

ION GEOPHYSICAL CORP

Form 424B3

July 15, 2010

Table of Contents

**Filed Pursuant to Rule 424(b)(3)
Registration No. 333-166200**

PROSPECTUS

**23,789,536 Shares
ION Geophysical Corporation
Common Stock**

The selling stockholder identified in this prospectus under the heading **Selling Stockholder** is offering and selling up to 23,789,536 shares of our common stock, \$0.01 par value. We issued 23,789,536 shares of our common stock to the selling stockholder in a private placement on March 25, 2010, as described in this prospectus under the heading **The Private Placement**. We will not receive any of the proceeds from the sale of shares by the selling stockholder, but we have agreed to bear the expenses in connection with the registration of the offer and sale of the shares.

The shares may be resold from time to time by and for the account of the selling stockholder named in this prospectus. The methods of resale of the shares offered hereby are described under the heading **Plan of Distribution**. The selling stockholder may sell the shares of common stock described in this prospectus in various ways and at different times as described in this prospectus, but it is not required to sell any of these shares. The price to the public for the shares and the proceeds to the selling stockholder at any time will depend upon the terms of such sale.

Investing in our common stock involves risks. Please read carefully the section entitled **Risk Factors beginning on page 5 of this prospectus, and the sections entitled **Risk Factors**, beginning on page 17 of our Annual Report on Form 10-K for the year ended December 31, 2009, and beginning on page 32 of our Quarterly Report on Form 10-Q for the fiscal quarter ended March 31, 2010, which reports have been filed with the Securities and Exchange Commission and are incorporated by reference into this prospectus.**

Our common stock is listed on The New York Stock Exchange under the symbol **IO**. On July 14, 2010, the last reported sale price of our common stock on The New York Stock Exchange was \$4.32 per share.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the accuracy or adequacy of this prospectus. Any representation to the contrary is a criminal offense.

The date of this prospectus is July 15, 2010.

| | Page |
|--|-------------|
| <u>ABOUT THIS PROSPECTUS</u> | 1 |
| <u>PROSPECTUS SUMMARY</u> | 2 |
| <u>FORWARD-LOOKING STATEMENTS</u> | 4 |
| <u>RISK FACTORS</u> | 5 |
| <u>THE PRIVATE PLACEMENT</u> | 8 |
| <u>USE OF PROCEEDS</u> | 8 |
| <u>SELLING STOCKHOLDER</u> | 8 |
| <u>PLAN OF DISTRIBUTION</u> | 9 |
| <u>LEGAL MATTERS</u> | 13 |
| <u>EXPERTS</u> | 13 |
| <u>WHERE YOU CAN FIND MORE INFORMATION</u> | 13 |
| <u>INCORPORATION OF CERTAIN INFORMATION BY REFERENCE</u> | 13 |

Table of Contents

ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed with the Securities and Exchange Commission (the SEC) utilizing a shelf registration or continuous offering process. Under this shelf registration process, the selling stockholder may, from time to time, sell the securities described in this prospectus in one or more offerings. The selling stockholder acquired the shares of common stock offered for resale under this prospectus in connection with our joint venture transaction with BGP Inc., China National Petroleum Corporation (BGP) in March 2010.

This prospectus provides you with a general description of the securities that may be offered by the selling stockholder. We may, to the extent necessary, provide a prospectus supplement, containing specific information about the selling stockholder and the terms of the securities being offered. That prospectus supplement may include additional risk factors or other special considerations applicable to those securities. Any prospectus supplement may also add, update or change information in this prospectus. If there is any inconsistency between the information in this prospectus and any prospectus supplement, you should rely on the information in that prospectus supplement. You should read both this prospectus and any prospectus supplement together with additional information described under Incorporation of Certain Information by Reference.

The selling stockholder may from time to time offer and sell up to 23,789,536 shares of our common stock owned by such selling stockholder, at prices and on terms to be determined at or prior to the time of sale.

This prospectus does not cover the issuance of any shares of common stock by us to the selling stockholder, and we will not receive any of the proceeds from any sale of shares by the selling stockholder. Except for any underwriting discounts and selling commissions that may be paid by the selling stockholder and any fees and expenses of counsel or other advisors representing any underwriters or other distributors, we have agreed to pay the expenses incurred in connection with the registration of the offer and sale of the shares of common stock covered by this prospectus.

Information about the selling stockholder may change over time. Any changed information given to us by the selling stockholder will be set forth in a prospectus supplement if and when necessary. Further, in some cases, we may file a prospectus supplement containing specific information about the terms on which the selling stockholder or its permitted successors and assignees are offering and selling our common stock. If a prospectus supplement is provided and the description of the offering in the prospectus supplement varies from the information in this prospectus, you should rely on the information in the prospectus supplement.

We have not authorized the selling stockholder or any dealer, salesman or other person to give you any information or to make any representations other than the information (i) contained in the documents that we incorporate by reference into this prospectus or (ii) provided in this prospectus or in any prospectus supplement. You should not rely on any information that is not incorporated by reference into or provided in this prospectus or in any prospectus supplement.

