

Strategic Research Agenda: Sharing major comments from the web-consultation

**STAR-Alliance Workshop
Paris, 12-13 November 2012**



Web consultation of the SRA

- First draft of the SRA finished on April 2012
- A Questionnaire was prepared
- Request to complete **questionnaire sent to 4000 email addresses:** Mid-July 2012.
- Questionnaire was available on the “Radioecology Exchange” (www.star-radioecology.org)
- Deadline for sending responses was 1 October 2012



The Questionnaire

- Of the 15 lines of research proposed, which **three** do you think are the **most Important** to address? **Why?**

- **Challenge One:** To predict human and wildlife exposure more robustly by quantifying key processes that influence radionuclide transfers, and incorporate the knowledge into new dynamic models

4 lines of research: A, B, C and D

- **Challenge Two:** To determine ecological consequences under the realistic conditions that organisms are exposed

5 lines of research: E, F, G, H and I

- **Challenge Three:** To improve human and environmental radiation protection by integrating radioecology

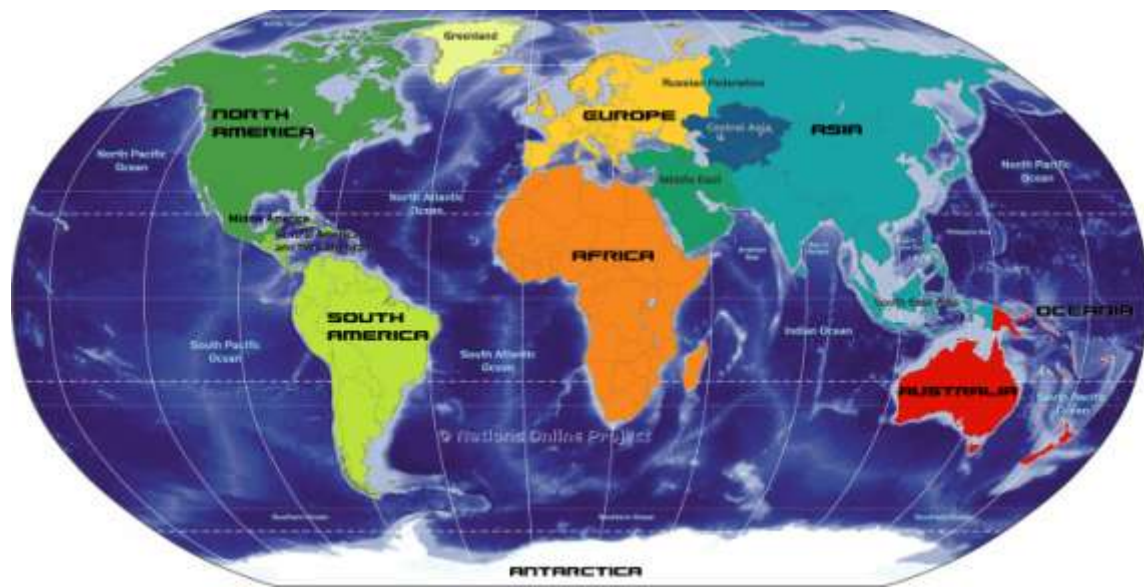
6 lines of research: J, K, L, M, N and O

The Questionnaire

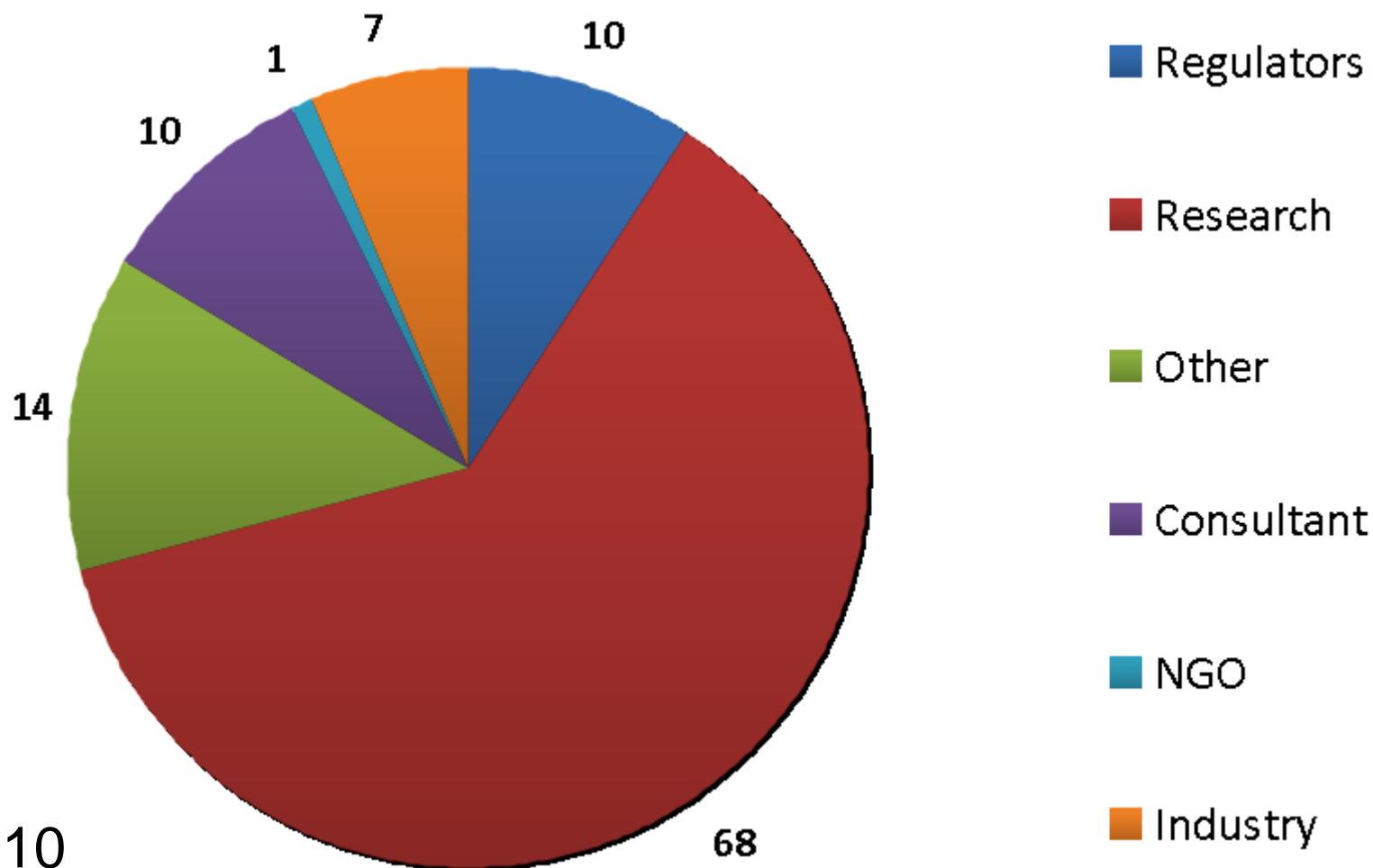
- Of the 15 lines of research proposed, which **three** do you think are the most Important to address? Why?
- Which of the above lines of research do you think will be **most difficult to achieve**? Why?
- **Other research challenges** which should have been included. **Why**?
- **Interest/activities** on radioecology of the responders.
- **Type of organization, Country**, answers on behalf of their organisation or as individuals.
- Do you **want to be updated** by email on the development of the SRA and the Workshop in Paris?

