

A Practice of Transdisciplinarity toward Restoration of Sound Hydrologic Cycle in Imbanuma Watershed, Chiba Prefecture

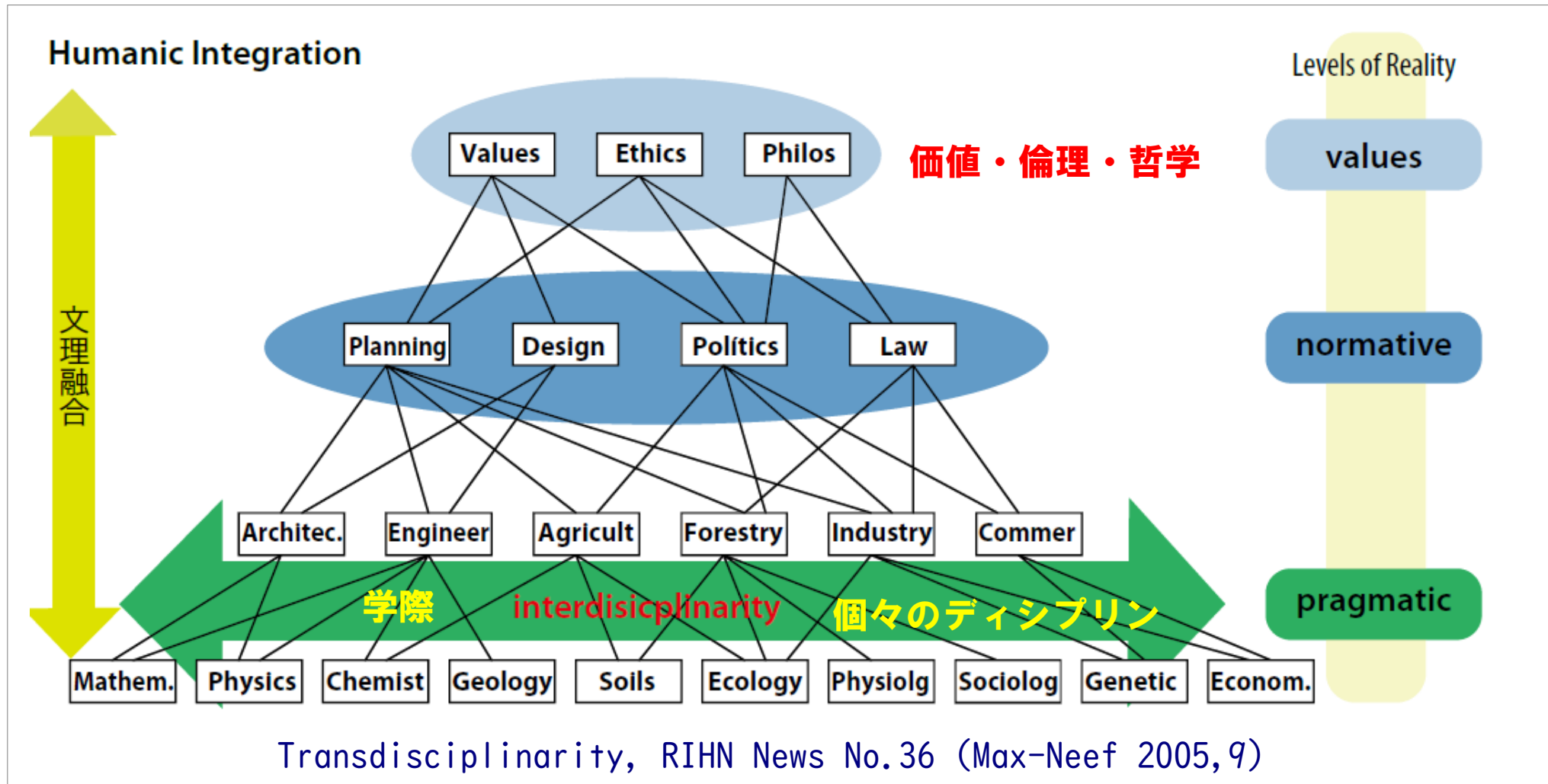
– A way of thinking to connect local environmental issue to the global –

- Science has become a real operational stage by the launch of **Future Earth** and **SDGs**. We, scientists, have to make a good practice.
- Problem should be solved through **transdisciplinarity** for the happiness of all the stakeholders.

Akihiko Kondoh
(CEReS, Chiba University)

FUTURE EARTH : Research for global sustainability

Transdisciplinarity : Collaboration with stakeholders.



- Most of Transdisciplinary study tend to be “**local**” study.
- Global Environmental Issue : the problem in a region concerning the relationship between human and nature.

SDGs Sustainable Development Goals

The 2030 Agenda for Sustainable Development



- All the Goals are mutually interrelated.
- If you once enter to a “goal”, you can access to another goal through interrelationship.

A Practice of Transdisciplinarity toward Restoration of Sound Hydrologic Cycle in Imbanuma Watershed, Chiba Prefecture

– A way of thinking to connect local environmental issue to the global –

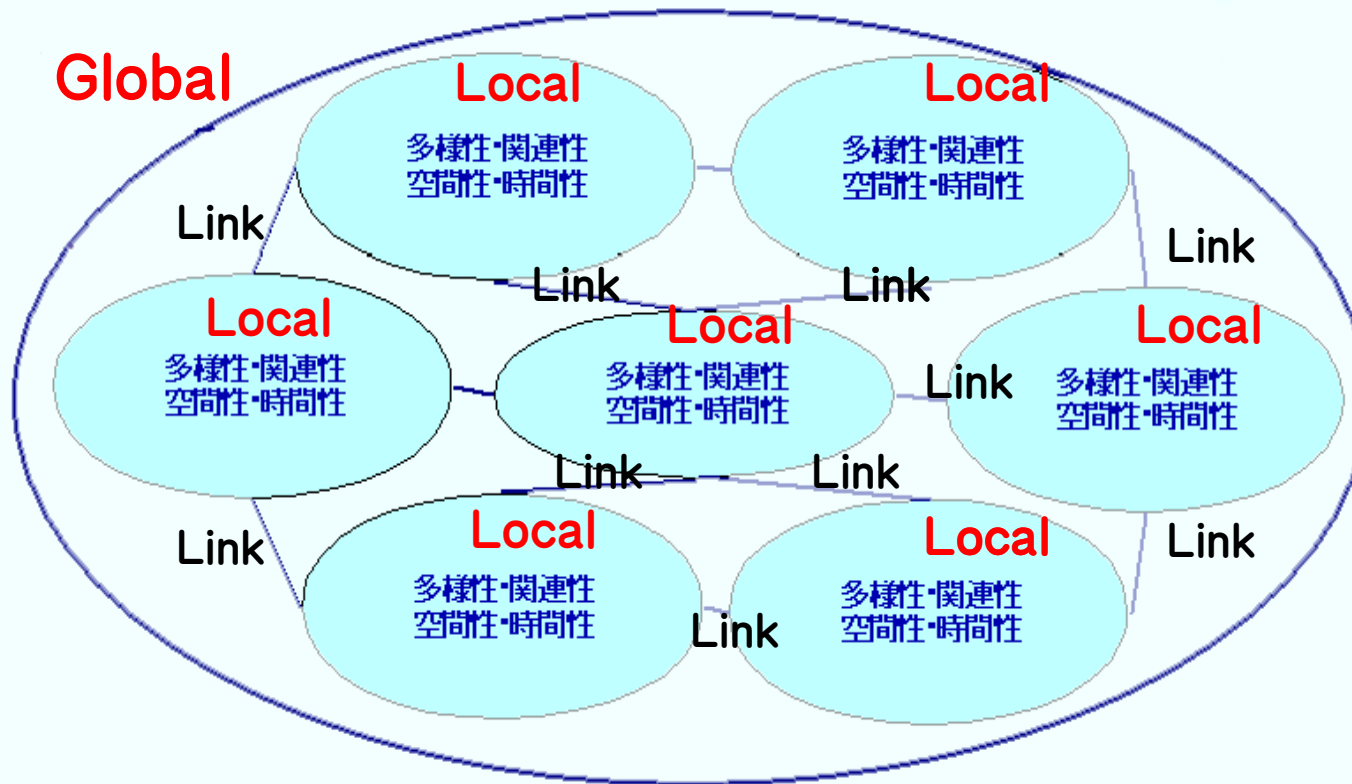
- Practice of Future Earth, SDGs start from Local region.
Return to 「Think globally, act locally」
- ▶ Clarify the view of Earth, Society, and Nature
Global as aggregation of many “Local”s
Various links among “Local”s
- Accumulation of Local Knowleges and Experiences
to a Global Frame
Share Globally --- sharing of knowledge and experience
- Step up to another issue at upper stage.

