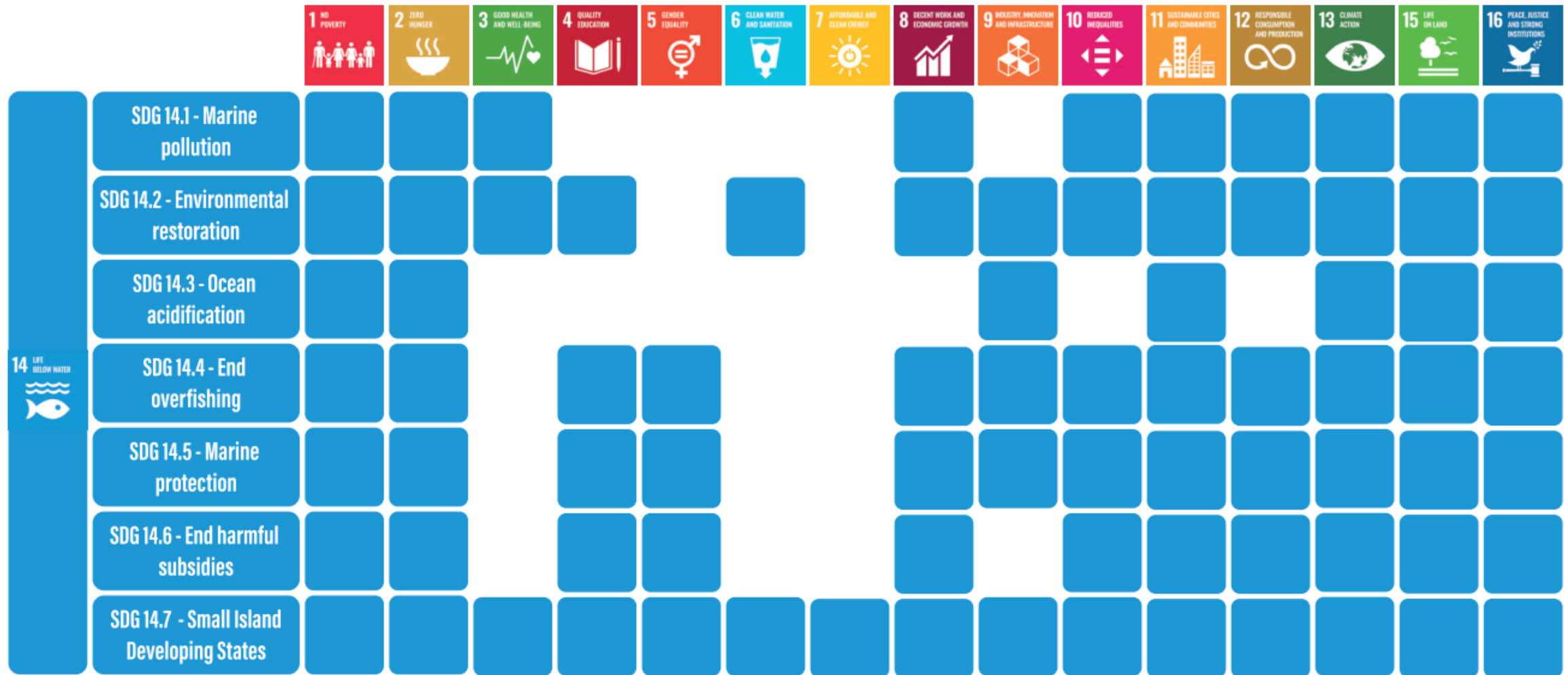


Relier les objectifs de conservation,
de développement et de coopération
pour accroître la résilience
au changement climatique, à l'insécurité
alimentaire et aux conflits émergents.



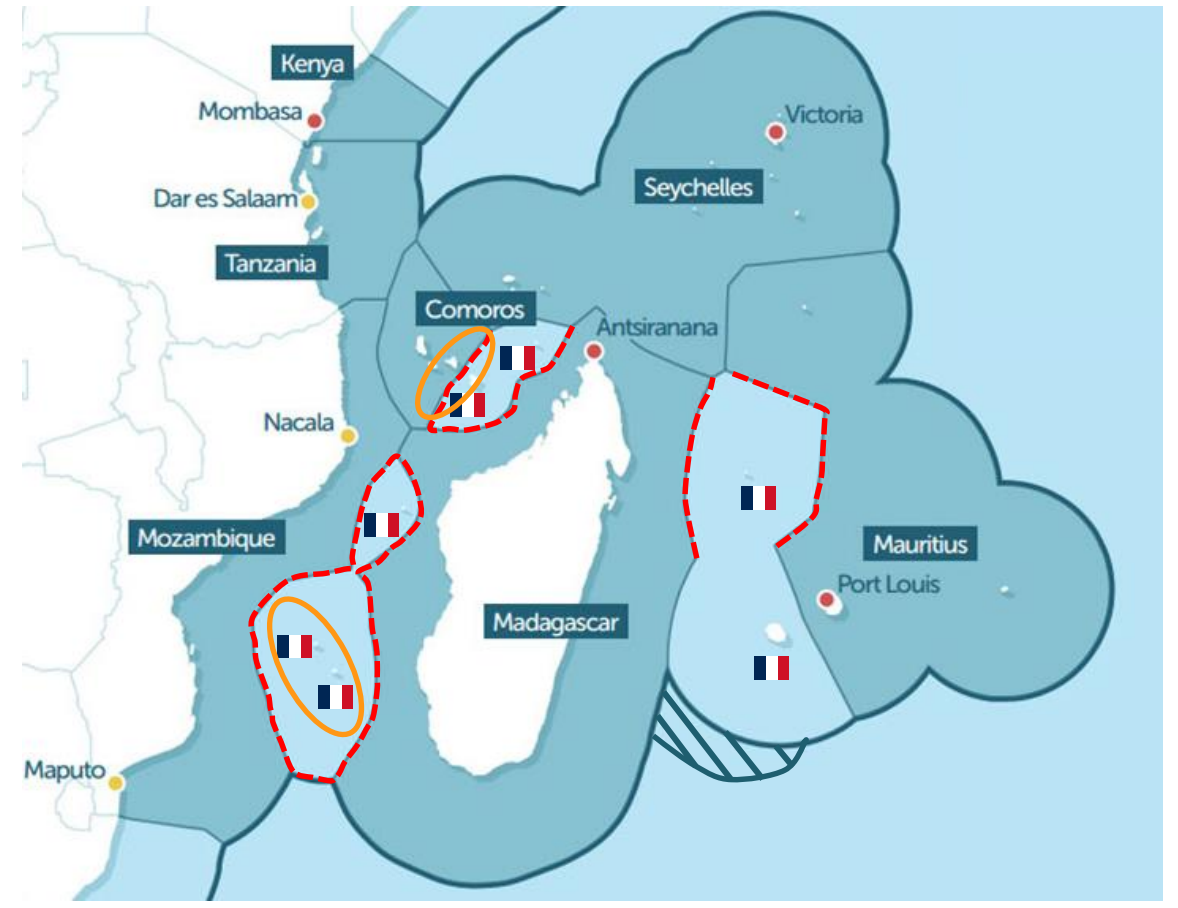
Réunion scientifique, zoom, 24 mars 2023

Un océan en bonne santé contribue à la durabilité



L'océan Indien occidental est menacé

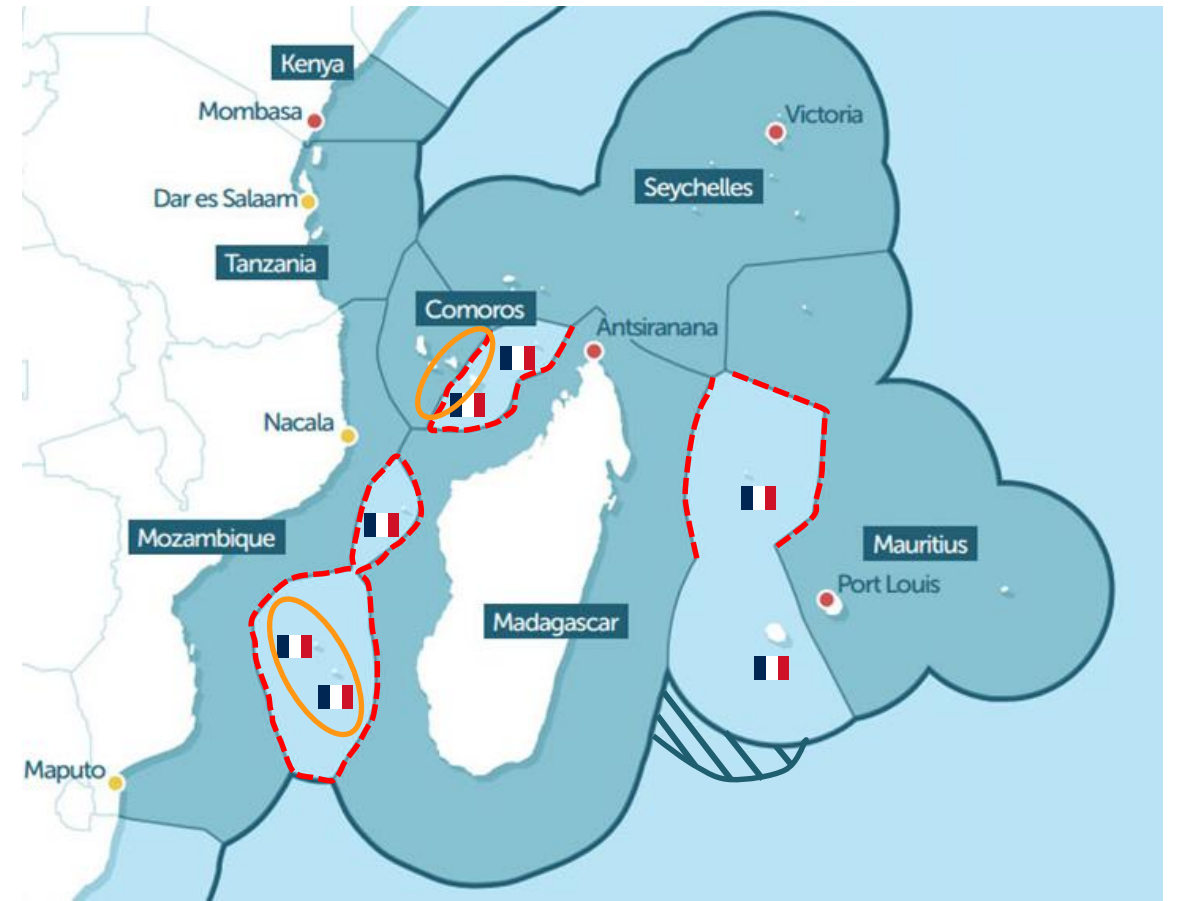
		SERIOUSNESS				
		NEGLIGIBLE	MINOR	SIGNIFICANT	MAJOR	CATASTROPHIC
		No disruptive effects; 'business as usual'	Tensions temporarily increase ; situation is manageable within existing processes	Conflict is temporary and generally constrained by existing arrangements	Significant disruption; limited to areas	Significant widespread disruptions
LIKELIHOOD						
Most unlikely but might occur in exceptional circumstances	RARE	Risques climatiques qui nécessiteraient interventions militaires				
Unlikely to occur without significant change in current circumstances	UNLIKELY					
Can occur in most circumstances in the foreseeable future	POTENTIAL	-	Rejection of a foreign presence or private assets Political instability and social tension due to economic/food insecurity	Growing influence of major powers in the region	Strategic infrastructure degradation or destruction Terrorist attack on public or private assets	-
Will occur in current circumstances	LIKELY	-	Mis-development and mis-adaptation to climate change Significant planned displacements	Pressure on HADR capacities	Sanitary crisis	-
Already occurs regularly	ALMOST CERTAIN	-	Criminal activity increase	More frequent incursions in EEZ Irregular migrations	-	Fish stock depletion