The Responders

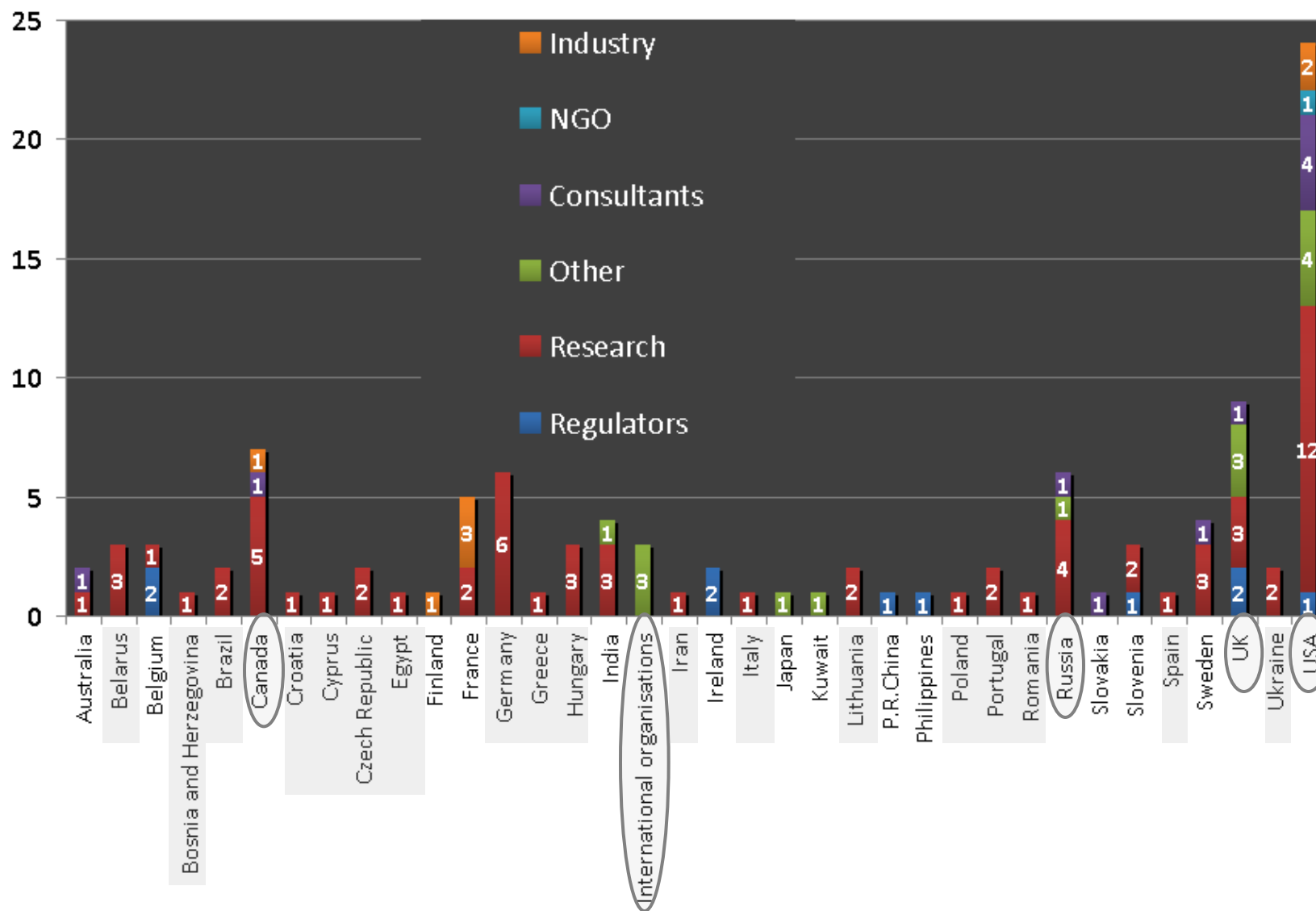
	n
Total number of questionnaires received	110
Total number of countries covered by responses	36
Number of total which are in EU	19