What is a global?

Global consists of many “local”s connected with various links.

Local has regional characteristics

- many elements (variability)
- relationship between the elements (relationship)
- distribution in the space (spatial nature)
- formation through history (time-axis)



Commonize
or
Customize ?



Each “local” area connected by “link”s.

- Economy link
- Religion link
- Politic link
- Ethnic link
- Racial link
- -----

(by S.Kito)

Solution



Individualities



Universality

A Practice of Transdisciplinarity toward Restoration of Sound Hydrologic Cycle in Imbanuma Watershed, Chiba Prefecture

– A way of thinking to connect local environmental issue to the global –

- Practice of Future Earth, SDGs start from Local region.
Return to 「Think globally, act locally」
- Clarify the view of Earth Society, Nature
Global as aggregation of Locals
Various links
- ▶ Accumulation of Local Knowleges and Experiences
to a Global Frame
Share Globally --- sharing of knowledge and experience
- Step up to another issue at upper stage.
Local issues to universal issues

INBANUMA : Water issue in closed lake.

- Closed lake near large city
- Common history, different regional characteristics

Inbanuma
Teganuma
Kasumigaura
Biwako

...

- Collaboration with administration
Conservation plan of water quality in lake (湖沼水質保全計画)

Social implementation of scientific achievement

- Collaboration with citizens
Field of transdisciplinarity



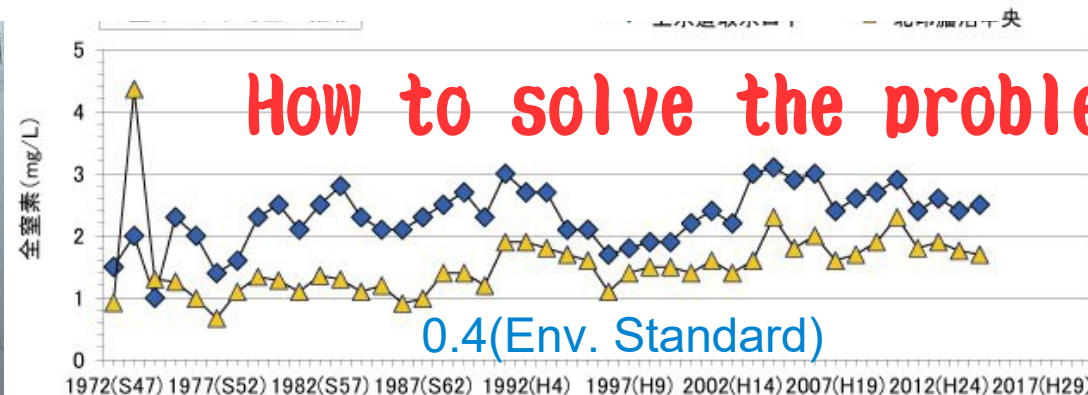
● Latest issues are deterioration of water quality and eutrophication.

Lake changed to Dam

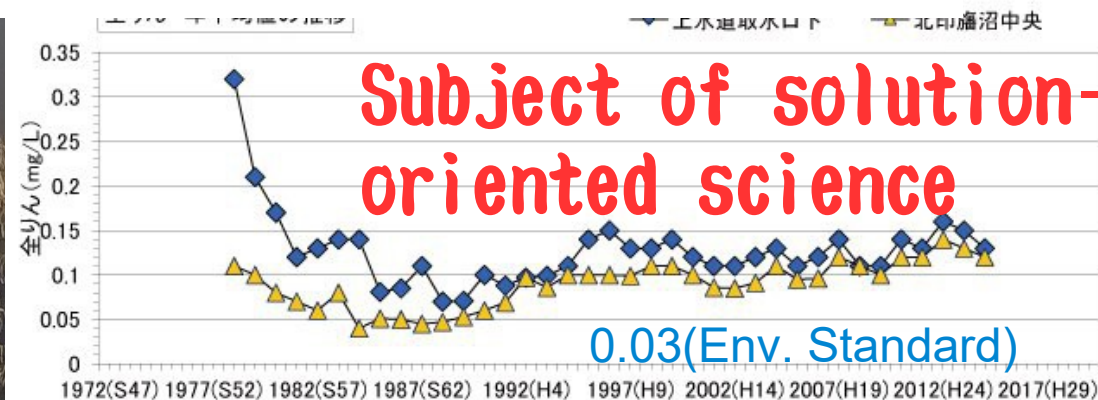
Common history

Countermeasure by government

Scientific outcome is not to reach the scene.



T-N



T-P

- Problem to be solved is in local.
- Link problem and man at local scale.
- Field of transdisciplinarity.

