



# CREWES

*Consortium for Research in Elastic Wave Exploration Seismology*

## PROJECT OVERVIEW

# 2011



UNIVERSITY OF  
CALGARY

## **SUMMARY**

The Consortium for Research in Elastic Wave Exploration Seismology (CREWES) invites organizations with an interest in exploration geophysics to participate in a one-year (renewable) program of geophysical research. There have been exciting new scientific developments in the past year, notably in the areas of accelerometer analysis, land streamer data acquisition, continuous seismic monitoring, anisotropy analysis, depth imaging, 3C-3D surface seismic cases, geostatistical integration, and VSP analysis. These developments are being assessed in collaboration with the industry. The project personnel are enthusiastically continuing their research efforts in these and other areas.

The overall objective of the Project is to work with industry sponsors to conduct advanced geophysical research and education in areas crucial to resource exploration and development. We are focused on multicomponent and 3-D data acquisition, new and improved processing algorithms, and interpretational techniques aimed at enhanced 3-D petrophysical imaging.

Five faculty members in the Department of Geoscience at the University of Calgary are working directly on the Project with their associated graduate students and post-doctoral fellows. Thirteen staff members provide additional research expertise, and technical and administrative support. An Industrial Advisory Board provides strategic and technical counsel to the Project.

CREWES communicates research results to its sponsors through an active website, an annual Research Report, and a yearly Sponsors Meeting where the achievements of the preceding twelve months are presented. These and other benefits of sponsorship are included in the following list.

## **BENEFITS OF SPONSORSHIP**

Each sponsor of CREWES:

- i) has immediate access to the CREWES Research Collection (948 research reports and 103 student theses), software, and CREWES News, through the web site ([www.crewes.org](http://www.crewes.org))
- ii) receives the yearly Research Report (approximately 80 chapters) on CREWES research activities, and the bi-annual CREWES Newsletter;
- iii) receives releases of software developed by the Project;
- iv) has access to detailed multicomponent field surveys acquired by the Project;
- v) has access to physical modelling data (acoustic and elastic);
- vi) is invited to continuing education seminars and courses on areas of recent technical development;
- vii) is invited to the annual Sponsors Meeting where CREWES-generated research results are presented;
- viii) has access to graduate-student theses, presentation abstracts, and publication reprints;

- ix) receives copies of lecture notes and CREWES-authored SEG publications, as well as PowerPoint presentations;
- x) has the opportunity to develop joint projects of mutual interest; and
- xi) has a chance to become acquainted with graduate students as potential future employees.

## FINANCING

We have received a one-year renewal from our existing sponsors and seek participation from new sponsors. Sponsorship will continue on an annual basis, with commitment for one year at a time. New sponsors receive access to previous research reports and software releases on the CREWES website.

### Sponsor Fees 2011

- **Main:** \$45,000 CAD - companies with annual gross revenue over \$50 million Canadian
  - **Please note that the 2012 fees will be increased to \$49,000 Canadian**
- **Intermediate:** \$35,000 CAD - companies with annual gross revenue between \$1 million and \$50 million\*
  - **Please note that the 2012 fees will be increased to \$37,000 Canadian**
- **Entry:** \$15,000 CAD - companies with annual gross revenue under \$1 million\*

#### \*Conditions

- Intermediate: Delay of receiving data of one year from date of the Sponsors Meeting in the year of joining the Project, and one year from release date for subsequent releases of data
- Entry: Delay on receiving data as for Intermediate level above, and delay of receiving software for one year from date of the Sponsors Meeting in the year of joining. A company is limited to three years at the entry level.
- All sponsors, regardless of level, have equal representation and are eligible to have a delegate on the CREWES Industrial Advisory Board.

## Current CREWES Industry Sponsors

BHP Billiton Petroleum	INOVA Geophysical Equipment Ltd.
CGGVeritas	Landmark Graphics Corporation
Chevron Corporation	Marathon Oil Corporation
ConocoPhillips	Nexen Inc.
Devon Energy Corp.	Penn West Energy Trust
Ecopetrol S.A.	Petrobras
Encana Corporation	Saudi Aramco
Eni S.p.A.	Sensor Geophysical Ltd.
Exxon Mobil Corporation	Shell Canada Limited
GDF Suez E&P Deutschland GmbH	Statoil ASA
Geokinetics Inc	Talisman Energy Inc.
Geophysical Exploration & Development Corporation	Tullow Oil p.l.c.
Geoprosados S.A. de C.V.	WesternGeco
Husky Energy Inc.	

