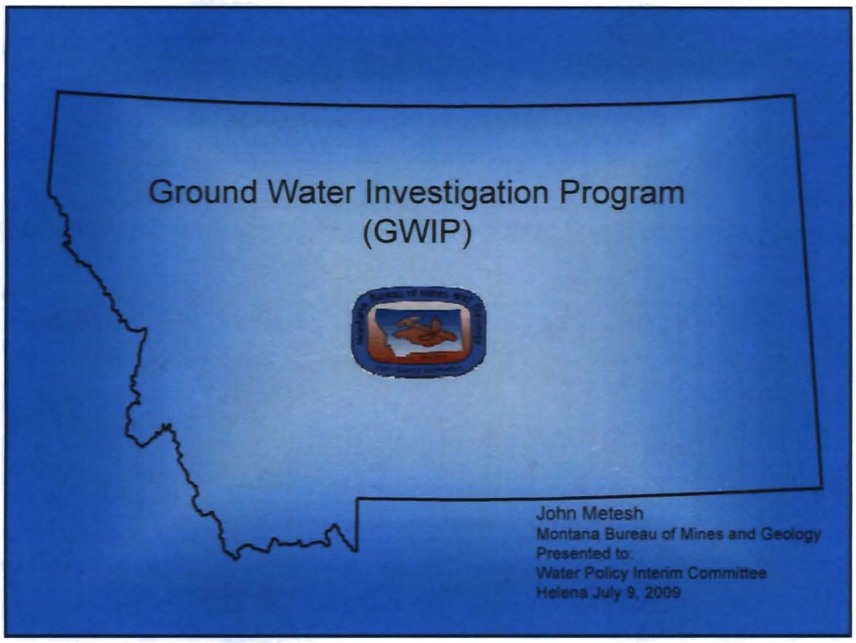
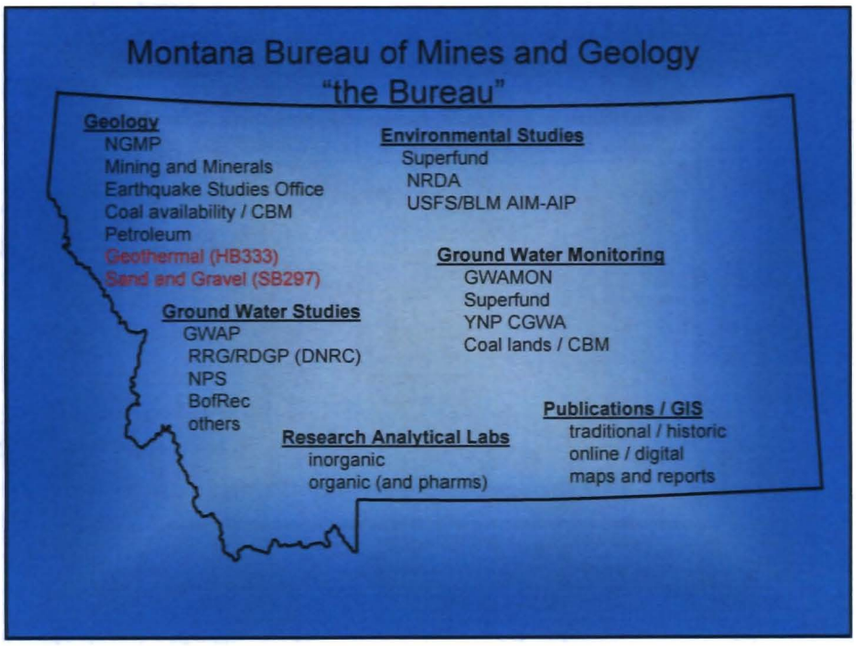
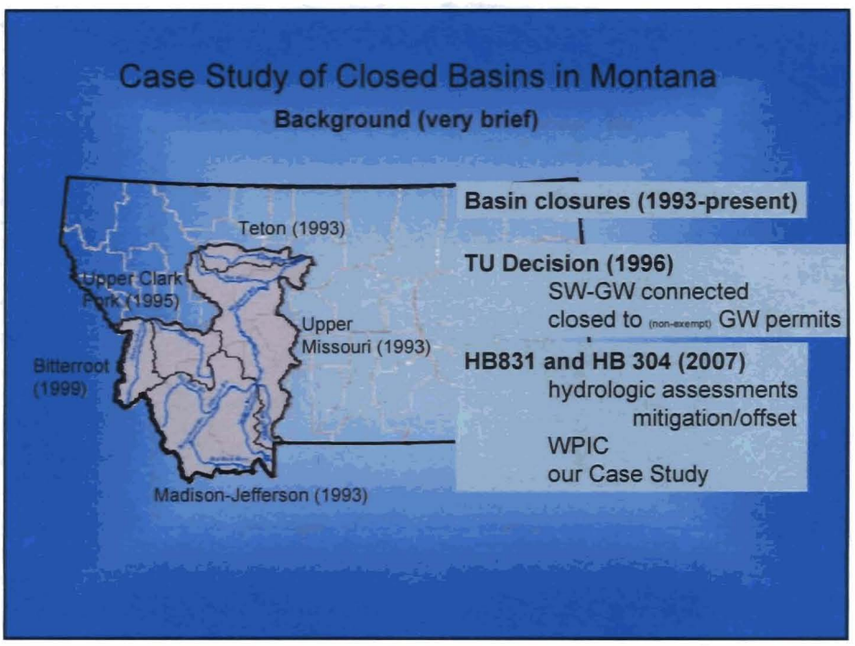
