

# PETROSYS

## PRODUCTS AND SOLUTIONS

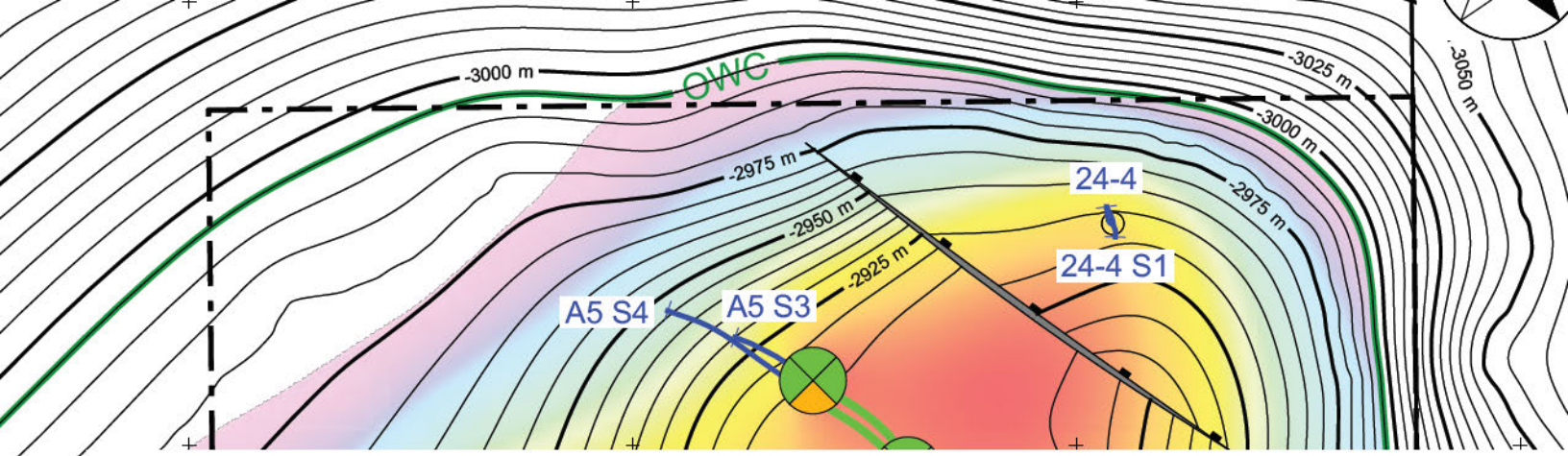
MAPPING, MODELING  
AND DATA MANAGEMENT  
SOFTWARE FOR OIL AND  
GAS PROFESSIONALS



[www.petrosys.com.au](http://www.petrosys.com.au)

"Maps are one of the most important tools used to help describe the subsurface. They are the fundamental work product that geoscientists across the breadth of the business use to present and communicate information and understanding."

*Chief Geologist and Chief Geophysicist, Mid-sized Independent*



# HOW TO ACHIEVE GURU STATUS

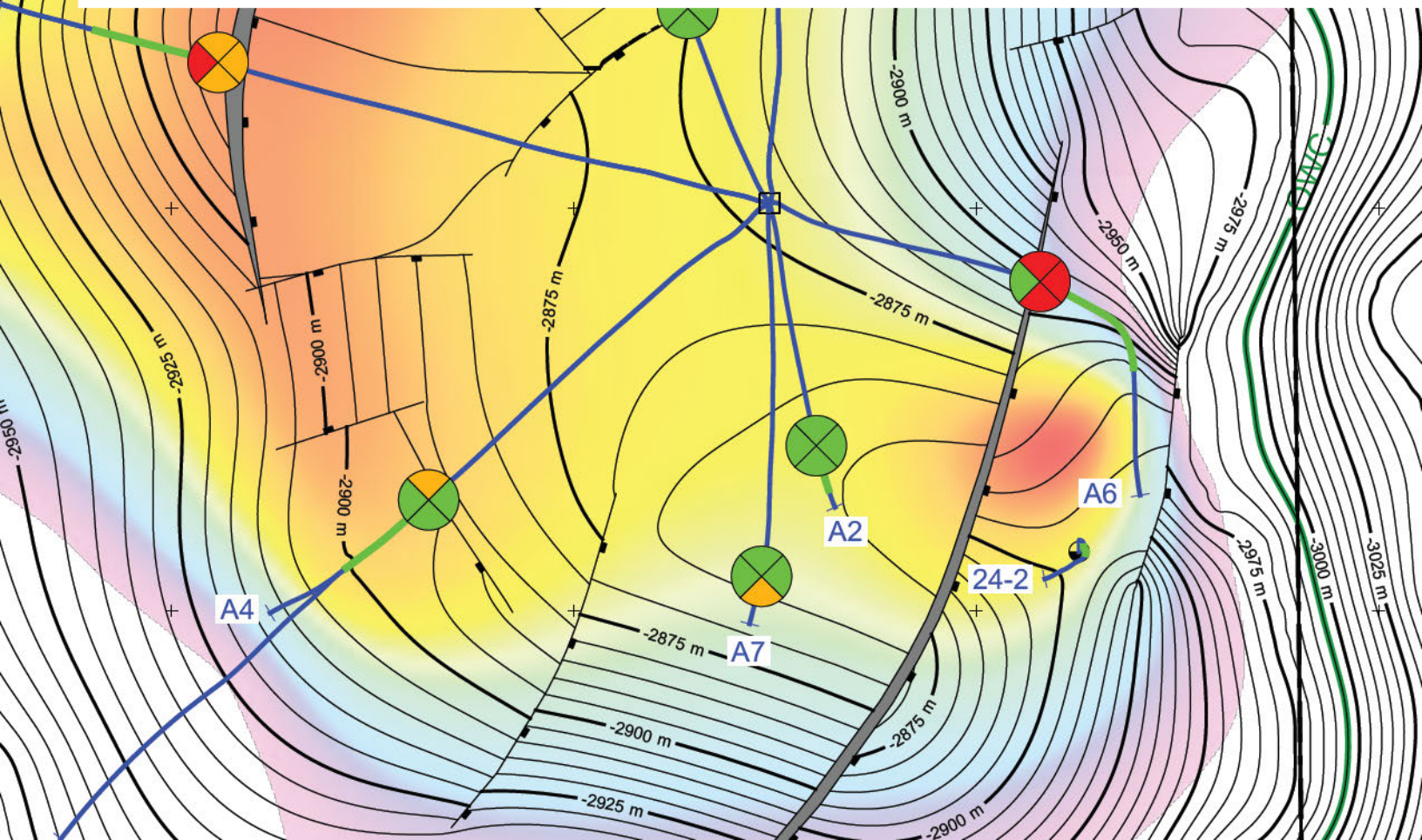
In a world of data-driven decisions, success means appreciating risk and opportunity before it becomes obvious. Embedded in your critical workflows, Petrosys will unify, enhance and present insights from your entire team – for actionable results that communicate with clarity and meaning.

Effortlessly combine data across disciplines with unique, powerful connectivity to the broadest range of E&P applications and data. Create volume estimates and surface models of the highest quality by leveraging the most trusted, repeatable geoscience methods. Present your insight with accurate, richly-layered, compelling maps and visualisations that faithfully honour every geological nuance and detail.

Improve the return on your data management investment with a secure, open and scalable dbMap solution. Centralised, best-in-class uncertainty analysis empowers you to compare and understand the prospects and leads in your portfolio.

With automated workflows and consistent, best-practice organisational standards, Petrosys makes complex decision-making more efficient, more intuitive and more impactful. The effect on your organisation will be transformational.

With over 30 years of experience and non-stop innovation, no wonder more than 250 industry leaders worldwide choose Petrosys.



# SUPPORTING GURUS WORLDWIDE

Petrosys consolidates the knowledge of your entire team. It helps you discover opportunities which may only become obvious when information from multiple applications, disciplines and datasets is combined.

Petrosys is the industry leader in mapping, surface modeling and data management software solutions delivering direct connectivity with the most popular exploration, production and GIS data sources. Petrosys produces high quality maps and surface models. It manages, edits, and analyses the underlying information, including the specialised seismic, well and geoscience data used in the search for oil and gas.

## Clients

Geoscientists, data managers and engineers at more than 300 sites worldwide use Petrosys as an essential tool for basin and field interpretation, to enhance enterprise data management and to help make better decisions.

## Our Commitment to Support

The Petrosys global support team is highly respected for speedy response and expert technical assistance. Take advantage of the team's expertise to resolve issues quickly and make the most of your software investment. Our product development team applies modern software engineering practices to create and maintain systems that are robustly deployable across a range of operating systems and third party applications versions.

The evolution of our product is strongly influenced by client feedback and balances requirements for improved functionality, intuitive and contemporary user interfaces, current and legacy operating systems, and flexibility.

## Our Vision

We strive to be the global leader in geoscience mapping software and services, and recognised experts in E&P technical data management within the oil and gas sector worldwide, with the objective of delivering solutions that improve our client's profitability. We pride ourselves on providing you with an outstanding team of professionals who enjoy working with all types of organisations to create, configure and deliver solutions that improve our ability to discover and develop energy resources in the best way possible.

*"There aren't many products where support gets back to you within the hour."*

*Geoscientist, European independent energy company.*

# PRODUCTS AND SERVICES

PETROSYS PRO		
CONNECTIVITY	MAPPING AND VISUALIZATION	SURFACE MODELING
 4	 6	 8

dbMap	PLDB		
DATA MANAGEMENT	RISK AND RESOURCES	E&P WORKFLOWS	SERVICES
 12	 15	 17	 22

# CONNECTIVITY

- Simple, direct connectivity with core subsurface applications and databases
- The most dynamic aggregator of data for mapping and surface modeling
- Powerful spatial and subsurface data exchange tools
- Works simultaneously with Windows® and Linux® based applications

**PETROSYS PRO**

## LANDMARK

DecisionSpace  
OpenWorks®  
SeisWorks®  
Z-MAP Plus®

## LMKR

GeoGraphix®

## SCHLUMBERGER

Petrel®  
GeoFrame®  
IESX®  
Charisma®  
Finder®  
OFM

## PARADIGM

Epos®  
GOCAD®

## ESRI

ArcGIS®  
ArcSDE®  
Geodatabases  
Shapefile  
LYR/MXD

## IHS

Kingdom®  
Petra®

## PPDM

## IC™

DUG Insight

## SEISWARE

CGG Trango

## KATALYST

## MICROSOFT

Excel®  
PowerPoint®

The simple and direct connectivity between **Petrosys Pro** and subsurface applications enables geoscientists to discover opportunities, with reduced data management challenges.

### Effective Integration

With Petrosys, data can be visualised on maps or included as input to surface modeling without the need for third party middleware. Petrosys reads subsurface data from its source location in a wide range of master, project and spatial data stores.

*"Connectivity with applications and data stores is superb in Petrosys..."*

### Cross Platform

Petrosys works with Windows and Linux based applications as well as in-house and hosted databases. Our software engineering team maintains an array of test systems to keep your connectivity aligned with the latest versions of applications and operating systems, reinforcing the long term value of your subsurface applications portfolio.

*"Petrosys is the easiest application to manage and deploy out of the many, many apps I have to deal with daily..."*

### Efficient Task Management

Workflows using data from multiple sources often involve complex import and export operations that are not only time consuming but which also reduce data integrity. Petrosys provides a range of options for accessing information directly. This improves the retention of data integrity whilst simplifying and speeding up operations.

*"Probably not what you expect – it's excellent middleware..."*

### Data Exchange

Petrosys Exchange functionality can be used to transfer subsurface and spatial data between a range of 3rd party sources. Choose input data sources and move data to defined output data sources interactively or in saved workflows.

..... WELL DATA

..... SEISMIC DATA

..... GEOSCIENCE DATA

..... GIS DATA

..... IMAGERY

..... POINT DATA

**PETROSYS**

SURFACE MODELING  
MAPPING  
DATA EXCHANGE

#### IMAGE FILES

CGM  
DGN  
GEO-TIFF  
JPEG  
JPEG-2000  
PNG  
WMS  
ZGF

#### LINKS

ODBC  
Excel  
Access  
Oracle®  
PPT

#### GIS FILES

ArcShape  
MapInfo  
Petrosys CUL  
KML  
XLS



## Honouring Data

Designed to recognise the source application coordinate reference systems, Petrosys converts data to project-specified map CRS on the fly.