- France in the Indian Ocean**
- French territories
 - Exclusive Economic Zones (EEZ) recognized by the international community
- Conflicts hotspots**
- EEZ (disputed boundaries)
 - French requests of EEZ extension
 - Illegal fisheries hotspot

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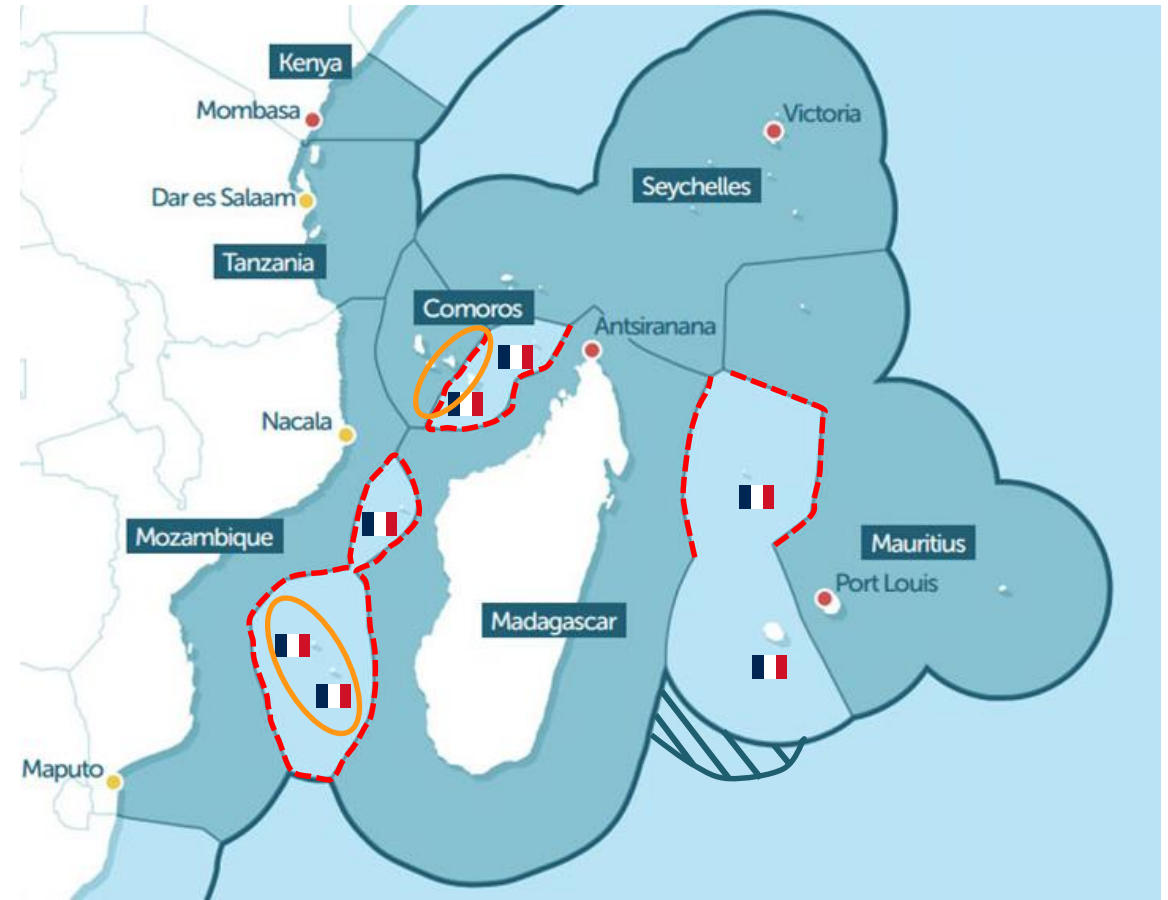
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France in the Indian Ocean

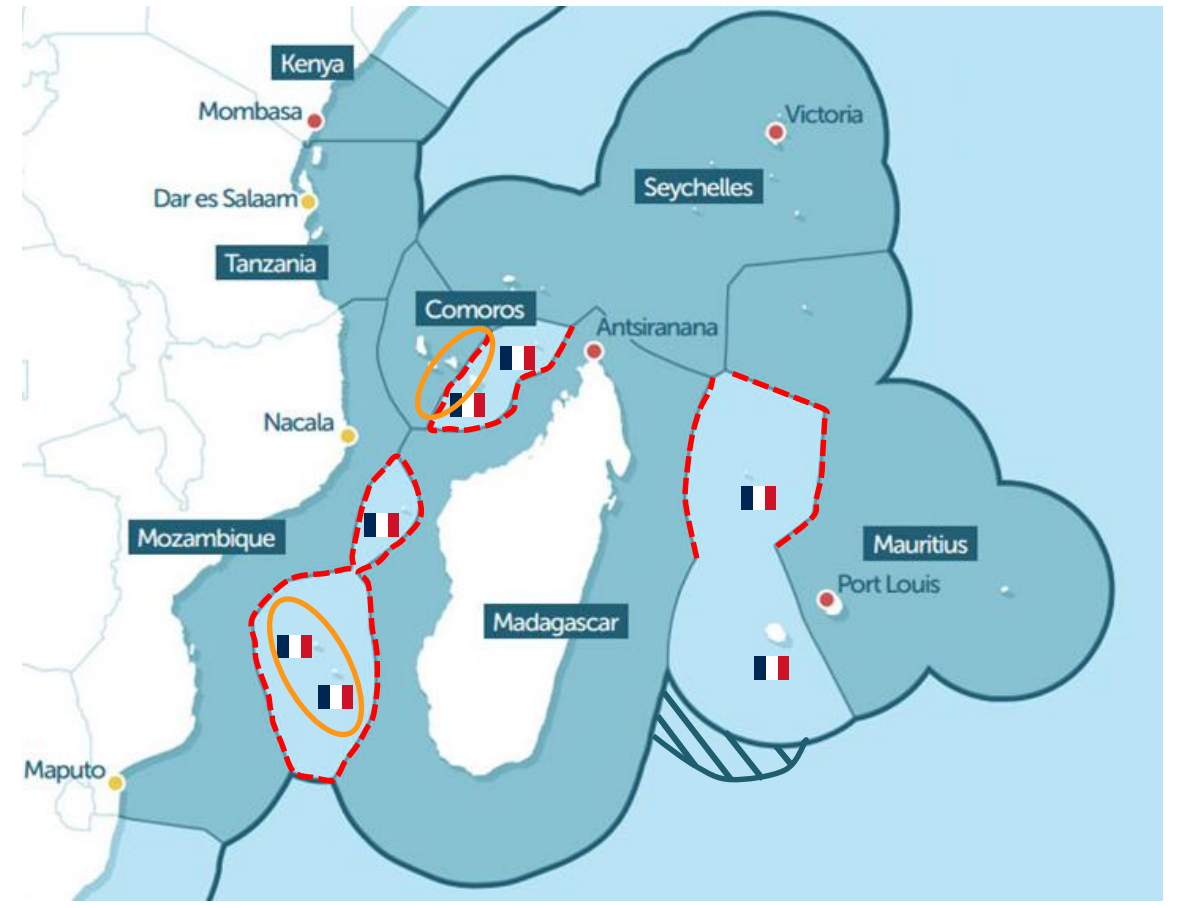
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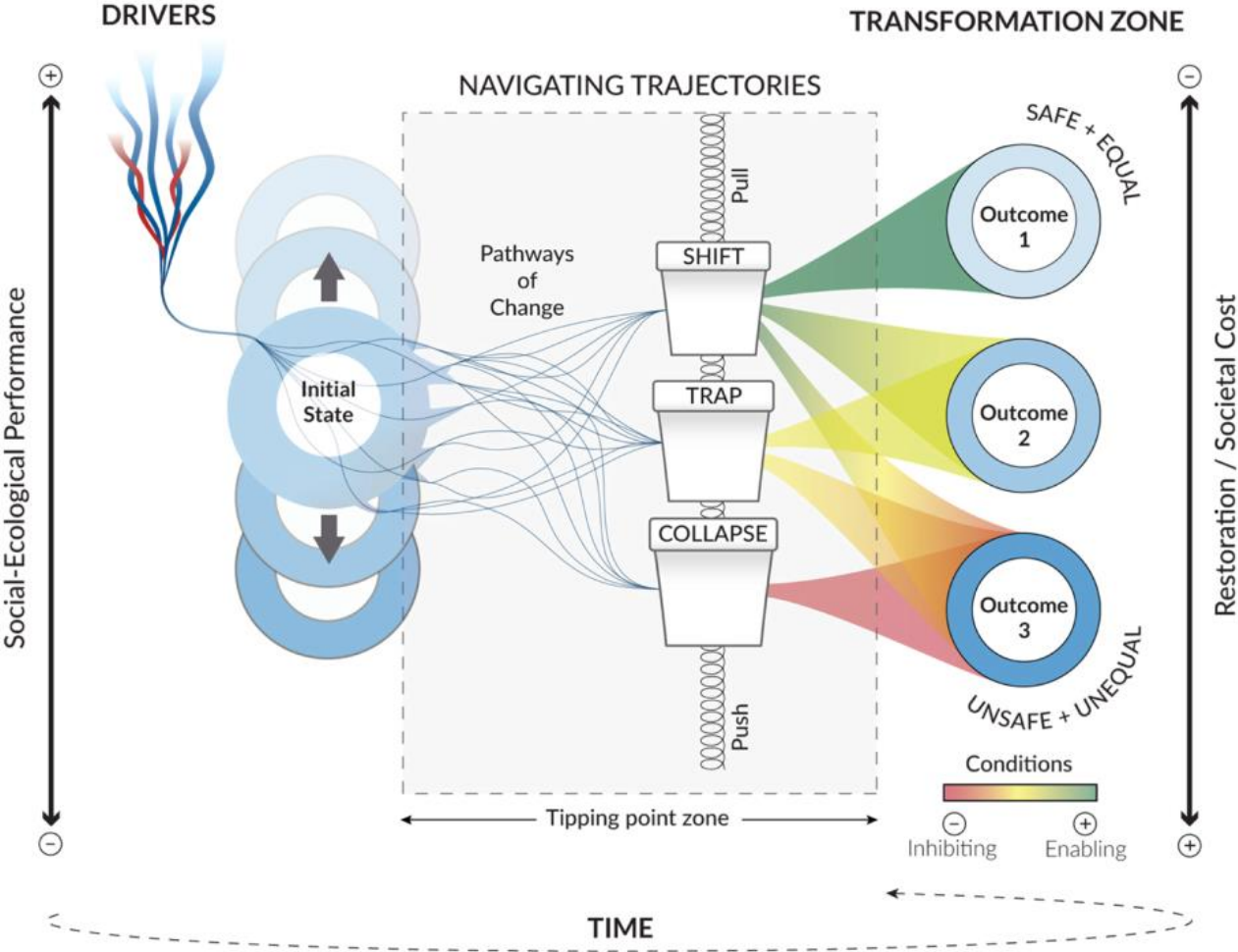