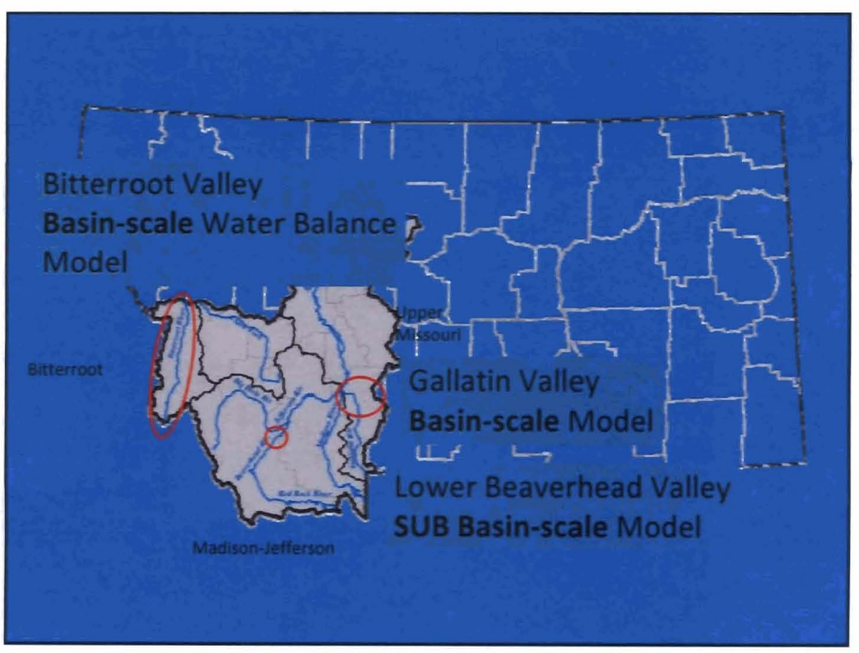
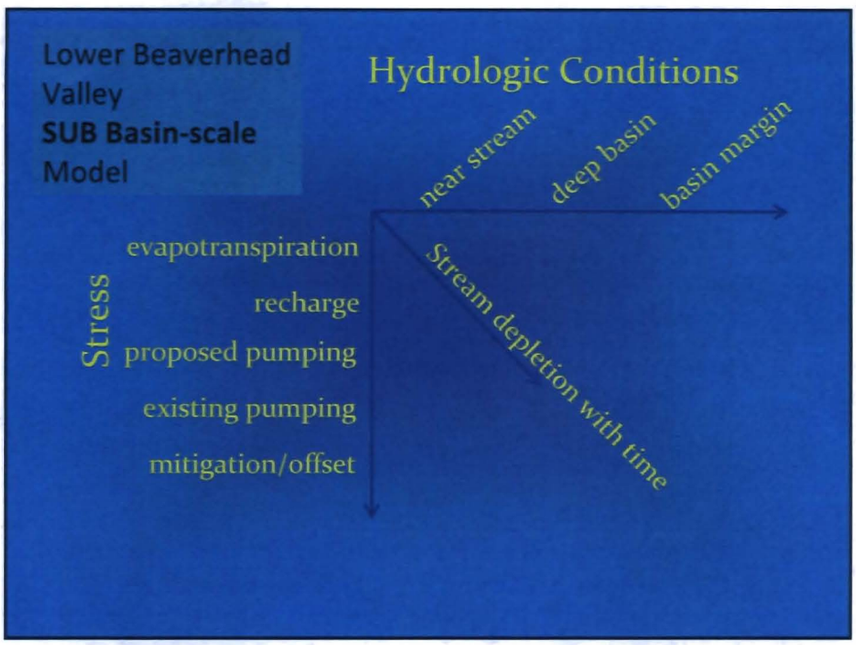
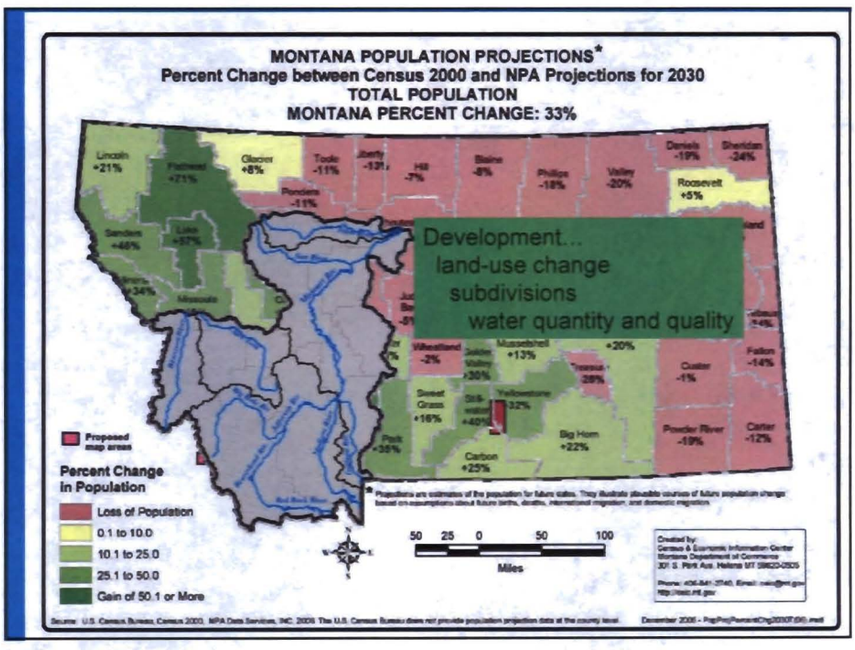