*"When Petrosys throws up a CRS warning on a project connection, we take note – cross-referencing locations has allowed us to identify and correct potentially costly well positioning errors..."*

## Interrogate then Select Data

Create maps, 3D displays and surface models from the latest interpretation data. Query data directly using the map interface and then update surface models.

## Customer Focused, Vendor Neutral

Petrosys works with third party development kits to provide direct links to subsurface applications and databases. New links are constantly being added in response to customer requests. As an independent software provider, Petrosys is proud of our collaboration with other leading edge systems developers who continue to provide the E&P industry with the technology it needs.

## Optimise Software License Use

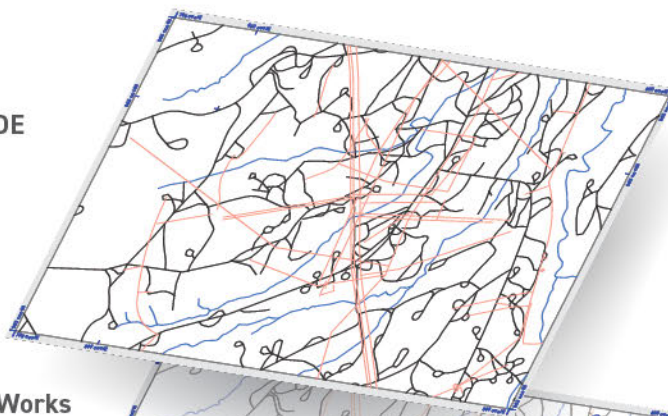
When you have a restricted license pool for an application, or are working on the road, using an offline Petrosys project can provide a useful snapshot of interpretation and other data without incurring new licensing costs.

## Share Spatial Data

The Petrosys spatial data translator provides fast easy export of much of the diverse and specialised range of Petrosys map content into more generic spatial formats for use in applications ranging from Petrel through ArcGIS to Google Earth. Our Esri Plugin also allows viewing of Petrosys grids, contours and faults in ArcMap.

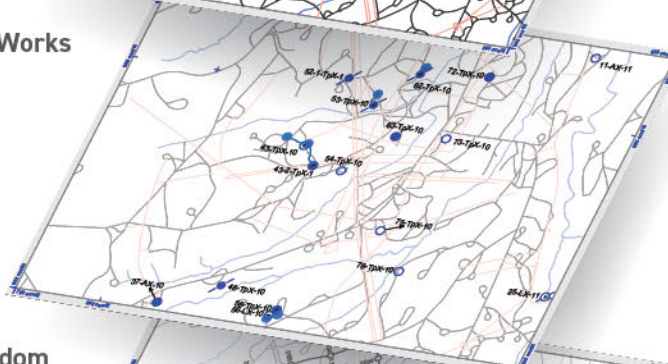
*"Petrosys provides the ability to bridge the interpretation and GIS environments."*

ArcSDE



Display roads from an ArcSDE GIS database.

OpenWorks



Add well tracks from OpenWorks.

Kingdom



Post 2D seismic data from Kingdom.

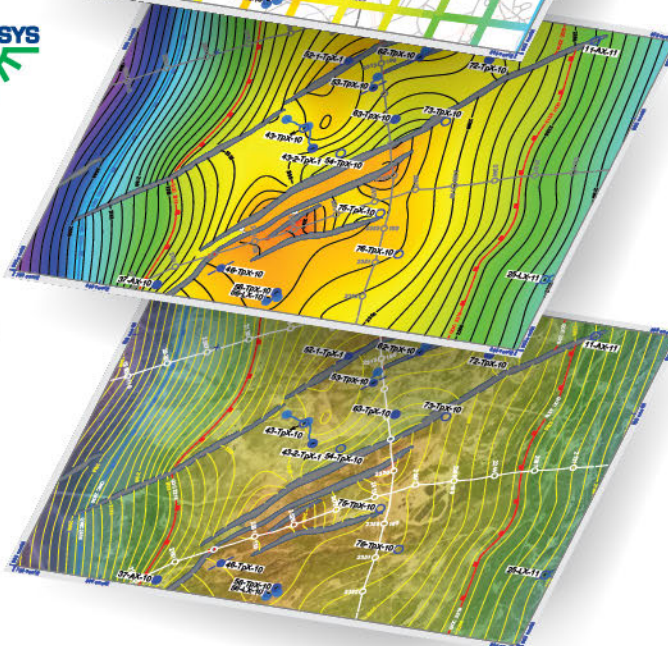
Petrel



Add 3D interpreted seismic from Petrel as a ribbon map layer.



WMS



Compute a well tied depth grid with velocities from a Petrosys SDF and display as color fill grid and contours.

Insert translucent satellite imagery to add current surface facility knowledge.



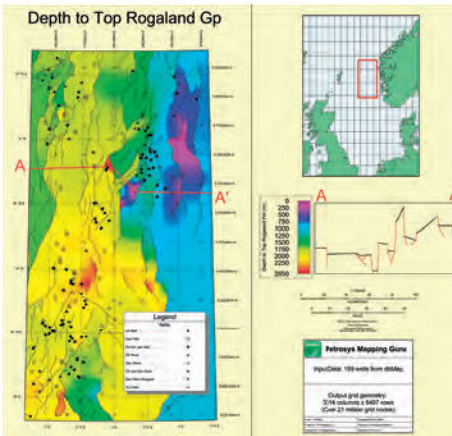
# MAPPING AND VISUALIZATION

- Reinforce the credibility of your work with compelling presentations
- Produce publication quality maps of current interpretation in minutes
- Display data directly from the most popular E&P applications and data stores
- Trace and edit contours, faults and outlines for subsurface map interpretation
- Accurately map data from multiple coordinate systems

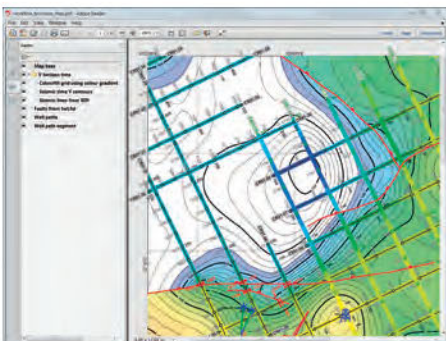
**PETROSYS PRO**



Full cartographic support allows the use of Petrosys anywhere on our planet.



Insert graphics from other applications, create custom title blocks and legends, and add text and graphical annotation to turn your map into a self-contained presentation.



Layered PDFs allow users of your maps to switch data types on and off to explore your subsurface presentation in PDF reading tools such as Adobe Reader.

Reinforce the credibility of your work by creating publication quality maps using the latest available data in the least possible time.

## Corporate Mapping Standards

Use the Petrosys map templates to build standard maps across projects and teams within your company. With Petrosys, E&P management can expect a consistent, high standard of map presentation for technical meetings, digital publications and reports.

## Prospect to Reservoir Scale Maps

With Petrosys it is easy to produce detailed prospectivity, exploration and reservoir maps to support farm-ins, licensing rounds and daily operations. Maps can be effortlessly updated as the underlying datasets evolve.

## Coordinate Reference Systems

Designed to recognise the Coordinate Reference Systems (CRS) of data, Petrosys converts spatial knowledge to the CRS played on. Datasets from multiple CRS can be correctly positioned, allowing basin scale mapping involving multiple seismic surveys and legacy well locations. The Petrosys CRS engine is built on the industry standard EPSG database of geodetic datums and projections, with robust handling of custom CRS.

## Versatile Map Management

Using Petrosys map sheet libraries, it is easy to create standard map layouts. When required, the area of interest can be adjusted, rescaled and rotated with a few clicks of the mouse or set to dynamically adapt to the data extent. Flexible map boundary styles support

both large format hardcopy maps and compact images for use in PowerPoint and other on screen presentations.

## Layer Management

Map data is stored as a series of layers which are easy to edit or re-sequence. Map layers can be grouped by data display types, source coordinate reference system, or manually. A single map file, or the associated layered PDF output, can convey the knowledge of all individual horizons or zones in a field, streamlining the management and sharing of maps.

Grouping of Petrosys map layers allows maps to include grid, contour and source data views of multiple horizons, sands and GIS data with powerful display controls.

## Visually Appealing Maps

A comprehensive suite of cartographic elements is available to help create maps that conform to industry and national standards. Select and create scale bars, title blocks, color bars and North arrows. An intelligent legend builder completes your masterpiece. Clever use of color bars, translucency and raster image overlay result in visually appealing maps. Automatic and manual overpost correction improves legibility in areas of dense well and seismic data.

## Display Data Directly

Display data directly from the most popular E&P applications and data stores - connectivity is the key. Petrosys can connect directly to all E&P data stores which allows for quick and easy display of data without the need to import or reformat. Direct connection reduces data duplication and makes it easy when updating maps.

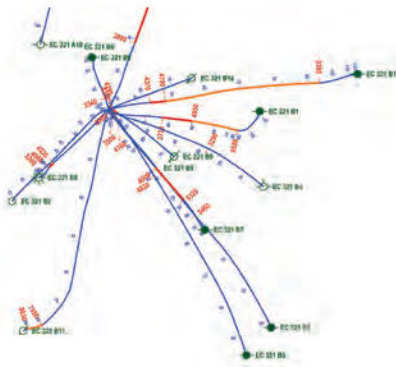


In conjunction with direct connections to popular seismic applications and Petrosys' established master storage of seismic navigation, Petrosys sets an industry standard for mapping of historical seismic data.

*"The key driver was efficiency of output – the ability to generate maps and do it again and again and do it quickly..."*

## Well and Seismic Mapping Tools

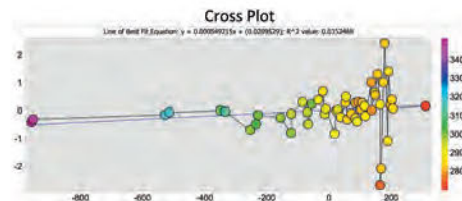
As Petrosys works with a comprehensive understanding of well data, it is easy to post downhole information along well tracks and at surface and bottom hole locations. With seismic data, Petrosys sets the industry standard for high quality base maps.



Proven technology for mapping directional surveys allows precise positioning of downhole zone intercepts and interactive tracking along well paths.

## Interact with Data

A Petrosys display is an active and intelligent mapping canvas. It knows the difference between wells, seismic lines, contours and lease boundaries. For example, clicking on a well gives access to the well header, directional surveys and queries specific to the connected data store, whilst selecting a contour tracks the contour level and provides access to the contour editing tool.



Cross plot to analyse data allows any two values from a list to be analysed in a fully customisable chart.

## Find and Fix Problems

Directly displaying data makes it possible to quickly and easily identify data errors such as directional survey problems or coordinate reference system inconsistencies.

## Subsurface Map Interpretation

Contours, faults and polygons associated with subsurface features can be traced and edited using geoscience-aware graphical editing tools.

## Thematic Mapping

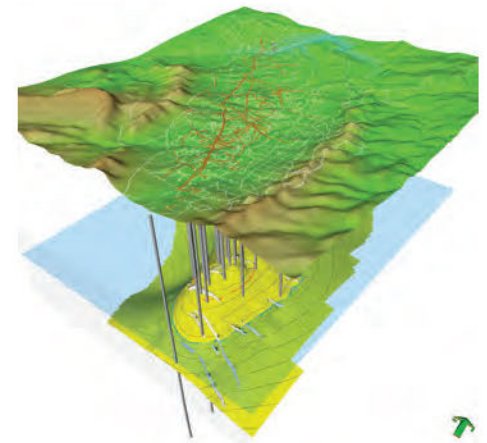
With thematic mapping, GIS features can be differentiated using colors selected based on data attributes. For example, leases can be colored by operator or expiry date and pipelines can be colored based on fluid carried.

## Refine the Content

The ability to specify subsets of large datasets and to refine the content of your Petrosys map with the most relevant information, enables you to focus clearly on the resolution of subsurface challenges.

## Expose the Subsurface

The 3D Viewer allows grids, wells point data and seismic surfaces from multiple data sources to be displayed in 3D. Images and Petrosys maps with live third party content can be projected to a horizontal surface or draped on a depth or time grid. With selectable resolution assuring high performance with even the largest grids, the 3D Viewer is an essential tool to monitor the outcomes of surface modeling operations.