View of Scientists

Biosphere integrity

③

Functional diversity

②

Land-system change

①

Freshwater use

Phosphorus

Biochemical flows

Nitrogen

Climate change

Genetic diversity

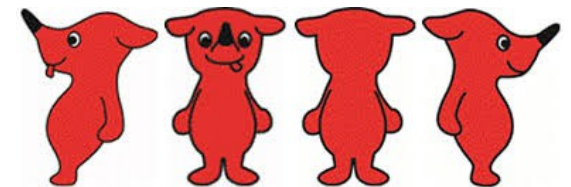
Novel e

Link of control variables

Nitrogen ↔ Freshwater use ↔ Land-system change ↔ Bio-diversity ↔ Climate change

Local problem should be solved under holistic view point

• A problem is appeared by integrating all the factors



Ocean acidificat

(Stefan et.al., 2015)

■ Beyond zone of uncertainty (high risk)
■ In zone of uncertainty (increasing risk)

■ Below boundary (safe)
■ Boundary not yet quantified

① Freshwater use

Many entities have relationship with Inbanuma

⇒ Various stakeholders

Water works



Water supply area
県営水道給水範囲

Agriculture

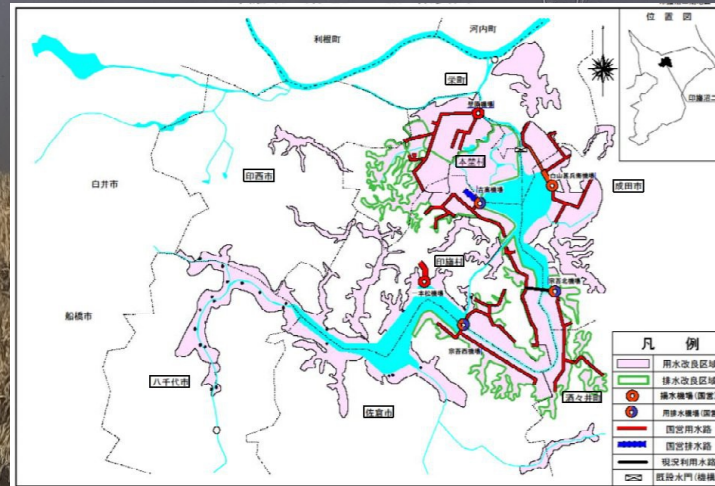
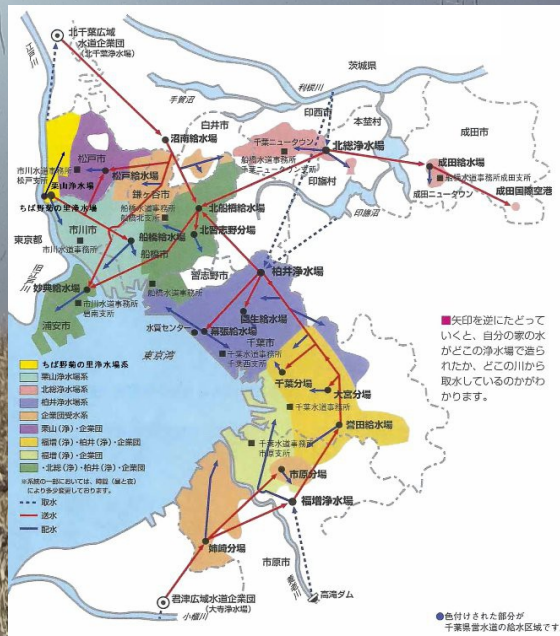


Governmental Irrigation and
Drainage System
国営灌漑排水事業印旛沼二期地区

Industry



Industrial water supply
network
工業用水ネットワーク



Comittee on restoration of sound hydrologic cycle in Inbanuma watershed

千葉県印旛沼流域水循環健全化会議

いんばぬま 情報広場

来訪者数 **147148**

今月 1327

スゴインバー

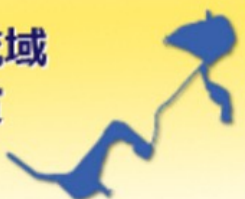


キインバー アオインバー アカインバー モモインバー ミトインバー

印旛沼

里沼ウォーキングマップを
ご利用ください!!!

印旛沼・流域
再生大賞
募集中!



印旛沼流域水...
111 いいね! の数

[はじめに](#) [水循環健全化会議とは](#) [本サイトについて](#) [ご意見](#) [用語解説](#) [リンク集](#) [サイトマップ](#)

きれいな印旛沼を取り戻すために、情報発信しています

<http://inba-numa.com>



印旛沼って
どんな沼?

