

*Rocky Mountain Biomonitoring
Laboratory Consortium and
Integration with Environmental
Public Health Tracking*

CDC – EPHT Conference

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ROCKY MOUNTAIN BIOMONITORING CONSORTIUM



Rocky Mountain National Park, NPS

Arizona

Colorado

Montana

New Mexico

Utah

Wyoming

RMBC Program Highlights

- ❖ Biomonitoring assesses environmental exposure to chemicals in human sample media such as blood or urine.
- ❖ Analyses to be conducted through State Laboratories
- ❖ NM is leading a consortium with 5 other Rocky Mountain States - Arizona, Colorado, Montana, Utah, Wyoming
- ❖ Recently completed 2-year planning study
- ❖ One of three programs selected to conduct follow-on 5 year implementation plan

Forming the Consortium – Why Rocky Mountain States?

- ❖ Common demographic characteristics – similar geographic population distribution; high populations of Native Americans and Hispanics
- ❖ Common geophysical/geochemical characteristics
- ❖ Similar environmental settings
- ❖ Extensive mining history and Federal military operations

Biomonitoring Laboratory Consorting

- ❖ Relationships already established among State laboratories
- ❖ Opportunity for epidemiologists to collaborate across states and with labs
- ❖ Epidemiologists could increase study population size
- ❖ Collaboration desirable to enhance depth of professional resources

Consortium

Communication

- ❖ **Essential for building a team**
- ❖ Conference calls every 2-4 weeks
- ❖ Emails/sub-group calls every week
- ❖ Meetings held at each of the six states throughout the planning grant to tour each others' labs and have face-to-face contact
- ❖ Both chemists and epidemiologists from each state participated in these meetings and tours

Consortium Process: Ranking of Analytes

❖ **Consortium evaluation criteria**

1. Hypothesized or known health effects
2. Number of people exposed or plausibly exposed
3. Capacity for intervention
4. Synergistic objectives with bio/chemical terrorism grants
5. Level of public concern or perceived need
6. Concerns pertinent or unique to all states
7. Potential freebies gained from panel analysis

❖ **Input from EH partners**

❖ **Feasibility for study**

❖ **Balance between addressing public exposure concerns and establishing ongoing surveillance systems**

Rocky Mountain Biomonitoring Consortium

Preliminary Analyte Ranking

Compound	AZ	CO	MT	NM	UT	WY	RANK
Heavy Metals Panel	1	3	1	3	1	1	1.7
Arsenic Speciation	2	2	2	11	2	5	4.0
VOCs /TCE/DCE/Solvents	8	7	6	1	6	2	5.0
Mercury [Speciation]	5	9	3	7	3	4	5.2
Organophosphates	10	5	4	5	10	8	7.0
Cotinine	4	13	7	4	4	14	7.7
PAHs [Wood Smoke]	3	11	10	8	12	3	7.8
Radionuclides	9	1	11	6	15	6	8.0
Organochlorine Pesticides	11	6	5	12	9	9	8.7
Nitrates/Nitrites	15	4	8	9	8	12	9.3
Disinfection Byproducts	12	8	14	2	14	10	10.0
Phthalate metabolites	14	10	16	10	13	7	11.7
Perchlorate	13	14	15	13	7	11	12.2
Creosote	6	12	9	15	16	17	12.5
Dioxin/Furan	17	15	13	14	5	18	13.7
Cyanide	16	18	12	17	11	16	15.0
Carbon Monoxide	7	16	18	16	18	15	15.0
Thiodiglycol and Sarin	18	17	17	18	17	13	16.7