The Petrosys 3D Viewer combines the rich knowledge content of Petrosys maps with the 3D spatial rendering of subsurface features.

## Publish

Modern communication builds on many technologies to disseminate ideas and interpretation. Petrosys output can be published to a comprehensive range of media including image files such as PNG for use in PowerPoint; Geospatial PDF, JPEG2000 and GeoTIFF for archiving; large format plotters for hardcopy; and KML and WMS for web-enabled mapping.

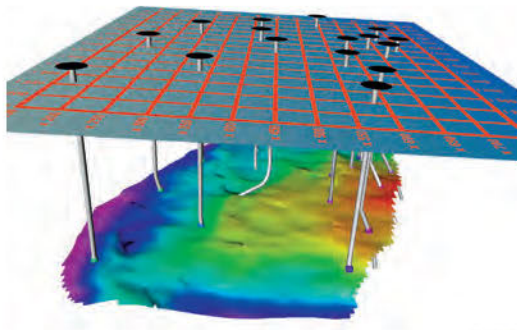
*"Petrosys' rich toolset lets you get so much further in a project within a single workflow – without the interruption of changing applications."*



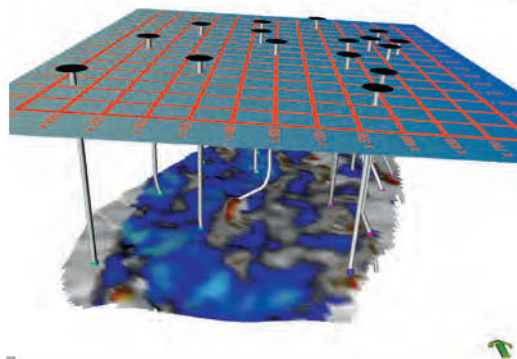
# SURFACE MODELING

- Unique ability to simultaneously model data from multiple sources
- Superior grid engineering with excellent fault handling
- Easy to configure and re-use modeling workflows that support automation
- Volumetrics – simple and accurate
- Clear logical user interface

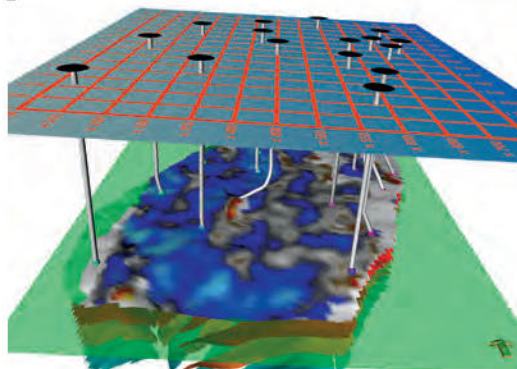
PETROSYS PRO



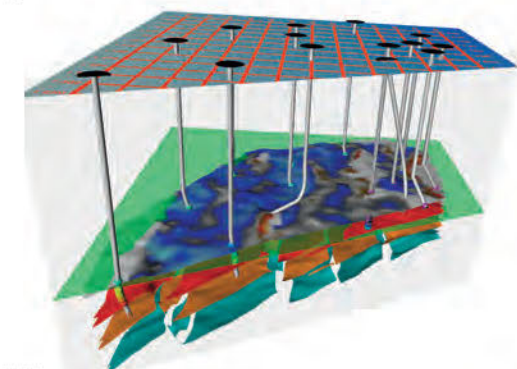
*A detailed subsurface structure mapped from seismic data can be depth converted then tied to well formation picks. Drape maps and images to bring navigation and bathymetry into context.*



*Arithmetic operations can be applied to this and additional surfaces, for example, to compute subcrops or attributes like porosity or permeability.*



*Families of surfaces can be created to model trap geometries and to assess contact levels.*



*Compute volumes between surfaces, horizontal fluid contacts and spatial outlines such as lease boundaries. Use time lapse or animation controls to assess attributes and scenarios. Make use of clipping planes near targets for pseudo sections.*

Petrosys surface modeling has the unique ability of being able to simultaneously model data from multiple input sources, drawing on a range of vendor applications and data stores. Surface models and maps are enhanced by greater access and run time filtering of data, supporting a geoscientist's ability to evaluate and conclude their interpretation on time.

## Superior Grid Engineering

*Grids in Petrosys are engineered to handle the wide range of surface modeling challenges in E&P work ranging from the field to the regional scale. Our flexible grid geometry supports very large grids defined in any projected or geographic coordinate reference system. Intelligent interpolation within grid cells allows high resolution output to be generated without the computational overheads of excessively fine grids.*



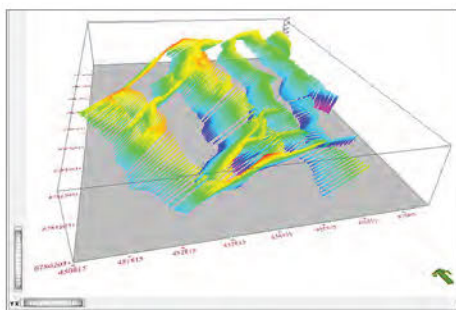
*Massive grids such as this global terrain model can be automatically overlaid on local maps in alternate projections.*





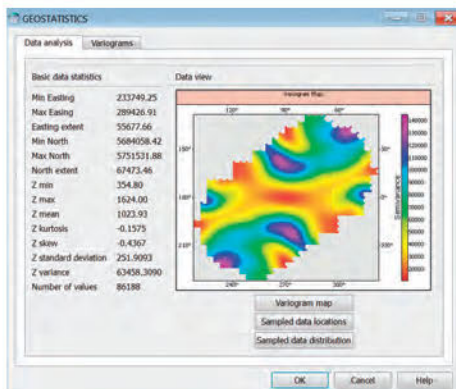
## Faults and Discontinuities

*Sharp discontinuities in a surface, such as are associated with faults, are honoured during computation and maintained by the inclusion of the fault geometry within the grid file. This distinctive geometric accuracy delivers a more geologically realistic representation of the subsurface.*



## Powerful Gridding Algorithms

Petrosys provides a broad range of surface modeling algorithms and mathematical operations to help interpret the subsurface. In addition to geometric methods such as minimum curvature and distance weighted averages, an interactive geostatistics approach can be used.



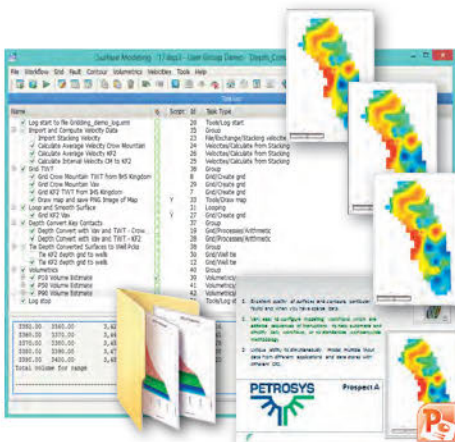
*Kriging with external drift is an excellent way of modeling attributes such as velocities or reservoir characteristics.*

## Extensive Range of Operations

Lateral and vertical grid merging techniques allow the geoscientist to develop consistent regional grids and sound structural and stratigraphic sequences. An established flexing procedure provides extensive control over the correction of seismic derived depth surfaces with well formation picks. Biased gridding enables highlighting of subtle trends such as in attribute variations due to channel deposits.

## Standard and Automated Workflows

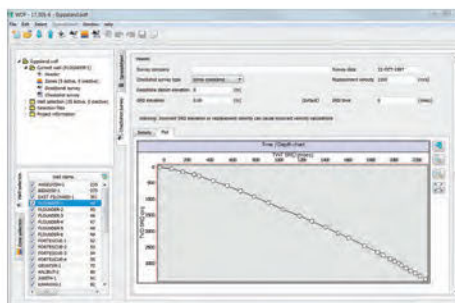
Standard geoscience process templates can be combined with arithmetic functions to simulate a range of scenarios. User defined task lists combine multiple steps with optional looping to automate routine and complex workflows such as the periodic updating of reservoir maps, computation of volumetrics and grid generation.



*Parameter scripting, looping and map generation allow automation of repetitive workflows and rapid investigation of simulated or time variant data.*

## Integrate Seismic Velocities

Petrosys helps geoscientists to perform depth conversions with tools that can use stacking velocities, SEG Y, well checkshots, and velocity depth functions with a range of data sources and formats.



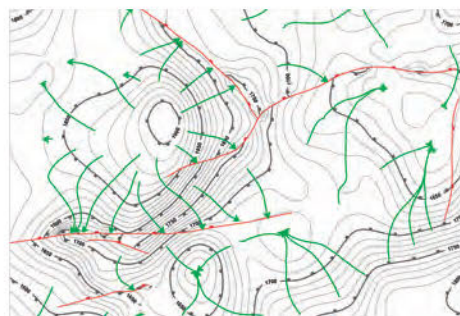
*Checkshots and stacking velocities can be used in Petrosys depth conversion workflows.*

## Representative Contours

Contours help geoscientists visualise and refine interpretation and are a vital component of reserves maps. Petrosys provides a high standard of contour displays including good matching of fault cuts, optional blanking of contours in areas of steep gradients, overpost correction and orthocontouring.

Graphical re-interpretation of contours and faults can be applied to update either an entire grid or a restricted area such as that affected by a recently drilled well.

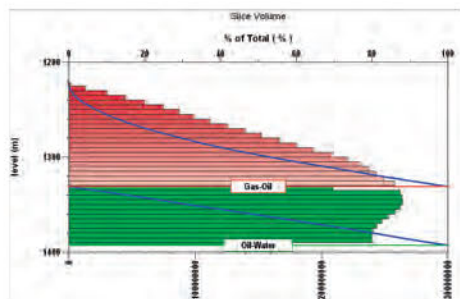
*Petrosys is simply the most intuitive application for editing contours and spatial objects ..."*



*Orthocontours help analyse potential flow paths.*

## Volumetrics

Gross rock volumes can be easily calculated from top, top and base, or thickness grids with optional user defined scale factors and volume units. Extensive quality assurance procedures ensure consistent and reliable volume estimates.