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Research gaps

- ▷ **Collecte et partage de données** fragmentées et non coordonnées sur l'état, les tendances et l'utilisation des ressources naturelles et sur les descripteurs du changement climatique
- ▷ Absence de **modélisation à haute résolution** et couplée atmosphère-océan
- ▷ Absence d'une **approche systémique socio-écologique** régionale de l'utilisation des ressources et des impacts climatiques
- ▷ Compréhension limitée de l'**importance du poisson** dans les systèmes alimentaires locaux, de l'océan à l'assiette, y compris la valeur nutritionnelle au-delà des protéines (par exemple, les micronutriments)
- ▷ Faible capacité de prédiction sur la façon dont les multiples facteurs directs et indirects interagissent pour modifier les **profils de vulnérabilité** régionaux et sous-régionaux
- ▷ Absence de méthodes de **mise à l'échelle des solutions** pour accroître la résilience au changement climatique, à l'insécurité alimentaire et aux conflits émergents
- ▷ **Renforcement des capacités** locales limité et inégalement réparti pour soutenir des approches innovantes de la gestion de la durabilité sur de longues périodes.

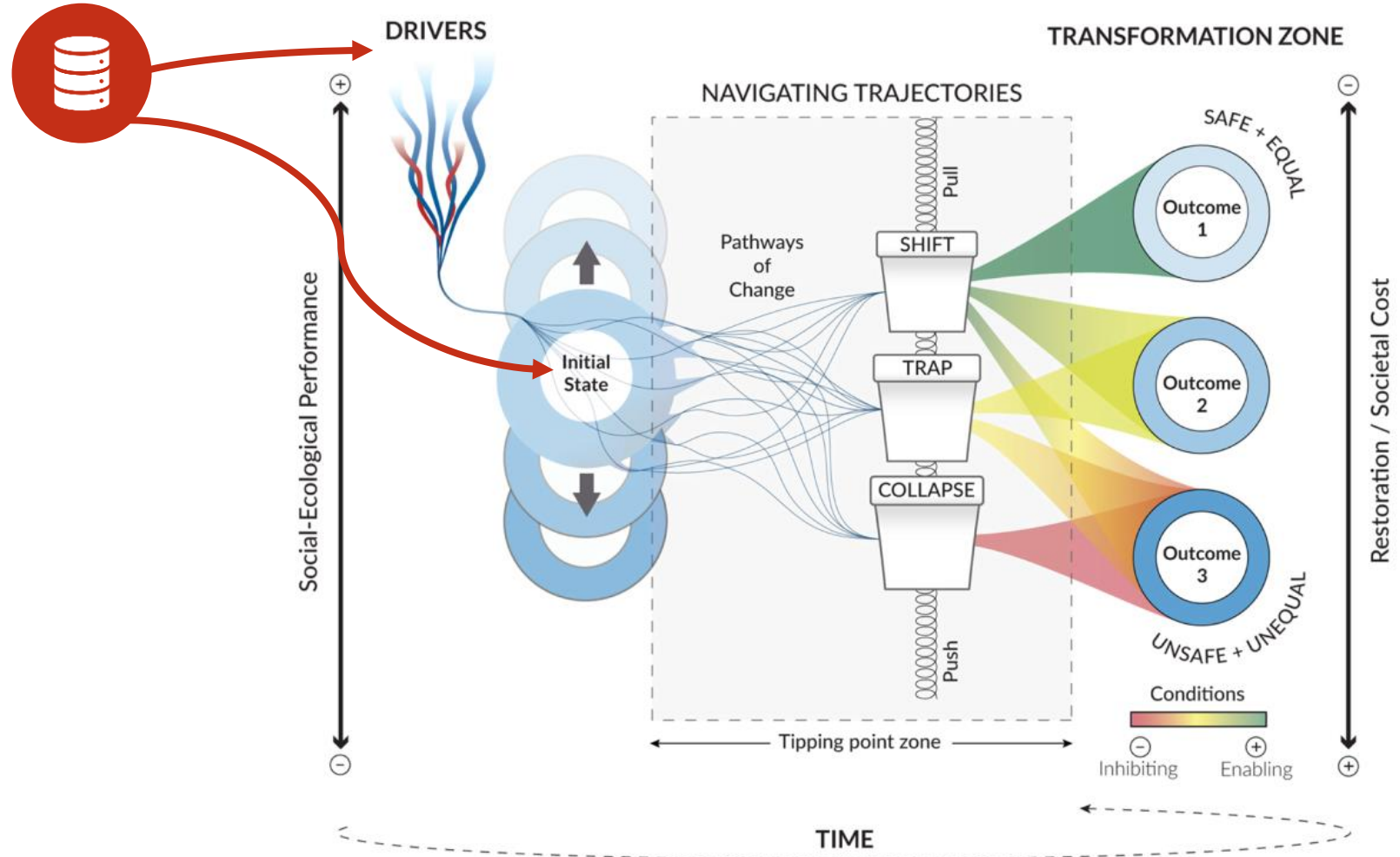
Paradigme de BRIDGES et fronts de connaissance



Paradigme de BRIDGES et fronts de connaissance

Challenge #1 – INNOVATE

climate-ocean-user-resource observation capacities to collect, store, and analyze data, and share information



Paradigme de BRIDGES et fronts de connaissance

Challenge #1 – INNOVATE

climate-ocean-user-resource observation capacities to collect, store, and analyze data, and share information