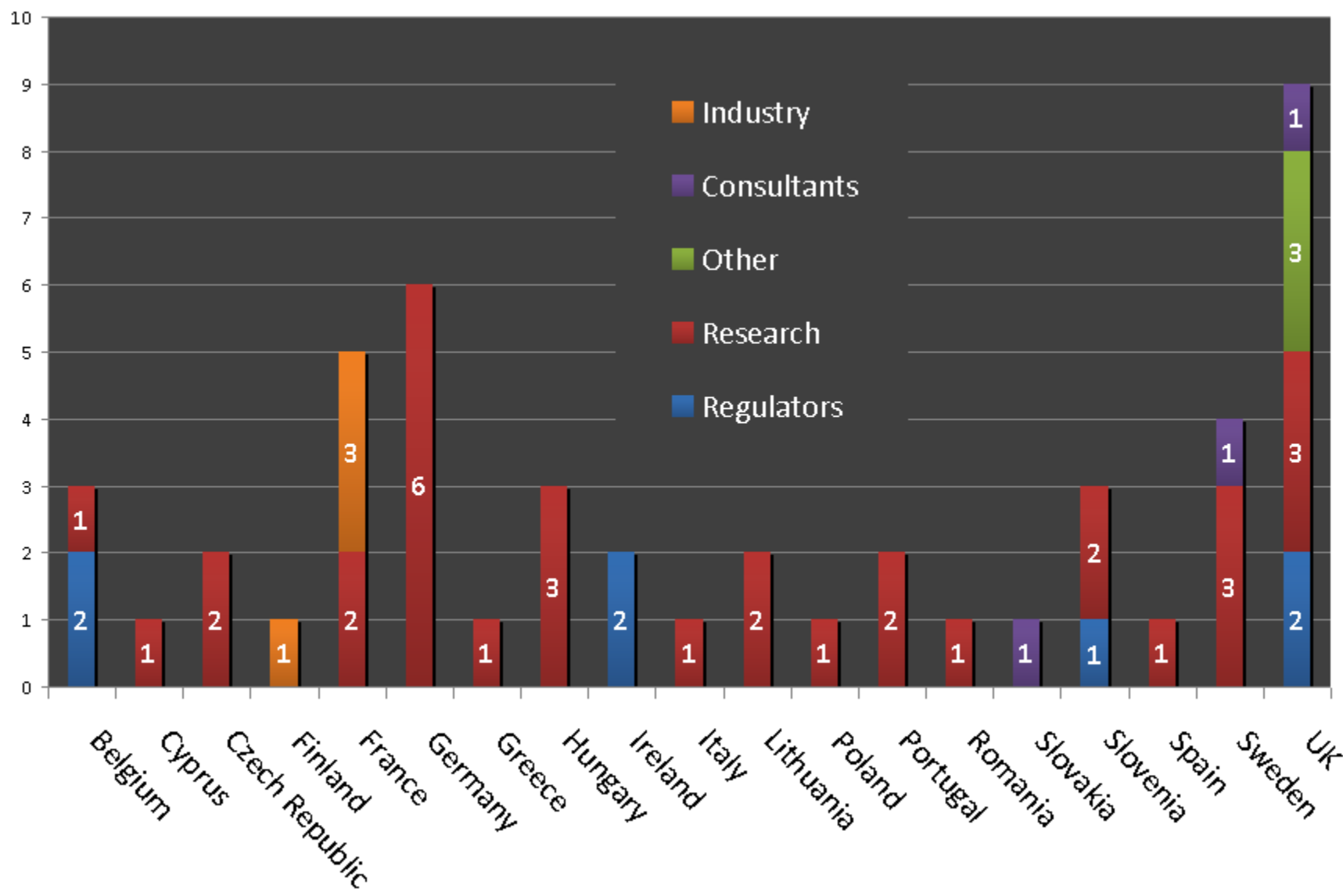
Types of organization responding



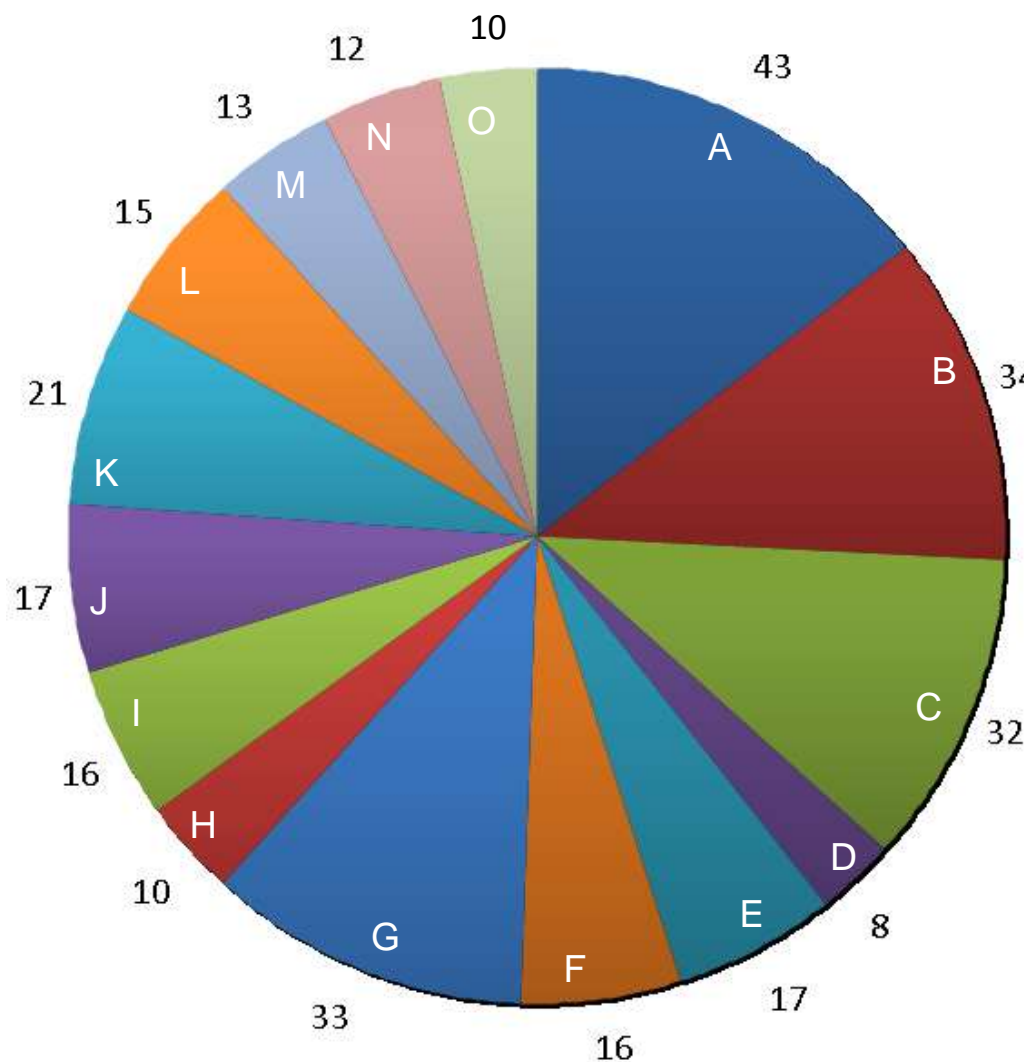
Responses by Country and type of organization