水循環健全化
計画

取り組み
紹介

市民活動
応援ページ

印旛沼に
行ってみよう

もっと詳しく
知りたい方へ

資料・
データ集

ニュース

2016.08.15 季節のおすすめイベントに「印旛沼クリーン大作戦」を掲載しました。

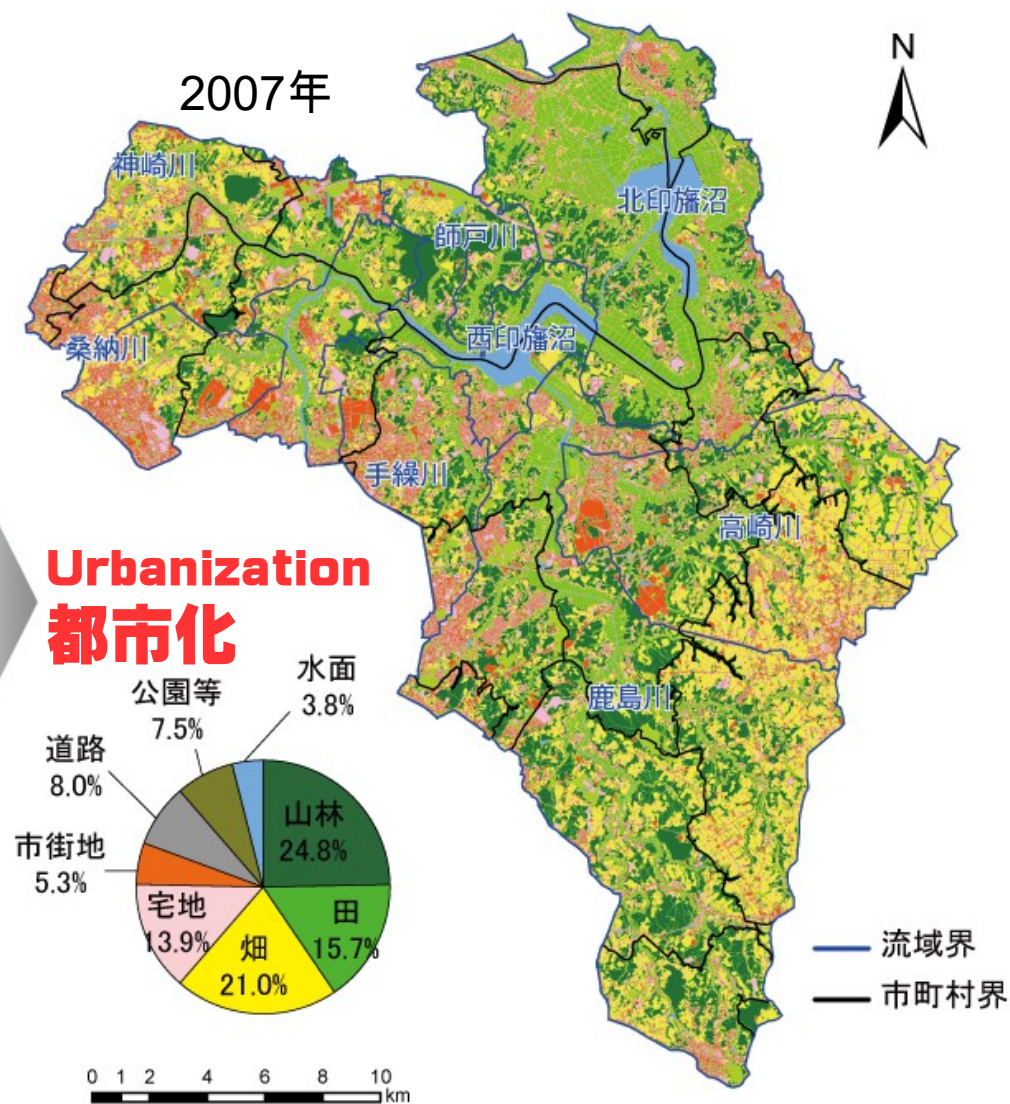
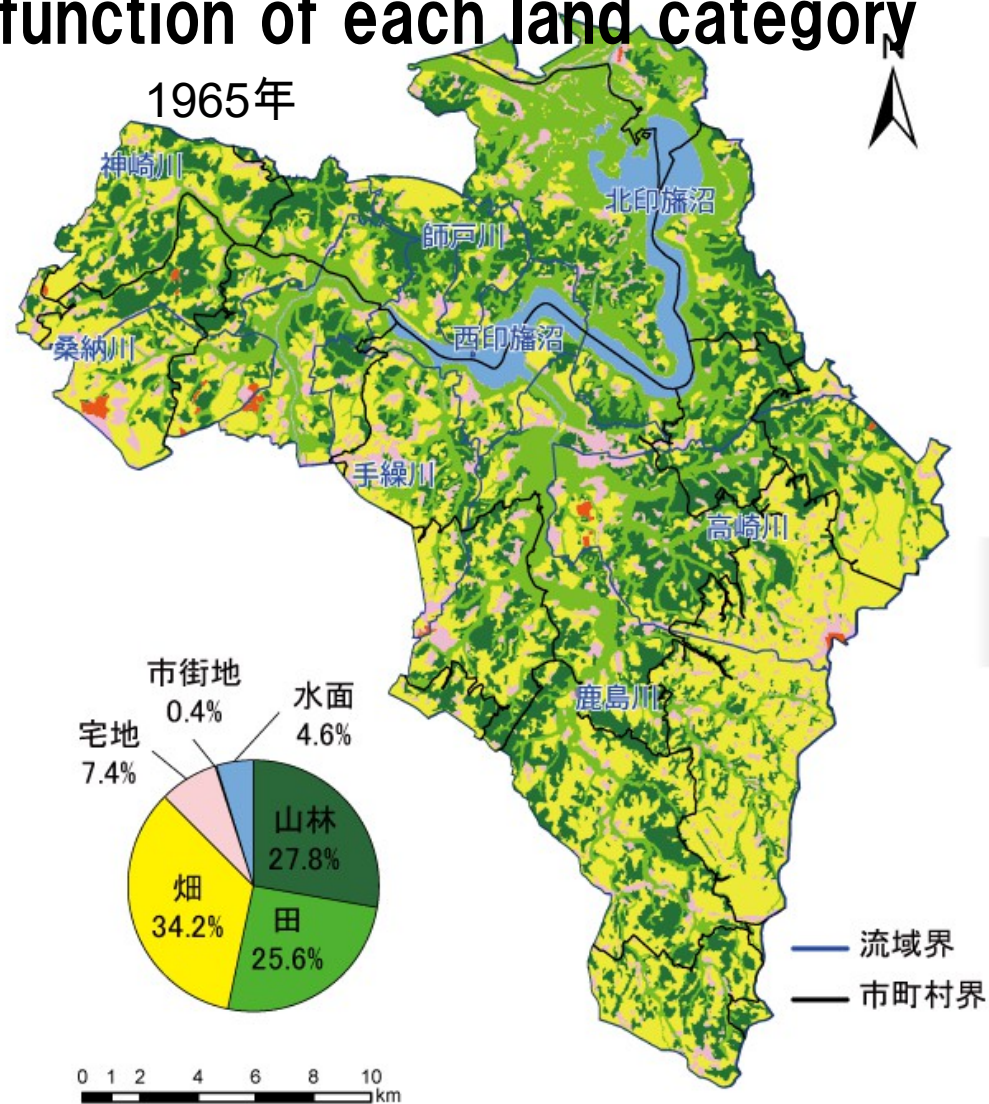
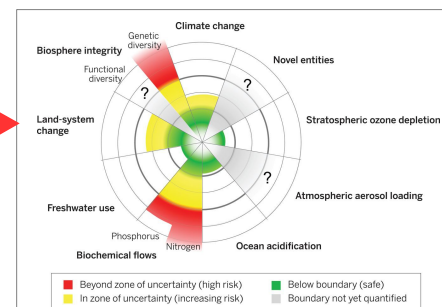
2016.08.10 イベント情報に「2016SAKAEリバーサイド・フェスティバル(栄町)」を掲載しました。

②Land-system change

Land Use and Cover Change (LUCC) Mapping

⇒A) Boundary condition of environmental model

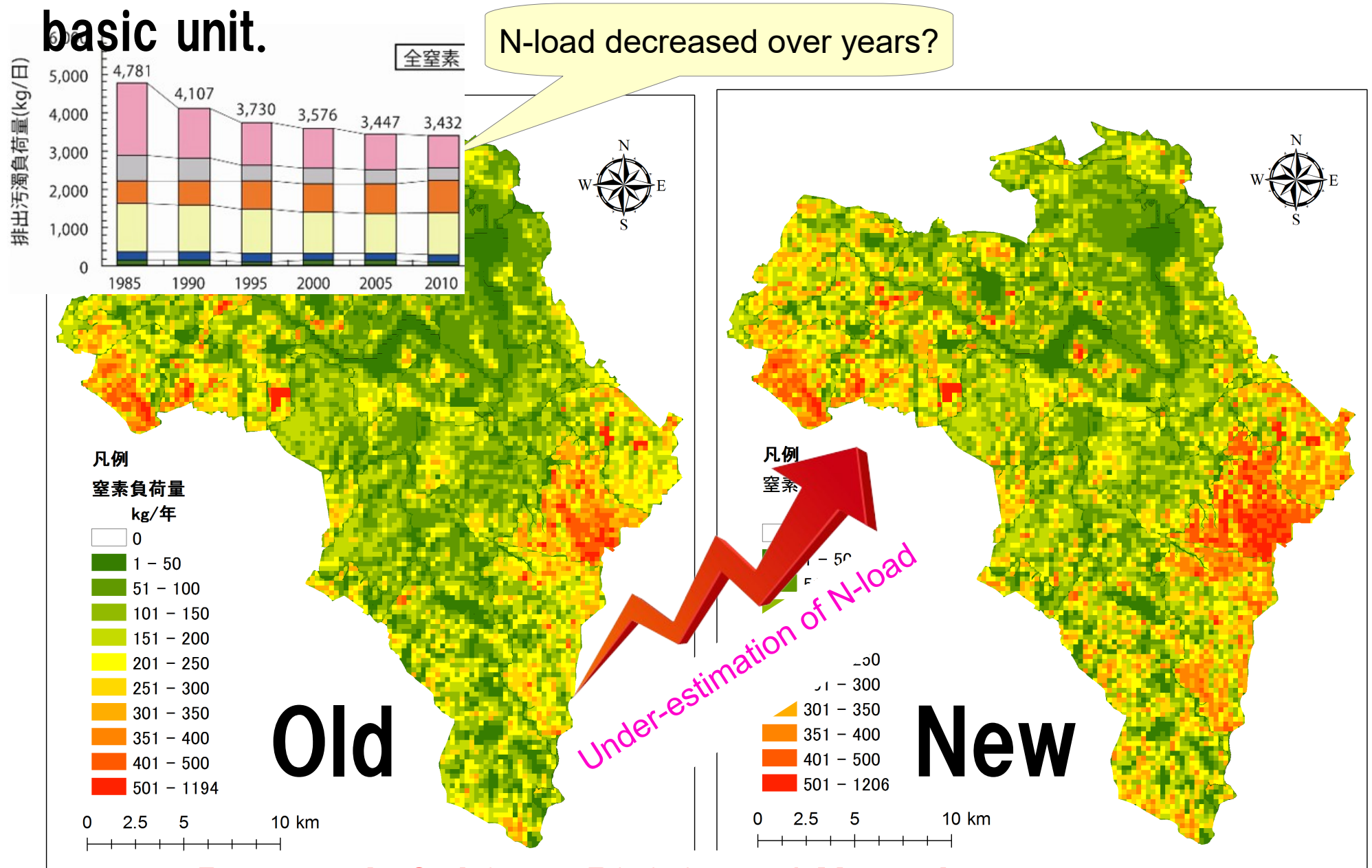
⇒B) Real state of water and material cycle through the function of each land category