This prospectus (and any prospectus supplement) should not be construed as an offer to sell, or a solicitation of an offer to buy, the securities offered hereby in any jurisdiction to any person to whom it is unlawful to make an offer or solicitation in that jurisdiction.

You should not assume that the information contained in this prospectus or any accompanying prospectus supplement is accurate on any date subsequent to the date set forth on the front of such document or that any information that we have incorporated by reference into this prospectus and any accompanying prospectus supplement is correct on any date subsequent to the date of the document so incorporated by reference, even though this prospectus and any accompanying prospectus supplement is delivered or deemed delivered, or the securities are sold, on a later date.

As used in this prospectus, the terms ION, company, we, our, ours and us refer to ION Geophysical Corporation and its consolidated subsidiaries, except where the context otherwise requires or as otherwise indicated.

Table of Contents

PROSPECTUS SUMMARY

This summary highlights selected information about us and this offering by the selling stockholder contained elsewhere in this prospectus and the documents incorporated by reference into this prospectus. This summary is not complete and may not contain all of the information that is important to you. We urge you to read carefully this prospectus, any accompanying prospectus supplement, and any documents we incorporate by reference in this prospectus and any accompanying prospectus supplement before you make your investment decision.

Our Company

We are a leading provider of geophysical technology, services, and solutions for the global oil and gas industry, offering advanced seismic data acquisition equipment, seismic software, and seismic planning, processing, and interpretation services to the global energy industry. Our product and service offerings allow exploration and production (E&P) operators to obtain higher resolution images of the subsurface to reduce the risk of exploration and reservoir development, and to enable seismic contractors to acquire geophysical data more efficiently.

We serve customers in all major energy producing regions of the world from strategically located offices in 20 cities on five continents. In March 2010, we formed a land seismic equipment joint venture with BGP Inc., China National Petroleum Corporation (BGP), a wholly-owned oil field service subsidiary of China National Petroleum Corporation (CNPC). We believe that this joint venture will provide us the opportunity to further extend the geographic scope of our business through the sales and service facilities of BGP, especially in Africa, the Middle East, China and Southeast Asia.

Our products and services include the following:

Land seismic data acquisition equipment, principally through our 49%-owned INOVA Geophysical Equipment Ltd. joint venture with BGP,

Marine seismic data acquisition equipment,

Navigation, command & control and data management software products,

Planning services for survey design and optimization,

Seismic data processing and reservoir imaging services, and

Seismic data libraries.

Seismic imaging plays a fundamental role in hydrocarbon exploration and reservoir development by delineating structures, rock types and fluid locations in the subsurface. Geoscientists interpret seismic data to identify new sources of hydrocarbons and pinpoint drilling locations for wells, which can be costly and entail a high degree of risk. As oil and gas reservoirs have become harder to find and more expensive to develop and exploit in recent years, the demand for advanced seismic imaging solutions has grown. In addition, seismic technologies are now being applied more broadly over the entire life cycle of a hydrocarbon reservoir to optimize production. For example, time-lapse seismic images (referred to as 4D or four-dimensional surveys), in which the fourth dimension is time, can be made of producing reservoirs to track the movement of injected or produced fluids and/or to identify locations containing by-passed hydrocarbons.

We have been involved in the seismic technology industry for approximately 40 years, starting in the 1960s when we designed and manufactured seismic equipment under our previous company name, Input/Output, Inc. In recent years, we have transformed our business from being principally a manufacturer and seller of seismic equipment to being a provider of a full range of seismic imaging products, technologies, and services.

In recent years, we have operated our company through four business segments. Three of these segments—Land Imaging Systems, Marine Imaging Systems and Data Management Solutions—make up our ION Systems

Table of Contents

division. The fourth segment is our ION Solutions division. The businesses comprising the Land Imaging Systems segment changed upon the completion of the INOVA Geophysical Equipment Ltd. joint venture with BGP.

Land Imaging Systems analog geophone sensors; and, through our INOVA Geophysical joint venture with BGP, cable-based, cableless and radio-controlled seismic data acquisition systems, digital sensors, vibroseis vehicles (i.e. vibrator trucks) and source controllers for detonator and energy sources business lines;

Marine Imaging Systems towed streamer and redeployable ocean bottom cable seismic data acquisition systems and shipboard recorders, streamer positioning and control systems and energy sources (such as air guns and air gun controllers);

Data Management Solutions software systems and related services for navigation and data management involving towed marine streamer and seabed operations; and

ION Solutions advanced seismic data processing services for marine and land environments, seismic data libraries, and our Integrated Seismic Solutions (ISS) services.

Our executive headquarters are located at 2105 CityWest Boulevard, Suite 400, Houston, Texas 77042-2839. Our telephone number is (281) 933-3339. Our home page on the Internet is www.iongeo.com. We make our website content available for information purposes only. It should not be relied upon for investment purposes, nor is it incorporated by reference into this prospectus.

For a description of our business, financial condition, results of operations and other important information regarding us, please refer to our filings with the SEC incorporated by reference in this prospectus. For instructions on how to find copies of these and our other filings incorporated by reference in this prospectus, see **Where You Can Find More Information**.