Ground Water Investigation Program
(GWIP)
John Metesh
Montana Bureau of Mines and Geology
Presented to:
Water Policy Interim Committee
Helena July 9, 2009


Montana Bureau of Mines and Geology
"the Bureau"
Geology
NGMP
Mining and Minerals
Earthquake Studies Office
Coal availability / CBM
Petroleum
Geothermal (HB333)
Sand and Gravel (SB297)
Environmental Studies
Superfund
NRDA
USFS/BLM AIM-AIP
Ground Water Monitoring
GWAMON
Superfund
YNP CGWA
Coal lands / CBM
Ground Water Studies
GWAP
RRG/RDGP (DNRC)
NPS
BofRec
others
Publications / GIS
traditional / historic
online / digital
maps and reports
Research Analytical Labs
inorganic
organic (and pharms)


Case Study of Closed Basins in Montana
Background (very brief)
Teton (1993)
Upper Clark Fork (1995)
Upper Missouri (1993)
Bitterroot (1999)
Madison-Jefferson (1993)
Basin closures (1993-present)
TU Decision (1996)
SW-GW connected
closed to (non-exempt) GW permits
HB831 and HB 304 (2007)
hydrologic assessments
mitigation/offset
WPIC
our Case Study


Bitterroot Valley
Basin-scale Water Balance
Model
Upper Missouri
Bitterroot
Gallatin Valley
Basin-scale Model
Lower Beaverhead Valley
SUB Basin-scale Model
Madison-Jefferson


Lower Beaverhead Valley
SUB Basin-scale Model
Hydrologic Conditions
near stream
deep basin
basin margin
Stress
evapotranspiration
recharge
proposed pumping
existing pumping
mitigation/offset
Stream depletion with time


MONTANA POPULATION PROJECTIONS*
Percent Change between Census 2000 and NPA Projections for 2030
TOTAL POPULATION
MONTANA PERCENT CHANGE: 33%
Development...
land-use change
subdivisions
water quantity and quality
Proposed map areas
Percent Change in Population
Loss of Population
0.1 to 10.0
10.1 to 25.0
25.1 to 50.0
Gain of 50.1 or More
50 25 0 50 100
Miles

HB52 was requested by the Water Policy Interim Committee (WPIC) and sponsored by Rep Walter McNutt (HD37, Sydney).