(千葉県印旛沼流域水循環健全化会議)

A) Basic Unit—Load of Nitrogen in unit area(kg/year)

Nitrogen load to Inbanuma had increased by applying new basic unit.



Research Subject: Revision of N load map.

B) Nitrogen Cycle – What has happen in the field?

- History of formation of quaternary upland and incised vally
- Structure of alluvial deposit
- Groundwater flow system
- LUCC and changes in hydrologic cycle

How much of Nitrogen add to soil, and how Nitrogen move through sediment

Groundwater flow system in Upland-Lowland system

Where is the place of de-nitrification ?
Flow line reaches to that place?

What is a structure of alluvial deposit underlain in the valley ?

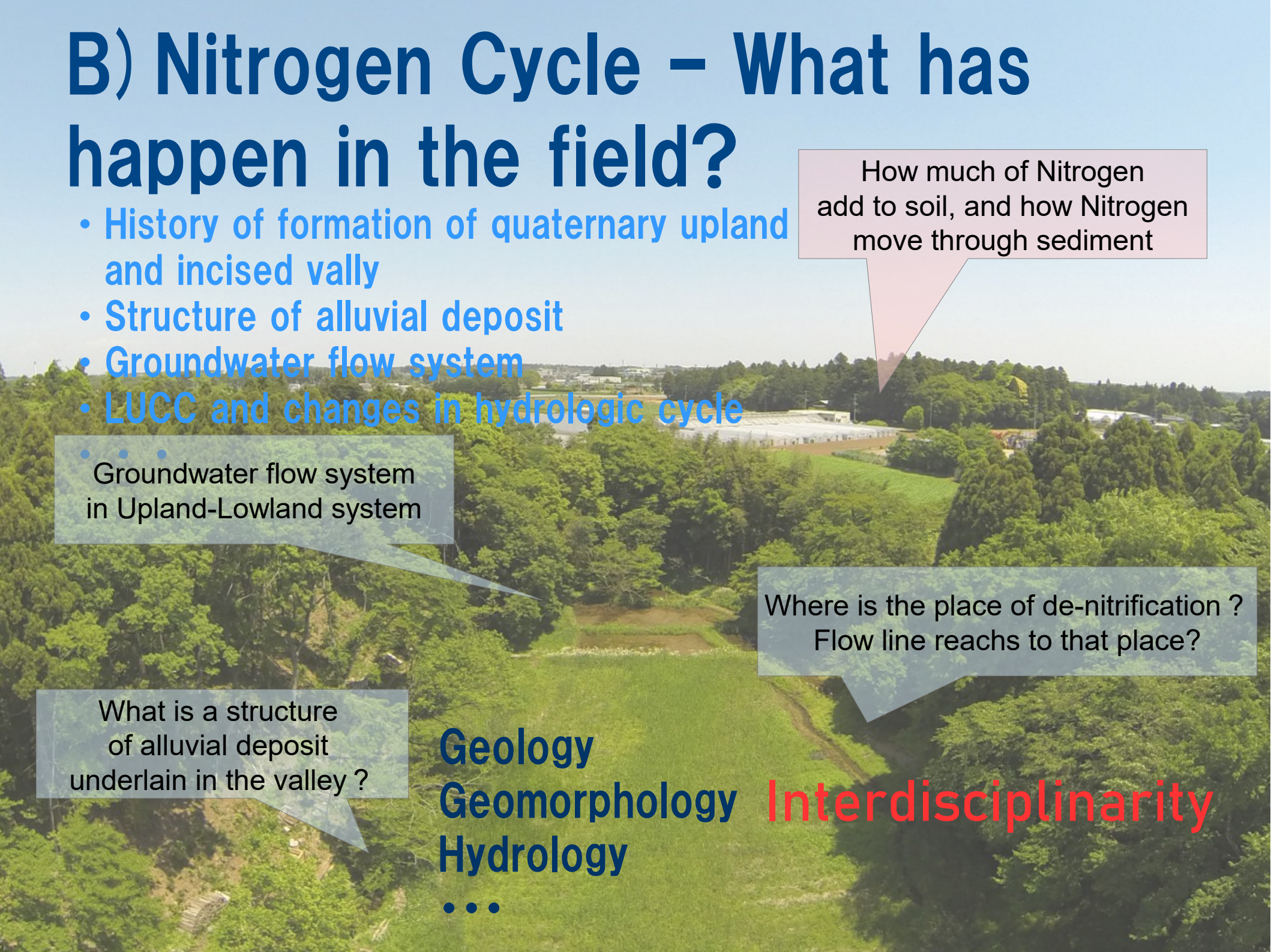
Geology

Geomorphology

Hydrology

...

Interdisciplinarity



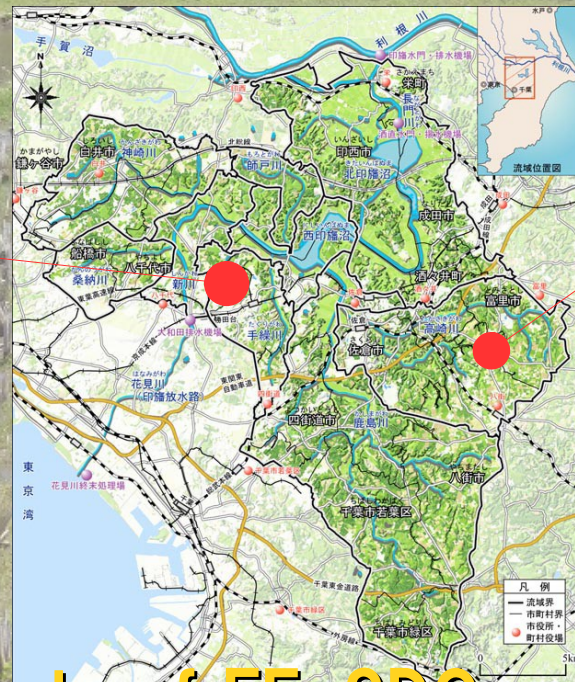
● Inter- to Trans-disciplinarity

Nitrogen outflow and connection to public water

- Hydrologic and material cycle in upland-lowland system

Who carry out tough field work?