The Offering

| | |
|---|--|
| Common stock offered by the selling stockholder | Up to 23,789,536 shares |
| Use of proceeds | All of the proceeds from the sale of common stock covered by this prospectus will be received by the selling stockholder. We will not receive any proceeds from the sale of the shares of common stock covered by this prospectus. |
| NYSE symbol | IO |

Risk Factors

An investment in our common stock involves a high degree of risk. For a discussion of certain matters that should be considered by prospective purchasers of our common stock offered hereby, see the section entitled **Risk Factors** beginning on page 5 of this prospectus, and the sections entitled **Risk Factors**, (i) beginning on page 17 of our Annual Report on Form 10-K for the fiscal year ended December 31, 2009 and (ii) beginning on page 32 of our Quarterly Report on Form 10-Q for the fiscal quarter ended March 31, 2010, which reports have been filed with the SEC and are incorporated by reference into this prospectus.

Table of Contents

FORWARD-LOOKING STATEMENTS

This prospectus contains or incorporates by reference statements concerning our future results and performance and other matters that are forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the Securities Act) and Section 21E of the Securities Exchange Act of 1934, as amended (the Exchange Act). These statements involve known and unknown risks, uncertainties and other factors that may cause our or our industry s results, levels of activity, performance or achievements to be materially different from any future results, levels of activity, performance or achievements expressed or implied by such forward-looking statements. In some cases, you can identify forward-looking statements by terminology such as may, will, would, should, intend, expect, plan, anticipate, believe, estimate, predict, potential or continue or the negative of such terms or comparable terminology. Examples of other forward-looking statements contained or incorporated by reference in this prospectus include statements regarding:

the expected effects of current and future worldwide economic conditions and demand for oil and natural gas and seismic equipment and services;

future compliance with our debt financial covenants;

future benefits to be derived from our INOVA Geophysical joint venture with BGP;

future availability of cash to fund our operations and pay our obligations;

the timing of anticipated sales;

future levels of spending by our customers;

future oil and gas commodity prices;

future cash needs and future sources of cash, including availability under our bank credit facilities;

expected net revenues, income from operations and net income;

the expected outcome of litigation and other claims against us;

expected gross profits for our products and services;

future benefits to our customers to be derived from our new products and services;

future growth rates for certain of our products and services;

the degree and rate of future market acceptance of our new products and services;

our expectations regarding oil and gas exploration and production companies and contractor end-users purchasing our more expensive, more technologically advanced products and services;

anticipated timing and success of commercialization and capabilities of products and services under development and start-up costs associated with their development;

expected improved operational efficiencies from our full-wave digital products and services;

potential future acquisitions;

future levels of capital expenditures;

4

Table of Contents

our ability to maintain our costs at consistent percentages of our revenues in the future;

future demand for seismic equipment and services;

future seismic industry fundamentals;

the adequacy of our future liquidity and capital resources;

future opportunities for new products and projected research and development expenses;

success in integrating our acquired businesses;

sufficient future profits to fully utilize our net operating losses;

expectations regarding realization of deferred tax assets; and

anticipated results regarding accounting estimates we make.

These forward-looking statements reflect our best judgment about future events and trends based on the information currently available to us. Our results of operations can be affected by inaccurate assumptions we make or by risks and uncertainties known or unknown to us. Therefore, we cannot guarantee the accuracy of the forward-looking statements. Actual events and results of operations may vary materially from our current expectations and assumptions.

Information regarding some of the important factors that could cause actual results to differ, perhaps materially, from those described in our forward-looking statements is contained in the section entitled "Risk Factors" below.

We disclaim any obligation, other than as may be imposed by law, to publicly update or revise any forward-looking statement, whether as a result of new information, future events or otherwise.

RISK FACTORS

In addition to the sections entitled "Risk Factors" in our Annual Report on Form 10-K for the year ended December 31, 2009 (beginning on page 17), and in our Quarterly Report on Form 10-Q for the fiscal quarter ended March 31, 2010 (beginning on page 32), which have been filed with the SEC and are incorporated by reference into this prospectus, we believe the following risk factors that relate to this offering should be considered carefully.

Our stock price has historically been very volatile from time to time. It declined precipitously from June 2008 to March 2009, and could decline again.

The securities markets in general and our common stock in particular have experienced significant price and volume volatility in 2008, 2009 and 2010. The market price and trading volume of our common stock may continue to experience significant fluctuations due not only to general stock market conditions but also to a change in sentiment in the market regarding our operations or business prospects or those of companies in our industry. In addition to the other risk factors discussed in this section, the price and volume volatility of our common stock may be affected by:

operating results that vary from the expectations of securities analysts and investors;

factors influencing the levels of global oil and natural gas exploration and exploitation activities, such as a decline in prices for natural gas in North America or reduced exploration in the Gulf of Mexico due to governmental restrictions;

the operating and securities price performance of companies that investors or analysts consider comparable to us;

announcements of strategic developments, acquisitions and other material events by us or our competitors; and

Table of Contents

changes in global financial markets and global economies and general market conditions, such as interest rates, commodity and equity prices and the value of financial assets.

To the extent that the price of our common stock remains at lower levels or it declines further, our ability to raise funds through the issuance of equity or otherwise use our common stock as consideration will be reduced. In addition, further increases in our leverage may make it more difficult for us to access additional capital. These factors may limit our ability to implement our operating and growth plans.

