF [-----] in GEODESIGN

SEMESTER 2

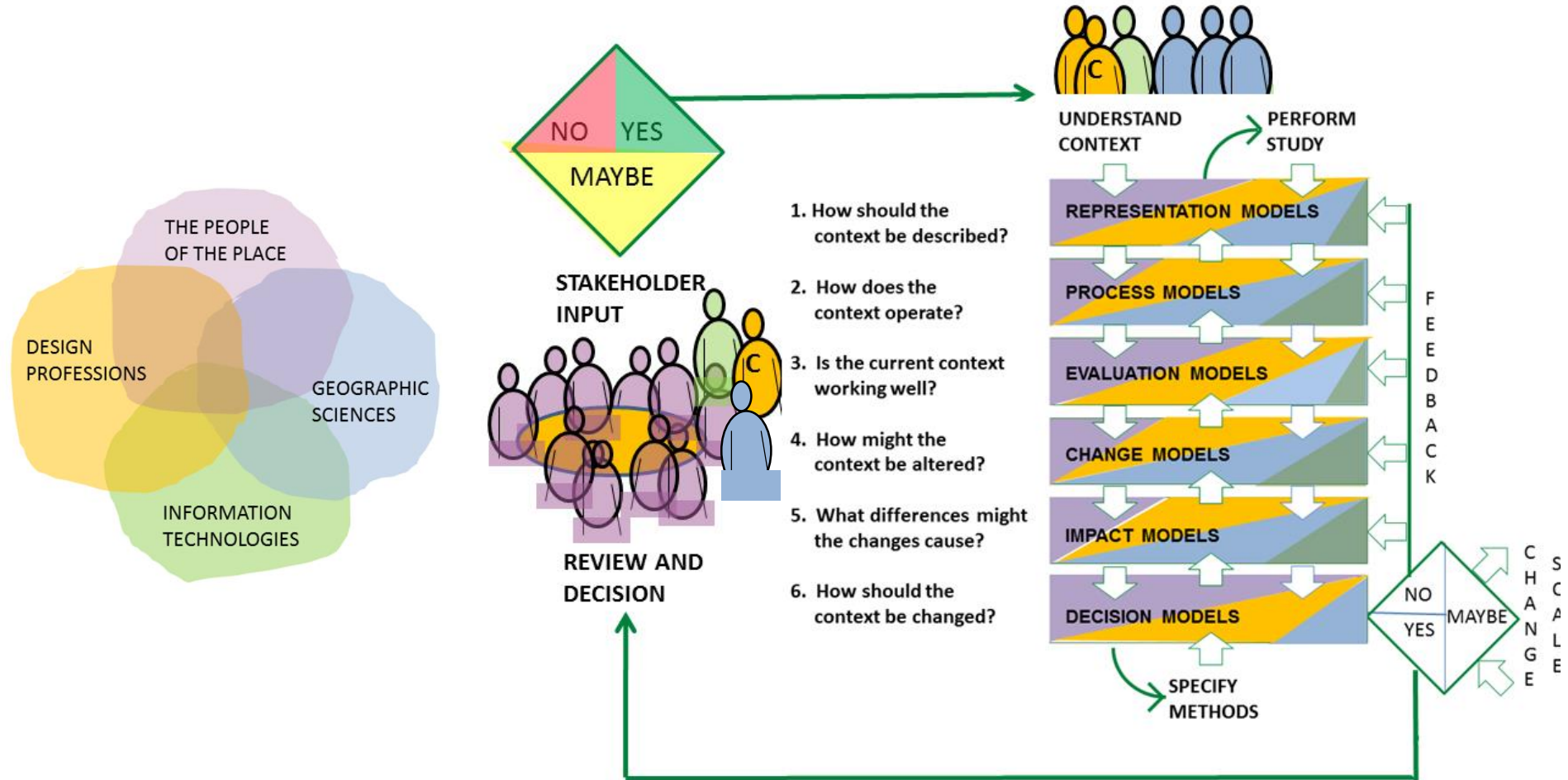


TECHNOLOGY TUTORIALS

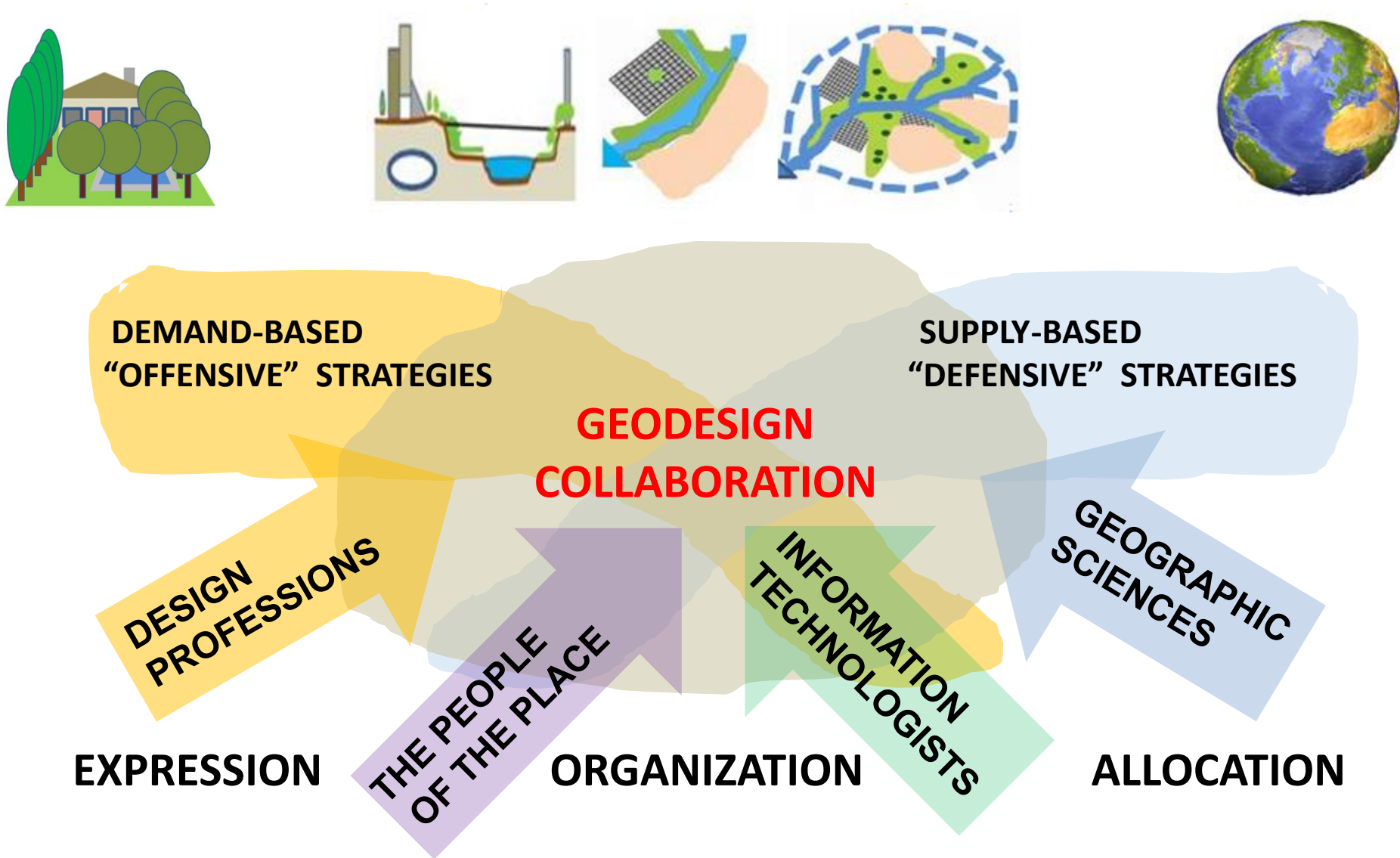
DOCTOR OF PHILOSOPHY in geodesign



GEODESIGN IS A COLLABORATION

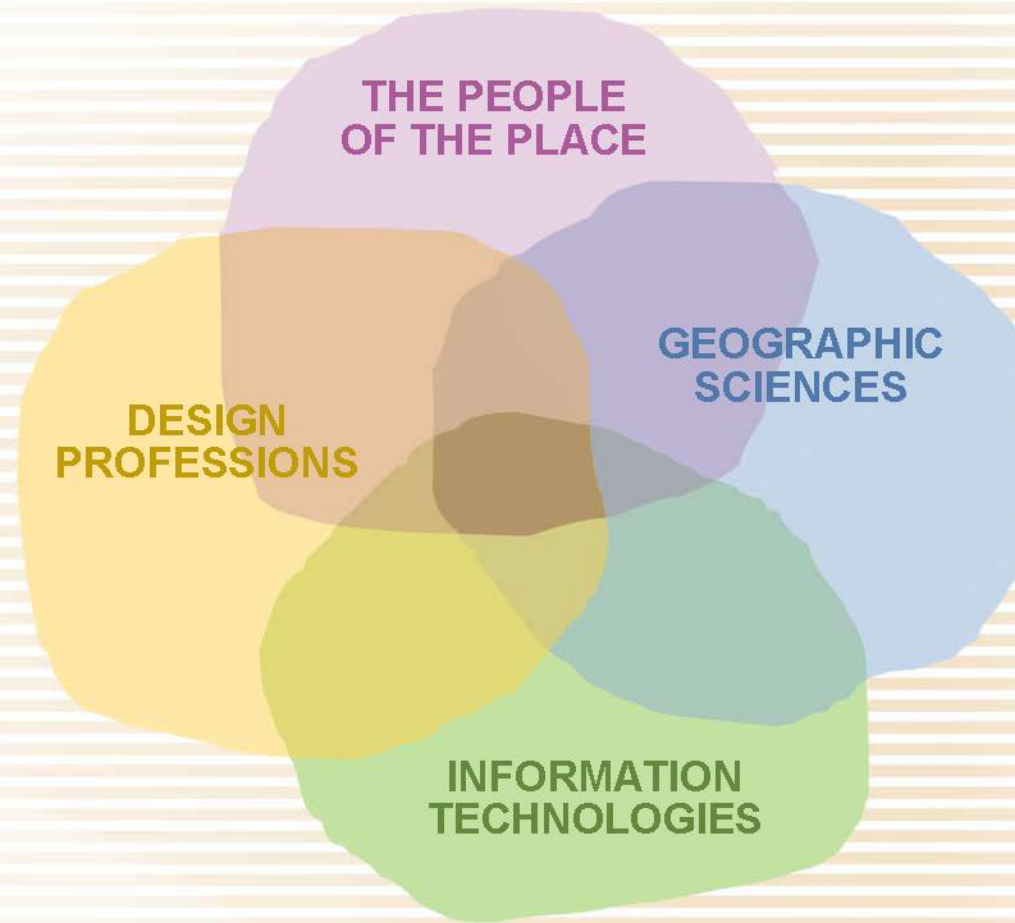


This is where I think a university should and can be.



A Framework for Geodesign

Carl Steinitz



Changing Geography by Design

XIII Seminario Urbanismo Internacional

Ciudad de oportunidades
e innovación

Acciones sustentables en la nueva agenda urbana
del 17 al 21 de abril del 2017
Museo Franz Mayer, Ciudad de México