WPIC Members included:

Senator Jim Elliott, Thompson Falls, Chair
Senator Gary L Perry, Manhattan,Vice Chair
Senator Greg Lind, Missoula
Senator Bill Tash, Dillon
Senator Larry Jent, Bozeman
Senator Terry Murphy, Cardwell
Representative Scott Boggio,Red Lodge
Representative Jill Cohenour, East Helena
Representative Edward Hilbert, Glendive
Representative Bill McChesney, Miles City
Representative Walter McNutt, Sidney

HB52 elements:

- Directs the Montana Bureau of Mines and Geology to conduct **1-3 year focused investigations** of ground water and surface water in high growth, or over-appropriated areas,
- **Adds a member** of the development community to the Ground-Water Assessment Steering Committee authorized in 2-15-1523 MCA,
- Directs the Ground-Water Assessment Steering Committee to **prioritize sub basin** investigations based on anticipated growth in housing, agriculture, industry and commercial activity

Ground-Water Investigation Program Products:

- A detailed **report** that describes the hydrogeologic system,
- **Models** that simulate hydrogeologic features and processes, and
- A comprehensive set of **hydrogeologic data** available through the MBMG Ground-Water Information Center (GWIC)

Project types (not inclusive):

- **stream depletion** from ground-water development by subdivisions or irrigation projects,
- **water quality** impacts from development by subdivisions or irrigation projects,
- **cumulative effects** of existing and proposed water development on stream flow,
- impacts to ground water and surface water from **changes in irrigation practices or land use**,
- implementation of **aquifer storage and recovery** (ASR) in Montana, and
- evaluating the success of **mitigation/offset plans** in closed basins.

Steering Committee:

Voting members:
DNRC, DEQ, Dept of Agriculture, State Library

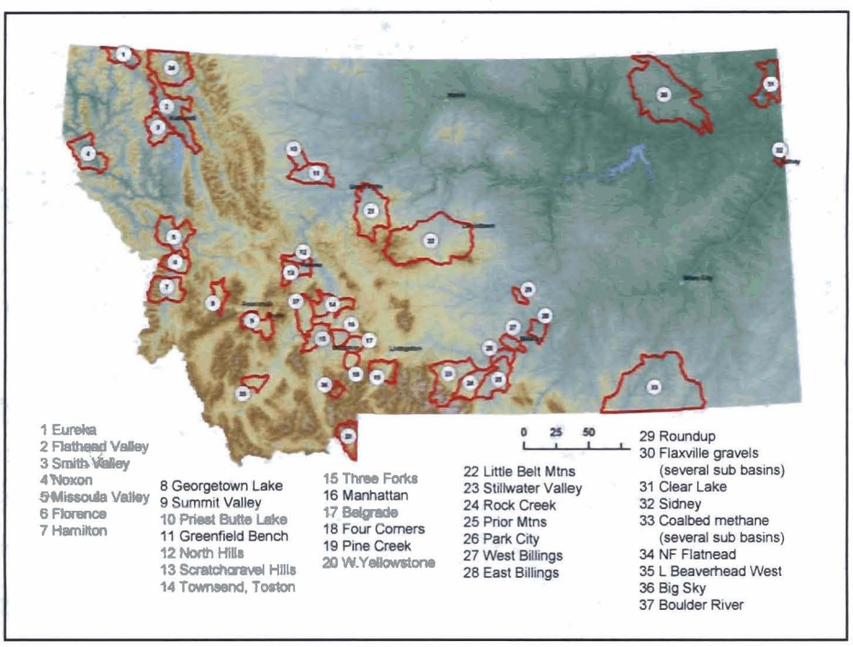
Ex officio members from:
(a) the legislative services division;
(b) the board of oil and gas conservation;
(c) the bureau of mines and geology;
(d) a unit of the university system,
(e) a county government,
(f) a city, town, or city-county government,
(g) principal federal agencies