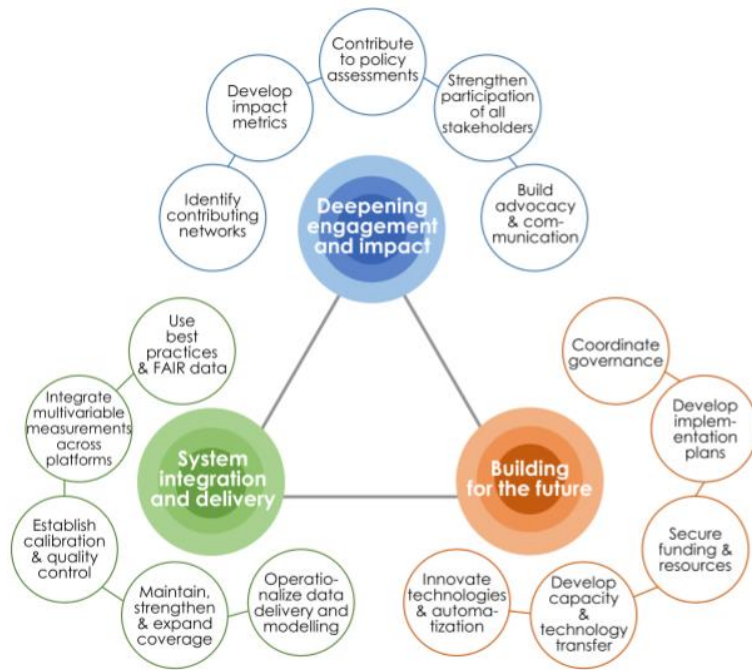


Sub-challenge #1.1 – Combined use of multiple observing systems

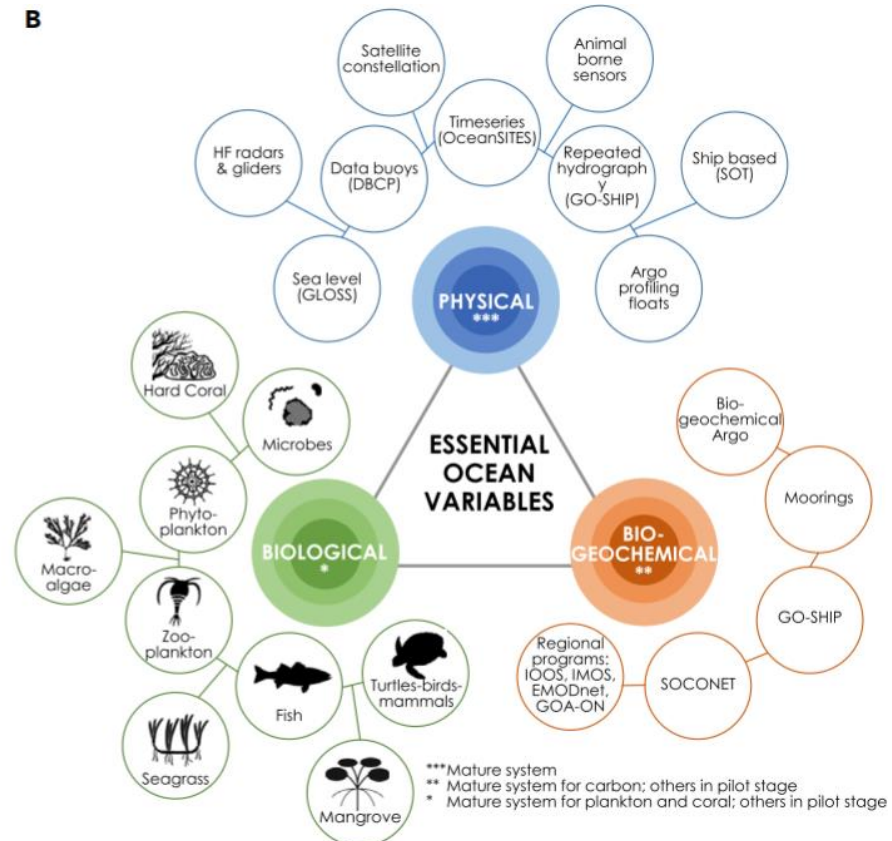
Sub-challenge #1.2 – Open and FAIR data

Sub-challenge #1.3 – Information processing

A



B



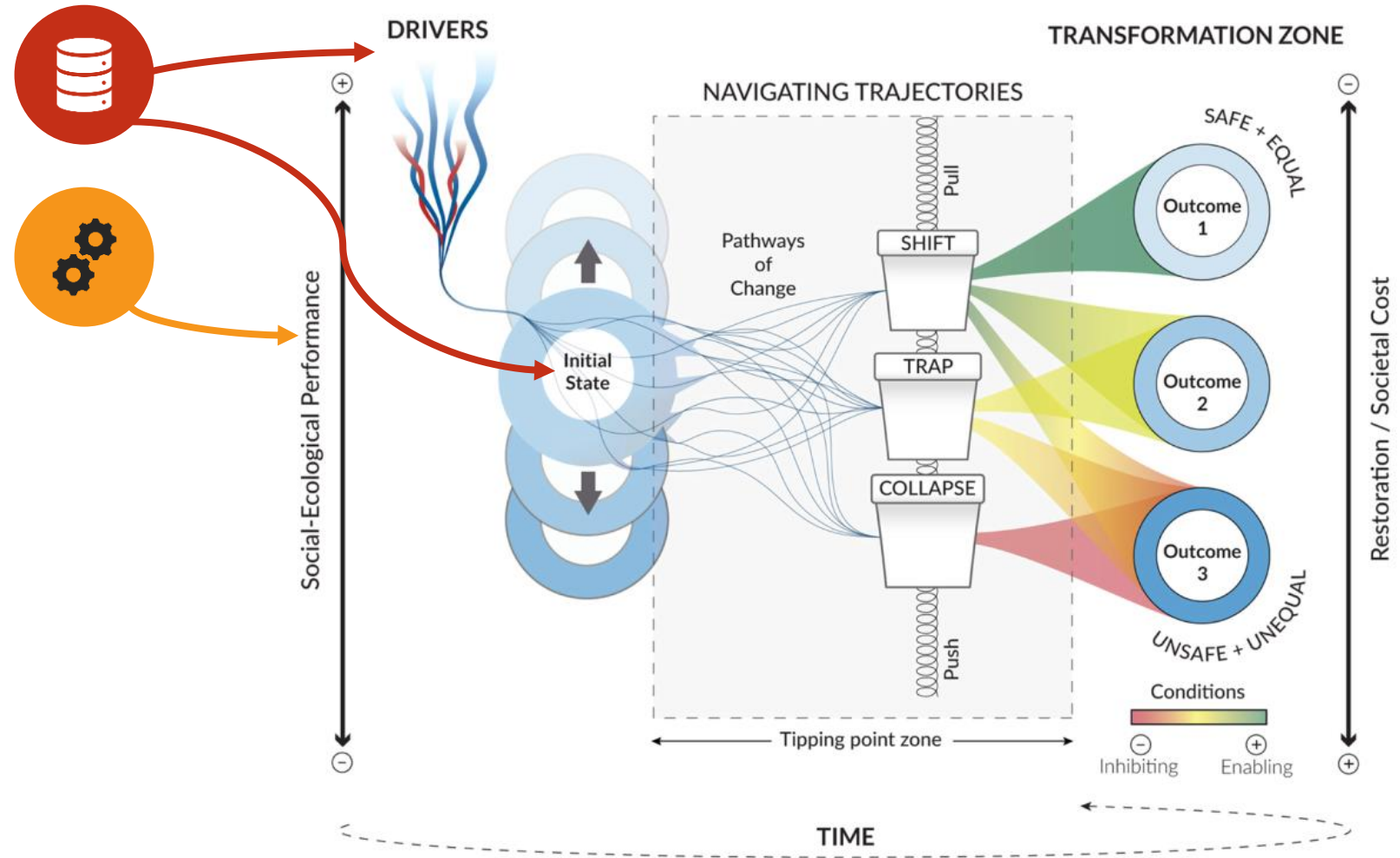
Paradigme de BRIDGES et fronts de connaissance

Challenge #1 – INNOVATE

climate-ocean-user-resource observation capacities to collect, store, and analyze data, and share information

Challenge #2 – MODEL

dynamic social-ecological systems accounting for multi-level and multi-scale interconnections and feedback loops