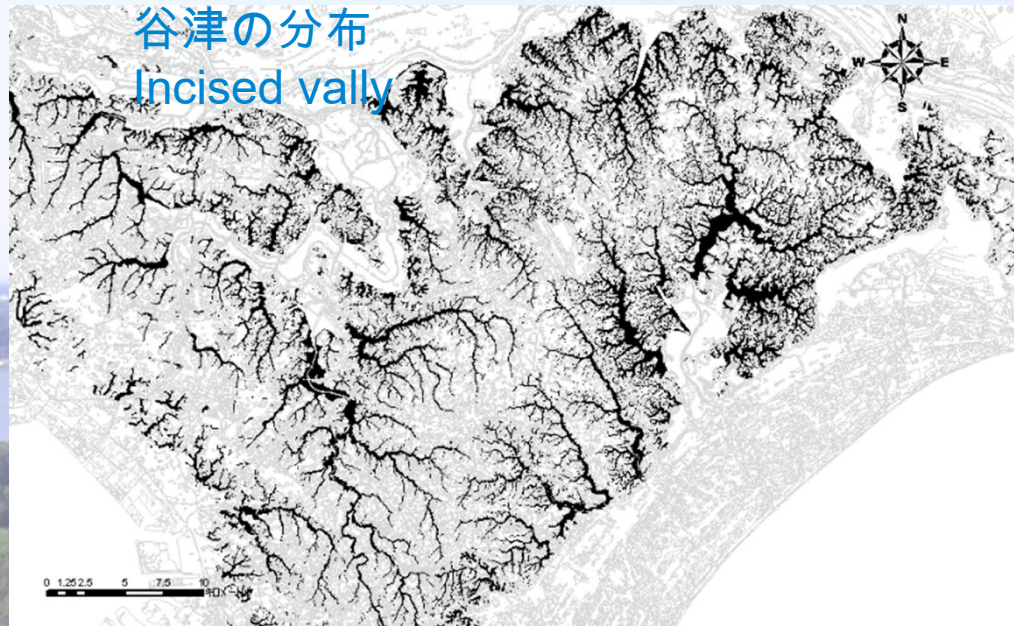
- Resent citizens are specialist, equal collaboration with scientist



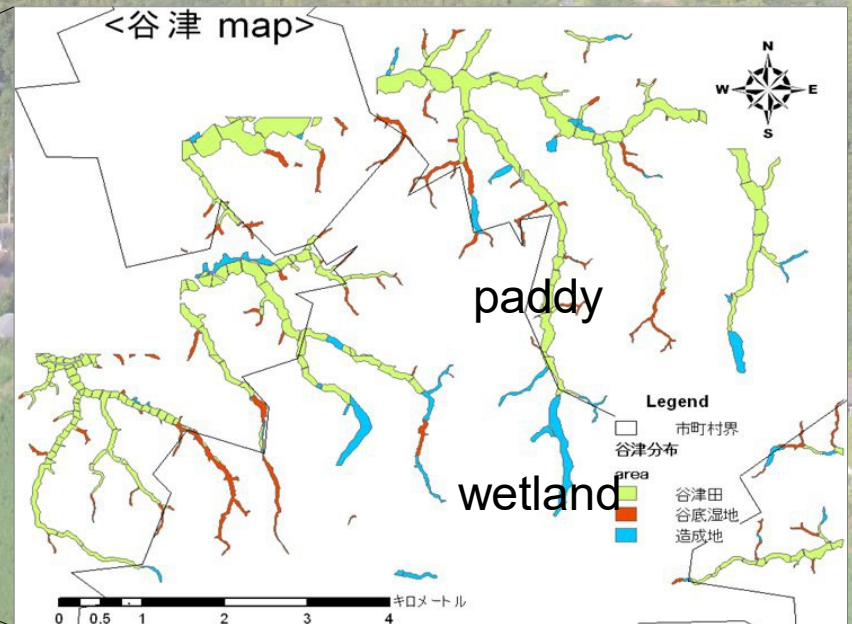
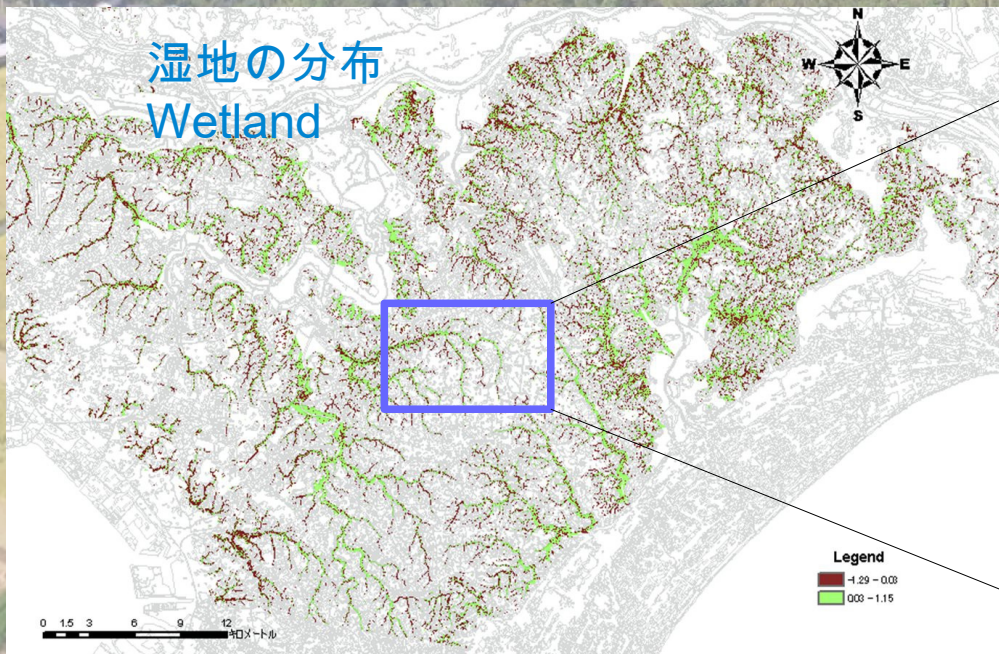
Achievements of FE, SDGs and citizen science

Distribution of Yatsu(谷津)