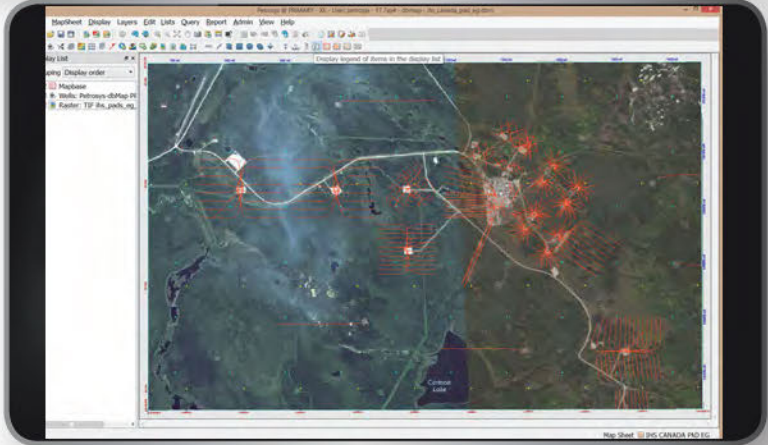
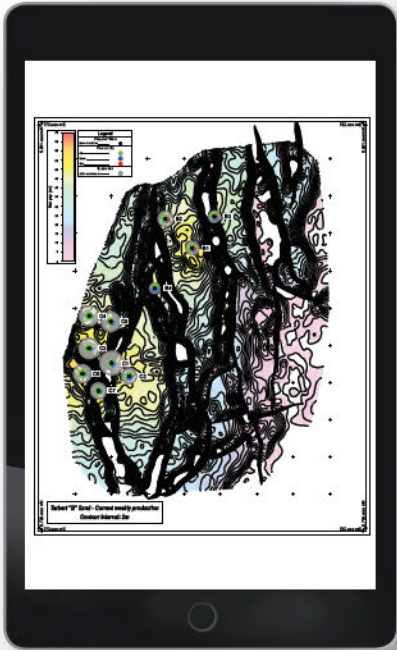
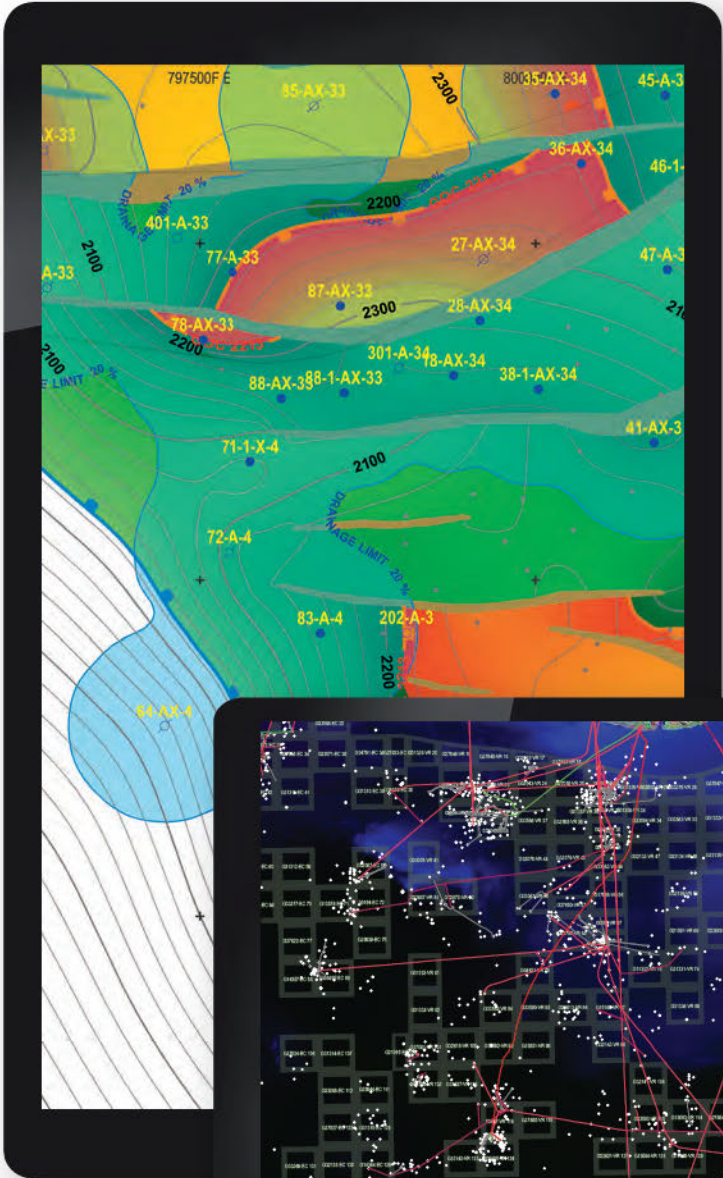


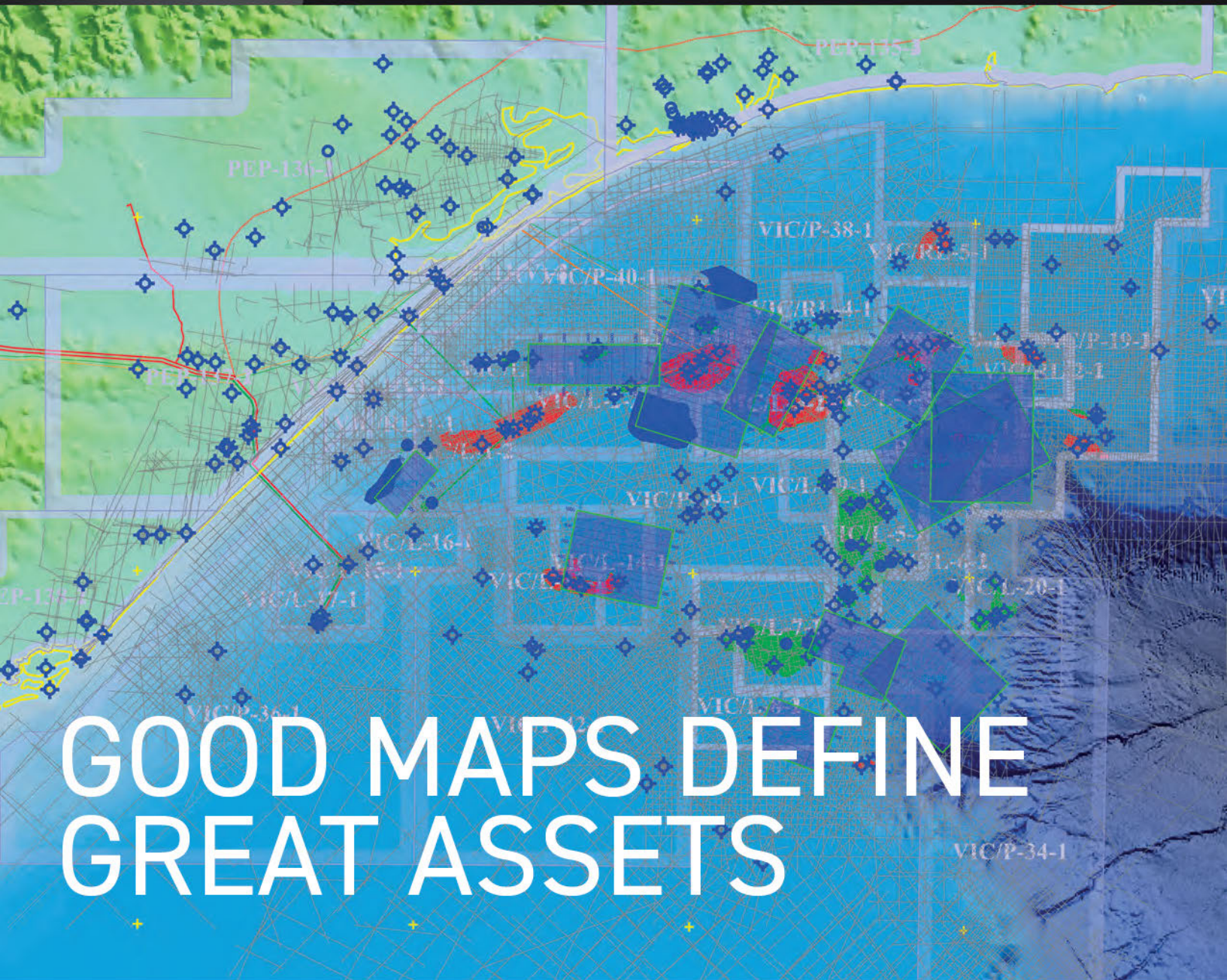
*Slice volumetric charts show the distribution of volumes in depth.*

## Accountability

*The ability to save, log and replay tasks enables consistent, accountable, and repeatable volume estimation to be performed across subsurface teams and over time. Within Petrosys all output is accompanied by comprehensive metadata reporting, which includes input sources, processes applied and coordinate reference system information. This supports auditability and best practice management.*





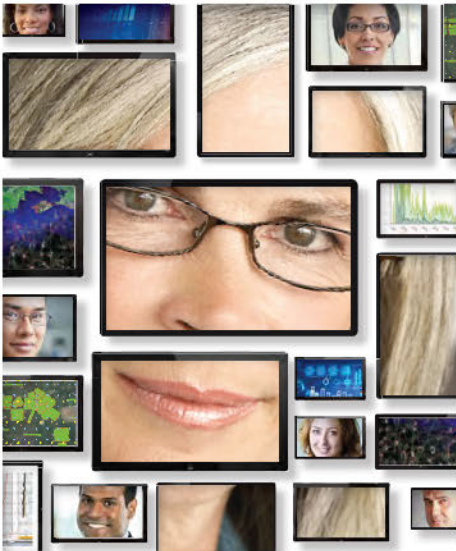


# GOOD MAPS DEFINE GREAT ASSETS

# dbMap® DATA MANAGEMENT

- Know your E&P assets through the data that describes them
- Create a gold standard master store
- Organise data sources to promote the best available data
- Support best practice corporate governance using tailored security
- Finish projects faster with better data quality and rapid resolution of data problems

dbMap



*"Open, configurable industry standard solutions from a trusted and experienced partner..."*

**Everyone does data management, we do it better...**



**...better access  
more accurate content  
improved discovery**

The effectiveness of the processes with which you manage your E&P assets will depend on the quality of the data that describes them. A Petrosys dbMap® data management strategy will help you build a reliable and secure collection of your E&P data, whether it's information that you have measured, interpreted or acquired. Our extensive experience with the PPDM data model will ensure that the security and performance of your data store can be tailored to meet your operational needs.

## Gold Standard Data

With multiple teams and different operational processes using data from the same business object over the history of an asset, it is essential that the business uses a consistent version of the data with a validated level of quality and a traceable change history. The aim of a well managed master data strategy is to create a gold standard source for the key components of business knowledge.

## Integrate Business Processes

Having confident access to reliable and unique reference data for wells, surveys and leases allows your organisation to integrate business processes across financial, engineering and geotechnical domains. Production records can be correctly assigned to well bores, which in turn are correctly positioned relative to geotechnical interpretation, reservoir models, and lease boundaries.

## Manage Sources, Track Data Changes and Large Data Sets

E&P data is frequently available from multiple sources, ranging from public records through commercially traded data to the operator's own information. Petrosys provides strategies for managing multiple versions of data and for selectively promoting elements to the master depending on data type and business context.

In Petrosys dbMap, data changes can be traced using audit history tables. Auditing can be selectively disabled for technical updates to allow the cost in resources and performance to be balanced against business value.

## Speed Technical Data Assembly

In putting together data acquired over decades of field development, drilling and seismic surveys, the resolution of inconsistencies, errors and data gaps can not only be a time consuming distraction but can also lead to poor interpretations and missed targets. The improved knowledge of data availability provided by the dbMap and dbMap Web user interfaces means the best data is used with confidence.

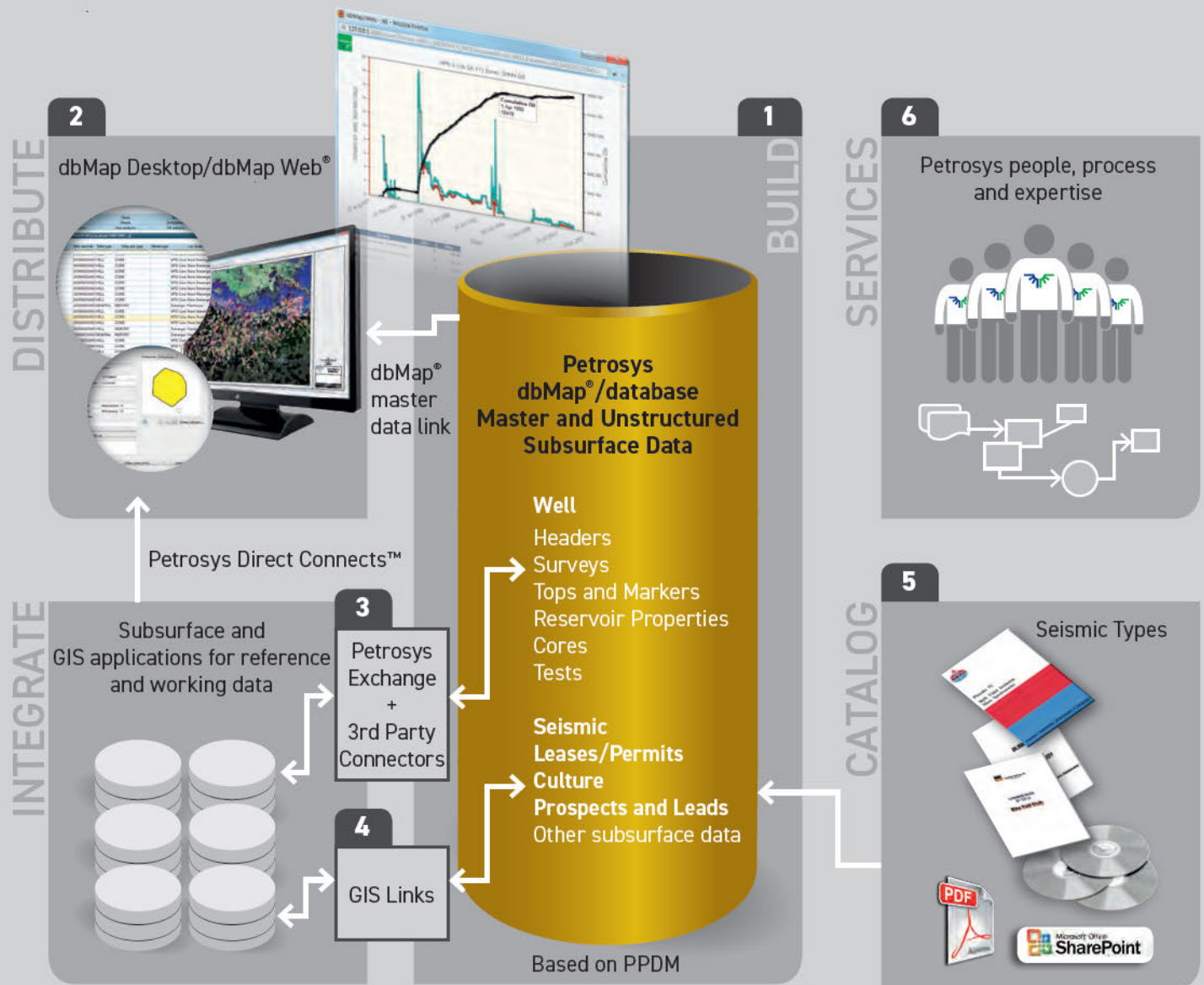
## Desktop and Web Interfaces

Petrosys provides both a desktop map interface (accessible through Windows or Linux) and the dbMap Web interface that features industry leading interactive performance in an easily deployed web browser environment. Both interfaces allow you to browse, query, report and edit your master data store.