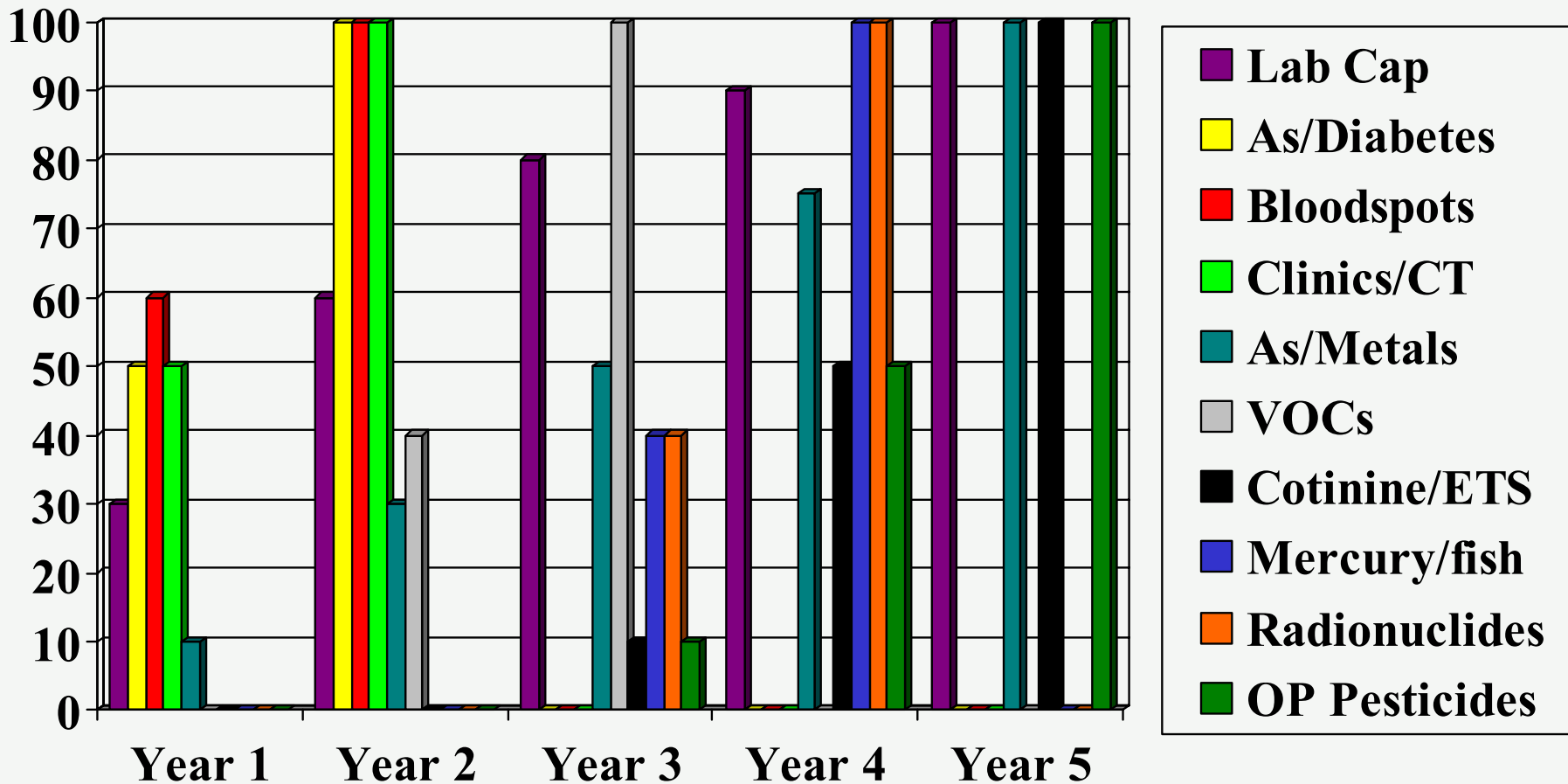
RMBC Program Goals

- ❖ (1) increase regional laboratory capacity to conduct biomonitoring,
- ❖ (2) enhance the collaboration between laboratories, epidemiologists, local public health agencies, tribes, and other partners within the region,
- ❖ (3) conduct biomonitoring activities,
- ❖ (4) complement on-going bioterrorism and chemical terrorism preparedness efforts, and
- ❖ (5) complement on-going Environmental Public Health Tracking efforts.

Consortium Pilot Studies

- ❖ Arsenic/metals/radionuclides in urine from drinking water exposure
- ❖ Arsenic levels in diabetic populations
- ❖ VOCs in blood following inhalation from subsurface vapor intrusion
- ❖ Cotinine from ETS, effects of statutes
- ❖ Mercury in blood from recreational fish ingestion
- ❖ Chemical terrorism agent baselines
- ❖ Pesticides – OP metabolites/pyrethroids
- ❖ Infant bloodspot heavy metal feasibility study