If we, our option holders or stockholders holding registration rights sell additional shares of our common stock in the future, the market price of our common stock could decline. Additionally, our outstanding shares of Series D Preferred Stock are convertible into shares of our common stock. The conversion of the Series D Preferred Stock and exercise of our stock options could result in substantial dilution to our existing stockholders. Sales in the open market of the shares of common stock acquired upon such conversion or exercises may have the effect of reducing the then-current market prices for our common stock.

The market price of our common stock could decline as a result of sales of a large number of shares of our common stock in the market in the future, or the perception that such sales could occur. These sales, or the possibility that these sales may occur, could make it more difficult for us to sell equity securities in the future at a time and at a price that we deem appropriate.

As of April 30, 2010, we had 152,279,674 shares of common stock issued and outstanding. Substantially all of these shares are available for public sale, subject in some cases to volume and other limitations or delivery of a prospectus. At April 30, 2010, we had outstanding stock options to purchase up to 7,637,600 shares of our common stock at a weighted average exercise price of \$7.53 per share. We also had, as of that date, 9,462 shares of common stock reserved for issuance under outstanding restricted stock unit awards.

On April 8, 2010, Fletcher International, Ltd., the holder of our Series D-1 Cumulative Convertible Preferred Stock, Series D-2 Cumulative Convertible Preferred Stock and Series D-3 Cumulative Convertible Preferred Stock (together, the Series D Preferred Stock), converted 8,000 shares of Series D-1 Cumulative Convertible Preferred Stock and 35,000 shares of Series D-3 Cumulative Convertible Preferred Stock into a total of 9,659,231 shares of our common stock. After giving effect to this conversion, Fletcher continues to hold 22,000 shares of our Series D-1 Cumulative Convertible Preferred Stock and 5,000 shares of our Series D-2 Cumulative Convertible Preferred Stock. Under the terms of the agreement with Fletcher by which it purchased the Series D Preferred Stock, Fletcher has the ability to sell, under currently effective registration statements, the shares of our common stock acquired by it upon conversion of the Series D Preferred Stock.

In September 2009, Fletcher delivered a notice to us purporting to increase the total maximum number of shares of our common stock into which Fletcher's preferred shares may convert, from 9,669,434 shares to 11,669,434 shares. Fletcher had delivered to us a similar notice in November 2008 to increase the then-maximum total number of shares of common stock into which Fletcher's preferred shares could convert, from 7,669,434 shares to 9,669,434 shares. Because we believe that our agreement with Fletcher does not provide it, as the holder of our Series D Preferred the right to demand the additional increase requested in September 2009, we have filed a declaratory judgment action in the Court of Chancery of the State of Delaware asking the court to resolve the issue. We currently have other pending litigation with Fletcher in Delaware regarding other issues involving our Series D Preferred Stock. For more information regarding our pending litigation with Fletcher, please see the sections entitled Legal Proceedings of our Annual Report on Form 10-K for the year ended December 31, 2009 (beginning on page 35), and of our Quarterly Report on Form 10-Q for the fiscal quarter ended March 31, 2010 (beginning on page 31).

The conversion of our outstanding shares of Series D Preferred Stock into shares of our common stock will dilute the ownership interests of existing stockholders. Sales in the public market of shares of common stock issued upon conversion would likely apply downward pressure on prevailing market prices of our common stock. In addition, the very existence of the outstanding shares of the Series D Preferred Stock represents potential issuances of common stock upon their conversion, and could represent potential sales into the market of our common stock to be acquired on conversion, which could also depress trading prices for our common stock.

Table of Contents

The conversion price of our outstanding Series D Preferred Stock is also subject to certain customary anti-dilution adjustments. For additional information regarding the terms of our Series D Preferred Stock, please see the section entitled "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations - Liquidity and Capital Resources - Sources of Capital - Cumulative Convertible Preferred Stock" on page 56 of our Annual Report on Form 10-K for the year ended December 31, 2009.

The 18,500,000 shares of common stock that we issued in June 2009 to certain institutional investors may be resold into the public markets in transactions pursuant to a currently-effective registration statement that was declared effective by the SEC on June 16, 2009. Thus, to the extent they have not already done so, these purchasing institutional investors currently have the right to dispose of their shares in the public markets.

Shares of our common stock are also subject to certain demand and piggyback registration rights held by Laitram, L.L.C. We also may enter into additional registration rights agreements in the future in connection with any subsequent acquisitions or securities transactions we may undertake. Any sales of our common stock under these registration rights arrangements with Laitram or other stockholders could be negatively perceived in the trading markets and negatively affect the price of our common stock. Sales of a substantial number of our shares of common stock in the public market under these arrangements, or the expectation of such sales, could cause the market price of our common stock to decline.

Our INOVA Geophysical Joint Venture with BGP involves numerous risks.