*"Petrosys have some of the best directional survey handling in the business."*



## How Petrosys dbMap® solutions help improve your data management.



- 1** Tailor a master data store around the PPDM data model. Optimise database performance and integrity to meet your specific business needs.
- 2** Access Petrosys and other data stores through Windows and Linux dbMap desktops and provide fast access to a wide audience with the dbMap Web browser based interface.
- 3** Exchange subsurface and spatial data with third party data stores using Petrosys exchange tools or custom built database functions.
- 4** Reinforce your GIS capability with automated publishing of master data to ArcSDE layers, display of GIS layers in the dbMap desktop, and EPSG coordinate reference systems support.
- 5** Manage your company's digital and physical records with the ability to store the data near line. Discover and browse online reports, documents and images directly via dbMap interfaces.
- 6** Work with Petrosys experts to build an effective data management team that will ensure that your knowledge assets contribute increasing value to corporate performance.



## Delve into Original Data Sources

When users suspect a problem with data from a well or survey, managed access to unstructured datasets allows them to drill down into the original source data to more rapidly and reliably resolve inconsistencies or add critical missing knowledge. Errors in simple numbers such as the elevation reference for a well, for example, can completely negate the value of the well in a data set. Being able to check a suspicious elevation against an original well completion report may be the key to reliable inclusion of additional formation picks or checkshot surveys in a sparsely drilled region.

## Manage Unstructured Data

Records management in the dbMap® PPDM model supports cataloguing of unstructured digital and physical data such as well logs, seismic data sets, core samples and images, and document collections. Links to both the E&P master data and any existing document or file storage systems open effective knowledge streams between specialised data stores.

## Finish Projects Faster

Enabling professional staff to overcome data hurdles more smoothly allows projects to get completed quicker and to a higher standard. As a result your business can achieve exploration and production targets at a lower cost and in a better time frame.

## Good Corporate Governance

Managing access to, and the ownership of, data is both a corporate responsibility and a competitive differentiator. Petrosys dbMap lets you control database level security to ensure that only authorised users can update information. Data governance procedures can be implemented to give control of data to the most appropriate staff.

## Excellent Spatial Integrity

dbMap builds on the EPSG coordinate reference system (CRS) database to reconcile historically and regionally diverse geographic information.

Extensively tested and mature algorithms ensure the optimal interpolation of downhole data from well directional surveys.

## Leverage GIS Investments

Petrosys supports a range of spatial data management technologies including Oracle Spatial and Esri ArcSDE. Well locations and seismic navigation from the PPDM master can be automatically made available to your ArcGIS community, whilst GIS managed spatial knowledge related to facilities, infrastructure and regional geology is also accessible to the dbMap user. dbMap's powerful spatial data translator turns your Petrosys desktop into an essential hub for moving spatial data in and out of geoscience applications. Several options are provided to allow for the management of leases in different business environments.

## PPDM Wells and Seismic

Petrosys supports a substantial footprint of the PPDM data model for well and seismic data. The well data coverage includes well header, directional surveys, tops, cores and logs run. Seismic coverage includes 2D and 3D spatial data, acquisition and processing histories.

## Agile and Relevant Extensions

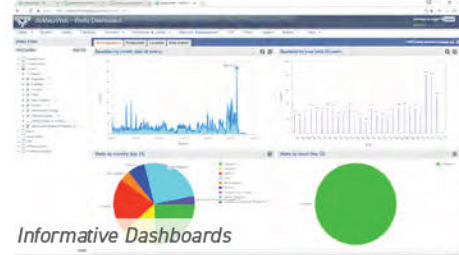
Our professional development and QA group ensures that dbMap is regularly extended to keep up with evolving industry needs. The FracDB extension manages well stimulation data with an emphasis on the needs of the operator. PLDB extends established prospects and leads workflows with advanced stochastic reserves estimation.

## Tailored to Meet your Needs

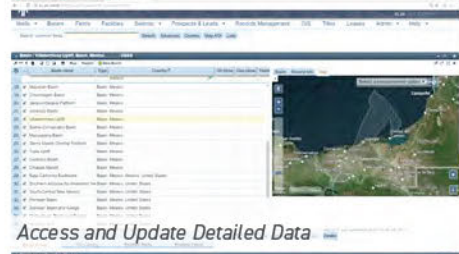
dbMap is designed to allow site specific extension to the data model as well as to accommodate alternate interpretations of PPDM elements, such as in the use of reference tables. Our database services team maintains a snapshot of site specific extensions to ensure that you can meet user expectations for technology and data model improvements with minimal service disruptions.



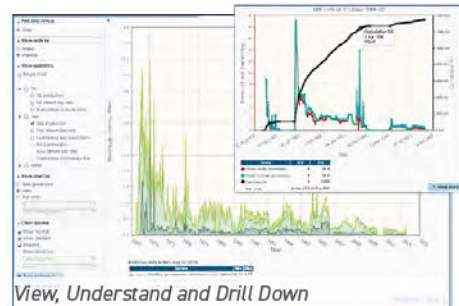
Browse, Chart and Report



Informative Dashboards



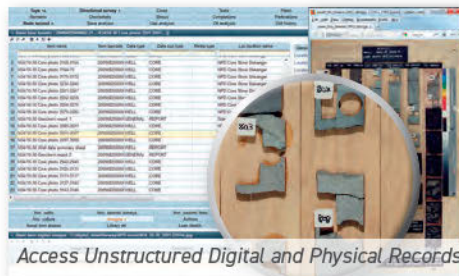
Access and Update Detailed Data



View, Understand and Drill Down



Wizards to Guide Workflows



Access Unstructured Digital and Physical Records

Well name	Wellhead	Control class	Lease name	County	Status	Date	Location	Date	Maintenance
1510	1510-1	UNKNOWNS	North Petroleum Reserve No. 1	United States of America	Active	2010-01-01	North Petroleum Reserve No. 1	2010-01-01	Confidence & Quality
1510	1510-2	UNKNOWNS	North Petroleum Reserve No. 2	United States of America	Active	2010-01-01	North Petroleum Reserve No. 2	2010-01-01	Confidence & Quality
1510	1510-3	UNKNOWNS	North Petroleum Reserve No. 3	United States of America	Active	2010-01-01	North Petroleum Reserve No. 3	2010-01-01	Confidence & Quality
1510	1510-4	UNKNOWNS	North Petroleum Reserve No. 4	United States of America	Active	2010-01-01	North Petroleum Reserve No. 4	2010-01-01	Confidence & Quality
1510	1510-5	UNKNOWNS	North Petroleum Reserve No. 5	United States of America	Active	2010-01-01	North Petroleum Reserve No. 5	2010-01-01	Confidence & Quality
1510	1510-6	UNKNOWNS	North Petroleum Reserve No. 6	United States of America	Active	2010-01-01	North Petroleum Reserve No. 6	2010-01-01	Confidence & Quality
1510	1510-7	UNKNOWNS	North Petroleum Reserve No. 7	United States of America	Active	2010-01-01	North Petroleum Reserve No. 7	2010-01-01	Confidence & Quality
1510	1510-8	UNKNOWNS	North Petroleum Reserve No. 8	United States of America	Active	2010-01-01	North Petroleum Reserve No. 8	2010-01-01	Confidence & Quality
1510	1510-9	UNKNOWNS	North Petroleum Reserve No. 9	United States of America	Active	2010-01-01	North Petroleum Reserve No. 9	2010-01-01	Confidence & Quality
1510	1510-10	UNKNOWNS	North Petroleum Reserve No. 10	United States of America	Active	2010-01-01	North Petroleum Reserve No. 10	2010-01-01	Confidence & Quality

Import, Export and Quality Control



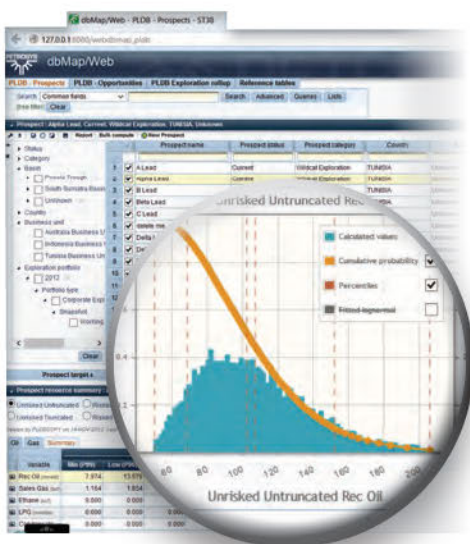
# RISK AND RESOURCES

- Basis for implementing or improving the corporate culture for consistent assessment of resources
- Web-based interface for credible, auditable and repeatable estimation of E&P asset values
- A working solution readily configured to meet corporate workflows and company specific algorithms
- Central repository and database which securely manages this critical company knowledge
- Built on Petrosys' 20 years of practical industry experience and standards in this domain

PLDB

Meeting strategic targets relies on making the best decisions about your exploration and development opportunities. Petrosys understands your goal is to drill the 'best' prospects and undertake the most effective development projects. To accomplish this, you need to assess your exploration and development opportunities fairly and consistently; aggregate your prospect assessments into programs and portfolios so they can be examined as groups as well as single opportunities; and, analyse your portfolios to help decide which prospects to drill and which programs to undertake.

PLDB™ (Prospects and Leads Database) is a powerful enterprise solution for creating an organised, secure repository of your prospects, leads, plays and opportunities. Built for industry standard petroleum



risk assessment and portfolio management workflows, PLDB provides the necessary tools for geoscientists and engineers to improve the risk and resource assessment of oil and gas exploration prospects and development projects.

### Understand and Assess Risk

Quantify and qualify the resource and value potential of exploration and development opportunities, enabling more timely and effective decision making.

### Effective Resource Management

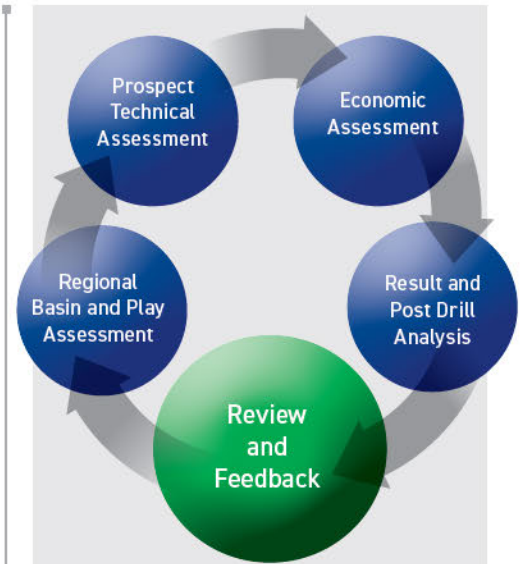
Effectively manage an entire portfolio of opportunities for the resource development lifecycle in a secure, robust and functional way.