Paradigme de BRIDGES et fronts de connaissance

Challenge #2 – MODEL

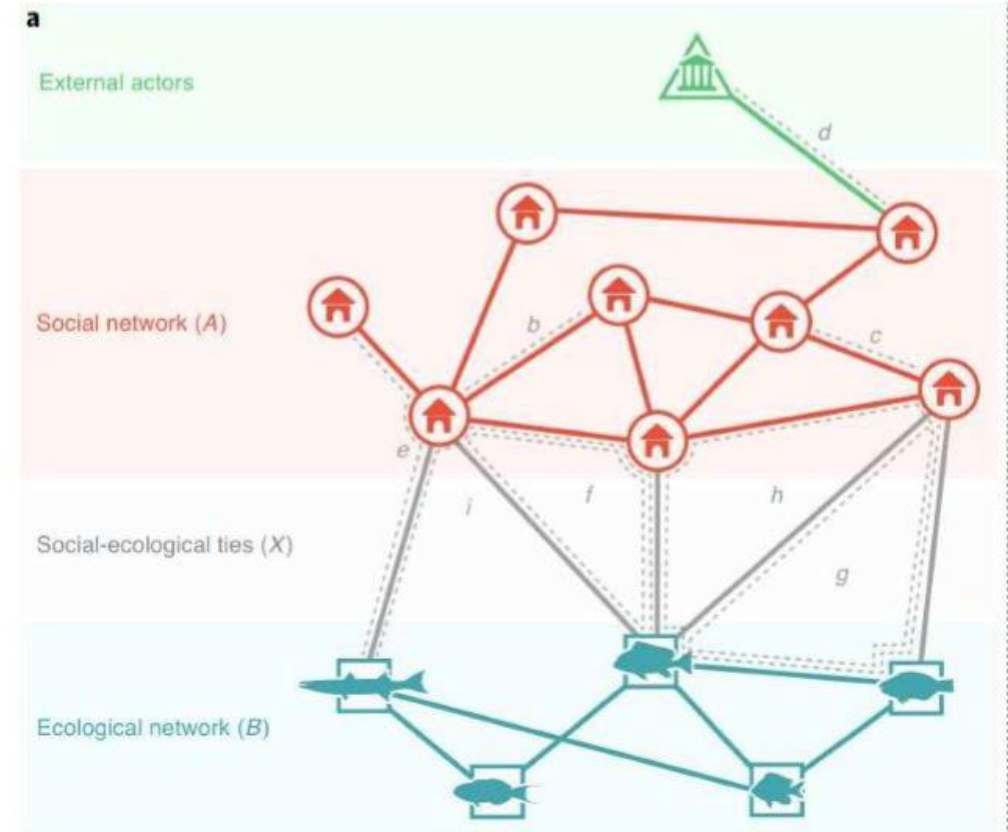
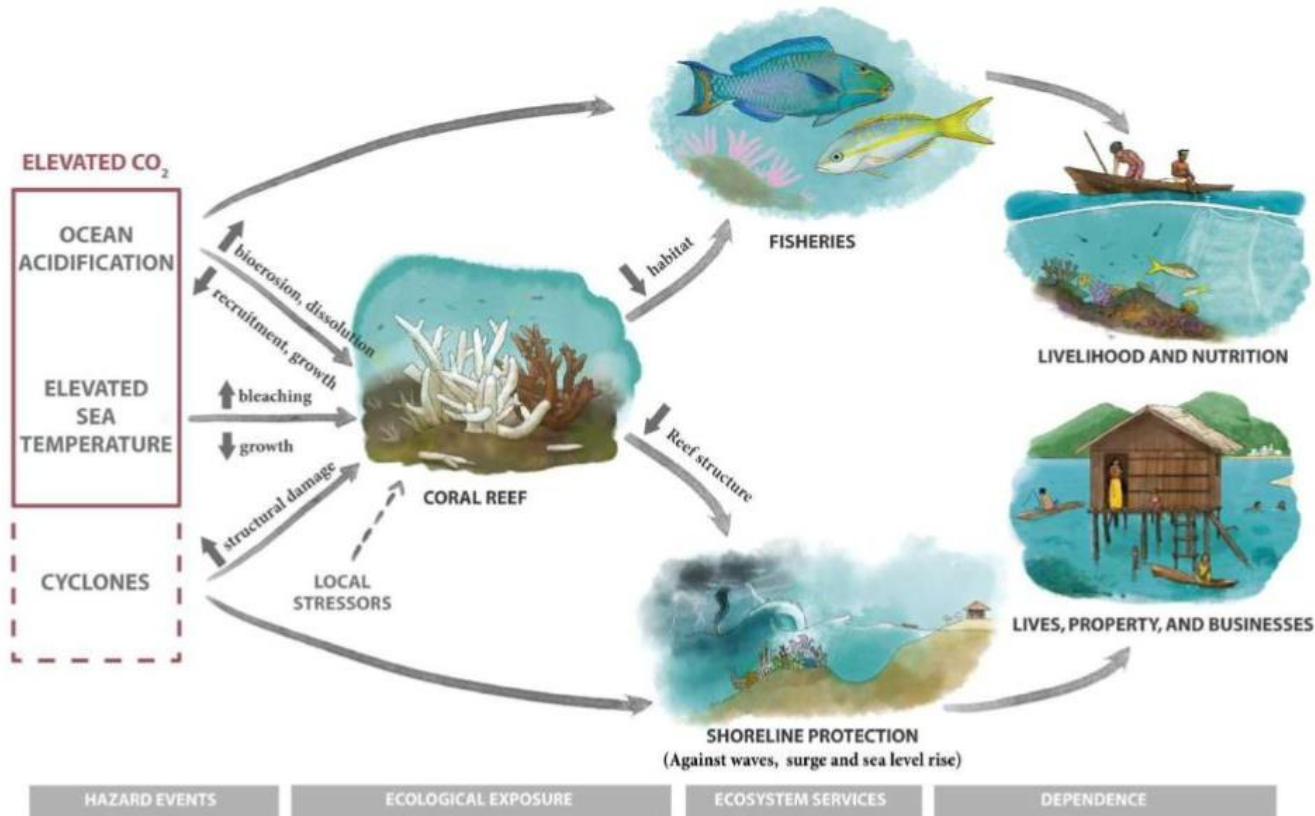
dynamic social-ecological systems
accounting for multi-level and multi-scale
interconnections and feedback loops



Sub-challenge #2.1 – Social-ecological modeling

Sub-challenge #2.2 – Connectivity

Sub-challenge #2.3 – Marine protected area networks



Paradigme de BRIDGES et fronts de connaissance

Challenge #2 – MODEL

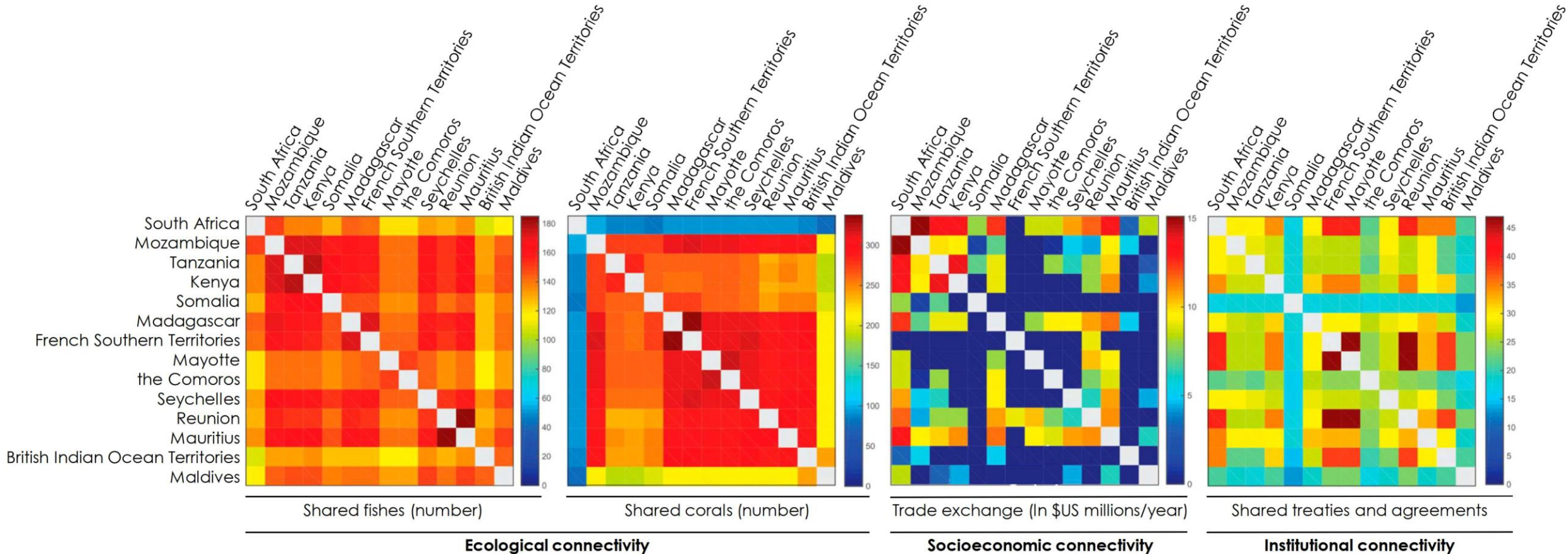
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Paradigme de BRIDGES et fronts de connaissance

Challenge #2 – MODEL

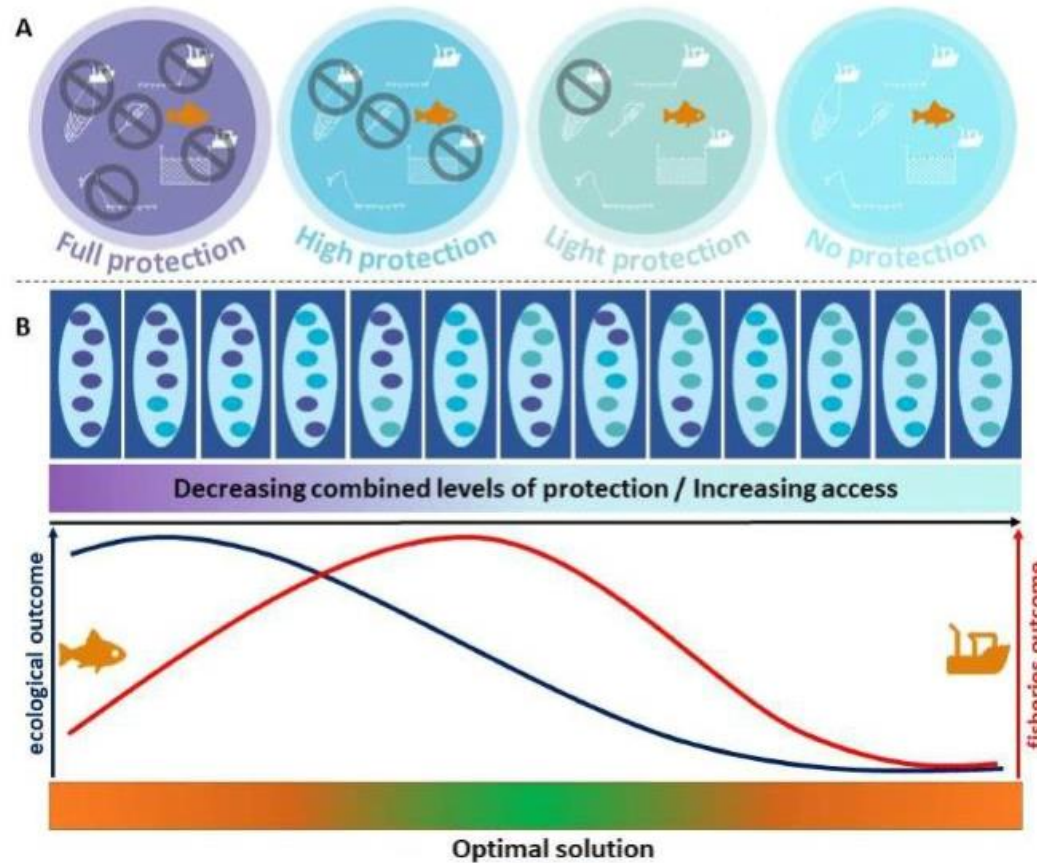
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Paradigme de BRIDGES et fronts de connaissance