Our INOVA Geophysical joint venture with BGP is focused on designing, engineering, manufacturing, research and development, sales and marketing and field support of land-based equipment used in seismic data acquisition for the oil and gas industry. Excluded from the scope of the joint venture's business will be (x) the analog sensor businesses of our company and BGP and (y) the businesses of certain companies in which BGP or we are currently a minority owner. In addition to these excluded businesses, all of our other businesses - Marine Imaging Systems, Data Management Solutions and ION Solutions, which includes GXT's Imaging Solutions, Integrated Seismic Solutions (ISS) and BasinSPAN and seismic data libraries - will remain owned and operated by us and will not comprise a part of the joint venture.

We may encounter difficulties in developing and expanding the business of INOVA Geophysical, funding capital contributions to the joint venture, exercising influence over the management and activities of the joint venture, quality control concerns regarding joint venture products and services and potential conflicts of interest with the joint venture and our joint venture partner. Any inability to meet our obligations as a joint venture partner under the joint venture agreement could result in our being subject to penalties and reduced percentage interests in the joint venture for our company. Also, we could be disadvantaged in the event of disputes and controversies with our joint venture partner, since our joint venture partner is a relatively significant customer of our products and services and future products and services of the joint venture.

The joint venture is also subject to various additional risks that could adversely affect our results of operations. These risks include the following:

our interests could diverge from BGP's interests in the future or we may not be able to agree with BGP on ongoing manufacturing, research and development and operational activities, or on the amount, timing or nature of further investments in the joint venture;

the terms of our joint venture arrangements may turn out to be unfavorable;

we currently own 49% of the total equity interests in INOVA Geophysical, meaning that there are many decisions affecting the business of the joint venture that we cannot control;

the joint venture's cash flows may be inadequate to fund its capital requirements, thereby requiring contributions to the capital of the joint venture by the partners;

Table of Contents

joint venture profits and cash flows may prove inadequate to fund cash dividends from the joint venture to the joint venture partners; and

we may experience difficulties and delays in ramping up production of the joint venture's products.

If the INOVA Geophysical joint venture is unsuccessful, our business, results of operations and financial condition will likely be adversely affected.

Recent events in the Gulf of Mexico may increase costs and cause delays for our customers, the effects of which could adversely affect our company.

In April 2010, the *Deepwater Horizon* drilling rig in the Gulf of Mexico sank following a catastrophic explosion and fire. Hydrocarbons have been discharged continuously into the Gulf of Mexico from the wellhead since the time of this disaster, as efforts to close the wellhead and contain the spill continue. These events, coupled with a federal government moratorium on deep-water drilling, have created uncertainties about future industry operations in the Gulf. They will likely result in increased governmental regulation and enforcement in a number of areas, including health and safety, environmental, licensing, taxation, equipment specifications and training requirements, as well as increased difficulty for E&P operators in obtaining leases and permits to drill offshore wells, and higher costs of operation. The effects of these events may result in an adverse effect on our business, results of operations or financial condition.

THE PRIVATE PLACEMENT

In connection with the completion of our joint venture and related transactions with BGP on March 25, 2010, we issued and sold a total of 23,789,536 shares of our common stock to BGP in a privately-negotiated transaction exempt from registration under the Securities Act. The 23,789,536 shares consisted of (i) 10,204,082 shares acquired by BGP upon its conversion of the approximately \$28.6 million principal balance of indebtedness outstanding under a Convertible Promissory Note issued by us dated as of October 23, 2009 (the *Convertible Note*) and (ii) 13,585,454 shares purchased directly by BGP from us for approximately \$38.0 million, under a Stock Purchase Agreement dated as of March 19, 2010 by and between BGP and ION. The conversion price per share of our common stock under the *Convertible Note* and the purchase price per share under the direct sale was \$2.80 per share.

The joint venture and related transactions were described in ION's Current Report on Form 8-K filed with the SEC on March 31, 2010.

At the closing of the transactions under the BGP Stock Purchase Agreement, we also entered into an Investor Rights Agreement with BGP dated as of March 25, 2010, to govern the parties' relationship with regards to BGP's ownership of the shares of our common stock that BGP acquired upon conversion of the *Convertible Note* and under the Stock Purchase Agreement. The Investor Rights Agreement, among other things, provides BGP with certain demand and piggyback registration rights, including rights to cause us to file with the SEC a registration statement or registration statements under the Securities Act to register resales of the shares of common stock acquired by BGP under the Stock Purchase Agreement. This prospectus forms part of a registration statement that we have filed with the SEC as requested by BGP under its Investor Rights Agreement.

USE OF PROCEEDS

We will not receive any proceeds from sales of the shares of common stock by the selling stockholder pursuant to this prospectus. The selling stockholder will receive all of the net proceeds from these sales.

SELLING STOCKHOLDER

On March 25, 2010, we issued and sold 23,789,536 shares of our common stock to BGP at an effective purchase price of \$2.80 per share. See *The Private Placement* above. BGP represented to us at the time of purchase that it was acquiring the shares for its own account, and that it did not have any agreement or understanding with any other person or entity to distribute any of the shares purchased.

The term *selling stockholder* also includes any transferees, pledgees, donees or other successors in interest to the selling stockholder, who acquire shares from the selling stockholder in accordance with the terms of the Investor Rights Agreement.