### Accelerated Decision Making

Conceptualise, develop, summarise and validate technical assessment of resource potential/risk and the programs required to deliver reserves and production improvements.

### Centralised Knowledge Base and Data Integration

- Map, browse and report from a dynamic web-based portal.
- Seamlessly integrates with the Petrosys desktop solution or your corporate E&P database.
- Effectively integrates with technical input from a diverse range of sources (including PPDM-oriented data management solutions).
- Coupled with Petrosys' well data management, PLDB provides organisations with a complete solution to manage the development and lifecycle of an asset.



### With PLDB you can:

- ✓ Capture and store company plays, prospects, targets and drilling opportunities
- ✓ Describe uncertainty associated with plays, targets, hydrocarbons and economic factors
- ✓ Stochastically and deterministically estimate resources
- ✓ Undertake historical comparison and manage versions of resource estimates
- ✓ Compare and contrast opportunities
- ✓ Effectively and securely manage critical corporate knowledge

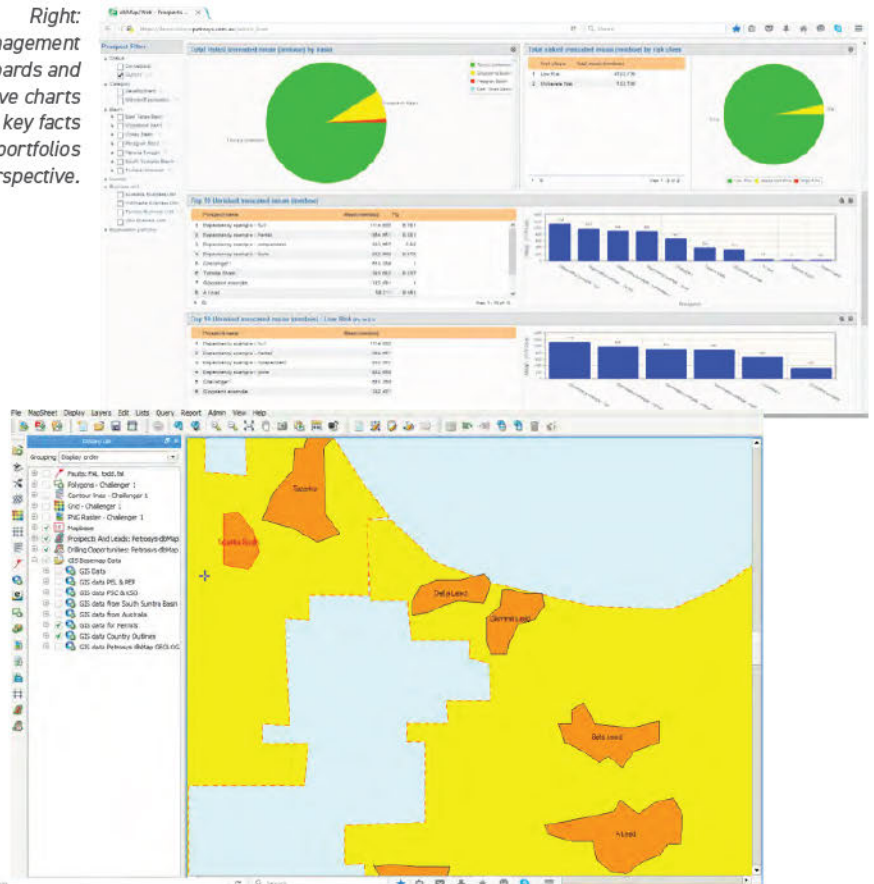
Ultimately make the best decisions about which opportunities to invest in.



## Petrosys Understands Data Management

As an independent mapping and data management software specialist, Petrosys understands the challenges that energy professionals face. The PLDB solution and data model is built on 20+ years of active use, starting with industry standard concepts and being progressively linked with other E&P data including the PPDM standard. The associated PLDB data management tools and user interfaces are a working solution that is readily configured and extended to meet individual corporate needs and to incorporate company-specific algorithms for resource aggregation.

Right: Management dashboards and interactive charts bring key facts about portfolios into perspective.



Implementing industry standard risk assessment and portfolio management concepts, PLDB empowers geoscientists to consistently describe, combine, visualise and quantify risk and value potential at all stages of the E&P lifecycle. PLDB is the basis for implementing a corporate culture around consistent assessment of resources to allow credible, auditable, transparent and repeatable aggregation of E&P asset values.

Right: PLDB uses stochastics to determine resource size, providing a range of potential outcomes in P10, P50 and P90 form.

Above: PLDB is effectively integrated with technical mapping workflows to allow geoscientists to share knowledge.

Prospect target resource computation

Resource type: Conventional oil or gas  
Compsite method: NetPayMethod

Variations in simulation: 10,000  
Event type: Resource estimate  
Reason for change: Built-update required after MDDMGA  
583356 updates

Iteration: 14-Nov-2013 10:16 am by PLDE2

Variable	Minimum (P99)	Low Side (P90)	Median (P50)	Mean	Constant Mode	High Side (P10)	Maximum (P1)	Distribution Type
Purity (%)	0.100	0.150	0.280	0.312	0.500	0.797	0.797	Lognormal
Degree of Fill (%)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	Constant
TGCF (%)	3.800	3.800	3.800	3.800	3.800	3.800	3.800	Constant
Pool Area (ac)	100,000	119,443	300,000	300,000	300,000	410,557	500,000	Triangular
Net Pay (in)	10,000	14,444	32,222	32,222	50,000	54,844	54,844	Uniform
Area Net Pay (in)	8,355	11,553	25,779	25,779	40,003	43,291	43,291	
100% NPV (in)	1,282,422	3,173,721	7,165,986	7,256,630	13,108,967	17,738,657	17,738,657	

Left: Stochastic monte-carlo prospect assessment.





# E&P WORKFLOWS

- Better exploration decisions from more powerful maps and flexible data management tools
- Find elusive targets by rapidly testing a wider range of geological scenarios
- Refine reservoir attributes and shapes in a map view before committing to reservoir models
- Apply standardised processes for reserves estimation and cataloguing
- Track the performance and manage development of producing fields

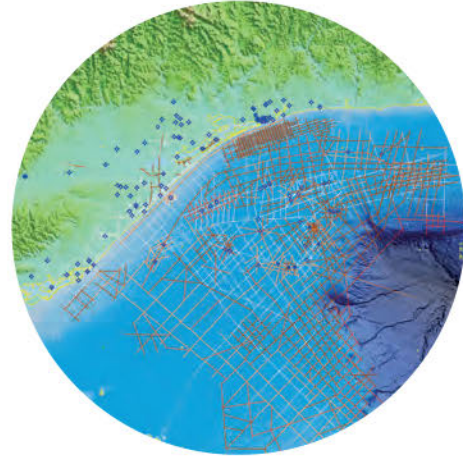
The intuitive interface and powerful connectivity of Petrosys mapping and surface modeling means that geoscientists and engineers can move easily between the wide range of technical and commercial challenges encountered across all stages of the petroleum exploration and development cycle.

Built with access to a broad range of data management tools and stores, and having excellent dynamic handling of global and historic coordinate reference systems, Petrosys provides a solid foundation for working with geotechnical data both at the regional and the field scale.

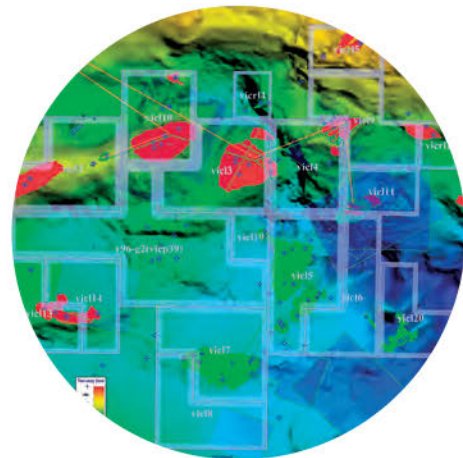
In addition to surface modeling and production quality mapping with intuitive display options specific to well, seismic and geomodeling display types, Petrosys features a surprising array of additional tools that have been identified as useful additions to workflows by our established base of enthusiastic users.

Directional survey computations, seismic velocity handling, vertical time to depth conversion, well tie operations, geostatistics, and a range of data exchange tools, are all accessible to the Petrosys user allowing extensive parts of exploration and development workflows to be completed in the Petrosys environment.

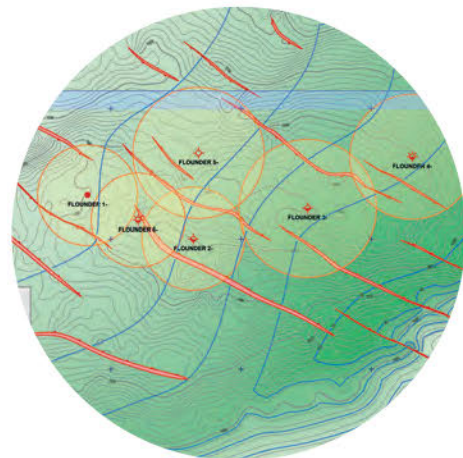
## Regional Exploration

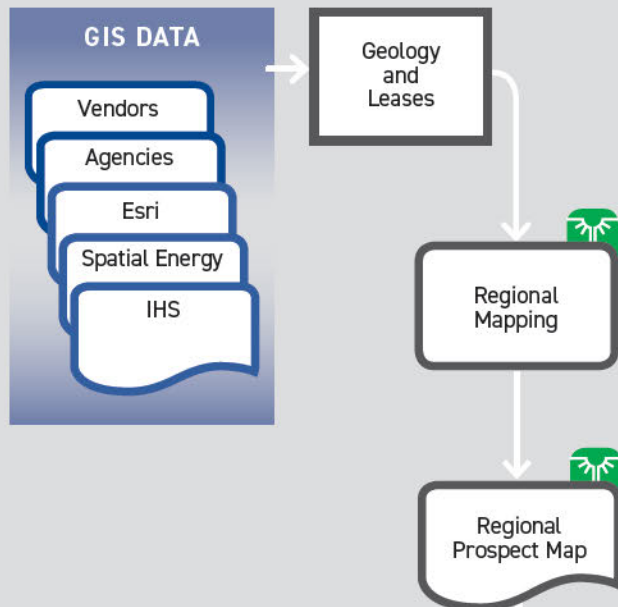


## Project Evaluation



## Field Development



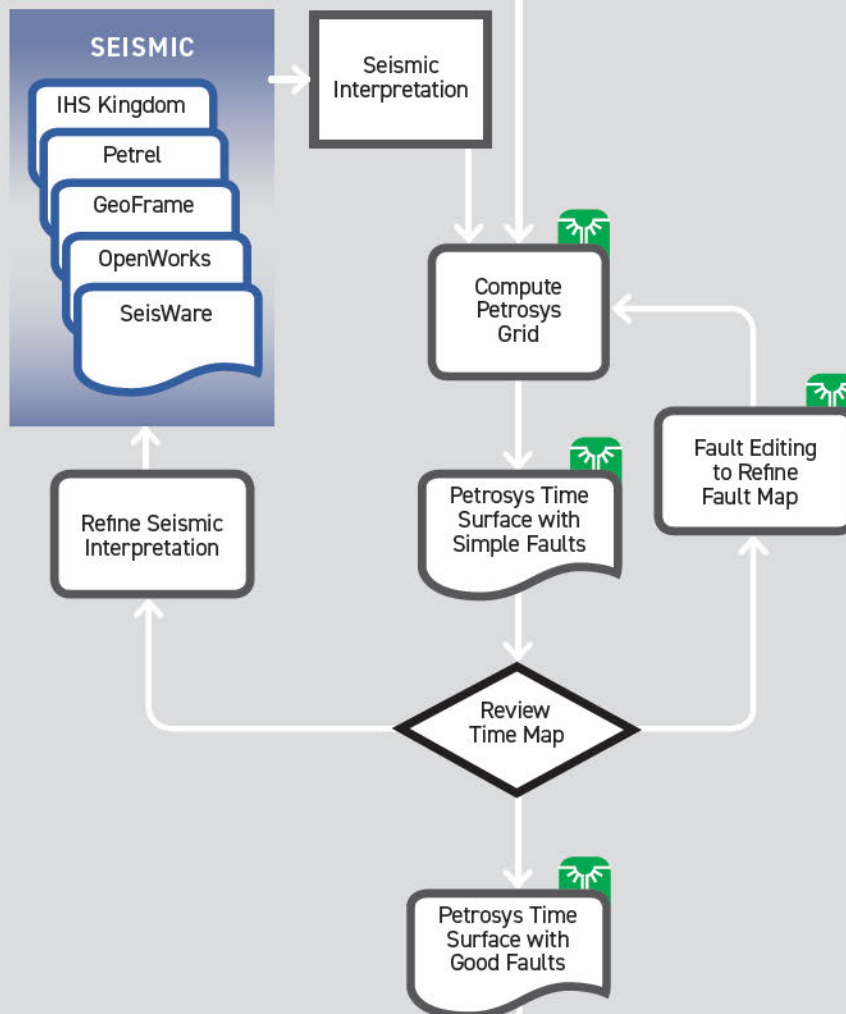


## Regional Assessment

In the reconnaissance stages of exploration, Petrosys lets you make the best use of available regional data sets. The Petrosys GIS display can access GIS data sets whether they are in files such as Arc Shapefiles, MapInfo, DGN or ZGF; in spatial databases such as ArcSDE or Oracle Spatial; from direct links to data vendors; or are raster images or WMS feeds.