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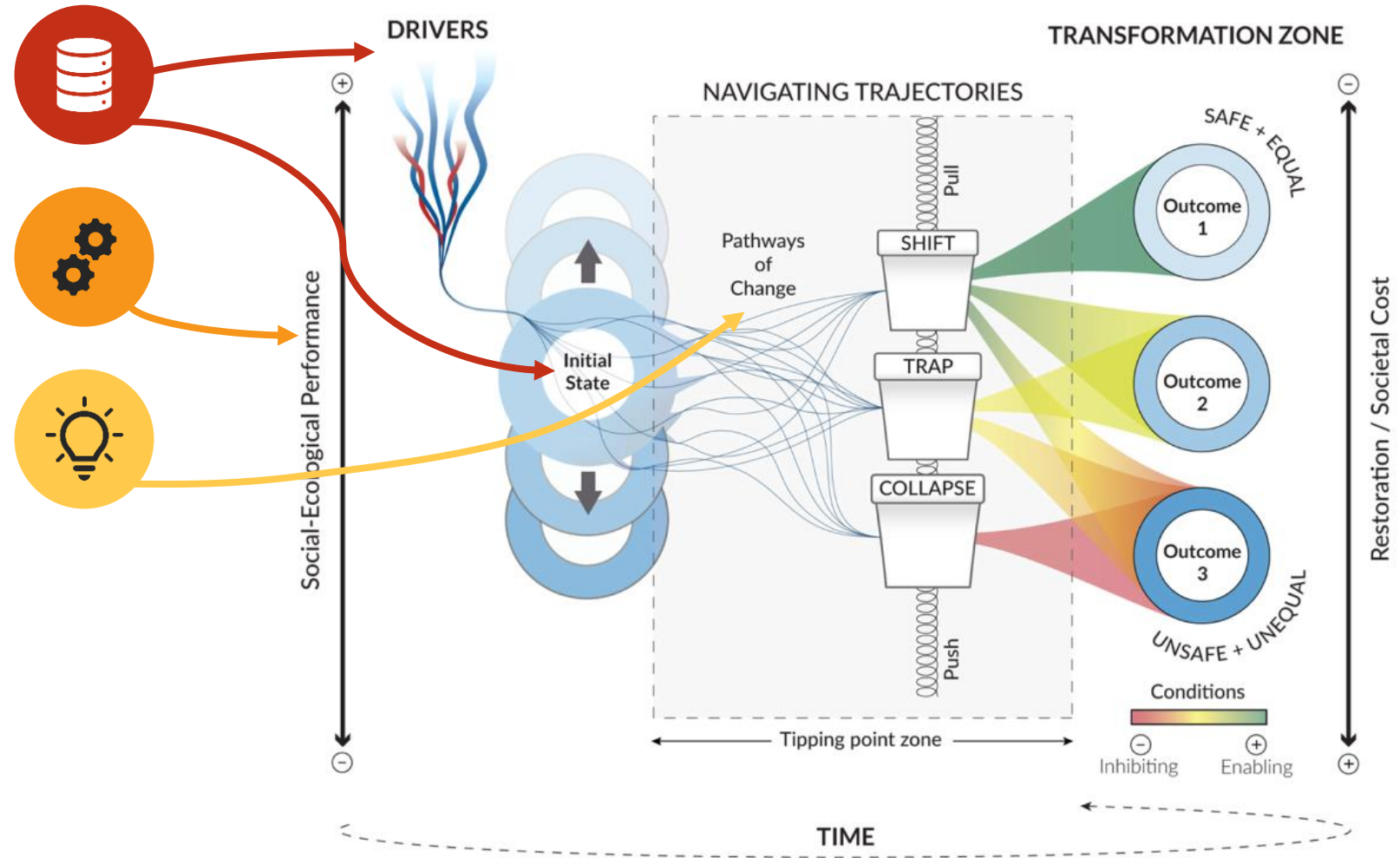
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Challenge #2 – MODEL

dynamic social-ecological systems accounting for multi-level and multi-scale interconnections and feedback loops

Challenge #3 – ANTICIPATE

vulnerabilities and conflicts to support rapid and flexible responses to impacts on livelihoods and industries



Paradigme de BRIDGES et fronts de connaissance

Challenge #3 – ANTICIPATE

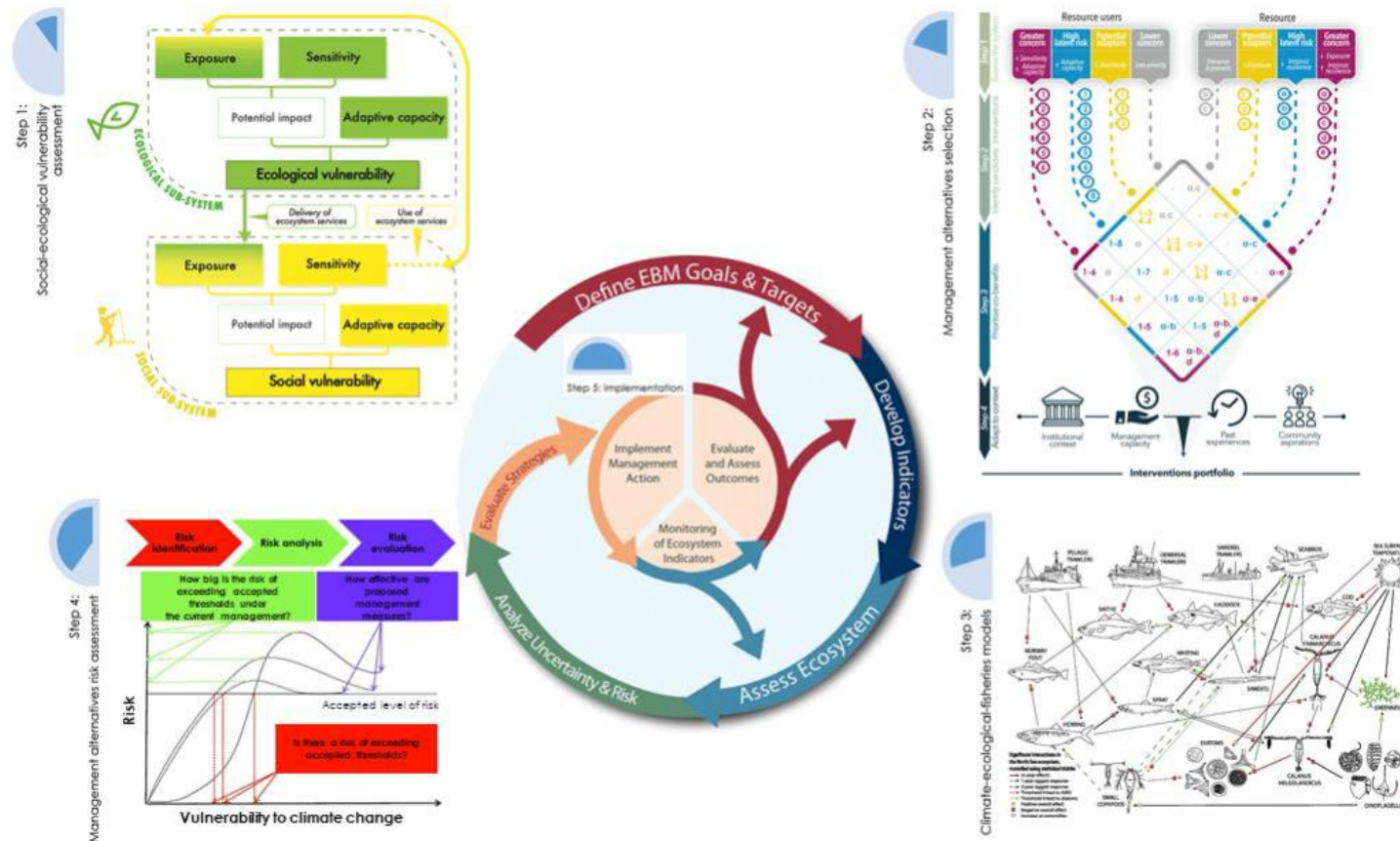
vulnerabilities and conflicts to support rapid and flexible responses to impacts on livelihoods and industries



Sub-challenge #3.1 – Vulnerability profiles and interventions portfolio

Sub-challenge #3.2 – Climate-ecological-social scenarios

Sub-challenge #3.3 – Risk assessment



Paradigme de BRIDGES et fronts de connaissance

Challenge #1 – INNOVATE

climate-ocean-user-resource observation capacities to collect, store, and analyze data, and share information