RMBC 5-Year Implementation Plan

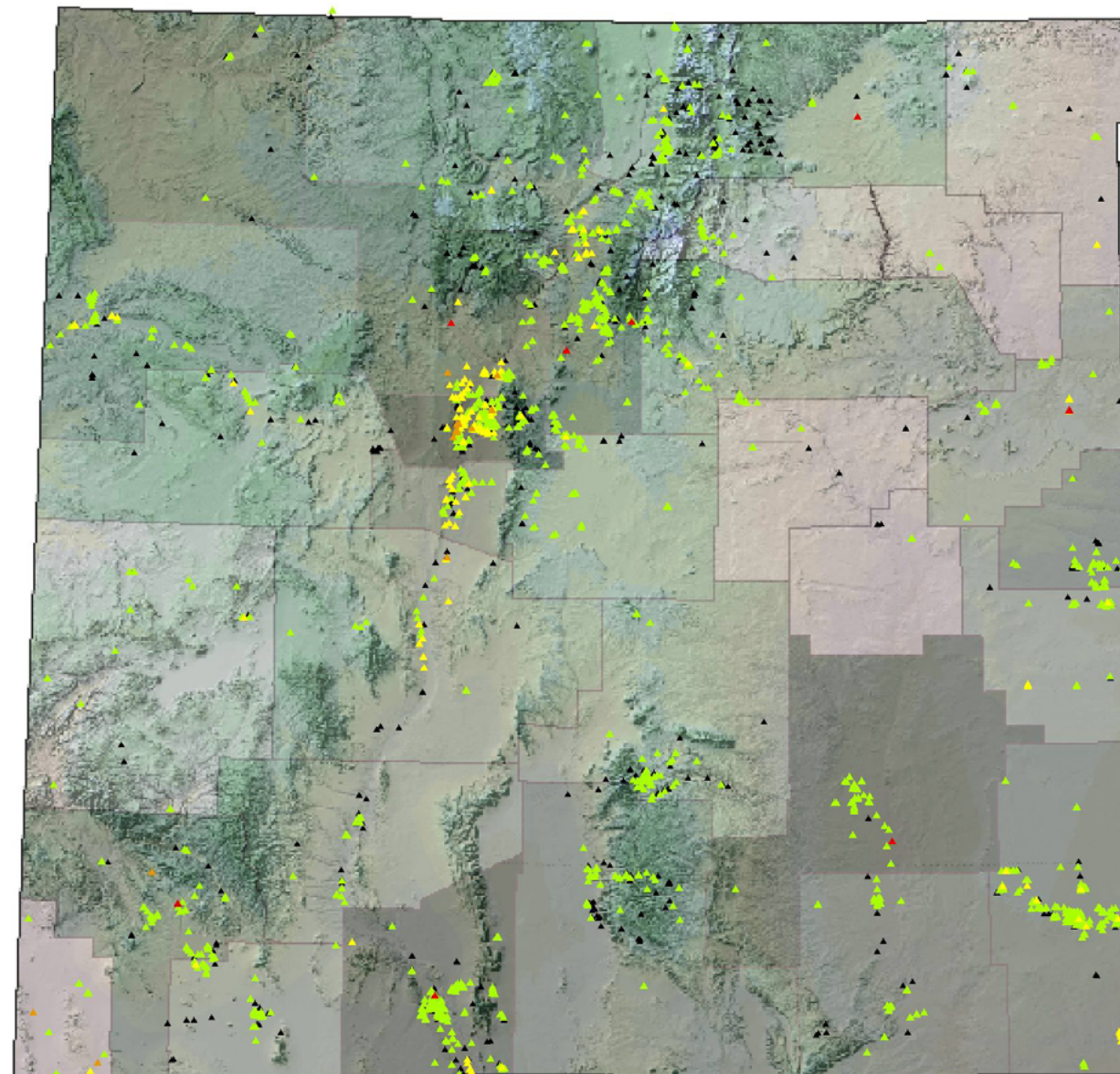


Consortium Pilot Study: Arsenic in Drinking Water Supplies

- ❖ Relatively high levels of arsenic in groundwater throughout the region
- ❖ Archived arsenic samples for Type 2 Diabetes Study allows analyses to start in year 1
- ❖ Additional arsenic in urine studies of the general population
- ❖ Integration with studies done for EPHT Tracking 1 and Tracking 2 grants
- ❖ Utilization of GIS mapping of water systems, biomonitoring results, and health effects data

Environmental Public Health Tracking Programs in RMBC

- ❖ Montana, New Mexico and Utah have Tracking Planning and Capacity Building Grants
- ❖ New Mexico also has Tracking Data Linkage Demonstration Grant
- ❖ Conducting Data Linkage Projects and Pilot Studies that complement biomonitoring