Responses by EU Country and type of organization



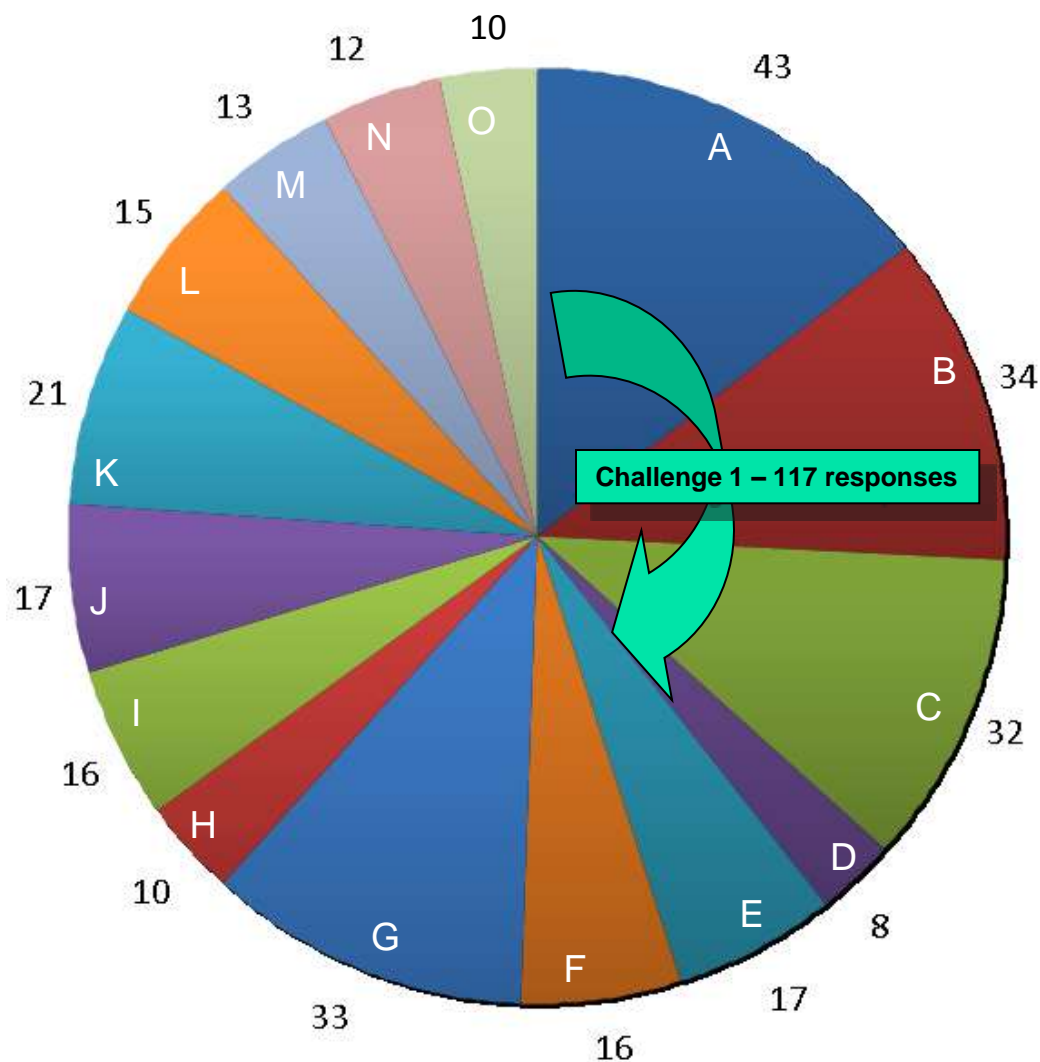
Most important lines of research (choose only 3)



- A. Identify key processes
- B. Parameterise key processes
- C. Develop models
- D. Model at a landscape level
- E. Understand how processes link effects from molecular to individual
- F. Understand what causes intra- and inter-species differences
- G. Understand multiple contaminants
- H. Understand multi-generational responses
- I. Understand how radiation effects interact at higher biological levels
- J. Integrate uncertainty and variability into risk characterisation
- K. Integrate human and environmental protection frameworks
- L. Integrate risk assessment frameworks for radiation and chemicals
- M. Provide a multi-criteria perspective in support of optimised decision-making
- N. Integrate ecosystem approaches, ecosystem services and ecological economics
- O. Integrate decision support systems

Most important lines of research (choose only 3)