Under the Investor Rights Agreement, we agreed to permit BGP to designate a nominee to serve on our Board of Directors. On April 1, 2010, we announced the appointment of Guo Yueliang to our Board of Directors. Mr. Guo

currently serves as Vice President of China National Petroleum Corporation, an affiliate of BGP, and until December 31, 2010 served as an executive officer of BGP. For our fiscal years ended December 31, 2009 and 2008, sales to BGP and CNPC collectively accounted for approximately 8.0% and 5.1% of our consolidated net revenues, respectively. Except as set forth in this paragraph, the selling stockholder had no position, office or relationship with us within the past three years.

Table of Contents

Information regarding the selling stockholder and any of its transferees may change from time to time and any changed information will be set forth in an amendment or amendments to the registration statement of which this prospectus is a part, or in prospectus supplements, if and when necessary.

The selling stockholder may dispose of all, some or none of its shares in this offering. See Plan of Distribution below. Because the selling stockholder may sell all, some or none of the shares beneficially owned by it, we cannot estimate the number of shares of common stock that will be beneficially owned by the selling stockholder after this offering.

The following table sets forth certain information regarding the selling stockholder's beneficial ownership of our common stock before and after this offering, and the number of shares of common stock to be sold by the selling stockholder in this offering. Beneficial ownership is determined in accordance with Rule 13d-3(d) promulgated by the SEC under the Exchange Act. Unless otherwise noted, the selling stockholder possesses sole voting and investment power with respect to the shares.

| Name of Selling Stockholder | Beneficial Ownership Before Offering | | Number of Shares Being Offered | Beneficial Ownership After Offering | |
|--------------------------------|--|----------------------|-----------------------------------|---|-------------------|
| | Number of Shares Owned | Percent | | Number of Shares | Percent |
| | BGP Inc., China National Petroleum Corporation | 23,789,536 shares | | 15.6% | 23,789,536 shares |

PLAN OF DISTRIBUTION

The shares of common stock being offered by the selling stockholder may be sold or distributed from time to time by the selling stockholder, or by pledgees, donees or transferees of, or other successors-in-interest to, the selling stockholder, directly to one or more purchasers (including pledgees) or through brokers, dealers or underwriters who may act solely as agents or who may acquire shares as principals and will act independently of us in making decisions with respect to the timing, manner and size of each sale.

The shares may be sold in one or more transactions at:

fixed prices,

prevailing market prices at the time of sale,

prices related to the prevailing market prices,

varying prices determined at the time of sale, or

otherwise negotiated prices.

The shares may be sold by one or more of the following methods:

a block trade in which the broker-dealer so engaged will attempt to sell the offered securities as agent but may position and resell a portion of the block as principal to facilitate the transaction,

purchases by a broker-dealer as principal and resales by the broker-dealer for its account pursuant to this prospectus,

Table of Contents

on any national securities exchange or quotation service on which our common stock may be listed or quoted at the time of sale, including the New York Stock Exchange (NYSE),

in the over-the-counter market,

in transactions otherwise than on these exchanges or systems or in the over-the-counter market,

through the writing of options, whether such options are listed on an options exchange or otherwise,

an exchange distribution in accordance with the rules of the applicable exchange,

sales pursuant to Rule 144 under the Securities Act,

agreements between broker-dealers and the selling stockholder to sell a specified number of such shares at a stipulated price per share,

ordinary brokerage transactions and transactions in which the broker solicits purchasers,

privately negotiated transactions,

by pledge to secure debts or other obligations,

at the market to or through market makers or into an existing market for our common stock,

in other ways not involving market makers or established trading markets, including direct sales to purchasers or sales effected through agents,

to cover hedging transactions made pursuant to this prospectus,

underwritten offerings,

a combination of any such methods of sale, and

any other method permitted under applicable law.

If required, this prospectus may be amended or supplemented on a continual basis to describe a specific plan of distribution. In making sales, broker-dealers engaged by the selling stockholder may arrange for other broker-dealers to participate in the resales.

If the selling stockholder effects such transactions by selling shares of common stock to or through underwriters, broker-dealers or agents, such underwriters, broker-dealers or agents may receive commissions in the form of discounts, concessions or commissions from the selling stockholder or commissions from purchasers of the shares of common stock for whom they may act as agent or to whom they may sell as principal (which discounts, concessions or commissions as to particular underwriters, broker-dealers or agents may be in excess of those customary in the types of transactions involved). The selling stockholder may sell shares of common stock short and deliver shares of common stock covered by this prospectus to close out short positions and to return borrowed shares in connection with such short sales, but only if such transactions comply with Section 16(c) of the Exchange Act and the rules and regulations adopted by the SEC under such Section 16(c) (assuming Section 16 is then applicable to the selling stockholder). The selling stockholder may also loan or pledge shares of common stock to broker-dealers that in turn may sell such shares.

The selling stockholder may pledge or grant a security interest in some or all of the shares of common stock owned by it and, if it defaults in the performance of its secured obligations, the pledgees or secured parties may offer and sell

the shares of common stock from time to time pursuant to this prospectus or any amendment to this prospectus under Rule 424(b)(3) under the Securities Act or other applicable provision under the Securities Act, amending, if necessary, the description of the selling stockholder included herein to include the pledgee, transferee

Table of Contents

or other successors in interest as a selling stockholder under this prospectus. The selling stockholder also may transfer and donate the shares of common stock in other circumstances in which case the transferees, donees, pledgees or other successors in interest will be the selling beneficial owners for purposes of this prospectus.