Legend

Arsenic Levels

- ▲ 50 - 1800 ug/L
- ▲ 30-50 ug/L
- ▲ 10-30 ug/L
- ▲ 0.1-10 ug/L
- ▲ No Detect

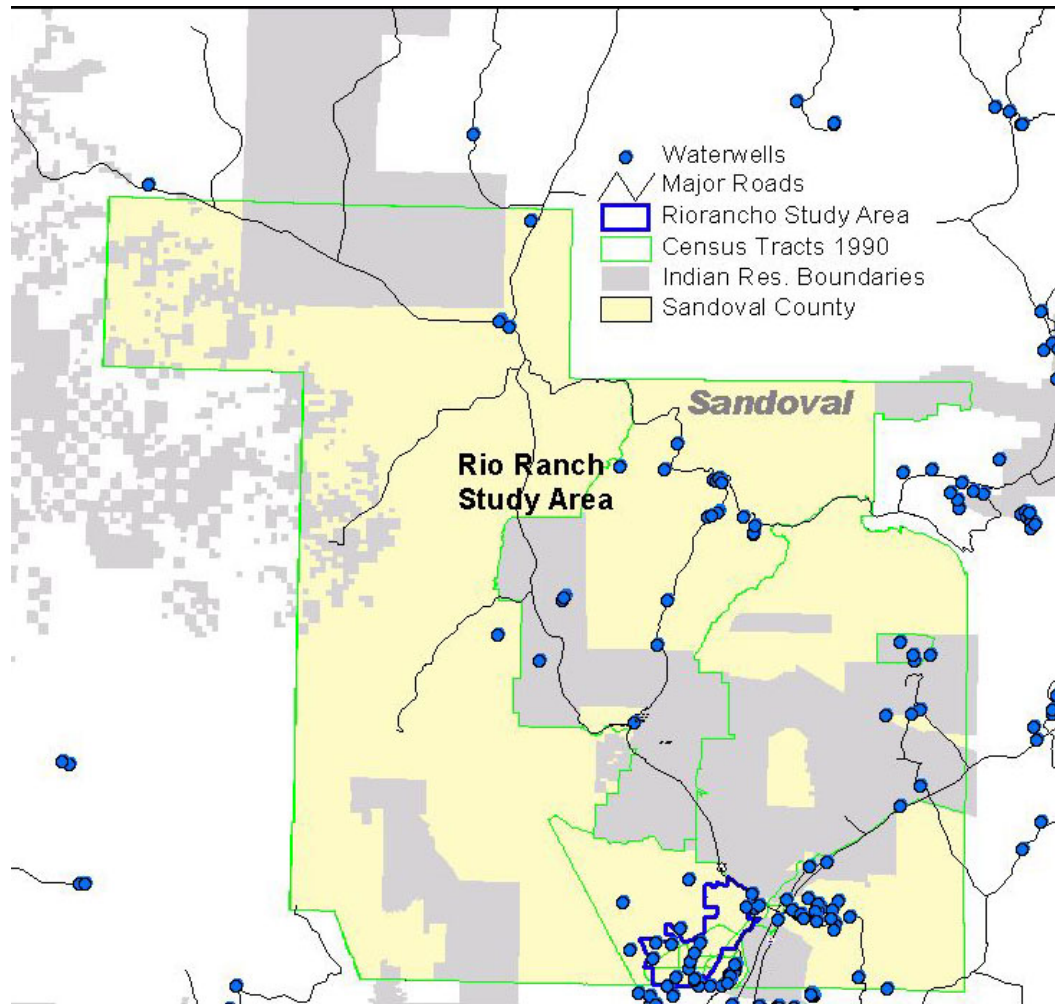
Newly diagnosed cancer cases 1990-2001

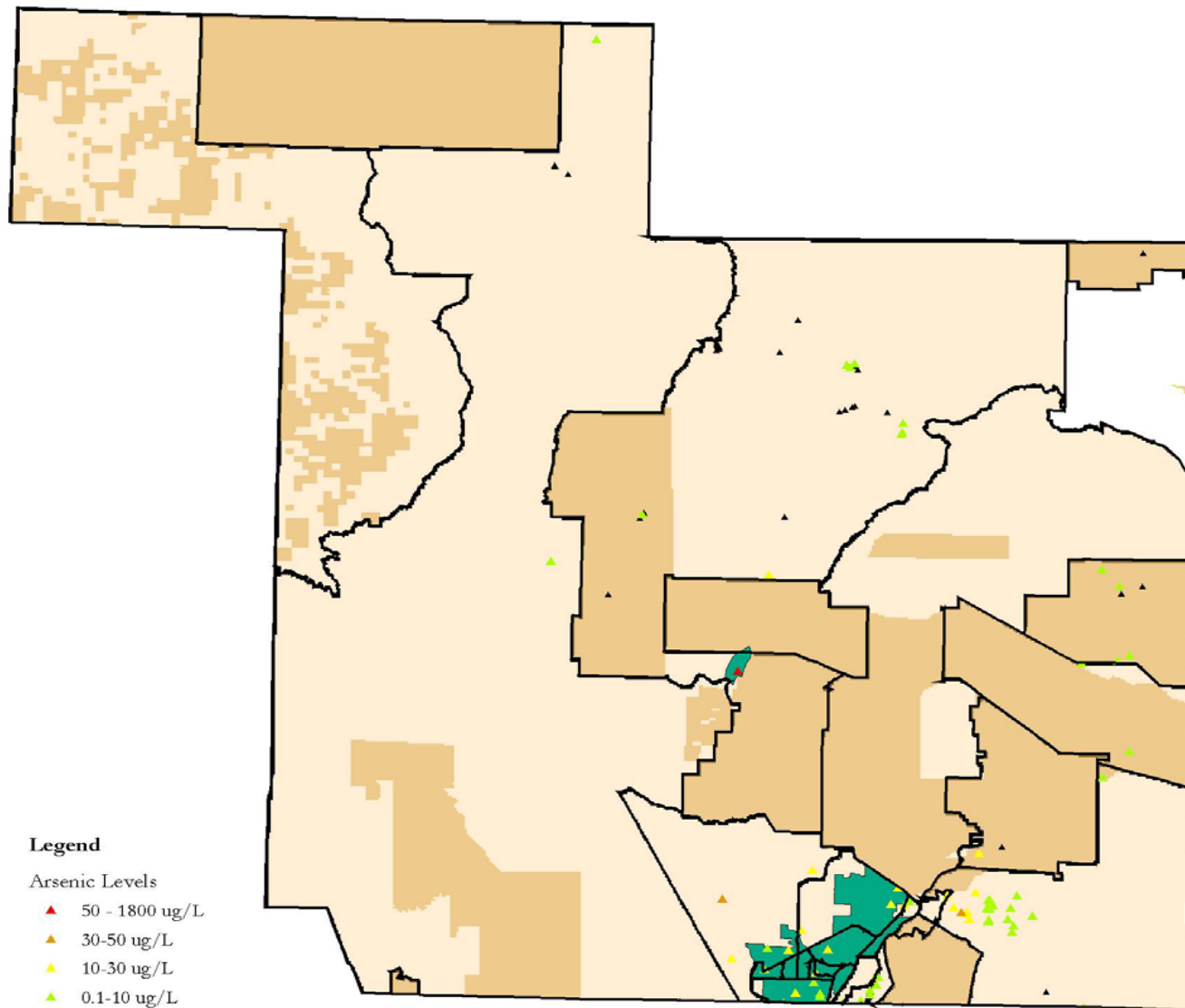
- 61 - 243 cases
- 592 - 1364 cases
- 1600 - 2996 cases
- 3478 - 6465 cases
- 28744 cases

Arsenic Data Linkage Project Description

- ❖ Compile the compliance monitoring data for statewide analyses of arsenic in drinking water and cancer risk at the census tract level.
- ❖ Explore the utility of GIS technology to facilitate and promote data linkage, analysis, and data dissemination.
- ❖ Demonstrate the utility of the linked data for surveillance with ecologic analyses of cancer incidence rates per drinking water arsenic levels.
- ❖ Demonstrate the utility of the linked data analyses in guiding public health practice and policy (changing MCLs) and public concerns.
- ❖ Evaluate potential for expansion of the data linkage capacity to additional drinking water contaminants.

Sandoval County





Legend

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- ▲ 50 - 1800 ug/L
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- ▲ 0.1-10 ug/L
- ▲ No Detect

- Study Areas
- Indian Reservation
- Census Tracts 2000

Tracking Linkage with other Environmental Health Projects

- ❖ Public Health Tracking 1 Grant – limited application of Conceptual Framework to arsenic data linkage, pilot projects
- ❖ Biomonitoring - Arsenic in urine from drinking water exposure for biomonitoring, identify populations at risk, enhance exposure assessment
- ❖ Asthma Surveillance System – identify populations at risk

RMBC Conclusions

- ❖ RMBC functioning as a team with unified regional goals as well as individual state goals
- ❖ Developing regional lab capabilities while evaluating samples to address exposure concerns and establish surveillance systems
- ❖ Coordinating with and complementing Tracking Projects in RMBC states
- ❖ Tracking technology transfer to other consortium states that do not have EPHT funding