Application of the local study to large area



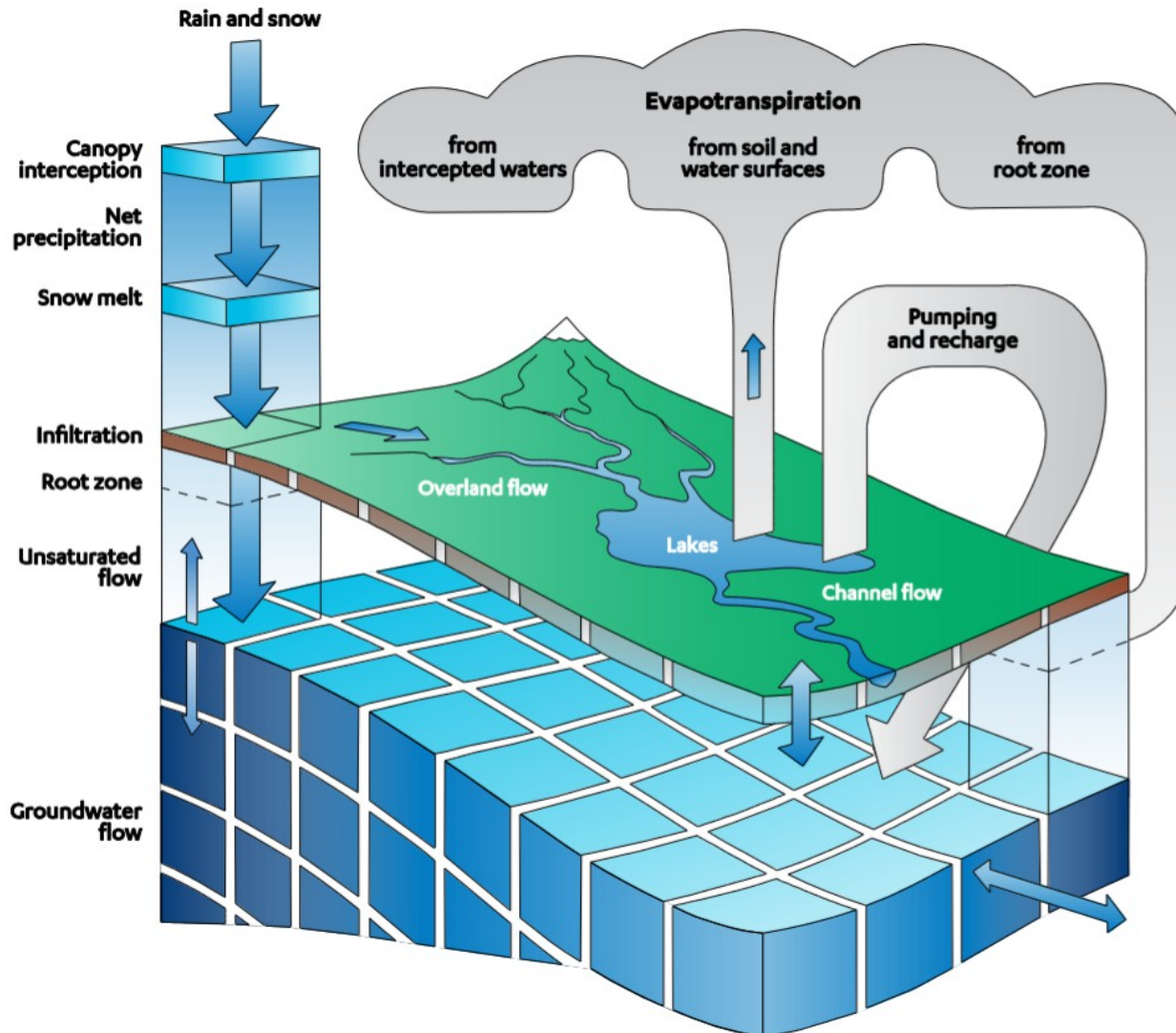
- Extraction of valley bottom from thematic maps
- Extraction of wetland by remote sensing
wetland → denitrification zone
- How do we know the integrated effect of wetland in the watershed scale?



Understanding by Model

- What is the model to disclose? -

Ongoing!



(C) MIKE-SHE An image of the model

Distributed parameter model

- The model reproduce elementary processes?
- What are the model abandoned by parameterization?
- What happens between the grids?
- Is mechanism and quantitativity compatible?
- ...

③ Biosphere integrity

Invasive alien species

ナガエツルノゲイトウ

オオバナミズキンバイ

(*Ludwigia grandiflora*)

Native species

オニビシ

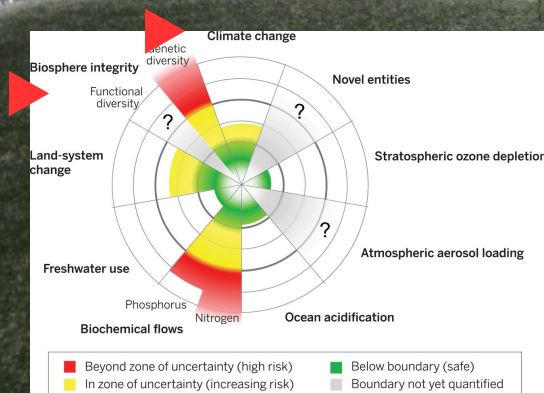
...

Trapa bispinosa
var. *japonica* (Onibishi)

④ Climatic change

COD remains high recently
Internal production

...



Alternanthera philoxeroides
(Nagaetsurunogeitou)

Achievement through Transdisciplinarity

Inbanuma Catchment Area Network(ICAN)



Loose connection among
Citizens, NPOs, Companies,
Administration, etc.

Transdisciplinarity

Motivation

Understanding

Indifference

The poster for the 15th Inbanuma Environment & Experience Festival features a blue sky with colorful bunting at the top. The title '第15回印旛沼流域環境・体験フェア' is prominently displayed in large, bold Japanese characters. Below the title, a speech bubble contains the English text 'Environment Festival to learn, experience, water, environment, food, in Inbanuma'. The poster includes several small images: a windmill, a boat on the water, and people participating in activities. At the bottom, the dates '2017 10/28 SAT' and '29 SUN' are listed, along with the time '11:00~15:00' and '10:00~14:00'. The location '会場 佐倉ふるさと広場 向かい側' is specified. A small cartoon character is also present. The bottom section contains detailed information about the event, including the organizing committee, sponsors, and a QR code for the official website.

水と食と発見のある印旛沼

第15回印旛沼流域環境・体験フェア

Environment Festival to learn, experience, water, environment, food, in Inbanuma

2017 10/28 SAT 11:00~15:00 29 SUN 10:00~14:00

会場 佐倉ふるさと広場 向かい側

入場無料

主催：千葉県・印旛沼流域水圏環境健全化会議
共催：印旛沼水質保全協議会
後援：千葉県河川協会・(公財)印旛沼環境基金・印旛沼環境団体連合会・千葉県工業用水協会・(公社)日本水道協会千葉県支部・利根川治水同盟千葉県支部・(公社)佐倉市観光協会・(株)千葉銀行・千葉県印旛地区 郵便局・(株)千葉日報社・(株)ベイエフエム・千葉テレビ放送・(株)広域高速ネット296・成田ケーブルテレビ(株)・北総鉄道(株)・東葉高速鉄道(株)・聖隷佐倉市民病院・印旛都市土地改良協会(順不同)
協力：農事組合法人 鹿島

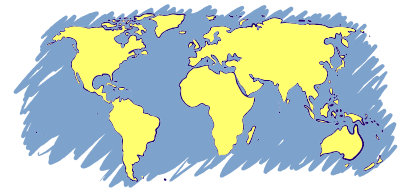
第15回印旛沼流域環境・体験フェア
公式Webサイト
詳しくは、以下を参照下さい。
<http://inba-numa.com/fair15/>
※会場周辺イベントも開催されます

問い合わせ先
事務局：印旛沼流域水圏環境健全化会議(千葉県県土整備部河川環境課)
☎ 043-223-3155 ✉ kawakan2@mz.pref.chiba.lg.jp