In connection with the sale of shares, the selling stockholder may, subject to the terms of the Investor Rights Agreement, (1) enter into transactions with brokers, dealers or others, who in turn may engage in sales, including short sales, of the shares in the course of hedging the positions they assume, (2) deliver shares to close out positions entered into with brokers, dealers or others or (3) loan shares to brokers, dealers or others that may in turn sell such shares. The brokers, dealers or others referred to in (1) above may engage in those transactions referred to in (1), (2) or (3) above through this prospectus.

The selling stockholder may enter into option, swap or other transactions with broker-dealers, other financial institutions or others that require the delivery to the broker-dealers, financial institutions or others of the shares. The broker-dealer or other financial institution or others may then resell or transfer these shares through this prospectus. The selling stockholder may also loan or pledge its shares to a broker-dealer or other financial institution. The broker-dealer or financial institution may sell the shares that are loaned or pursuant to a right to rehypothecate while pledged or, upon a default, the broker-dealer or other financial institution may sell the pledged shares by use of this prospectus. The broker-dealer or other financial institution may use shares pledged by the selling stockholder or borrowed from the selling stockholder or others to settle those sales or to close out any related open borrowings of shares, and may use securities received from the selling stockholder in settlement of those derivatives to close out any related open borrowings of shares.

All transactions by the selling stockholder with respect to our shares of common stock will have to comply with Section 16 of the Exchange Act and the rules and regulations adopted by the SEC under Section 16 until such time as the selling stockholder is no longer directly or indirectly the beneficial owner of more than 10 percent of our common stock. This includes Section 16(c) and the rules and regulations under Section 16(c) relating to certain short sales of our common stock by the selling stockholder.

Some or all of the shares offered in this prospectus may also be sold to or through an underwriter or underwriters. Any shares sold in that manner will be acquired by the underwriters for their own accounts and may be resold at different times in one or more transactions, including negotiated transactions, at a fixed public offering price or at varying prices determined at the time of sale. These shares may be offered to the public through underwriting syndicates represented by one or more managing underwriters or may be offered to the public directly by one or more underwriters. Any public offering price and any discounts or concessions allowed or disallowed to be paid to dealers may be changed at different times.

The selling stockholder may pay usual and customary or specifically negotiated underwriting discounts and concessions or brokerage fees or commissions in connection with their sales.

The selling stockholder and any dealers or agents that participate in the distribution of the shares may be deemed to be underwriters within the meaning of the Securities Act, and any commission paid, or any discounts or concessions allowed to, any such broker-dealer may be deemed to be underwriting commissions or discounts under the Securities Act. At the time a particular offering of the shares of common stock is made, a prospectus supplement, if required, will be filed which will set forth the total number of shares of common stock being offered in such distribution and the terms of the offering, including the name or names of any broker-dealers or agents, any discounts, commissions and other terms constituting compensation from the selling stockholder and any discounts, commissions or concessions allowed or reallocated or paid to broker-dealers.

The selling stockholder and any other person participating in such distribution will be subject to applicable provisions of the Exchange Act and the rules and regulations thereunder, including, without limitation, Regulation M under the Exchange Act, which may limit the timing of purchases and sales of any of the shares of common stock by the selling stockholder and any other participating person. Regulation M may also restrict the ability of any person engaged in the distribution of the shares of common stock to engage in market-making activities with respect to the shares of common stock. All of the foregoing may affect the marketability of the shares of common stock and the ability of any person or entity to engage in market-making activities with respect to the shares of common stock.

Table of Contents

To the extent required by the Securities Act, a prospectus supplement will be filed that will disclose the specific number of shares of common stock to be sold, the name of the selling stockholder, the purchase price, the public offering price, the names of any agent, dealer or underwriter and any applicable commissions paid or discounts or concessions allowed with respect to a particular offering, and other facts material to the transaction.

We will pay all expenses of the registration of the shares of common stock pursuant to the terms of the Investor Rights Agreement, including, without limitation, SEC filing fees and expenses of compliance with state securities or blue sky laws; the selling stockholder will pay all underwriting discounts and selling commissions, if any. We will indemnify the selling stockholder against certain liabilities, including liabilities under the Securities Act, or the selling stockholder will be entitled to contribution, all in accordance with the terms of the Investor Rights Agreement. We may be indemnified by the selling stockholder against certain civil liabilities, including liabilities under the Securities Act, that may arise from any written information furnished to us by the selling stockholder specifically for use in this prospectus, or we may be entitled to contribution, all in accordance with the terms of the Investor Rights Agreement. We will not receive any of the proceeds from the sale of the shares of common stock offered by this prospectus.

We have agreed to file a registration statement with the SEC for the benefit of the selling stockholder and to keep it effective for a period of 90 days after the later of the following dates:

the effective date of such registration statement; or

the date on which the applicable holding period for restricted securities held by an affiliate of our company pursuant to Rule 144 under the Securities Act shall have lapsed;

however, this period may be extended under certain circumstances pursuant to the Investor Rights Agreement. In no event will we be obligated to keep any such registration statement effective at any time on or after the date on which there are no longer any shares for which the registration rights are provided under the Investor Rights Agreement.