## Other Funding

Since 1994, CREWES has been successful in obtaining Natural Sciences and Engineering Research Council (NSERC) funding to match a portion of the industry contributions. The support received from NSERC is equal to approximately thirty percent of the total Project funding. The NSERC funds are also used to conduct advanced applied geophysical research, and support the CREWES goals. In June of 2009, CREWES received an NSERC Collaborative Research and Development grant in the amount of \$574,500 per year for five years.

## RESEARCH DIRECTIONS

The table of contents of the 2010 CREWES Research Report, attached, indicates the current scope of research being conducted by project personnel.

## PERSONNEL

CREWES is led by the following faculty members of the Department of Geoscience at the University of Calgary:

- Director: Dr. Gary Margrave
- Associate Directors: Drs. Don Lawton, Robert Ferguson, Kris Innanen, Larry Lines, David Eaton, and Robert Stewart
- Associated Faculty: Drs. John Bancroft, Michael Lamoureux, Matt Yedlin

These scientists, with input from representatives of sponsor companies, set the scientific direction of the project that, in turn, determines its budget and organization. This direction and management is in accordance with operations of the Department of Geoscience under its head Dr. David Eaton, and the rules and provisions of the University of Calgary.

A number of graduate students are supervised and supported by the Project, either fully or in part. The students' research projects are compatible with the research directions of CREWES and the results of their research are shared with sponsors.

### Active Graduate Students (Degree Program)

Mohammed Alarfaj (M.Sc.)	Steve Kim (M.Sc.)
Mahdi Al-Mutlaq (Ph.D.)	Diane Lespinasse (M.Sc.)
Abdallah Al-Zaharani (M.Sc.)	Heather Lloyd (M.Sc.)
Jessie Arthur (M.Sc.)	Faranak Mahmoudian (Ph.D.)
Roohollah Askari (Ph.D.)	Matt McDonald (M.Sc.)
Chris Bird (M.Sc.)	Shahin Moradi (Ph.D.)
Peng Cheng (Ph.D.)	Andrew Nicol (M.Sc.)
David Cho (M.Sc.)	Agnieszka Pawlak (Ph.D.)
Jean Cui (Ph.D.)	Chris Petten (M.Sc.)
Peter Gagliardi (M.Sc.)	Baolin Qiao (M.Sc.)
Patricia Gavotti (M.Sc.)	A-Nassir Saeed (M.Sc.)
Saul Guevara (Ph.D.)	Todor Todorov (Ph.D.)
Thais Guirigay (M.Sc.)	Virginia Vera (M.Sc.)
Melissa Hernández (M.Sc.)	Vanja Vracar (M.Sc.)
Hormoz Izadi (M.Sc.)	Ben Wards (Ph.D.)
Shahin Jabbari (Ph.D.)	Marcus Wilson (M.Sc.)
Zaiming Jiang (Ph.D.)	Glen Young (M.Sc.)
Byron Kelly (M.Sc.)	Abdolnaser Yousefzadeh (Ph.D.)
Hassan Khaniani (Ph.D.)	Liliana Zuleta (M.Sc.)

Staff members supported by the project conduct research, and provide technical and administrative support.

### **Staff Members**

Laura Baird  
Admin Manager

Kevin Bertram  
Research Technologist

Malcolm Bertram  
Acquisition Research Scientist

Pat Daley, Ph.D.  
Research Geoscientist

Eric Gallant  
Research Technologist

Kevin Hall, M.Sc., P. Geoph.  
Technical Manager

Chris Harrison, Ph.D.  
Post Doctoral Researcher

Dave Henley, M.Sc.  
Research Geophysicist

Helen Isaac, Ph.D.  
Research Scientist

Rolf Maier, Ph.D.  
Systems Geoscientist

Peter Manning, Ph.D.  
Post Doctoral Researcher

Mostafa Naghizadeh, Ph.D.  
Post Doctoral Researcher

Joe Wong, Ph.D.  
Research Geophysicist

### **2011 CREWES SPONSORS MEETING**

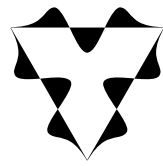
November 30 – December 2, 2011

Banff Park Lodge - Banff, Alberta, Canada

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# **CREWES**

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