Full EPSG coordinate reference systems support quickly puts you in the right location in even the least explored parts of the world.

Using thematic mapping, lease outlines can be posted to graphically highlight the current status of blocks, with dynamic querying of linked data.



## Exploration Seismic

As soon as interpretation of the first seismic is available you can start assembling a time surface model in Petrosys. Whether your geophysics is coming from Kingdom, GeoFrame, Petrel, Epos, SeisWorks or SeisWare, Petrosys gives you the option of working on or offline with the interpretation data.

The Petrosys surface model, with its excellent handling of faults and tailored geophysical displays may suggest alternate structural trends that can be modeled in Petrosys and lead to refinement of the evolving interpretation.

Earlier seismic surveys and interpretation, such as from previous operators or JV partners, can be added to your map, allowing you to take into account previous ideas without the overhead of loading seismic data or introducing additional interpretation software.

## Tying the Seismic Surface to Well Picks

The seismic derived depth surface can be accurately tied to measured well formation picks once those are available. Picks can be accessed directly from the geological application in which they were interpreted, or they can be imported into a Petrosys well data file for offline use.

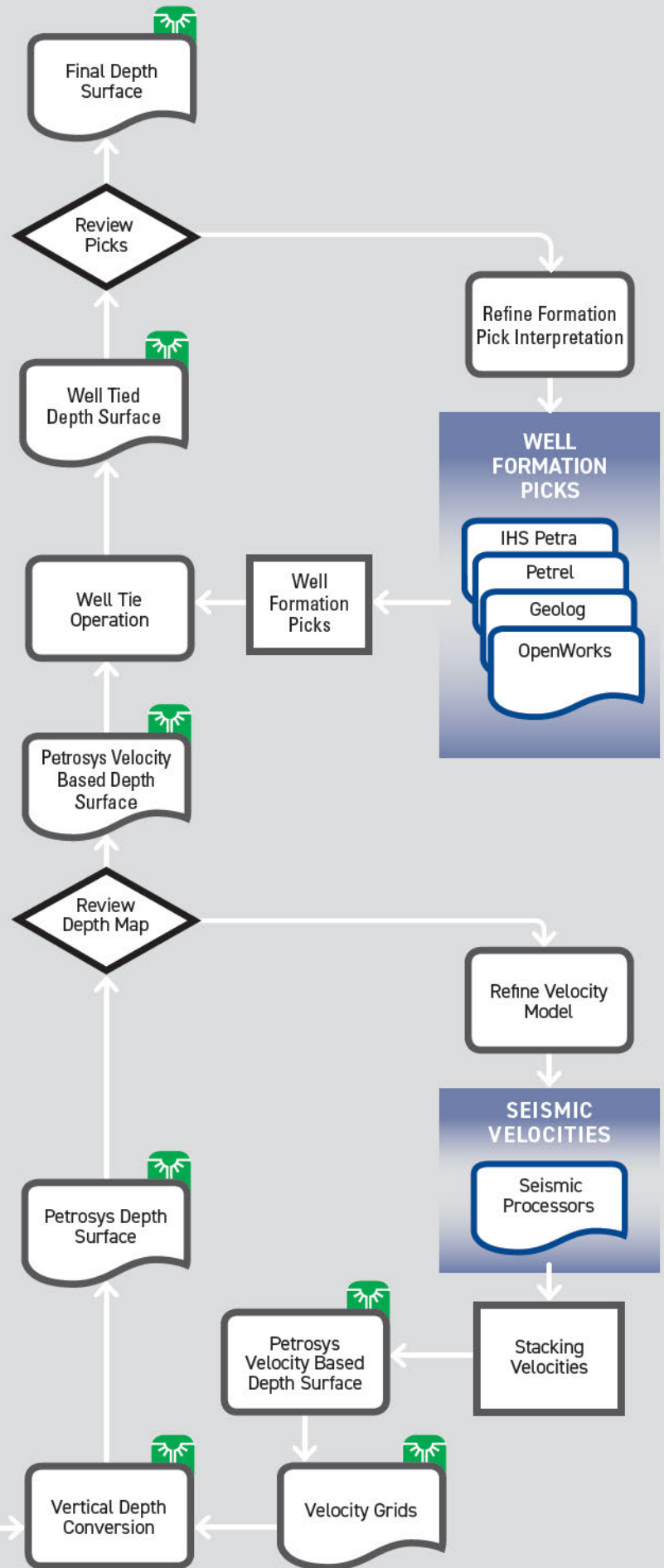
The Petrosys well tie function uses the wide range of Petrosys gridding functions and a selection of extrapolation methods to balance the difference between well based formation picks and the seismic depth model. In addition to the popular minimum curvature method, Kriging is particularly effective for creating a realistic and smoothly varying depth correction.

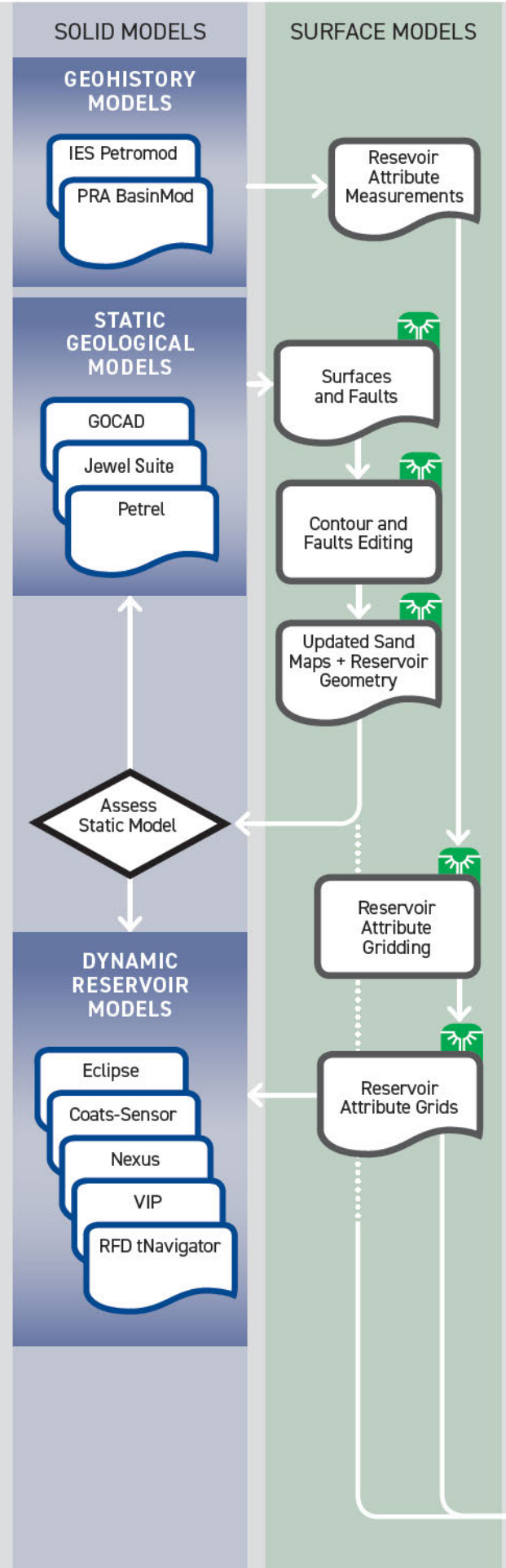
By quality controlling your depth correction in Petrosys map and 3D views, you can identify and re-interpret spurious picks. Petrosys well selection lists make it easy to exclude wells with data errors. If you're linked to a Petrosys data management system, you may have direct access to well completion reports and other unstructured data to resolve depth and other issues in your data set.

## Initial Depth Estimation

Velocity information for initial estimation of depth surfaces from interpreted seismic can be derived by interpolation of stacking velocities to 2D interpreted time horizons, or from well based velocity profiles. Petrosys supports a range of vertical time to depth conversion techniques, both along seismic sections, or through a sequence of gridded surfaces.

The velocity based depth model gives a good representation of the regional structure based on the seismic interpretation.





### Describe Your Reservoir Geology

Understanding the hydrocarbon potential of a structure requires analysis of a broad range of science ranging from regional petroleum systems modeling to detailed geochemistry. Irrespective of the specialised software and expert data sources most appropriate to regional needs, Petrosys can be used to collate and rationalise the data into consistent grid models allowing map and 3D presentations for a more informed interpretation of the subsurface.

### Standardise Net Pay Maps

Map views of reservoir units with associated engineering and economic elements such as drainage areas, lease outlines and transportation infrastructure provide a standardised report format best suited to the short term management and long term auditing of field developments. Changes to surface interpretations, zone thicknesses or reservoir attributes can be documented on map views to enable a rigorous version control over what goes into solid reservoir models.

### Drive Reservoir Simulators

Petrosys map based interpretation of surface and fault geometries can be readily converted into grids of varying resolutions to help build both static and dynamic reservoir models. Easily repeated surface modeling workflows allow significant changes in subsurface interpretation to be rapidly propagated to the gridded data inputs for the rebuilding of a solid model. Output from diverse modeling applications can be put back together to create a coherent geotechnical account on Petrosys maps, for example to demonstrate water encroachment during a modeled exploitation program.

## Automate Reservoir Management

Petrosys mapping and data management tools can be put together with custom database connectors, web service interfaces and heavy duty batch processing for effective implementation of real time reservoir management operations.

## Protect, Preserve and Publish Data

Subsurface assets, in particular, depend on data for their definition. Accurate spatial knowledge, reliable metadata, and a sustainable balance between useful structured and unstructured forms of technical detail can be delivered through a carefully designed Petrosys data management strategy. Long term preservation and vendor neutral access is encouraged through the use of the PPDM data model.

