



# USING MODELLING AND MEASURING TOOLS TO BUILD RELEVANT ENVIRONMENTAL MONITORING PLANS



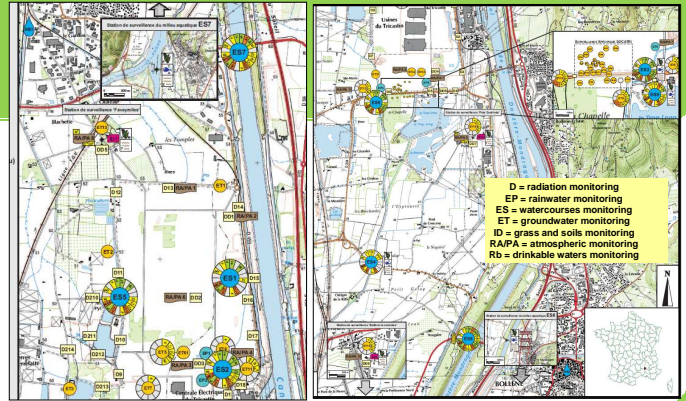
Catherine MERCAT - AREVA Tricastin Site, 26700 Pierrelatte, France  
& Claire BALDASSARRA - Aergon, 24000 Périgueux, France



## Introduction

The AREVA nuclear Tricastin site = 5 nuclear operators :

- ❖ AREVA NC : 1 secret nuclear plant, 1 nuclear plant, 4 chemical plants
  - ❖ COMURHEX : 1 nuclear plant, 1 chemical plant
  - ❖ EURODIF Production : 1 nuclear plant, 1 chemical plant
  - ❖ SET : 1 nuclear plant,
  - ❖ SOCATRI : 1 nuclear plant
- ➔ A very complicated environmental monitoring plan



## Objectives & Method

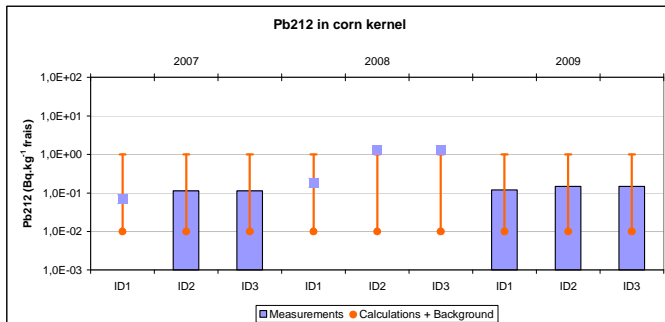
How to test the relevance of the monitoring plan ?

How to guaranty that the influence of the radioactive discharges are well surveyed ?

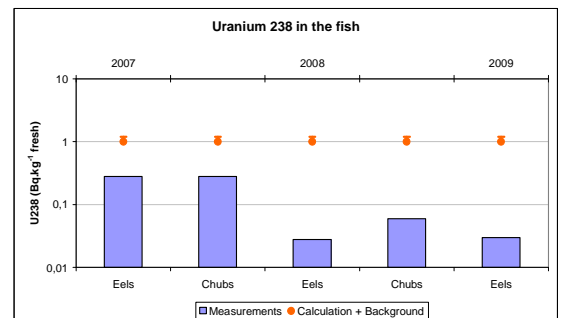
By confronting the measurements with the estimations from computer codes

75 cases-studies related to 29 radionuclides ( $^{232}\text{U}$ ,  $^{234}\text{U}$ ,  $^{235}\text{U}$ ,  $^{236}\text{U}$ ,  $^{238}\text{U}$ ,  $^{237}\text{Np}$ ,  $^{238}\text{Pu}$ ,  $^{239}\text{Pu}$ ,  $^{99}\text{Tc}$ ,  $^{95}\text{Nb}$ ,  $^{103}\text{Ru}$ ,  $^{106}\text{Ru}$ ,  $^{134}\text{Cs}$ ,  $^{137}\text{Cs}$ ,  $^{144}\text{Ce}$ ,  $^{233}\text{Pa}$ ,  $^{125}\text{Sb}$ ,  $^{95}\text{Zr}$ ,  $^{208}\text{Tl}$ ,  $^{212}\text{Bi}$ ,  $^{212}\text{Pb}$ ,  $^{224}\text{Ra}$ ,  $^{228}\text{Th}$ ,  $^{234}\text{Th}$ ,  $^{231}\text{Th}$ ,  $^{234}\text{Pa}$ ,  $^{129}\text{I}$ ,  $^3\text{H}$  and  $^{14}\text{C}$ ) were performed

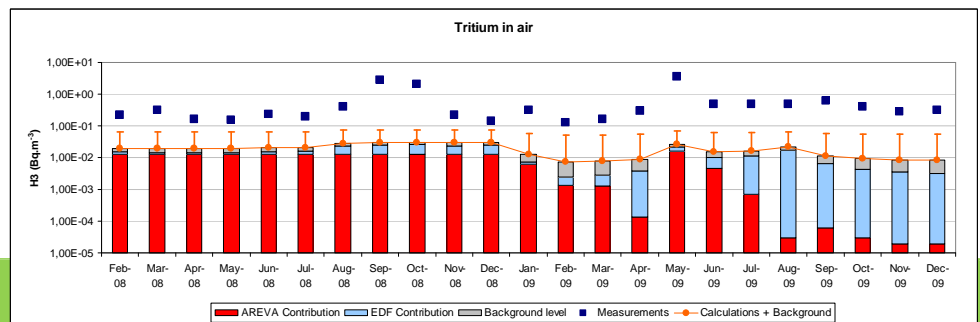
In more than 90% of cases, consistency between metrology and modeling



In the case of uranium in the fish, inconsistency lightened an overestimated local reference value



In the case of tritium and carbon 14, inconsistencies drove us to modify our sampling procedure



## Conclusion

- ❖ This confrontation of modeling estimations Vs. measurements results allowed us to improve the environmental monitoring plan of the AREVA Tricastin nuclear site.
- ❖ Beyond the lessons for our environmental monitoring plan, this study confirms also all the interests of comparing the results of regular measurements with estimates of model calculations.