Nº of responders who chose each research line



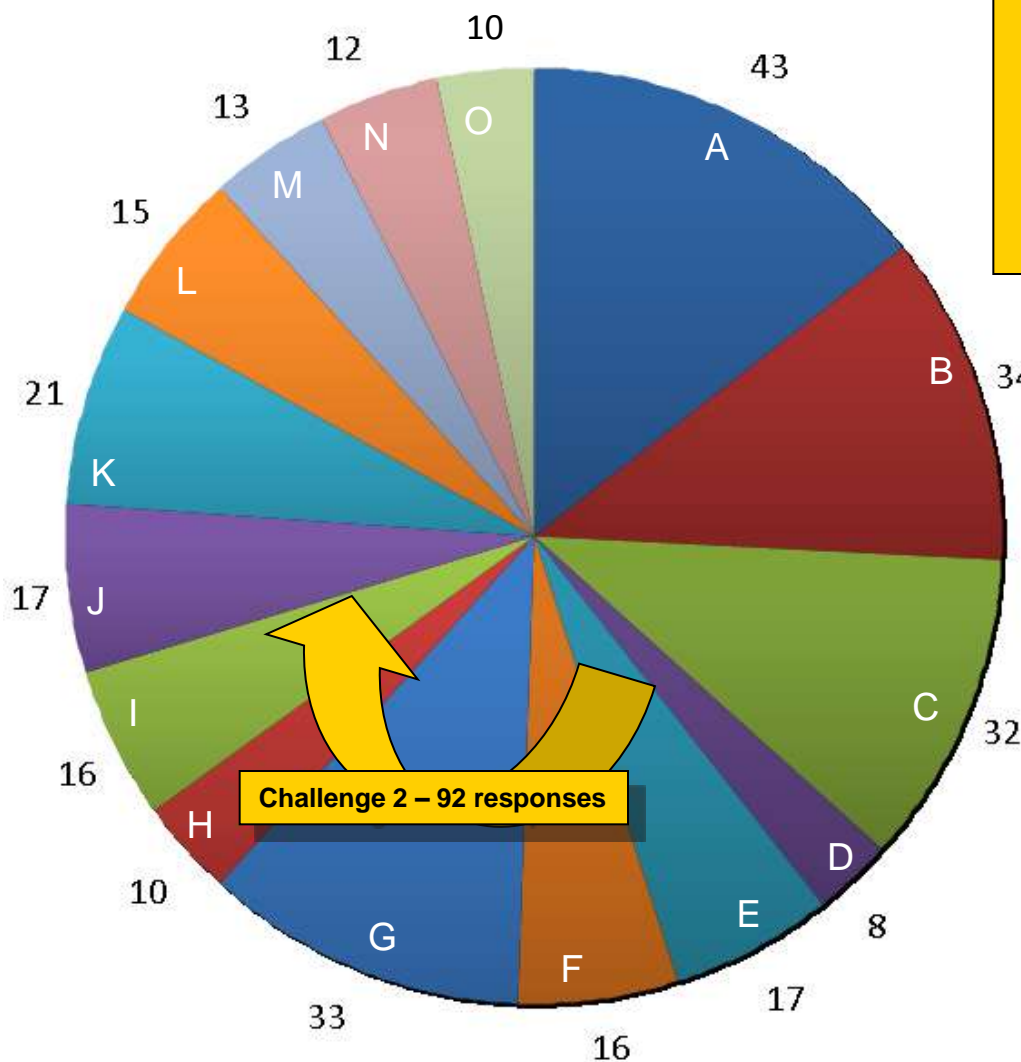
CHALLENGE- 1

Quantify key processes that most influence RN transfers
(40%)

- A. Identify key processes
- B. Parameterise key processes
- C. Develop models
- D. Model at a landscape level

Most important lines of research (choose only 3)

Nº of responders who chose each research line



CHALLENGE- 2

Determine ecological consequences under realistic conditions (30%)

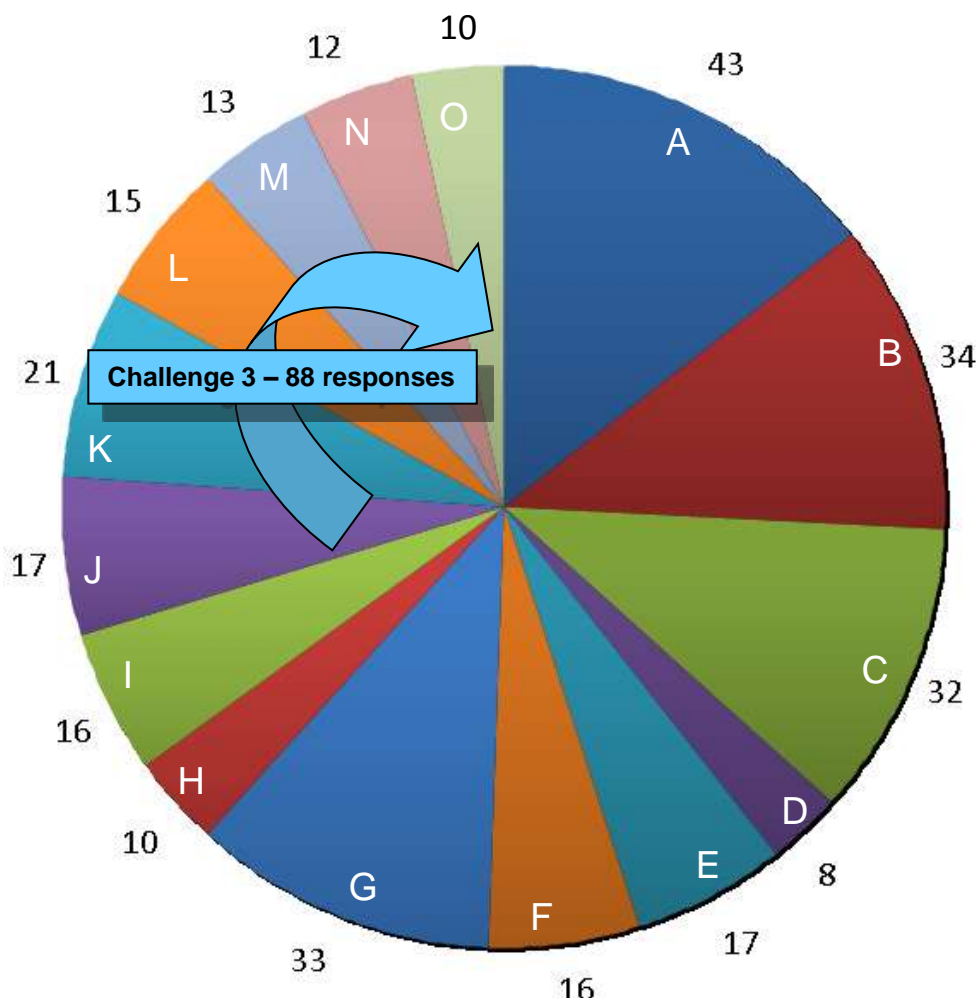
- E. How processes link effects from molecular to individuals
- F. What causes intra- and inter-species differences
- G. Understand multiple contaminants
- H. Understand multi-generational responses
- I. Understand how radiation effects interact at higher biological levels

Most important lines of research (choose only 3)