Any securities covered by this prospectus that qualify for sale pursuant to Rule 144 under the Securities Act may be sold under that rule rather than pursuant to this prospectus.

The shares may be sold through registered or licensed brokers or dealers if required under applicable state securities laws. Additionally, in some states the shares may not be sold unless they have been registered or qualified for sale in the applicable state or an exemption from the registration or qualification requirement is available and is complied with.

Once sold pursuant to the registration statement of which this prospectus forms a part, the shares of common stock will be freely tradable in the hands of persons other than our affiliates.

Table of Contents

LEGAL MATTERS

Mayer Brown LLP, Houston, Texas, has passed on certain legal matters with respect to the shares of common stock offered hereunder.

EXPERTS

The consolidated financial statements of ION Geophysical Corporation and subsidiaries appearing in ION Geophysical Corporation's Annual Report (Form 10-K) for the year ended December 31, 2009 (including the schedule appearing therein), and the effectiveness of ION Geophysical Corporation's and subsidiaries' internal control over financial reporting as of December 31, 2009, have been audited by Ernst & Young LLP, independent registered public accounting firm, as set forth in their reports thereon included therein, and incorporated herein by reference. Such consolidated financial statements are incorporated herein by reference in reliance upon such reports given on the authority of such firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We have filed with the SEC a registration statement on Form S-3 under the Securities Act with respect to the shares. This prospectus, which is included in the registration statement, does not contain all of the information in the registration statement.

In portions of this Form S-3, we incorporate by reference information from parts of other documents filed with the SEC. The SEC allows us to disclose important information by referring to it in this manner, and you should review this information. We file annual, quarterly and special reports, proxy statements and other information with the SEC under the reporting requirements of the Exchange Act. You may read and copy any document we file at the SEC's public reference room located at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the public reference room. Our filings with the SEC are also available to the public at the SEC's website at <http://www.sec.gov>.

We make our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, annual reports and proxy statements for our stockholders' meetings, as well as any amendments to those reports, available free of charge through our website as soon as reasonably practicable after we electronically file those materials with, or furnish them to, the SEC. You can learn more about us by reviewing our SEC filings on our website. Our SEC reports can be accessed through the investor relations page of our website located at www.iongeo.com.

We furnish holders of our common stock with annual reports containing financial statements audited by our independent registered public accounting firm in accordance with generally accepted accounting principles following the end of each fiscal year.

Our common stock is listed on the NYSE and we are required to file reports, proxy statements and other information with the NYSE. You may obtain information on any document we file with the NYSE at the offices of The New York Stock Exchange, Inc. which is located at 20 Broad Street, New York, New York.

Descriptions in this prospectus of documents are intended to be summaries of the material, relevant portions of those documents, but may not be complete descriptions of those documents. For complete copies of those documents, please refer to the exhibits to the registration statement and other documents filed by us with the SEC.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The following documents that we have filed with the SEC are incorporated herein by reference:

Our Annual Report on Form 10-K for our fiscal year ended December 31, 2009, as amended by Form 10-K/A filed with the SEC on July 9, 2010;

Our Quarterly Report on Form 10-Q for our fiscal quarter ended March 31, 2010;

Table of Contents

Our Current Reports on Form 8-K filed with the SEC on January 14, March 25, March 31, April 1, April 12 and June 1, 2010, to the extent filed and not furnished pursuant to Section 13(a) of the Exchange Act;

The description of our common stock, \$0.01 par value per share, contained in our Registration Statement on Form 8-A filed with the SEC on October 17, 1994, as amended by our Current Reports on Form 8-K filed with the SEC on March 8, 2002, December 20, 2007 and February 28, 2008, respectively; and

The description of our rights to purchase shares of Series A Junior Participating Preferred Stock contained in our Registration Statement on Form 8-A filed with the SEC on January 5, 2009.

All documents we file with the SEC pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act after the date of this prospectus but before the termination of the offering by this prospectus shall be deemed to be incorporated herein by reference and to be a part hereof from the date of the filing of those documents. In no event, however, will any information that we furnish under Item 2.02 or Item 7.01 of any Current Report on Form 8-K that we may file from time to time with the SEC be incorporated by reference into or otherwise included in this prospectus.

Any statement contained in a document incorporated by reference herein shall be deemed to be modified or superseded for all purposes to the extent that a statement contained in this prospectus, or in any other subsequently filed document which is also incorporated or deemed to be incorporated by reference, modifies or supersedes such statement. Any statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this prospectus.

We will provide, without charge, to each person to whom a copy of this prospectus has been delivered, upon written or oral request of such person, a copy of any or all of the documents incorporated by reference herein (other than certain exhibits to such documents not specifically incorporated by reference). Requests for such copies should be directed to:

ION Geophysical Corporation
2105 CityWest Blvd.
Suite 400
Houston, Texas 77042-2839
Tel: (281) 933-3339
Attention: Senior Vice President,
General Counsel and Corporate Secretary

14