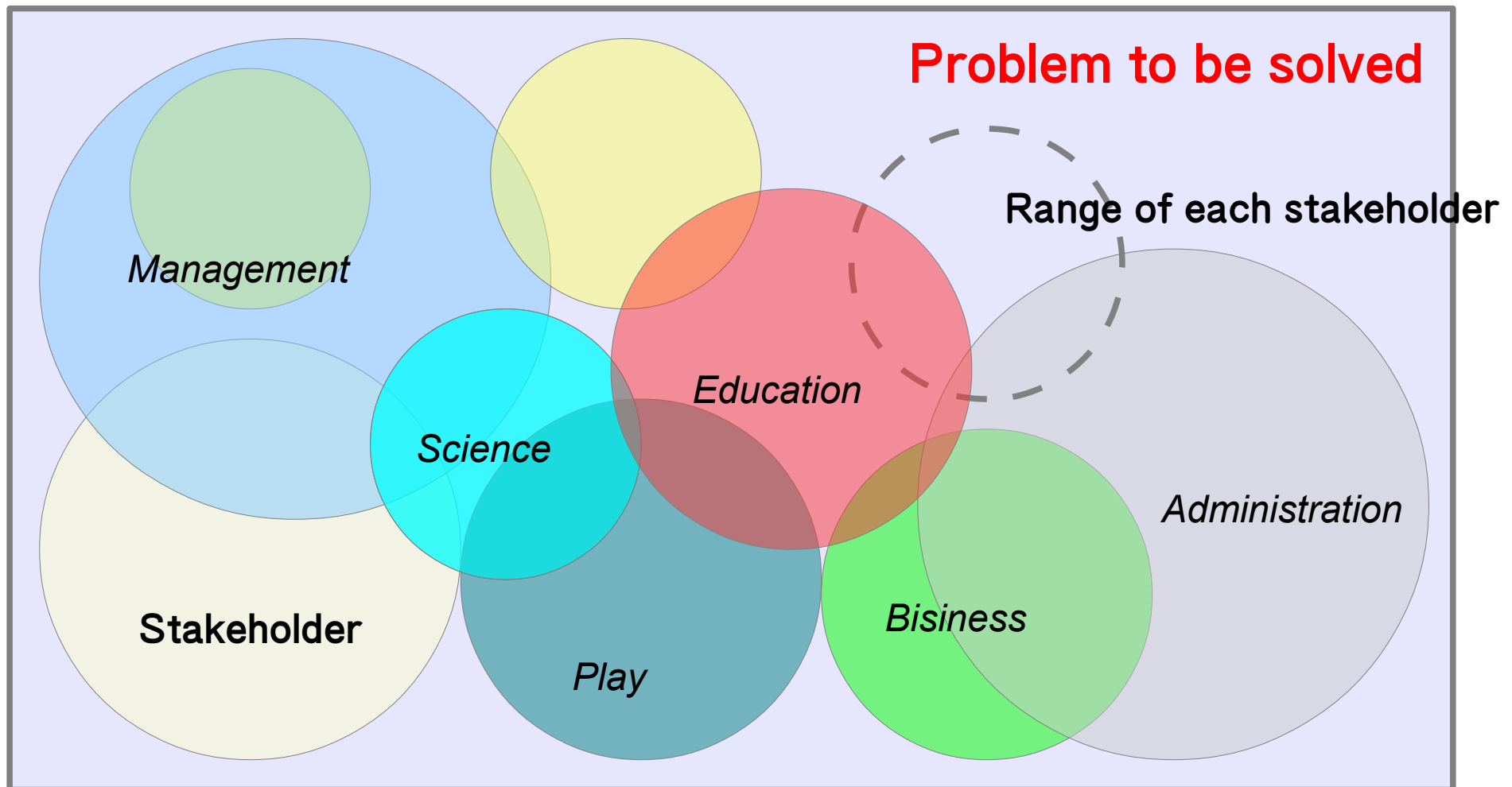
開催・中止の確認方法
フェア前日(10/27)から音声案内で、開催もしくは中止を御案内します。
☎ 0180-99-1600 (※通話料が発生します)

To make a good area connect to the solution of water problem.

TRANSDISCIPLINARITY



In the frame of “problem”, scientist should fulfil responsibility



Local and Global :Change of Subject

A research in a closed lake \Rightarrow case study?

Accumulation of local experience in a global frame(Share Globally)

\Rightarrow Comparative study (Commonize, Learning)

\Rightarrow Move to upper subject

●Case study and universal methodology ?

Global is aggregation of local areas.

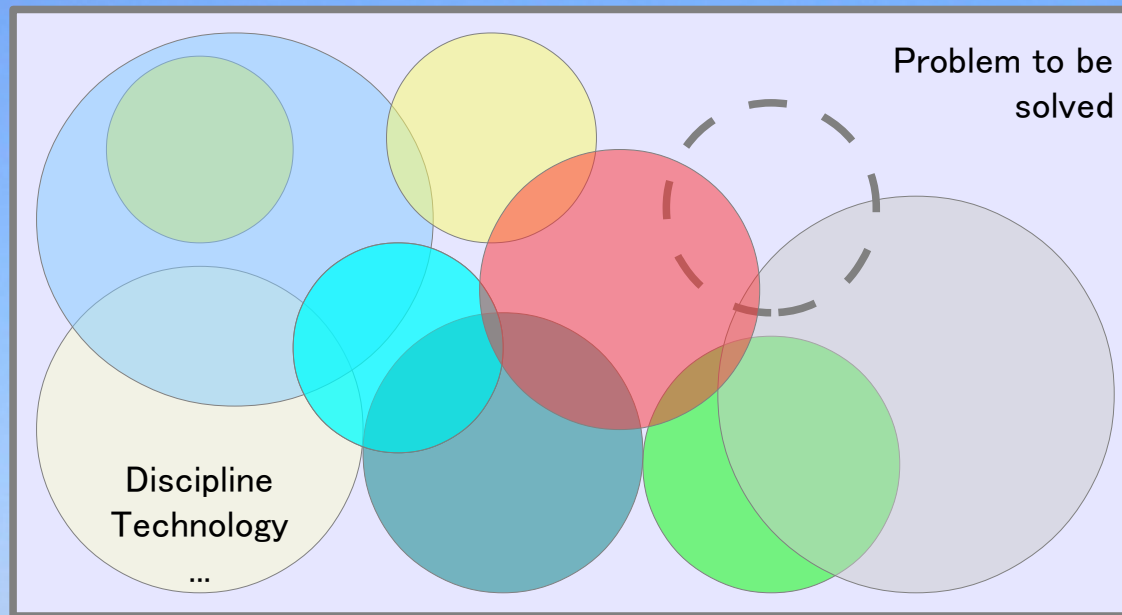
We have to make global frames!

●Change of the subject

Relationship between urban and rural---conflict or harmony ?

Current state of modern civilization...development of transformation ?





鳥越皓之著「環境社会学」 科学の守備範囲の模式図をベースに作成



Contribution to FE&SDGs

In the frame of collaboration sharing the achievement of common purpose scientist should work well.

⇒ Restriction of water environment

Creation of good homeland