Challenge #2 – MODEL

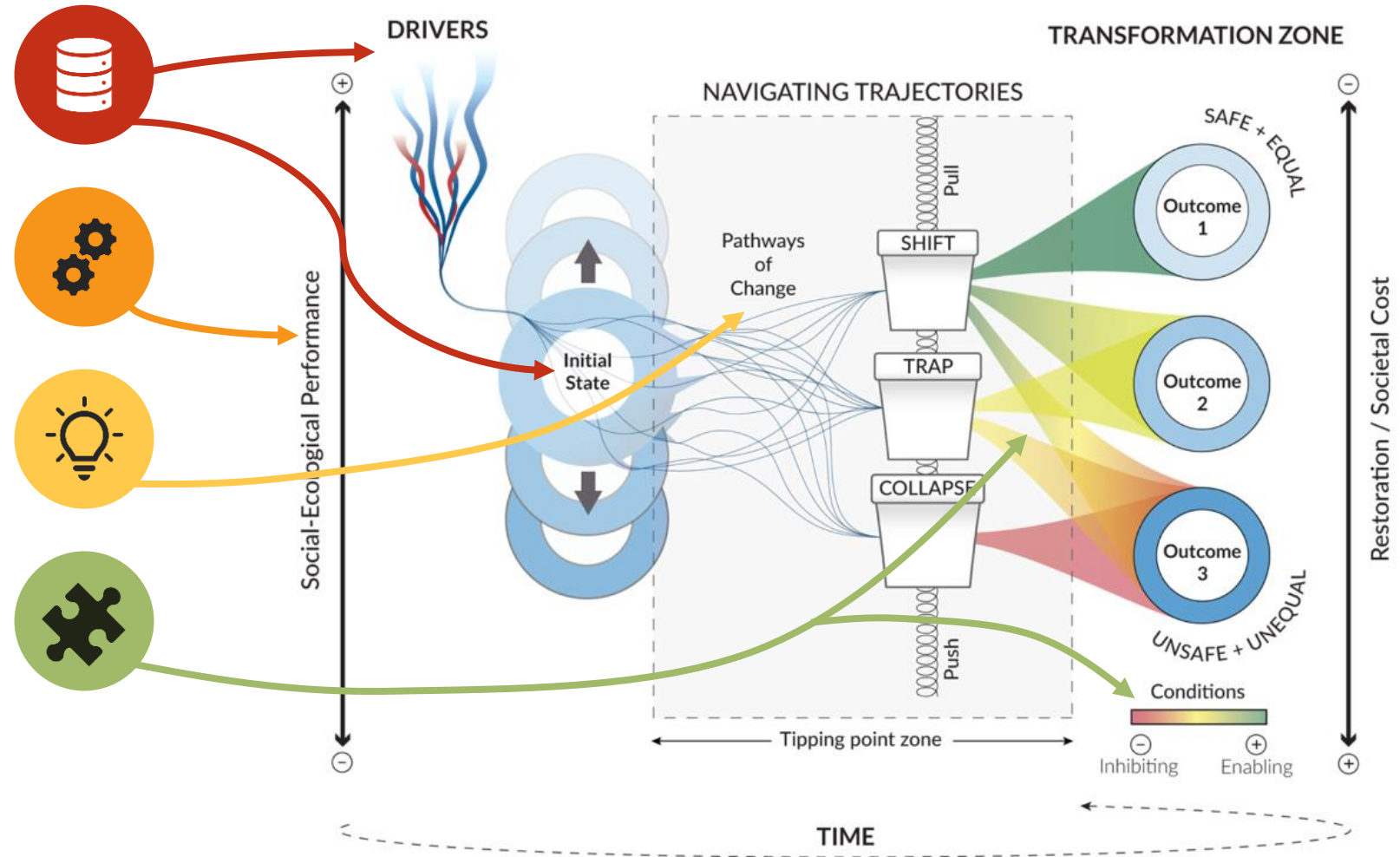
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vulnerabilities and conflicts to support rapid and flexible responses to impacts on livelihoods and industries

Challenge #4 – SOLVE

sustainability problems, co-developing pathways to mitigate future tensions and increase resilience – living lab approach



Paradigme de BRIDGES et fronts de connaissance

Challenge #4 – SOLVE

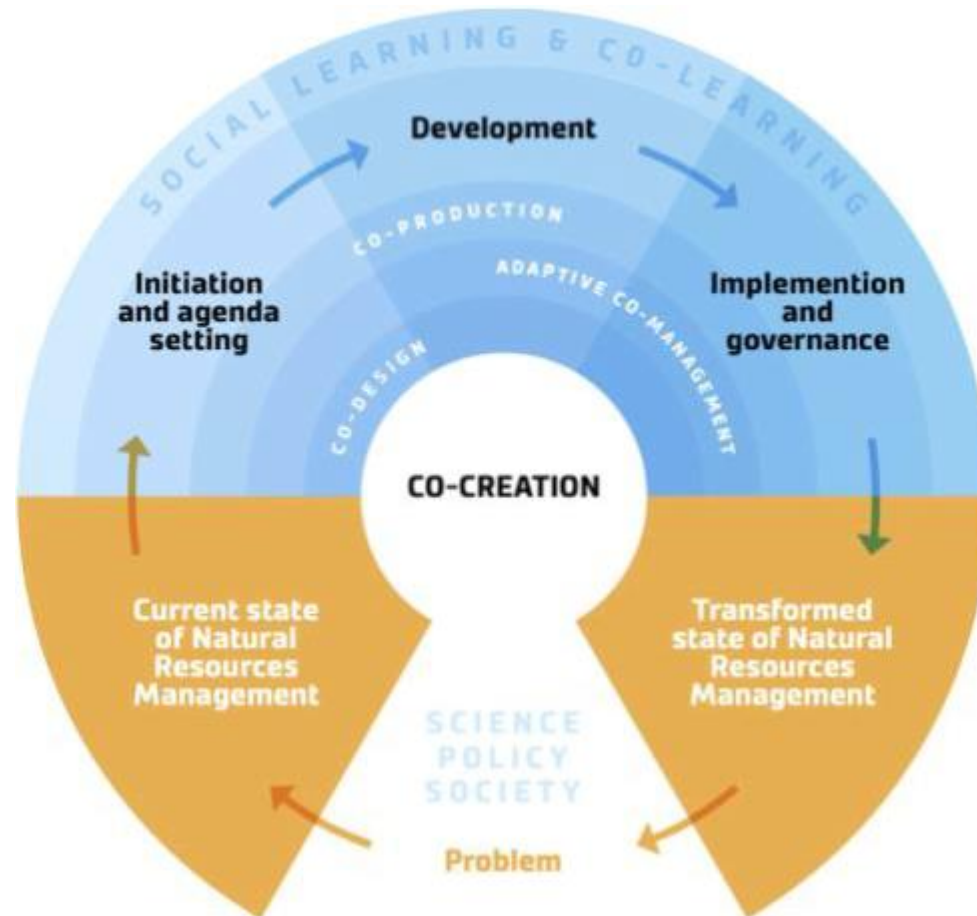
sustainability problems, co-developing pathways to mitigate future tensions and increase resilience – living lab approach



Sub-challenge #4.1 – Blind spots

Sub-challenge #4.2 – Co-production

Sub-challenge #4.3 – Scenarios and narratives



Paradigme de BRIDGES et fronts de connaissance

Challenge #5 – TRANSFORM

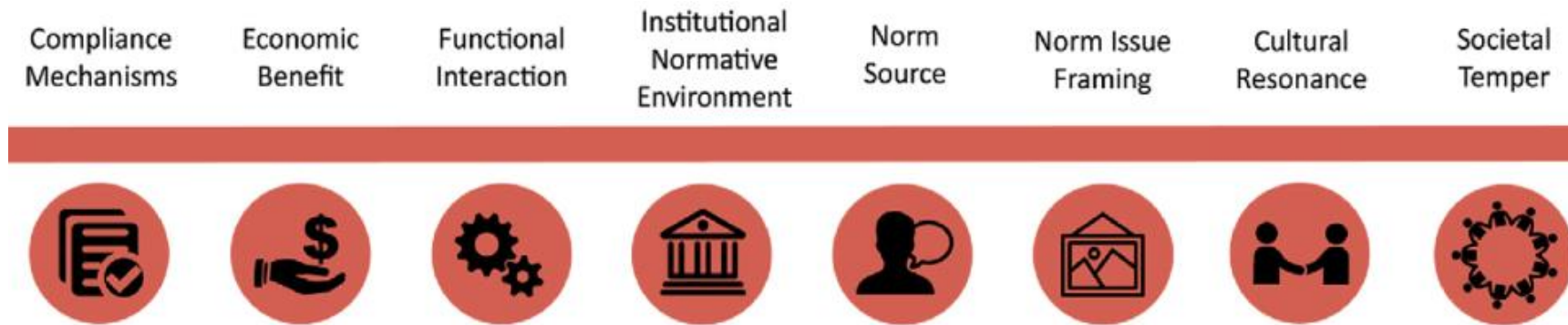
capacity building and training through research to enable transition towards a new holistic, equitable and multi-sectoral governance



Sub-challenge #5.1 – Paradigm shift

Sub-challenge #5.2 – Food and health systems

Sub-challenge #5.3 – Impact



Vision transformative de BRIDGES

Challenge #1 – INNOVATE

climate-ocean-user-resource observation capacities to collect, store, and analyze data, and share information



Challenge #2 – MODEL

dynamic social-ecological systems accounting for multi-level and multi-scale interconnections and feedback loops



Challenge #3 – ANTICIPATE

vulnerabilities and conflicts to support rapid and flexible responses to impacts on livelihoods and industries



Challenge #4 – SOLVE

sustainability problems, co-developing pathways to mitigate future tensions and increase resilience – living lab approach



Challenge #5 – TRANSFORM

capacity building and training through research to enable transition towards a new holistic, equitable and multi-sectoral governance



5 défis complémentaires pour un objectif: augmenter résilience au changement climatique et réduire les risques de conflits

Challenge #1 – INNOVATE

climate-ocean-user-resource observation capacities to collect, store, and analyze data, and share information

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dynamic social-ecological systems accounting for multi-level and multi-scale interconnections and feedback loops

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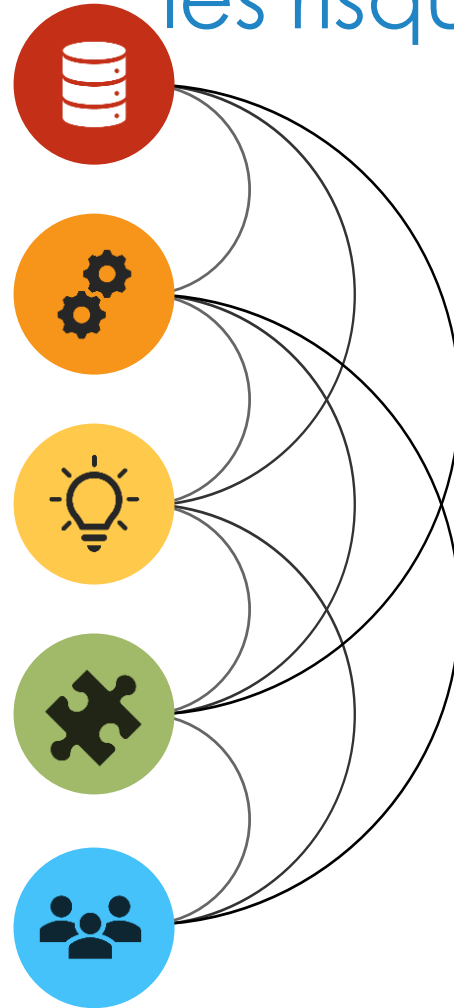
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sustainability problems, co-developing pathways to mitigate future tensions and increase resilience – living lab approach