## Plan Future Investment

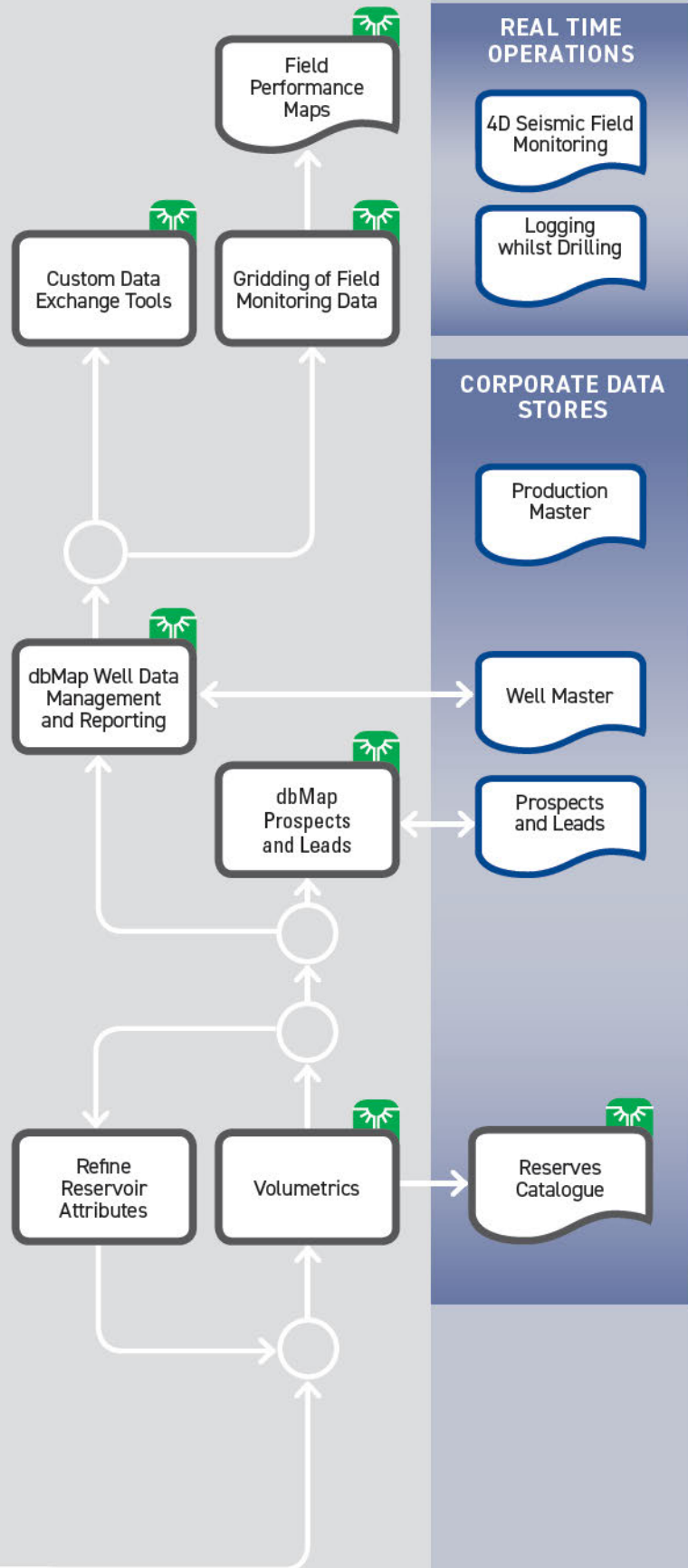
A wide range of factors which influence future E&P investment decisions can be brought together for discussion from the Petrosys map and interfaces. Infrastructure and logistical information from GIS systems can be seen alongside geoscience and reservoir engineering data from E&P applications and stores.

The Petrosys Prospect & Leads development helps manage your E&P asset portfolio, with extensive tools to base future estimates on past performance.

## Catalogue Reserves

Petrosys' extensively tested volume calculations provide rapid and repeatable surface model volumetrics, providing the bottom line numbers underlying net pay maps.

Workflow automation and XML scriptable output make Petrosys the ideal basis for the development of custom reserves catalogue systems suited to individual corporate needs.



# SERVICES

- Innovate, transform and optimise
- Specialist services help to maximise subsurface workflow efficiencies
- Our experts bring best practice insights gained from working with a global client base
- Take advantage of the latest techniques and most efficient practices tailored to your business needs
- See commercially supported software evolve to resolve real business pain points, quickly and cost effectively

## Onsite Visits and Consulting



*Petrosys provides a number of onsite services that will help your staff to improve their competency, skills, efficiency and accuracy.*

## What's New Presentations

Petrosys is constantly improving its software and we love to come and show you what's new. These short presentations are designed to keep your staff informed about the latest enhancements to Petrosys software.

## Lunch and Learns

Lunch and learns are open, interactive sessions that are specifically designed around your business workflow needs. They suit small groups of attendees who have similar workflow requirements.

## Walk Around Visits

Walk arounds provide one-on-one, personalised support for users. These visits allow for specific questions and basic workflow issues to be solved promptly and in the context of real working data.

## Advanced Workflow Consulting

Petrosys provides experienced geoscientists and data managers who are skilled at solving complex workflow issues.



*Petrosys staff can work remotely or onsite. Consulting engagements can span half day to a week, or longer as required.*

### Specific areas of expertise include:

**Mapping Standards** – Ensure consistent and best practice subsurface mapping standards are implemented.

**Connectivity** – Help to validate you are accessing and using all available data, regardless of its type or source.

**Modeling and Depth Conversion** – Experts who are experienced in utilising different modeling/volumetrics techniques help you to make the right choices when it comes to gridding and modeling data.

**Workflows** – One of Petrosys' strengths is easily repeated workflows. We can help you to leverage this power, resulting in improvements to efficiency, error reduction and improved accuracy.

**Visualization** – A critical part of communication. Information is expected to be generated quickly, accurately and delivered in a variety of formats to a diverse audience.

**Health Checks** – Data and system health checks provide a consistent validated environment that can be leveraged with confidence.

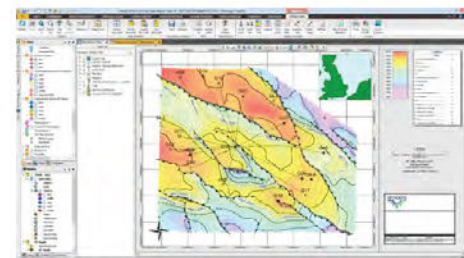
## Bespoke Software Development

Petrosys has a long track record of helping to solve specific business requirements by creating collaborative partnerships with E&P companies around the world. These partnerships allow clients to provide input into software development resulting in accelerated access to solutions that are critical to their business, whilst enabling Petrosys to add additional resources to specific areas.

## Embedded Technology

Petrosys works with clients and partners to see our leading technologies embedded in commercial and in-house software. Petrosys offers OEM licensing, combined with software development expertise to see our technology leveraged in creative and collaborative ways.

The Petrel Mapping Module by Petrosys (PMMbP), is an example of embedded technology - seamlessly integrating advanced map making capabilities in Petrel\*.



*Full details at <http://www.petrosys.com.au/products-services/pmmbp/>.*

*"Petrosys understands the complexity of the E&P business, and maintains expert software development capabilities in the petroleum domain..."*

# TRAINING AND SUPPORT

- Get started in Petrosys immediately
- What you need to run Petrosys
- We can help find the right solution to serve your needs

## Beginner and Intermediate Courses



## Advanced Courses



## Database Courses



## Training and Support

Petrosys offers a comprehensive range of software training designed for individuals and companies to acquire, maintain and optimise their skills. Structured training starts with a one day introduction and can be built up with a number of additional short courses, such that even new users can achieve advanced status within one week. Petrosys can provide customised in-house training to suit your needs, data and schedule, as well as offering public training at major locations worldwide. Please visit [www.petrosys.com.au/training](http://www.petrosys.com.au/training) for course information and public schedules or contact your nearest Petrosys office to arrange on-site training.

Petrosys maintenance and support provides access to the Petrosys global support team which is highly respected for speedy response and expert technical assistance. Take advantage of the team's expertise to resolve issues quickly and make the most of your software investment. A regular schedule of software updates ensures that Petrosys applications evolve with changing industry needs.

To access Petrosys support, call your local Petrosys office or send an email to the general support line [support@petrosys.com.au](mailto:support@petrosys.com.au). Support calls are answered locally and redirected globally when necessary.

Our technology is constantly updated for compatibility with the latest computing environments. Up-to-date information on technical specifications, supported computing environments and 3rd party integration are detailed online at: [www.petrosys.com.au/support/supported-environments/](http://www.petrosys.com.au/support/supported-environments/).



## Get Started Now

### Online self paced training

You'll be creating impressive maps within hours.

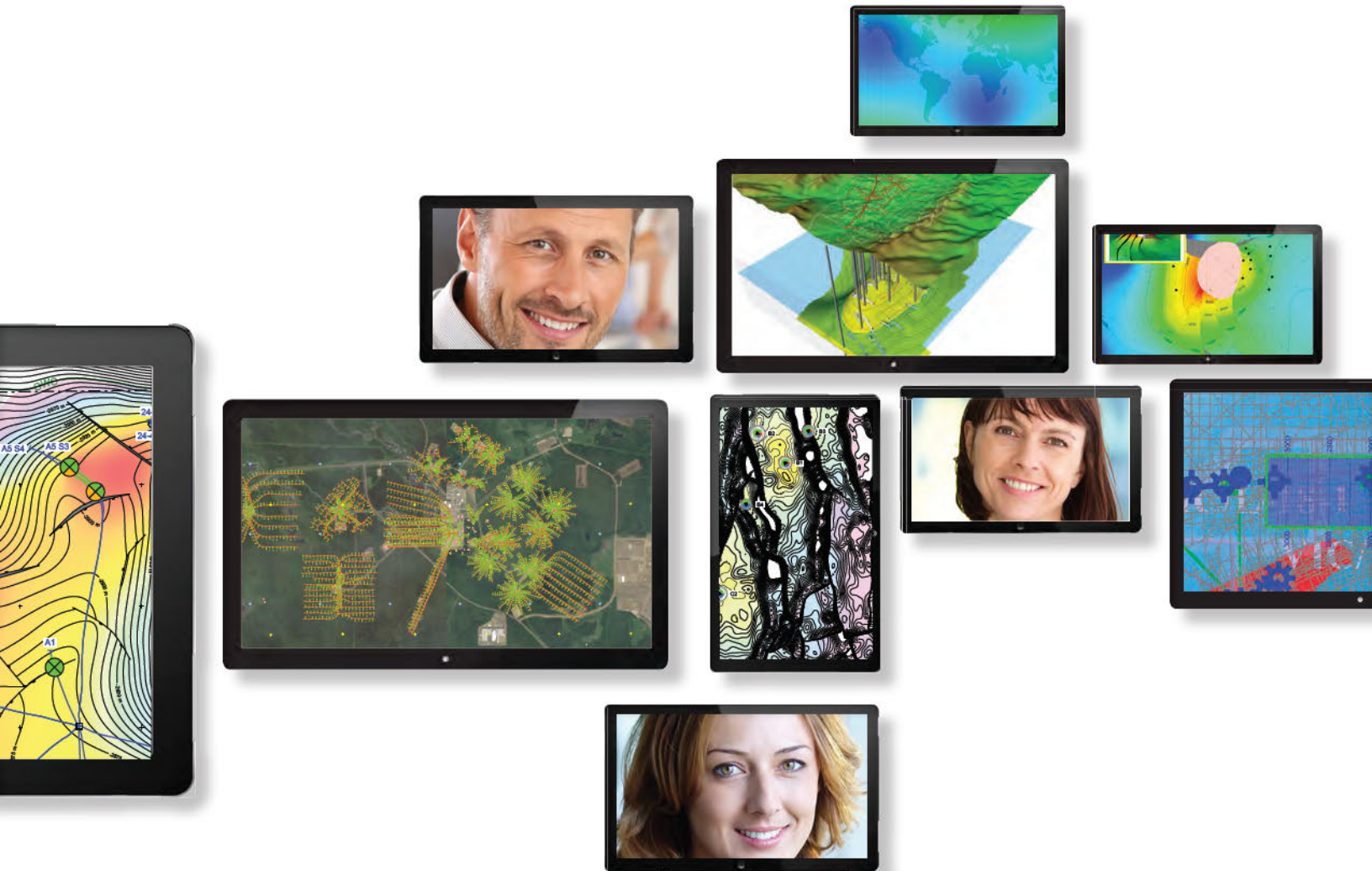
[www.petrosys.com.au/onlinetraining](http://www.petrosys.com.au/onlinetraining)

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# THE PETROSYS ADVANTAGE

As an independent leader in mapping, modeling and E&P data management solutions for over 30 years, we understand the challenges that oil and gas industry professionals face. Our technology and innovative software development programme is committed to enhancing our clients' existing workflows. Public and customised onsite training programmes ensure our clients are using our technology to maximise their productivity and make better decisions in less time. Client testimonials consistently confirm the knowledge and effectiveness of our world-class global support team.



[www.petrosys.com.au](http://www.petrosys.com.au)

AUSTRALIA | CANADA | MALAYSIA | UNITED KINGDOM | USA

GENERAL INFORMATION EMAIL [INFO@PETROSYS.COM.AU](mailto:INFO@PETROSYS.COM.AU)

SUPPORT EMAIL [SUPPORT@PETROSYS.COM.AU](mailto:SUPPORT@PETROSYS.COM.AU)

