Climate: the only thing that's certain is change. We can help you plan.

one-stop climate mitigation and adaptation services

At Barr, we have a wide range of experts to provide climate adaptation services to clients in mining, power, and fuel sectors—as well as local and regional communities and governments. Whether your problem requires complex modeling, stormwater management, infrastructure design, low-impact development, geotechnical analysis, energy analysis—or a combination—we have engineers and scientists available to help you solve it. In fact, we have 800 of them, working collaboratively to provide innovative approaches to climate-related problems.

Below are just some of the services we provide to help our clients manage climate change:

landscape and stormwater

- Landscape design for storm resiliency, water conservation and energy conservation
- Urban forest planning for resilience
- Managing soils to readily infiltrate and hold stormwater
- Rainwater capture and use
- Stormwater capture and use
- Cistern and water system distribution design
- Designing adequate stormwater infrastructure.
- Pavement reduction planning and designs that minimize runoff
- Urban heat island assessment and mitigation
- Threatened and endangered species review

surface water

- Prediction of base stream flow, lake levels and wetland fluctuation
- Future floodplain conditions mapping
- Drought period mapping
- Data compilation for project funding
- Lake, river, stream and wetland restoration
- Water quality and flood management
- Lakeshore stabilization and restoration
- Invasive aquatic species management planning

energy

- Renewable energy consultation
- Wind resource assessment
- Wind turbine foundation design
- Solar array planning and design
- Hydro power analysis and dam design
- Biomass plant design
- Facility permitting

groundwater

- Modeling to forecast possible effects of climate change on groundwater resources and base stream flows—for both water-supply planning and natural resource management
- Groundwater recharge forecasting incorporating projected climate change impacts
- Storage of stormwater in aquifers for use during drought conditions systems design
- Drinking water acquisition and distribution systems planning and design
- Emergency water-supply systems development

structures

- Conduct Life Cycle Analysis to determine least impactful materials
- Designing flood control structures
- Designing infrastructure that is resilient to a range of future climatic stresses

air

- Greenhouse gas inventories, reporting, and mitigation
- Health risk assessment

land

- Utilize the Envision Rating SystemTM to evaluate efficiency and sustainability of infrastructure
- Rules and ordinance development
- Landslide analysis, repair, and slope reinforcement
- Levee and dam design
- Native plant community restoration
- Terrestrial invasive species management planning
- Nutrient cycle modeling for terrestrial systems
- Carbon sequestration and soils storage modeling for various terrestrial system

Our Changing Climate

Key Messages:

1. It's happening
2. It's serious
3. **There are things we can do to address it!**

Prevent It from Getting Worse

Reduce Emissions

- Energy efficiency
  - Energy Production
  - Industry
  - Housing
  - Transportation
  - Agriculture
- Renewable Energy
  - Wind
  - Solar
  - Geothermal

Sequester Carbon

- Forest and Other Native Plant Community Restoration
- Soil Regeneration
- Farming Practices
- Landscaping

Conservation

- Energy
- Food
- Construction
  - Recycle
  - Reduce
- Water
- Soil
- Native Plant Communities
  - Forest
  - Wetlands

Education

- Understand Materials Life Cycle Analysis
- Green Infrastructure
- Envision™

Prepare & Adapt

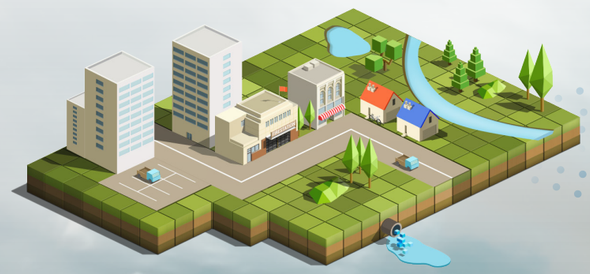
How?
(see next page)

www.barr.com | for additional information, contact Fred Rozumalski | 952-832-2733 | frozumalski@barr.com

Preparing for our Changing Climate

Situation Today
changes are occurring

Engage Stakeholders



Possible Future Scenarios

- High Wind
- Extreme Storm Events
- Extreme Heat Events
- Extended Drought

→

- Catastrophic Flooding?
- Water Shortage?
- Failed Infrastructure?
- Industrial Challenges?
- Health Impacts?
- What Else?

→ **Strategy**
(Informed Decisions)
Community Engagement

→ Conclusions:
A
B
C
D
E
F

Operate Strategically for a Resilient Tomorrow

WHAT ARE WE NOTICING NOW? → WHAT COULD HAPPEN? → HOW VULNERABLE ARE WE? → CREATE A PLAN! → WHAT WILL WE DO?... → FOR A RESILIENT TOMORROW

Barr Can Help By:

1. Asking The Right Questions
2. Modeling Impacts of Extreme Events
3. Assessing For Vulnerability
   - What is at Risk?
   - Who is at Risk?
4. Facilitating Community Adaptation Planning to Minimize Risks
5. Designing Solutions
6. Ongoing Adaptive Management

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