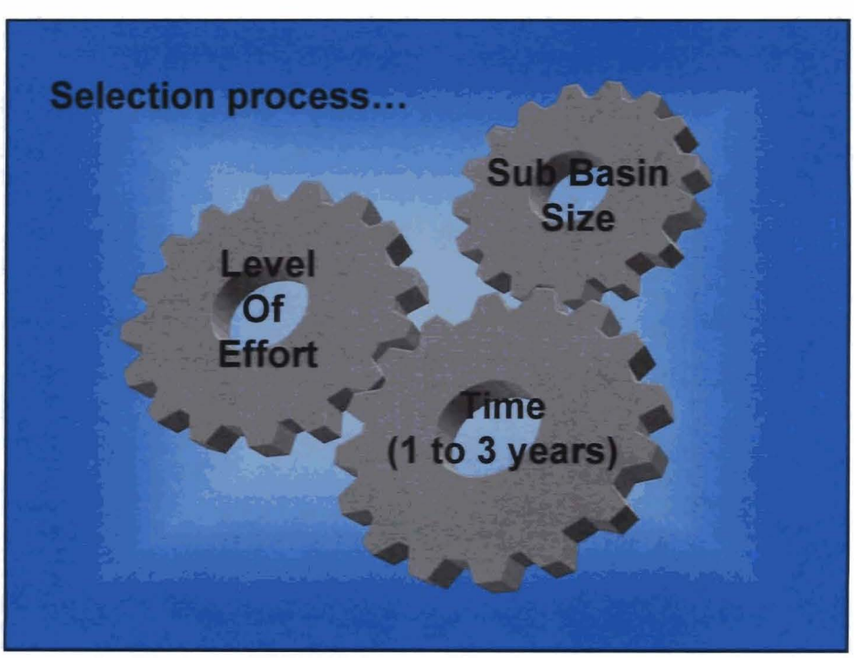
Governor appointees:
(i) agricultural water users;
(ii) industrial water users;
(iii) a conservation or ecological protection organization;
(iv) the development community

Steering Committee Activities:

Fall 2008 (post 1383, pre-session)
developed preliminary criteria
developed list of sub basins

Spring 2009 (post session)
finalize selection criteria
prioritize sub basins


1 Eureka
2 Flathead Valley
3 Smith Valley
4 Noxon
5 Missoula Valley
6 Florence
7 Hamilton
8 Georgetown Lake
9 Summit Valley
10 Priest Butte Lake
11 Greenfield Bench
12 North Hills
13 Scratchgravel Hills
14 Townsend, Toston
15 Three Forks
16 Manhattan
17 Belgrade
18 Four Corners
19 Pine Creek
20 W.Yellowstone
0 25 50
22 Little Belt Mtns
23 Stillwater Valley
24 Rock Creek
25 Prior Mtns
26 Park City
27 West Billings
28 East Billings
29 Roundup
30 Flaxville gravels
(several sub basins)
31 Clear Lake
32 Sidney
33 Coalbed methane
(several sub basins)
34 NF Flatnead
35 L Beaverhead West
36 Big Sky
37 Boulder River


Selection process…
Sub Basin Size
Level Of Effort
Time (1 to 3 years)