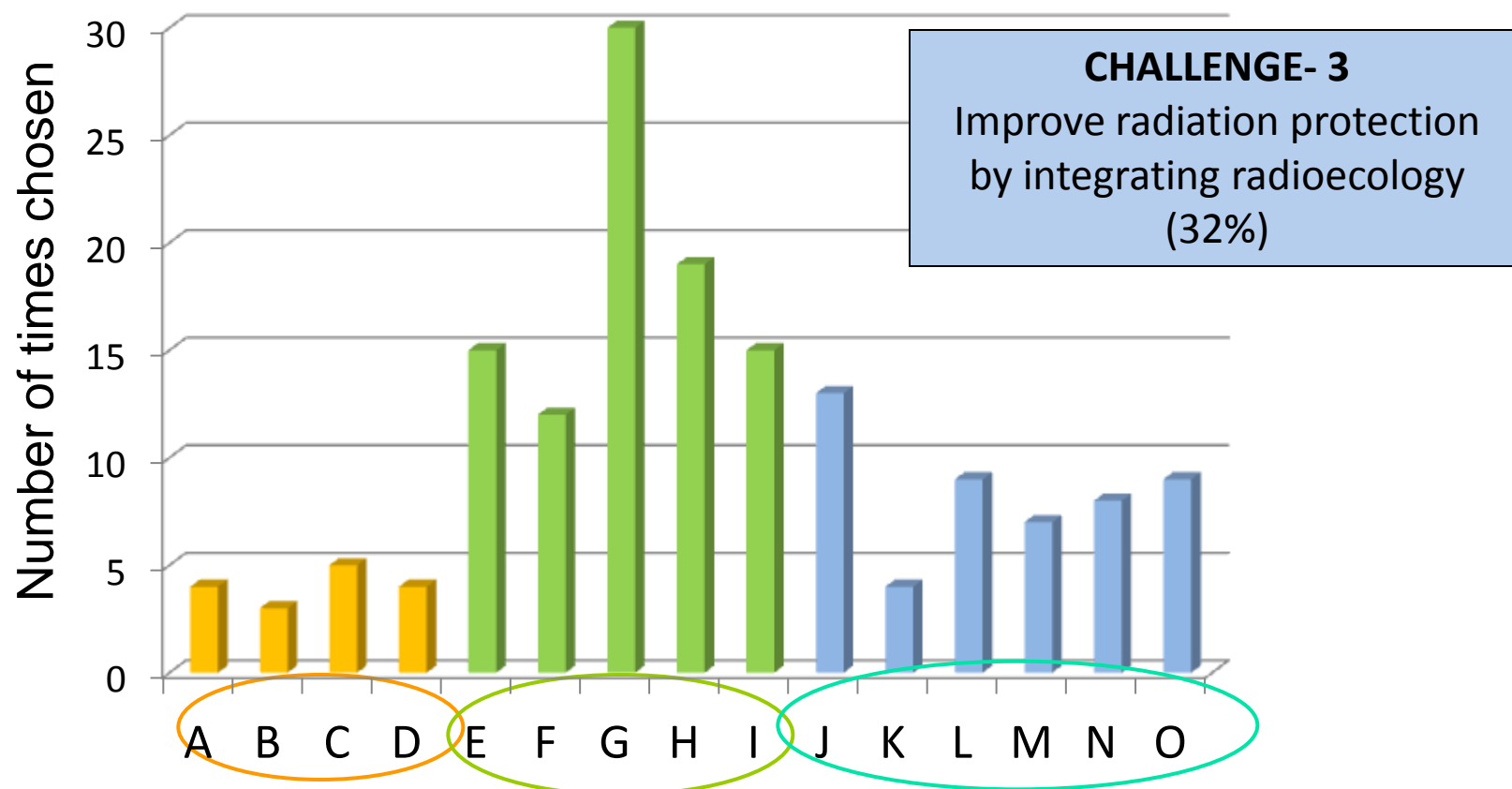
CHALLENGE- 3

Improve radiation protection by integrating radioecology (30%)

- J. Integrate uncertainty and variability into risk characterization
- K. Integrate human and environmental protection frameworks
- L. Integrate risk assessment framework for radiation and chemicals
- M. Provide a multi-criteria perspective in support of optimised decision-making
- N. Integrate ecosystem approaches, ecosystem services and ecological economics
- O. Integrate decision support systems



Which lines of research will be the most difficult to achieve?



CHALLENGE- 1

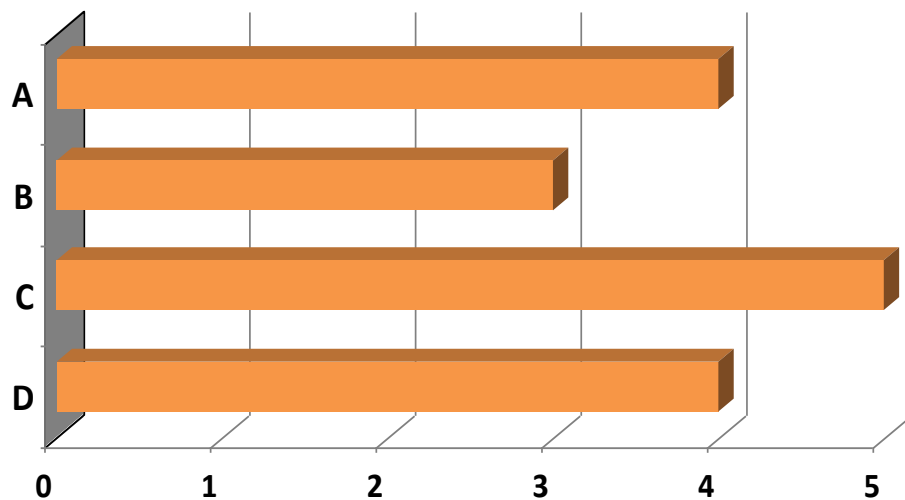
Quantify key processes that
most influence RN transfers
(10%)

CHALLENGE- 2

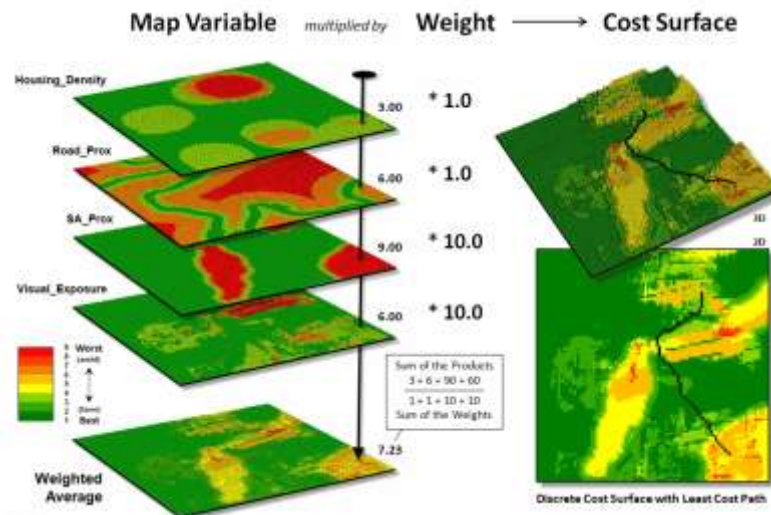
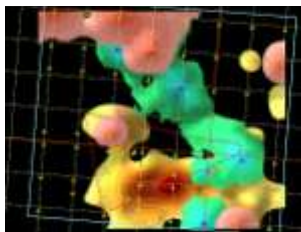
Determine ecological consequences
under realistic conditions
(58%)

Challenge 1:

Quantify key processes that most influence RN transfers (10%)