Challenge #5 – TRANSFORM

capacity building and training through research to enable transition towards a new holistic, equitable and multi-sectoral governance



Une colonne vertébrale de 6 projets



Intégration innovante des données socio-écologiques

Nouveaux observatoires des systèmes socio-écologiques



Support au développement d'un jumeau numérique régional



Co-construction pour des transformations durables



Aires marines protégées et hot-spots de biodiversité

Evaluation de l'impact des transformations durables



PC#1 : Innovative integration of social-ecological information

Challenge #1 – INNOVATE

climate-ocean-user-resource observation capacities to collect, store, and analyze data, and share information



Challenge #2 – MODEL

dynamic social-ecological systems accounting for multi-level and multi-scale interconnections and feedback loops



Challenge #3 – ANTICIPATE

vulnerabilities and conflicts to support rapid and flexible responses to impacts on livelihoods and industries



Challenge #4 – SOLVE

sustainability problems, co-developing pathways to mitigate future tensions and increase resilience – living lab approach



Challenge #5 – TRANSFORM

capacity building and training through research to enable transition towards a new holistic, equitable and multi-sectoral governance



Objectif : Identifier, cataloguer, organiser et donner accès à toutes les données existantes sur la région qui seront nécessaires pour étudier les systèmes socio-écologiques et les intégrer dans notre nouvelle approche de réseau.

Comprend : impacts climatiques passés sur les systèmes socio-écologiques côtiers et marins, conditions climatiques et océanographiques actuelles et projetées, surveillance et évaluations biologiques et écologiques, évaluations de la pêche, contribution connue des prises de pêche à la nutrition, descripteurs sociaux, composantes institutionnelles.

Durée : 24 mois

Budget : 300 k€

Etablissement coordinateur : Université de La Réunion

Consortium : CNRS, MNHN, IRD, METEO-FRANCE, Ifremer, CUFR Mayotte

PC#2 : Novel social-ecological systems observatories

Challenge #1 – INNOVATE

climate-ocean-user-resource observation capacities to collect, store, and analyze data, and share information



Challenge #2 – MODEL

dynamic social-ecological systems accounting for multi-level and multi-scale interconnections and feedback loops



Challenge #3 – ANTICIPATE

vulnerabilities and conflicts to support rapid and flexible responses to impacts on livelihoods and industries



Challenge #4 – SOLVE

sustainability problems, co-developing pathways to mitigate future tensions and increase resilience – living lab approach



Challenge #5 – TRANSFORM

capacity building and training through research to enable transition towards a new holistic, equitable and multi-sectoral governance



Objectif : Développer cadres, outils et plateformes innovants pour collecter et intégrer informations multi-échelles physiques, chimiques, écologiques, sociales et culturelles (y compris institutionnelles) qui serviront de base au suivi à long terme des systèmes socio-écologiques. Cadres, outils et plateformes ouverts et disponibles pour tous les acteurs de la région, tant pour la recherche que pour le développement.

Durée : 120 mois

Budget : 3,000 k€

Etablissement coordinateur : CNRS

Consortium : MNHN, IRD, Université de la Réunion, IRIS, METEO-FRANCE, Ifremer, CUFR Mayotte

PC#3 : Support the development of a regional digital social-ecological system avatar

Challenge #2 – MODEL

dynamic social-ecological systems accounting for multi-level and multi-scale interconnections and feedback loops



Challenge #3 – ANTICIPATE

vulnerabilities and conflicts to support rapid and flexible responses to impacts on livelihoods and industries



Challenge #4 – SOLVE

sustainability problems, co-developing pathways to mitigate future tensions and increase resilience – living lab approach



Objectif : Créer un jumeau numérique, ou avatar, des systèmes socio-écologiques imbriqués régionaux, prenant en compte les interconnexions et les boucles de rétroaction multi-niveaux et multi-échelles. Avatar ensuite utilisé pour modéliser changements climatiques, écologiques et sociaux dans les systèmes imbriqués.

Durée : 72 mois

Budget : 2,000 k€

Etablissement coordinateur : Ifremer

Consortium : CNRS, MNHN, IRD, METEO-FRANCE, Université de la Réunion, CUFR Mayotte

PC#4 : Identification of climate-change/resource-use conflict hotspots and multi-use MPA networks

Challenge #3 – ANTICIPATE

vulnerabilities and conflicts to support rapid and flexible responses to impacts on livelihoods and industries



Durée : 72 mois

Budget : 2,000 k€

Challenge #4 – SOLVE

sustainability problems, co-developing pathways to mitigate future tensions and increase resilience – living lab approach



Etablissement coordinateur : Ifremer

Consortium : MNHN, IRD, Université de la Réunion, IRIS, CUFR Mayotte, CNRS

Challenge #5 – TRANSFORM

capacity building and training through research to enable transition towards a new holistic, equitable and multi-sectoral governance



PC#5 : Enabling co-productive agility for collaborative pathways to sustainability transformations

Objectif : Identification des conditions propices à l'agilité dans la coproduction de connaissances et développement d'un cadre pour aider à naviguer les tensions et les opportunités dans la mise en œuvre d'une théorie partagée du changement.

Durée : 120 mois

Budget : 1,500 k€

Etablissement coordinateur : IRD

Consortium : CNRS, MNHN, IRIS, Ifremer, CUFR, Université de La Réunion

Challenge #4 – SOLVE

sustainability problems, co-developing pathways to mitigate future tensions and increase resilience – living lab approach



Challenge #5 – TRANSFORM

capacity building and training through research to enable transition towards a new holistic, equitable and multi-sectoral governance



PC#6 : Impact assessment framework for sustainability transformations

Objectif : Développement d'un cadre opérationnel pour évaluer la performance et les impacts des partenariats transdisciplinaires pour la durabilité et leur contribution à des avenir durables.

Durée : 120 mois

Budget : 1,500 k€

Etablissement coordinateur : IRD

Consortium : CNRS, MNHN, CUFR, Université de La Réunion, Ifremer

Challenge #5 – TRANSFORM

capacity building and training
through research to enable transition
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and multi-sectoral governance



PC#7 : Logistical structures and living labs

Challenge #1 – INNOVATE

climate-ocean-user-resource observation capacities to collect, store, and analyze data, and share information



Challenge #2 – MODEL

dynamic social-ecological systems accounting for multi-level and multi-scale interconnections and feedback loops



Challenge #3 – ANTICIPATE

vulnerabilities and conflicts to support rapid and flexible responses to impacts on livelihoods and industries



Challenge #4 – SOLVE

sustainability problems, co-developing pathways to mitigate future tensions and increase resilience – living lab approach



Challenge #5 – TRANSFORM

capacity building and training through research to enable transition towards a new holistic, equitable and multi-sectoral governance



Objectif : Acquisition, stockage, analyse, modélisation de données ; Sites de démonstration et living labs ; Ressources logistiques ; Outils structurants durables et open-science.

Durée : 120 mois

Budget : 6,000 k€

Etablissement coordinateur : CNRS

Consortium : Tous les partenaires

Suivi de la progression des blocs de construction BRIDGES

Éléments de BRIDGES

Année

2023 2024 2025 2026 2027 2028 2029 2030 2031 2032

Milestones and progress indicators

Gouvernance, animation scientifique et communication

- Site web
- Colloque de lancement
- Réunions ComEx et CI
- Réunions CSI
- Réunions scientifiques sur les défis de BRIDGES
- Réunions conjointes avec autres initiatives
- Science to policy knowledge cafés
- Scientific conferences



- Overall number of publications
- Number of public policy informed by BRIDGES outputs**
- Public-private partnerships
- Long-term challenges in research organizations inspired by BRIDGES**

Projets ciblés

- PC#1. Social-ecological information integration
- PC#2. Novel social-ecological systems observatories
- PC#3. Regional digital social-ecological system avatar
- PC#4. Conflict hotspots and multi-use MPA networks
- PC#5. Co-productive agility and sustainability pathways
- PC#6. Sustainability transformations
- PC#7. Logistical structures and living labs



- Presence and origin of co-funding schemes**
- Engagement of stakeholders
- Co-development of scenarios**
- Scientific publications
- Perceptions of impacts by local actors
- Participation of BRIDGES actors in regional and stakeholders committees**

Appels ouverts

- AMI sur projets inter-défis et living labs (vague 1)
- AO sur projets inter-défis et living labs (vague 1)
- AMI sur projets inter-défis et living labs (vague 2)
- AO sur projets inter-défis et living labs (vague 2)



- Number, quality, and interdisciplinarity of applicants
- Presence and origin of co-funding schemes
- Engagement of stakeholders**
- Scientific publications

Renforcement des capacités et éducation

- Programme international de Master
- Ecole d'été interprofessionnelle (école flottante)
- Programmes de renforcement des capacités



- Number of participants
- Participants entering academia
- Participants creating or entering sustainable businesses**

Équipement

- Acquisition, stockage, analyse, modélisation de données
- Sites de démonstration et living labs
- Resources logistiques
- Outils structurants durables et open-science



- Sensors deployment
- Data sharing platform
- Operating digital twin sub-models
- Operating social-ecological avatar**
- Citizen science data acquisition

Suivi de la progression globale du changement transformateur de BRIDGES