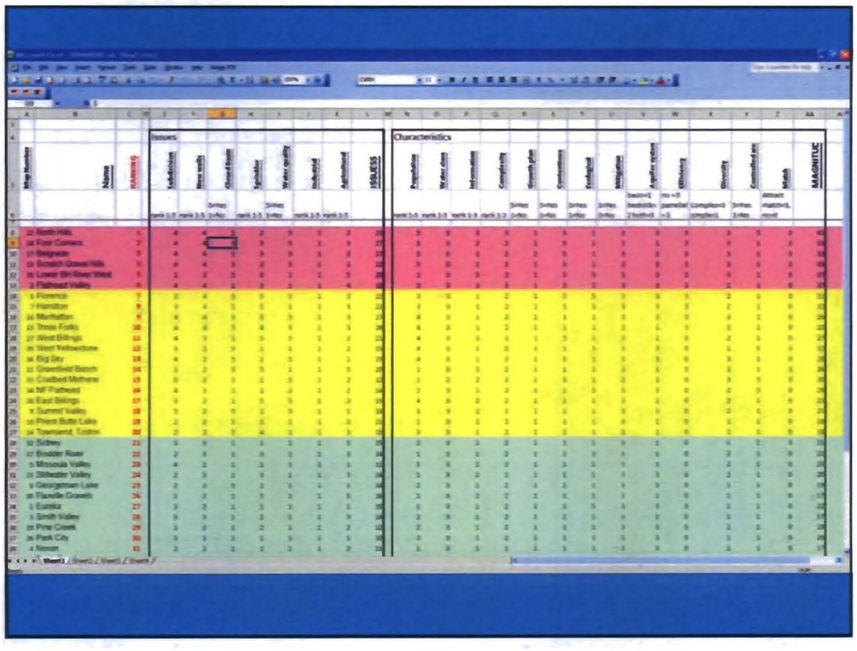
Prioritizing Project Areas

Problems/issues

- Subdivision growth rate
- New wells
- Closed Basin
- Flood to sprinkler conversion
- Impaired water quality
- Expansion of industrial water use
- Expansion of agricultural water use

Characteristics

- Population density
- Usability of the water
- Information already known
- System complexity
- County growth plan in place, with a high density area
- Contentious/ litigious
- Highly valued ecological water system
- Mitigation water availability
- Basin fill vs. bedrock
- Efficiency of effort
- Diversity
- Controlled groundwater area

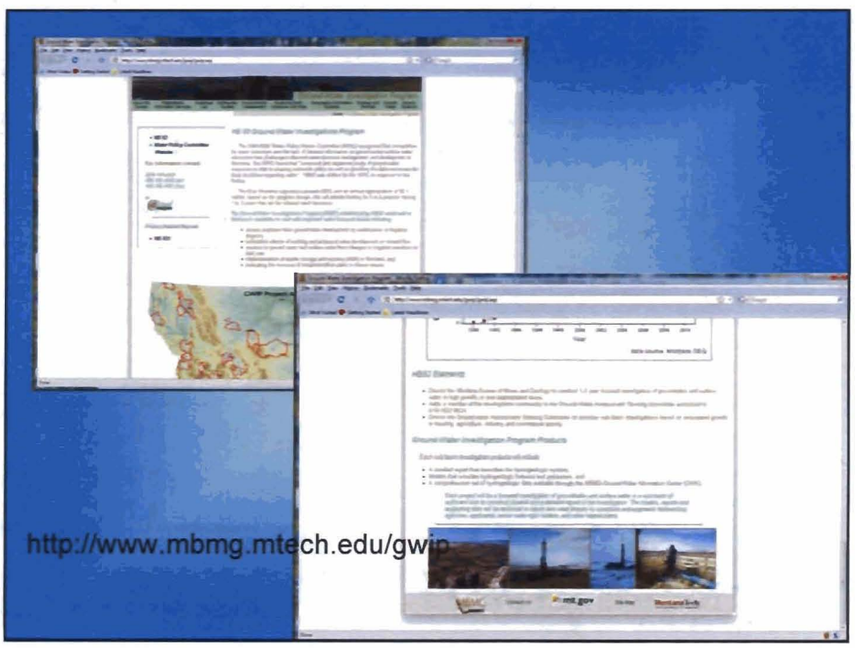


Program Status (July 9, 2009)

- Personnel (from in house):
  - •John Metesh: Research Division Chief (occasional modeler)
  - •John Wheaton: Program Manager, Principal Investigator
  - •Ginette Abdo: Principal Investigator
  - •Tom Michalek: Principal Investigator
  - •Kirk Waren: Principal Investigator
  - •2 positions for Hydrogeologist: in progress
- •Personnel (new)
  - •Principal Investigator: 6 applications
  - •Hydrogeologists: 16 applications

Projects (top 4):
Work plan (project design)
Budget

GWIP will create 10 to 15 new positions with the Bureau



http://www.mbmg.mtech.edu/gwip

Acknowledgements:

Funding: Montana 60th Legislature (HB831)

60th Legislature Water Policy Interim Committee
(guidance [in more ways than one])

Montana DNRC and DEQ (guidance and comments)

MSU and UofM (comments)

Many supporters (from all sides of the issues) at hearings

61st Legislature/Governor