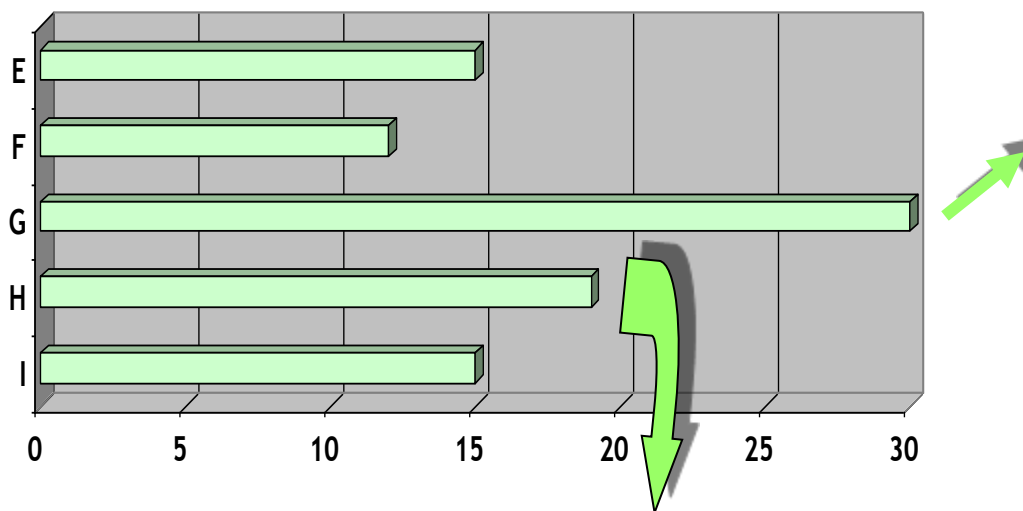


C) Develop transfer and exposure models that incorporate physical, chemical and biological interactions, and enable predictions to be made spatially and temporally



Challenge 2:

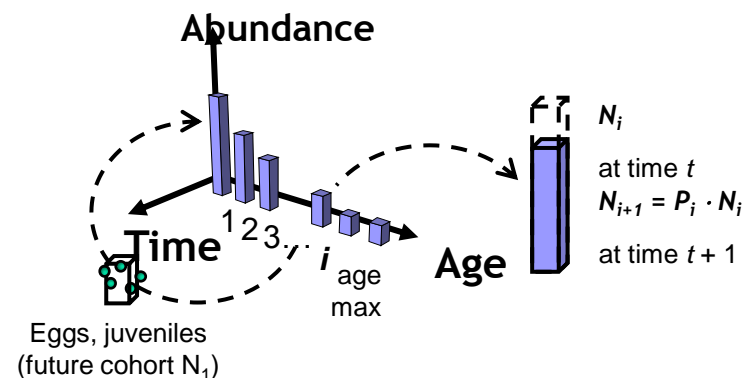
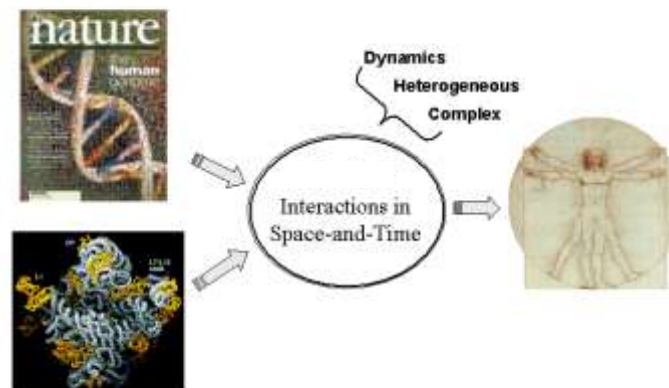
Determine ecological consequences under realistic conditions (58%)



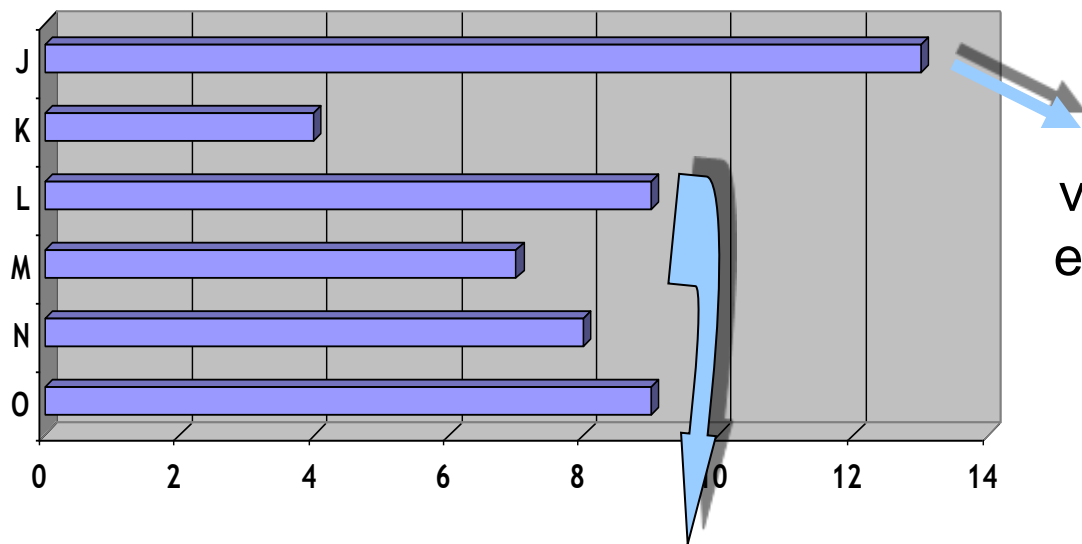
H) Understand the mechanisms underlying multi-generational responses to long-term ecologically relevant exposures



G) Understand the interactions between ionising radiation effects and other co-stressors

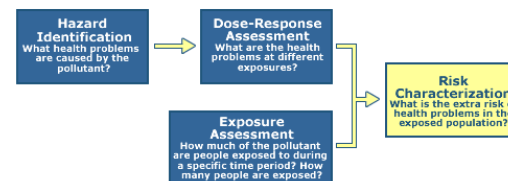


Challenge 3: Improve radiation protection by integrating radioecology (32%)



J) Integrate uncertainty and variability from transfer modelling, exposure assessment, and effects characterisation into risk characterisation

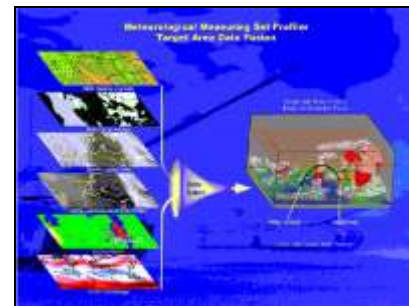
The 4 Step Risk Assessment Process



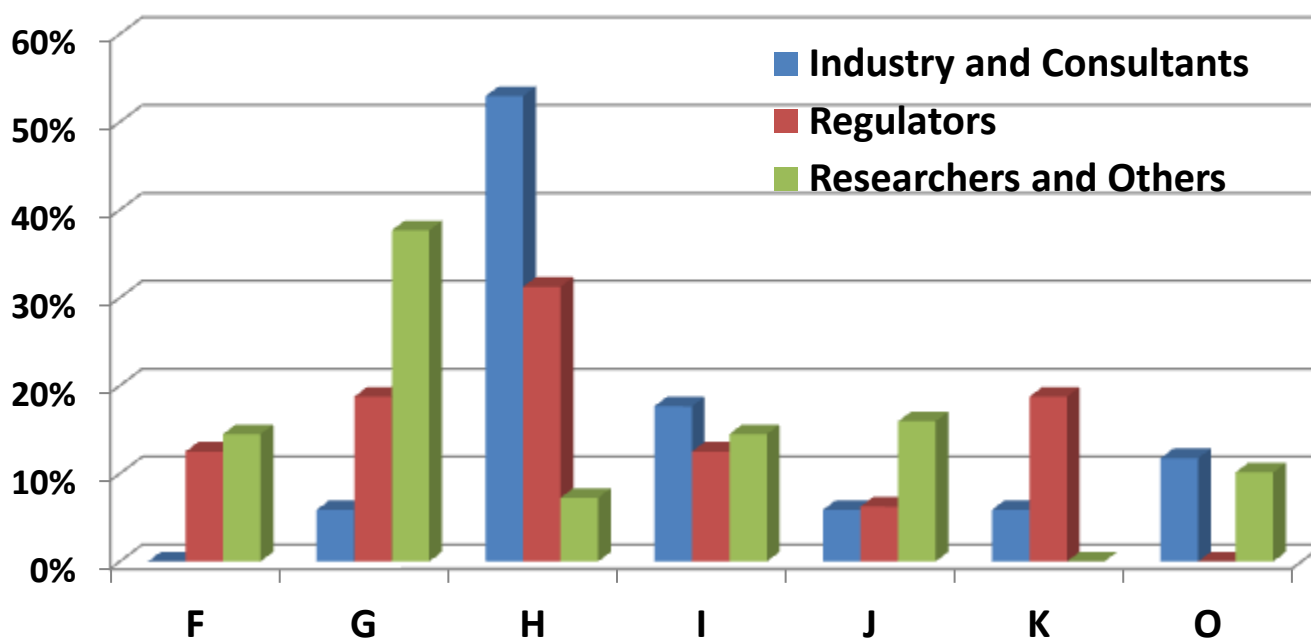
L) Integrate the risk assessment frameworks for ionising radiation and chemicals



O) Integrate decision support systems



Which lines of research will be the most difficult to achieve?



G) Multi-stressor interactions

H) Multi-generational responses

O) Integrate decision support systems

K) Integrate human and environmental protection frameworks

Research challenges that should have been included

56 responders suggested other items that should be in the SRA

STAKEHOLDERS	INTEGRATION	RESEARCH	RESEARCH	METHODS
<ul style="list-style-type: none"> • Need to build public confidence in the assessment models • Focus activities on stakeholder engagement • Public education in radioecology • Social acceptance and risk perception • Improve communication with stakeholders 	<ul style="list-style-type: none"> • Emergency preparedness & Radioecology • Need management tools for Response, Remediation and Restoration • DSSs RODOS and ARGOS: improvements from a radioecology perspective • Radiobiology & Radioecology 	<ul style="list-style-type: none"> • Urban environments • Model validation • Radionuclides as tracers • Effects from internal versus external exposure • Economic consequences • Biomarkers • Hormesis • Remediation strategies 	<ul style="list-style-type: none"> • Global change (climatic) and radioecology • U mining (past and future) is not adequately covered. • ^{241}Am • Marine environment • Dosimetry • Low dose effects • Effects to populations 	<ul style="list-style-type: none"> • To quickly and easily identify radionuclides in soils • To improve lower limits of detection • Non-lethal sampling methods are needed

Many encouraging comments!

**Very
encouraging
task!**

**I appreciate the efforts of the SRA thus far
and would encourage you along your way**

**This is the great
work on this area**

Overall, this is a great plan

**Creating an interdisciplinary approach to
radioecology/radiological risk assessment/
nuclear safety analysis is pertinent**

**This SRA is an excellent
effort. Thanks for allowing
us to comment on it**

**I support
this effort**

**Very interesting, taking into account new frontiers of research to
deepen knowledge at molecular, organism and population levels
on effects of radionuclides, especially in the ecosystem**

**The result is a logical collection of research themes
that, if addressed fully, would not only revolutionize
radioecology but also ecotoxicology and ultimately
integrated environmental management**

**Combining chemistry,
biology, radiological, and
nuclear science is of
fundamental importance**

Thanks for giving me the opportunity to contribute

**A good start that
is sure to bring
good results**

**I applaud the SRA for tackling this topic and trying to
advance the field. I feel strongly that radioecology needs to
look "out" at least as much as it looks "in" if it is to have a
chance to be successful in the endeavor**

and some concerns

...it seems to cover everything. And focus on everything. Without going to the details, it is difficult to see where the strategy lies...

Priority setting will be essential in order to ensure that something is delivered, that is of use to the wider community.

The SRA will most probably be the future research activities of STAR members..... As STAR consist of the most financially powerful institutes in the Europe dealing with radioecology, I expect to find more focused SRA research goals in future EC funded calls...

It is of course difficult to expect that someone outside of STAR will be able to compete with STAR members for this money, which will consequently erode all other radioecology capabilities in Europe.



Do you want to be updated by email on the development of the SRA?

110 responders

106 answered **YES**



What STAR-ALLIANCE will do with all the comments/suggestions received?

- All inputs will be available in full (except, when requested, the identity of the responders) on the Radioecology Exchange (by the end of the year).
- Some of the 'critical' comments will be directly responded (web)
- On Wednesday (14th Nov) there is a STAR Meeting to discuss how to proceed with the information contained in the 110 questionnaires received

“The SRA is clearly the product of substantial international discussion and evaluation of different perspectives on the medium-term future of radioecology. The result is a logical collection of research themes that, if addressed fully, would not only revolutionise radioecology but also ecotoxicology and ultimately integrated environmental management.”

to SINCERELY THANK all the responders!!



STAR Working Group

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Almudena Real (CIEMAT)



THANK YOU FOR YOUR ATTENTION!